

Life Science Journal

Acta Zhengzhou University Overseas Edition

Life Science Journal

Marsland Press
PO Box 180432
Richmond Hill, New York 11418, USA

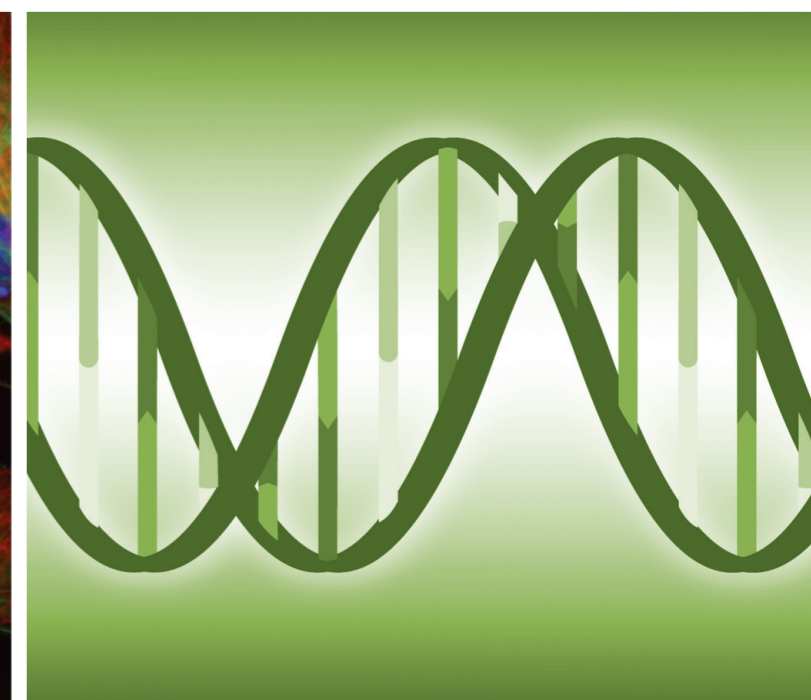
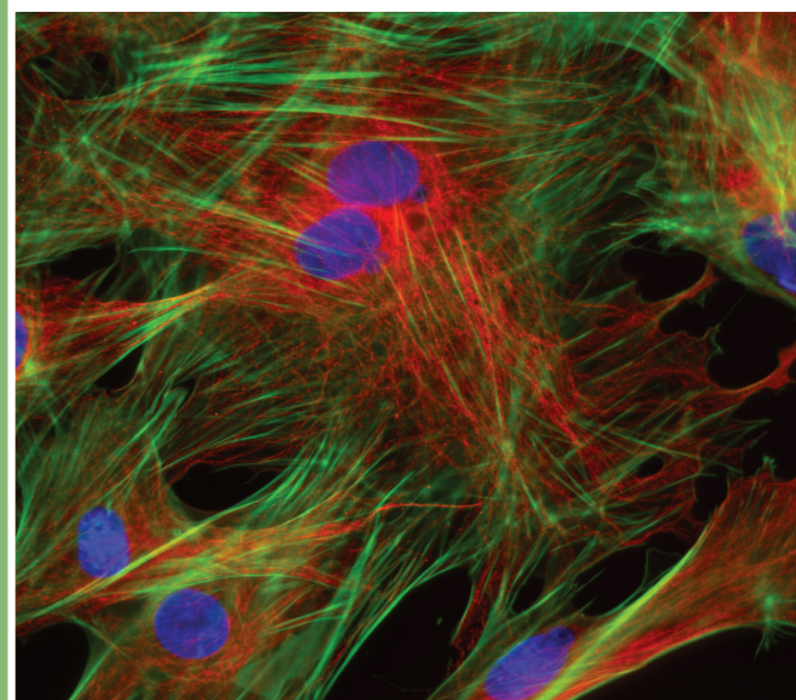
Website:
<http://www.lifesciencesite.com>

Emails:
editor@sciencepub.net
lifesciencej@gmail.com

Phone: (347) 321-7172

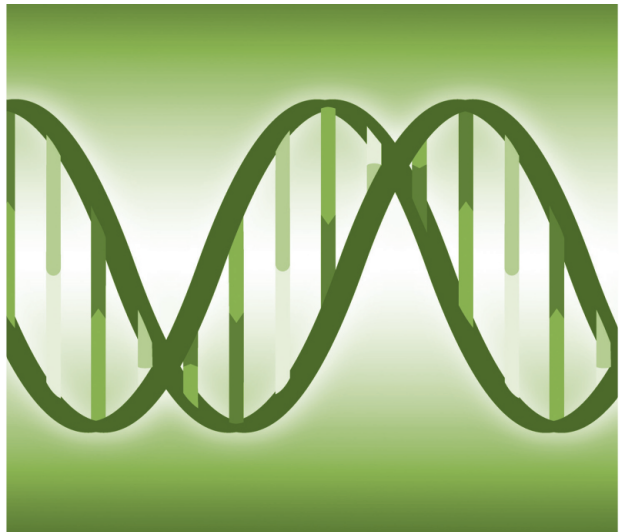
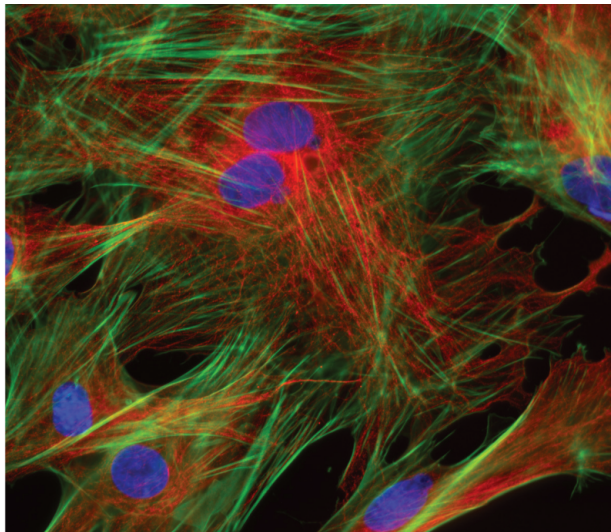
Cover design: CAO, Zhaolong
Photograph: YANG, Yizhong; YOUNG, Mary

Life Science Journal
2013
Volume 10, Number 1, Part 9
ISSN:1097-8135



Volume 10, Number 1, Part 9 March 25, 2013 ISSN:1097-8135

Life Science Journal



 **MARSLAND PRESS**
Multidisciplinary Academic Journal Publisher

Website:
<http://www.lifesciencesite.com>

Emails:
editor@sciencepub.net
lifesciencej@gmail.com

Life Science Journal - Acta Zhengzhou University Oversea Version

ISSN: 1097-8135

Life Science Journal, the Acta Zhengzhou University Oversea Version, is an international journal with the purpose to enhance our natural and scientific knowledge dissemination in the world under the free publication principle. The journal is calling for papers from all who are associated with Zhengzhou University-home and abroad. Any valuable papers or reports that are related to life science - in their broadest sense - are welcome. Other academic articles that are less relevant but are of high quality will also be considered and published. Papers submitted could be reviews, objective descriptions, research reports, opinions/debates, news, letters, and other types of writings. Let's work together to disseminate our research results and our opinions.

Editor-in-Chief: Shen, Changyu, Ph.D., Professor, Chinese Academy of Sciences

Associate Editors-in-Chief: Ma, Hongbao; Cherng, Shen; Xin, Shijun

Editorial Boards: Aghdam, Hashemi; An, Xiuli; Cao, Zhaolong; Chandra, Avinash; Chen, George; Dong, Ziming; Duan, uangcai; Edmondson, Jingjing; Fu, Qiang; Fu, Xianzhen; Gao, Danying; Han, Quancheng; Han, Zhijiang; Hosseini, Seyyed Mousa; Huang, Shuan-Yu; Kan, Quancheng; Lang, Jinghe; Li, Hui; Li, Xinhua; Li, Yan; Li, Yuhua; Li, Yusheng; Li, Zhen; Lindley, Mark; Liu, Hongmin; Liu, Hua; Liu, Xinjing; Ma, Changsheng; Ma, Margret; Ma, Yongsheng; Maio, Zhongrong; Ming, Gongguang; Mousavi, Amin; Nie, Wei; Qi, Yuanming; Qiao, Nancy X; Qin, Jie; Qin, Qin; Qin, Yuhua; Ouyang, Da; Sabyasachi Chatterjee; Seryasat, Omid Rahmani; Shang, Fude; Shi, Lifeng; Song, Chunpeng; Song, Yongping; Spurr, Lydia; Sun, Yan; Sun, Yingpu; Sun, Yiwu; Tan, Song; Venkatesh, Jaganathan; Wang, Jianliu; Wang, Lidong; Wang, Longde; Wang, Xiaoying; Wang, Yilong; Wang, Yongjun; Wang, Zhonggao; Wen, Jianguo; Wu, Ziyang; Xu, Cunshuan; Xu, Yuming; Xue, Changgui; Yang, Qian; Young, Jenny; Zaki, Mona; Zhang, Guangxian; Zhang, Hong; Zhang, Jianying; Zhang, Kehao; Zhang, Liusuo; Zhang, Mingzhi; Zhang, Rui; Zhang, Shengjun; Zhang, Shuijun; Zhang, Suming; Zhang, Wei; Zhang, Xueguo; Zhang, Yanzhou; Zhang, Zhan; Zhang, Zhao; Zhang, Zhenxiang; Zhu, Huaijie.

Introductions to Authors

1. General Information: (1) **Goals:** As an international journal published both in print and on internet, **Life Science Journal** is dedicated to the dissemination of fundamental knowledge in all areas of nature and science. The main purpose of **Life Science Journal** is to enhance our knowledge spreading in the world under the free publication principle. It publishes full-length papers (original contributions), reviews, rapid communications, and any debates and opinions in all the fields of nature and science. (2) **What to Do:** The **Life Science Journal** provides a place for discussion of scientific news, research, theory, philosophy, profession and technology - that will drive scientific progress. Research reports and regular manuscripts that contain new and significant information of general interest are welcome. (3) **Who:** All people are welcome to submit manuscripts in life science fields. Papers of other fields are also considered. (4) **Copyright and Responsibility of Authors to their Articles:** When the manuscript(s) is submitted to the journal, the authors agree the following: All the authors have participated sufficiently in this work; The article is not published elsewhere; Authors are responsibility on the contents of the article; The journal and author(s) have same right for the copyright of the article and either of the journal or author(s) can use it by anyway without noting the other party. (5) **Publication Costs:** US\$640 per article to defray costs of the publication will be paid by the authors when it is received. (6) **Advertisements:** The price will be US\$400/page, and we normally accept one advertisement for one page. Other size of the advertisement please contact with our editorial office through email.

2. Manuscript Preparation - Each manuscript is suggested to include the following components but authors can do their own ways: (1) **Title:** including the complete article title; each author's full name; institution(s) with which each author is affiliated, with city, state/province, zip code, and country; and the name, complete mailing address, telephone number, facsimile number (if available), and at least one email address for author(s). (2) **Abstract:** including Background, Materials and Methods, Results, and Discussions. (3) **Key Words.** (4) **Introduction.** (5) **Materials and Methods.** (6) **Results.** (7) **Discussions.** (8) **Acknowledgments.** (9) **References.**

3. Manuscripts Submission: (1) **Submission Methods:** Submission through email (editor@sciencepub.net or lifesciencej@gmail.com) is encouraged. (2) **Software:** The Microsoft Word file. (3) **Font:** Normal, Times New Roman, 10 pt, single space. (4) **Page Setup:** Paper-Letter size; Margins-2.54 cm each side; Header/Footer-1.27 cm. (5) **Indent:** Type 8 spaces in the beginning of each new paragraph. (6) **Manuscript:** Don't use "Footnote" or "Header and Footer". (7) **Email:** At least one author's email must be put under title. (8) **Title:** Use Title Case in the title and subtitles, e.g. "Molecular Study of Stem Cell". (9) **Figures and Tables:** Use full word of figure and table, e.g. Figure 1. Annual Income of Different Groups, Table 1. Annual Increase of Investment. (10) **References:** Cite references by "last name, year", e.g. "(Smith, 2003)". References should include all the authors' last names and initials, title, journal, year, volume, issue, and pages etc. **Reference Examples: Journal Article:** Hacker J, Hentschel U, Dobrindt U. Prokaryotic chromosomes and disease. *Science* 2003;301(34):790-3. **Book:** Berkowitz BA, Katzung BG. Basic and clinical evaluation of new drugs. In: Katzung BG, ed. Basic and clinical pharmacology. Appleton & Lance Publisher. Norwalk, Connecticut, USA. 1995:60-9. (11) **Submission Address:** editor@sciencepub.net or lifesciencej@gmail.com, Marsland Press, PO Box 180432, Richmond Hill, New York 11418, USA, 347-321-7172.

Life Science Journal - Acta Zhengzhou University Overseas Edition (*Life Sci J*), ISSN: 1097-8135

PO Box 180432, Richmond Hill, New York 11418, USA

<http://www.lifesciencesite.com>; <http://www.sciencepub.net>; lifesciencej@gmail.com; editor@sciencepub.net

CONTENTS

184	Some Studies in Baraki Sheep Intoxicated with Cadmium. Mona. S. Zaki and Mohamed M.I	1202-1205
185	Assessment of Pravastatin effects on healing of bone defect in rats Ghafour Mousavi, Daryoush Mohajeri	1206-1209
186	Students' And Teachers' Perspectives On Biotechnology Education: A Review On Publications In Selected Journals Rashidah Begum Gelamdin, Norlidah Alias, Mohammad Attaran	1210-1221
187	Assessing Quality Assurance for Teaching and Learning in Higher Education in Malaysia: Reflecting on its Policy and Processes Abu Bakar Nordin, Norlidah Alias & Saedah Siraj	1222-1232
188	Corporate Governance and Predicting Bankruptcy of Firms Using Survival Analysis (Case Study of Companies Listed in Tehran Stock Exchange) Maryam Mokarami, Zeinab Motefares	1233-1239
189	Histological and Cytological Effects Of Aqueous Extract of <i>Myristica fragrans</i> (Nutmeg) on the Renal Cortical of Male and Female Rats Aisha D. Alalwani	1240-1249
190	deniatbo stcartxe lonahte dna retaw fo seitivitca recnacitna dna tnadixoitna iakaN <i>sisnetreapleuq asaSmorf</i> Ji Young Kim, Jung Hyun Kim, Ji Hee Byun, Ji Hye Kim, Youn Ji Lee, Soon Jae Im, Dong-Sun Lee, Seo Hyun Moon, Min Young Kim	1250-1254
191	Return and Volatility in Tehran Stock Exchange Seyed Hossein Miri, Ph.D.	1255-1259
192	Relationship between Internet Addiction, Mental Health, and Academic Performance among Adolescents 15 to 18 Years Referred to Cafe-Net in Hamedan-Iran Fatemeh Saraei, Mohammad Esmaeil Ebrahimi and Mohammad Reza Zoghi Paydar	1260-1267
193	The Relationship between Organizational Commitment and Job Burnout among High Schools Physical Education Teachers Shahram Alam (PhD), Shahrokh bahmaei (MA), Maryam Monazami (MA), Zahra Alam (MA)	1268-1273
194	Application of GIS, AHP, Fuzzy and WLC in Island Ecotourism Development (Case study of Qeshm Island, Iran) Soolmaz Dashti, Seyed Masoud Monavari, Seyed Mohsen Hosseini, Borhan Riazi, Mansoor Momeni	1274-1282
195	Outcome of Different Diagnostic and Therapeutic Modalities of Acute Lower Gastrointestinal Bleeding; a University Hospital Experience Yasser El-Naggar, Essam A. Wahab, Afifi F. Afifi, Hasan Abd Alshaqour and Abdelrahman I. Abdelrahman	1283-1292

196	Reviewing Customer Satisfaction of After Sales Services Quality Case Study: Modiran Khodro Co. (MVM) Sassan Eisazadeh Nashli, Ali Shahsavarian, Fatemeh Karimi, Mostafa Maleki	1293-1297
197	Satirical Poetry:An Intuitive Propensity or a Novel Technique Javad Sadounzadeh, Sohad jadary, Moradali Valadbeigi,Ebrahim Yaghobi	1298-1307
198	Cesarean Delivery on Maternal Request in Zanzan, Iran Shakeri M, MS.c, Shakibazade E, Ph.D, Arami R, MS.c, Soleimani M, MS.c	1308-1311
199	The Contributing Factors Associated withBreastfeeding durationin Iranian Mothers, 2012 Shakeri M, MS.c, Mojtahedi Y,MD, Rostamkhani F, MS.c, Moghadam R, MS.c	1312-1316
200	New actors of international law, reality or dream? (The role of non-state international organizations at international level) Pooneh Tabibzadeh	1317-1331
201	Evaluation of Some Material Properties of Cercon Fixed Partial Dentures Yaser M. Alkhiary	1332-1337
202	Application of ICT in Psychological Operations and War Mohammad Abolfathi,Bahram Moradi,Shapoor Amrai,Bakhtiar-Maleki-Tulabi	1338-1346
203	Educational Needs Assessment for Warehouse Workers (Case of Govah Company) Shokouh Alamati	1347-1351

Some Studies in Barki Sheep Intoxicated with Cadmium.

Mona. S. Zaki* Abd El-Rahman, H.H**, Mohamed M.I** and Soha S. Abd El-Magid**

*. Department of Hydrobiology National Research Center, Egypt

** Department. of Animal Production National Research Center, Egypt

dr_mona_zaki@yahoo.co.uk

Abstract: Eighteen rams (27 - 28 kg. B.wt and 6 - 10 months old) were divided into 3 equal groups (gps. 1-3) and kept on a basal ration to evaluate the cadmium toxicity on the digestibility, blood picture and reproductive status, beside the hepatic and renal functions. Gp. (1) was the control. Gps. (2 and 3) were orally given 50 and 100 mg. Cadmium chloride/kg. Bwt respectively for 4 weeks. Heparinized and non-heparinized blood samples were collected for blood picture and serum separation, respectively. The serum was used for the determination of some biochemical blood parameters. Atrophy and necrosis of the testes, liver and kidneys were associated with clinicopathological changes. A significant decrease was detected in the values of RBCs, PCV, Hb, LH, FSH, Testosterone, total proteins, zinc concentration and digestion coefficient. On the other hand, there was significant increase in levels of ESR, WBCs, ALT, AST, Urea, Creatinine, Sodium, Potassium and Cadmium.

[Mona. S. Zaki, Abd El-Rahman, H.H, Mohamed M.I and Soha S. Abd El-Magid. **Some Studies in Barki Sheep Intoxicated with Cadmium.** *Life Sci J* 2013;10(1):1202-1205] (ISSN: 1097-8135). <http://www.lifesciencesite.com>.

184

Keywords: Baraki Sheep, Cadmium toxicity, liver function, kidney function.

1. Introduction

The heavy metals are toxic due to the low rate of its elimination from the body. The environmental contamination with heavy metals such as lead, cadmium, zinc, mercury and copper are widely distributed in the agricultural land and water, **Adriana (1986), Hires et al., (1999), Bryant and Rose (1995)**. The heavy metals may be absorbed from digestive tract of the animal, some by grazing, some of these metals are toxic virtually for every system of human body, **Kabata and Peiido (1999)** and may cause serious health problems in man, depending on their levels of contamination, **Fayed and Abdallall (1997)**. Industrial agriculture like coal and oil combustion byproducts chemical and chloride plant emissions, fertilizers and sludge used in agricultural lands **Kajikawa et al. (1991)**. Sewage effluents, some types of plastics and pesticides are considered the primary source of lead and cadmium pollutions for animals and fish, **Abe and Itakawa (1993)**. Heavy metals are cumulative poisons for man and animals, therefore the current study was planned to estimate the effect of cadmium on the nutritional status of sheep together with its effect on the liver, kidney and reproductive organs from the clinicopathologic aspect increased.

Anoxia, depression, emaciation, tucked up abdomen pluse and respiration rates with laboured breathing, exophthalmia and diarrhea beside frequently edema were encountered after 30 days on treatment.

The objectives of the present work were to study the effects of cadmium toxicosis on

digestibility, hematology and reproductive status beside the liver and kidney functions of sheep.

2. Material and Methods

Eighteen rams (6-10 month old and 27-28 kg Bwt) were equally divided into 3 groups (gps. 1-3) and kept on a balanced ration. (Table 1). Gp. (1) was the control. Gp. (2) was orally given 50 mg cadmium chloride/kg B wt/day. Gp. (3) was orally given 100 mg cadmium chloride/kg Bwt/day. The experiment extended for 4 successive weeks.

Blood was collected from the jugular vein after 30 days of the start of the experiment in heparinized test-tubes for determination of blood picture according to **Jain (1986)** and non heparinized test-tubes for serum collection where test tubes were centrifuged at 3000 r.p.m. for 15 minutes and then the sera were kept in deep freeze at -20°C. Determination of total testosterone was done by **Radiimmunoassay method according Ismail (1986)**. Evaluation of follicular stimulating hormone (F.S.H) and leutinizing hormone (L.H.) were determined by **Kulin and Santer (1977) and Fuquay (1983)**. Serum zinc, sodium, potassium and cadmium were estimated by atomic absorption according to **Joseph and Roger (1979)**.

The activities of aspartate aminotransferase (AST) and alanine aminotransferase (ALT), beside the total protein, urea and creatinine were determined by using commercial kits (diagnostic kits-Bio Merieux France).

Three digestion trials were conducted to evaluate the digestion coefficients of nutrients of the

three groups. The animals of each treatment were penned individually in the digestion cages. The digestion trials lasted for 21 days. The preliminary period lasted for the first 14 days and the collection period lasted for the other 7 days. The fecal samples were collected daily and dried at 60°C for 72 hrs and

men stored in screw-top glass jars for determining the different chemical constituents according to **A.O.A.C. (1984)**. Statistical analysis of the obtained data were determined by using student (t) test according to **Gad and Weil (1983)**.

Table (1): Composition of the basal diet for sheep, according to the national research. Council (1976): Nutrient requirements of domestic animals, National Academy of science, Washington D.C, 5th edition (4): 10 -26.

Ingredient	Percentage
Cotton seed cake.	30
Corn yellow.	25
Roughages.	25
Wheat bran.	15.5
Calcium chloride.	2
Sodium chloride.	1
Vitamin and mineral mixture	2

Calculated Nutrient Composition:

Crude protein.	18.525
Energy (ME/ kg).	1772.5
Crude fiber.	13.51
Ether extract.	2.85
Calcium.	2.111
Phosphorus.	0.649

Table (2): Some haematological parameters after 30 days of experiments (Means ± SE)

Groups	Control 1	Cadmium chloride 50mg 2	Cadmium, chloride 100mg 3
RBCs $10^6/\text{mm}^3$	9.08 ± 0.03	8.75 ± 0.01*	8.00 ± 0.43**
PCV%	34 ± 0.25	32 ± 0.14*	30 ± 0.27**
HB g/dl.	12.7 ± 0.72	11.8 ± 0.08*	10.9 ± 0.012**
ESR mm/2hrs	1.04 ± 0.32	2.00 ± 0.79*	1.07 ± 0.98**
WBCs $10^3/\text{mm}^3$	7.94 ± 0.32	8.01 ± 0.73	8.09 ± 0.88**

**P<0.01

*P<0.05

PCV = Packed cell volume. ESR = Sedimentation rate HB = Hemoglobin W.B.C.S = White blood cells.
RBCs = Red blood corpuscles.

Table (3): Effect of cadmium chloride on some biochemical parameters after 30 days of experiments (Means ± SE)

Groups	Control 1	Cad cl 50mg 2	Cad cl 100mg 3
AST U/L	22.7 ± 0.22	23 ± 0.49*	33.5 ± 0.29**
ALT U/L	19.0 ± 0.18	20.5 ± 0.37*	23 ± 0.28**
Total protein gm/dl	6.97 ± 0.85	6.72 ± 0.12*	6.3 ± 0.27**
Urea mg/dl	14.00 ± 0.09	14.50 ± 0.73*	15.5 ± 0.70**
Creatinine mg/dl	1.81 ± 0.03	1.50 ± 0.92*	1.62 ± 0.64**
Sodium MEq/L	11.00 ± 0.24	11.22 ± 0.12*	124.3 ± 0.17**
Potassium MEq/L	9.3 ± 0.72	10.7 ± 0.98*	11.9 ± 0.62**
Serum zinc, ppm	2.00 ± 0.72	1.85 ± 0.74*	1.25 ± 0.07**
Cadmium ppm.	0.6 ± 0.45	0.84 ± 0.20*	1.49 ± 0.67**

**P<0.01

*P<0.05

Table (4): Effect of cadmium chloride on some hormonal parameters after 30 days of experiments (Means \pm SE)

Parameters	Control 1	Cad cl 50 mg 2	Cad. Cl. 100 mg 3
LHIU/L	1.67 \pm 0.01	0.89 \pm 0.04*	0.70 \pm 0.06**
Testosterone ng/ml	2.74 \pm 0.07	2.52 \pm 0.31*	2.15 \pm 0.23**
F.S.H U/L	1.87 \pm 0.24	1.72 \pm 0.06*	1.50 \pm 0.04**

**P<0.01 *P<0.05

Table (5): Digestion coefficient of the different experimental rations (Means \pm SE).

Groups	Nutrients digestibility %					
	DM	OM	CP	EE	CF	NFE
1	62.3 \pm	63.5 \pm	60.8 \pm	58.7	55.3*	63.1 \pm *
2	61.5 \pm	62.8 \pm	60.3 \pm	59.4	54.7	62.5 \pm **
3	43.25 \pm **	43.49 \pm **	39.2 \pm **	35.4**	30.1**	42.7 \pm **
SE	14.3	12.7	15.3	11.8	12.7	13.5

**P<0.01 OM = Organic matter DM = Dry matter. CP = Crude protein.
EE = Ether extract. CF = Crude fiber. NFE = Nitrogen Free extract

3. Results

There was a decrease in the body weight. Necrosis and calcification were detected in the kidney and liver of the dead animals. There was a significant decrease in the RBC, PCV and Hemoglobin ($P < 0.01$) while there was a significant increase in ESR and WBC count (Table 3).

There was a significant increase in AST, ALT, urea, creatinine, sodium, potassium and serum cadmium, while a significant decrease in TP and zinc concentration were recorded as shown in table (4). There was a significant decrease in mean LH, FSH and testosterone (Table 5). Table (6) shows that the digestion coefficients were significantly decreased in gp (2) and highly significantly decreased in gp. (3).

4. Discussion

Cadmium is apparently non-essential element that is virtually absent from the body of man and animal at birth. Air pollution with cadmium from industrial sources may be transmitted to man and animals through contaminated food stuffs **Catalaba and Yarland (1986), Bryant and Rose (1995), Fiberg et al. (1996), Sharl et al. (1999).**

Significant decreases were observed in RBCS, PCV and hemoglobin. On the contrary, there were significant increases in the ESR and WBC. Similar results were obtained by **Fiberg et al. (1996)**. It is well known that the toxicity of cadmium inhibits reproduction in animals. [**Kumimata and Miruo (1986), Hew et al. (1993), Mircda (1996), Fayed and Abdallal (1997)**]. There was a reduction in the level of LH, FSH and testosterone in comparison with the control. The available literature concerning the

effect of cadmium on the levels of LH, FSH and testosterone are very scarce. These results are in accordance with those obtained by **Kuo et al. (1995), Watanabe et al. (1998), and Santner et al., (1981)** who reported that the LH, FSH, testosterone were significantly decreased in mice. The fertility and libido were lost after treatment with cadmium chloride 5mg/kg Bwt and decreased after treatment with 2mg/kg Bwt, in mice. Such effects could be the result of vascular damage of the testes and the leydig cells, **Nishiyama and Nakamura (1984)**. The pollution with cadmium adversely affected the fertility and libido of the exposed animals.

The ALT, AST, urea, creatinine, Na⁺, K⁺ and cad⁺ concentrations were significantly increased. This may be attributed to the necrosis of both kidney and liver. These results are coincident with **Gabiani et al., (1974), Mamkiewicz et al., (1975), Ferguson (1980), Bcrraw and Deaves (1984), Adriana (1986), Abu Salem (1991), Mansi et al., (1993), Bryant and Rose (1995) and Fiberg et al (1996)**. Moreover total protein decreased probably due to necrosis of liver cells.

It could be concluded that cadmium toxicity markedly suppressed the LH, FSH and Testosterone and caused degeneration of testes. On the other hand, it caused atrophy of the liver, kidney, which showed renal calcification due to deposition of calcium.

This work was supported by the Internal Project from National Research Center belonging to **Dr. Mamdouh Ibrahim and **Dr. Mona. S.Zaki** Project 10/8/5.

Reference

1. **Abe T. and Itakawa Y. (1993):** Experimental cadmium poisoning. Effect of cadmium on kidney and liver function test. Japanese journal of Hygiene 28, 243-245.
2. **Abu Salem M. (1991):** Some Toxicological studies on some environment pollutant Ph. D. Thesis Fac. of Vet. Men. Zigzag University Banaha Branch.
3. **Adriano D. C. (1986):** Trace Elements in Environment Germany, New York Inc.
4. **A.O.A.C., (1984):** Analysis of digestibility.
5. **Berraw M. and Deavcs Y. A. (1984):** Proceeding of the international conference on environmental science on cadmium, Fdinheg M. K. PP 330-335.
6. **Bires J., Vrzgula L. and Juhasova Z. (1999):** Distribution of toxic chemical elements in the body of sheep of experimental administration of industrial emission. Veterinari Medicina, 36(6):361-371.
7. **Bryant S.L. and Rose R.W., (1998):** "Effect of cadmium on the reproductive organ of the male (macropodidae). "Australian Journal of Biological Sciences", 28,305-311,15ref.
8. **Catalaba D. A, Yarland T. R. (1986):** Cadmium in the environment, Elscvicr appl. SCI publ -London pp. 280-285.
9. **Fayed, A. H. and Abdallah E. B.,(1997):** " Effect of cadmium chloride on some reproductive aspect in adult male rats "Ninth Annual Congress of Egyptian Soc. Anim. Reprod, Pert., 61 -68.
10. **Ferguson J. F. (1995):** The Heavy Element Chemistry, Environmental Impact and Health of Animals, Pergaman Press.
11. **Fiberg L. Ebidu C., Kjella. T, and Word berg - F. (1996):** Cadmium and health A. toxicologicaland epidemiological Approach C. R. C. publishers vol.(10) and vol.(2). Pp. 78, pp153.
12. **Fuquay J. W. and Moberg G. P.(1983):** Influence of the pituitary axis on the induced release of lutenizing hormone in rams. J. Endocrinol., 99, 51-53.
13. **Gabiani G. B. Marie., Sheila M. Malhcwson M. B. and Graeme B. R. (1974):** Acute cadmium intoxication, early selective lesions of endothelial cells J. Endocrinology, 30: 686-687.
14. **Gad S. C. and Weil C. S. (1983):**Statistics for lexicologists. In Hayes, A. W. (2nd Ed.), "Principles and Methods of Toxicology": Raven Press. New York, pp. 273-320.
15. **Hew K. W., Heath G. L, Jiwa A. H. and Welsh M. J. (1993):** Cadmium in vivo causes disruption of tight junction associated microfilaments in rat Sertoli cells. Biol. Reprod., 49: 840-841.
16. **Ismail M. (1986):** Caseous lymphadenitis in reproduction of sheep. J. Vet. Med. Assoc., 38,211.
17. **Jain S. D. (1986):** Evaluation of haemogram in healthy and diseased sheep. Res. Vet. SCI. 33,21.
18. **Joseph, A.D. and Roger W.G. (1979):** Clinical Chemistry Principles and 4th ed. Boston, pp. 168-196.
19. **Kabata pendias A. and Pendo H.(1999):**Trace Element in Soil Plants and Animals C.R.C.London. Paris.
20. **Kajikawa K., NakanishiJ. and Kuvoda K. (1991):** Exp. Mol. Pathology 349 -350.
21. **Kulin L.D. and Santner L.R. (1977):** The effect of prolonged stress of lutenizing hormonein rams. J. Endocrind. 92,151.
22. **Kumimata M, and Miruo T. (1986):** Density increment and decreased survival of red blood cells induced by cadmium. Environ. 39, 86-95.
23. **Kuo T.F, Chang C.H. And Lou - CF,(1995):** Effects of cadmium on the lipido and fertility of mice. Journal of the Chinese - society of veterinary -science., 21, 1,1 -11, 17 ref.
24. **Mamkiewicz J., Jaczewski S. and Dynarowicz 1. (1975):** Heavy metal content of the semen of bulls from various environments Medycyna -Weterynaryjna, 31, 11, 684 -686.
25. **Mansi A., Cecil H.C. and Bakst M.R. (1993):** Aspects of biological changes in breeder toms. After treatment with subcutaneous cadmium injection, study of some characteristics. Journal of Applied Animal Research, 4: 2, 83 - 90, 29 ref.
26. **Mireda R.J. (1996):** Toxicity and accumulation of cadmium in the Cray Fish *Orcanectes vivilis* Environ. Canton. Toxicol 15: 401-407.
27. **Nishijama H. and Nakamura K. (1984):** Effect of cadmium an plasma aldosterone in male rats Toxicol Applied pharmacology 76pp 420 - 425.
28. **Santner H.K., Brown C. A. and Clarke D. G. (1981):** Studies on drenal and hormonal functional activities in diseased stress rams. Cand. Vet. J., 24, 16.
29. **Scott E.G. and Baily W. R. (1968):**Diagnostic Microbiology, St Ed Tue. C. V. Moshy cost Louis.
30. **Shore R.F. Myhill D.G., Routtedcg E.J. and Wilby A. (1999):** Impact of an environmentally realistic intake of cadmium on calcium, magnesium and phosphate metabolism. in sheep. Arch. Environ. Toxicol, 46: 180-182.
31. **Topley and Wilson (1984):** Principles of Bacteriology, Virology and Immunology 7th Ed, Williams and Wilkins Baltimore.
32. **Watanabc ML Shiroishi K., Nishine H. (1998):** An experimental study on long, term effect of mice fed cadmium polluted rice, with special reference to the effect of reproductive cycles Environ, Des 40, 25 -46.
33. **William W.C. and Donald M.Gav (1995):** Vet. Pathology 2nd ca. Yearbook. London.

Assessment of Pravastatin effects on healing of bone defect in rats

Ghafour Mousavi^{1*}, Daryoush Mohajeri²

¹Department of Clinical Science, Faculty of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran (Corresponding author, Email: gh_mousavi@iaut.ac.ir)

²Department of Pathobiology, Faculty of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran

Abstract: Statins are a commonly prescribed cholesterol-lowering drug; however, it has recently been shown that they also have the beneficial side effect of enhancing bone matrix formation. As a result, this study is to assay probability effect of Pravastatin on osteogenesis which is made in experimental flaw and it is as a laboratory pattern in rat femur. This experimental study was conducted on 30 male SD rats. Animals were divided randomly into 3 groups (control and experimental). After induction of general anesthesia, a hole in size of 2 mm in diameter was made using a dental bit in femur width to medullary channel. After surgery, the control group received orally sterile water daily and experimental groups 1 and 2 respectively received daily 10 and 20 mg/kg/PO of Pravastatin. Histopathological and histomorphometrical studies for evaluation of bone healing were carried out in experimental rats, which were euthanized after 45 days of the experiment. In control group, defect seemed to be filled with woven bone and bone marrow spaces and in spite of a poor osteogenic activity. In experiment groups, many osteoblasts groupings, and young bone trabeculas increased in number and bone trabeculas more organized. Histomorphometric results, observed that Pravastatin has significant effect on bone healing in experimental groups 2 and 3 than control group ($p=0/000$), analyzing obtained results show that Pravastatin has significant effect in group 3 that received high dosage of Pravastatin than group 2 ($p=0/000$). The results of this study show that Pravastatin could stimulate osteogenesis in rats.

[Ghafour Mousavi, Daryoush Mohajeri. **Assessment of Pravastatin effects on healing of bone defect in rats.** *Life Sci J* 2013;10(1):1206-1209] (ISSN: 1097-8135). <http://www.lifesciencesite.com>. 185

Keywords: Pravastatin, bone healing, Rat, Histopathology, Histomorphometry

1. Introduction

Statinic drugs are competitive inhibitors of enzyme Hydroxymethyl Glutaryl CoA Reductase (HMG-CoA reductase) and act as lowering of blood lipids and cholesterol. Nowadays, these drugs have common uses in curing the heart disease (1). Studies on statinic drugs show the effectiveness of these drugs on bones (2,3). Also, to anti-inflammatory effects of it due to reducing interleukin-6 and interleukin-8 have been mentioned (4). There are many studies in proving the supportive effect of statins on bones in topical administration in animal models. As well as, the effect of simvastatin in condensation of bone tissue, increase bone formation and its strength have been proved (5). Mundy et al., (1999) for the first time have reported that statins have positive effect in bone condensation. In that study they shown that the mass of trabecular bone increased in ovariectomized rats that were receiving simvastatin at the dose 5-10 mg for 35 days (2). In the case of statin drugs and bone metabolism having such overviews are important. These compounds stimulate bone formation by increase in osteoblasts activities which apply by BMP-2. Another effect of statins is inhibition of enzyme HMG-CoA reductase so preventing the synthesis of mevalonate which yields to disturbance in osteoclasts activity and apoptosis, finally, prevents bone reabsorption (6).

The third effect of statins is their anti-inflammatory effects, that inflammation is seen during the bone formation in the involved bone and surrounded tissues which help to bone healing (7). The aim of present study was evaluation of efficacy of pravastatin in healing of bone defect in femoral bone in rats.

2. Materials and methods

30 healthy male Sprague-Dawley rats (about 250-300 g body weight) were used for this study. All animals were obtained from the animal laboratory center of Islamic Azad University Tabriz Branch. Management and husbandry conditions were identical in all groups with 12/12 h light/dark cycle at $21\pm 2^\circ\text{C}$. Food and water were provided *ad libitum*. After transmission to the department of surgery, for avoiding of stress and adaptation with environment, they did not receive such an experiment for a week. The rats were randomly divided into 3 control and experiments groups of 10 animals. Investigations using experimental animals were conducted in accordance with the internationally accepted principles for laboratory animal use and care and our ethical committee on animal care approved the protocol. Animals were anesthetized with Ketamine hydrochloride (Ketamine 10%, Alfasan, Worden-Holland, 50mg/kg) and Xylazine (Xylazin 2%, Alfasan, Worden-Holland, 5mg/kg) intraperitoneally.

The right hind limb was shaved and prepared aseptically with povidone iodine. A 2-cm skin incision was made on the lateral site of femur. The muscles were dissected bluntly to expose the bone. A confined cortical defect was drilled using a low-speed dental bit, saline-cooled in a stepwise fashion. A hole in size of 2 mm was made as monocortical and left untreated. Tissue was closed in layers. Animals were monitored postoperatively, and then returned to their cages. Animals received intramuscular injections of Penicillin G, 60000 Iu/kg immediately after surgery and 24 h later. In first group as control group, after induction of defect received sterile water. In two other groups, Pravastatin was used orally at 10 and 20 mg/kg, each rat was given pravastatin dissolved in sterile water, administered by direct injection into the stomach using a blunt-ended needle inserted via the esophagus. Animals were euthanized after 45 days postoperatively under general anesthesia, with an injection of over dosage of Thiopental sodium (60 mg/kg). The femurs include osseous defect were harvested, stripped of soft tissues, and prepared for analyses.

The samples were fixed by immersing it in 10% neutral-buffered formalin. The sample was then embedded in paraffin, sliced into 5 μ m sections, and stained with hematoxylin-eosin for blinded histological assessment. Slides were assayed by light microscope model NIKON ECLIPSE E200. For histomorphologic evaluations we used of linear measurement method by crossed reticulate lines through the one ocular reticulate lens containing 100 cubical nests and by determination the percentage of bone defect by 1) bone marrow, 2) immature bone, and 3) occupied lamellar bone was performed. Considered tissue contents were measured by 40X magnification and mouse. Bone marrow and connective tissue were detected by presence of abundant fat cells and fibroblasts and collagen strains respectively. For comparative assessments, a part of normal femoral bone from contralateral side also was obtained.

Statistical evaluation of data was performed using the software package SPSS version 18.0 (SPSS Inc., Chicago, IL). Data are reported as mean \pm SEM. The significant level was set at $p < 0.05$. Statistical

comparisons were used analysis of variance (ANOVA). Tukey HSD multiple comparison testing was used to determine experimental defects with normal bone.

3. Results

Microscopic findings showed that induced defect in rats of control group has been filled by immature bone spicules in middle part of diaphysis of femur and newly immature bone formed at its junction with the old bone and is being replaced by primary bone trabeculae (fig 1&2). The second group of rats (Pravastatin 10 mg/kg), A thin layer of immature bone has closed bone defect. Primitive cortical trabeculae gradually formed. Bone marrows between the immature and primitive condensed trabeculae have been reduced and these spaces were denser. Compared with the control group, density of new bone tissue was relatively higher (fig 3&4). The third group of rats (Pravastatin 20 mg/kg) bone defect was almost completely filled with new bone formation. Formed bone was denser and more organized. Bone marrows between the immature and primitive condensed trabeculae almost lost. Immature bone reduced and major part of bone defect was filled by lamellar bone. Haversian bone systems gradually occur. There was continuity between newly formed bone and old bone (fig 5&6).

Evaluation of Histomorphometry results obtained indicates that amounts of lamellar bone in the third group significantly higher than other groups, this value is lower than normal bone ($p=0.000$). The bone marrow and immature bone in control group was significantly more than experiments groups ($p=0.000$). In comparison between studied groups, in terms of lamellar bone formation, bone marrows and immature bones rates, there were a significant differences between low dose of Pravastatin group and control group ($p=0.000$). Also among the high dose of Pravastatin group and control group is significant ($p=0.000$). Significant differences between high and low dose of Pravastatin in terms of lamellar bone formation, bone marrows and immature bones rate was observed ($p=0.000$). Histomorphometry evaluation results are shown in Table 1.

Table 1: Comparison of mean and standard deviation of the bone tissue healing area components between the groups studied

	Normal bone	Group 1 (control)	Group 2 (Pravastatin 10 mg/kg)	Group 3 (Pravastatin 20 mg/kg)
Lamellar bone	95.10 \pm 1.59 ^a	15.10 \pm 1.78 ^b	44.1 \pm 1.13 ^c	60 \pm 1.2 ^d
Immature bone	4.20 \pm 1.31 ^a	34.15 \pm 2.2 ^b	32.1 \pm 1.26 ^c	19.21 \pm 1.16 ^d
Bone marrow	0.70 \pm 0.63 ^a	50.75 \pm 2.86 ^b	23.8 \pm 2.1 ^c	20.79 \pm 1.13 ^d

a,b,c,d,e: Dissimilar letters indicate significant differences in each row.

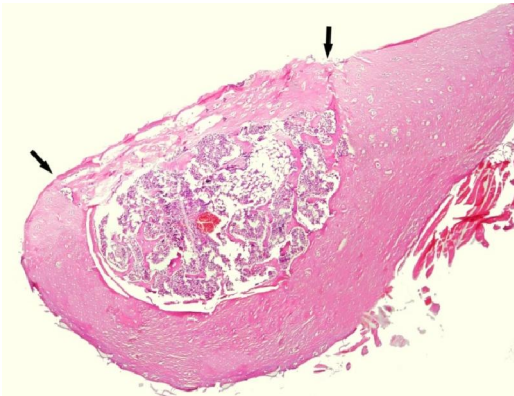


Fig 1: Microscopic view from experimental induced defect in middle part of the diaphysis of femoral bone in rats of control group. Newly formed immature bone trabeculae (woven bone) and wide spaces of bone marrow which filled the major areas of defect (H&E 250x).

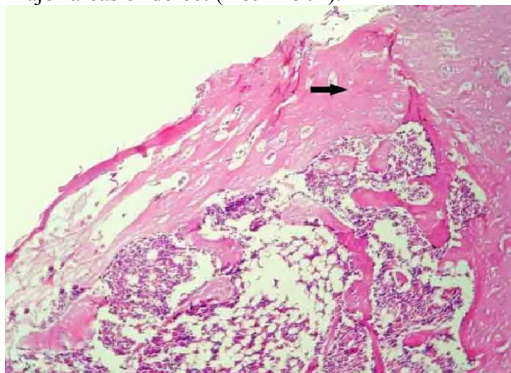


Fig 2: Microscopic view from experimental induced defect in middle part of the diaphysis of femoral bone in rats of control group. Immature bones has filled the major areas of healing tissue in location of defect. Newly immature formed bones confluence with the old bone adjacent to the defect is being replaced with primary trabeculae bone (H&E 600x).

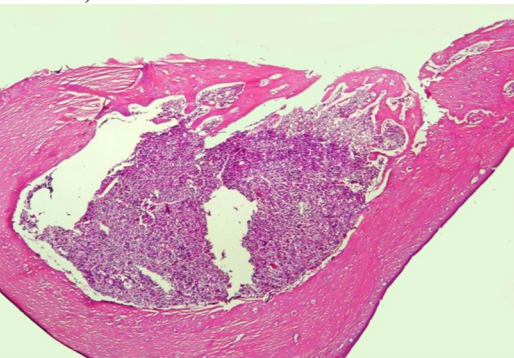


Fig 3: Microscopic view from experimental induced in middle part of the diaphysis of femoral bone in rats of group 2 (Pravastatin 10 mg/kg). Defect filled with woven bone and primitive compact bone and wide spaces of bone marrow is observed. Trabeculae were greater dispersion. There is not enough coordination between the trabeculae (H&E 250x).

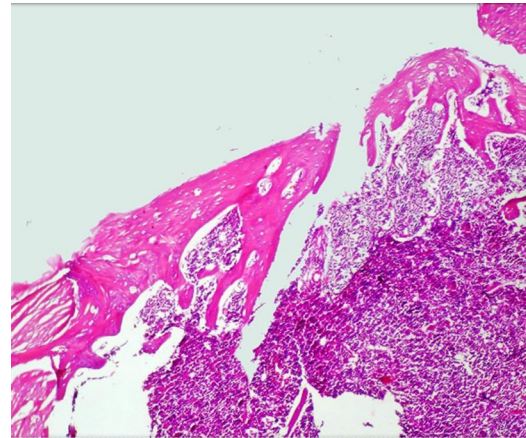


Fig 4: Microscopic view from experimental induced in middle part of the diaphysis of femoral bone in rats of group 2 (Pravastatin 10 mg/kg). The bulk of the bone defect is filled with wide spaces of bone marrow between woven bone and primitive compact bone (H&E 600x).

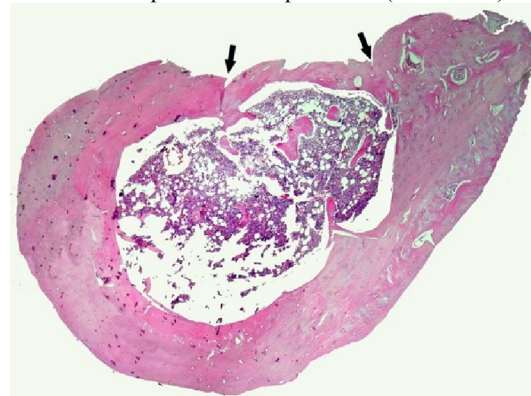


Fig 5: Microscopic view from experimental induced in middle part of the diaphysis of femoral bone in rats of group 3 (Pravastatin 20 mg/kg). Bone defect blocked with a thin layer of new formed bone. New formed bone and the "old" bone tissue have been joined together (H&E 250x).

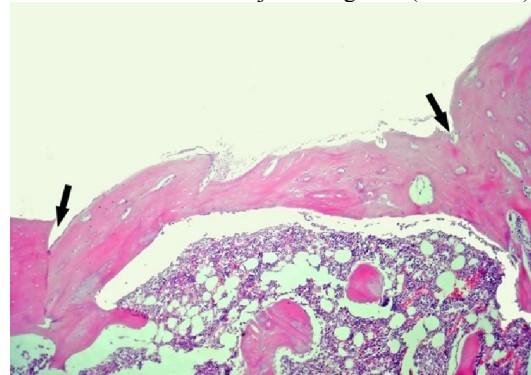


Fig 6: Microscopic view from experimental induced in middle part of the diaphysis of femoral bone in rats of group 3 (Pravastatin 20 mg/kg). Primary newly bone is remodeling. So immature and primitive lamellar bone conversion to compact bone. Haversian bone system gradually occur (H&E 600x).

4. Discussion

In the present study, microscopic evaluations indicate bone formation in the induced defect in femoral bone. In control group, changing the connective tissue to bone and starting the healing processes was not more severe and powerful and after 45 days, only a thin layer of immature bone with a wide spaces of bone marrow in it was saw. As well as histopathologic findings, in groups treated with pravastatin, after 45 days, organized and regular bone trabeculae was seeing. In group treated with 10mg/kg pravastatin, only a thin layer of immature and primitive bone have filled bone defect. However, by increasing the dose to 20 mg/kg whole of the defect was filled by newly formed bone, which was more condensed and organized and haversian system was forming. After 45 days, amount of the a little mature and regular bone trabeculae was changing to lamellar bone. Comparison results between groups show positive effects of high dose pravastatin than low dose. In a study by Wong et al., 2003, it has been shown that combination of collagen and astatine is an osteo-inductive agent which results in rapid healing of bone when used in skull bone fractures (8). In another study by Wong et al., in 2005, it has been shown that soluble astatine also can increase BMP; it yields to increase in osteoblasts and bone formation (9). Majima during a study in 2006 showed the positive effects of atorvastatin in increasing the bone density in the patients with hypercholesterolemia. In that study, the short term effect of atorvastatin has been shown (10). In another study by Kawane et al., (2004), the bone density of ovariohysterectomized rats was increased significantly subsequent use of atorvastatin (11). Nyan et al., (2007) reported that combined use of simvastatin and calcium sulfate accelerates bone healing (12). Montagnani et al., (2003) demonstrated that simvastatin increases the bone density, bone formation and spongy tissue pressure (13). Also, in another study by Ayukawa et al., (2004) it has been reported that use of simvastatin around the titanium implants increases the bone density near by the implant (14). After digestive absorption, 95% of astatines metabolize in the liver and only a small part passes from liver and reach in the bone tissue. So, astatinic drugs which are used widely for treatment the hypercholesterolemia not bone tissue, this research suggests to produce new generation of astatines by focus on the bone tissue target, and for reaching to the appropriate dose we need to other studies many more.

1/17/2013

Conclusion:

The results of this study indicate that Pravastatin can increase the bone formation and to accelerate healing process of defect.

References:

1. Law MR, Wald NJ, Rudnicka AR. Quantifying effect of statins on low density lipoprotein cholesterol, ischaemic heart disease, and stroke: Systematic review and meta-analysis. *BMJ* 2003; 326:1423.
2. Mundy G, Garrett R, Harris S, Chan J, Chen D, Rossini G, Boyce B, Zhao M, Gutierrez G. Stimulation of bone formation in vitro and in rodents by statins. *Science* 1999;286:1946-9.
3. Fernández-Tresguerres-Hernández-Gil I, Alobera-Gracia MA, del-Canto-Pingarrón M, Blanco-Jerez L. Physiological bases of bone regeneration I. Histology and physiology of bone tissue. *Med Oral Patol Oral Cir Bucal* 2006;11:E47-51.
4. Sakoda K, Yamamoto M, Negishi Y, Liao JK, Node K, Izumi Y. Simvastatin decreases IL-6 and IL-8 production in epithelial cells. *J Dent Res* 2006;85:520-3.
5. Gutierrez GE, Lalka D, Garrett IR, Rossini G, Mundy GR. Transdermal application of lovastatin to rats causes profound increases in bone formation and plasma concentrations. *Osteoporos Int* 2006;17:1033-42.
6. Liao JK. Isoprenoids as mediators of the biological effects of statins. *J Clin Invest* 2002; 110(3):285-8.
7. Steinberg D. Hypercholesterolemia and inflammation in atherogenesis: two sides of the same coin. *Mol Nutr Food Res* 2005;49(11):995-8.
8. Wong RW, Rabie AB. Statin collagen grafts used to repair defects in the parietal bone of rabbits. *Br J Oral Maxillofac Surg* 2003;41:244-8.
9. Wong RW, Rabie AB. Histological and ultrastructural study on statin graft in rabbit skulls. *Br J Oral Maxillofacial Surg* 2005;63:1515-21.
10. Majima T, Komatsu Y, Fukao A, Nakao K. Short-term effects of Atorvastatin on bone turnover in male patients with hypercholesterolemia. *Endocr J* 2006;54(1):145-51.
11. Kawane T, Terashima S, Kurahashi I, Yanagawa T, Yoshida H, Horiuchi N. Atorvastatin Enhances Bone Density in Ovariectomized Rats Given 17_Estradiol or Human Parathyroid Hormone (1-34). *Endocrine* 2004;24(2):121-9.
12. Nyan M, Sato D, Oda M, Machida T, Kobayashi H, Nakamura T, Kasugai S. Bone formation with the combination of simvastatin and calcium sulfate in critical-sized rat calvarial defect. *J Pharmacol Sci* 2007;104:384-6.
13. Montagnani A, Gonnelli S, Cepollaro C, Pacini S, Campagna MS, Franci MB, Lucani B, Gennari C. Effect of simvastatin treatment on bone mineral density and bone turnover in hypercholesterolemic postmenopausal women: a 1-year longitudinal study. *Bone* 2003;32:427-33.
14. Ayukawa Y, Okamura A, Koyano K. Simvastatin promotes osteogenesis around titanium implants—a histological and histometrical study in rats. *Clin Oral Implants Res* 2004;15:346-50.

Students' And Teachers' Perspectives On Biotechnology Education: A Review On Publications In Selected Journals

Rashidah Begum Gelamdin, Norlidah Alias, Mohammad Attaran

Department of Curriculum and Instructional Technology, Faculty of Education, University of Malaya, Kuala Lumpur 50603, Malaysia
drnorlidah@um.edu.my

Abstract: Modern biotechnology has brought a lot of changes in science and technology. As a scientific discipline, modern biotechnology goes hand in hand with cultural, social, and public policy controversies, the development of theories and techniques enables scientists to alter the genetic code of all living organisms practically. Science education is to enhance the scientific and technological literacy in each and every child. Young people need to be informed, not only about the practical applications of biotechnology, but also of the need to appreciate the social and ethical implications so that they can make wise personal choices and contribute to public debate in the future. The present study intends to explore the trend of research conducted on students and the in-service and pre-service teachers. Besides that, the findings of the research will also be discussed in-depth. The articles were analyzed by publication year, journal, and research topic categories. Results for the most and least published research topics can indicate the overall patterns and research trends in this field. The discussion carried out focused on the related articles published in a few journals from the year 2000 until 2012. Some recommendations were also discussed. [Rashidah BG, Norlidah A, Mohammad A. **Students' And Teachers' Perspectives On Biotechnology Education: A Review On Publications In Selected Journals.** *Life Sci J* 2013;10(1):1210-1221] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 186

Keywords: Biotechnology, Teachers, Students.

1. Introduction

Modern biotechnology has brought a lot of changes to science and humankind. As a scientific discipline, modern biotechnology goes hand in hand with cultural, social, and public policy controversies; the development of theories and techniques enables scientists to alter the genetic code of all living organisms practically. Biotechnological applications of all kinds are in the making and already evident in a growing range of genetically modified foods in supermarkets (Klop, Severiens, Knipples, Van Mil, & Ten Dam, 2010). Besides that, biotechnology was the impetus in the rapid development in biomedical (Dawson & Cowan, 2003), agricultural and industrial breakthroughs. Despite its potential, however, biotechnology continuously challenges the public by raising many controversial issues (Hanegan & Bigler, 2009).

An important outcome of science education is to enhance the scientific and technological literacy in every child; this has been universally welcomed as a desirable goal for education (Hodson, 2003). A high level of scientific literacy can help young people to question the claims of the scientific community and enable them to use their understanding of science to make well-informed ethical decisions. Young people need to be informed, not only about the practical applications of biotechnology, but they also need to appreciate the social and ethical implications so that they can make wise personal choices and

contribute to future public debate (Dawson & Schibeci, 2003). Science education researchers and practitioners endeavour to promote scientific literacy based on the premise that the ability to make informed decisions about socio-scientific issues is essential for an active and balanced citizenship (Bryce & Gray, 2004; Fonseca, Costa, Lencastre, & Tavares, 2012).

Given the importance of biotechnology, some of the related topics have been incorporated in school science curricula in a few countries (Hanegan & Bigler, 2009; Kwon & Chang, 2009; Steele & Aubusson, 2004). Despite all efforts to incorporate biotechnology into the school curriculum, some related issues have emerged. Studies conducted in countries such as South Korea, Portugal, Scotland, Spain and New Zealand, have shown that the teachers tend to avoid teaching biotechnology-related topics. They reason that they had inadequate academic training, insufficient resources for experimental activities, time constraints and lack of funding (Bryce & Gray, 2004; Hanegan & Bigler, 2009; Kwon & Chang, 2009; Steele & Aubusson, 2004).

In this context, the present study intends to explore the trend of research conducted on students, in-service and pre-service teachers. Besides that, the findings of the research will also be discussed in-depth. The articles on biotechnology were analyzed by publication year, journal title, and research topic categories. Results for the most and least published

research topics can indicate the overall patterns and research trends in this field. The discussion carried out will be focused on the related articles published in a few journals from 2000 until 2012.

In addition, looking at the trend of current research studies can help researchers get some ideas of the kind of research that has been carried out and the new areas that need to be focused in this field. Besides that, the appropriate agencies and policy makers in related fields can use the findings from this article to guide them in their future research.

Therefore, this article will try to find the answers and get some insightful view of the biotechnology education carried out in some countries. The research questions addressed by this study are:

1. What were the trends of research on students with reference to biotechnology education?
2. What were the trends of research on teachers with reference to biotechnology education?
3. What were the research findings on students with reference to biotechnology education?
4. What were the research findings on teachers with reference to biotechnology education?

2. Methodology

The main focus of this study is to gather some information over the trend of research carried out and published in journals regarding Biotechnology Education. This was done by using the Education Journals@ProQuest database as a source to gather the number of articles which have been published in journals related to the field of science, biology, technology, teaching and innovation. The publication years for each article were only limited from 2000 until 2012. This is to ensure that the research conducted in these years will discuss the latest findings as we know that biotechnology is a field still undergoing rapid changes. New findings and innovations are discovered and added to the knowledge base and changes are still taking place.

Using the search terms 'biotechnology', 'education', 'teacher' and 'school'; and narrowing down to only the articles published between 2000 - 2012, it was found that there were 19 articles related to these studies. The articles were categorised according to their field of research. Mainly there were two categories seen; concentrating on students, preservice and in-service teachers. Then, the articles were further analysed by going through the abstract and the whole research paper. Related to the two categories mentioned above; the findings and the suggestions highlighted by the researchers were analysed.

3. Results

3.1 Trends of research on students with reference to biotechnology education

From the journals searched through the Education Journals@ProQuest database, there were eight main journals in which articles on biotechnology education have been published. As shown in Table 1, out of the nineteen articles reviewed, the highest number of eleven articles (58.0%) were published in the International Journal of Science Education, followed by three (16.0%) in the Journal of Biology Education. The other journals were less popular and the percentage of articles published were only 5.2%. This may be because the area of biotechnology teaching is mainly from these two major subjects. Therefore, it can be seen that the biotechnology in education field is generally infused into the subject of science and biology although in some countries this topic stands on its own as a subject known as biotechnology.

Table 1. The distribution and percentage of research articles from 2000 - 2012

No.	Journals	Frequency	Percentage(%)
1	International Journal of Science Education	11	58.0
2	Journal of Biology Education	3	16.0
3	Italian Journal of Food Science	1	5.2
4	Teaching and Teacher Education	1	5.2
5	Journal of Technology Studies	1	5.2
6	International Journal of Environmental and Science Education	1	5.2
7	Research in Science & Technological Education	1	5.2
	Total	19	100

From Figure 1, the highest number of research done was in the students' attitude. There were three articles was on attitude solely and another three were a mixture of attitude and another category of interest; that was values, understanding and one particular article was basically on an instrument developed to measure students' attitude. Beside that, two articles were on students' perception respectively and their debating ability on biotechnology topic. The other area of interest was students' understanding, ethical and knowledge, and reasoning and argumentation.

Table 2: Student: The research title, authors and year published in the main journals

No.	Journals	Article Title	Focus	Authors (Year)
1	International Journal of Science Education	A study of pupils' conceptions and reasoning in connection with 'microbes', as a contribution to research in biotechnology education.	Concept and reasoning	Simonneaux (2000)
2	Journal of Biology Education	Analysis of classroom debating strategies in the field of biotechnology.	Debate Strategies	Simonneaux (2002)
3	Journal of Biology Education	Western Australian high school students' attitudes towards biotechnology processes.	Attitude	Dawson & Schibeci (2003a)
4	International Journal of Science Education	Western Australian school students' understanding of biotechnology.	Understanding	Dawson & Schibeci (2003b)
5	Research in Science & Technological Education	The effect of biotechnology education on Australian high school students' understandings and attitudes about biotechnology processes.	Understanding and attitude	Dawson & Soames (2006)
6	International Journal of Science Education	An exploration of attitudes towards modern biotechnology: A study among Dutch secondary school students.	Attitude	Klop & Severiens (2007)
7	International Journal of Science Education	Matching society values: Students' views of biotechnology.	Values and attitude	Saez, Niño, & Carretero (2008)
8	International Journal of Science Education	High-school students' informal reasoning and argumentation about biotechnology: An indicator of scientific literacy?	Reasoning and argumentation	Dawson & Venville (2009)
9	International Journal of Science Education	Effects of a science education module on attitudes towards modern biotechnology of secondary school students.	Attitude	Klop, Severiens, Knipples, Van Mil, & Ten Dam (2010)
10	International Journal of Science Education	High school students debate the use of embryonic stem cells: The influence of context on decision-making	Debate and decision making	Molinatti, Girault, & Hammond (2010)
11	Italian Journal of Food Science	Risk perception about GMOS and food choices among adolescents attending secondary schools: A Tuscan case.	Perception	Bonaccorsi, Levi, Bassetti, Sabatini, Comodo, & Lorini. (2010)
12	International Journal of Science Education	Is judgement of biotechnological ethical aspects related to high school students' knowledge.	Ethics and knowledge	Črne-Hladnik, Hladnik, Javornik, Kosmelj, & Peklaj (2011)
13	International Journal of Science Education	Development and validation of the GMOAS, an instrument measuring secondary school students' attitudes towards genetically modified organisms	Measure attitude	Herodotou, Kyza, Nicolaidou, Hadji-chambis, Kafouris, & Terzian (2011)
14	Journal of Biology Education	Multidimensional analysis of high-school students' Perceptions about biotechnology.	Perception	Fonseca, Costa, Lencastre, & Tavares (2011)

Table 3. Teachers: The research title, authors and year published in the main journals

No.	Journals	Article Title	Focus	Authors (Year)
1	International Journal of Science Education	Tough acts to follow: The challenges to science teachers presented by biotechnological progress	Thinking	Bryce & Gray (2004)
2	International Journal of Science Education	Slovakian students' knowledge of and attitudes towards biotechnology	Attitude, Know-ledge	Prokop, Les-kova, Kubiak-ko & Diran (2007)
3	Journal of Technology Studies	Technology teachers' belief about biotechnology and its instruction in South Korea	Belief	Kwon & Chang (2009)
4	International Journal of Environmental & Science Education	American elementary education pre-service teachers' attitudes towards biotechnology processes.	Attitude	Chabalengula, Mumba & Chitiyo (2011)
5	Teaching and Teacher Education	Disclosing biology teachers' beliefs about biotechnology and biotechnology education	Belief	Fon-seca, Costa, Lencastre, Tava-res (2012)

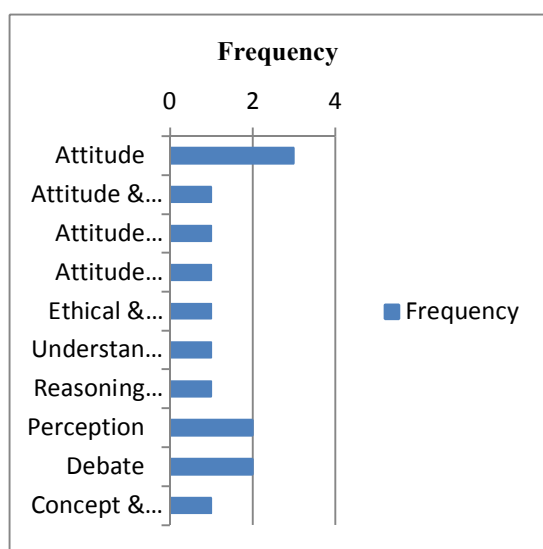


Figure 1: Frequency count on the research areas on students related to biotechnology education out of 20 selected journals

Further analysis was conducted to learn what were the research titles, author and the year of publication of the journal articles. From Table 2 and Figure 1, it was found that there is a change in the trend of research carried out throughout the years. Simonneaux (2000) conducted research focused on the concept and reasoning ability of the students regarding microbes in general and bacteria and virus specifically. This is seen as important because it will be the foundation for better student understanding about microbes as gene vectors. The same author in 2002 analysed the classroom debating strategy of students. He had presented a method for analysing the didactic strategies to develop students' argumentation skills in biotechnology. To become a scientifically literate citizen, the student must be

guided to have the strategy of debating and knows about the pros and cons of the matter being argued.

Out of 19 journal articles, 14 were on students mainly in secondary and high school, and the rest were articles on pre-service and in-service teachers as shown in Table 2 and Table 3.

Dawson and Schibeci (2003a) conducted a study on students' attitude and understanding. It is quite clear that understanding is a crucial element that must be tackled so that students can use their knowledge about biotechnology and then build an appropriate attitude. Therefore, from 2003 until 2010, a vast number of studies were done on the student attitudes; either in secondary or high school. It can be seen that some of the researchers even tried to find the relationship between the attitudes of a student with other factors, such as knowledge and values. Knowing the importance of measuring attitude with a standardized instrument, especially about the genetically modified organisms; Herodotou et al. (2011) developed the tool and reported that Cypriot secondary school students had rather non-supportive attitudes towards GMO cultivation and use.

Not only that, some researchers had also explored students' ability to reason and argue when engaged in discussion or debate. Fonseca, Costa, Lencastre, and Tavares (2011) had conducted a multidimensional analysis of high-school students' perception about biotechnology. They evaluated education and gender effects on knowledge, attitudes, interest and importance given to biotechnology by the students. It was noticed that the focus of the research conducted still linger around the same themes.

Out of all the research articles analysed, it can be concluded that most of the research discussed the same areas of interest. None of the research papers tried to explore the students' cognitive levels, their metacognitive skills and how they think about the issues and ways to solve problems.

Besides that, it can be noticed that a gap exists that can be bridged. In accordance to the findings, it is also noticed that the research were mainly from the western part of the world. None of the articles on students were published which originated from the Asia region generally and the Asia Pacific region specifically. What is going on in these countries in relation to biotechnology education in the schools were not being thrust out and shared by the rest of the world. It will be valuable if the approach and the curriculum aspects can be explored and discussed further.

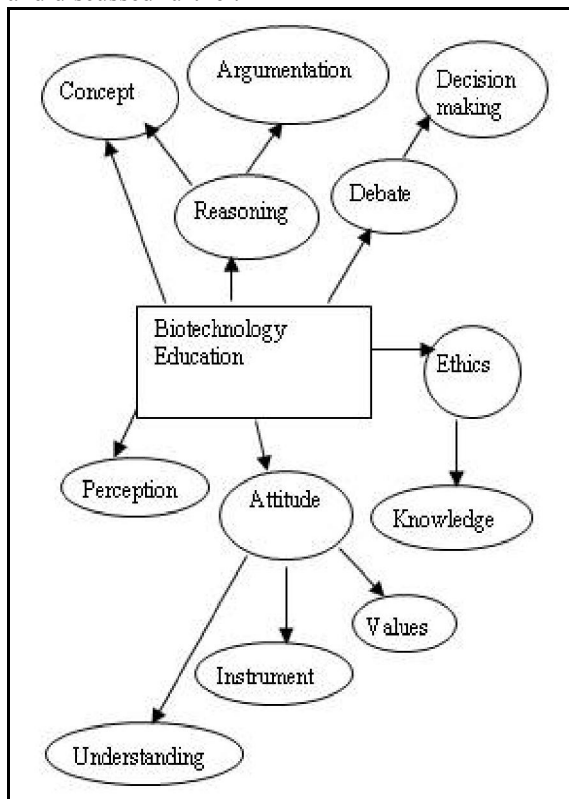


Figure 2. Concept map of research focus of students in biotechnology education.

3.2 Trend of research on teachers with reference to biotechnology education

From the research articles gathered, only five articles published in the selected journals focused on teachers, as shown in Table 3. Two out of the five articles were about the teachers' beliefs on biotechnology or biotechnology education. One discussed the attitude of the pre-service teachers, the others were about the thinking of the in-service teacher and one was on the attitude and knowledge of pre-service teachers.

Bryce and Grace (2004) conducted a study focused on the thinking of biology science teachers who attempted to implement the first year of the New Scottish Advanced Higher Biology course and the

challenges they faced associated with biotechnology controversies. Kwon and Chang (2009) studied the technology teachers in South Korea on their belief about biotechnology and its instruction. The same trend was noticed when Fonseca et al. (2012) did research on the same aspect but it was on the biology teachers in biotechnology and biotechnology education recently. It can be deduced that biotechnology education involves teachers in different fields. Some countries leave it in the hands of science teachers, whereas others leave it to the biology teachers and some leave it to the technology teachers. So far, no findings on agricultural teachers from other countries involved in biotechnology teaching have been reported in the journals selected for this article.

From Figure 2 and Table 3, it is clearly seen that the most research conducted from the reviews was on teachers' belief which has two articles and the other articles was on teachers' thinking, attitude and also knowledge.

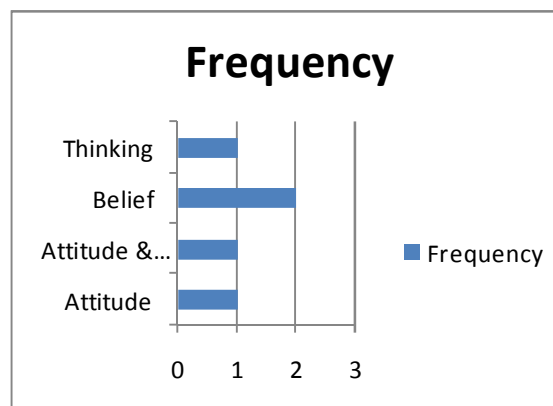


Figure 3: Frequency count on research areas on teachers related to biotechnology education

As attitude was the main focus in students research reported in the articles reviewed; it is observed that there is one article by Chabalengula et al. (2011) which was also interested to know about pre-service teachers' attitudes towards biotechnology processes. As seen in the research relating to students, not much attention has been given to teachers; either the in-service or the pre-service. A lot of opportunity remains to be researched and explored further in this area. New researchers should try to look into the other areas still unexplored. Perhaps, by looking at another angle, we will be able to see a bigger scope and solve another puzzle.

3.3 Research findings on students with reference to biotechnology education

The findings from the selected articles will be discussed under seven major categories. There are basically attitude, perception, understanding, reasoning, debate, ethics, and values.

3.3.1 Attitude

Six research articles in this study related to attitudes of the students from secondary and high school as shown in Table 4.

In the research on Western Australian high school students' attitude, Dawson and Schibeci (2003a) found that the students held a wide range of beliefs about what constitutes acceptable use of biotechnology. Six percent of the students did not agree with the use of any living organisms in biotechnology and some 14% of them approved all the stated uses of biotechnology, with a wide spread of students having mixed reaction in between. Beside that, the students' acceptance of the use of organisms in biotechnology decreased; 90% of students approve the use of microorganisms, 71 – 82% approve the use of plants, 42 – 45% of students approve the use of human and 34 – 40% of students approve of using animals in biotechnology. In this research the author suggested that the biotechnology processes and associated issues should be included in the science curriculum.

Studies by Klop and Severiens (2007) found four different group of students based on their attitude towards biotechnology. The four groups are labelled as “confident supporter” (22%), “not sure” (42%), “concerned sceptic” (18%), and “not for me” (17%). While Dawson and Soames (2006) found that the students felt that usefulness was one of the values considered best when supporting biotechnology applications, precautionary measures must be taken to guarantee reduction of risks to health and environment.

Dawson and Soames (2006) mentioned that after completing a biotechnology course, students' understanding increased but their attitudes remained constant with the exception of their views on human uses of gene technology. While Klop et al. (2010) discovered that the students exposed to science modules on cancer and modern biotechnology showed that the science module had a significant effect on attitudes, although predominantly towards a more supportive and not towards a more critical stance. Therefore, offering science modules of this kind can indeed encourage students to become more aware of modern biotechnology, although promoting a more critical attitude towards modern biotechnology should receive more attention.

Looking at the trend of research conducted by other researchers, Herodotou et al. (2011) developed a 16-item, five-point Likert-type instrument, GMOAS, which showed satisfactory internal consistency and discriminant validity. When the instrument was used to analyse data from Cyprus, results revealed that Cypriot secondary school students have rather non-supportive attitudes towards GMO cultivation and use. Male students were less negative in using GMOs for health and environmental purposes than female students. Surprisingly, female students were found to be more interested in learning about GMOs. From the six research studies discussed, we concluded that the attitudes of the students are varied and do not show a similar trend. The underlying factors that probably have an influence in the attitude of the students need to be known.

Table 4: Related articles on students attitudes towards biotechnology education

No.	Article Title	Authors (Year)	Research Objectives
1	Western Australian high school students' attitudes towards biotechnology processes.	Dawson & Schibeci (2003a)	To explore attitudes held by 15 – 16- year-old students (Year 11) about biotechno-logy processes
2	An exploration of attitudes towards modern biotechnology: A study among Dutch secondary school students.	Klop & Severiens (2007)	To explore decision-making and critical attitudes in secondary school students (16 years old).
3	Matching society values: Students' views of biotechnology.	Saez, Nino & Carretero (2008)	i.Exploring the different cultural contexts in which biotechno-logy teaching and learning is embedded. ii. Students' attitudes and values.
4	Effects of a science education module on attitudes towards modern biotechnology of secondary school students.	Klop, Severiens, Knipples, Van Mil & Ten Dam	To evaluate the impact of a four-lesson science module on the attitudes of secondary school students.
5	The development and validation of the GMOAS, an instrument measuring secondary school students' attitudes towards genetically modified organisms	Hero-dotou, Kyza, Nicolai-dou, Hadjichambis, Kafouris & Terzian (2010)	To present the delopment and validation of the genetically modified organisms attitude scale (GMOAS),an instrument measuring secondary school students'attitude towards GMOs.
6	The effect of biotechnology education on Australian high school students' understandings and attitudes about biotechnology processes	Dawson & Soames (2006)	To determine the effect of biotechno-logy education on Year 10 (15 years old) adolescents' understanding and attitudes about processes associated with biotechno-logy.

3.3.2 Perception

There are two articles on perception; one each on secondary school and high school students as shown in Table 5.

The research related to perception can be considered as a new trend in biotechnology research because it was published in 2010 and 2011. Bonaccorsi et al. (2010) in their study investigated the students' risk perception of biotechnology and GMOs and found that students knowledge seemed rather confused. To rectify these issues, education training needs to train teachers on the pedagogical aspect on how to teach biotechnology. Not only that, schools were suggested to serve as a channel through which physicians and other professionals in biotechnology can convey beneficial information to students.

Table 5: Related articles on students perceptions towards biotechnology education

No.	Article Title	Authors (Year)	Research Objectives
1	Risk perception about GMOS and food choices among adolescents attending secondary schools: A Tuscan case.	Bonaccorsi, Levi, Bassetti, Sabatini, Comodo, & Lorini. (2010)	To investigate students (17-18 years old) risk perception of biotechnologies, in general and GMOs, in particular.
2	Multidimensional analysis of high-school students' perceptions about biotechnology	Fonseca, Costa, Lencastre & Tavares (2011)	Evaluates education and gender effects on knowledge, attitudes, interest, and importance given to biotechnology.

The second research by Fonseca, Costa, Lencastre, and Tavares (2011) was a multidisciplinary analysis of students from science and non-science courses. Students particularly those from non-science courses, revealed knowledge and interest limitations, but they still acknowledged the importance of biotechnology. Most students demonstrated positive attitudes towards different applications, except when animal manipulation was involved. Positive correlations seen between knowledge, attitudes, interest and importance attributed to biotechnology were identified.

3.3.3 Understanding

Two related articles on understanding were found and both the research were performed on students in Australia. Table 6 shows the details of the research carried out.

While Dawson and Schibeci (2003b) who studied 1116 Year 10 Western Australian students showed that one third of students (33.5%, 374) were unable to give an example of biotechnology; some 23.3% (250) students were unable to give an example of genetic engineering. About 19% (204) students were unable to give an example of cloning. As a whole, one third of the survey result indicated students had little or no understanding of biotechnology. Many students over-estimated the use of biotechnology in society by confusing current uses with possible future applications.

In 2006, Dawson and Soames (2006b) conducted research on the effect biotechnology education had on high school students. After completing a biotechnology course, students' understanding was increased but their attitudes remained constant with the exception of their views about human uses of gene technology. These two articles showed that the level of understanding between this two sample were considered low. More research must be done with the intention to boost up students' level of understanding.

Table 6: Related articles on students understanding towards biotechnology education

No.	Article Title	Authors	Research Objectives
1	Western Australian school students' understanding of biotechnology.	Dawson & Schibeci (2003b)	To assess whether students were able to make an informed contribution to public debate about issues such as cloning of human cells to produce a new individual, or the cultivation of genetically modified crops. To determine their understanding towards biotechnology issues above.
2	The effect of biotechnology education on Australian high school students' understandings and attitudes about biotechnology processes.	Dawson & Soames (2006)	To determine the effect of biotechnology education on Year 10 (15 years old) adolescents' understanding and attitudes about processes associated with biotechnology

3.3.4 Reasoning

There are two articles related to this category as shown in Table 7.

In the study carried out by Simonneaux (2000), the findings showed that students were vague about the exact nature of 'microbes'. Bacteria was often seen solely as decomposing agents, while viruses and bacteria were only more or less seen as involved in pathological conditions. Beside that, only some of them knew about how bacteria was used in industry. Some students simply could not conceive how 'microbes', which were necessarily harmful, could possibly be used to manufacture food.

It was suggested that the teaching of biotechnology should start with historical facts and some input on prokaryote biology; students should be encouraged to understand how 'microbes' can be involved both in pathological conditions and in industrial uses, including genetic manipulation.

A related study by Dawson and Venville (2009) showed that the students mostly used no data or only simple data to justify their claims during their argumentation. Students of all year groups used intuitive and emotive informal reasoning more frequently than rational.

Table 7: Related articles on students reasoning ability towards biotechnology education

No.	Article Title	Authors (Year)	Research Objectives
1	A study of pupils' conceptions and reasoning in connection with 'microbes', as a contribution to research in biotechnology education.	Simonneaux (2000)	To identify the difficulties encountered by students as they attempt to comprehend current and future biotechnology.
2	High-school students' informal reasoning and argumentation about biotechnology: An indicator of scientific literacy?	Dawson & Venville (2009)	To explore Australian high-school students' argumentation and informal reasoning about biotechnology.

Rational informal reasoning was associated with more sophisticated arguments. Arguments were not consistent with the goal of scientific literacy of the curriculum that underpins the education of these students. The approach of using both levels of argumentation and patterns of informal reasoning to analyse each statement made by students enabled greater insight into the data and introduces a new and unique method that can be used by other researchers.

3.3.5 Debating

There are two research articles on student reasoning as shown in Table 8.

Simonneaux (2002) showed that reverse shown by some of the students in the debate. Teachers also found it difficult to remain neutral when leading a debate. It was suggested that the didactic strategy involving class discussions, whether through role play or debate, would seem to be a useful way of helping students to develop their arguments. Teachers were encouraged to adapt activities to their students' ability.

Reference to Molinatti, Girault, and Hammond (2010) in the findings showed that analysis of the students' arguments and decision-making revealed that contextualization introduced dynamism in the students' exchanges. The students paid more attention to their peers' arguments and were more motivated to argue their own opinion. However, this type of contextualization may contribute to reinforcing ideology in scientific progress.

Table 8: Related articles on student reasoning ability towards biotechnology education

No.	Article Title	Authors (Year)	Research Objectives
1	Analysis of classroom debating strategies in the field of biotechnology	Simonneaux (2002)	Presents a method for analysing the didactic strategies put forward to develop students' argumentation skills in biotechnology.
2	High school students debate the use of embryonic stem cells: The influence of context on decision-making	Molinatti, Girault, & Hammond (2010)	To analyze decision-making and argumentation by high school students in a debate situation on socioscientific issues, the use of embryonic stem cells in research and therapy. Influence on the debates of two different contexts was tested.

3.3.6 Ethics

There is one research article related to students' ethics as shown in Table 9.

Table 9: Related articles on students ethics towards biotechnology education

No.	Article Title	Authors (Year)	Research Objectives
1	Is judgement of biotechnological ethical aspects related to high school students' knowledge	Črne-Hladnik, Hladnik, Javornik, Kosmelj, & Peklaj (2011)	To explore relationship among students' pre-knowledge of molecular and human genetics, and their attitudes to four specific biotechno-logical applications.

Molinatti et al. (2010) found clear gender differences regarding the relationship between students' pre-knowledge of genetics and their attitudes to biotechnological applications. Females with a better genetics background expressed a higher risk perception in the case of GM salmon. Males emphasised the risk associated with the use of germ line GT. With all four biotechnological applications, patterns of both rationalistic – deontological and teleological – and intuitive moral reasoning were identified. Students with poorer genetics pre-knowledge applied an intuitive pattern of moral reasoning more frequently than their peers with better pre-knowledge.

A pattern of emotive reasoning was detected only in the case of GM salmon. A relatively low quality of students' moral reasoning, as demonstrated by their brief and small number of supporting justifications (explanation), showed there was a strong need for practising skills of argumentation about socio-scientific issues in Slovenian high schools on a much larger scale.

Some suggestions thrown by the researcher was that biology teachers must be equipped well enough to teach these controversial topics, so that they would undoubtedly feel more confident to discuss various moral issues. Cooperation was suggested between biology teachers and social science subject teachers, such as sociology, psychology and philosophy.

3.3.7 Values

There is one research article related to students' values as shown in Table 10.

Table 10: Related articles on students values towards biotechnology education

No.	Article Title	Authors	Research Objectives
1	Matching society values: Students' views of biotechnology	Saez, Nino & Carretero (2008)	i.Exploring the different cultural contexts in which biotechnology teaching and learning is embedded. ii.Attitudes and values of students.

This study used a case study approach involving 770 students in the health science or technology fields from 13 secondary schools. The findings showed that ethical and moral issues played a significant role in shaping attitudes towards applications of modern biotechnology among young people. Four main values were identified from this research, namely: principles of the natural, principle of the welfare, principle of the technological solution attitude and lastly principle of the individual decisions. All the main values are important to cultivate a good set of values that the student will have and use as an informed and scientifically literate citizen later on.

3.4 Research findings on teachers with reference to biotechnology education

The findings from the selected articles will be discussed based on three major categories of attitude, belief and thinking.

3.4.1 Attitude

There are two research article related to teachers' attitude as shown in Table 11.

Although Chabalengula, Mumba, and Chitiyo (2011) focused on elementary pre-service, it was considered a valuable information for the other teachers as well. The elementary education pre-service teachers from both the introductory Science methods and the Advance Science methods course generally held a wide range of attitudes towards biotechnology education.

Table 11: Related articles on teachers attitude towards biotechnology education

No.	Article Title	Authors	Research Objectives
1	American elementary education pre-service teachers' attitudes towards biotechnology processes	Chabalengula, Mumba & Chitiyo (2011)	To examine elementary education pre-service teachers' attitudes towards biotechno-logy processes.
2	Slovakian students' knowledge of and attitudes towards biotechno-logy	Prokop, Leskova, Kubiato & Diran (2007)	To examine preservice teachers' knowledge of and attitudes towards biotechnology courses.

The majority of pre-service teachers approved the genetic modification of microorganism and plants, but disapproved the processes that involved the insertion or removal of genes in human and animals. Some suggestions made by the researcher were that university teachers were charged with developing science education curriculum materials that would enable pre-service teachers to acquire relevant and current information about what biotechnology contributed to our personal and societal lives as well as its shortfalls. It was also hoped that they would have a better understanding of ethical, social and cultural issues related to biotechnology.

Prokop et al. (2012), whose research was on pre -service teachers, showed that the students had a poor knowledge of what biotechnology processes mean. Females students show less positive attitudes toward biotechnology regardless of their knowledge about genetic engineering. The most negative attitudes were found in items related to control of genetic engineering. On top of that, about one-half of the students thought that genetic modification was painful for animals and other 41% thought that consumption of GM foods could destroy human genes.

3.4.2 Thinking

Only one study from the research articles related to teachers' thinking as shown in Table 11.

Table 11: Related articles on teachers' thinking towards biotechnology education

No.	Article Title	Authors	Research Objectives
1	Tough acts to follow: The challenges to science teachers presented by biotechnological progress	Bryce & Gray (2004)	Focused upon the thinking of biology teachers as they attempted to implement the first year of the new Scottish Advanced Higher Biology course and to face the challenges associated with these controversies.

In this research, although teachers were found to be fairly positively disposed to handling discussion of such contentious matters, they were none too clear as to its precise merits and functions. Many teachers were lacking in confidence while handling discussion. It was suggested that this emerging problem needs to be tackled by way of professional development for science teachers who are now engaged in dimensions new to science teaching. A developed pedagogy is required and teachers must have the confidence and it should increase accordingly.

3.4.3 Belief

There are two research articles related to teachers' belief as shown in Table 12.

Table 12: Related articles on teachers belief towards biotechnology education

No.	Article Title	Authors	Research Objectives
1	Disclosing biology teachers' belief about biotechnology and biotechnology	Fonseca, Costa, Lencastre & Tavares (2012)	To under-stand the extent to which teachers's engagement in biotech-nology teaching is influenced by their beliefs and /or by extrinsic con-straints, such as practical limitations; To evaluate biology teachers' beliefs about biotechnology and biotechnology teaching.
2	Technology teachers' belief about biotechnology and its instruction in South Korea	Kwon & Chang (2009)	Investigate Korean technology teachers' beliefs related to imple-mentation of biotech-nology instruction.

Fonseca et al. (2012) found that teachers over-estimated the obstacles presented in biotechnology teaching, particularly concerning material and resource limitations. They demanded the improvement of their information management skills. It was suggested that there was a need to improve teachers' competencies in searching, selecting and adapting information for classroom instruction in the context of biotechnology teaching. Hence teacher training programs should be developed and implemented as part of teachers' preservice and inservice education. Beside that, more complex interventions needed to instruct teachers to adapt

those resources according to the specificities of their students and schools should be organized at national level.

Kwon and Chang (2009) who conducted research on 114 Korean middle school technology teachers stated that the teachers' beliefs were measured in three domains that are value, expectancy and innovation. The results indicate that their beliefs were significantly associated with teacher intent to teach biotechnology content in their classes. This study recommends that biotechnology content should be delivered systematically to technology teachers through professional

development (i.e., in-service and pre-service training).

4 Educational implications

Biotechnology is an area which is still undergoing evolution and new discoveries are reported abundantly. Linking to this phenomenon, the school children need to be equipped with the knowledge of biotechnology. Students need to be aware of the advantages and disadvantages of biotechnology to humankind. As teachers, they have to be well versed with the knowledge, the method and approach of teaching biotechnology. Only then will we be able to inculcate the right decisions and inform citizens of the future generation.

From the articles analysed related to teachers and students, we concluded that there is a lot of room for improvement. In the perspective of students, their understanding about biotechnology terms and concept was still low. They were still confused with the basic knowledge about biotechnology. The attitudes, the sets of values and ethics which the student held were varied as shown in the reports from the papers published in the journals used in this study. The argumentation, decision making and debating strategies the students implemented were not consistent with the goal of scientific literacy. This may be due to the lack of understanding the student had and insufficient debating skills thus making it difficult for them to produce constructive and a meaningful debate.

Looking at the angle of teachers, they seem to have difficulties in conveying the teaching of biotechnology to the students. Both the pre-service and the in-service teachers showed that they lacked the opportunity to undertake biotechnology teaching because the concept was quite abstract. The resources in school were not making it happen because the laboratory equipment needed was very limited and it required a well equipped laboratory to teach teach concepts. Beside that, the teachers seemed to be unsure about the best techniques to teach concepts. They were looking around to find ways to make their teaching more meaningful.

The following are our recommendations for helping to improve the teaching and learning of biotechnology in education:

- i) Research on other related areas should be carried out. How students understand and how they transfer the knowledge they gather from the learning of biotechnology related topics to solving problems and issues in their daily lives deserve further investigation. It will help us to really understand how they think and learn, how

they assimilate and accommodate new knowledge into their existing schemata. Research on metacognitive aspect of the students is another kind of research that can be considered. This will give some understanding on how the students use particular strategies for learning or problem solving or how they are aware about their metacognition.

- ii) The in-service teachers need to be given more exposure to the new and current advances in biotechnology so that they will have confidence and could teach the students using the new knowledge acquired.
- iii) Schools should collaborate with universities or any other biotechnology-related agencies so that the students can have an opportunity to at least see in reality how biotechnologists work and come up with their findings.
- iv) Teacher training colleges or universities involved in preparing pre-service teachers should incorporate biotechnology courses in their curriculum. This will give the teachers a feel of biotechnology activities and experiments so that they can pass the knowledge with confidence to their students.
- v) The curriculum board should revise and improvise the existing teacher training and school curriculum. The limitations found must be addressed in a better manner to achieve the vision of having a scientifically literate citizen in the 21st century.

Corresponding Author:

Dr. Norlidah Alias
Department of Curriculum and Instructional
Technology, Faculty of Education, University of
Malaya, Kuala Lumpur 50603, Malaysia
drnorlidah@um.edu.my

References

1. Bonaccorsi G, Levi M, Bassetti A, Sabatini C, Comodo N, Lorini C. (2010). Risk perception about GMOS and food choices among adolescents attending secondary schools: A Tuscan case. *Italian Journal of Food Science*, 3(22), 264 -273.
2. Bryce T, Gray D. (2004). Tough acts to follow: The challenges to science teachers presented by biotechnological progress. *International Journal of Science Education*, 26, 717- 733.
3. Chabalengula VM., Mumba F, Chitiyo J. (2011). American elementary education pre-service teachers'attitudes towards biotechnology processes, *International Journal of*

- Environmental & Science Education*, 6(4), 341-357.
4. Crne-Hladnik H, Hladnik A, Javornik B, Kosmelj K, Peklaj C. (2011). Is judgement of Biotechnological ethical aspects related to High School students' knowledge? *International Journal of Science Education*, 1-20, iFirst Article.
 5. Dawson V, Cowan E. (2003). Western Australian school students' understanding of biotechnology, *International Journal of Science Education*, 25(1), 57- 69.
 6. Dawson V, Soames C. (2006). The effect of biotechnology education on Australian high school students' understandings and attitudes about biotechnology processes, *Research Science & Technological Education*, 24(2),183 -198.
 7. Dawson V, Schibeci R. (2003). Western Australian high school students' attitudes towards biotechnology processes, *Journal of Biological Education*, 38(1), 7 -12.
 8. Dawson V, Schibeci R. (2003). Western Australian high school students' understanding of biotechnology, *International Journal of Science Education*, 25(1), 57-69.
 9. Dawson V, Venville GJ. (2009). High-school students' informal reasoning and argumentation about biotechnology: An indicator of scientific literacy? *International Journal of Science Education*, 31(11), 1421-1445.
 10. Fonseca, MJ, Costa P, Lencastre L, Tavares F. (2011). Multidimensional analysis of high-school students' perception about biotechnology, *Journal of Biological Education*, 1-11, First Article.
 11. Fonseca MJ, Costa P, Lencastre L, Tavares F. (2012). Disclosing biology teachers' beliefs about biotechnology education. *Teaching and Teacher Education*, 28, 368- 381.
 12. Hanegan, N, & Bigler, A. (2009). Infusing authentic inquiry into biotechnology, *Journal of Science Education and Technology*, 18(5), 393-401.
 13. Herodotou C, Kyza EA, Nicolaidou I, Hadjichambis A, Kafouris D, Terzian F. (2011). The development and validation of the GMOAS, an Instrument measuring secondary school students' attitudes towards genetically modified organisms, *International Journal of Science Education*, Part B, 1-17, First Article.
 14. Hodson D. (2003). Time for action: Science education for an alternative future. *International Journal of Science Education*, 25(6), 645 – 670.
 15. Klop T, Severiens, S. (2007). An exploration of attitudes towards modern biotechnology: A study among Dutch secondary school students. *International Journal of Science Education*, 29(5), 663 – 679.
 16. Klop T, Severiens S., Knipples MCPJ, Van Mil, MHW, Ten Dam GTM. (2010). Effects of a science education module on attitudes towards modern biotechnology of secondary school students, *International Journal of Science Education*, 32(9), 1127 -1150.
 17. Kwon H, Chang M. (2009). Technology teachers beliefs about biotechnology and its instruction in South Korea, *Journal of Technology Studies*, 35(1), 67-75.
 18. Molinatti G, Girault Y, Hammond C. (2010). High school students debate the use of embryonic stem cells: The influence of context on decision-making, *International Journal of Science Education*, 32(16), 2235-2251.
 19. Prokop P, Leskova A, Kubiato M, & Diran C. (2007). Slovakian students' knowledge of and attitudes towards biotechnology, *International Journal of Science Education*, 29(7), 895-907.
 20. Saez MJ, Nino AG, Carretero, A. (2008). Matching society values: Students' view of biotechnology. *International Journal of science Education*, 30(2), 167-183.
 21. Simonneaux L. (2000). A study of pupils' conceptions and reasoning in connection with 'microbes', as a contribution to research in biotechnology education, *International Journal of Science Education*, 22(6), 619-644.
 22. Simonneaux L. (2002). Analysis of classroom debating strategies in the field of biotechnology. *Journal of Biology Education*, 37(1), 9-12.
 23. Steele F, Aubusson P. (2004). The challenge in teaching biotechnology. *Research in Science Education*, 34, 365- 387.

1/8/2013

Assessing Quality Assurance for Teaching and Learning in Higher Education in Malaysia: Reflecting on its Policy and Processes

Abu Bakar Nordin, Norlidah Alias & Saedah Siraj

Department of Curriculum and Instructional Technology, Faculty of Education, University of Malaya
50603 Kuala Lumpur, Malaysia
drnorlidah@um.edu.my

Abstract: The rapid expansion of higher education systems and globalization have placed demands on effective mechanisms for professional recognition of higher education credentials. Despite differences in the size and stage of development of their higher education sectors, many governments have found traditional academic controls inadequate for facing today's challenges. Organizations such as the European Commission (OECD) have made calls for new structures and approaches to quality assurance. Malaysia also has embarked on new quality assurance initiatives such as the Malaysian Qualification Framework, implementation of ISO 9001 Standard in higher education institutions, and intensifying collaboration with professional bodies. At the heart of QA is the issue of the quality of teaching and learning. In the Code of Practice of Institutional Audit (COPIA) and Code of Practice of Programme Accreditation implemented by the Malaysia Qualification Agency, teaching and learning has received extensive attention. This paper reviews the current status of national policy and processes for QA in teaching and learning, the extent of policy implementation, the processes implemented including assessment practices, recent trends and areas of emerging consensus as well as issues likely to shape policy over the next decade, and finally offers recommendations for effecting improvement and change in teaching and learning.

[Abu Bakar Nordin, Norlidah Alias & Saedah Siraj. **Assessing Quality Assurance for Teaching and Learning in Higher Education in Malaysia: Reflecting on its Policy and Processes.** *Life Sci J* 2013; 10(1):1222-1232] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 187

Keywords: Assessing Quality Assurance, Higher Education in Malaysia, Quality Assurance Policy and Processes, Quality Assurance for Teaching and Learning.

1. Introduction

Throughout the world there has been a move to mass higher education, and cross border education involving greater diversity of programmes. This expansion of higher education has prompted the rise of a variety of modes of course delivery hence posing challenges for the efficacy of institutional quality controls. Traditionally, academia has largely been left independent; this largely is in the interests of freedom to provide the environment for scholarship in research and writing. But times are changing. The external pressures for change in universities and colleges are increasing. Public funds are being reduced in many systems, competition is up, students are becoming more forthright about getting value for money, government scrutiny is increasing and external quality audits are more common. Businesses are critical not only about the skills and knowledge of graduates but about how universities and colleges operate. They feel that faculty have an outmoded view of teaching that has failed to keep up with advancing understanding of effective teaching. What business leaders say is needed most is assessment of learning as a first step. This led to the development of a more uniform and systematic approach towards quality assurance in both private and public institutions of higher learning (HEIs). The resultant code of practice is a design which is hoped to

promote public confidence in maintenance of quality of higher education

In Malaysia, in view of achieving the country's aspiration of being a centre of excellence for education, a fresh impetus and direction resulted, with emphasis on the private sector of the higher education industry including that of the transnational sector which expanded at a rapid pace since 2002. Currently there are 20 public universities, 24 polytechnics, 37 public community colleges, 33 private universities, 4 foreign university branch campuses and about 500 private colleges in Malaysia (National Higher Education Action Plan, 2007). In 2010 there were 80,000 international students studying in the country. Many of these private HEIs have established twinning arrangements with universities abroad and therefore use the curriculum and materials in the original programmes. Since the programmes are foreign based but offered locally in Malaysia, they need to undergo stringent quality assurance measures by the agencies from the home country. In addition, they have to undergo the validation and accreditation process. In carrying out the process a number of related problems such as vision and mission statement is insufficiently translated as the strategic plan of the faculty, lack of clarity in stating objectives and performance measures, incoherence in the programmes offered as there in no

clear articulation of goals or student learning outcomes, and the programmes not getting inputs from research done by the faculty as shown by many developed countries, and all these pointed to a lack of pedagogical skills among the faculty members (Sharifah Hapsah, 2009).

2. Quality Assurance Frameworks

Most countries recognise the importance of quality assurance for both their HEIs and their respective programmes. Consequently, many of these countries have enacted policies on HEI quality assurance and drawn clear frameworks for guidelines to be prepared and enforced. In Great Britain, the Quality Assurance Agency's (QAA's) academic infrastructure consists of a series of documents covering the Framework for Higher Education Qualifications (FHEQ), Subject Benchmarks, the Code of Practice, the use of Programme Specifications and Progress Files. While HEIs are not required to conform to every element, the infrastructure provides useful guidelines on what needs to be done to ensure that standards and the quality of the student learning experience are maintained and enhanced. Subject benchmark statements set out broad expectations about degree standards in specific subject areas. HEIs are responsible for setting their own curricula but these benchmark statements are used at subject level to inform course design, delivery and review. They describe what can be expected of a graduate in terms of broad subject coverage and the techniques and skills gained on completion of a degree. Programme specifications give information about the specific content of a programme of study (such as the curriculum structure, delivery methods and assessment), and what knowledge, understanding, skills and other attributes the student will develop. The code of practice for the assurance of academic quality and standards has ten sections and provides guidelines for institutions on good practice in management of academic standards and quality (sections cover for example, assessment, admissions and external examination). Basically the framework employed covers two parts, quality assurance of the respective HEIs and quality assurance of their programmes.

In Australia, since 1998 funded institutions have been required to submit an Institutional Quality Assurance and Improvement Plan to the Commonwealth as part of the educational profiles process. The plans outline the HEI's goals and aims in the key areas of teaching and learning, research, management and community service. Each HEI is required to provide details of the strategies adopted to achieve the goals and the success indicators. In recent years the Government funded the development of a benchmarking manual. The manual provides sixty-

seven benchmarks that HEIs can use to assess themselves against similar HEIs. The benchmarks cover the spectrum of HEI activities from teaching and learning to research, finances, internal management and internationalisation. In offering programmes authorisation by law to award higher education qualifications across a range of fields and standards set for those qualifications to be equivalent to Australian and international standards; teaching and learning that engages with advanced knowledge and inquiry; a culture of sustained scholarship extending from that which informs inquiry and basic teaching and learning, to the creation of new knowledge through research, and original creative endeavour; commitment of teachers, researchers, course designers and assessors, and to free inquiry and the systematic advancement of knowledge.

Similar requirements were called for in many other HEIs throughout the world such as at the University of Missouri which moved through this phase and is now taking stock of the effectiveness of quality assurance measures and their impact on academic quality and productivity. In Europe quality assurance policies and procedures underpin the framework for all levels of European Qualifications. In teaching and learning, quality assurance should include regular evaluation of HEIs, and their programmes and subject to regular review of context, input, process and output dimensions, while emphasising outputs and learning outcomes. In the University of Auckland it was reported that major features of the quality system for teaching and learning in the long term planning were establishing procedures and practices both periodic and continuous quality assurance at Departmental, Faculty and University levels, review and assurance of the quality of teaching and learning, setting up of committees at various levels responsible for monitoring and suggesting improvement for teaching and learning. These are embodied in the policy of which some of the features are:

1. All undergraduate courses and teaching are evaluated by students at least once every three years. Postgraduate courses of a significant size (e.g., 10 students or more) are evaluated by students at least once every three years.
2. Each teaching unit maintains a rolling 3-year Student Evaluation Plan, updated annually, for the conduct of course and teaching evaluations.
3. Summative evaluations are conducted using standardised instruments and supplementary questions approved by Teaching and Learning Quality Committee.
4. Student evaluations of courses and teaching are conducted in a way that enables students to provide anonymous feedback.

5. The results of course and teaching evaluations commissioned under Student Evaluation Plans are processed centrally in a timely manner and made available to the relevant teaching staff, Academic Heads and Faculty Deans as appropriate.

6. Teaching and Learning Quality Committee and Deans of Faculties receive annually an aggregate report on evaluation results.

7. Students are informed of any changes to courses and teaching that are made as a result of prior evaluations.

In implementing the policy the following activities and mechanism were emplaced in the processes. Firstly, in the evaluations and reviews of course quality these procedures were adapted. Student evaluations (using the University Course Questionnaire); regular discussions and feedback sessions among contributing staff; processes of programme accreditation and departmental reviews and annual performance review of staff by Head of Department were employed. These were done through the following mechanisms: Evaluations of teaching staff by students and peer review – at least once every 3 years of which the results were reported to and monitored by the Head of Department, and the academics can commission student evaluations (formative and/or summative) more frequently for their own quality assurance and improvement purposes. The tools used to gather the relevant information are the University Lecturing Questionnaire, University Tutoring Questionnaire, and Annual Performance Review of Academic Staff. Similarly in Europe for teaching and learning specific criteria used to assess quality are: quality of curriculum design and content; quality of instruction and teaching; quality of faculty-student relationship; quality of learning facility and quality of infrastructure.

3. Strategic Approach to Quality

In enforcing quality the European standards and guidelines for internal quality assurance within higher education institutions Approval, monitoring and periodic review of programmes and awards Institutions should have formal mechanisms for the approval, periodic review and monitoring of their programmes and awards. Specific guidelines were developed in order to maintain through effective quality assurance activities which ensure that programmes are well-designed, regularly monitored and periodically reviewed, thereby ensuring their continuing relevance and currency. The quality assurance of programmes and awards are expected to include: development and publication of explicit intended learning outcomes; careful attention to curriculum and programme design and content; specific needs of different delivery modes (e.g., full time, part-time, distance-learning, e-

learning); availability of appropriate learning resources; formal programme approval procedures by a body other than that teaching the programme; monitoring of student progress and achievement; regular periodic reviews of programmes (including external panel members); regular feedback from employers, labour market representatives and other relevant organisations; and participation of students in quality assurance activities. Under student assessment, the standard set was that students should be assessed using published criteria, regulations and procedures which are applied consistently. The outcomes of assessment have a profound effect on students' future careers. It is therefore important that assessment emphasised the learning outcomes.

The MQA is committed to the continuous enhancement of quality. Rather than establishing a separate quality and enhancement strategy, MQA has developed an overarching Teaching, Learning and research Strategy. Teaching, Learning and Research Strategy has been developed as a result of a wide consultative process. This Strategy is seen as the main driver for change and for systematic enhancement. Hence the policies in place seek to identify the minimum institution-wide requirements with which all departments and centres are expected to comply to a common framework to ensure consistency of standards and equivalence in the student experience and to assure a high quality education whilst enabling appropriate diversity in local practices.

Institution policies and procedures for developing and maintaining academic standards and for assessing and enhancing the quality of learning opportunities are determined through its deliberative structures. Departments are responsible for their implementation. Schools/ faculties/centres of Studies are expected to monitor and ensure that their constituent departments do this effectively. Schools report on the outcomes of this activity to institution - level committees in order to inform consideration of institution -wide issues or provision, to identify areas of good and effective practice which might be disseminated to other areas of the institution and to identify areas of potential weakness where there may be scope for improvement. It also allows the institution to identify generic trends or themes which may require attention and/or wider dissemination. The key quality assurance and enhancement procedures benefit from the participation of external peer reviewers. Policies and procedures take account of appropriate external reference points and national and international good practice. There is a management framework for the development and support of quality assurance and enhancement, for fostering a climate of review and reflection, and for leading and setting targets for enhancement.

4. Malaysian Qualifications Framework (MQF)

Traditionally in Malaysia, higher education institutions (HEIs), through their senates and councils working in conjunction with the Public Service Department, took the responsibility in ensuring the quality of their programmes. However, as the practice of quality assurance evolves a much more systematic and rigorous quality assurance system was adapted, devised and put in place. The system will keep on evolving to ensure a globally competitive tertiary education is available in Malaysia.

Left on their own each public HEI took the initiative to improve the quality of its own institution. As quality assurance and Total Quality Management (TQM) gained popularity particularly in the private sector and had a major influence on the management thinking in industry, many of the public HEIs began to adopt TQM. In many years of trial it is found that its application has been generally more successful when related to administrative processes and service activities, rather than to academic functions. Questions raised following application of TQM to improve the quality and standards of HEIs and both in their degree awards and research activities led to the adoption of MS ISO 9000. This development is accelerated as Malaysia opened its doors to overseas degrees in the form of twinning programmes; and after the passing of the Education Act 1996 which opened up the country for the establishment of both overseas and local private HEIs. To complement the issues on quality, ISO 9000 becomes extremely relevant and useful. The standard provides the HEIs with a framework, platform, and a system for the construction of a quality management system that serves the varied stakeholder interests. Thus with ISO 9000 certification, the reputation of the HEIs had been enhanced.

As after 1996 with the establishment of private HEIs offering transnational programmes, issues related to programme quality and standards, comparability of quality of education, faculty staff, and facilities need to be resolved and the answer lies in the formulation and implementation of quality assurance policy. Through the Education Act 1996, The National Accreditation Board (LAN) was established with the mandate to formulate policies on standards and criteria for quality assurance, accreditation of programmes and providing advice and making recommendations to the Minister of Education for approval of programmes for the private HEIs only. Its objectives are to ensure provision of education in the private HEIs is of high quality and able to meet international standards. This led to initiatives being taken to study various frameworks of quality assurance from the different parts of the world including Europe and Japan and particularly those being enforced in New Zealand, Australia and England.

Finally five critical areas were selected to be focused and they were general prescription of type of programme and its objectives and outcomes, quality of curriculum and assessments; academic and support staff; facilities and resources and quality management systems. A programme which fails to meet minimum standards will be recommended for revocation of approval which requires necessary actions taken, and the institution monitored by the Ministry and LAN to ensure corrective actions are taken. This is a critical step in which further system improvement is made.

Standards and quality criteria were developed based on national and international best practices, and also in consultation with stakeholders. An important step taken in ensuring quality of professional programmes is the establishment of a number of joint technical accreditation committees. This arrangement is highly effective in ensuring quality of professional courses particularly in dealing with recognition issues, reducing cost, duplication and wastage of manpower whilst maintaining standards of professional programmes. Other challenges, some of which are solved through improving the quality system include ensuring that the students get good education, equality of access, funding, strengthening internationalisation initiatives and dealing effectively with issues of cross-border recognition. This is witnessed in forms of admission into graduate programmes in foreign universities in such countries as the United Kingdom, Japan, the United States and Egypt; research collaboration with foreign universities, staff and student exchange and formulation of joint degrees. The consolidation of the quality assurance system emerged with the formulation and issuing of the Malaysian Qualifications Framework (MQF).

In the Framework nine areas were proposed for quality assurance and enhancement. These nine areas were: vision, mission goals and learning outcomes; design of the educational programme and teaching-learning methodology; student assessment; student selection and support system; academic staff / faculty; educational resources; programme evaluation; leadership and governance; and continuous quality improvement. These prescribed areas formed the basis for formulating the Code of Practice for Quality Assurance which functioned as programme standards of many disciplines, postgraduate standards, procedures, and reports of benchmarking outcomes, good practices, and training.

The principle underpinning the MQF revolves around the anticipation and thus avoidance of faults, and the improvement of learning management and products. Basically, it involves setting of standards, organizing of working procedures and reviewing the

attainment for further improvement. In the Malaysia Education Summit 2005, in the discussion on the findings of the quality assurance processes in public HEIs Sharifah Hapsah (2009) mooted the idea that self-motivation for quality is the answer, not compliance with thousands of bureaucratic laws and regulations. Institutional self-evaluation is the key to quality because only then can one be sure that quality is continuously maintained, improved and enhanced. The Codes of Practice for Programme Audit (COPPA) and the Codes of Practice for Institutional Audit (COPIA) thus provide comprehensive guidelines on general requirements in the nine areas mentioned. For each of these areas criteria or indicators were developed and standards set. Standards are defined as the expected level of attainment for each criterion and served as a performance indicator. Standards are specified at two levels of attainment: benchmarked standards and enhanced standards. Benchmarking standards are standards that must be met while enhanced standards are standards which are deemed desirable.

5. Teaching and Learning in the MQF

Underpinning quality assurance is a great concern with the quality of teaching and learning. This is true of all the quality assurance systems as practiced in most parts of the world as stated earlier. Hence the emphasis on the programme of studies and each course within it as offered by a respective HEI should have a clear statement of programme aims, objectives and learning outcomes. These will also be indicated in each of the courses offered within the programme. The quality of a programme is ultimately assessed by the ability of the learners to carry out their expected roles and responsibilities in society. As mentioned earlier, for each criterion in the main quality areas and in their sub-areas benchmarked standards and enhanced standards were set.

In determining objectives and learning outcomes for both the programme and the courses some of the requirements stated in COPPA are that the programme and courses must define aims, objectives and learning outcomes and make them known to the internal and external stakeholders. The programme and course objectives must reflect the key elements of the outcomes of higher education that are in line with national and global developments. For academic autonomy it is expected that an academic institution has sufficient autonomy over academic matters, and such autonomy should be reflected at the departmental level where the programme and courses are being offered. Consequently, the benchmarked standards set are that the department must have sufficient autonomy to design the curriculum and to allocate the resources necessary for its implementation to ensure the

achievement of learning outcomes. The academic staff must be given sufficient autonomy to focus on areas of expertise, such as curriculum development and implementation, academic supervision of students, research and writing, scholarly activities, and academically-related administrative duties and community engagement. For the enhanced standards it is hoped that the HEIs involved have a clearly stated policy on conflict of interest, particularly in the area of private practice and part-time employment. Meanwhile the boundaries of academic autonomy for the department and the academic staff should continue to expand reflecting the intellectual maturity of the HEIs.

In the area of curriculum design and delivery five sub-areas were given due attention and they are academic autonomy, programme design and teaching-learning methods, curriculum content and structure, programme management, and linkages with external stakeholders. In an area of academic autonomy an institution is expected to have sufficient autonomy over academic matters. Such autonomy should be reflected at the departmental level where the programme is being offered.

As for programme design and teaching-learning methods, the benchmarked standards are that the department must have a defined process by which the curriculum is established, reviewed and evaluated. The process must involve the academic and administrative staff of the department. The programme must be considered only after a needs assessment has indicated that there is a need for conducting the programme. The programme must be considered only after the resources to support it have been identified. The programme content, approach, and teaching-learning methods must be appropriate and consistent, and support the achievement of programme learning outcomes. There must be a variety of teaching-learning methods in order to achieve the eight domains of the learning outcomes and to ensure students take responsibility for their own learning. For the enhanced standards some of the hopes deemed achievable are that the curriculum should encourage multi-disciplinary approaches to enhance student personal development through electives, study pathways and other means, which should be monitored and appraised, and the needs analysis for the programme should involve feedback from external sources including market, students, alumni, peers, and international experts whose comments should inform curriculum improvement.

In curriculum content and structure it is expected that a teaching-learning environment can only be effective when the curriculum content and structure of a programme continually keeps abreast with the most current development in the field of study. Thus the benchmarked standards set are that the

programme must incorporate the core subject matter essential for understanding the concepts, principles and methods that support the programme outcomes. And the programme must also fulfill the requirements of the discipline taking into account the appropriate discipline standards and international best practices for the field.

In the area of student assessment it is crucial that the quality assurance procedure is able to drive students towards learning. Convincing and reliable evidence is in the measures of student learning outcomes in the forms of examination results, assignments, research works, and experience acquired and competencies displayed during industrial training. The result of assessment also forms the basis in awarding qualifications. Hence, methods of student assessment have to be clear, consistent, effective, reliable and in line with current practices and must clearly support the achievement of learning outcomes. Particular attention is addressed in assessment principles, methods and practices, and aligned with programme content and outcomes. This is translated into benchmarked standards that the assessment must be consistent with the levels defined in the MQF, the eight domains of learning outcomes and the programme standards.

For the assessment methods the benchmarked standards are set in terms of the frequency, methods, and criteria of student assessment -- including the grading criteria which must be documented and communicated to students on the commencement of the programme, while assessment must be summative and formative, a variety of methods and tools must be used appropriately to assess the learning outcomes and competencies, mechanisms must be installed to ensure the validity, reliability, consistency, currency and fairness of the assessment methods, and the assessment system must be reviewed at appropriate scheduled intervals. Other requirements set in the benchmarked standards are that student assessment results must be communicated to the student within reasonable time, changes to student assessment methods must follow established procedures and regulations and communicated to the student prior to their implementation; there must be mechanisms to ensure the security of assessment documents and records. Lastly, the programme grading, assessment, and appeal policies and practices must be publicised.

6. Questions Raised on MQF Implementation in Teaching and Learning

As MQF is being implemented particularly in teaching and learning a number of macro-level issues were raised. For this paper these macro-level issues are issues related to:

1. What are quality assurance initiatives undertaken by HEIs?
2. To what degree are quality assurance specifications based on MQF being pursued at the faculty and department levels (programme and course levels)?
3. What are the mechanisms employed by HEIs to determine and to ensure compliance on the parts of the academicians?
4. What is the overall reaction by the academic staff with regard to the implementation of quality assurance using MQF?

7. Methodology

A survey was undertaken for this study. Ten public HEIs and private HEIs were selected to provide the data. Information sources are from the documents such as those found in course files, minutes of meetings and circulars; and interviews with academic staff. In gathering the data four trained researchers were employed, and they were specifically instructed to gather specific information. In doing this they were given the interview protocol and guide on what information to look for from the available documents. The data gathered are mainly descriptive and hence they were presented descriptively in the findings.

8. Findings on the implementation of the MQF in teaching and learning

Renewed quality assurance initiatives were undertaken through a number of phases. Many HEIs such as Universiti Utara Malaysia, University of Malaya and Universiti Teknologi MARA in the early phase started emplacing the MS ISO9001:2000 framework. In 2002 for example, the certification of MSISO9001:2000 was bestowed upon University of Malaya which then verified that it has fulfilled the requirements of the said standard and is endorsed to practice a quality management system. University of Malaya Quality Management System (QMS) encompasses all the core processes at the University which include teaching and learning, research and consultancies, and their supporting services.

Internal quality assessment involves self-study bestowed upon each of the faculties or schools. In the first instance, programme review or assessment rests on self-appraisal by the programme committee or staff involved. Legitimate self-appraisal processes are guided by the mission and strategic plan of the university, department and the learning outcomes of the programme under review. It was observed that a necessary part of self-appraisal is the collection, presentation and analysis of relevant data about the programme. Specifically, a self study process involves collection and revision of data about the faculty and its educational programme, identification of strengths,

areas of concern and opportunities, discussion of strategic planning to ensure sustainability of the strengths and ways of addressing problems and lastly, making recommendations for further quality enhancement.

To facilitate implementation of the academic Quality Assurance all public HEIs, and some private ones have established quality assurance units or centres with the functions of planning and implementing quality assurance systems, liaising with Malaysian Qualification Agencies (MQA) and departments within each respective HEI, and providing training and guidance to the HEI staff. A brief survey of a number of HEIs indicates that there are various degrees of compliance to the MQF requirements. Evidence of compliance is found in various forms of documentations such as minutes of the meetings within each HEI and also with external stakeholders, letters corresponded to relevant persons and agencies, course files of the academics, student course assessments and assignments, examination results, and course assessments by various parties. Other evidence of compliance is found in the experience recorded and competencies of the academic staff displayed in the forms of their researches and writing activities, involvement in consultancy work and also in administrative capacities as heads of departments, deans and others.

One clear indication of the degree of compliance can be witnessed in staff course files. Many HEIs formulated various forms in an attempt to capture teaching and learning for courses offered. The number of forms issued varied and some even have as much as nine. They include course pro-forma, course outline, student learning time, programme objectives or learning outcomes by domains and levels, course objective or learning outcomes by domains and levels, and student assessment -- by domains and levels. In the pro-forma, for example the form must state a number of basic information such as learning outcomes, course summary and modes of assessment. The learning outcomes have to cover a number of prescribed domains. These domains are knowledge, practical skills, social skills and responsibilities, values, attitudes and professionalism, communication, leadership and team skills, problem solving and scientific skills, information management and lifelong learning skills, and managerial and entrepreneurial skills. In addition to those domains the learning outcome must also encompass transferable learning.

In trying to adhere to the set of procedures and comply with the standards set, the University of Malaya (UM) has improved its QA procedures. Newton (2000) realized that QA can improve quality assurance procedures in universities. The danger is that it does not necessarily improve the quality of student

learning. In the present quality assurance systems, quality is defined and monitored by those outside the university. Commonly, it is quantity not quality that is measured. In teaching among others, the reviewers tend to pay attention to the number of graduating students, the grades they attain, the teacher to student ratio and student to computer ratios. In research, concern is focused on the number of refereed journal articles and the size of research grants. This in turn steers the sort of assessments that are used in universities. The danger of this is that those within the university might abrogate their responsibility for defining and assuring the quality of assessment.

The process of ensuring compliance of quality assurance activities involved both internal and external auditing. In the internal quality auditing the institution's internal quality assurance auditing begins with the process of preparing the database of the self-study analysis of each programme. The committee set up by the HEI allocates the task of writing each section in the database to the most appropriate and knowledgeable person in the committee. A coordinator, a person familiar with the nine areas of standards as outlined in the COPPA and *Guidelines on Standard of Specific Disciplines at Bachelor Degree* will ensure that: all specific criteria in each nine area of standards are answered; sufficient reliable data and information are provided; the accuracy and consistency of data across sections of the database; the write-up is done and arranged according to the sections and sub-sections; required in the COPPA and wherever necessary, related quality document in the Quality Management. In some HEIs SIRIM's certification MS ISO 9001: 2000, is also included in the database. Other forms of feedback from students, staff and stakeholders are obtained to provide input for continuous quality improvement and self-study analysis. At the end of this process an internal audit team is then appointed by the HEI to study the documents prepared and conduct site visit to ensure compliance.

In the external quality assurance the HEI must first conduct a self-review and produce a self-study report which is not just an evaluation but which includes the institution's proposed quality improvement plans. The self-study report and database cover nine areas of standards in which each area is divided into several criteria which cover input and performance or management indicators. The panel of external assessors or auditors constituting mainly of peers will study the self-review report and other documents provided, conduct a site visit and at the end of the process would provide recommendations to the HEI to implement its own continuous improvement plans. The completed self-analysis report and the database are then presented to the management.

In the past most academicians believed that they were sole experts in their field and hence they were the best teachers in their fields. It is true if one refers to the mastery of content knowledge; however, teaching also involves pedagogical content knowledge, pedagogical skills and suitable personal disposition apart from having a conducive learning environment. In the quality assurance programme all those factors were reviewed and made known to those concerned in order to improve the teaching and learning process. There is no doubt that many academicians today are aware of this benefit, but some perceive the exercise as burdensome.

An overall view of the academic staff on the quality assurance review processes was quite positive. For many of them the quality assurance review provided an opportunity for HEIs to be aware of the status of quality of the programmes in the faculties. Most agreed that engaging in QA programme reviews forced them to gauge the quality of their courses and programme. In the process of preparing the documents and in executing them these academicians interacted and engaged among themselves and also with outside experts which helps to improve their collegiality and professionalism. The process improved programmes by pointing out the strong and weak points and areas for improvement. Programme reviews promote programme self knowledge because they involved critical self evaluation by programme groups. The outcomes of programme reviews help to improve programme planning. The internal self evaluation reports provided a baseline for continuous improvement processes. There is no doubt that quality audits can improve the quality of teaching and learning. Nevertheless, certain academicians and students sometimes feel disempowered by external quality assurance. Researchers, teachers and students in universities should be given a chance to comply with intrinsic standards of excellence rather than with those imposed from outside. In quality assurance one has to adhere to a set procedure and comply with a set of standards. The most common objection is that it promotes a "culture of compliance" within the university. As pointed by Harvey and Knight (1996), the demands on teaching staff to respond to external monitoring can adversely affect efforts to enhance the student learning experience.

The evaluation process contributed to the build-up of a self-evaluation culture in UM. The evaluation has further assisted UM academicians in becoming more reflexive about their practice, and the institutions have made their education programmes more transparent to the public and students. Programme reviews identified gaps in programmes that were already integrated and offered. They provided a platform for inculcating the culture of peer

review system in UM, and inculcated quality practices at faculty and programme level, where quality is seen as an integral part of the teaching and learning processes.

9. Challenges and Recommendations

In reviewing the findings of this brief survey it is found that a number of challenges have to be faced particularly in implementation at the faculty and department levels, and new initiatives have to be undertaken in order to improve the system. Setting up of quality assurance units or centres is an important prerequisite step forward; however translating of the policy and the processes into action poses a problem. Lacking of clear empirical evidence of the positive effect of quality assurance exercise or review on either teaching or learning creates doubt regarding the usefulness of such an exercise among the academicians. Many case studies (Brennan & Shah, 2000) reported that the introduction of teaching quality assessment that is more attention given to the teaching function within the institution – to talking about teaching, and to monitoring teaching, led to more time devoted to the monitoring of teaching at the expense of time dedicated to teaching itself. To overcome these problems perhaps quality assurance review needs to be sensitive to the academicians' workload by being critical and selective in exacting them to the quality assurance exercise as insensitivity to the task performed by the academicians may lead to the defacement of their status as academicians. Perhaps the number of forms they have to fill may need to be reduced and details of information required may need to be less duplicative. For the sake of meeting the criteria and standards many of the specifications which lack flexibility have to be revised so that teaching would be able to accommodate reflection and freedom to propose, enact or even to choose from many of one's own ideas. In other words teaching should be a combination of both science and art.

In actual fact, academic auditing has great potentials. Dill (2000) drawing on studies on the outcomes of academic audit procedures in the UK, New Zealand, Hong Kong and Sweden argues that academic audits have placed attention to enhancing teaching and learning on institutional agendas. They have also helped to clarify responsibility for improving quality in teaching and learning at the individual, academic unit, faculty, and institutional level. Quality assessment can also affect the relative powers between students and academics. Students can be empowered by contributing their views and experiences to the assessment process and by using the public reports produced by the quality assurance system in making decisions about what and where to study (Brennan & Shah, 2000). On the other hand, Harvey and Newton

(2004) point out that most studies reinforce the view that quality is about compliance and accountability and has contributed little to improving the student learning experience. They argued that, in most countries, external quality monitoring makes no attempt to encourage quality in learning, but tends to be driven by accountability requirements.

Newton (2000) reports that in his case study, there was little support amongst staff for the view that student learning experience *per se* had been improved. Rather academic staff associated the quality assurance system with improved 'discipline' and 'technology' for validation, monitoring, and external scrutiny. Furthermore, it is argued that changes in learning outcomes are not necessarily linked to quality assurance mechanisms. Where positive changes to the student learning experience have taken place, these are not necessarily directly attributable to the existence of a quality assurance system (Newton, 2000) and, it is argued, the existence of external quality arrangements provides, at the best, a legitimation for internally-driven innovation (Harvey & Newton, 2004). It is argued that other factors completely outweigh the impact of external quality monitoring on student learning.

Although teaching is often an idiosyncratic and individualistic activity there are fundamental pedagogical elements which each academic staff should master before teaching is able to be improved. Time management, clarity about learning outcomes, sensitivity to monitoring, assessment and feedback at the right time and parts of learning, and ability to motivate students at the right time are some of these fundamental elements. Quality assurance as a system is able to provide clear and coherent guides particularly for the novice academic staff. For HEIs encouraging teachers to share their practice would help not only impact on outcomes for learners but also would help in enhancing teaching skills across the academic staff, young and old. In order to achieve this, HEIs need to help the academic staff overcome their inhibition about sharing information on teaching and learning.

HEIs also have to cultivate a culture of a curriculum meeting of the highest standards so that none of the academic staff is left unaware of what is taking place in the process of improving the teaching and learning and in accepting quality assurance as an integral part of the process. Information on the process, whether about the strengths or weaknesses would be useful in programme or course improvement as well as in staff development. Many unintended or collateral outcomes are found as the quality assurance exercise is enforced. Some academic staff have the tendency to take a defensive mode due to the intensity of the programme review criteria, thus resulting in staff not being honest about the quality of their provision. Some

succumbed to the circumstances resulting in not really being committed or convinced of what they are asked to do, yet do not display objection to what is asked of them. Some dishonestly take the opportunity to display their best performance in order to gain rewards while some others openly air their grievances against the system. It is also sometimes true that quality assurance exercise and review findings were wrongly used as information to rationalize and confirm academic staff promotion or demotion or even redeployment. Of course programme review findings are also used as a tool to promote personal agendas of those managing the HEIs. For whatever purpose the quality assurance review is used, one must try to ensure that teaching and learning should benefit from the exercise.

Programme and course review undertaken at department and HEI level is a source where academic staff can review the way a course was taught for them to decide on any necessary improvements or changes. In this process a number of reliable feedback sources were used and hence the feedback is much more helpful as it reflects the needs from different stakeholders, both immediate and long term. This exercise demands the cooperation and goodwill from all those who provide the necessary information. Time pressure needs to be taken into consideration. To do it yearly may pose a burden on those who are already overburdened, even for the students. Therefore programmes or courses with large enrolments or of strategic importance may employ a five or a ten-year cycle under the HEI programme review.

Many of the earlier issues on quality assurance implementation relate to the lack of trust among key players in the system. It is often mentioned in literature that in order for academicians to accept and implement changes, they must trust and own the process of problem definition and solution design. This is certainly the case in any quality assurance exercise. Only if the academicians accept quality assurance as their own activity will the system be successful. Thus the self-evaluation and self-report can be useful in getting and building the trust of academic staff (Van Vugt, 2009). Recognising the importance of creating this trust the new systems of quality assurance that have emerged internationally include both intrinsic and extrinsic elements providing elements of self-study or self-evaluation, and peer review. Self-study has the advantage of being cost-effective, providing a high sense of ownership by the institution or unit being reviewed, and increasing the likelihood of improvements following from evaluation.

Despite the issues raised and challenges faced, it is important that HEIs and their academic staff be involved with the exercise in a positive way. A study should be undertaken to explore the impact of quality assurance practices on teaching and learning. In

such study good indicators of success in teaching and learning should be both in the forms of process and products. The indicators may be in terms of type of learning activities, degree of student participation, active learning time and so forth; for product indicators one can refer to the number of students who have successfully completed all components required for a qualification compared to the total number enrolled, student progression to higher level study, student retention in the programme and even student marketability.

10. Conclusion

Owing to a number of reasons among which are the rapid expansion of higher education systems with a diverse range of providers both public and private, and globalization with the demand for trustworthy organizations that can establish confidence due to economic constraints and a shift in priorities from advanced levels to basic education; emphasizing on the need for more effective mechanisms for the professional recognition of higher education credentials and encouraging of professional mobility through a growing number of regional and international integration processes has led many Governments in most parts of the world to focus their attention and their agenda for higher education on issues of quality assurance and quality enhancement.

Despite differences in the size and stage of development of their higher education sectors, many governments have decided that traditional academic controls are inadequate to face today's challenges and thus explicit assurances about quality are needed. Organizations such as the European Commission (OECD) for example, have reinforced this trend by their own calls for new structures and new approaches to quality assurance. Malaysia, not to be left behind, has embarked on a number of quality assurance initiatives such as in placing of Malaysian Qualification Framework, encouraging institutions of higher learning to implement ISO 9001 Standard and intensifying collaboration with professional bodies. At the heart of quality assurance is the issue of the quality of teaching and learning. In the Code of Practice of Programme Accreditation as implemented by the Malaysia Qualification Agency, the issue of teaching and learning as reflected in Curriculum Design and Delivery, and Student Assessment has been dealt with extensively. This paper reviewed and examined the current status of national policy and processes for QA in teaching and learning, the extent to which the policy was in place and the process implemented, the nature and the variations of the process implemented in instruction and other academic activities including assessment practices, recent trends and areas of emerging consensus as well as issues likely to shape

policy over the next decade, and finally offered recommendations for Government and institutions of higher learning might embark upon to hasten the pace of improvement in teaching and learning.

Corresponding Author:

Dr. Norlidah Alias
Department of Curriculum and Instructional Technology,
Faculty of Education
University of Malaya
50603 Kuala Lumpur
Malaysia
E-mail: drnorlidah@um.edu.my

References

1. Ako Aotearoa Regional Seminars. (2008, April). Retrieved from ako.aotearoa.ac.nz/.../n1403-whole-of-organisation-approaches-to-im
2. Boyle P, Bowden J. (1997). Educational quality assurance in universities: An enhanced model. *Assessment and Evaluation in Higher Education*, 22(2), 111-121.
3. Brennan T, Shah T. (2000). *Managing Quality in Higher Education: An International Perspective on Institutional Assessment and Change*. Buckingham: The Society for Research into Higher Education and Open University Press.
4. Crosby P. (1979). *Quality is free*. New York, NY: McGraw-Hill.
5. Harvey L. (2002a). Quality assurance in higher education: some international trends' Higher Education Conference, Oslo, 22-23 January 2002, pp. 19-20.
6. Harvey L, Green D. (1993). Assessing quality in higher education: A trans binary research project. *Assessment and Evaluation in Higher Education*, 18(2), pp.143-148.
7. Harvey L, Green D. (1993). Defining Quality. *Assessment and Evaluation in Higher Education*, 18(1), pp. 9-34.
8. Harvey L, Newton, J. (2004). Transforming Quality Evaluation. *Quality in Higher Education*, 10(2).
9. Higher Education in Australia. (2000). Occasional Paper Series, Higher Education Division Department of Education, Training and Youth Affairs
10. Educational performance indicators in context . Retrieved from www.auckland.ac.
11. Horsburgh, M. (2010). Quality monitoring in Higher Education: Impact on student learning. doi: 10.1080/1353832990050102
12. Managing Quality in Higher Education: An International Perspective on Institutional

- Assessment and Change. *Higher Education*, 42, No. 4(2001) doi:10.1023/A:1012216124122
13. Mustaffa Kamal Shuib, Sharifah Norul Akmar Syed Zamri, Rosman Abdullah, Fatimah Said, Rohani Yusof. (2008). *Implementation of quality assurance in Public higher education institutions: University of Malaya experience*. Quality Assurance Management Unit, University of Malaya.
 14. National Higher Education Action Plan. (2007). Retrieved from <http://planipolis.iiep.unesco.org/upload/Malaysia/Malaysia%20Higher%20education%20action%20plan%202007-2010.pdf>
 15. Newton, J. (2000). Feeding the beast or improving quality?: Academics' perceptions of quality assurance and quality monitoring. *Quality in Higher Education*, 6(2), pp.153-162.
 16. Newton, J. (2002a). Evaluating the impact of external and internal quality monitoring: perceptions and responses of front-line academics.
 17. Quality Assurance Code of Practice in Public Universities of Malaysia (3rd ed.), Ministry of Higher Education Malaysia
 18. Quality Assurance Division (2005). Rating for quality assurance report in public universities of Malaysia, Ministry of Higher Education Malaysia.
 19. Quality Assurance Division (2004). *Decorum and conduct of the assessment team* (1sted.). Kuala Lumpur: Ministry of Higher Education Malaysia.
 20. Sharifah Hapsah Syed Hasan. Responses to global ranking ranking (THES) in Malaysia 5th EUA Convention of European Higher Education Institutions 18-21 March 2009, Prague, Czech Republic.
 21. Standards and Guidelines for Quality Assurance in the European Countries. (2005). European Association for Quality Assurance in Higher Education. Helsinki: Pikseri Julkaisupalvelut.
 22. The QAA Academic Infrastructure: Mapping Northumbria's Processes www.ond.vlaanderen.be/hogeronderwijs/bologna/documents/Standards... www.northumbria.ac.uk/static/worddocuments/ar docs/qaacode.doc
 23. The Higher Education Credit Framework of England.(2008).Retrieved from <http://www.qaa.ac.uk/academicinfrastructure/FH EQ/EWNI08/> or <http://www.qaa.ac.uk/england/credit>
 24. Van Vugt F. (2009). *Mapping the higher education landscape: Towards a European classification of Higher Education*. Dordrecht: Springer.
 25. Viktoria, K. (2005). Quality Assurance in Tertiary Education: Current Practices in OECD Countries and a Literature Review on Potential the Effects. www.oecd.org/dataoecd/55/30/38006910.pdf.

1/9/2013

Corporate Governance and Predicting Bankruptcy of Firms Using Survival Analysis (Case Study of Companies Listed in Tehran Stock Exchange)

Maryam Mokarami, Zeinab Motefares

* Master of Accounting, Persian Gulf International, Educational Brunch-Islamic Azad University- Khorramshahr – Iran, E-mail: Maryam.Mokarami1@yahoo.com

** Master of Accounting, Persian Gulf International, Educational Brunch-Islamic Azad University-Khorramshahr-Iran

Abstract: The purpose of This Study is to Provide Evidence Associated With Corporate Governance Role From the PRESPECTIVE That Whether Internal Mechanisms Are Effective on Bankruptcy of Firms or not. There fore, a Sample Consisted of 76 Listed Companies in Tehran Stock Exchange Over a Nine_ year Period (1380_1388) Was Select and Investigated. For Hypothesis Testing, Cox Regression Have Been Used. Criteria Used for Corporate Governance are : Size of Board of Directors, Percentage of non Executive Directors, Chief Executive Officer (CEO) Change, and Major Ownership. Control Variables of the Study are : Firm's Size, Profitability, Interest Coverage Ratio, Liquidity, Financial Risk, and Operational Risk. Results indicates a significant Relationship Between CEO Change and Bankruptcy, However a Significant Relationship Was Not Seen Between Percentage of non Executive Directors, Size of Board Of Directors, Major Ownership and Bankruptcy.

[Maryam Mokarami, Zeinab Motefares. **Corporate Governance and Predicting Bankruptcy of Firms Using Survival Analysis (Case Study of Companies Listed in Tehran Stock Exchange)**. *Life Sci J* 2013;10(1):1233-1239] (ISSN: 1097-8135). <http://www.lifesciencesite.com>. 188

KEYWORDS: Corporate Governance, Bankruptcy, Survival Analysis, Longitudinal Data, Tehran Stock Exchange.

INTRODUCTION:

Corporate Governance is a set of Relationships Among Share Holders, Directors, and Auditors of the Company That Ensures the Establishment of a Control System to Observe the Rights of Minor Share Holders and Proper Implementation of Assembly Legislation and Preventing Potential Abuse (HASSAS REGANEH, and KHEIROLLAHI). OCCURANCE of Financial Crises Around The World and Bankruptcy of Firms Has Concerned Owners and in General, all the Society. Since Bankruptcy Incurs Heavy Economical and Social Costs on Society and Wastes the Economic Resources of Society (GHODRATI and MANAVI MOGHADAM). With the Increasing Expansion of Corporations and Diversification of Their Capital Structure on one Hand, and Emergence of Severe Financial Crises in Micro and Macro Economic Dimensions on the Other Hand, Owners and Stakeholders are Looking for a Cover to Protect Themselves Against Such Risks, and this will Lead Them to use Tools and Models for Predicting Bankruptcy (GHADIRI MOGHADAM, 1388). Warning Systems of Financial Crises Usually Use Historical Information of Financial Statements and Other Associated information That are Subject to Manipulation Of the Management, While Other Expected Information Such as Ownership Structure of the Firm and Components of Corporate Governance (Features of Board Of Directors) also Could be useful in Predicting Financial Crises. For example, Ownership Structure and Corporate Governance Which are

essentially qualitative and Expected, Was Knows as the Main Cause of the Asian financial Crisis in 1997. There fore, an Immediate Alarm System With Both Financial Variables and Corporate Governance is able to Improve Prediction Power of the Model (POURZAMANI, 1385).

1_Raising and Statement of the Issue:

(1-1)_ Concepts, Definitions, and Basics of Corporate Governance: Nowadays, the Term ((corporate Governance)) is an evolving Concept of Concern in the Word of Business. Corporate Governance is the Foundation of the Firm's relationship With Interested Groups. Like many Discussed and Evolving Issues, There are Various Interpretations and Definitions of Corporate Governance. The main Difference in Attitudes is Associated With the Range of Firm's Relationship With Stakeholders. Corporate Governance at the Micro Level, aims to Achieve the Objectives of the firm, and at the Macro Level, it Considers Optimal allocation of Society Resources. Historical Background of Corporate Governance, at it is Today, Dates Back to 1990 s and OCCURANCE of Financial Scandals in Some Large Companies. In Spite of Some differences, it Appears That Main Principles of Corporate Governance in Developed and developing Companies Have Travelled the Path of Convergence Over Time. To Develop a Desirable Corporate Governance System, Considering the Internal External Factors as Well as Economic, Political, and Cultural Conditions Of any Country Seems Necessary (BADRI, 1390).

(2-1)_ Bankruptcy's Concepts, Definitions, and Basics:

Nowadays, Rapid Advancement of Technology and Vast Environmental Changes, has Increasingly Accelerated the Economy, and Increasing Competition of Firms has Limited the Achieved Profit(Earnings) and Increased Probability of Bankruptcy (ALIKHANI and MARANJOURI, 1388). Bankruptcy is One of the Most Important Issues Worldwide That Influences the economy of all Countries. Bankruptcy has Always attracted the attention of a Wide Range of Interested Groups of People, Organizations and in General, a Large Part of Society. However it can be Claimed That Management, Investors, Competitors, and Legal Institution are More Influenced by Bankruptcy phenomenon Than Others (SOLEIMANI AMIRI, 1381). It is Not Easy to Determine the Cause (s) of Financial Crisis in any Particular Case. Financial Problems are Often Due to Various Factors That Finally Lead to an Event Which Causes Bankruptcy. in General, Causes of Bankruptcy are Divided into Two Groups: In –Built Causes Including Excessive Expansion of Credit, Inefficient Management, Inadequate Capital, Infidelity and Cheating ; and External Causes Including the Characteristics of Economic System, Lock of Proper Understanding of Competitors, Lack of Proper Understanding of Customer, Commercial Fluctuations, Problems associated With Financing, Natural Events and OCCURANCES (SAEIDI and AFSHARIJOU). Investors by Predicting Bankruptcy Not Only Prevent Their Capital From the Risk of Being Unpaid,But also They Use it as a Tool For Decreasing Their Portfolio. Managers of the Firms Can Also Take Preventive Measures if They are Informed of the Risk of Bankruptcy in Time. This is Consider From a Macro Perspective as Well, Because wasted Resources in a firm in Crisis can be allocated to Other Profitable Opportunities (ALIKHANI and MARANJOURI).

(3-1) _Relationship of Corporate Governance Components With Bankruptcy:

Given That Bankruptcy and Financial Crises Incur High Costs to Firms as Well as Wasting capital and Financial Resources, So Predicting Continuous Activity of Firms in Future Periods is one of the Main Elements in the Investment decisions. In This Regard, Corporate Governance Indicators Have an Effect Role in Predictions. Indicators of Corporate Governance Mainly Focus on Features of Board of Directors. Separation Between Ownership and Management in New Institutions Increases the Role of Management in Company's Performance. Motivational and Regulatory Issues are Obtained From Such Relationships. Thus, Board of Directors Turns Into a Mechanism With More Influence on the Internal Control System (to Solve the Agency Issues) that Eventually affects the Company's

Performance as Well as the Probability of the OCCURANCE of the Company's Financial Crisis. Theoretical Relationship Between Corporate Governance and Bankruptcy has its Root in Literary History of Organizational Theory of Which it is Inferred That Organizations Often Change Corporate Governance With Board of Directors' Composition and Structure When They Have a Descending Trend or Face Financial Crises.

2_ Background of the Study: There Have Been Conducted no Particular Study Regarding the Issue of Corporate Governance and Bankruptcy Prediction Inside the Country (IRAN), However Corporate Governance and Bankruptcy Prediction Have Been Separately Studied Each of Which we Describe as Follows: (1-2) _ Background of the Research Related to Bankruptcy :

Altman (1986) is First to Offer Multivariate Prediction Models. He Sough to Predict Bankruptcy of Firms by Applying Multiple Discriminate Analysis and Using Financial Ratios as Independent Variables. He Presented His Well_Know Model Titled as (Z) Model. Which is Know in Predicting Bankruptcy.

Ahlsvn(1980),as Well, Was the First to Use Logit Regression Model in the Area of Bankruptcy Prediction in (1980). Given That His Sample Consisted of 105 Bankrupt Companies and 2058 Bankrupt and Healthy Companies, His work Was the Most Comprehensive Study Ever Done in Those Times. His Extracted Prediction Model Could Predict Companies' Bankruptcy For First to Third Years With 85/1, 87/6, and 82/6 Percent Accuracy, Respectively. Variables of Debt to Total Assets Ratio and Net Profit to Total Assets Ratio Were Best Discriminant Ratios in his Model.

Adnan_ Aziz (2006), Compared Various Bankruptcy Prediction Models one Year Prior to Bankruptcy and By Analyzing the Results of 46 Studies (43 Papers, a Technical Report, and Two Q and A Papers) And Investigating 89 Companies Concluded That % 60 of the Studies Used Financial Ratios as Descriptive Variables of Their Research, %7 of Them Used Cash Flow Information, and The Remaining %33 Used a Combination of Financial Ratios and Other Variables Such as Variables of Micro and Macro Economy, Industry_ Specific Variables, and Company_ Specific Variables. These Findings Suggest That Information Content of the Company's Accounts are Valid.

Chitnomera et al in (2011) in a Study Entitled (Corporate Governance and Reorganization Performance After Bankruptcy) Using a Sample Consisted of the Company, Level of Cash Bonuses Awarded to Employees By the Administrator, Number of Planning Managers Outside Board of Directors, and

Check Project Managers Outside Board of Directors With Company's Performance after Bankruptcy.

KARIMI and ASHRAFI (2011) Conducted a Study Titled as((Investigation of The Association Between Corporate Governance Mechanisms and Capital Structure in Tehran Stock Exchange))in Order to Provide Evidence Related to the role of Corporate Governance from the Perspective That Not the Internal and External Mechanisms of Corporate Governance are Effective on the Company's Capital Structure.

3_ The Study Hypotheses:

Considering the Background and Exploratory Studies, the Basic Hypotheses of This Study are as Follows: 1_ there is a Significant Relationship Between CEO Change and Bankruptcy. 2_ There is a Significant Relationship Between Board of Directors' Size and Bankruptcy. 3_ There is a Significant Relationship Between non Executive Directors and Bankruptcy. 4_ There is a Significant Relationship Between MAJOR Shareholders Ownership and Bankruptcy.

*The Study Methodology: in This Study, Survival Analysis Along With Longitudinal Data are Used. General From of The Model is Described as Follows:

*Financial Risk = $\frac{\text{Total Debt}}{\text{Total Asset}}$

*Interest Coverage Ratio = $\frac{\text{Earnings Brfore Interest and Tax}}{\text{total Interest}}$

*Operational Risk = $\frac{\text{Total Assets}}{\text{Total Sales}}$ *Company's Size = log of Total assets

*Liquidity = $\frac{\text{Current Assets}}{\text{Current Debts}}$

*Profitability Indicators = $\frac{\text{Earning Brfore Interest and Tax (EBIT)}}{\text{Sales}}$

*E= the Value of Regression Model Error

(1-4)_ the area of the Study: Given the Importance of the issue, the Study Area Has been Considered in Terms of Time, Place and Subject as Follows: 1_ Time Domain : Time Zone of the Study is a 9_ Year Period from 2001 to 2009.

2_ Spatial Domain: Spatial Domain of this Study is this Study is the organization of Tehran Stock Exchange. 3_

Subject Domain : Subject Domain of the Study is investigation of the Effects of Some Corporate Governance Criteria Including : Size of Board of Directors, CEO Change, Number of Non Executive Directors, and Major Ownership on Firms' Bankruptcy Using Survival Analysis.

*Chart(1) : Number of Companies in any Industry

Industry Code	Type of Industry	Number of Companies in the Sample
1	Automobile and Parts Manu Fature	5
2	Manufacturing Radio, television, and Communication Devices and Tools	2
3	Manufacturing Metal Products	5
4	Other Non_ Metallic Mineral Products	6
5	Cement, Lime, Chalk	8
6	Basic Metals	6
7	Tile and Ceramics	5
8	Rubber and Plastic	6
9	MACHINARY and Equipment	3
10	MACHINARY and electric Devices	1
11	Chemical Products	5

Bankruptcy= b_1 CEO Change+ b_2 Major OWNERSHIP+ b_3 Number of Non Executive Directors + b_4 Board of Directors' Size+ b_5 Operational Risk+ b_6 Financial Rick+ b_7 Profitability + b_8 Liquidity+ b_9 Company's Size+ b_{10} Interest Coverage Ratio+4 (1)

In This Model, Bankruptcy is a Dependent Variable Which is Defined as Follows: Companies Whose Accumulated Losses are at Least Over %50 of the Company's Capital are Considered Bankrupt and Code (1) is Allocated to Them, Otherwise (Healthy Companies) Code (0) is allocated. Independent Variables are described as Follows: CEO Change : It is CEO Tenure Which Means the Number of Years That a CEO Holds This Post. Board of Directors' Size: Log of Number of Directors in the Board. Major Ownership : Ownership Percentage of Owners Having Over %5 of the Company's Stock. Number of Non Executive Directors: the Ratio of number of non Executive Directors to Total Number of Members. Control Variables (Accounting Standards) are Described as Follows:

12	Food and Beverage Products Except Sugar	7
13	Textiles	2
14	Pharmaceutical Materials and Products	7
15	Other Industries	8
16		78

6_ Data collection Method: to Collect the Date, Financial Statements Presented to Tehran Stock exchange and Other associated Information Resources Such as (TADBIR PARDZA) and (RAHAVARD _E_ NOVIN) Databases Have Been Used.

7_ Data Analysis: Cox Regression is the Statistical Method Used in this Study to Predict Companies` Financial Was Conducted By (SPSS)18th Version. In This Set of Data, One of the Variables of Concern is the time Required to the OCCURANCE of a Certain Event Which is Called Survival Time or Failure Time. In Certain Companies For Reasons Such as Passing of the Study time. In This Case, we Consider Survival Time Censored. Ordinary Regression Models Can Not be Used to Model the Survival Data For Two Regression. Survival Data Generally Do Not Have a Symmetrical Distribution and Their Context Writer Have a positive Strain.

(1-7)_ Modeling Bankruptcy : (1-1-7)_ Model Fitting:

In Modeling Process, We Seek To Establish a Relationship Between dependent Variable (Here, Survival Time (t)>0) and Independent Variables. Cox Model Instead of Establishing a Relationship Between (X). This is Conducted By Various Methods Such as Step_ By _ Step, Back word and Forward. In this Study, Backward Method is Used. to Show the Impact of Corporal Governance Features on Bankruptcy Time, Cox Proportional Hazard Model is used as Follows:

$$\frac{h(t)}{h_0(t_0)} = \text{EXP}[b_1x_1 + b_2x_2 + \dots + b_px_p]$$

Where, H(t) is Hazard Rate Which Shows the Probability of the OCCURANCE of Bankruptcy in Next Moment, Provided That it Has Not Occurred Till That Moment: Ho(to)is Basic Hazard Rate Which is Determined When the Values of Independent Variables are Zero. In Fact, Hazard Rate Equals an Exponential Number Multiplied By Ho(T) Function.

This Numerical Coefficient Depends on Regression Coefficients.

$$*h(t) = h_0(t) \text{EXP}[b_1x_1 + b_2x_2 + \dots + b_px_p] \quad (3)$$

(2-1-7) Testing Significance of the Model : the First Statistical hypothesis States that None of the Independent Variables Have an effect on Hazard Rate of Bankruptcy. in Contrast, the Alternative Statistical Hypothesis States That at Least there is One Independent Variable That is Effective on Hazard Rate of Bankruptcy (S.GARAJAI). in Other Words:

$$H_0: b_1 = b_2 = \dots = b_{10} = 0 \quad (4)$$

(For at Least One (I) $H_1: b_i \neq 0$)

*Chart (2): Omnibus Tests of Model Coefficients^{a,b}

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change From Previous Block		
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square	df	Sig.
350.579	166.352	10	.000	51.548	10	.000	51.548	10	.000

According to the Value (Chi- SQUIRE= 166/352, Sig= 0/000), We Can See That Test Statistic is Located in reject District of ho. Thus at Least there is One Effective Independent Variable, and there is No reason For Rejecting the Significance of the Whole model. As Mentioned in the Previous Section, the Method used in Modeling is a Backward Method. This Method is Such That First all Variables Get Into the Model and then, at Different Stages, Insignificant Variables Get Out of the Model and Finally, a Model With an Appropriate of Variables is Obtained.in Association With This model, 3 Steps Are Formed. In the First Step, the Model is Obtained as Follows:

$$b_1 \frac{h(t)}{h_0(t)} = \text{Major Ownership} + b_2 \text{Liquidity} + b_3 \text{Financial Rick} \quad (5)$$

Table 3

Proportional Hazard (EXPCB)	Significance (Sig)	Standard Deviation (SE)	Regression Coefficients (b)	Variable`s
.878	.481	.184	-.130	Number of Non Executive Directors
1.179	.192	.126	.164	CEO Change

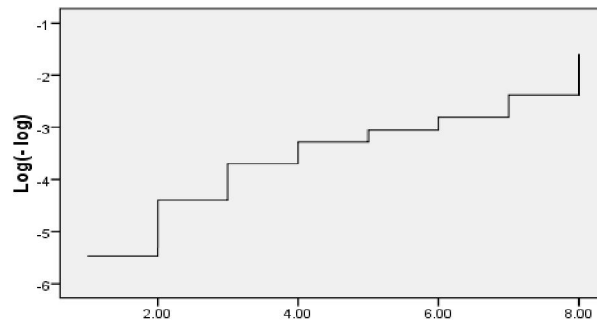
1.001	.000	.007	.001	Major ownership
.218	.001	.468	-1.523	Liquidity
1.422	.000	.091	.352	Financial Rick
1.105	.354	.108	.100	Operational Rick
.999	.605	.002	.000	Interest Coverage Ratio
.989	.831	.051	-.011	Productivity Ratio
.845	.211	.135	-.169	Company`s Size
./298	./638	2/568	-1/210	Board of Director`s Size

$$\frac{h(t)}{h_0(t)} = 0.0001 \text{ Major Ownership} - 1.523 \text{ Liquidity} + .352 \text{ Financial Rick} *$$

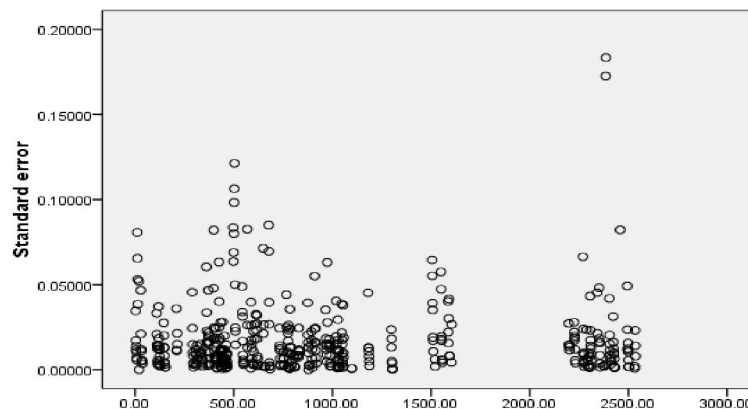
Results of Initial Fitting of Cox Model Shows that Only Variables of Major Ownership, Liquidity, and Financial Rick are Present in the Model (Sig<9%5). if this Set Has Other Conditions of Cox Model, it Will Be the Final Model. In Next Sections, First We Check the Hypotheses of the Model, and than We Will Introduce the Final Model and Analyze its Results.

(2-7)_ Checking the Model Hypotheses

Hypothesis of the Proportionality of Hazard:

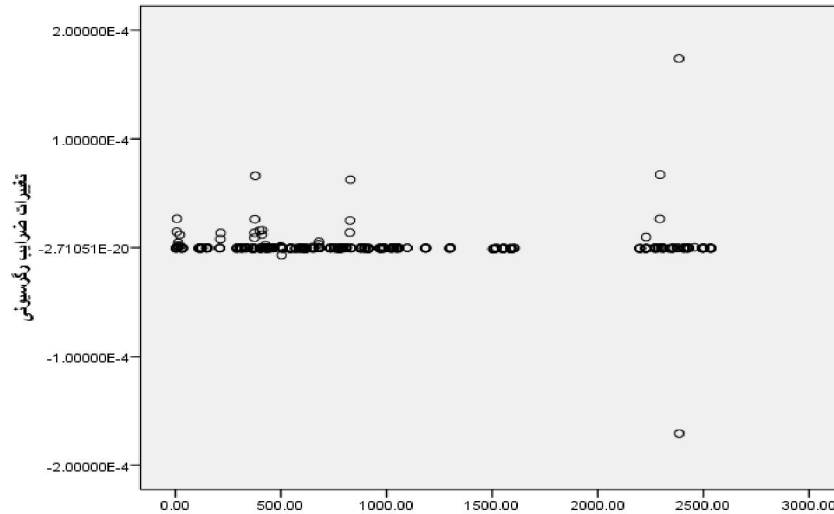


(2-2-7)- Outliers: the Following Graph Shows the Distribution of the remaining deviations For Cox Model. According to the Observations, the Two Data (2385 and 2384) are Outliers.



(3-2-7) Recognizing the Effective Data

Fig.(3) Delta Graph: Shows Beta (B) For Cox Model. The Figure Suggests That Excluding Outlier Observations Changes the Regression coefficient, and Even it Changes the Significance of Variables. In Other Words, Instead of the Ownership Variable, CEO Change Variable Became Significant.



(4-2-7) Final Model : as We Mentioned Above, Two Data are outlier and Effective that Should be Removed. By Removing These Two Observations, the Final Model is Gained as Follows:

$$*b_1 \frac{h(t)}{h_0(t)} = \text{CEO Change} + b_2 \text{ Liquidity} + b_3 \text{ Financial Rick} \quad (6)$$

*Table (7) : Final Step Data *

Independent Variables	Regression Coefficient(b)	Standard Deviation (CE)	Significance (SIG)	Proportional Hazard (EXP(B))
CEO Change	0/268	0/126	0/034	1/308
Liquidity	-1/613	0/479	0/001	0/199
Financial Rick	0/378	0/091	0/000	1/459

$\frac{h(t)}{h_0(t)} = 0/268 \text{ CEO Change} + 1/613 \text{ Liquidity} + 0/378 \text{ Financial Rick}$ Results of Final Fitting of COX Model (Table2).

Shows That Only the Variables of CEO Change, Liquidity, and Financial Risk are Present in the Model (Sig< 0/05). Coefficients of the Model Shows That as the Variables of Financial Risk and CEO Change Increase, Bankruptcy Hazard Increases as Well, And as Liquidity Increases, Bankruptcy Decreases. Proportional Hazard Greater Than 1 Shows that as the Independent Variable increases, Bankruptcy Hazard I increases as Well, and Proportional Hazard Smaller Than 1 Shows That as Independent Variable Increases, Bankruptcy Hazard Decreases. For Example, Proportional Hazard of CEO Change is 1/308, Which Shows That Per One Unit Increase in This Variable, Bankruptcy Hazard Increases a Much as %30/8.

(3-7) Descriptive Statistics of the Study

The Study's Descriptive Statistics Which Include Average, Median, Max, Min, and Standard Deviation of the Study's Data, are Calculated and Presented in the Following Chart:

The Values Mentioned Only Present a Schematic of Data Distribution Status of the Study

*Chart (8) : descriptive Statistics of the Study

Max	Min	Standard Deviation (SD)	Median	Average	Number	Variable
6	0	0/985	3	2/987	635	Number of Non executive Directors
10	0	2/015	2	2/787	635	CEO Change
5597	7/28	3/252	81/86	97/59	553	Major Ownership
10/1	0/02	0/889	1/13	1/265	567	Liquidity
15/2	0/04	1/802	1/31	1/787	558	Operational Risk
7539	-1162	5098/1	5/19	422/48	507	Interest Coverage Ratio
225/9	-29/3	9/970	0/21	0/722	534	Profitability
16/17	7/09	1/580	12/63	12/664	559	Firm's Size
98/37	0/03	4/151	0/68	0/916	567	Financial Risk
2/2	1/1	0/091	1/609	1/624	635	Board of Director's Size

Results

Presented in the Above Chart Shows That the Average (Median) if the Ratio of Non Executive Directors is (3) 2/98, CEO Change is (2) 2/78, Major Ownership of Shareholders is (81) 97/5, Liquidity is (1/13) 1/26, Operational Risk is (1/31) 1/78, Interest Coverage Ratio is (519) 422/4, Profitability is (21) 72, Firm's Size is (12/62) 12/66, Financial Risk is (68) 91, and Board of Directors' Size is (1/60) 1/62. Max and Min of the Number of Non Executive Directors is (0/000) 6, CEO Change is (0/000) 10, Major Ownership is (7/28) 5597, Liquidity is (0/02) 10/10, Operational Risk is (0/04) 15/20, Interest Coverage Ratio is (-1162) 75395, Profitability is (-29/3) 225/9, Firm's Size is (7/09) 16/17, Financial Risk is (0/03) 98/37, and Board of Directors' Size is (1/10) 2/20 Also Standard Deviation of the Variables of the Number of Non Executive Directors is 0/98, CEO Change is 2/01, Major Ownership is 3/25, Liquidity is 0/88, Operational Risk is 1/80, Interest Coverage Ratio is 5098/12, Profitability is 9/97, Firm's is 1/58, Financial Risk is 4/15, and Board of Directors' Size is 0/09.

CONCLUSION

In First Hypothesis of the Study, Investigating the Association Between CEO Change Variable as the First Agent of the Corporate Governance and Bankruptcy Showed Significant relationship Between These Two Variables. This Implies That First Hypothesis is Confirmed. A Significant Relationship Between These Two Variables (CEO Change and Bankruptcy) Shows That Companies frequently Experiencing a CEO Change are More Subject to Bankruptcy Than Other Companies. In Second Hypothesis of the Study, the Relationship Between the Board Of Directors' Size and Bankruptcy Was Examined. Results of the Estimation of the Model Indicates That There Isn't a Significant Relationship Between the Variable of the Board of Directors' Size and Bankruptcy. Thus, Second Hypothesis of the Study is Rejected.

In Addition, in Third Hypothesis of the Study, Regarding the Percentage of Non Executive Directors and its Relationship With Bankruptcy, the Results of the Model's Estimation Indicate the Insignificance of the Relationship Between the Two Variables. This Means That There is Not a Significant Relationship Between the Percentage of Non Executive Directors and Bankruptcy. There Fore Third Hypothesis of the Study is Also Rejected. In Fourth Hypothesis, RESULTS of Examining the Relationship Between Major Ownership Variable and Bankruptcy Show That the

Relationship between These Two Variables is Insignificant and Finally, the Fourth Hypothesis is Rejected

References

- 1) Karimi, Farzad and Ashrafi, Mehdi (2011). "A study of corporate governance mechanisms and capital structure on Tehran Stock Exchange", Financial accounting research Magazine. 3rd year, PP 79-92
- 2) Saeidi, Ali and Foroughi, Darioush and Resaeian, Amir (2011). "Corporate governance and capital structure in firms listed on Tehran Stock Exchange". Seasonal Bulletin of Research and Economical Policies, nineteen impressions, No. 58, PP 191-214
- 3) Hosanna and Butts. (2009). "Impact of ownership structure and corporate Governance on capital structure of Pakistani listed companies". International Journal of Business and Management. vol 4, pp 50-57.
- 4) Abor, Joshua. (2007). "Corporate governance and financing decisions of Ghanaian listed firms". Vol 7 no, 2007, pp 83-92. Emerald Group publishing limited, ISSN 1472-0701
- 5) Altman, E and Mc Gough, T (1986), Accounting Implications of Failure Prediction Models, Journal of Accounting-Auditing and Finance.
- 6) M. Adnan Aziz and Homayon A. Dar, 2006. Predicting Corporate Bankruptcy: Where We Stand?, Corporate Governance Journal, Vol. 18, no. 1, pp. 18-33.
- 7) Ohlson, J., (1980), "Financial Ratios and Probabilistic Prediction of Bankruptcy", Journal of Accounting Research, 18(1), 109-131.
- 8) Parker, S and Peters, G and Turetsky, H, (2002), Corporate Governance and Corporate Failure: a Survival Analysis, MCB UP Limited, 1472-0701, pp 4-12.
- 9) Raei, Reza and Saeed Falahpour. 2004. Financial Distress Prediction of Companies by Artificial Neural Networks Technique. Journal of Financial Research, no. 17. p. 39-69.
- 10) Thanida Chitnomrath, Robert Evans, Theo Christopher, (2011), "Corporate governance and post-bankruptcy reorganisation performance: Evidence from Thailand", Asian Review of Accounting, Vol. 19 Iss: 1 pp. 50 – 67
- 11) Marziana Btmadah Marzuki, "Corporate Governance and Corporate Failures: an Empirical Evidence of Malaysian Public Listed Companies", Jun 2005, Copyright © uitm.

Histological and Cytological Effects Of Aqueous Extract of *Myristica fragrans* (Nutmeg) on the Renal Cortical of Male and Female Rats

Aisha D. Alalwani

Biology Department- Science Faculty for Girls - King Abdulaziz University- Jeddah- Saudi Arabia
dralwani2@gmail.com

Abstract: Aqueous extract of *Myristica fragrans* was evaluated for its renal cortical structures of changes of male and female Wistar rats. Rats of both sexes (n = 40) were randomly assigned into two treatment and two Control groups (n=10 each). Groups (G1&G3) served as control, while the rats in the test groups (G2&G4) received oral daily single dose of 1000 mg/kg b.w of aqueous extract nutmeg for 6 weeks. Serum biomarker urea nitrogen, serum creatinine and alkaline phosphatase of kidney injury pointed at levels increased as well as body weights and the mean relative kidney weights were affected by the treatment. Examination histological showed congested and fragmented glomeruli of treated male rats. While, glomerular in the female rats appeared atrophy and tissue lysis. However proximal convoluted tubules appeared atrophy, necrosis, cytoplasmic degeneration with brush border damage and cellular infiltration in male and female treated groups. In addition, destruction of cytoplasmic organelles, irregular of basement membrane with dilation of basal in folding were observed in distal convoluted tubules both treated sexes. The results of the present study suggest that use of nutmeg in higher doses (1000 mg/kg) could be toxic to the renal cortical tissues and metabolic functions in both rats sexes.

[Aisha D. Alalwani. **Histological and Cytological Effects Of Aqueous Extract of *Myristica fragrans* (Nutmeg) on the Renal Cortical of Male and Female Rats.** *Life Sci J* 2013;10(1):1240-1249] (ISSN: 1097-8135).
<http://www.lifesciencesite.com>. 189

Key words: *Myristica fragrans* (nutmeg), kidney tubules, histopathology, ultrastructure, creatinine, urea.

1. Introduction

There is a tendency to use herbal medicines in all parts of the world, hence it is possible to misuse *M. fragrans* in order its medicinal properties. The nutmeg plant, *Myristica fragrans* Houtt, is a member of the small primitive family called Myristicaceae, taxonomically placed between the Annonaceae and Lauraceae (Joseph,1980). Medicinally, nutmeg is known for its anti-inflammatory (Olajide *et al.*, 1999), as well as anti-rheumatic, carminative properties (Prabuseenivasan *et al.*, 2006). Utilization nutmeg as a medicinal or spice suggest that it contains some constituents which are responsible for the reported biological activities. Some of these activity may at the same time possess some adverse effects. One of the active ingredients in nutmeg is called myristicine, which has neurotoxic effects (Madsen and Bertelsen,1996). It has also been found possesses anti-inflammatory (Olumayokun *et al.*, 1999) antifungal, hepatoprotective (Tatsuya *et al.*, 2003), anti-diarrheal agent, and tonic for the heart and brain(Olaleye *et al.*,2006). Nutmeg has long been known for its psychoactive properties when ingested in large quantities (1-3 nutmegs) causing convulsions, hallucinations, and possibly death (Kelly *et al.*, 2003; Forrester, 2005). It has been reported to reduce cell viability in a dose dependent manner (Lee *et al.*, 2005). Previous studies by Hummdi, (2011) reported that administration of

nutmeg may have some deleterious effects on the hepatocytes of adults rats at higher doses. Indiscriminate use is well reported previously in the medical literature(Sonavane *et al.*, 2002; Mckenna *et al.*, 2004). However, subcellular pathological perspective are studied. Therefore, study possible subcellular effects of chronic consuming of nutmeg on the glomerular and renal tubules of adult male and female Wistar rats could be worthwhile. With a view to advising the consumers on the inherent dangers of excessive consumption of the *M. fragrans*.

2. Materials and Methods

Experimental animals

The study was conducted in accordance with the National Institutes of Health guidelines for the use of experimental animals. Wistar rats, a total of 20 males and 20 females were divided randomly into four groups (10 rats per group), weighing 248.60±9.553g and 234.40± 8.264 of male and female respectively. Obtained from the Animal House of the King Fahd Center for Medical Research, King Abdul Aziz University in Jeddah of Saudi Arabia. Rats were maintained on a 12 h light/dark cycle at 21 ± 1°C and 50 ± 10% humidity, and left several days of adaptation.

Preparation of extract

Seeds of *Myristica fragrans* found in Spices market in Jeddah of Saudi Arabia, they have been

brought and authentication in the King Fahd Center for Medical Research, King Abdulaziz University according to **Olaleye et al., (2006)** method grated nutmeg seeds (760g) were soaked in 3 L of hot distilled water and left to stand for 72 hrs, then filtered the extract. The extract was freeze-dried and kept frozen until used.

Nutmeg administration

The animals in treatment groups (G2 & G4) were daily given 1000 mg/kg/ b.w. of *Myristica fragrans* (Nutmeg) aqueous extract orally for forty-two days (6weeks). Control groups (G1 & G3) the rats were used as control and given orally distilled water throughout the experiment. Thereafter, during the entire experiment, all animals were checked daily for state of health and behavior. Individual body weights were recorded weekly. After 6 weeks of treatment all animals of group were sacrificed by cervical dislocation and blood biochemical assay were done and quantitative morphometrics analysis. Histopathological evaluations and electron microscopic studies were performed on kidney tissues.

Biochemical study

At the end of the trail-24 hours after the experiment, the blood samples were collected and analyzed for serum creatinine (Cre), urea nitrogen (UN), alkaline phosphatase (ALP) were determined according to the procedures recommended by the manufacturer of the kits employed according to **Chromy et al., (2008)** procedures.

Histological study

After sacrifice rats the kidneys transported quickly dissected out and fixed in 10% formal saline for routine histological techniques. The tissues were

dehydrated in an ascending grade of alcohol (ethanol), cleared in xylene and embedded in paraffin wax. Serial sections of 2 microns thick were obtained using a rotatory microtome. The deparaffinized sections were stained routinely with hematoxylin and eosin (**Bancroft and Gamble, 2002**). Photomicrographs of the desired sections were made by light microscope for further observations.

Electron Microscopy

Samples of kidney were fixed in 2.5% glutaraldehyde and 0.25 M sodium cacodylate, post-fixed in 1% osmium tetroxide and embedded in Spurr's epoxy. Ultrathin sections were picked up on nickel grids, stained with uranyl acetate/lead citrate (**Woods and Stirling, 2002**) and examined in a Philips TEM 100 microscope in KFCMR.

Statistical analysis

All data were presented as Means \pm SE. Multiple comparisons were performed using student's t-test. A value $p < 0.05$ were taken into consideration for determining significance. All Statistical procedures were computed using SPSS 18.0 software.

3. Results

Body and kidney weights

The *M. fragrans* extract caused a significant increased in the mean value of body weight of male rats, While there was no visible increased in body weights in females **Table 1**. Significant increased in relative kidney weights of male animals and highly significant decreased of female animals given nutmeg compared to their respective controls, it also no mortality or treatment macroscopic findings observed in both rats sexes were recorded.

Table 1: Body weight and relative kidney weight of experimental and control rats after 6 weeks of Nutmeg administration.

Weights		Experimental Groups			
		Male		Female	
		Control (G1)	Treated (G2)	Control (G3)	Treated (G4)
Body Weight	Mean	248.60	301.60	234.40	242.00
	\pm SE	± 9.553	± 10.375	± 8.712	± 8.264
	P	-	.002**	-	.586
Relative kidney weight	Mean	0.680	1.040	0.620	0.410
	\pm SE	± 0.048	± 0.132	± 0.020	± 0.001
	P	-	.057*	-	.003**

* $P < 0.05$, ** $P < 0.001$

Effects of nutmeg on renal function

Increased levels of serum creatinine (Cre), urea nitrogen (UN) and alkaline phosphatase (ALP) were

observed as biochemical parameters in the treated rats (**Table 2**).

Table 2: serum creatinine and serum urea of experimental animals kidney and control rats after 6 weeks of Nutmeg administration.

Kidney bioassay		Experimental Groups			
		Male		Female	
		Control (G1)	Treated (G2)	Control (G3)	Treated (G4)
S. creatinine mg/dl	Mean	.650	.720	.680	.780
	±SE	±.022	±.040	±.124	±.046
	P	-	.245	-	.277
Blood urea mg/dl	Mean	4.120	4.880	4.680	5.480
	±SE	±.332	±.190	±.177	±.664
	P	-	.170	-	.008**
alkaline phosphatase (U/L)	Mean	237.00	258.60	116.20	131.80
	±SE	±15.911	±21.139	±14.392	±24.374
	P	-	.053*	-	.032*
Na ⁺ (mmol/L)	Mean	14.023	10.322	8.7722	7.2856
	±SE	±.2330	±.2371	±.3200	±.5041
	P	-	.000**	-	.000**
Cl ⁻ (mmol/L)	Mean	13.0430	12.1009	8.7391	7.5911
	±SE	.392±	±.2899	±.372	±.5008
	P	-	.001**	-	.001**

* $P < 0.05$,** $P < 0.001$

Histological results

No histological changes were observed in the control groups (G1&G3) of male and female rats kidneys. Cortical zone of rats kidneys displayed urinary glomeruli, proximal convoluted tubules (PCTs) and distal convoluted tubules (DCTs) (Figs. 1a,b). Glomeruli of renal corpuscles were made up of parietal cells and podocytes with foot processes, the glomerular basement membrane (GBM), foot processes and filtration slits were observed in normal structure (Fig. 2a), mesangial cells, mesangial matrix (Fig. 2b) and endothelial cells in capillary (Fig. 2c). The results of light microscopy of the kidney of male animals in group (G2) revealed some congested, fragmented glomeruli and obliterated urinary space (Fig. 1c). However, electron microscopic examination of the group G2 confirm the endothelial cells necrotic and capillaries filled with deformed red blood cells. Some endothelial cells appeared marked deformed nuclei, mitochondrial hypertrophied and separation of its basement membrane in some areas (Fig. 2e). As appear mitochondria necrotic inside the remains of mesangial cell and decreased mesangial matrix (Fig. 2f). The podocytes have appeared nuclei atrophy, different electronic density and severe podocyte pedicles fusion association with swollen pedicles and indistinct filtration slits (Figs. 2d-f).

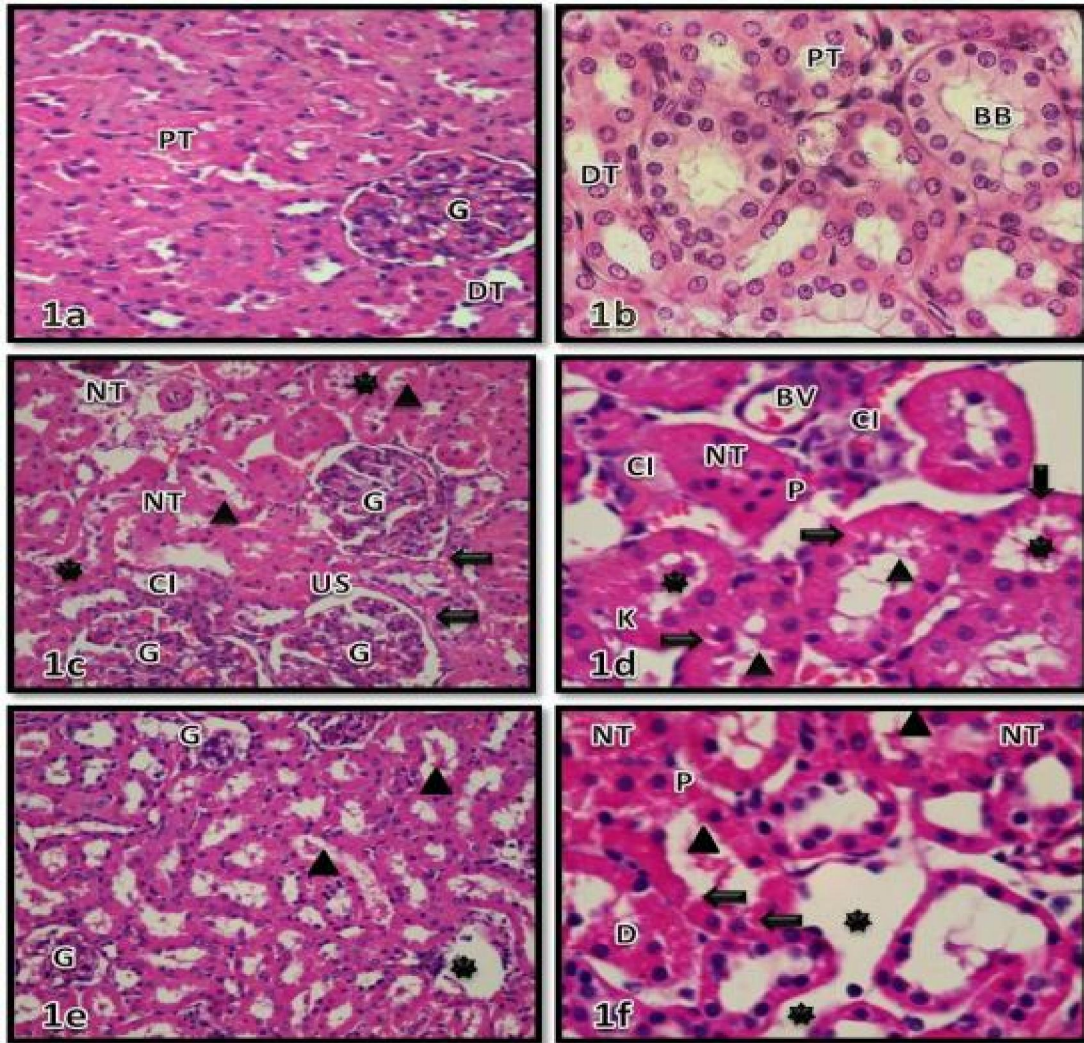
On the other hand, nutmeg caused marked histopathological alterations in the kidney of female animal groups (G4) as distortion of the renal cortical structures, and reduction in the number of renal corpuscle, some glomerular were atrophied and lysis (Fig. 1e). However, electron microscopic indicated capillaries lesions associated with analyzed of cells

and GBM thickening in several areas (Fig. 3a), vesiculation endoplasmic reticulum of endothelial cells and nuclei hypertrophy, internal chromatin condensation and conversion to active chromatin (Fig. 3b). Hypertrophy mesangial cells, necrosis nuclei, atrophy mitochondrial and lysis (Fig. 3c). Nuclei of the podocytes appeared atrophic, chromatin condensation and manifested deterioration fused pedicles and ruptured lead to cytoplasmic organelles lysis than those observed in (G2) (Figs. 3a-d), in addition to, affected and deformed nuclei were indicated in the treated group (G4).

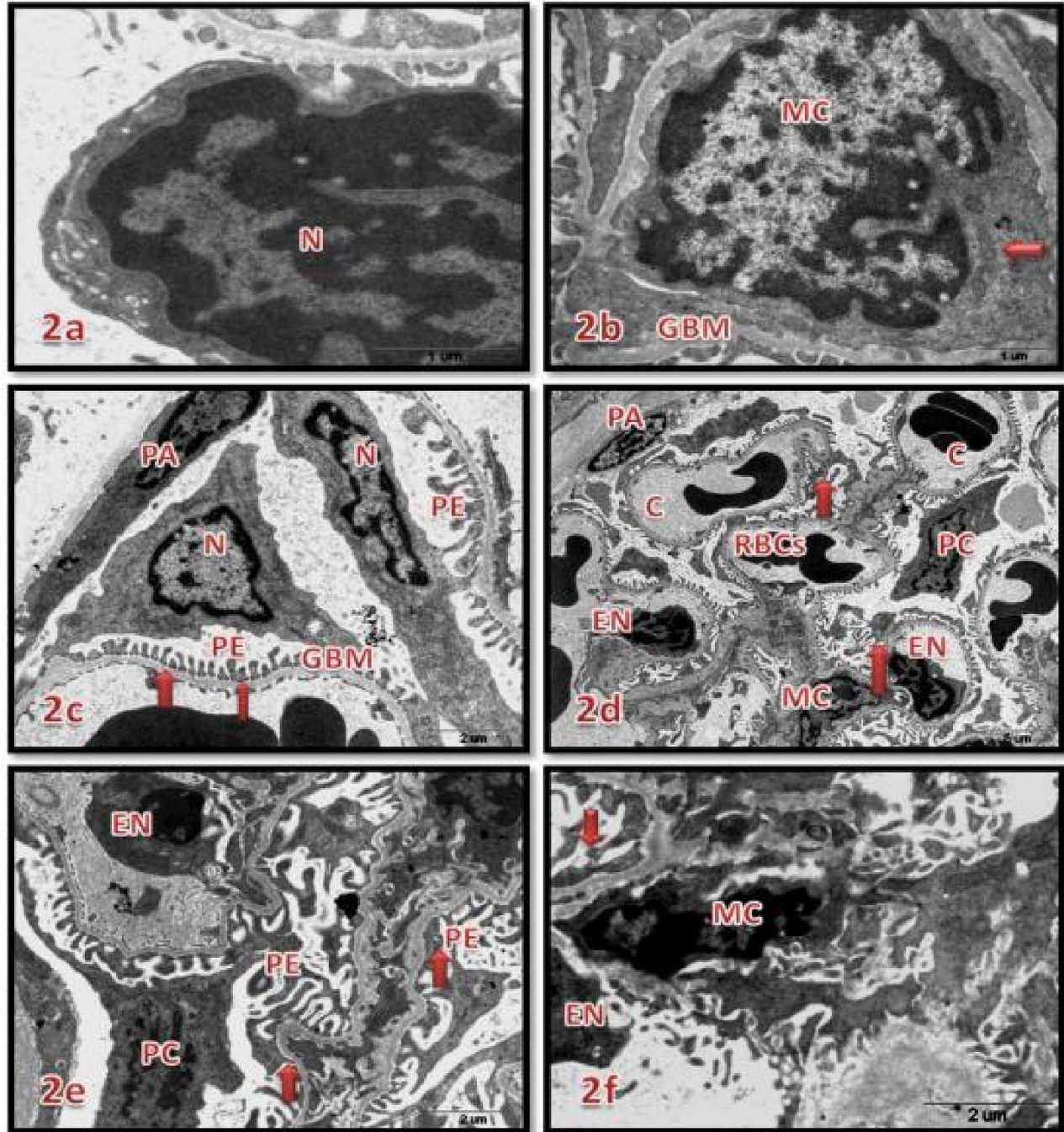
Histological examination restricted the same findings in the PCTs and DCTs in male and female treated animals G2 & G4 (Figs. 1c,f). Diffuse cytoplasmic vacuolation, widen irregular luminal surface, dilated with accumulation of eosinophilic homogenous material in tubular lumina, fragmented brush border, dilated intercellular spaces in epithelial lining cells and necrosis with nuclear pyknosis of tubular cells were seen in PCTs in treated animals. Hence, the changes showed in the DCTs displayed tubular atrophy and necrosis, cytoplasmic degeneration and separated the cells from the basement membrane. Also, deformed and nuclear margination of the tubular epithelial cells were showed (Figs. 1d,f). Through examination of the kidney of treated animal groups under transmission electron microscopy, indicated that nutmeg induced various degrees of damage on the architecture of proximal and distal tubular epithelium (Figs. 4a,d), severe impairment of PCTs brush border, such as disorganized, coalescence, shrinkage, loss and vacuolated with swollen mitochondrial, fragmented and dilatation of RER in treated group (Figs. 4b,c).

In addition to the appearance of cytoplasmic lysis with loss most of the cytoplasmic electron density and cellular organelles, irregularly- shaped of nuclei with loss chromatin materials. In addition to, thickened, irregular and widening the basal

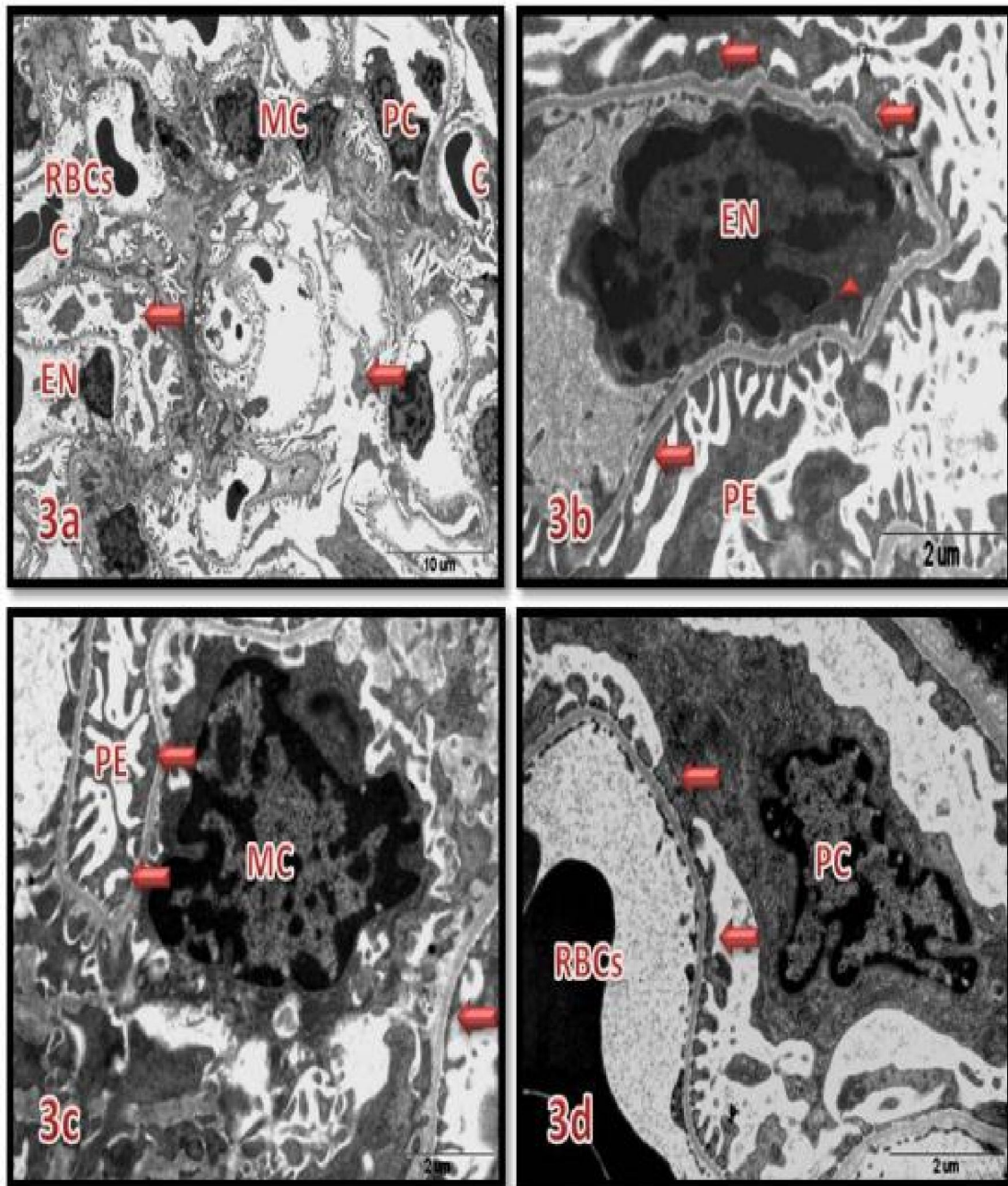
membrane infolding with scattered deformed electron dense mitochondria, tubular lumen filled with damaged mitochondria and accumulation of lipid droplets were observed in DTCs (Figs. 4e,f) in treated animal groups G2&G4.



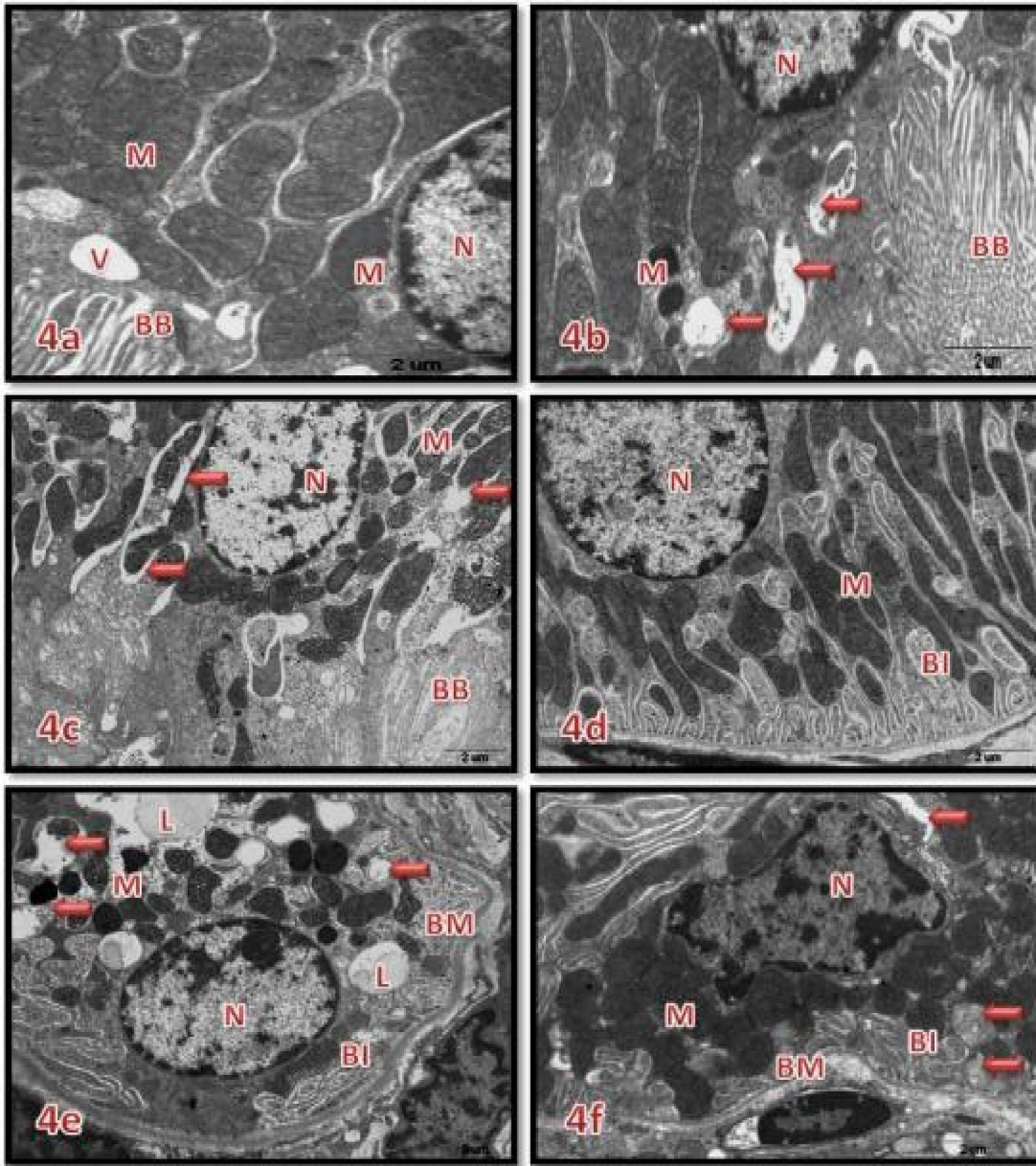
Plate(1a-f):Cross sections of kidney cortex of male and female Wister rats; H&E.(a-b): kidney sections of control rats (G1&G3):(a): showing the normal histological structure of the glomerulus(G), proximal convoluted tubules(PT) and distal convoluted tubules(DT) in the cortical portion ;x400. (b):High power from previous section showing proximal convoluted tubules(PT), brush border (BB) and distal convoluted tubules(DT) in the cortical portion ;x1000.(c-d) sections of males treated kidney(G2):(c): showing a fragmented and congested of glomeruli(G), obliterated urinary space(US), tubular atrophy and necrosis(NT), cytoplasmic degeneration (arrows), brush border damaged in some proximal tubules(head arrow), eosinophilic casts inside widen proximal tubules lumen(*) and cellular infiltration(CI) ;x400.(d): showing dilation of the cortical blood vessel(BV) with red blood cells stasis,cellular infiltration(CI), tubular necrosis(NT), brush border fragmented(headarrows), pyknosis(P), karyolysis(K) of tubular cells nuclei and dilated intercellular spaces(arrows) ;x1000. (e-f) sections of females treated kidney (G4):(e):showing glomerular atrophy(G) and tissue lysis(*)x400. (f): showing necrotic tubules (NT) with pyknotic nuclei (P) and tissue lysis (*),blocked of some proximal tubular lumen with eosinophilic materials(headarrows), dilated intercellular spaces in epithelial lining(arrows), distal tubules with wide lumen, separated the epithelium lining from the basement membrane (D) ;x1000.



Plate(2a-f):Electron micrographs(E.M.) of renal corpuscle. **(a-c):** kidney cortex of control rats (G1&G3): **(a):** showing endothelial cell with large irregular nucleus (N). also note glomerular basement membrane(GBM) and pedicles of podocytes (PE); **x19000.****(b):** showing mesangial cell (MC) mesangial matrix and normal mitochondria (**arrow**), note glomerular basement membrane GBM) ;**x13500.** **(c):**showing podocytes with normal nucleus (N), pedicles(PE), normal appearing glomerular basement membrane (GBM) and filtration slits with diaphragm(**arrows**), parietal epithelial cell (PA) ;**x7900.** **(d-f):**section of renal corpuscle in kidney cortex of male rats treated(G3) :**(d):** a part from glomerulus showing congested capillaries (C) filled with deformed red blood cells (RBCs) and necrotic endothelial cell (EN) damaged mesangial cell (MC), mesangial matrix and focal fused foot processes (**arrows**) of podocytes, parietal epithelial cell (PA) ;**x2600.****(e):**showing deformation nuclei of endothelial cell (EN) and separation the (EN) from its basement membrane, note podocytes (PC) with electron dense cytoplasm, swollen pedicles (PE), indistinct filtration slits (**arrows**);**x7900.****(f):**showing necrotic mesangial cell(MC), note also necrotic endothelial cell (EN), swollen pedicles of podocytes and indistinct filtration slits(**arrow**) ; **x7900.**



Plate(3a,d): E.M. of renal corpuscle in kidney cortex of female rats (G4): (a): apart of glomerulus showing atrophied podocytes(PC) and lysis (arrows), mesangial cell hypertrophied (MC), necrotic endothelial cell (EN), deformed (RBCs) in capillary loops (C);x1950.(b):showing vesiculation endoplasmic reticulum(head arrow) of endothelial cell(EN), nucleus hypertrophy and condensation of peripheral chromatin, focal fused of podocytes (PE) foot processes(arrows); x10500. (c): showing hypertrophied mesangial cell(MC) with nucleus necrosis, mitochondrial atrophied and lysis, also note pedicles(PE) fused on epithelial side of thickened indistinct GBM(arrows) ;x7900. (d):showing podocytes (PC) nucleus appeared atrophic, chromatin condensation, focal fused foot processes (arrows) and deformed red blood cells(RBCs) ;x7900.



Plate(4a-f): (a-c) E.M. of a parts of PCT cells of rats kidney: (a): control PCT(G1&G3):showing central located nucleus(N) with normal chromatin distribution, numerous well organized elongated mitochondria (M), pinocytotic vesicles (V) and brush border (BB); x7900. (b):a part of PTC cell of treated kidney of male rat (G2): showing irregular of nuclei (N), membrane with condense chromatin materials,atrophied mitochondria (M),cytoplasmic lysis (arrows) and brush border disorganized (BB);x2600. (c): a part of damaged PCT cell of treated kidney of female rat (G4): showing deformed nucleus(N)dilation of basal membrane infolding (arrows) and scattered deformed electron dense mitochondria (M) coalescence of brush border (BB) ; x7900. (d-f) E.M. of a parts of DCT cells of rats kidney: (d): a part of normal distal convoluted tubules cell (G1&G3): showing apical spheroid nuclei(N) of DCT, well developed basal infolding (BI) surrounding elongated mitochondria (M) ;x7900.(e): a part of a DTC cell of treated kidney of male rat (G2) showing condense chromatin nucleus (N), mitochondria (M) dilation and distortion of basement membrane infolding (BI), destruction of cytoplasmic organelles (arrows), lipid droplets(L) and irregular basement membrane (BM). Note also the tubular lumen filled with secretion and lipid droplets (L) ;x5800.(f):a part of DCT cell of female treated rat (G4) showing necrotic cells with pyknotic nucleus(N), low electron dense cytoplasm, massive electron dense mitochondria(M) loss cellular organelles(arrows),shorter and damage basal infolding (BI) with irregular of basement membrane (BM) ;x7900.

4. Discussion

Increase in body weight and relative kidney weight in male rats in present work may be due to the congestion of glomeruli which observed in this study and as previously described (**Olaleye et al., 2006; Eweka and Eweka, 2010**). Other authors have reported that no significant difference in body weight of male mice treated with the aqueous extract of nutmeg seeds at the end of the 6 weeks of injection with low dose range employed 20-80 mg/kg (**Al-Hazmi et al., 2004**). While, decreased in kidney weight of female rats in the present work may be due to the atrophic changes and necrosis of epithelial cells in glomeruli and renal tubules.

Kumar et al., (1988) display that the changes in serum UN, Cre, Na^+ and Cl^- are associated with impairment of renal function. The elevated serum levels of UN and Cre and the decreased serum levels of serum Na^+ and Cl^- indicate reduced ability of the kidney to eliminate the toxic metabolic substances and reabsorb the metal and non-metal ions. These changes in serum biochemical parameters are consistent with renal histological structure degenerations (**Prasad et al., 2011**). Damage the brush border and leakage of ALP into urine could have been a result of toxin binding to the brush border. This enzyme is associated with the brush border of the renal tubules, and the urinary concentration of ALP in particular has been used as an early marker of toxic tubular agent (**Cooper et al., 1986; Porter, 1994**).

May be inferred from the results of the present study that higher doses of nutmeg consumption may have resulted in degenerative and atrophic changes observed in the renal corpuscle. The possible deduction from these results is that secondary metabolites, which are largely responsible for therapeutic or pharmacological activities of medicinal plant (**Perry, 1980**), may also account for their toxicity when the dosage is abused.

In consistent with recent work the nutmeg has a specific potential toxicity to the kidney parenchyma was confirmed (**Eweka and Eweka, 2010**). It has been reported that the chronic administration of high dose of nutmeg resulted in cellular structures hypertrophy due to the adverse effects of nutmeg on the organ tissue (**Adjene, 2010**). As well, **Al-Hazmi et al., (2004)** found fatty degeneration and cellular vacuoles.

Correspond to present work, the previous studies have reported ultrastructural changes in rats glomeruli at treatment with various pollutants, pesticides and toxins represented in glomerular cells (**Abd El-Aal and Fares, 1993**), podocytes vacuolation with pedicles fusion and GBM indistinct layers with electron dense deposits (**El-Banhawy et al., 1994**;

Rahmy and Hemmaid, 1999; Ahmed, 2000), mitochondrial, rough endoplasmic reticulum (RER) damage with nuclei pyknosis (**Ramadan, 1996; Luty et al., 1998; Latuszynska et al., 1999; Rahmy and Hemmaid, 1999**).

Moreover, **Hummdi, (2011)** stated ballooning degeneration, mitochondrial swollen with cristae disruption, dilatation with fragmented of RER, a marked distortion of the bile canaliculi microvilli, Sinusoid congestion with some degree of endothelia necrosis, increased in the number of lysosomes and lipid droplets in rats injected by nutmeg extract.

It observed in this study, the presence of tubular injuries. There were several factors that may have played a role in tubular injuries, such as decrease in glomerular capillary permeability, back-leakage of glomerular filtrate through tubular cell walls (**Alden and Frith, 1992**). All these degenerative changes are consistent with the several studies reported renal toxicity associated with toxic substances leading to DCTs histological damage (**Ramadan, 1996; Latuszynska et al., 1999; Rahmy and Hemmaid, 1999**).

Tubular obstruction may be caused by release of cytoplasmic fragments and lipid droplets mixed with intratubular proteins. This can lead to increased intratubular pressure, which again may result in sufficient back pressure to alter the transglomerular hydrostatic pressure. These observations may be due to nutmeg interference with metabolic activities, since it has been reported that myristicine obtained from the nutmeg may have a cytotoxic and apoptotic effects on the body cells (**Lee et al., 2005**). These results supported by present biochemical study of experimental animals and other studies subjected to various noxious influences (**Ghadially, 1988**). ALP enzyme is associated with the brush border of the renal tubules, and the urinary concentration of ALP in particular has been used as an early marker of toxic tubular insult (**Cooper, et al., 1986 and Porter, 1994**).

The pathological changes in mitochondria as swollen or cavitations are an important indicator of cellular damage leading to loss of functional efficiency (**Robbins, 1995**), the morphological alterations of male rats mitochondria in recent study were pointed out earlier by **Ghadially, (1988)** that the swollen or hydropic mitochondria is due to the entry of water and solutes into the organelle and can be engendered by numerous agents, together with swelling and vesiculation of RER which produce cell damage.

Additionally, **Ericsson, (1969) and Ghadially, (1988)** reported with ongoing cellular toxicity the SER comes to occupy most of the cell both by proliferation and dilatation of its cisternae with

vesiculated. As well as **Ghadially, (1988)** suggested that the RER from the variable cell organelles, which swells or atrophy reflects a state of altered functional activity. **Ghadially, (1988)** and **Albano et al., (1989)**. Added that the degranulation of RER is an early, relatively mild lesion can produce more drastic alterations of membranes structure such as vesiculation, fragmentation or dissolution of the membranes of RER, accompanied by a general decrease in ribosomes, both attached to and lying free in the cytoplasm after administration of noxious agents and various drugs.

Nevertheless, actual mechanism by which nutmeg induced cellular necrosis observed in this experiment needs further investigation. The necrosis observed is probably due to the high concentration of nutmeg on the kidney. Pathological or accidental cell death is regarded as necrotic and could result from extrinsic insults to the cell as osmotic thermal, toxic and traumatic effect. The process of cellular necrosis involves disruption of membranes, as well as structural and functional integrity. Cellular necrosis is not induced by stimuli intrinsic to the cells as in programmed cell death (PCD), but by an abrupt environmental perturbation and departure from the normal physiological conditions (**Hayes,1994**).

5. Conclusion

These findings indicate that administration of nutmeg may have some deleterious effects of the renal cortical of adult Wistar rats in both sexes at higher doses and may affect on kidney metabolic function. *Myristica fragrans* seeds should therefore be cautiously used in both man and animals.

References

- Abd El-Aal, A. and Fares, N.H. (1993)**. Renal alterations induced by *Cerastes cerastes* venom. *J. Nat. Toxins*, 7: 45-71.
- Adjene, J.O. (2010)**. Histological effects of chronic consumption of Nutmeg on the superior colliculus of adult Wistar rats. *Inter J Biomedical Health Sci.*, 6(2):51-55.
- Ahmed, E.A. (2000)**. Histological and ultrastructural studies on the effect of (captopril) on some organs of albino Swiss mice. Ph.D. Thesis, Faculty of Science, Alexandria University, Egypt.
- Albano, A., Tomasi, A., Gorla-Gatti, L., and Iannone, A. (1989)**. Free radical activation of monomethyl and dimethyl hydrazines in isolated hepatocytes and liver microsomes. *Free Radical Biol Medicine.*, 6(1):3-8.
- Alden, C.L., and C.H. Frith, (1992)**. Urinary system. In: *Handbook of Toxicologic Pathology*, ed. Haschek WM and RousseauxCG, 1st ed., Academic Press, San Diego, CA, pp. 316-379.
- Al-Hazmi, A. M., Alullad I. Assaggaf., Al-Sayed, G. N. E. and Bin-Naser, Y.S. (2004)**. Effect of Acute and Subchronic Administration of Nutmeg Seed's Extraction Mice Behaviour, Histological Structure and Biochemical Functions. *Saudi J Biol Sci.*, 11(2):177-188.
- Bancroft, J.D. and Gamble, M. (2002)**. *Theory and Practice of Histological Techniques*. 5th Edn., Churchill Livingstone, Edinburgh, UK.
- Chromy, V., K. Rozkosna and Sedlak, P.(2008)**. Determination of serum creatinine by Jaffe method and how to calibrate to eliminate matrix interference problems. *Chem. Lab. Med.*, 46: 1127-1133.
- Cooper, T.B., Huxtable, C.R., and Vogel, P.(1986)**. The nephrotoxicity of *Isotropis forrestii* in sheep. *Aust Vet J* 63: 178-182.
- El-Banhawy, M.A., I.I. Seif, M.A. Shahin and Ramadan R.A.(1994)**. Ultrastructural pathology of the kidney of mice treated with the anti-inflammatory drug indomethacin. *J. Egypt. Ger. Soc. Zool.*, 14: 33-69.
- Ericsson, J. L. E.(1969)**. Mechanism of Cellular Autophagy. In *Lysosomes in Biology and Pathology*. Eds. J. T. Dingle and H. B. Fell. Amsterdam: North-Holland publishing Co. vol.2, pp. 346-349.
- Eweka, A.O. and Eweka, A. (2010)**. Histological effects of oral administration of nutmeg on the kidneys of adult Wistar rats. *North Am J Medical Sci.*, 2 (4): 189-192.
- Forrester, M.B.(2005)**. Nutmeg Intoxication in Texas, 1998 – 2004. *Hum Exp Toxicol.*, 24: 563-566.
- Ghadially, F.N.(1988)**. Ultra structure pathology of the cell and matrix. A text and Atlas of physiological and pathological Alterations in cell fine structure, Butterworths London and Boston, pp.790.
- Hayes, A.W.(1994)**. *Principles and Methods of Toxicology*. 3rd Edn., Raven Press, New York.
- Hummdi, L.(2011)**. Hepatic fine structure alterations in male and female rats induced by aqueous extract of *Myristica Frangans* (Nutmeg), *Bio. Sci. Res.* Vol., 27(2):77-91.
- Joseph, J.(1980)**. The Nutmeg, its Botany, Agronomy, Production, Composition and Uses. *J. Botany*, 2: 61-67.
- Kelly, B.D., Gavin, B.E., Clarke, M., Lane, A. and Larkin, C. (2003)**. Nutmeg and Psychosis. *Schizophr Res.*, 60: 85-96.
- Kumar, A., S.K. Sharma and Vaidyanathan, S. (1988)**. Results of surgical reconstruction in patients with renal failure owing to

- ureteropelvic junction obstruction. *J. Urol.*, 140: 484-486.
20. **Latuszynska, J., S. Luty, J. Halliop, E. Przylepa, A. Tochman, D. Obuchowska and E. Korczak, 1999.** Studies of toxicity of dermally-absorbed nurelle D 550 EC preparations. *Ann. Agric. Environ. Med.*, 6: 151-159.
 21. **Lee, B.K., Kim, J.H., and Jung, J.W. (2005).** Myristicin-induced Neurotoxicity in Human neuroblastoma SK-N-SH Cells. *Toxicol Lett.*, 157: 49- 56.
 22. **Luty, S., J. Latuszynska, J. Halliop, A. Tochman and D. Obuchowskai. et al.(1998).** Toxicity of dermally applied alpha - cypermethrin in rats. *Ann. Agric. Environ. Med.*, 5 (2) : 109 -116.
 23. **Madsen, H.L. and Bertelsen, G. (1996).** Spices as antioxidants. *Trends Food Sci. Technol.*, 6: 271- 277.
 24. **Mckenna, A., Nordt, S.P. and Ryan, J. (2004).** Acute nutmeg poisoning. *Eur J Emerg Med.*, 11: 240-241.
 25. **Olajide OA, Ajayi FF, Ekhelar AI, Awe SO, Makinde JM, Alada AR.(1999).** Biological effects of *Myristica fragrans* (nutmeg) extract. *Phytother Res.*; 13: 344-345.
 26. **Olaleye, M.T., Akinmoladun, A.C. and Akindahunsi, A. A. (2006).** Anti-oxidantproperties of *Myristica fragrans* (Houtt) and its effect on selected organs of albino rats. *Afr. J. Biotechnol.*, 5 (13):1274-1278.
 27. **Olumayokun, O. A., Franklin, A. F., Ambrosei, K. E., Olubusayo, A. S., Modupe, M. J., and Akinola, A.R. (1999).** Biological Effects of *Myristica fragrans* (Nutmeg) Extract. *Phytother. Res.*,13:344-345.
 28. **Perry, L.M.(1980).** Medicinal plants of East and South East Asia, MIT Press, Cambridge Massachusetts.pp.279.
 29. **Porter, G.A.(1994).** Urinary biomarkers and nephrotoxicity. *Miner Electrolyte Metab* 20: 181-186.
 30. **Prabuseenivasan S, Jayakumar M, Ignacimuthu S. (2006).** *In vitro* antibacterial activity of some plant essential oils. *BMC Complement Altern Med.*; 6: 39.
 31. **Prasad, N.R., A.R. Rao Bitla, S.M. Manohar, N. Harini Devi and Srinivasa Rao, P.V.L.N.(2011).** A retrospective study on the biochemical profile of self poisoning with a popular Indian hair dye. *J. Clini. Diag. Res.*, 5:1343-1346.
 32. **Rahmy, T.R. and Hemmaid K.Z.(1999).** Acute histological and histochemical alterations induced by cobra snake venom in the hepatic tissues of rabbits. *J. Egypt. Ger. Soc.*, (28) : 157 - 173.
 33. **Ramadan, R.A.(1996).** The toxic impacts of the anti-protozoal drug metronidazole (Elyzol) on the ultrastructure of the kidney of albino mice. *J. Egypt. Ger. Soc. Zool.*, 20 (c) : 1 - 26.
 34. **Robbins, C. (1995).** Pathological Basis of Disease.5th.ed. International edition W B Saunders, pp. 1750.
 35. **Sonavane, G.S., Sarveiya, V.P., Kasture,V.S. and Kasture, S.B.(2002).** Anxiogenic activity of *Myristica fragrans* seeds. *Pharmacol Biochem Behav.*, 71: 239-244.
 36. **Tatsuya, M., Keiko, J., Hirokazu, K., Yasushi.A., Hiroyuki, S., Takahiro, I. and Kimio, S.(2003).** Hepatoprotective Effect of Myristicin from Nutmeg (*Myristica fragrans*)on Lipopolysaccharide/D-Galactosamine- Induced Liver Injury. *J. Agric. Food Chem.*,51: 1560-1565.
 37. **Woods, A.E. and Stirling, J.W. (2002).** Electron microscopy: The preparative techniques In: Theory and practice of histological techniques. Ed. Bancroft, J. D. and Gamble, M. 5th ed. Harcourt Publishers, Ch.31.

Antioxidant and anticancer activities of water and ethanol extracts obtained from *Sasa quelpaertensis* Nakai

Ji Young Kim ^{§1}, Jung Hyun Kim ^{§2}, Ji Hee Byun ^{§1}, Ji Hye Kim ¹, Youn Ji Lee ¹, Soon Jae Im ¹, Dong-Sun Lee ^{1,4},
Seo Hyun Moon ³, Min Young Kim ^{1,4,*}

¹ Laboratory of Pharmacology and Toxicology, Faculty of Biotechnology, College of Applied Life Science, Jeju National University, Jeju 690-756, Republic of Korea

² Department of Tourism and Food Service Cuisine, Cheju Tourism College, Jeju 695-900, Republic of Korea

³ DNA Forensic Center, National Forensic Service, Seoul 158-707, Republic of Korea

⁴ Subtropical Horticulture Research Institute, Jeju National University, Jeju 690-756, Republic of Korea

[§] Contributed equally

jeffmkim@jejunu.ac.kr

Abstract: Antioxidant activities of *Sasa quelpaertensis* Nakai leaf extracts using two different solvents (water and ethanol) were determined by using *in vitro* antioxidant models including 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical, hydrogen peroxide and nitric oxide scavenging activities, and ferrous chelating and reducing power activities. Both extracts were shown to be antioxidants; however, ethanol extract exhibited higher antioxidant activity than that of water extract. The total phenolic and flavonoid contents of *Sasa quelpaertensis* Nakai leaf extract was positively correlated with the antioxidant activity. Significantly, the ethanol extract exerted the most potent cytotoxicity activity against human colon cancer HCT116 cells.

[Ji Young Kim, Jung Hyun Kim, Ji Hee Byun, Ji Hye Kim, Youn Ji Lee, Soon Jae Im, Dong-Sun Lee, Seo Hyun Moon, Min Young Kim. **Antioxidant and anticancer activities of water and ethanol extracts obtained from *Sasa quelpaertensis* Nakai.** *Life Sci J* 2013;10(1):1250-1254] (ISSN: 1097-8135). <http://www.lifesciencesite.com>. 190

Keywords: *Sasa quelpaertensis* Nakai; antioxidant and anticancer potentials

1. Introduction

More than 1250 bamboo species, belonging to 75 genera, are distributed all over the world (Jiang, 2007; Wang et al., 2012). Most bamboo used as ornamental plant, but also used as a pharmaceutical intermediate and food additive. Bamboo leaves have been extensively used in folk medicine as an antifebrile and antihypertensive for centuries (Kweon et al., 2001; Wang et al., 2012). It was found that extract of bamboo leaves has multiple biological activities, such as cancer prevention (Seki et al., 2010; Seki and Maeda, 2010), antioxidant and antioxidation (Park et al., 2007; Mu et al., 2004). Bamboo leaves from *Sasa veitchii* and *Phyllostachys nigra* 'Henonis' are also used as an antioxidant food additive in Japan and China, respectively (Nakajima et al., 2003). Some functional components from bamboo leaves, such as flavonoids, lactones and phenolic acids, were reported (Zhang et al., 2008; Wang et al., 2012).

Sasa quelpaertensis Nakai is a type of bamboo grass widely distributed in Halla mountain, Jeju Island, Korea, which has been used as antidiabetic, diuretic and anti-inflammatory drugs (Ryou et al., 2012). *Sasa quelpaertensis* Nakai has recently gained considerable interest for its capacity to inhibit human leukemia HL-60 cell proliferation by inducing apoptosis (Jang et al., 2008). Other studies have demonstrated that *Sasa quelpaertensis*

Nakai leaf controls electrolyte and body fluid balance (Ryou et al., 2012), and reduces melanin production via inhibition of tyrosine hydroxylase (Yoon et al., 2007; Sultana et al., 2009).

In this study, we investigated the antioxidant and anticarcinogenic activities of *Sasa quelpaertensis* Nakai leaf extracts and demonstrated the potent bioactivities of the extracts suitable to be used as natural antioxidant compounds or pharmaceutical supplements.

2. Material and Methods

2.1. Plant material

The leaves of *Sasa quelpaertensis* Nakai used for the present study were collected from Halla mountain in February 2012. The leaves were dried in oven at 60 °C for 24 h and grounded into powder using a blender.

2.2. Extraction

Dried powder (25 g) of *Sasa quelpaertensis* Nakai leaf was extracted in a rotary shaker with 250 mL of water and 70% ethanol at 25 °C for 24 h. The extract was then purified by using a Sep-Pak C₁₈ cartridge and a 0.45 µm membrane filter (Waters, Milford, MA, US), concentrated using a rotary evaporator (Buchi Rotavapor R-200, New Castle, DE, US), freeze dried and finally stored at -20 °C until further use. The extraction yield of water

and ethanol extracts was determined to be 13.6 ± 0.34 and $11.8 \pm 0.13\%$, respectively.

2.3. Determination of total phenolic and flavonoid contents

Total phenolic and flavonoid contents of *Sasa quelpaertensis* Nakai leaf extracts were determined by the method described previously (Kim et al., 2012a). Each experiment was performed at least in triplicate.

2.4. Analyses of antioxidant activities

2.4.1. 1,1-Diphenyl-2-picrylhydrazyl (DPPH), hydrogen peroxide and nitric oxide scavenging assays

DPPH radical, hydrogen peroxide and nitric oxide scavenging activities of *Sasa quelpaertensis* Nakai leaf extracts were determined as described in our recently published paper (Kim et al., 2012b). A dose response curve was plotted to determine the EC_{50} values. EC_{50} is defined as the effective concentration sufficient to obtain 50 % of a maximum scavenging capacity. All tests were performed in triplicate.

2.4.2. Ferrous ion chelating assay

This methodology was performed using a microplate reader (Spectra MR, Dynex, VA, US). An aliquot (250 μ L) of each extract (concentration range 12.5 to 200 μ g/mL) in the 96-well plate was mixed with 5 μ L of 2 mM ferrous chloride solution. The reaction was initiated by the addition of 10 μ L of 5 mM ferrozine solution. After incubation at room temperature for 10 min, the absorbance was measured at 562 nm.

2.4.3. Reducing power assay

This methodology was performed using a microplate reader described above. The water and ethanol extract solutions (concentration range 12.5 to 200 μ g/mL) were mixed with 200 mM sodium phosphate buffer (pH 6.6) containing 1% (w/v) potassium ferricyanide. The mixture was incubated at 50 °C for 20 min, and 10% (w/v) trichloroacetic acid was added. The mixture was poured into the each well of 96-well plate, and the absorbance was measured at 700 nm. EC_{50} value (μ g/mL) is the effective concentration at which the absorbance was 0.5 for reducing power and was obtained by interpolation from linear regression analysis (Huang et al., 2006).

2.5. Analysis of anticancer activity

2.5.1. Cell line and culture

Human colon cancer HCT116 cells were a

kind gift from Dr. G.N. Wogan (Massachusetts Institute of Technology, MA, US), and were maintained in McCoy's 5A medium supplemented with 10% heat-inactivated fetal bovine serum, 100 units/mL penicillin, 100 μ g/mL streptomycin and 2 mM L-glutamine at 37 °C with 5% CO₂ in a humidified atmosphere.

2.5.2. Determination of the cell viability

The inhibitory effect of the *Sasa quelpaertensis* Nakai leaf extracts on the proliferation of human colon cancer cells was determined using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay. Briefly, HCT116 cells (2×10^3 /well) were loaded into 96-well culture plates and treated with fresh medium containing various concentrations (0–200 μ M) of each extract for 24 h. Cells were washed once with phosphate-buffered saline and reacted with the MTT solution (Boehringer Mannheim, Indianapolis, IN) at 37 °C for 4 h to produce the formazan salt. Finally, the formazan salt formed in each cultured cells was dissolved in DMSO, and the optical density (OD) value of each solution was measured at 540 nm using a microplate reader. The OD value detected for the control (cells without treatment with any samples) from the treated cells was plotted on the x-axis, designated as proliferation (% of control), to demonstrate the effect of each extract on the viability of the cells.

2.6. Statistical analysis

Student's *t*-test or one-way analysis of variance (ANOVA) with the Bonferroni post test was used to determine the statistical significance of data ($p < 0.05$).

3. Results and Discussion

Figure 1 shows the total phenolic and flavonoid contents of water and ethanol extracts of *Sasa quelpaertensis* Nakai. Phenolic compounds, aromatic secondary plant metabolites, which mainly include flavonoids, phenolic acids, stilbenes, coumarins and tannins (Robbins, 2003). From the general concept, the more phenolic and flavonoid substances the sample contains, the higher antioxidant activity it shows. In this study, the contents of total phenols and flavonoids were significantly higher for ethanol extract (136267.1 and 7650 mg/g, respectively) than that for water extract (62267.3 and 1670.2 mg/g, respectively) ($p < 0.05$) (Figure 1). This indicates that ethanol is relatively more efficient extraction solvent of polyphenolic compounds from *Sasa quelpaertensis* Nakai.

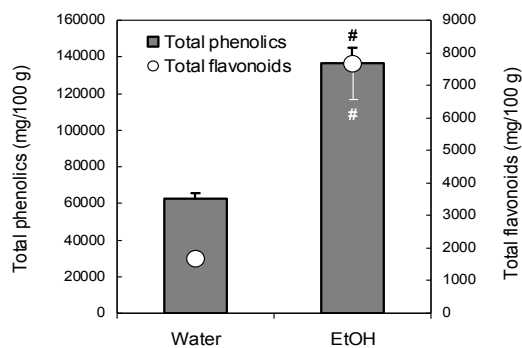


Fig. 1. Total phenolic and flavonoid compositions of the water and ethanol extracts obtained from *Sasa quelpaertensis* Nakai. Each value is expressed as mean \pm standard deviation ($n = 3$). [#] $p < 0.05$ compared to water extract by Student's t -test.

The DPPH radical is usually used as a substrate to evaluate the antioxidative action of antioxidants by determining the free radical-scavenging ability of various samples (Amarowicz et al., 2004). The DPPH radical scavenging activities of water and ethanol extracts obtained from *Sasa*

quelpaertensis Nakai showed increasing trends with increase of extract concentration (Figure 1A). The half effective concentration (EC_{50}) value for DPPH radical scavenging activity of ethanol extract ($129.5 \mu\text{g/mL}$) was significantly lower than that of water extract ($151.1 \mu\text{g/mL}$) (Figure 1A).

The results of hydrogen peroxide inhibition by the water and ethanol extracts of *Sasa quelpaertensis* Nakai are presented in Figure 1B. Obviously, the hydrogen peroxide scavenging activities were concentration-dependent for both extracts. The EC_{50} values of Ethanol extract was $98.2 \mu\text{g/mL}$, which were lower than that of water extract ($127 \mu\text{g/mL}$) (Figure 1B).

Nitric oxide is an essential bioregulatory molecule required for several physiological processes. The elevation of the nitric oxide results in inflammation, cancer and other pathological conditions (Kim et al., 2012b). The same trend was observed for the level of nitric oxide scavenging effects in tested *Sasa quelpaertensis* Nakai leaf extracts; both extracts scavenged nitric oxide in a dose-dependent manner, and ethanolic extract ($114.7 \mu\text{g/mL } EC_{50}$) had higher nitric oxide scavenging ability than water extract ($142.7 \mu\text{g/mL } EC_{50}$) (Figure 1C).

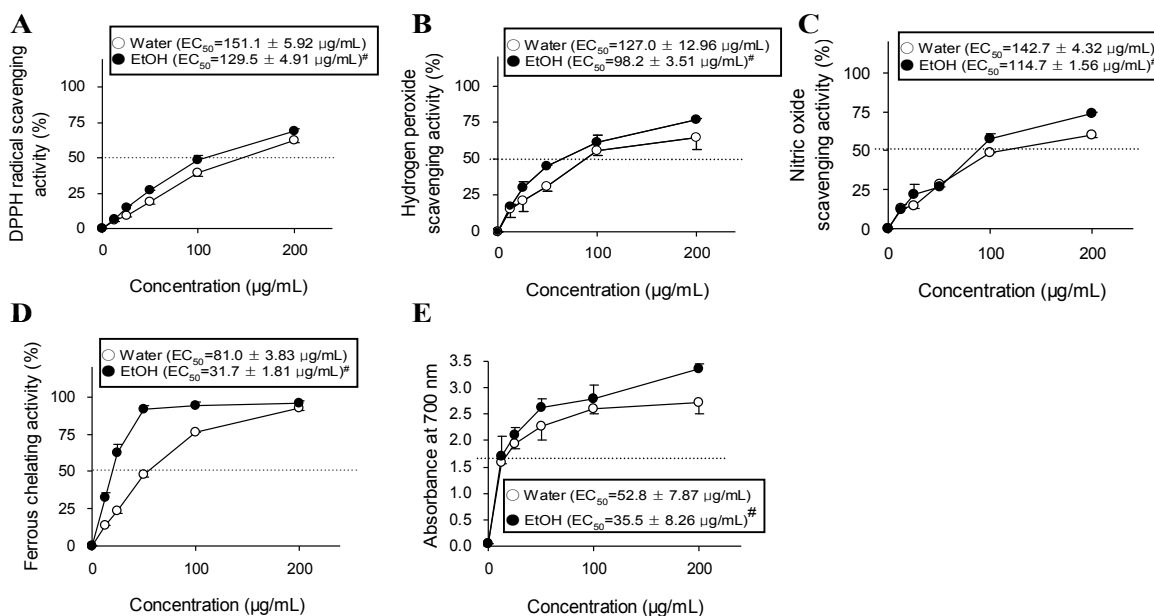


Fig. 2. Scavenging effects of the water and ethanol extracts obtained from *Sasa quelpaertensis* Nakai on DPPH (A), hydrogen peroxide (B) and nitric oxide (C), and activities of ferrous chelating (D) and reducing power (E). EC_{50} means the effective concentration at which the antioxidant activity was 50%, the absorbance was 1.75 for reducing power, the DPPH, hydrogen and nitric oxide radicals were scavenged by 50%, and ferrous ions were chelated by 50%, respectively. EC_{50} was obtained by interpolation from linear regression analysis. Each value is expressed as mean \pm standard deviation ($n = 3$). [#] $p < 0.05$ compared to water extract by Student's t -test.

Chelating effect on ferrous ions of *Sasa quelpaertensis* Nakai extracts were 13–33% and 24–96% at 12.5 and 25–200 $\mu\text{g}/\text{mL}$, respectively (Figure 2D). The EC_{50} values for the water and ethanol extracts were 81 and 31.7 $\mu\text{g}/\text{mL}$, respectively (Figure 2D), indicating that extraction solvent affected the chelating effect of *quelpaertensis* Nakai.

The antioxidant activity has been reported to be concomitant with reducing power (Lee et al., 2003). The reducing power is generally associated with the presence of reductones, which exert antioxidant action by breaking the free radical chains by donating a hydrogen atom. In this assay, the presence of reductants in the antioxidant sample causes the reduction of the $\text{Fe}^{3+}/\text{ferricyanide}$ complex to the $\text{Fe}^{2+}/\text{ferrous}$ form, so the reducing power of the sample can be monitored by measuring the formation of Perl's Prussian blue at 700 nm (Singh and Rajini, 2004). As shown in Figure 2E, reducing power of *Sasa quelpaertensis* Nakai extracts increased with concentration. With regard to reducing power, ethanol extract (35.5 $\mu\text{g}/\text{mL}$ EC_{50}) was more effective than water extract (52.8 $\mu\text{g}/\text{mL}$ EC_{50}) (Figure 2E). The reducing power of *Sasa quelpaertensis* Nakai leaf extracts is probably due to the presence of phenolic compounds which might act as electron donors.

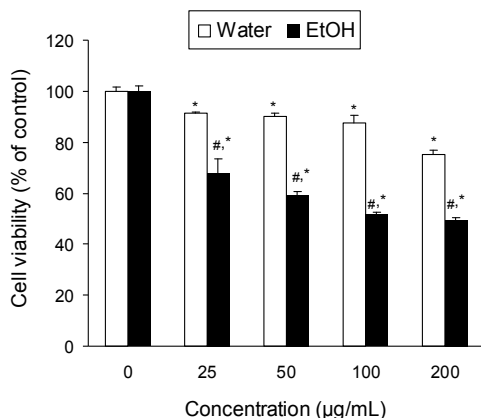


Fig. 3. The percentage of viable HCT116 cells after *Sasa quelpaertensis* Nakai bamboo leaves treatment. Cell viability was determined by MTT assay after treatment with 0, 25, 50, 100 and 200 $\mu\text{g}/\text{mL}$ of water and ethanol extracts for 24 h. Each point is the mean \pm SD of three experiments. [#] $p < 0.05$ compared to water extract and ^{*} $p < 0.05$ compared to vehicle (DMSO) control by Student's t -test.

In the present study, the anticancer activity of *Sasa quelpaertensis* Nakai extracts was investigated using an 3-(4,5-dimethylthiazole-2-yl)-2,5-diphenyl tetrazolium bromide assay on human colon cancer cell line, HCT116. Cells were treated with various concentrations (0–200 $\mu\text{g}/\text{mL}$) of water and ethanol extracts for 24 h, and then analyzed by MTT cell viability assay for the cell viability, proliferation (% control), as shown in Figure 3. The formazan product of MTT assay was analyzed for quantification of the viability of cells. Both water and ethanol extracts were found to exhibit significantly growth inhibitory effect in HCT116 cells, and ethanol extract exhibited the most significant antiproliferative effect: it led to a maximum decrease of 49% at 200 $\mu\text{g}/\text{mL}$ (Figure 3). Polyphenolic compounds might inhibit cancer cells by xenobiotic metabolizing enzymes that alter metabolic activation of potential carcinogens, while some flavonoids could also alter hormone production and inhibit aromatase to prevent the development of cancer cells (Zhao et al., 2007). The mechanism of action of anticancer activity of phenolics could be by disturbing the cellular division during mitosis at the telophase stage. It was also reported that phenolics reduced the amount of cellular protein and mitotic index, and the colony formation during cell proliferation of cancer cells (Gawron and Kruk, 1992). Therefore, it is of interest to characterize the cytotoxic and apoptotic mechanisms in HCT116 cells induced by *Sasa quelpaertensis* Nakai extracts. This work is in progress.

In this study, application of different solvents to extract antioxidant and anticancer compounds from *Sasa quelpaertensis* Nakai was investigated. The study indicated that the ethanol extract possessed the highest phenolic and flavonoid contents and exhibited strong antioxidant and anticancer activities. This seems that *Sasa quelpaertensis* Nakai extract can be used as natural antioxidant and anticancer agent.

Corresponding Author:

Dr. Min Young Kim
Laboratory of Pharmacology and Toxicology
Faculty of Biotechnology
College of Applied Life Sciences
Jeju National University
Jeju 690-756, Republic of Korea
E-mail: jeffmkim@jejunu.ac.kr

Acknowledgement

This work was supported by the research grant of Jeju National University in 2012.

References

1. Amarowicz R, Pegg RB, Rahim-Moghaddam P, Barl B, Weil JA. Free radical-scavenging capacity and antioxidant activity of selected plant species from the Canadian prairies. *Food Chem.* 2004; 84: 551-62.
2. Gawron A, Kruk G. Cytotoxic effect of xanthotoxol (8-hydroxypsoralen) on TCTC cells in vitro. *Polish J Pharm Pharm.* 1992; 44(1): 51-7.
3. Huang YC, Chang YH, Shao YY. Effects of genotype and treatment on the antioxidant activity of sweet potato in Taiwan. *Food Chem.* 2006; 98: 529-38.
4. Jang MG, Park SY, Lee SR, Choi SY, Hwang JH, Ko HC, Park JG, Chung WS, Kim SJ *Sasa quelpaertensis* leaf extracts induce apoptosis in human leukemia HL-60 cells. *Food Sci Biotechnol.* 2008; 17(1): 188-90.
5. Jiang ZH, *Bamboo and Rattan in the World*, China Forestry Publishing House, Beijing, China, 2007.
6. Kweon MH, Hwang HJ, Sung HC. Identification and antioxidant activity of novel chlorogenic acid derivatives from bamboo (*Phyllostachys. edulis*). *J Agric Food Chem.* 2001; 10: 4646-55.
7. Kim MY, Im SJ, Kim JH, Kim IJ, Lee HY, Lee DS, Lee YJ, Byun JH, Kim JH, Kim JY, Jeong SR, Kim JH, Moon SH. Changes in the phenolic composition of citrus fruits and leaves prepared by gamma irradiation of budsticks. *Life Sci J.* 2012a; 9(3): 1281-5.
8. Kim MY, Kim IJ, Lee HY, Lee DS, Im SJ, Kim JH, Byun JH, Kim JY, Lee YJ, Jeong SR, Kim JH, Moon SH. Characterization of the antioxidant properties of citrus mutants induced by Gamma-rays. *Life Sci J.* 2012b; 9(3): 1495-500.
9. Lee SC, Kim JH, Nam KC, Ahn DU. Antioxidant properties of farinfrared-treated rice hull extract in irradiated raw and cooked turkey breast. *J Food Sci.* 2003; 68: 1904-9.
10. Mu J, Uehara T, Li J, Furuno T. Identification and evaluation of antioxidant activities of bamboo extracts. *Forest Studies China.* 2004; 6(2): 1-5.
11. Park HS, Ju HL, Hyun JK, Hyun JC, Lee IS. Antioxidant flavone glycosides from the leaves of *Sasa borealis*. *Arch Pharm Res.* 2007; 30(2): 161-3.
12. Robbins RJ. Phenolic acids in foods: an overview of analytical methodology. *Journal of Agricultural and Food Chemistry* 2003; 51: 2866-87.
13. Ryu SH, Kang MS, Kim KI, Kang YH, Kang JS. Effects of green tea or *Sasa quelpaertensis* bamboo leaves on plasma and liver lipids, erythrocyte Na efflux, and platelet aggregation in ovariectomized rats. *Nutr Res Pract* 2012; 6(2): 106-12.
14. Seki T, Kida K, Maeda H. Immuno stimulation mediated anti-tumor activity of bamboo (*Sasa senanensis*) leaf extracts obtained under vigorous condition. *Evid Based Complement Alternat Med.* 2010; 7(4): 447-57.
15. Seki T, Maeda H. Cancer preventive effect of Kumaizasa bamboo leaf extracts administered prior to carcinogenesis or cancer inoculation. *Anticancer Res.* 2010; 30(1): 111-8.
16. Senevirathne M, Kim SH, Kim YD, Oh CK, Oh MC, Ahn CB, Je JY, Lee WW, Jeon YJ. Effect of far-infrared radiation drying of citrus press-cakes on free radical scavenging and antioxidant activities. *J Food Eng* 2010; 97: 168-76.
17. Singh N, Rajini PS. Free radical scavenging activity of an aqueous extract of potato peel. *Food Chem.* 2004; 85(4): 611-6.
18. Sultana N, Lee NH. New phenylpropanoids from *Sasa quelpaertensis* Nakai with tyrosinase inhibition activities. *Bull Korean Chem Soc* 2009; 30: 1729-32.
19. Wang J, Yue YD, Jiang H, Tang F. Rapid screening for flavone C-glycosides in the leaves of different species of bamboo and simultaneous quantitation of four marker compounds by HPLC-UV/DAD. *Int J Anal Chem.* 2012; 205101:1-205101:8.
20. Yoon HS, Kim JK, Kim SJ. inhibitory effect on the melanin synthesis in B16/F10 mouse melanoma cells by *Sasa quelpaertensis* leaf extract. *H Life Sci* 2007; 17(6): 873-875.
21. Zhang Y, Jiao J, Liu C, Wu X, Zhang Y. Isolation and purification of four flavone C-glycosides from antioxidant of bamboo leaves by macroporous resin column chromatography and preparative high-performance liquid chromatography. *Food Chem* 2008; 3: 1326-36.
22. Zhao M, Yang B, Wang J, Liu Y, Yu L, Jiang Y. Immunomodulatory and anticancer activities of flavonoids extracted from litchi (*Litchi chinensis* Sonn.) pericarp. *Int Immunopharm.* 2007; 7(2): 162-6.

1/21/2013

Return and Volatility in Tehran Stock Exchange

Seyed Hossein Miri, Ph.D.

Department of Accounting, Islamic Azad University, Semnan Branch, Semnan, Iran

Abstract: The aim of this paper is considering the relationship between return and volatility in Tehran Stock Exchange. We have used the daily data of price index of TSE during 2009-2010. The data are available on website of TSE. We have estimated ARMA (1, 1)-GARCH (1, 1) model for estimation volatility of Tehran stock exchange. Results indicate that there is a negative relationship between volatility and rate of return in TSE. The correlation coefficient between volatility and return is -0.00182. The hypothesis of “return does not Granger Cause volatility” has rejected. Also, the hypothesis of volatility does not Granger because return has not rejected.

[Seyed Hossein Miri. **Return and Volatility in Tehran Stock Exchange**. *Life Sci J* 2013;10(1):1255-1259] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 191

Keywords: Return, Volatility, Tehran Stock Exchange

1. Introduction

There are many studies about Tehran Stock Exchange (TSE) as Fasanghari, M., & Montazer, G. A. (2010), Fasanghari, M., & Montazer, G. A. (2010), Foster, K. R., & Kharazi, A. (2008), Albadvi, A., Chaharsooghi, S. K., & Esfahanipour, A. (2007), Ebrahimpour, R., Nikoo, H., Masoudnia, S., Yousefi, M. R., & Ghaemi, M. S. (2011) and Yahyazadehfar, M., Abounoori, E., & Shababi, H. (2006). Rahmani, Sheri & Tajvidi (2006) have tested Beta for the prediction of stock return in order to recognize the variables which are better capable of predicting the stock return in Tehran Stock Exchange (TSE). Independent variables were tested against the dependant variable (return) on an annual basis for the years 1997-2003.[Rahmani, Sheri & Tajvidi (2006)]. Further, multi-variable models were tested, both annually and pooled cross sectional. In single variable tests, a significant relationship was observed between the stock return and sale-to-price ratio, earnings-to-price ratio and size (stock market value) in 4 consecutive years. [Rahmani, Sheri & Tajvidi (2006)]. The book-to-market ratio demonstrated great dispersion in results. However, since the results of different years varied greatly, no stable relationship was observed between Beta and stock return as predicted in the CAPM model. Further, no relation was observed between debt-to-equity ratio and the stock return. Considering the potential effect of statistical models on the findings, complementary tests were carried out in portfolio level based on Beta and book-to-market ratio variables. [Rahmani, Sheri & Tajvidi (2006)]. Three portfolios were formed taking into consideration the magnitude of each variable. The findings of these tests substantiated that, in the years 2000, 2002 and 2003, portfolios with higher Beta proved to have higher return compared to the ones with lower Beta. With respect to the portfolios formed on the basis of book-to-

market ratio, the findings proved compatible with the regression models [Rahmani, Sheri & Tajvidi (2006)]. Seyyed, Abraham and Al-Hajji (2005) have used a GARCH specification and data for the Saudi Arabian stock market – now the largest stock market in the Muslim world – they have documented a systematic pattern of decline in volatility during Ramadan, implying a predictable variation in the market price of risk. An examination of trading data showed that this anomaly appears to be consistent with a decline in trading activity during Ramadan. Evidence of systematic decline in volatility during Ramadan has significant implications for pricing of securities especially option-like products and asset allocation decisions by investors in the Islamic countries [Seyyed, Abraham and Al-Hajji (2005)]. Dey (2005) has studied how growth affects liquidity of global stock exchanges and how liquidity determines cross-sectional returns on those stock exchange index portfolios [Dey (2005)]. He measured portfolio liquidity by turnover ratio computed as value of shares traded over the market capitalization. He obtained data from FIBV, an association of global stock exchanges. In a multiple regression model for turnover ratio, he found age, size, type of exchange, competition for order flow, and growth rate to be significant determinants of portfolio liquidity; however, exchange- and time-specific effects are more appropriate for modeling portfolio liquidity [Dey (2005)]. The time effects yield to three distinct regimes, while the exchange-specific effects are surrogates for the legal systems, English common law, and Civil laws of the countries [Dey (2005)]. He estimated the parameters of a multiple regression model in a two-stage GLS framework in which index return is a function of turnover [Dey (2005)]. The GLS method is preferable since a turnover ratio may have a non-stationary, random component. The significant determinants of

index return are turnover and volatility, although some of the volatility effect may be a spillover from a January effect [Dey (2005)]. Investors expect higher return from high turnover markets. However, the positive turnover expected return relation was true only in emerging markets; in developed markets expected return was a function of volatility [Dey (2005)]. Its result confirmed existing empirical evidence that high turnover stock portfolios generate superior returns and further the sources and pricing of risk in emerging and developed markets were different [Dey (2005)]. Shoghi & Talaneh (2010) have analyzed the volatility behavior of Tehran Stock Exchange returns. Since volatility is an important factor in portfolio selection, asset pricing, and risk management, the main purpose of our study is to model and forecast the returns volatility of the Tehran Stock Exchange (TSE). [Shoghi & Talaneh (2010)] Using primary index data of TSE for 2003-2008, they investigated the appropriateness of several potential models of autoregressive (AR), moving averages (MA), and autoregressive moving averages (ARMA). The ARMA (2, 1) has been chosen as the best process for modeling the conditional means [Shoghi & Talaneh (2010)]. They have used EGARCH and TGARCH models to capture asymmetries in terms of negative and positive shocks and the leverage effect. The ARMA (2, 1)-TGARCH (1, 1) model was the best process to fit the data [Shoghi & Talaneh (2010)]. They have found no evidence of the presence of the leverage in the news; nor does the bad news have a larger effect on the volatility of returns than the good news. Of the three forecast performance measures, the TGARCH (1, 1) was the best model to forecast the volatility [Shoghi & Talaneh (2010)]. Abounoori & Nademi (2011) have used daily data from the Tehran stock exchange (TSE) to illustrate the nature of stock market volatility in an emerging stock market. They have estimated GJR models with both Gaussian innovations and fat-tailed distributions, such as the Student's t and the GED [Abounoori & Nademi (2011)]. Their results indicate that leverage effect exists in Tehran Stock Exchange, because in GJR models with t-student and GED distributions, the effects of bad news on volatility (α_1) is larger than the effects of good news on volatility (λ) [Abounoori & Nademi (2011)]. P-Value LR Test for Leverage Effect indicates that the differences between the α_1 and λ coefficients is not significant for GJR-N model but it is significant at 5% confidence level for GJR models with t student and GED distributions [Abounoori & Nademi (2011)]. Korkmaz, Çevik & Atukeren (2012) have examined the return and volatility spillovers between the CIVETS countries. The contemporaneous spillover effects are found to

be generally low. They have found the presence of intra-regional return interdependence effects. The inter-regional volatility interdependence effects were also determined [Korkmaz, Çevik & Atukeren (2012)]. The aim of this paper is considering the relationship between return and volatility in Tehran Stock Exchange. This paper is organized by 4 sections. The next section is devoted to research method, section 3 shows empirical results and in final section, we conclude.

2. Material and Methods

We have used a GARCH model for estimation volatility, also we have calculated rate of return as following:

$$r_t = 100(\log P_t - \log P_{t-1})$$

Where P_t is stock price index of TSE?

Let R_t be the rate of return of a stock, or a portfolio

of stocks from time $t-1$ to t and Ω_{t-1} be the past Information set containing the Realized value of all relevant variables up to time $t-1$. So the conditional mean and variance are

$$y_t = E(R_t | \Omega_t), h_t = \text{var}(R_t | \Omega_t) \quad \text{respectively.}$$

Given this definition, the unexpected return at time t is $\varepsilon_t = R_t - y_t$. In order to model the effect of ε_t on returns we present ARCH models. ARCH models were Introduced by Engle (1982) and generalized as GARCH models by Bollerslev (1986). In developing GARCH (p, q) we will have to provide mean and variance Equation

$$R_t = x_t' \gamma + \varepsilon_t \quad (1)$$

$$h_t = \omega + \sum_{i=1}^p \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^q \beta_j h_{t-j}$$

Where $\omega, \alpha_i, \beta_j, \gamma$ are constant parameters and x_t contains exogenous and predetermined repressors. As h_t is variance it must be nonnegative which impose the following conditions: $\omega > 0, \alpha_1, \dots, \alpha_p \geq 0$ and $\beta_1, \dots, \beta_q \geq 0$. The conditional variance under ARCH (p) model reflects only information from time $t-p$ to $t-1$ with more importance being placed on the most recent innovation implying $\alpha_i < \alpha_j$ for $i > j$. To avoid long lag lengths on ε_t in ARCH (p) and difficulty in selecting the optional length p, and ensuring the non-negativity of coefficients of conditional variance equation (2), Bollerslev (1986) present GARCH(P, q). A common parameterization for the GARCH model that has been adopted in most applied studies is the GARCH (1, 1) specification under which the effect of a shock to

volatility declines geometrically over time. One problem with ARCH (p) and GARCH (p, q) is that good news and bad news with some absolute size have the same effect on h_t . This fact is symmetric effect. However, the market may react differently to good and bad news. It is important, to be able to test for and allow asymmetry in the ARCH type specification. Nelson (1991) proposes the exponential GARCH (EGARCH) model as a way to deal with this problem. Under the EGARCH (1, 1) the h_t is given as:

$$\log(h_t) = \omega + \alpha \left[\frac{\varepsilon_{t-1}}{\sqrt{h_{t-1}}} - \sqrt{\frac{2}{\pi}} \right] + \beta \log h_{t-1} + \gamma \frac{\varepsilon_{t-1}}{\sqrt{h_{t-1}}} \quad (3)$$

The EGARCH news Impact differs from the GARCH new Impact in four ways: (1) it is not symmetric. (2) Big news can have a much greater impact than in the GARCH model. (3) Log construction of Equation 3 ensures that the estimated h_t is strictly positive, thus non-negativity constraints used in the estimation of the ARCH and GARCH are not necessary. (4) Since the parameter of γ typically enters equation 3 with a negative sign, bad news generates more volatility than good news. The Component GARCH (CGARCH) model by Engle and Lee (1993) decomposes returns uncertainty into a short-run and a long-run component by permitting transitory deviations of the conditional volatility around a time-varying trend, q_t , modeled as:

$$\sigma_t^2 - q_t = a(\varepsilon_{t-1}^2 - q_{t-1}) + \beta(\sigma_{t-1}^2 - q_{t-1}) \quad (4)$$

$$q_t = \omega + \rho(q_{t-1} - \omega) + \phi(\varepsilon_{t-1}^2 - \sigma_{t-1}^2) \quad (5)$$

Here σ_t^2 is still the volatility, while q_t takes the place of ω and is the time varying long run volatility. The first equation describes the transitory component, $\sigma_t^2 - q_t$, which converges to zero with powers of $(\alpha + \beta)$. The second equation describes the long run component q_t , which converges to ω with powers of ρ . Typically ρ is between 0.99 and 1 so that q_t approaches ω very slowly. We can combine the transitory and permanent equations and write [Engle and Lee (1993)]

3. Results

We have used the daily data of price index of TSE during 2009-2010. The data are available on website of TSE.

1.3. Empirical Results

We have estimated ARMA(1,1)-GARCH(1,1) model for estimation volatility of tehran stock exchange. Table 1 indicates the estimation results.

Table 1. The estimation results.

Dependent Variable: R
 Method: ML - ARCH (Marquardt) - Normal distribution
 Date: 01/01/13 Time: 16:57
 Sample (adjusted): 7/31/2007 6/21/2010
Included observations: 755 after adjustments
 Convergence achieved after 55 iterations
 MA Backcast: 7/30/2007
 Presample variance: backcast (parameter = 0.7)
 GARCH = C(4) + C(5)*RESID(-1)^2 + C(6)*GARCH(-1)

Table1. Estimation Results of GARCH Model

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.129048	0.071332	-1.809104	0.0704
AR(1)	0.958277	0.015238	62.88824	0.0000
MA(1)	-0.687631	0.026081	-26.36564	0.0000
Variance Equation				
C	0.000879	0.000305	2.881814	0.0040
RESID(-1)^2	0.266993	0.013974	19.10611	0.0000
GARCH(-1)	0.831559	0.005110	162.7164	0.0000
R-squared	0.164282	Mean dependent var	-0.006072	
Adjusted R-squared	0.158703	S.D. dependent var	0.486675	
S.E. of regression	0.446389	Akaike info criterion	0.820069	
Sum squared resid	149.2481	Schwarz criterion	0.856837	
Log likelihood	-303.5759	Hannan-Quinn criter.	0.834232	
F-statistic	29.44698	Durbin-Watson stat	2.004703	
Prob(F-statistic)	0.000000			
Inverted AR Roots	.96			
Inverted MA Roots	.69			

Results indicate that the model is significance. All of the parameters are statistically significant.

Results from Table 2 indicate that there is a negative relationship between volatility and rate of return in TSE. The correlation coefficient between volatility and return is -0.00182.

Table 3 and 4 indicate Tabulation of volatility and return and pairwise Granger Causality tests respectively. Results indicate that

- ✓ The hypothesis of RETURN does not Granger Cause VOLATILITY has rejected

The hypothesis of VOLATILITY does not Granger Cause RETURN has not rejected.

Figure 1 and 2 indicate volatility and return series respectively. In the next step we have calculated correlation between volatility and return as in Tables 2, 3, 4.

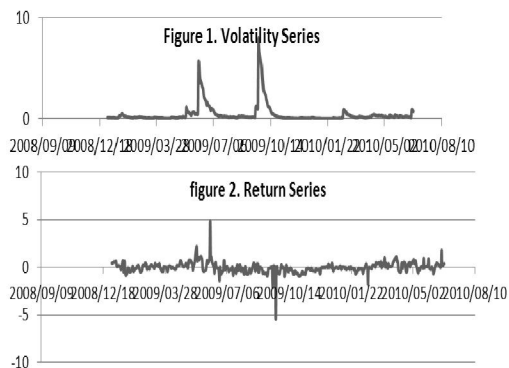


Figure 1 and 2. Volatility and return series respectively.

Table 2. Correlation Matrix

	RETURN	VOLATILITY
RETURN	1	-0.00182
VOLATILITY	-0.00182	1

Table 3. Tabulation of VOLATILITY and RETURN

Date: 01/01/13 Time: 17:16
 Sample (adjusted): 1/01/2009 6/21/2010
 Included observations: 383 after adjustments
 Tabulation Summary

Variable	Categories
VOLATILITY	4
RETURN	3
Product of Categories	12

Measures of Association	Value
Phi Coefficient	0.072436
Cramer's V	0.051220
Contingency Coefficient	0.072247

Test Statistics	df	Value
Pearson X2	6	2.009619
Likelihood Ratio G2	6	2.101038

WARNING: Expected value is less than 5 in 83.33% of cells (10 of 12).

Count		[-10, -5)	[-5, 0)
VOLATILITY	[0, 2)	1	184
	[2, 4)	0	3
	[4, 6)	0	2
	[6, 8)	0	2
	Total	1	191

Table 4. Pairwise Granger Causality Tests

Date: 01/01/13 Time: 17:19
 Sample: 1/01/2009 12/31/2010
 Lags: 2

Null Hypothesis:	F-	Obs	Statistic	Prob.
RETURN does not Granger Cause VOLATILITY		381	5.52169	0.0043
VOLATILITY does not Granger Cause RETURN			2.02776	0.1331

4. Discussions

The volatility of financial markets has been the object of numerous developments and applications over the past two decades, both theoretically and empirically. Portfolio managers, option traders and market makers all are interested in the possibility of forecasting volatility, with a reasonable level of accuracy. That is so important, in order to obtain either higher profits or less risky positions. In this respect, the most widely used class of models is that of GARCH models (see e.g. Bollerslev, Engle, and Nelson (1994) for an overview). The aim of this paper is considering the relationship between return and volatility in Tehran Stock Exchange. We have used the daily data of price index of TSE during 2009-2010. The data are available on website of TSE. We have estimated ARMA(1,1)-GARCH(1,1) model for estimation volatility of Tehran stock exchange. Results indicate that there is a negative relationship between volatility and rate of return in TSE. The correlation coefficient between volatility and return is -0.00182. The hypothesis of RETURN does not Granger Cause VOLATILITY has rejected. Also, the hypothesis of VOLATILITY does not Granger because RETURN has not rejected

Acknowledgements:

Author is grateful to Department of Accounting, Islamic Azad University, Semnan Branch for financial support to carry out this work.

Corresponding Author:

Seyed Hossein Miri Ph.D
 Department of Accounting, Islamic Azad University, Semnan Branch, Semnan, Iran

References

1. Abounoori, E., & Nademi, Y. The Asymmetric Effect of News on Tehran Stock Exchange Volatility.
2. Albadvi, A., Chaharsooghi, S. K., & Esfahanipour, A. (2007). Decision making in stock trading: An application of PROMETHEE. European Journal of Operational Research, 177(2), 673-683.
3. Bollerslev, T., (1986) "Generalized autoregressive conditional heteroskedasticity." Journal of Econometrics 31, 307-327.
4. Bollerslev, T., R. Engle, and D. Nelson (1994) "ARCH Models," in Handbook of Econometrics, ed. by R. Engle, and D. McFadden, chap. 4, pp. 2959-3038. North Holland Press, Amsterdam.
5. Dey, M. K. (2005). Turnover and return in global stock markets. Emerging Markets Review, 6(1), 45-67.

6. Ebrahimpour, R., Nikoo, H., Masoudnia, S., Yousefi, M. R., & Ghaemi, M. S. (2011). Mixture of MLP-experts for trend forecasting of time series: A case study of the Tehran stock exchange. *International Journal of Forecasting*, 27(3), 804-816.
7. Engle, R., (1982) "Autoregression conditional heteroskedasticity with estimates of the variance of the UK inflation." *Econometrica* 50, 987-1007.
8. Engle, R., Lee, G., (1993) "A permanent and transitory component model of stock return volatility." Discussion paper 92-44R, University of San Diego.
9. Engle, R.F., Ng, V.K., (1993) "Measuring and testing the impact of news on volatility." *Journal of Finance* 48, 1749-1778.
10. Fasanghari, M., & Montazer, G. A. (2010). Design and implementation of fuzzy expert system for Tehran Stock Exchange portfolio recommendation. *Expert Systems with Applications*, 37(9), 6138-6147.
11. Foster, K. R., & Kharazi, A. (2008). Contrarian and momentum returns on Iran's Tehran Stock Exchange. *Journal of International Financial Markets, Institutions and Money*, 18(1), 16-30.
12. Korkmaz, T., Çevik, E. İ., & Atukeren, E. (2012). Return and volatility spillovers among CIVETS stock markets. *Emerging Markets Review*.
13. Nelson, D.B., (1991) "Conditional heteroskedasticity in asset returns: a new approach." *Econometrica* 59, 347-370.
14. Rahmani, A., Sheri, S., & Tajvidi, E. (2006). Accounting Variables, Market Variables and Stock Return in Emerging Markets: Case of Iran. *Market Variables and Stock Return in Emerging Markets: Case of Iran* (November 21, 2006).
15. Seyyed, F. J., Abraham, A., & Al-Hajji, M. (2005). Seasonality in stock returns and volatility: The Ramadan effect. *Research in International Business and Finance*, 19(3), 374-383.
16. Shoghi, M. P., & Talaneh, A. (2010). An Analysis of Emerging Markets Returns Volatility: Case of Tehran Stock Exchange. Working Paper Series.
17. Yahyazadehfar, M., Abounoori, E., & Shababi, H. (2006). Days-of-Week Effect on Tehran Stock Exchange Returns: An Empirical Analysis. *Iranian Economic Review*, 11(6).

1/8/2013

Relationship between Internet Addiction, Mental Health, and Academic Performance among Adolescents 15 to 18 Years Referred to Cafe-Net in Hamedan-Iran

Fatemeh Saraei¹, Mohammad Esmaeil Ebrahimi¹ and Mohammad Reza Zoghi Paydar²

- 1- Department of Education Psychology, Faculty of Humanities, Islamic Azad University, Hamedan Branch, Hamedan, Iran.
- 2- Faculty of Humanities, Bu-Ali Sina University, Hamedan, Iran.

Abstract: The current study examined the association between internet addiction, mental health, and academic performance. Respondents of the present study comprised of 351 male and female adolescents who were identified by random sampling technique. Instruments for data collection included Internet Addiction Test (IAT) and General Mental Health (GHQ). The results of the Pearson correlation analysis revealed a positive relationship between mental health with adolescent internet addiction and academic performance. In contrast, the results of present study indicated a negative relationship between internet addiction and academic performance. Also, the results of multiple regression showed that mental health and internet addiction predict adolescents' academic performance.

[Fatemeh Saraei, Mohammad Esmaeil Ebrahimi and Mohammad Reza Zoghi Paydar. **Relationship between Internet Addiction, Mental Health, and Academic Performance among Adolescents 15 to 18 Years Referred to Cafe-Net in Hamedan-Iran.** *Life Sci J* 2013;10(1):1260-1267]. (ISSN: 1097-8135). <http://www.lifesciencesite.com>. 192

Keywords: Internet Addiction, Mental Health, School Performance, Juvenile

Introduction

In the recent years with the development of science and communications that were the pioneers of the industrial revolution like the internet with thousands of new users every day and near 200 million users all around the world, are shaping a communication, social and economic revolution(Khajeh Moughi & Alasound, 2011). Nowadays internet is at the peak of the mountain of digital industrial revolution and any new revolution will have its own new problems. Unique specifications of the internet like being reachable 24 hours per day, easy to use, cheap, staying unidentified as a user all made it very popular all around the world(Shaw & Black 2008). so for all these reasons it causes an addiction to the internet that is related to the long hours of using the internet, its high speed, being reachable and the huge amount of information that are being transferred online and if this hypothesis is right so we will have higher amount of addiction to the internet if we upgrade the modems and the systems and the internet and have better internet and faster speed (Kim et al., 2010).

Phenomenon of addiction to the internet is a disorder and is the kind of use from the internet that could cause psychological, social, study or work problem for the user. The most common definition for addiction to the internet is that it causes a kind of behavioral attachment for the user. The main syndromes of addiction that must continue for at least 20months are as follows: bearing, addiction syndromes (like shaking, anxiety, having repeated thoughts about the internet, hallucination, dreaming about the internet, moving the fingers willingly or unwillingly). Being force to use the internet to decrease or stopping the symptoms of addiction, using the internet more than what is needed and usual, decreasing social, work and fun activities and risk of losing job, study and job opportunities because of using the internet more than usual(Nimz Grifhthz and Ban Yard 2005).

So internet by itself is a harmless tool but by using it more than usual and in the wrong way it will make big troubles for the users and so the society. In spite there are different researches going on regarding the effects of the internet on the users. Some of the

researchers believe that the best way for a teenager to grow socially and emotionally is to interact with other people and learn by experience and interact with others; but when people are spending so much time with the internet there will be no motive to interact with others and they will also be less able and interested to keep their friendships; also will spend less time with their families and with experiencing more anxiety they will feel more lonely and depressed (Ghasemzadeh, Shahriari and Moradi, 2007; Skilli, 2002; Vizshafar, 2005; Kim & colleagues, 2010).

The researches in the last few years shows the rate of spread of addiction to the internet is between 3% to 22%, regarding the fact that near 60% of people on earth are using it in some ways (Lam, 2009; Sanchez et al., 2008). With regard to the effects of addiction to the internet on the life of the users like changing the life style for having more time to surf on the net, having no concerns about him/her health, ignoring the important activities of life, decreasing social relations, don't care about the family, friends and relatives, educational problems because of spending lots of time on the internet, financial problems because of the internet costs and its whereabouts, all of these factors will directly affect the psychological health of the addicted user.

Nasty Zane (2009) believes that psychological health in interactions and involving on positive activities, starting relations with family and friends and also being successful in education and work and addiction to the internet is opposite to all these. Psychological health of a person is crucial in affecting his/her education. Surely a good learner must interact with its activities in a useful way, must be able to interact with his/her teachers and classmates in a useful way and also be able to overcome the problems of educational anxiety. One of the psychological organizes is to be able to interact with other people and that means a good and successful learner is a person who can affect the environment and also answers to others organizing interactions (Seyed Mohammadi, 1386).

Lam et al. (2009) indicated that the internet like other technologies will cause body laziness, help low movement and decrease the effort to interact with others in real world and so it will cause social isolation and will affect the psychological health of the person. Also Ghasemzadeh et al. (2007) showed that using too much of the internet will affect the family relationships diversely.

Regarding the researches of Ko et al. (2008) addicted users of the internet have more anxiety than normal people and they also aren't able to make personal contacts and this anxiety will affect their educational, work and family environment directly. Also with regard to the increasing number of the users of the internet for work and personal reasons, makes it clear that this research and the relation between the psychological health of the person and its educational work and its importance are opposite in this regard.

Kim et al. (2010) by examining the demographic variables as the foreseen variables believe that sex, age, being jobless and being married are the affective variables for being attracted to the internet. It's obvious that the teenagers and young people and also the ones that have lots of time will be more attracted to the internet and spending time with this communication device. In some other studies they do it by the user's personal behavior like shame, loneliness, anxiety, depressed and psychological behaviors (anxiety, anger, depressed, shame and being vulnerable on stress), roughness and quarrelsome, being an inside person, low self-respect, unsteady feelings and imaginative, looking for new things, trying not get hurt and don't look for any reward are effective in addicting to the internet (Wan et al., 2008).

Kaoo (2007) investigated relationship between being a maniac and moody and attracting to the internet on Chinese youth showed that being attracted to the internet is opposite to the psychological health and the ones that have this kind of addiction shows high levels of anxiety and depression and there is also a straight connection between being a maniac and moody person. Thong (2008) investigated personality differences between ordinary and addicted students. He found that behaviors like being an inside person, being too open and also the amount of anxiety are related to the addiction to the internet. Bridge (2001) showed that the lonely people that are not socially protected will be more vulnerable to the addiction to the internet.

Mottram (2009) indicated that there is no a significant relationship between internet use and depression. While, users who spend more time in chat room suffer from depression. Also, Mottram showed that internet use lead to high creativity in students. Thus, based on different results of studies; the present study is developed in order to answer this question: whether there is a relationship between internet addiction, mental health and academic performance among adolescents?

Objectives

The objectives of the present study are:

1. To describe the levels of internet addiction, mental health, and academic performance of respondents.
2. To determine relationships between internet addiction, mental health, and academic performance of respondents.
3. To determine the predictors of academic performance among respondents.

Hypotheses

- H_{a1}: There is a significant relationship between Internet addiction and mental health among respondents.
- H_{a2}: There is a significant relationship between Internet addiction and academic performance among respondents.
- H_{a3}: There is a significant relationship between mental health and academic performance among respondents.
- H_{a4}: Internet addiction and mental health predict adolescents' academic performance.

Method

Research design

Research design of the present study is descriptive and correlational.

Participants

The study population consisted of all adolescents who referred to cafe-nets in Hamedan city. These referred adolescents were 20700. According to Levy and Lemshow formula (1999), sample size was determined 351 adolescent (180 male and 171 female). These 351 respondents were selected by random sampling method technique and filled the following questionnaires

Measures

Internet Addiction Test

The Kimberly Yung Internet Addiction Test was designed to gain information about addiction to internet in adolescents. This Scale consists of 20-items. It is rated on a five point Likert scale ranging based on 1=never, 2= occasionally, 3= sometimes, 4= usually and 5= always. The score for internet addiction measured by summing up the scores for the 20 items. The total score ranged from 20 to 100, that high score showing high internet addiction among respondents. You et al. (2004) reported reliability results from the internet addiction with Cronbach coefficient alpha values of .90. Also, Ghasemizadeh (2007) reported reliability results from the internet addiction with Cronbach coefficient alpha values of .88 in Iranian society.

Mental Health Questionnaire

Mental health was measured using General Mental Health Scale (GHQ) by Goldberg & Heller (1979). The GHQ has 28 items with four somatic symptom, anxiety and sleep disorder, social function, and depression symptoms. In the present study, GHQ has demonstrated respectable psychometric properties (alpha =.75).

Analysis of Data

Data from the current study were analyzed using Statistical Package for Social Science (SPSS). Two statistical procedures i.e. descriptive analysis and inferential statistical analysis were used for the data analyses. Descriptive statistics such as mean score, standard deviation, percentage and frequency distribution were used to describe the demographic profiles of the respondents. Inferential statistics that was conducted in the data analysis was Pearson Correlation Analysis to conduct of relationship between internet addiction, mental health, and academic performance. Also, multiple regression analysis was conducted that determine predictors of academic performance.

Results

Descriptive findings

There were different number of male (51.6%) and female (48.4%) adolescents who were involved as respondents of the study.

Levels of internet addiction, mental health, and academic performance

The key variables studied in the present study were internet addiction, mental health, and academic performance. As shown in Table 1, minority of the

respondents reported high mental health (3.1%), internet addiction (7.1%), and low academic performance (18.2%).

Table 1: Levels of Variables

Variables	n	%
Internet Addiction		
<i>Medium</i>	200	57
<i>High</i>	126	35.9
<i>Very high</i>	25	7.1
Mental Health		
<i>Very Low</i>	182	51.9
<i>Low</i>	132	37.6
<i>Medium</i>	26	7.4
<i>high</i>	11	3.1
Academic Performance		
<i>Low</i>	64	18.2
<i>Medium</i>	194	55.3
<i>High</i>	93	26.5

Correlation Findings

Analysis of the relationships between internet addiction and mental health

The Pearson correlation analysis was used to study the relationships between internet addiction and mental health. As shown in Table 2, the result of the current study shows that there was a significant positive association ($r = .46$, $p < .01$) between internet addiction and total mental health of adolescents. This means adolescents that who reported higher scores in internet addiction reported higher mental health scores. Also, Pearson correlation analysis indicates that there was not significant relationship between internet addiction and physical complaints ($r = .07$, $p > .01$). While, there was a positive relationship between internet addiction with anxiety and sleep disorder ($r = .24$, $p < .01$), depression ($r = .38$, $p < .01$), social dysfunction ($r = .54$, $p < .01$). This means that adolescents who reported higher scores in internet addiction suffer anxiety, depression, and social dysfunction.

Analysis of the relationships between internet addiction and academic performance

As shown in Table 2, the result of the current study indicate that there was a significant negative association between internet addiction and academic performance of adolescents ($r = -.28$, $p < .01$). This means that respondents who were highly addicted to internet, reported lower academic performance.

Analysis of the relationships between mental health and academic performance

The Pearson correlation analysis showed that there was a negative relationship between mental health and academic performance ($r = -.29$, $p < .01$) between total mental health and academic performance of adolescents. This means adolescents that who reported higher scores in mental health reported lower academic performance scores. Also, Pearson correlation analysis indicates that there was a negative significant relationship between physical complaints and academic performance ($r = -.30$, $p > .01$). Also, there was a negative relationship

between academic performance with anxiety and sleep disorder ($r=-.15$, $p<.01$), depression ($r=-.22$,

$p<.01$), social dysfunction ($r=-.20$, $p<.01$).

Table 2: Correlation Analysis

Variables	X1	X2	X3	X4	X5	X6	Y
X1 Internet Addiction	1						
X2 Mental Health	.46**	1					
X3 Physical Compliments	.07	.40**	1				
X4 Anxiety and sleep disorder	.24**	.82**	.34**	1			
X5 Depression	.38**	.18**	-.06	.18**	1		
X6 Social Dysfunction	.54**	.61**	.14**	.36**	.14**	1	
Y Academic Performance	-.28**	-.29**	-.03**	-.15**	-.22**	-.20**	1

Analysis of multiple regressions to predict of adolescent's academic performance based on mental health and internet addiction

To determine the best set of predictor variables in adolescent's academic performance, enter regression method was used. Analysis revealed two predictor variables (mental health and internet addiction) were significant in explaining adolescent's academic performance.

As shown in Table 3, the R-squared of .210 implied that two predictor variables (mental health and internet addiction) explained about 21% of the variance in the student's academic performance. This was fairly a good and respectable result. The

ANOVA table revealed [$F(3, 347) = 21.99$] and P-value was significant (.000). Table 4 revealed that mental health has a significant negative effect on adolescents' academic performance (Beta= -.22, $p<.05$). It means that one standard deviation increased in mental health is followed by .22 standard deviation decrease in adolescent' academic performance. The beta value for internet addiction is the second predictor (-.17). Also, internet addiction has a significant negative effect on adolescents' academic performance (Beta= -.17, $p<.05$). It means that one standard deviation increased in internet addiction is followed by .17 standard deviation decrease in adolescent' academic performance. Thus, mental health and internet addiction predict adolescents' academic performance.

Table 3: Multiple regression analysis on academic performance

Model	Total square	t	Mean square	F	Sig	R	R ²
Regression	202.8	3	101.4	21.10	.001	.43	.21
Residual	1667.38	347	4.81				
Total	1870.18	349	-				

Table 4: ANOVA

Model	B	Std.Error	Beta	t	Sig
1 (Constant)	19.56	.72		27.21	.001
Mental health	-.04	.01	-.22	-3.77	.001
Internet addiction	-.05	.02	-.17	-3.04	.002

Discussion and Conclusion

In response to the significant relationship between internet addiction and mental health, the results of the present study indicated that students with high levels of internet addiction reported lower mental health. The present finding is consistent with the findings of past studies (Young, 1998; Orzak, 1999; nasty zany, 2009; phires, 2003; grouhol, 2003). Internet addiction has effect on mental health and mental health is consisted of involvement in positive activities, warm and intimate relationship with friends and family, and academic success. Thus, internet addiction is uncoordinated with all of these components. Thus, adolescents with high levels of anxiety, depression, and social dysfunction are involved in internet addiction. Khajeh Moughi & Alamound (2011) indicated that addicted adolescents to internet reported high levels of anxiety and depression.

In response to the significant relationship between internet addiction and academic performance, the results of the present study indicated that students with high levels of internet addiction reported lower levels of academic performance. The present results is in line to young (1996) and Nasty Zayn (2009). It can be concludes that internet addiction lead to failure in educational, social, and financial in participants. It's clear that adolescents who are addicted to the internet drop in their education.

Chak (2004) indicated that adolescents who are addicted to the internet reported lower academic performance (cited by Omidvar & Sarami, 1381).

In response to the significant relationship between mental health and academic performance, the results of the present study indicated that there is a negative

relationship between total mental health and academic performance. This means that adolescents with high scores of mental health (low mental health) reported lower academic performance. The present finding is consistent with Nasty Zayn (2009). Mental health in adolescents is an important factor and directly influences their school performance. A successful student should be involved with his/her activities and homework and be able to communicate with the teacher and his/her classmates to decreases the tensions of school anxiety.

In response to the predictors of adolescents' academic performance, the results of the present study indicated that internet addiction and mental health can predict adolescents' academic performance. The results of the present study are in accordance with Anderson (1997) that investigated the effects of adolescents' internet addiction. He found that 1/3 of adolescents drop in school because of excessive use of internet. The results of the present study is consistent with Koli (2003) and Ko et al. (2008). Therefore, it can be concluded that the addicted adolescents to the internet ignore his/her responsibilities and this causes drop in school (Vizshefer, 2003).

Suggestions for future research

It is suggested to interested researchers:

- 1- A research can do be done about the relationship between addiction to the internet and social level.
- 2- This research is cross-sectional and it is suggested that a longitudinal study with and interview will be done to make clear the results of this research and show different

aspects of adolescent's internet addiction in school.

- 3- It is suggested that a research examine addiction to the internet in all ages and levels of education.
- 4- Preparing exact and applicable questionnaire about addiction to the internet which will be suitable for Iran society.

Applicable suggestions

- 1- Inform people about addiction to the internet in mass media. Today, the use of internet is spreading in Iran. But not many television program talks about damages and problems related to internet addiction. It will be better to use expert idea and make programs about addiction to the internet.
- 2- Pay serious attention to the communicational and mental problems of adolescents in universities.
- 3- Teach the proper use of internet in the universities, schools and television.
- 4- Pay attention to adolescents' entertainment and alternative and enjoying activities in order to decrease their eagerness to chat in the internet and useless searching in the internet.
- 5- Prepare booklets and brochures to inform adolescents about addiction to the internet and symptoms related to addiction internet.

References

- Omidvar, A., & Sarami, A. (2003). *Addiction to internet: describing the etiology, prevention, treatment and measures to disrupt the Internet*. Mashhad: exercise.
- Khajeh Moughi, A., & Alamound, M. (2011). Predictors of internet addiction. *Psychological*
- Ghaffari, M., Vahedi, H. (2008). The effect of emotional self-awareness and impulse control training in reducing social isolation and compulsive Internet use. *Psychological Studies*. (2) 3, 91-107.
- Ghasem-Zadeh, L., Shahr Aray, M. & Moradi, A.R. (2008). Examine how rates of Internet addiction than girls and girls on an internet addict and unwonted self-esteem and social skills variables alone. *Contemporary Psychology*. (1) 2, 39-40.
- Keramaty Moghadam, R. (2007). *Relationship between Internet Addiction and value system of Shahid Beheshti University graduate students*. Master's thesis. Shahid Beheshti University.
- Vyzshefer, F. (2007). A survey of users of Internet Addiction in lar City Cafe. *Journal of Mental Health*. 25,26,17,33.
- Chak. K, Leung. L. (2004). Shyness and locus of control as predictors of internet addiction and internet use. *Cyber psychology behavior*. 7 (5), 70-559.
- Christensen, M.H., Orzack , M.H., Babington, L.M., & Patcdaugther, C.A. (2001). Computer addiction: When monitor becomes control center. *Journal of Psychosocial Nursing and Mental Health Services*. 39(3), 40-47.
- Ghasemzadeh. L, Shahraray. M, Moradi. A.R. (2007). The study of degree of prevalence to internetaddiction and its loneliness and self-esteem in high schools students of Tehran. Ed. 1;41-68.
- Hardie, E.(2007). Excessive internet use: The role of personality, loneliness and social support networks in internet addiction. *Australian Journal of Emerging Technologies and Society*, 5(1), 34-47.
- Kim. JH, Lau. CH, Cheuk. K, Kan. P, Hui. HL, Griffiths SM. (2010). Predictors of heavy internet use and associationswith health-promoting and health risk behavior among Hong Kong university students. *J Adolesc*; 33 (1): 20-215.
- Ko, C.H., Yen, J.Y., Yen, C.F., Lin, H.C., & Yang, M.J. (200). Factors predictive for incidence and remission of internet addiction in young adolescents: A prospective study. *Cyber Psychology and Behavior*, 10(4), 545-551.
- Orzack,M.H. (1999). *Computer addiction: is it real or virtual?* New York: John wiley and
- Srauy, S.O. (2006). *Sensation seeking and internet motives: why and where we explore on the electronic frontier*. Unpublished Masters Dissertation, California State University.

- Young, K.S. (1996). Internet addiction: The emergence of a new clinical disorder. Paper Presented at the 104th annual meeting of the Eastern Psychological Association, Toronto, Canada.
- Young, K.S. (1997). What makes the internet addictive: Potential explanations for pathological internet use. Paper presented at the 105th annual conference of the American Psychological Association, August 15, 1997, Chicago, IL.
- Young, K.S. (1998). Caught in the net: How to recognize the signs of internet addiction and a winning strategy for recovery. New York: John Wiley & Sons, Inc.
- Young, K.S. (1998), Internet addiction: The emergence of a new clinical disorder. *Cyber Psychology and Behavior*, 1(3), 237-244.
- Young, K.S. (1999). Internet addiction: Symptoms, evaluation and treatment. *Innovations in Clinical Practice*, 17, 19-31.

The Relationship between Organizational Commitment and Job Burnout among High Schools Physical Education Teachers

Shahram Alam (PhD)¹, Shahrokh bahmaei (MA)², Maryam Monazami (MA)¹, Zahra Alam (MA)³

¹ Department of Physical Education, Shahr-e-Ray Branch, Islamic Azad University, Tehran, Iran

² Department of Physical Education, Rahmhormoz Branch, Islamic Azad University, Rahmhormoz, Iran

³ Department of Physical Education, Roudehen Branch, Islamic Azad University, Roudehen, Iran

E-mail: shahramalam@yahoo.com

Abstract: The purpose of this study was to find the relationship between the organizational commitment and job burnout among high schools physical education teachers of Ahvaz city and its comparison between full-time and invited teachers. The method of this study was correlative. The statistical population of the research included all the 139 high schools physical education teachers of Ahvaz city. 119 teachers were selected for the sample group. The instruments of collecting data were the questionnaire of demographic information, Allen and Meyer organizational commitment (1990) and Maslach burnout (1986) questionnaires. In this study, descriptive statistics were used for organizing, summarizing, classifying, and describing the data. Significant mean differences were computed by T-Test method. Pearson's coefficient was used to find the relationships. Zr Fischer was used to find whether the relationship coefficient difference among variables was significant or not. There was a significant relationship between the organizational commitment and burnout among full-time teachers, but there was no significant relationship among invited teachers. The results showed no significant difference between the organizational commitment of full-time and invited teachers; also, there was no significant difference between their job burnout. *Life Sci J* 2013;10(1):1268-1273] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 193

Keywords: Organizational commitment; job burnout; full-time teachers and invited teachers

1. Introduction

Physical education teachers are people whose important role is evident in the society and if they are not committed to their work and don't feel responsible to their important duties, it is not expected that they educate healthy, creative, progressive, responsible and good students. Indeed, when the output of the work labor is increased that the staffs feel more near the organization and they will have commitment, belonging and more loyalty to the organization because a person who is under the consult of the organization and participates in the decision making feel that the organization belongs to him and he should be committed to the goals and this unity causes the consistency of his goals and the organization. Thus, to use and maintain them, there should be some regulations and criteria along with the cultural, economical, and social and education system that by preparation, qualification and morale, we can use their abilities in educational activities (Tusi, 2000). Strong mental pressure of the nature or unsuitable nature of work results into the state that is called burnout. In this condition, the person lose the importance of the meaning of work and is tiered always. He is aggressive, pessimistic, suspicious and angry. The burn out person transfers this feeling to all his colleagues. The burn out person should be recognized rapidly and some solutions to remove his tension should be considered (Moshabaki, 1997).

Education department for its mission in education process and human resources requires healthy, empowered, motivated and committed education group and on the other hand, like other organizations due to personal reasons, organizations and super-organization are exposed to burn-out and reduction of motivation and commitment and low output of human resources in education sector (Eskandari Rad, 2005).

Although the relationship between burn-out and organization commitment is investigated via some researches, the research gap is evident in various job communities. In addition, the researches prove that burnout and organization commitment can be related by some ways. Separately or in combination with each other, these two factors and related components can be intermediate variables between stress variables and organization outcomes. One of the weaknesses of the research literature is related to the relationship between the burnout and organization obligation and most of the studies are done in health services institution in which high level of burn out is reported. In this regard, some of the studies by referring to the point that burn out and organization commitment are related by similar aspects of organization characteristics and organization outcomes emphasize on the need of the study of these two variables as it is stated that to remove the existing concept contradictions, it is

required to clarify the relationship between the burnout and organization commitment with each other and other variables (Lither and Moslesh, 1988).

Some of the main reasons of burnout from the view of scientists are the high volume of work, the great number of clients and organization commitment. As the nature of physical education is of high work volume and the volume of the clients to the teachers of physical education is high, the physical education teachers' community can be susceptible to burnout (Sabaqianrad et al., 2006).

The teachers of physical education are a part of human resources in Iran and they take some measurements for health goals of the society. It should be considered that the existing problems of work fields and the factors making negative in specialized fields to provide a good job environment for them. The questions raised here are that how is the organization commitment of physical education teachers of high school? Is there any association between organization commitment and job burnout of these teachers? How are the dimensions of organization commitment and burnout dimensions of the teachers? How we can avoid burnout among physical education teachers by creating good personal and organization conditions to provide the background for more health of the future generation of the society?

Method: The current study is descriptive-correlation and the data are collected by field method and questionnaire. The statistical population is all the full-time teachers and invited teachers of physical education of high school of Ahvaz city as 139 people. Of 139 people, 119 people were selected as sample. The data collection measurement was organization commitment of Alen and Mayer 1990 and Moslesh burnout questionnaire (1986) and personal characteristics questionnaire of the participants.

2. Research findings

1. There is a reversed and significant association between organization commitment and job burnout in all the teachers and full-time teachers of physical education (Table 4).
2. There is a reversed and significant association between emotional commitment and job burnout in all the teachers and full-time teachers of physical education (Table 5).
3. There is a reversed and significant association between permanent commitment and job burnout in all the teachers and full-time teachers and invited teachers of physical education (Table 6).
4. There is a reversed and significant association between normative commitment and job

burnout in all the teachers and full-time teachers of physical education (Table 7).

Table 1: The characteristics of physical education teachers (Research sample)

Characteristics		F	%
Gender	Woman	53	56.4
	Man	41	43.6
Employment	Full-time	67	71.2
	Invited	27	28.8
Education	Diploma	4	4.3
	Associate	25	26.6
	BA	55	58.51
	MA	10	10.59
Age (y)	To 30 years	28	29.1
	31-40	46	48.9
	Above 40	20	21
Experience (y)	Under 5 years	17	18
	5-10	25	26.6
	11-15	15	16
	Above 15 years	37	39.4
Total		94	100

Table 2: Statistical indices of organization commitment variable of full-time teachers and invited teachers and total teachers of physical education

Statistical indices			Min score	Max score	Mean	SD
Variables	Subjects	N				
Emotional commitment	Full-time	67	13	56	37.44	8.54
	Invited teacher	27	30	53	38.43	6.6
	Total teachers	94	13	56	37.7	8.05
Permanent commitment	Full-time	67	19	54	33.64	6.89
	Invited teacher	27	29	44	36.69	3.86
	Total teachers	94	19	54	34.41	6.38
Normative commitment	Full-time	67	28	47	35.76	4.75
	Invited teacher	27	28	45	32.94	4.05
	Total teachers	94	28	47	35.05	4.72
Organization commitment	Full-time	67	78	141	107.08	12.39
	Invited teacher	27	90	128	108.06	10.9
	Total teachers	94	78	141	107.33	11.95

Table 3: Statistical indices of job burnout variable of full-time teachers and invited teachers and total teachers of physical education

Statistical indices			Min score	Max score	Mean	SD
Variables	Subjects	N				
Emotional fatigue	Full-time	67	9	46	21.04	8.7
	Invited teacher	27	11	42	21.37	9.83
	Total teachers	94	9	46	21.12	8.91
Performance reduction	Full-time	67	8	41	23.23	7.46
	Invited teacher	27	8	43	27.37	9.35
	Total teachers	94	8	43	24.28	8.11
Personality degradation	Full-time	67	0	24	7.42	4.34
	Invited teacher	27	5	28	9.81	6.89
	Total teachers	94	0	28	8.03	5.15
Job burnout	Full-time	67	23	91	51.7	16.14
	Invited teacher	27	27	88	58.25	18.25
	Total teachers	94	23	91	53.36	16.79

Table 4: Pearson correlation coefficient and significance level between organization commitment and job burnout

Index	r Pearson coefficient	P significance level	N
Organization commitment and burnout of total teachers	-0.42	0.001	94
Organization commitment and burnout of full-time teachers	-0.443	0.002	67
Organization commitment and burnout of invited teachers	-0.416	0.109	27

Table 5: Pearson correlation coefficient and significance level between emotional commitment and job burnout

Index	r Pearson coefficient	P significance level	N
Emotional commitment and burnout of total teachers	-0.432	0.0001	94
Emotional commitment and burnout of full-time teachers	-0.497	0.0001	67
Emotional commitment and burnout of invited teachers	-0.30	0.253	27

Table 6: Pearson correlation coefficient and significance level between permanent commitment and job burnout

Index	r Pearson coefficient	P significance level	N
Permanent commitment and burnout of total teachers	0.003	0.981	94
Permanent commitment and burnout of full-time teachers	-0.025	0.866	67
Permanent commitment and burnout of invited teachers	-0.084	0.757	27

Table 7: Pearson correlation coefficient and significance level between permanent commitment and job burnout

Index	r Pearson coefficient	P significance level	N
Normative commitment and burnout of total teachers	-0.326	0.009	94
Normative commitment and burnout of full-time teachers	-0.221	0.136	67
Normative commitment and burnout of invited teachers	-0.542	0.030	27

3. Discussion and conclusion

In the current study, it was observed that in both groups of the teachers of physical education have high organization commitments. The results of the study were consistent with the results of Sabaqianrad et al. (2006) and Kiwit (2000) based on the fact that physical education teachers have high commitment. There was no significant difference between full-time teachers and invited teachers in terms of organization commitment and the three dimensions. The results of the study were not in line with the results of the study of Mortazavi (1991) regarding the fact that organization commitment is more among full-time staffs than invited staffs. One of the reasons of the lack of consistency of the results of this study with the study of Mortazavi was the lack of similarity of the test groups that is different with the characteristics of the current study. Job security is one of the most important aspects of organization commitment that in some full-time groups increased organization commitment to the invited groups. Teacher job is one of the jobs that is different in terms of internal nature and people do this job with interest and invited teachers fill the gap of job security affecting the organization commitment by increasing the positive emotional, valuable and belief attitudes to their job. By some extensive studies among full-time staffs and invited staffs in various organizations with social, economical and cultural

backgrounds and controlling some of the effective factors as environmental, personal and organizational factors and even internal nature of work, we can achieve exact findings to increase the generalization capability. One of the most important findings of the study was that there was a negative and significant association between organization commitment and job burnout of the physical education teachers of Ahvaz city. The results of this study were in line with the results of Sabaqianrad et al. (2006), King Vesti (1997), Vikram and Rut (1998), Chang et al. (2003), Busman et al. (2005), Liter and MOslash (2006), Lambert et al. (2010) and Jordian and Chenort (2010) regarding the negative and significant association between organization commitment and job burnout. There was significant and negative association between organization commitment and job burnout of full-time teachers of physical education. By reviewing the literature, we can say that organization commitment is one of the most important factors on job burnout in each organization and this effective factor is true about the physical education teachers of Ahvaz. Thus, the authorities of education organization by creating a good environment in this organization by good solutions increased the organization commitment of physical education teachers that by this way, their job burnout is reduced. The other result of the study was that there was no association between organization commitment and job burnout of invited teachers of physical education in Ahvaz. The results of this study were in line with the results of Sabaqianrad et al. (2006) regarding the lack of relationship between the organization commitment and job burnout of the invited teachers. It seems that there are other effective factors instead of organization commitment such as job satisfaction, organization support, organization justice, personal characteristics or self-sufficiency belief with invited teachers' job burnout.

The other result of this study showed that there was negative and significant association between emotional commitment and job burnout in total teachers and full-time teachers. The results of this study were in line with the researches of King Vesti (1997), Vikram and Rut (1998) and Busman et al. (2005) and were not in line with the results of the study of Sabaqian rad et al. (2006) regarding the lack of relationship between the emotional commitment and job burnout. Other results of the study were that there was no association between emotional commitment and job burnout of invited teachers of physical education and they were not in line with the results of Sabaqianrad et al. (2006) regarding the positive and significant relationship between emotional commitment and job burnout of invited teachers. As emotional commitment is including the

strong dependency and interest to the organization and its identity (Alen and Mayer, 1996) and as Mulki (2006) considered four characteristics as effective factors on emotional commitment and the factors are the need to achieve success, structural characteristics as the participation of people in decision making process, job characteristics as having an improved job and work experiences that are effective by fulfillment of job expectations on emotional commitment. Thus, if we consider the need to achieve success and more participation in organization and having good job, we can increase the emotional commitment and we can expect that the bad conditions of each factor can affect the mental and emotional and personality conditions of a person and affects his efficiency and performance. As full-time teachers are working for many years in this organization and are related emotionally and found their real identity. If they got problematic in terms of emotional commitment to the organization, this change in the emotional commitment can cause their burnout. It seems that invited teachers couldn't establish emotional bond with the organization and they couldn't find their real identity in these organizations. The change in the emotional commitment approach can not cause their burn out and burn out in them cause personal and organization factors or other dimensions of organization commitment.

Another finding of this study showed that there was no association between permanent commitment and job burnout of total teachers and full-time and invited teachers of physical education of Ahvaz city. The results of this study were in line with the research of Sabaqianrad et al. (2006) and King Vesti (1997) regarding the lack of association between the permanent commitment and job burnout and were not in line with the Vicram and Rot (1998) study regarding the positive and significant relationship between permanent commitment and job burnout. As permanent commitment is the advantage of the staffs in the organization and lose it by leaving the organization (Baker, 1960). According to the research findings, we can say that normally, physical education teacher give importance to spiritual, emotional, ethical and belief aspects of their job more than materialistic aspects and achieved points in the organization (wage, pension, promotion, easy work, comfort of life) and the change in permanent commitment approach didn't have any effect on burnouts.

Other findings of the research showed negative and significant association between normative commitment and job burnout of total teachers and invited teachers. The results of the study were in line with the Busman et al. (2010) regarding the negative

and significant association between normative commitment and job burnout and were not in line with the researches of Durin and Seyed Akhtar (1998) regarding the positive and significant relationship between normative commitment and job burnout and were in line with the researches of Sabaqianrad et al. (2006) regarding the lack of relationship between the normative commitment and job burnout. As Normative commitment is consisting of the belief of the staffs against the responsibility to the organization and its goals (Allen and Mayer, 1996). According to the findings of the study we can say that total teachers and invited teachers are more responsible to their job and resort to the organization goals and if a problem is made in their beliefs, they find that the reality of the organization job is in contrast with their goals and can cause a background for job burnout. It seems that normative commitment can be considered as predictive factor of job burnout in invited teachers. This factor in full-time teachers can not be a factor for their job burnout and their burnout can be due to other organization commitment factors.

The research findings showed that there was a multiple relationship between the organization commitment components and job burnout of the teachers of physical education of Ahvaz. The results of this study were in line with the findings of Sabaqianrad et al. (2006). As multiple correlation is looking for that fact that which of the predictive variables (emotional commitment, permanent commitment and normative commitment) can predict job burnout, the results of this study showed that in all the teachers, emotional commitment and normative commitment were job burnout predictive factors and permanent commitment didn't have any role in prediction of job burnout. In full-time teachers, emotional commitment was predicting factor of job burnout and permanent commitment and normative commitment were no role in burnout. In invited teachers, normative commitment was prediction factor of job burnout and emotional and permanent commitment didn't have any role in prediction of burnout.

Briefly, according to the current study results regarding the organization commitment and its relationship with the job burnout, we can say that organization commitment as one of the important job attitudes can have good or bad effect on job burnout of people. Based on this fact, providing good conditions for increasing organization commitment that is achieved by change in its subsets, can lead into the main changes and reduction of job burnout in people, while the lack of consideration of this relation caused the weakness of the organization and make the organization away from its goals. Because the

staffs are considered as the main tools of achieving the goals. Thus, it is recommended to the managers and authorities of the organization that use good management methods to improve their job level to improve the quality level of organization commitment of physical education teachers.

Corresponding Author:

Shahram Alam (PhD)
Department of Physical Education,
Shahr-e-Ray Branch, Islamic Azad University,
Tehran,
Iran
E-mail: shahramalam@yahoo.com

References

1. Eskandarirad, Hossein. 2005. The investigation and comparison of the job burnout of physical education teachers and non-physical education teachers of Kashmar. MA thesis of Islamic Azad University. Mashad.
2. Sabaqianrad, Leila. Tondnevis, Fereidun, Mozafari, Amirahmad; Zarei, Ali. 2006. The relationship between organization commitment and job burn out of public physical education teachers, Research journal in sport sciences. No. 10. P. 89-103.
3. Tusi, Mohammad Ali. 2000. Educating the staffs. The selected papers of management. State management education center. Second volume. 25th volume. P. 44-45.
4. Mortazavi, Shahnaz. 1991. The efficiency of human resources. Job satisfaction, organization commitment and job security. Management studies journal. Accounting school and management of Allameh Tabatabayi University. Third period.
5. Moshabaki, Asqar. 1997. The job pressure and mental stress. State management education centers. No. 38.
6. Allen, N.J., Meyer, JP. (1996). The relationship between communication affect, job alternatives and voluntary turnover intention. Southern-Communication journal, 61(3): 193-209.
7. Allen, N.J. Meyer, J.P. (1990). The measurement and antecedents of effective continuance and normative commitment to the organization. Journal Of Occupational Psychology, Vol(63): 1-18.
8. Becker, H.S. (1960). Notes on the concepts of commitment. American Journal of Sociology, vol(66): 32-49.
9. Bosman, J., Buitendach, J., Laba, K. (2005). Job insecurity, burnout and organizational commitment among employees of financial

- institution Gauteng. *Journal of Industrial Psychology*, 31(4): 32-40.
10. Cevat, C. (2000). Teachers organization commitment in educational organization. *National forum of Teachers Education Journal*, Vol 10(30) :59-60.
 11. Chung, I., Chine, J., Hao, L. (2003). The role of burnout in the relationship between perceptions of organizational politics and turnover intentions. *Public Personnel Management*.
 12. Doreen, s.k., Syed Akhtar, t. (1998). Organizational commitment and experienced burnout. *International Journal of organizational Analysis*, 6(4): 310-333.
 13. Gray, D. E. (2005). Burnout in Texas division 4A and 5A high school athletic trainers from a reversal theory perspective. *Journal Home Help*, 76(1): 100-101.
 14. Jourdian, G., Chenevert, D. (2010). Job demands-resources burnout and intention to leave the nursing profession. *International Journal of Nursing Studies*, 47(6): 709-722.
 15. King, R.C., sethi, V. (1997). The moderating of organizational commitment on burnout in information systems professional. *European Journal of Information systems*, 6 (2): 86-96.
 16. Lambert, E.G., Hogan, N.L., Jiang, S., Elechi, O.O., Benjamin, B., Morris, A., Laux, M., Dupuy, P. (2010). The relationship among distributive and procedural Justice and correctional life satisfaction, burnout, and turnover intent. *Journal of criminal Justice*, 38(1): 7-16.
 17. Leiter, MP., Maslach, C. (2006). The impact of interpersonal on burnout and organizational commitment. *Journal of organizational Behavior*, 9(4): 297-308.
 18. Maslach, C. (1986). *Burnout Inventory manual* plato, CA: Consulting psychologist Press.
 19. Mulki, J.P., Jarmillo, F., Locander, W.B. (2006). Emotional exhaustion and organizational deviance. *Journal of Business Research*, 59(12): 1222-1230.
 20. Vikram, S., Ruth, K. (1998). The multidimensional nature of organizational commitment. *Journal of Information Technology Management*, IX (1).

9/6/2012

Application of GIS, AHP, Fuzzy and WLC in Island Ecotourism Development (Case study of Qeshm Island, Iran)

Soolmaz Dashti¹, Seyed Masoud Monavari², Seyed Mohsen Hosseini³, Borhan Riazi⁴, Mansoor Momeni⁵

¹ Department of Environment and Energy, Science and Research Branch, Islamic Azad University, Tehran, Iran

² Department of Environment and Energy, Science and Research Branch, Islamic Azad University, Tehran, Iran

³ Department of Forestry, Faculty of Natural Resources & Marine Sciences, Tarbiat Modares University, Noor, Iran

⁴ Department of Environment and Energy, Science and Research Branch, Islamic Azad University, Tehran, Iran

⁵ Department of Industrial Management, Tehran University, Iran

E-mail: solmazdashti@yahoo.com

Abstract: Ecotourism is based on environmental abilities and natural resources that if it will be combined with specific planning and rehabilitations due to ecotourism attraction potential it could be used as an approach to optimum use of area along its conservation. This study examines the applicability of an integrated spatial decision support framework which is according to geographic information systems (GIS), multicriteria evaluation (MCE) and fuzzy logic to suitable identify locations for ecotourism in Qeshm Island. In these research ecotourism criteria is classified in to 3 parts such as physical, biological and cultural socioeconomic criteria. Weight of criteria has been clarified based on AHP method. And criteria maps were digitized in GIS framework. Criteria of layer was standardized by fuzzy logic and map fuzzy of each criteria traced in GIS. According to WLC method suitable area of ecotourism development were clarified in Qeshm Island and the result showed that 35.58% of Qeshm Island where 530.50 km² is has high potential however 19.8% by 295.22 km² has no ecotourism potential.

[Soolmaz Dashti, Seyed Masoud Monavari, Seyed Mohsen Hosseini, Borhan Riazi, Mansoor Momen. **Application of GIS, AHP, Fuzzy and WLC in Island Ecotourism Development (Case study of Qeshm Island, Iran)**. *Life Sci J* 2013;10(1):1274-1282] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 194

Keywords: GIS; AHP; WLC; Island Ecotourism Development; Iran

1. Introduction

Allong to the concept of sustainable development, many studies have concentrated on sustainable tourism development, including: Nash and Butler (1990), Jarvilouma (1992), Cater (1993), Stewart and Sekartjakrarini (1994), Driml and Common (1996), Weaver (1999, 2005) and Nouri and Malmasi (2004).

Sixty three percent of Europeans prefer to spend their holiday on seaside areas (Nouri et al., 2008).

Since the 1970s, tourism has been found as the strongest and fastest growing industry worldwide (Boo, 1990) and tourism can play an important role of a country's economy (Loperz and Monteros, 2002).

Tourism is considered as the most important cause of employment in the world. Which is directly or indirectly contained 200 million occupations or on the hand 10% of all jobs in the world and also approximately 10% of GDP belong to this industry in the world (Duha Buchsbaum, 2004).

The tourism industry is dramatically having an ecological impact on the world's protected areas and the increasing number of tourists shows both threats and opportunities (Goodwin, 1996)

Tourism which has sustainable natural resource is called ecotourism (Fung and Wong, 2007).

Ecotourism can play an important role in attracting support, in both fields of political and financial, to preserve threatened natural areas (Boo, 1990; Agardy, 1993; Dixon et al., 1993; Miller, 1993; Wall, 1993; Western, 1993; Burton, 1997; Instituto Nacional de Ecolog'ia (INE), 1997; Ceballos-Lascura'in, 1998; Go'ssling, 1999; Honey, 1999)

Ecotourism, which is known as ecological tourism, is a form of tourism that attracts to ecological and social conscious individuals (Ryngnga, 2008).

WTO is estimated that tourists using the Mediterranean coastal region alone will be reached to 350 million by 2020 (WTO, 2004).

A large number of tourists are attracted to coastal areas to look for sea air, beaches, sun, sea food and scenic views (Davenport and Davenport, 2006), influencing coastal area's resources and eco-systems, directly and indirectly (e.g. loss of wetlands and dunes, coastal erosion, etc.).

Approximately 60% of the world's population lives within 60 km of the coast. Which is rapidly increased due to the benefits of coastal areas offer for different activities such as tourism, fishing

and sea transport activities (Sorensen and McCreary, 1990).

In sensitive environmental area specially coasts and Islands land use should be applied precisely. Sustainable development of Qeshm Island be attention to its situation along ecological and presence of special ecosystems such as coral reef, mangrove forest and areas like geopark has such a big deal. According to previous development disorder process and ambitiously developing plan which is predicted for this Island it's necessary to work on it by exact recognition of present position, offering the land use planning and environmental continuous management.

Over the previous years, studies of land-use management were mostly conducted within watershed and regional contexts (Ren,1997; Wang et al., 2004), concentrating on tourism area (Nouri et al., 2008; Fung and Wong, 2007; Aminu, 2007; Chhetri and Arrowsmith, 2008), agricultural area (Carsjens and Van der Knaap, 2002; Klocking et al., 2003), forest land (Sharawi, 2006) and land-use allocation of farming and forestry land (Riveiro et al., 2005).

A number of innovative approaches were applied in land-use management, covering land-use suitability assessment, land-use change predicting, land evaluation and land-use allocation. In the field of land-use suitability assessment, GIS techniques are known to be a powerful device that is implied by recent studies (Burrough, 1990; Pereira and Duckstein, 1993; Bojorquez-Tapia et al., 2001; Collins et al., 2001; Joerin et al., 2001; Ramandan and Aina, 2004; Phua and Minowa, 2005).

Many other approaches were also employed in past studies for coping with the allocation problems in land-use management, such as fuzzy allocation of forest land in British Columbia (Ells et al., 1997), GIS-based multicriteria evaluation and fuzzy sets to clarify priority sites for marine protection (Wood and Dragicevic, 2007), cost-benefit investigation on decision making for local land-use allocations (McDonald, 2001) and integer linear programming that is suitable for multi-site land-use allocations (Aerts et al., 2003).

The MCDM is a main approach that has been used to a wide range of natural resource management situations. From the scientific point of view and critical reviews of MCDM, it is clear that MCDM presents a suitable planning and decision-making framework for natural resources management and regional tourism planning, because it is inherently strong and not supposed to fail can lead to conflicting, multidimensional, incommensurable and

incomparable objectives. (Anada and Herath, 2008; Mendoza and Martins, 2006)

Multiple Criteria Decision Support (MCDS) methods are decision analyses tools that have been developed for coping with all that information in order to support complex decision making with multiple objectives (Babaie-Kafaky et al., 2009).

So this study has attempted to determine the sustainable area for ecotourism development by MCDM method and GIS techniques.

2. Materials and methods

Site of Study

The Qeshm Island, with an area of 1491 km², is located in the farthest end eastern Persian Gulf in Hormoz Strait. It lies between 26 ° 32' and 27 ° 00' north latitude and between 55 ° 15' and 56 ° 16' east longitude. Its length is about 110 km and its width is less than 20 km and it is known as the biggest, richest and the most beautiful Island in Persian Gulf and its position in Hormozgan province in Iran was shown (Fig.1).



Fig. 1: The position of the Qeshm Island in Hormozgan province of Iran

Method

For the identification potential sites for ecotourism in Qeshm Island we applied a single-objective multi-criteria analysis methodology which is involving the following major steps:

- (i) Identification of criteria and of their suitable ranges for each criterion;
- (ii) Collection of necessary geographic data;
- (iii) Weighing of data layer
- (iii) Standardization of each criterion
- (iv) Obtaining Fuzzy maps of each criterion
- (v) Calculation of the composite decision criterion for tourism potential sites.

Criteria that are impacting the suitability of land use for tourism were chosen by expert's judgment within reviewing relevant information from the

literature. Criteria were mapped using accessible maps and data, fieldwork, RS, GIS and different methods.

All of criteria of land use for tourism were weighted with pair wise comparison by expert judgments within the analytical hierarchy process.

Saaty developed AHP in 1980, addresses how to determine the relative importance of a set of activities in a multi-criteria decision problem. AHP method makes it possible to incorporate judgments on intangible qualitative criteria alongside tangible quantitative criteria (Badri, 2001). The AHP process is based on three principles: first, structure of the model; second, comparative judgment of the alternatives and the criteria; third, combination of the priorities. In the literature, AHP, has been widely used in solving many complex decision-making problems (Xuling et al., 2009; Hsu et al., 2009; Dagdeviren and Yüksel, 2008; Boroushaki and Malczewski, 2008; Onut and Soner, 2008 ; Chan et al., 2007; Kulak and Kahraman, 2005; Kahraman et al., 2003).

The AHP framework questionnaires was developed. In the questionnaire, respondents were determined relative importance of each criterion with respect to other, for example, importance of soil with respect to water.

These criteria maps are the input to multicriteria decision analysis. The map of criteria attributes are measured in different units. The criterion maps can be used in multicriteria decision analysis after they are standardized in multicriteria decision rules (Djenaliev, 2007).

The use of fuzzy logic theory by developing criterion layers is considered to let more flexible MCE operations, and explicitly take into account the continuity and uncertainty in the relation between the criteria and the decision set (Jiang and Eastman, 2000).

For instance, standardizing criterion layers to fuzzy measures means that the criterion value for each cell is standardized according to by measure of the possibility of belonging to the set along a continuous scale from 0 to 1 (real number scale) or 0 to 255 (byte scale) (Eastman, 2003).

To catch this continuous scale has been used the decision support module Fuzzy factor standardization. This module has the type of membership function like Sigmoid, J-shaped, Linear and the type of shape of membership function like monotonically increasing, monotonically decreasing, and symmetric. GIS is used for fuzzy operations which are based several algebraic operations on fuzzy numbers to showing fuzzy sets (Djenaliev, 2007).

The fuzzy set operation has been used in IDRISI for the solving of the problem to find a suitable location of a tourism site.

The simple additive weighting methods, also is known as weighted linear combination, is the most usual type of decision rule that is used in GIS-based on decision making (Malczewski, 1999).

A priority map for tourism was created by using GIS-based Weighted Linear Combination (WLC) model along with MCE analyzes. GIS could be used to identify specific developmental sites based on a set of criteria which is using economic, social and environmental data (Rachel and Chen, 2007).

3. Result

In this paper, we attempt to explore the potential of using GIS for ecotourism planning in Qeshm Island. As it was mentioned selecting of criteria for tourism in Qeshm Island was done according to literature and judgment (Beedasy and Whyatt, 1999; IUCN/WCPA, 1999 ; Kliskey, 2000 ; Steiner et al., 2000; lee, 2001; Katiyar and Nidhi, 2001; Tanzania coastal management partnership, 2003; Proctor and Drechsler, 2003; Perez et al., 2003; Brody et al., 2004; Ramand and Aina, 2004; Erkinand Usul, 2005; Yaakup et al., 2006; Garrod et al., 2006; Alvarez and French, 2006; National marine sanctuaries, 2006; Nouri et al., 2008; Rynngnga, 2008 ; Babaie-Kafaky et al., 2009; Bestard and Font, 2009; Luberichs, 2009; Windupranata and Hayatiningsih, 2009; Bukenya, 2012).

A GIS is set up for this study incorporating both spatial and non-spatial data. Layer of criteria was digitized in GIS. That slope map and hypsometry of Qeshm Island was done in GIS by using of DEM and most of criterion maps are digitized in GIS by using fieldwork and RS. Map of ecotourism criteria was shown in Qeshm Island (Fig 2 – 6).

The weights of each criteria was done by AHP method and judgment questionnaires. Saaty (1980) explain the development 9-point ratio response scale that is integral to the AHP. The decision maker can express his/her preference between every 2 factors verbally as equally important, moderately more important, strongly more important, very strongly more important, and extremely more Important. These descriptive preferences would then be changed into numerical ratings 1, 3, 5, 7, and 9, respectively, with 2, 4, 6, and 8 as intermediate values for compromising two successful qualitative judgments (Saaty, 1980). The composite weights of the alternatives are then determined by aggregating the weights throughout the hierarchy. One important benefit of using AHP is that it can measure the degree to which the pair wise comparisons are

consistent (Hsu et al., 2009). This measure, consistency ratio (CR), let managers to detect inadvertent misjudgments in comparisons. If $CR < 0.1$, then the comparisons are acceptable. If the CR is larger than 0.1, it is suggested that the decision maker reevaluate the comparisons, because some of the judgments are contradictory (Saaty, 1980).

Weight of factors are then used to each specific factor with a total sum equal to one. The weights show the relative degree of importance each factor plays in determining the suitability for an objective (Fung and Wong, 2007).

Because of scale differences upon which each criterion is measured, all criteria are standardized based on the fuzzy algorithm in which the shape of membership functions. After selecting the shape of membership functions, control points are used to define the suitable range of data value to be standardized into a 0–1 byte scale. The criteria for ecological modeling and MCE, weight of criteria and shape of membership function is shown in Table 1.

After determination of factor weights and standardization of map of criteria in IDRISI software,

process of multicriteria evaluation was done. By use of WLC (weight linear combination) which is the most current method is decision multicriteria the evaluation of ecotourism in Qeshm Island was applied. At first criteria fuzzy value is multiplied by this own weight. Then by summing up the result, regional suitable map was shown for land use (Malczewski, 1999).

$$A_i = \sum_j W_j X_{ij}$$

A_i : Final Utility

W_j : Factor Weight

X_{ij} : Factor Fuzzy Value

In this research, the external map is as a result of multicriteria evaluation for land suitability due to ecotourism development in Qeshm Island. Which is a combinations of number from values between 0-1. The number, the more land suitability and the less number, the less land suitability for tourism development we have.

Table 2 is suggested for the better showing of tourism capability in Qeshm Island and Fig. 7 shows tourism capability according to WLC method.

Table 1: criteria for ecological modeling and MCE, weight of criteria and shape of membership function

Criteria	Limits of Criteria Layer	weight of criteria	shape of membership function	Final Utility
Slope (%)		0.019	Monotonically decreasing (linear)	0-25% equal 1, 25- 50% between 1-0, more than 50% equal to 0
Elevation (m)		0.011	Monotonically increasing (linear)	0-100m equal 0, 100- 400m between 0-1, more than 400m equal to 1
Distance from Coast Line (km)		0.097	Monotonically decreasing (linear)	0-1 km equal 1, 1- 4 km between 1-0, more than 4 km equal to 0
Distance from Water Resources (m)	0-200 Buffer (m)	0.063	Monotonically decreasing (linear)	200-500 m equal 1, 500- 1500m between 1-0, more than 1500m equal to 0
Coast Combination		0.020	discrete	Sandy shore equal 1, Rocky shore equal 0.7, Muddy shore equal 0.4
Geology		0.040	discrete	Sandy Stone equal 1, Alluvium Sediment, Lime Stone, Clay Stone between 1-0, Marn equal to 0
Distance from Fault (m)		0.160	Monotonically increasing (linear)	0-500 m equal 0, 500- 1500m between 0-1, more than 1500m equal to 1
Soil		0.016	discrete	Depth Loam equal 1, Sand Loam Clay, Loam Clay, Loam Clay (Depth - Sub Depth) between 1-0, Low Depth Clay equal to 0
Ground Cover		0.013	Trapezoidal	0-5% equal 0, 5- 40% between 0-1, 40-60% equal 1, 60- 80% between 1-0, more than 80% equal to 0
Distance from Protected area (m)	0-200 Buffer (m)	0.101	Monotonically decreasing (linear)	200-500 m equal 1, 500- 3000 m between 1-0, more than 3000 m equal to 0
Distance from Sensitive habitat (m)	0-200 Buffer (m)	0.057	Monotonically decreasing (linear)	200-500 m equal 1, 500- 3000 m between 1-0, more than 3000 m equal to 0
Distance from Landscape (m)		0.108	Monotonically decreasing (linear)	0-200m equal 1, 200- 1500m between 1-0, more than 1500m equal to 0
Distance from Archaeological, istorical, Cultural Literary (m)		0.127	Monotonically decreasing (linear)	0-200m equal 1, 200- 1500m between 1-0, more than 1500m equal to 0
Distance from road (m)	0-150 Buffer (m)	0.031	Monotonically decreasing (linear)	150-300 m equal 1, 300- 1000 m between 1-0, more than 1000 m equal to 0
Distance from Port & Jetty (m)		0.028	Monotonically decreasing (linear)	0-200m equal 1, 200- 1000 m between 1-0, more than 1000 m equal to 0
Distance from Airport (km)		0.011	Monotonically decreasing (linear)	0-5 km equal 1, 5- 30 km between 1-0, more than 30 km equal to 0
Distance from Built – up Areas (m)		0.021	Monotonically decreasing (linear)	0-500 m equal 1, 500- 1500m between 1-0, more than 1500m equal to 0
Distance from Tourism facilities (m)		0.029	Monotonically decreasing (linear)	0-1500 m equal 1, 1500- 3000 m between 1-0, more than 3000 m equal to 0
Distance from Indusry Areas (m)		0.023	Monotonically decreasing (linear)	0-500 m equal 0, 500- 3000 m between 0-1, more than 3000 m equal to 1
Distance from Agriculture Areas and Garden (m)		0.024	Monotonically decreasing (linear)	0-50 m equal 1, 50- 1500 m between 1-0, more than 1500 m equal to 0

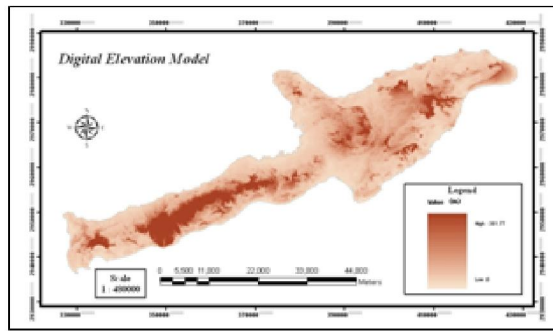


Fig. 2: Digital Elevation Model

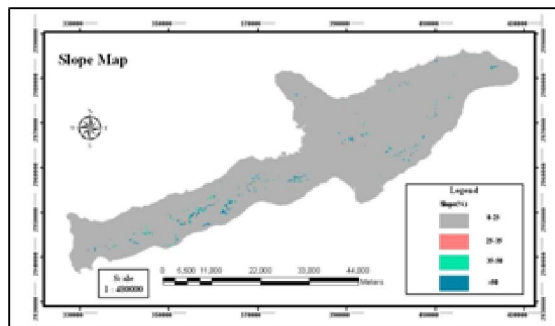


Fig. 3: Slope Map

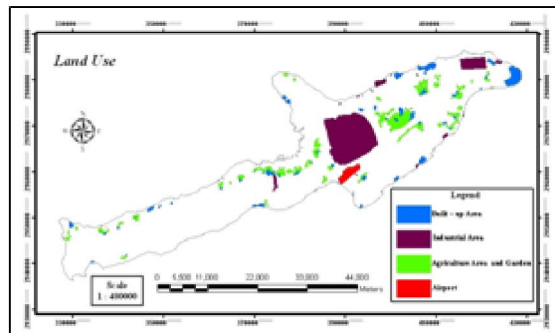


Fig. 4: Land Use

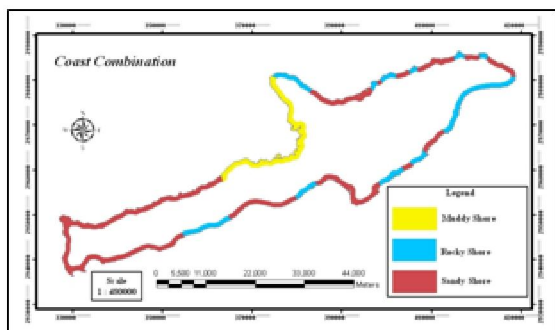


Fig. 5: Coast Combination

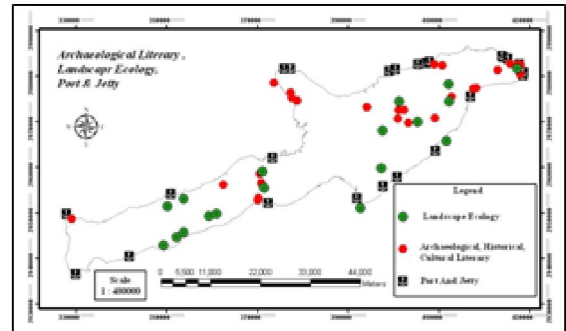


Fig. 6: Archaeological Literary, Landscape Ecology, Port & Jetty

Table 2: Qeshm Island Tourism Capability Classification

Final value for each pixel	Tourism Capability	Class
0.8 - 1	Extremely Capability	1
0.6 - 0.8	High Capability	2
0.4 - 0.6	Moderate Capability	3
0.2 - 0.4	Low Capability	4
0 - 0.2	Unsuitable	5

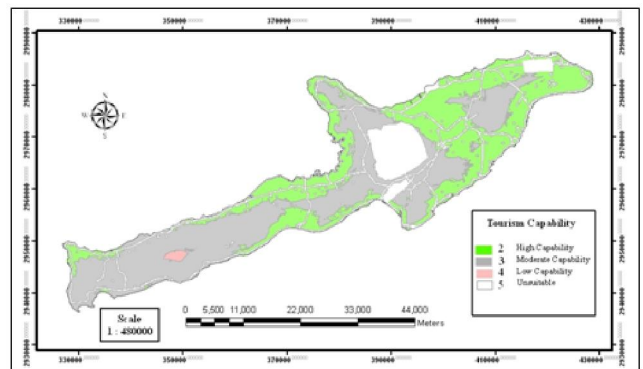


Fig. 7: Tourism Capability in Qeshm Island according to WLC

4. Conclusion

The objective of this study is to evaluate the potential for ecotourism planning in Qeshm Island.

Existing the monumental places, historical and cultural from Hakhamaneshian, Ashkanian and Sasanian dynasty, the beginning of Islam, Ilkhanian, Saljoghian, Teymorian, Safaviyeh, Ghajariye and Pahlavian dynasty, landscape of ecology such as Kaseh_Salakh, Tandis valley (from Geopark region), Naz Island, coral reef, rocky and sandy shore, mangrove forest area which is located in the north of

Qeshm Island which is considered as a habitat of many living things and planting community that are able to continue their life in a special feeding environment, sea turtle breeding site, existing port and jetty for transferring passengers, having an access to tourism facilities and accommodation for tourists, existing of ground availability road and agricultural and gardening area in this region and not having any fault in this area causes that 35.58% of Qeshm Island with 530.50 km² has the highest capability tourism.

Ecological landscape contain Namakdan_ Mountain, Namak spring, Tang_e_Ali, Tang_e_Chahkoo, Shoor valley, Stair valley (from Geopark region), Kargah and Goori spring by having water healing, being near to the airport, existing agricultural lands and palms, having slope of 25-35%, being near to the fault in this area caused that 44.13% in Qeshm Island by 657.98 km² has the moderate capability.

By considering of high slope near 35% and lack of marine and ground availability roads and being far from the shore seaside, 0.49% of Qeshm Island with 7.31 km² has the lowest capability.

By considering to existing of Gavarzin gas source, industrial area, airport, buffer layer for availability road which are known as limited layers. 19.8% of Qeshm Island with 295.22 km² doesn't have any capability.

For identifying priority sites for marine protection we used GIS_ based multicriteria evaluation and fuzzy sets. These study shows that MCE is a suitable process which is used widely for land suitability region and it is directed the decision that both of them could be practiced in marine area planning (Wood and Dragicevic, 2007).

Ecotourism planning using multiple criteria evaluation with GIS was in used in Yan Chau Tong and closest ambient. In this study by using MCE process we clarified suitable are for conservation and recreational are which contains (camping, snorkel diving, heritage visit, hiking) and for each kind of land use suitable criteria was suggested (Fung and Wong, 2007).

The study under the name Methods of Spatial analysis in GIS was done. That in research it was clarified that WLC process can be performed by GIS overlaying capability. Overlaying techniques in GIS shows that external map is combination criteria of map (Burrough, 1990).

The results can show as a guideline and support for ecotourism planning. The use of GIS and MCE techniques impressively helps ecotourism planning. MCE is a sound device for ecotourism planning, since it takes into consideration the various criteria

that have a significant impact on the decision. MCE has also effectively been applied the most suitable areas for the different activities with specific sets of criteria.

Corresponding Author:

Soolmaz Dashti

Department of Environment and Energy,
Science and Research Branch, Islamic Azad
University, Tehran, Iran

E-mail: solmazdashti@yahoo.com

References

1. Aerts, J.C.J.H., Eisinger, E., Heuvelink, G.B.M. and Stewart, T.J. (2003). Using linear integer programming for multi-site land-use allocation. *Geogr. Ana.* 35 (2), 148–169.
2. Agardy, M.T. (1993). Accommodating ecotourism in multiple use planning of coastal and marine protected areas. *Ocean and Coastal Management* 20: 217–239.
3. Alvarez, M, French, L. (2006). Planning for Ecotourism in Uaxactún, Guatemala. A Master's Practicum Submitted in Partial Fulfillment of the requirements for the Degree of Master's of Landscape Architecture at The University of Michigan.
4. Aminu, M. (2007). A Geographical Information System (GIS) and Multi_Criteria Analysis for Sustainable Tourism Planning. A project submitted in fulfillment of the requirements for the award of the degree of Master of Science (Planning-Information Technology) Faculty of Built Environment Universiti Teknologi Malaysia.
5. Anada, J. and Herath, G. (2008). Multi-attribute preference modeling and regional land-use planning. *Ecologic. Econ.*, 65: 325-335. DOI: 10.1016/j.ecolecon.2007.06.024.
6. Babaie-Kafaky, S., Mataji, A. and Ahmadi Sani, N. (2009). Ecological Capability Assessment for Multiple-Use in Forest Areas Using GIS- Based Multiple Criteria Decision Making Approach. *American Journal of Environmental Sciences* 5 (6): 714-721.
7. Badri, M.A. (2001). A combined AHP-GP model for quality control systems. *International Journal of Production Economics*, 72, 27–40.
8. Beedasy, J. and Whyatt, D. (1999). Diverting the tourists : a spatial decision _Support system for tourism Planning on a developing Island. *Journal of JAG*. Vol 1. Issue 3/4. Pp 163-174.
9. Bestard, A.B. and Font, A.R. (2009). Environmental diversity in recreational choice modeling. *Journal of Ecological Economics*. 68 Pp 2743–2750.

10. Bojorquez-Tapia, L.A., Diaz-Mondragon, S. and Ezcurra, E. (2001). GIS-based approach for participatory decision making and land suitability assessment. *Int. J. Geogr. Inf. Sci.* 15 (2), 129–151.
11. Boo, E. (1990). *Ecotourism: the Potential and Pitfalls*. World Wildlife Fund, Washington, DC.
12. Boroushaki, S. and Malczewski, J. (2008). Implementing an extension of the analytical hierarchy process using ordered weighted averaging operators with fuzzy quantifiers in ArcGIS. *Computers & Geosciences.* 34: 399–410.
13. Brody, S.D., Higfield, W., Arlikatti, S., Bierling D.H. and Ismailova, R.M. (2004). Conflict on the Coast: Using Geographic Information Systems to Map Potential Environmental Disputes in Matagorda Bay, Texas. *Journal of Environmental Management* Vol. 34, No. 1, pp. 11–25.
14. Bukenya, J.O. (2012). Application of GIS ecotourism development Decision : Evidence from the Pearl of Africa. Research Assistant Natural Resource Economics Program, West Virginia University.
15. Burrough, P.A. (1990). "Methods of Spatial analysis in GIS". *International journal of geographic information systems*, 4, Pp.221–223.
16. Burton, R. (1997). The sustainability of ecotourism. In: Stabler M.J. (ed.), *Tourism and Sustainability: Principles to Practice*. CAB International, New York, pp. 357–375.
17. Ceballos-Lascuráin, H. (1998). *Ecoturismo, naturaleza y desarrollo sustentable*. Diana, México, DF.
18. Carsjens, G.J. and Van der Knaap, W. (2002). Strategic land-use allocation: dealing with spatial relationships and fragmentation of agriculture. *Landsc. Urban Plann.* 58 (2–4), 171–179.
19. Cater, E. (1993). Ecotourism in the third world: problems for sustainable tourism development. *Tour Manage* 14:85–89.
20. Chan, F.T.S., Kumar, N., Tiwari, M.K., Lau, H.C.W., and Choy, K.L. (2007). Global supplier selection: a fuzzy-AHP approach. *International Journal of Production Research*. doi:10.1080/00207540600787200.
21. Chhetri, P. and Arrowsmith, C. (2008). GIS-based Modelling of Recreational Potential of Nature-Based Tourist Destinations. *Tourism Geographies*. Vol. 10, No. 2, 233–257.
22. Collins, M.G., Steiner, F.R. and Rushman, M.J. (2001). Land-use suitability analysis in the United States: historical development and promising technological achievements. *Environ. Manage.* 28 (5), 611–621.
23. Dagdeviren, M. and Yüksel, I. (2008). Developing a fuzzy analytic hierarchy process (AHP) model for behavior-based safety management. *Information Science*, 178,1717–1733.
24. Davenport, J. and Davenport, J. (2006). The impact of tourism and personal leisure transport on coastal environments: a review. *Estuar Coast Shelf Sci* 67:280–292.
25. Djenaliev, A. (2007). Multicriteria decision making and GIS for railroad planning in Kyrgyzstan. Master's of Science Thesis in Geoinformatics TRITA-GIT EX 07-007.School of Architecture and the Built Environment Royal Institute of Technology (KTH) 100 44 Stockholm, Sweden.
26. Dixon J.A., Scura, L.F. and Van't Hof, T. (1993). Meeting ecological and economic goals: marine parks in the Caribbean. *Ambio* 22: 117–125.
27. Driml, S. and Common, M. (1996). Ecological criteria for sustainable tourism: application to the Great Barrier Reef and wet tropics world heritage areas, Australia. *J Sustain Tour* 4:3–16.
28. Duha Buchsbaum, B. (2004). *Ecotourism and Sustainable Development ic Costa Rica*.
29. Eastman, JR. (2003). *IDIRISI Kilimanjaro guide to GIS and image processing*. Clark Labs, Clark University, Worcester, MA, pp 305.
30. Ells, A., Bulte, E. and VanKooten, G.C. (1997). Uncertainty and forest land use allocation in British Columbia: vague priorities and imprecise coefficients. *Forest Sci.* 43 (4), 509–520.
31. Erkin, E. and Usul, N. (2005). Site Selection for New Tourism Types in Bodrum Peninsula, MU_LA, TURKEY,ESRI Users Conference 2005. Accessed date 2 January 2009. <http://gis.esri.com/library/userconf/proc05/papers/pap1856.pdf>.
32. Fung, T. and Wong, F.K.K. (2007). Ecotourism planning using multiple criteria evaluation with GIS. *Geocarto International* Vol. 22, No. 287–105.
33. Garrod, B., Wornell, R. and Youell, R. (2006). Re-conceptualising rural resources as countryside capital: The case of rural tourism. *Journal of Rural Studies* 22,Pp 117–128.
34. Goodwin, H. (1996). In pursuit of ecotourism. *Biodiversity and Conservation* 5: 277–291.
35. Go'ssling, S. (1999). Ecotourism: a means to safeguard biodiversity and ecosystem functions? *Ecological Economics* 29: 303–320.

36. Honey, M. (1999). *Ecotourism and Sustainable Development: Who Owns Paradise?* Island Press, Washington, DC.
37. Hsu, T.K., Tsai, Y.F. and Wu, H.H. (2009). The preference analysis for tourist choice of destination: A case study of Taiwan. *Tourism Management Journal* 30, Pp 288–297.
38. Instituto Nacional de Ecología (INE). (1997). Programa de ecoturismo en áreas naturales de México. SEMARNAP-SECTUR.
39. IUCN/WCPA. (1999). *Guidelines for Marine Protected Areas*, Edited & coordinated by Graeme Kelleher, Adrian Phillips, Series Editor.
40. Jarvilouma, J. (1992). Alternative tourism and the evolution of tourist area. *Tour Manage* 13:118–120.
41. Joerin, F., Theriault, M. and Musy, A. (2001). Using GIS and outranking multicriteria analysis for land-use suitability assessment. *Int. J. Geogr. Inf. Sci.* 15 (2), 153–174.
42. Kahraman, C., Ruan, D., and Dog˘an, I. (2003). Fuzzy group decision-making for facility location selection. *Information Sciences*, 157, 135–153.
43. Katiyar, P. and Nidhi, J. (2001). Sites Need Attention In Maharashtra Shore RS and GIS an Ultimate Tool to Explore and Develop These Beaches as a new Tourist Spot.
44. Kliskey, A.D. (2000). Recreation terrain suitability mapping: a spatially explicit methodology for determining recreation potential for resource use assessment. *Landscape and Urban Planning* 52,33–43.
45. Klocking, B., Strobl, B., Knoblauch, S., Maierc, U., Pfütznerd, B. and Gericke, A. (2003). Development and allocation of land-use scenarios in agriculture for hydrological impact studies. *Phys. Chem. Earth* 28 (33–36), 1311–1321.
46. Kulak, O. and Kahraman, C. (2005). Fuzzy multi-attribute selection among transportation companies using axiomatic design and analytic hierarchy process. *Information Sciences*, 170, 191–210.
47. Lee, S. (2001). A Spatial Decision Support System For Guiding The Selection Of Tourism Development Sites. Submitted to Texas A & M University in partial fulfillment of the requirements for the degree of Doctor of Philosophy. P 162.
48. Loperz, R., Monteros, E.D. (2002). Evaluating ecotourism in natural protected areas of La Paz Bay, Baja California Sur, México: ecotourism or nature-based tourism? *Biodiversity and Conservation* 11: 1539–1550.
49. Luberichs, J. (2009). GIS and Tourist Consumer Research (The Spatial Profile of German Low Cost Carrier Passengers in Mallorca. Submitted in fulfillment of the requirement for the degree of Master of Science in Geographical Information Systems (UNIGIS). Faculty of Earth and Life Sciences Vrije Universiteit Amsterdam The Netherlands.
50. Malczewski, J. (1999). *GIS and Multicriteria Decision Analysis*. John Wiley & Sons, Inc., pp 392.
51. McDonald, J.F. (2001). Cost-benefit analysis of local land use allocation decisions. *J. Regional Sci.* 41 (2), 277–299.
52. Mendoza, G.A. and Martins, H. (2006). Multicriteria decision analysis in natural resource management: A critical review of methods and new modeling paradigms. *For. Ecol. Manage.*, 230: 1–22. DOI: 10.1016/j.foreco.2006.03.023.
53. Miller, M.L. (1993). The rise of coastal and marine tourism. *Ocean and Coastal Management* 20: 181–199.
54. Nash, D. and Butler, R. (1990). Alternative forms of tourism. *Int J Hosp Manage* 9:163–165.
55. National marine sanctuaries. (2006). Coastal tourism development criteria for Maldives, Handout 4.6 : Tourism Industry, South china sea planning for sustainable tourism in MPAs training, USA.
56. Nouri, J., Danehkar, A. and Sharifipour, R. (2008). Evaluation of ecotourism potential in the northern coastline of the Persian Gulf. *Environ Geol* 55:681–686.
57. Nouri, J. and Malmasi, S. (2004). Environmental impact assessment of urban development plan by vulnerability model application. *Int J Environ Sci Technol* 1(1):7–15.
58. Onut, S. and Soner, S. (2008). "Transshipment site selection using the AHP and TOPSIS approaches under fuzzy environment" *Waste Management*, Vol 28, pp. 1552-1559.
59. Pereira, J. and Duckstein, L. (1993). A Multiple criteria decision-making approach to GIS-based land suitability evaluation. *Int. J. Geogr. Inf. Syst.* 7, 407–424.
60. Perez, O.M., Telfer, T.C. and Ross, L.G. (2003). Use of GIS Based Models for integrating and developing marine fish cage within the tourism industry in tenerif (Canary Islands), *Coastal management*, No31, Taylor & Francis Inc.
61. Phua, M.H. and Minowa, M. (2005). A GIS-based multi-criteria decision making approach to forest conservation planning at a landscape

- scale: a case study in the Kinabalu Area, Sabah, Malaysia. *Landsc. Urban Plann.* 71 (2–4), 207–222.
62. Proctor, W and Drechsler, M. (2003). Deliberative Multi-criteria Evaluation: A case study of recreation and tourism options in Victoria Australia. *European Society for Ecological Economics, Frontiers 2 Conference Tenerife, Feb 11-15.*
 63. Rachel, J. and Chen, C. (2007). Geographic information systems (GIS) applications in retail tourism and teaching curriculum. *Journal of Retailing and Consumer Services* 14, 289–295.
 64. Ramand, B.A. and Aina, Y. (2004). GIS Applications in Optimum Site Selection for Tourist Sites: Texas State as a Case Study. *Third International Conference & Exhibition - GIS BAHRAIN September 27– 29.*
 65. Ren, F.H. (1997). Atraining model for GIS application in land resource allocation. *ISPRS J. Photogrammetry Remote Sensing* 52 (6), 261–265.
 66. Riveiro, J.A., Alvarez, C.J., Pereira, J.M. and Miranda, D. (2005). Profitability and production requirements for land use allocation of farming and forestry land. *Biosyst. Eng.* 90 (4), 477–484.
 67. Ryngnga, P.K. (2008). Ecotourism Prioritization; A Geographic Information System Approach. *South Asia Journal of Tourism & heritage.* Vol 1, No 1, Pp 49-56.
 68. Saaty, T.L. (1980). *The analytic hierarchy process.* New York: McGraw-Hill.
 69. Sharawi, H.A. (2006). Optimal land-use allocation in central Sudan. *Forest Policy Econ.* 8 (1), 10–21.
 70. Sorensen, J. and McCreary, S. (1990). Institutional arrangements for managing coastal resources and environments, US Nat. Parks Service, Int. Affairs Office, DC (1990).
 71. Steiner, F., McSherry, L. and Cohen, J. (2000). Land suitability analysis for the upper Gila River watershed. *Journal of Landscape and Urban Planning* 50 Pp 199-214.
 72. Stewart, S. and Sektartjakrarini, S. (1994). Disentangling ecotourism. *Ann Tour Res* 21:840–842.
 73. Tanzania coastal management partnership. (2003). *Guidlines for coastal tourism development in tanzania,* Ministry of natural resources and tourism.
 74. Wall, G. (1993). Ecological reserves and protected areas: the challenge of ecotourism. <http://www.planeta.com/mader/planeta/0499/0499geoff.html>.
 75. Wang, X.H., Yu, S. and Huang, G.H. (2004). Land allocation based on integrated GIS-optimization modeling at a watershed level. *Landsc. Urban Plann.* 66 (2), 61–74.
 76. Weaver, D.B. (1999). Magnitude of ecotourism in Costa Rica and Kenya. *Ann Tour Res* 26:792–816.
 77. Weaver, D.B. (2005). Comprehensive and minimalist dimension of ecotourism. *Ann Tour Res* 32:432–455.
 78. Western, D. (1993). Defining ecotourism. In: Lindberg K. and Hawkins D.E. (eds), *Ecotourism, a Guide for Planners and Managers* Vol. 1. The Ecotourism Society, Burlington, Vermont, pp. 7–10.
 79. Windupranata, W. and Hayatiningsih, I. (2009). Optimaization of Marriculture site in the tourism area of Seribu Islands, Java sea, Indonesia, the 6th international congress on coastal and marine tourism, Port Elizabeth – Nelson Mandela Bay – South Africa.
 80. Wood, L.J. and Dragicevic, S. (2007). GIS-based multicriteria evaluation and fuzzy sets to identify priority sites for marine protection. *Journal of Biodivers Conserv* 16:2539–2558.
 81. World Tourism Organization (WTO). (2004). <http://www.worldtourism.org/facts>.
 82. Xuling, L., Zhaoping, Y., Feng, D. and Xuegang, C. (2009). Evaluation on Tourism Ecological Security in Nature Heritage Sites :Case of Kanas Nature Reserve of Xinjiang, China. *Chin. Geogra. Sci* 1 9(3), Pp 265–273.
 83. Yaakup, A., Che' Man, N., Hosni, N., Haron, H.W. and Sulaiman, S. (2006). A GIS Approach in Evaluation of Metropolitan Green Area: A Case of Sungai Pulai Wetland. *Urban Forestry Conference: Managing Urban Green For Sustainable Cities.* Kuala Lumpur, 6-7 June.

11/6/2012

Outcome of Different Diagnostic and Therapeutic Modalities of Acute Lower Gastrointestinal Bleeding; a University Hospital Experience

Yasser El-Naggar¹, Essam A.Wahab¹, Afifi F. Afifi¹, Hasan Abd Alshaqour² and Abdelrahman I. Abdelrahman³

¹Internal Medicine, ²General Surgery and ³Radiology departments, Zagazig University Hospitals, Egypt
essamabdelwahab72@gmail.com

Abstract: Background: Acute lower GI bleeding (LGIB) is a common clinical situation that needs work up for proper diagnosis and individualized management. **Aim of the work:** Enlisting causes of acute LGIB in our locality, detecting the relation between causes and severity of the bleeding and compare different available therapeutic options for each case. **Patients and Methods:** One hundred patients with acute LGIB were included in this study. Patients attended our hospital during period from *September 2011 to February 2012* were classified according to the risk assessment score into two groups; group I (high risk group) included 39 patients and group II (moderate risk group) included 61 patients. Initial resuscitation and routine laboratory studies were done for all patients, and then procedures for localization of the bleeding site were done utilizing colonoscopy, enteroscopy, mesenteric angiography and radionuclide scintigraphy that were individualized for every patient. Medical, endoscopic, angiographic or surgical treatments were initiated according to the bleeding type, site and availability of the treatment modality. **Results:** Our study included 100 patients, 63 males and 37 females. Group I included 39 patients (24 males and 15 females) with age range (24-78 y) and mean \pm SD (56.2 \pm 14.1 y) and group II included 61 patients (39 males and 22 females) with age range (30-64 years) and mean \pm SD (44 \pm 15.3 y). Majority of patients (84.7%) in group I were presented with bright red hematochezia (84.6%), while, majority of patients (70.5%) in group II were presented with a maroon stool. Abdominal tenderness was the most frequent associated symptoms in both groups (74.4 % in group I and 36 % in group II). Requirement of blood units in group I was twice as that of group II. Significant differences were found between the two groups regarding hemoglobin level, hematocrit value, PT, and INR concentration. Rectosigmoid junction and descending colon followed by anorectal area and sigmoid colon (20.5 % vs. 37.7 % , 15.4 % vs. 14.7 % and 12.8 % vs. 11.5% respectively) were the commonest sites of the bleeding in both groups, moreover, bleeding from ascending colon was found to be more severe than other sites followed by bleeding from small intestine and descending colon. Diverticular disease, angiodysplasia and portal hypertensive colopathy (28.2 % , 12.9 % and 12.9 % respectively) were the main causes of acute LGIB among patients in group I, while, colitis, malignant neoplasm and benign polyps (14.7 % , 13.3 % and 11.5 % respectively) were the main causes of acute LGIB in group II. Colonoscopy was the best and beneficial diagnostic modality in our study; it was able to detect causes of the bleeding in 95% in group I and 91 % of causes in group II. Conservative medical management was successful in stopping bleeding in 18 patients (46.2%) in group I and in 28 patients (49.9%) in group II, while, endoscopic therapy was effective in stopping the bleeding in 15 patients (38.5%) in group I and in 27 patients (44.3%) in group II. Complete recovery was achieved in 71.8% of cases in group I and in 86% in group II. **Conclusion:** Acute LGIB is a common medical and surgical challenge. Diverticular disease is by far the most common cause of acute LGIB in our study. Medical conservation and endoscopic treatment are successful tools in stopping most cases of acute LGIB.

[Yasser El-Naggar, Essam A.Wahab, Afifi F. Afifi, Hasan Abd Alshaqour and Abdelrahman I. Abdelrahman. **Outcome of Different Diagnostic and Therapeutic Modalities of Acute Lower Gastrointestinal Bleeding; a University Hospital Experience**] Life Science Journal 2013; 10(1): 1283-1292]. (ISSN: 1097-8135). <http://www.lifesciencesite.com> 195

Keywords: Outcome; Therapeutic modalities; acute lower GI bleeding.

1. Introduction

Lower gastrointestinal bleeding (LGIB) is a broad topic, which can include passage of a small amount of red blood on tissue paper associated with formed brown stool to life-threatening severe hemorrhage.⁽¹⁾

LGIB is one-fifth to one-third as common as upper gastrointestinal bleeding (UGIB) and generally has a less severe course. The annual incidence rate of LGIB in United States ranges from 20.5 to 27 cases per 100,000 adults populations, while, the annual incidence rate for UGIB is reported to range from 100 to 200 cases per the same adult population.⁽²⁾ LGIB accounts for approximately 30% of all GI bleeding and it is the reason for hospitalization in up to 0.02 % of hospitalized patients each year and carries a mortality rate of 3.6 %.⁽³⁾

Bleeding from lower GI tract may be acute or chronic, acute LGIB is rather arbitrarily defined as a bleeding situation in which blood loss has been occurring for less than 3 days causing hemodynamic instability, anemia, and/or need for blood transfusion. The source of acute LGIB is not always apparent from initial history and physical examination. Hematochezia is the most common clinical presentation of acute LGIB that necessitating hospitalization and immediate evaluation for proper diagnosis and management.⁽⁴⁾

Causes of acute LGIB include diverticular disease, vascular ectasia, ischemic, inflammatory or infectious colitis, colonic neoplasia (including post-polypectomy bleeding), anorectal diseases (including haemorrhoids, anal fissures and rectal varices) and small bowel lesions (Crohn's, vascular ectasia, Meckel's diverticula, and small bowel tumours).⁽⁵⁾

Acute LGIB is less frequent and less dramatic than UGIB, in most cases, bleeding from colon and rectum is self-limiting and usually requires no specific therapy on contrary to UGIB. ⁽⁶⁾ The incidence of LGIB increases with age, with a more than 200-fold increase from age of 20 to age 80 years. This rise in incidence with age is most likely explained by age-related increase of prevalence of colonic diverticulosis and angiodysplasia. ⁽⁶⁾ Moreover, mortality rate among hospitalized patients with acute LGIB is about 2.4%, but if bleeding occurs during hospital stay in patients hospitalized for causes other than LGIB, the rate increases dramatically to 23.1%. ⁽⁷⁾

The aims of this study were to enlist the causes of acute LGIB in our hospital, to detect the relationship between causes and severity of the bleeding, and lastly to evaluate the outcome of different available therapeutic options.

2. Patients and Methods

Study design and setting:

This study was carried out in our GI unit, internal medicine department, in collaboration with of interventional radiology and general surgery departments, Zagazig university hospitals, Egypt.

Target population and sampling:

All patients with acute LGIB who were admitted to our GI unit during the study period (*from September 2011 to February 2012*) fulfilling inclusion and exclusion criteria. Sampling included cases, which resolve with conservative medical measures as well as those who need radiological, endoscopic or surgical intervention to control the bleeding.

Inclusion criteria:

- Bloody bowel motions within the previous three days.
- More than three bloody bowel motions within less than 8 hours.
- Clinical or laboratory evidence of significant blood loss manifested by any the followings:
 - Decrease of more than 5% hematocrit value in the first 12 hours of hospital admission.
 - Transfusion of more than 3 units of packed RBC within 24 hours.
 - Hemodynamic instability in the previous 6 hours manifested either anginal pain, syncopal attack, orthostatic changes, mean arterial blood pressure <80 mmHg, or resting pulse >110.

Exclusion criteria:

- LGIB case, which was proven and documented by any diagnostic modality to be originated from a lesion above the ligament of Treitz.
- Patients with minimal clinically non-significant bleeding.
- Abdominal surgery within the previous 10 days.

- Known or suspected small or large bowel's ischemia, perforation or peritonitis.
- Patients with acute LGIB as a result of acute infectious diarrhea.
- Documented pregnancy.

Patient's classification:

After fulfillment of inclusion and exclusion criteria, one hundred adult patients were included in this study. Risk score assessment was used to classify patients and to assess patients presented with acute LGIB (*Strate and Saltzman, 2005*). ⁽⁹⁾

- Heart rate >100 BPM.
- Systolic blood pressure <115mmHg.
- Syncope.
- Non -tender abdominal examination.
- Rectal bleeding within the first 4 hours of the clinical evaluation.
- Aspirin use one week prior to evaluation.
- More than two active comorbid conditions.

Using this scoring system, patients were classified into two groups; **group I** (High risk group) that included 39 patients who have acute LGIB with more than 3 risk factors and **group II** (Moderate risk group), which included 61 patients who have acute LGIB with 1-3 risk factors.

Methods and study tools:

All included patients were subjected to the followings work up:

- 1) Initial standard resuscitation and management measures needed for patients stabilization. The number of packed RBC units needed to stabilize patient's hemodynamic status was listed and counted.
- 2) History taking with special stress on:
 - Bleeding per rectum (duration, color of the blood, relation to stool and frequency of bleeding).
 - Associated GI symptoms (abdominal pain, vomiting, hematemesis and disturbed bowel habits).
 - History of prior episodes of GI bleeding.
 - Comorbid diseases (DM, hypertension, IHD, COPD, CRF, cancer, coagulopathy and chronic liver disease).
 - Current/recent medications (NSAIDs, aspirin, antiplatelets and anticoagulant).
 - History of previous abdominal surgery or irradiation.
- 3) Physical examination including general examination, vital data recording, careful abdominal examination, perineal, perianal, and digital rectal examinations.
- 4) Nasogastric tube lavage to exclude possible upper GI bleeding.

5) Routine laboratory investigations that included complete blood picture, ESR, blood grouping and cross match, stool analysis, serum bilirubin, serum albumin, ALT and AST, serum creatinine and BUN and PT/PTT and INR.

6) Real time pelviabdominal U/S.

7) Diagnostic procedures for localization of the bleeding site:

A) Endoscopic Assessment:

1) Colonoscopy:

- **Timing:** Elective colonoscopy was done within 96 hour of hospital admission in unstable patients while hemodynamic stable patients underwent colonoscopy after rapid colonic preparation within 48 hour.
- **Bowel preparation for colonoscopy:** Bowel cleansing began as fluid resuscitation was carried out. Colonic preparation was done using 500 cc of Mannitol 20 % taken orally one day before the procedure and a cleaning enema at the procedure's day.
- **Equipments for colonoscopy:** Colonoscopy series used was (GF- Q160AL- Olympous, Japan). Diathermy equipment (Berchtold-Electron 610) included heater probes, electrocautery device and argon plasma coagulation. Snare and biopsy forceps (CBF2.5 Wilson-cook 230)
- **Preendoscopic sedation:** Midazolam in weight-based regimen (0.1ug/kg) and Meperidine (50-100 mg) were used for achievement of conscious endoscopic sedation.
- **Procedure:** procedure was done according to the standard recommendations (Bejay et al., 2002).

2) **Upper GI endoscopy:** Was done, if nasogastric lavage was bloody, the patient was hemodynamically unstable and nasogastric lavage was not bile stained and lastly, if negative colonoscopic findings.

3) **Enteroscopy:** Push enteroscopy was done for hemodynamically stable patients, if colonoscopy and upper GI endoscopic findings were negative.

B) Mesenteric angiography: (Darcy, 2006)

- **Timing:** In hemodynamic stable patients, angiography was done (within 24-48 hours from bleeding onset). For hemodynamically unstable patients, elective angiography was done (within 7 days from the clinical presentation).
- **Procedure:** Transfemoral arterial catheter was inserted and achieved cephalically. Visualization of superior mesenteric, inferior mesenteric and celiac arteries was achieved after injection of a contrast

material. A positive test result was defined as extravasations of contrast into bowel's lumen.

C) Radionuclide scintigraphy:

Was performed using Tc^{99} labeled RBCs. Criteria for identifying the site of LGIB included; intraluminal accumulation of radiotracer activity, increasing intensity of intraluminal activity over time and movement of the radiotracer on successive images (Weldon et al., 2008).

Treatment of acute LGIB:

Once bleeding site was identified, different therapeutic tools were used separately or in combination according to patient's clinical condition. Treatment options included one/or more of the followings:

1) **Medical treatment:** including I.V., fluid therapy, blood transfusion, vasoactive agents, antibiotics, and other conservative drugs.

2) Endoscopic treatment:

- Polypectomy for bleeding colorectal polyps.
- Argon plasma photocoagulation (APC) for angiodysplastic lesions.
- Endoscopic injection with noradrenalin, ethanolamine Oleate or foam gel for bleeding ectatic vessels.

3) **Super-selective angiography:** Transcatheter embolization of the aberrant bleeding vessels if present.

4) **Surgical management:** Exploratory laparotomy and segmental bowel resection or subtotal colectomy were done according to patient's clinical condition, site and pathology of the bleeding.

Outcomes and follow up:

Patients were followed during their hospital stay. Discharged cases were followed in our outpatient clinic and traced by telephone for any new event. Recorded data included; number of transfused RBCs units, rebleeding, length of hospital stay, occurrence of complications and mortality rate.

Statistical analysis:

Microsoft office 2007 (Excel) and Statistical Package for Social Science (SPSS) version 15 (SPSS, INC Chicago, IL) were used for analysis of patient's data. Prevalence rates were calculated, tests of significance used were chi-square tests, one-sample t test, and Fisher exact tests via cross-tabulation. *P* value was considered significant at value < 0.05.

3. Results

Our study included 100 patients, 63 males and 37 females, they were classified into 2 groups (according to risk assessment score); *group I* (high risk group) included 39 patients (24 males and 15 females) with

mean age (24-78 y) and mean \pm SD (56.2 ± 14.1 y) and *group II* (Moderate risk group) included 61 patients (39 males and 22 females) with mean age (30-64 y) and mean \pm SD (44 ± 15.3 y). A great significant difference was found as regard patient's age in both patients groups while, six-wise distribution showed no significant difference in both groups (Table 1).

On looking to the bleeding's site in both groups, we found that rectosegmoid junction and descending colon followed by anorectal area were the commonest sites for acute LGIB in both groups, moreover, unidentified site was reported in 4% in *group I* and in 5% in *group II* (Table 3). Moreover, we noticed that bleeding from ascending colon was found to be more severe than other sites followed by bleeding from small intestine and descending colon.

Majority of patients in *group I* were presented clinically with bright red hemochezia while, majority of patients in *group II* were presented with maroon stool. In the same direction, there were great significant differences between the two groups as regard history of previous GI bleeding, drug use and the number of comorbid diseases. Moreover, the duration of bleeding was significantly longer in *group I* than in *group II* (Table 4).

On looking to the bleeding's associated symptoms, no significant difference was found between the two groups. Abdominal pain followed by weight loss was the most frequent associated symptoms in both groups. Interestingly, majority of patients of *group I* (74.6%) had non-tender abdomen on clinical examination (63, 9%) while, more than half of patients of *group II* (63.9%) had non-tender abdomen on clinical examination. Other clinical data are listed in (Table 2 &4).

A great significant difference was found between both groups as regard number of RBC units needed for patient's stabilization; requirement of blood units in *group I* was twice as that of *group II*. Laboratory findings great significant differences between the two groups as regard hemoglobin level, hematocrit value, PT, and INR concentration; Patients of *group I* tended to have lower hemoglobin and hematocrit level, prolonged PT and higher INR than those of patients in *group II*, however, no significant difference was found as regard platelet count between both groups (Table 5).

As regards the etiology of LGIB in both groups, diverticular disease, angiodysplasia and portal hypertensive colopathy were found to be the main causes of acute LGIB among patients in *group I* while,

colitis, malignant neoplasm and benign polyps were the main causes of bleeding in *group II*. Moreover, there was a high significant difference regarding bleeding duration; patients of *group I* had longer bleeding duration more than those of *group II*, Added to, about half of patients with colopathy and ischemic colitis tend to have severe bleeding (Table 6).

The diagnostic modalities used for diagnosis of acute LGIB were as follow (Table 7):

- Colonoscopy was found to have a good diagnostic yield in *group II* more than in *group I* while, push enteroscopy had a low diagnostic yield in both groups.
- Mesenteric angiography was done for only 3 patients of *group I*; all of them had positive angiographic findings while, 5 patients of *group II* underwent angiography and all of them showed negative angiographic findings.
- Nuclear scan was done only for 2 patients but both of them had negative findings.

Considering therapeutic procedures that were done for patients according to etiology of the bleeding (Table 7 &8):

- With conservative medical management, bleeding stopped in 18 patients (46.2%) in *group I* and in 28 patients (49.9%) in *group II*.
- Endoscopic therapy was effective in stopping the bleeding in 15 patients (38.5%) in *group I* and in 27 patients (44.3%) in *group II*. The main endoscopic modalities used for bleeding cessation were endoscopic injection with vasoactive or sclerosant materials, APC and endoscopic polypectomy.
- Angiographic intervention using transarterial embolization was successful in bleeding cessation in 2 patients in *group I*.
- Surgical interference was indicated for 4 patients in *group I* and for 10 patients in *group II*. Rectosegmoid junction and descending colon lesions were found to be the commonest sites for surgical intervention. Surgical intervention included four surgical resections with end-to-end anastomosis, 5 proctosigmoidectomies, 4 right hemicolectomies, and one left hemicolectomy.

Duration of hospital stay was found to be significantly longer in *group I* than in *group II*, but, complete recovery was achieved in the majority of patients in both groups (71.8% & 86.9% respectively). Seven deaths were recorded in *group I* with nil deaths in *group II* (Table 8)

Table (1): Demographic data of the patients in both groups.

Variable	Group I (N=39)		Group II (N=61)		<i>t</i>	<i>p</i>
	Mean ± SD		Mean ± SD			
Age (years)	56.2 ± 14.1		44.1±15.3		3.9	0.001
Sex	No.	%	No	%	X ²	<i>p</i>
Male	24	61.9	39	63.93		
Female	15	38.5	22	36.07		

Table (2) Selected clinical signs among studied patients with in both groups.

Variable	Group I (N=39)		Group II (N=61)		X ²	<i>p</i>
	No.	%	No.	%		
Non tender abdomen	29	74.36	39	63.9	4.56	0.032
Tender abdomen	10	25.64	22	36.1		
Pulse (beat/min)	X ± SD		X ± SD		<i>t</i>	<i>p</i>
	106±11.3		96.2±8.6		5.02	0.001
Systolic BP	79.9± 13.87		110.8 ± 13.5		4.63	0.001
Diastolic BP	61± 8.7		70.1 ± 8.3		4.7	0.001

Table (3) Sites of acute LGIB among patients of both groups.

Site of bleeding	Group I (N=39)		Group II (N=61)		X ²
	N.	%	N.	%	
Anorectal	6	15.38	9	14.75	0.04
Sigmoid colon	5	12.82	7	11.46	0.18
Descending colon	4	10.26	2	3.28	1.96
Transverse colon	1	2.56	8	13.11	5.56
Ascending colon and Caecum	3	7.69	1	1.46	3.97
Recto sigmoid and Descending colon	7	20.52	23	37.70	3.91
Transverse and Ascending colon	1	2.56	5	8.20	2.64
All the colon	4	7.69	1	1.46	4.79
Small intestine	4	10.26	0	0.00	4.12
Unidentified	4	10.26	5	8.20	0.09

Table (4): Selected clinical variables among the studied patients with acute LGIB.

Variable	Group I (N=39)		Group II (N=61)		X ²	p
	No.	%	No.	%		
Clinical presentation:						
Maroon stool	6	15.34	43	70.49	28.91	0.001
Bright red hematochezia.	33	84.66	18	29.51		
Associated symptoms:						
Negative symptoms	18	46.15	17	27.87	3.5	0.06
Positive symptoms	21	53.85	44	72.13		
Abdominal pain	12	30.77	31	50.82	5.56	0.351
Anal pain	00	00	9	14.75		
Constipation	5	12.82	16	26.23		
Diarrhea	2	5.13	9	14.75		
Wight loss	8	20.51	17	27.87		
Fever	00	00	4	6.56		
Previous GI bleeding:						
Upper	4	15.4	00	00	7.44	0.006
Lower	2					
Drug history:						
Aspirin	18	46.15	10	16.39	8.80	0.032
NSAIDs	5	12.82	8	13.11		
Steroid	1	2.56	9	14.75		
Anticoagulant	4	10.26	2	3.28		
Number of comorbid disease:						
No comorbidity	3	7.69	28	45.9	22.17	0.0001
1-2 comorbid Disease.	16	41.02	24	14.8		
> 2 comorbid Diseases.	20	51.28	9	39.3		
	X ± SD		X ± SD		t	p
Duration of bleeding (hours):	42.9 ± 22		28.6 ± 18		3.4	0.001

Table (5) Hemostatic findings and need for packed RBCs among the studied patients of both groups.

Variable	Group I (N=39)	Group II (N=61)	t	p
	X ± SD	X ± SD		
Hemoglobin(g/dl)	7.7 ± 1.5	9.65 ± 1.3	7.6	0.001
Hematocrit (%)	25.5 ± 5	29.3 ± 3.6	4.37	0.001
Prothrombin time (sec)	13.2 ± 3.4	11.5 ± 2.1	3.01	0.003
INR	1.34 ± 0.49	1.1 ± 0.25	3.3	0.001
Platelet count (per cc)	193.2 ± 89.9	216 ± 62.5	1.51	0.13
Transfused packed RBCs per Pt.	4.3 ± 1.9	1.9 ± 2.1	5.7	0.0001

Table (6): Causes of acute LGIB in both groups.

Causes of bleeding	Group I (N=39)		Group II (N=61)		X ²
	N.	%	N.	%	
Diverticulosis	11	28.21	8	13.11	3.52
Angiodysplasia	5	12.82	4	6.56	0.5
Anorectal causes:					
Rectal varix	2	5.13	00	00	1.11
Solitary rectal ulcer	00	00	1	1.64	0.05
Internal hemorrhoids	4	10.26	4	6.56	0.08
Colitis:					
Ischemic colitis	1	2.26	9	14.75	3.89
IBD	2	5.13	10	16.39	1.38
Belharzial colitis	0	00	5	8.2	1.23
Malignant neoplasm	1	2.26	8	13.12	2.07
Polyps and postpolypectomy bleeding	1	2.26	7	11.48	4.26
Portal hypertensive colopathy	5	12.82	2	3.28	4.95
Others: (DL, vasculitis, haemangioma)	3	7.68	0	00	0.05
Unknown	4	10.26	3	4.92	0.07

Table (7): Diagnostic modalities used for diagnosis of acute LGIB in the studied groups.

Diagnostic tool	Group I (N=39)		Group II (N=61)		X ²
	N.	%	N.	%	
Colonoscopy:					
Total cases	38	95.44	61	100	0.05
Positive cases	30	78.95	56	91.80	4.38
Negative cases	8	21.05	5	8.20	3.19
Enteroscopy:					
Total	7	17.95	5	8.19	3.12
Positive cases	2	28.57	00	00	3.16
Negative cases	5	71.43	5	100	0.5
Nuclear scan:					
Total	1	2.56	1	1.64	0.17
Positive cases	0	00	0	00	00
Negative cases	1	100	1	100	0.17
Angiography:					
Total	3	7.67	5	8.20	0.08
Positive cases	3	100	0	00	4.79
Negative cases	0	00	5	100	3.33

Table (8): The outcomes of patients of the studied groups.

Variable	Group I (N=39)		Group II (N=61)		X ²	
	N.	%	N.	%		
Complete recovery:						
Yes	28	71.79	53	86.89	3.52	
No	11	28.21	8	13.11		
Rebleeding	4	10.26	8	13.12	0.01	
Need for surgery	4	10.26	10	16.39	0.74	
Death	7	17.95	0	00	9.18	
Duration of hospital stay(days)	X ± SD		X ± SD		t	P
	7.78 ± 3.6		4.96 ± 3.8		2.31	

4. Discussion

Lower gastrointestinal bleeding (LGIB) accounts for approximately 20 to 33% of GI bleeding with an annual incidence of about 20-27 cases per 100,000 populations in Western countries. Although LGIB is statistically less common than UGIB, it has been suggested that LGIB is underreported because, a higher percentage of affected patients do not usually seek medical attention; indeed, acute LGIB continues to be a frequent cause of hospital admission and is a factor in hospital morbidity and mortality. (20) LGIB is distinct from UGIB in epidemiology, management, and prognosis. It encompasses a wide spectrum of symptoms, ranging from trivial hematochezia to massive bleeding with shock. (5)

Acute LGIB is defined as bleeding that is of recent duration, originates beyond ligament of Treitz, and results in instability of vital signs and is associated with clinical signs of anemia with or without need for blood transfusion. (4) Despite advanced age and significant comorbid diseases, most patients with acute LGIB have favorable outcome; indeed, bleeding in majority of patients (at least 75%) with acute LGIB will stop spontaneously without any interference. (5) The hospital mortality rate of LGIB is less than 5%, and often caused by a comorbid illness or nosocomial complication rather than uncontrolled bleeding. (8)

Our study was aimed to detect the common causes of acute LGIB, to assess bleeding severity, and lastly, to discuss the available diagnostic and therapeutic procedures in our unit for management of acute LGIB.

Most published studies reported no sex predilection regarding acute LGIB, however, in our study, acute LGIB was predominant in men than in women. *Fearhead* (9) also recorded the same finding, however, *Das et al.*, (13) reported slight predominance of acute LGIB in females.

The chief presenting complaint in our study was hematochezia (84.6%) in *group I* followed by maroon stool (15.4%) in *group II*. Our finding is slight similar to that of *Gayer et al.*, (14) who reported that the chief presenting complaint in 1112 patient with acute LGIB admitted to an emergency medical center was bright red hematochezia (62%) followed by maroon stool (14.3%).

Negative symptom (absent of visible bleeding) was found in 46% of our patients in *group I* and in 28% of patients in *group II*. Moreover, abdominal pain was found to be the main associated symptom in 31% and 51% in *group I* and *group II* respectively. These results are slightly consistent with findings recorded by *Rios et al.*, (15) who reported negative symptom in 54% and 24% of patients with severe and non-severe acute LGIB respectively. Moreover, in *Rios's* study, abdominal pain was the common associated symptom in 21% and 47% of patients with severe and non-severe acute LGIB respectively.

About 46% of *group I* and 16% of *group II* were found to be chronic aspirin users; moreover, about 15% of the patients had history of previous episodes of GI

bleeding. *Wilcox and Clark* (16) reported slightly similar percentages regarding aspirin intake (52%) and previous GI bleeding (20 %), but *Rios et al.*, (15) reported concomitance aspirin use in only 12% of patients with severe bleeding which required urgent surgery. Moreover, *Rios* reported that about 29% of the patients with acute LGIB have history of previous episodes of GI bleeding. Association of aspirin use may reflect its common use in elderly patients who usually have diabetes and hypertension together with diverticular disease which is common in this age category.

In our study, the mean duration of bleeding was (43±22 hours) and (29 ±18 hours) in *group I* and in *group II* patients respectively. *Riose et al.*, (15) reported that more than 24 hours passed before medical consultation in about 46% of patients with severe LGIB. Delay in requesting medical consultation in our study, may be related to delayed referral from primary centers. Moreover, *Zink et al.*, (17) reported mean duration of bleeding (72 ± 16.8 hours). This much delay in patient's presentation in *Zink's* study may be related to the fact that he and his colleagues studied all cases presented with acute LGIB regardless the severity while we studied only cases presented with moderate and severe bleeding.

We reported the colon as the most common site for acute LGIB (more than 75% of cases), small intestine was a cause in ~10% of cases, and about 8 ~10% of cases were of unidentified origin. The rectosigmoid and descending colon followed by the anorectal area were the most frequent sites of acute colonic LGIB. Regarding the site of colonic bleeding, our conclusion was identical to that reported by *Ohyama et al.*, (18) *Ohyama* reported that small intestine as a cause of acute LGIB in only 1.7% of cases and about 11% of acute LGIB cases were of unidentified origin. Also, in *Ohyama's* study, bleeding from right side colon tend to be graver than that from left sided colonic lesion. This finding may be due to predominance of right-sided diverticular bleeding which is more common and more severe than the left colonic diverticular bleeding. (22)

Causes of acute LGIB are numerous and uncountable ranging from small bleeding piles to small intestinal lymphoma. Colonic causes represent about 85 % of all causes of LGIB. (23) Diverticular disease, angiodysplasia and portal hypertensive colopathy were the most frequent causes of acute LGIB in our study, while ischemic and Bilharzial colitis and IBD followed by malignant neoplasm and benign polyps were the most frequent causes of bleeding in patients with moderate bleeding. *Wilcox and Clark* (16), *Ohyama et al.*, (18) *Rios et al.*, (15) *Gayer et al.*, (14) and *Strate and Neumann* (2) reported slightly similar findings. With more advancement in digital medical visualization that including CT virtual colonoscopy and wireless capsule endoscopy for diagnostic work up of acute and chronic LGIB, more small and large intestinal causes and unidentified etiologies may be easily diagnosed and managed. (19)

Rios *et al.*,⁽¹⁶⁾ found that diverticular disease was the main colonic cause for acute LGIB in 51 % of cases, followed by angiodysplasia and anorectal causes (28%, 16% and 15% respectively), also *Strate and Nauman* reported the diverticular disease as the main causes of acute LGIB (30-33%) followed by angiodysplasia (9-15%), colitis (8-15%) and anorectal causes (6-12%), however, slight low percents were recorded by *Cyzmek et al.*,⁽²¹⁾ regarding colonic diverticular bleeding (22.7%), angiodysplasia (22.3%), colitis (13.6%) and small bowel bleeding (9.4%). In our study, colonic diverticulosis, angiodysplasia and portal hypertensive colopathy were found to produce severe LGIB than other causes. This finding is in agreement with that of *Riose et al.*,⁽¹⁵⁾ who reported a similar finding.

About 95% of *group I* and 100% of *group II* patients in our study underwent colonoscopic examination. The diagnostic yield of colonoscopy was ranged from 79% in *group I* to 91% in *group II*. Our findings regarding the value and diagnostic yield of colonoscopic examination for patients with acute LGIB were slightly near to that of *Strate and Neumann*⁽²⁴⁾, *Gayer, et al.*,⁽¹⁴⁾, *Strate and Syngal*⁽²⁵⁾, *Smoot et al.*,⁽²⁶⁾ and *Schmulewitz et al.*,⁽²⁷⁾; They reported that the diagnostic yield of colonoscopy for detection of the site of lesions is ranging from 74% to 96% of patients presented with acute LGIB. These slight similar results regarding colonoscopic benefits were obtained regardless the site of bleeding, patient selection criteria, operator's experience and timing of colonoscopic examination. In the other hand, push enteroscopy had a low diagnostic yield; only 18% of patients with *group I* and less than 5% of patients with *group II* had positive enteroscopy findings, moreover, *Gayer et al.*,⁽¹⁴⁾ reported that the sources of bleeding were identified in only half of patients who underwent push enteroscopy.

Considerable controversy exists about the reliability of nuclear scans for localizing of the site of acute LGIB, its non-invasive nature makes it attractive, but its usefulness is questionable. *Al Qahtani et al.*,⁽²⁸⁾ used nuclear scans in 39% of patients with acute LGIB, only 24% of the scans were positive and the site of bleeding was localized only in 17% of the patients whom underwent nuclear scan. Only 2% of patients in our study underwent nuclear scan, but the scans could not specify the location of the bleeding. Moreover, *Gayer et al.*,⁽²⁴⁾ reported a positive scan in 41% of patients underwent nuclear scan, but the scans could not specify the location of bleeding, also *Zink et al.*,⁽¹⁷⁾ *Czimeck et al.*,⁽²¹⁾ and *Lee et al.*,⁽²⁹⁾ reported a low diagnostic yield of nuclear scans for the localization of the site of acute LGIB ranging from (39% to 46%).

As regard the beneficial effects of the mesenteric angiography in our study, it was found that angiography had a slight low diagnostic yield (positive data in only 3 patients with *group I* but, nil positive data in patients with *group II*). *Strate and Nauman* reported positive angiographic data in approximately 85% of patients with

severe LGIB who are hemodynamically unstable compared to 15% of hemodynamically stable patients. Moreover, *Weldon et al.*,⁽¹¹⁾ and *Fearnhead*⁽¹²⁾ reported that positive angiographic examinations were found in 25% to 70% of cases presented with acute LGIB depending on the nature and the rate of bleeding. Positive angiographic findings in patients with continuous bleeding may be due to the fact that active arterial bleeding is generally present at the time of examination, while, positive angiographic data are usually absent in cases with intermittent or slow bleeding as in moderate bleeders.⁽¹²⁾

Majority of our patients with acute LGIB were managed conservatively. Endoscopic hemostasis was effective in stoppage of LGIB in about 38% of *group I* patients and 43% of *group II* patients, while, transcatheter embolization was effective in stoppage of bleeding in only 5% of patients with severe bleeding. Surgical intervention was indicated only in about 10% of *group I* patients and in 16% of *group II* patients. Our obtained results and percentages are slightly near to that of *Rios et al.*, who reported that acute LGIB can be managed conservatively in majority of patients even with severe bleeding, and if not controlled medically, interventional endoscopy and/or radiology can currently be used and usually effective for bleeding cessation. Moreover, in *Rios's* series, surgery was indicated in approximately 10 to 25% of all patients presented with acute LGIB. Also, *Fearnhead* concluded that most cases of acute LGIB are self-limited with adequate resuscitation and only about 10% of cases require surgical intervention. The need for endoscopic, radiological and surgical interventions is actually depend upon type and clinical presentations of the patients, availability of expertise endoscopist, radiologist and surgical teams.

Complete recovery of our patients with acute LGIB was the role; 7 deaths were reported in *group I* (18%) and the overall mortality was 7%. Hospital rebleeding was recorded in 13% of patient and 10% patients in *group I* and 16% of patients in *group II* needed surgical intervention with hospital stay approximately 5-8 days. Results obtained by *Wilcox et al.*⁽¹⁶⁾ are slight near to our findings; *Wilcox et al.*, reported an overall rebleeding in 20% of patients, overall mortality was 3.6%, need for surgery was 9.7% of cases and the mean hospital stay was (6± 2.3 days). Hospital outcomes and mortality are depending upon many factors that include patient's clinical condition, patient's age and comorbidities together with availability of necessary diagnostic procedures and expertise operators. Early diagnosis and proper management after lesion localization will improve the outcomes of acute LGIB especially after the vast advancement in diagnostic and interventional radiological tools.

In conclusion, acute LGIB is a common medical and surgical challenge. Diverticular disease is by far the most common cause of acute LGIB. Medical conservation and endoscopic treatments are successful tools in stopping most cases of acute LGIB.

References

- (1) Zuccaro G. (2008): **Epidemiology of lower gastrointestinal bleeding.** Best Practice & Research Clinical Gastroenterology, Vol. 22, No. (2): p. 225–32.
- (2) Strate LL. and Nauman CR. (2010): **The Role of Colonoscopy and Radiological Procedures in the Management of Acute Lower Intestinal Bleeding.** ClinGastroenterolHepatol; 8: 333–43.
- (3) Laing CJ, Tobias T, Rosenblum DI. et al. (2007): **Acute gastrointestinal bleeding: Emerging role of multidetector CT angiography and review of current imaging techniques.** Radiographics; 27:1055-70.
- (4) Zuccaro G. (1998): **Management of the adult patient with acute lower gastrointestinal bleeding.** AJG, Vol. 93, No. 8, PP.1202-08.
- (5) Barnett J. and Messmann H. (2008): **Management of lower gastrointestinal tract bleeding.** Best Practice & Research Clinical Gastroenterology Vol. 22, No. 2, pp. 295–312.
- (6) Bramley PN, Masson JW, McKnight G. et al. (1996): **The role of an open-access bleeding unit in the management of colonic hemorrhage. A 2-year prospective study.** Scand J Gastroenterol ; 31: 764–69.
- (7) Longstreth GF. (1997): **Epidemiology and outcome of patients hospitalized with acute lower gastrointestinal hemorrhage: a population-based study.** Am J Gastroenterol; 92: 419–24.
- (8) Strate LL, Ayanian J, Kotler G. and Syngal S. (2008): **Risk Factors for Mortality in Lower Intestinal Bleeding.** Clinical Gastroenterology and Hepatology; 6, Issue 9: 1004-10.
- (9) Beejay U. and Marcon NE. (2002): **Endoscopic treatment of lower gastrointestinal bleeding.** CurrOpinGastroenterol; 18:87-93.
- (10) Darcy M. (2006): **Embolization for lower GI bleeding.** In: Golzarian J, Sun S, Sharafuddin MJ (eds) Vascular embolotherapy. Springer, Berlin Heidelberg, New York, pp 73–84
- (11) Weldon DT, Burke SJ, Sun S, et al. (2008): **Interventional management of lower GI bleeding.** EurRadiol 18: 857–67.
- (12) Fearnhead NS. (2011): **Acute lower gastrointestinal bleeding.** Medicine; 39, 2:100-04.
- (13) Das A, Ben-Menachem T, Cooper GS. et al. (2003): **Prediction of outcome in acute lower gastrointestinal hemorrhage based on an artificial neural network: internal and external validation of a predictive model.** Lancet; 362: 1261– 6.
- (14) Gayer C, Chino A., Lucas C, et al. (2009): **Acute lower gastrointestinal bleeding in 1112 patients admitted to an urban emergency medical center.** Surgery; 14:2364-9.
- (15) Rios A, Mariano J, Jose M. et al., (2007): **Severe acute lower gastrointestinal bleeding: risk factors for morbidity and mortality.** Langenbecks Arch Surg; 392: 165-171.
- (16) Wilcox CM. and Clark WS. (1999): **Causes and outcomes of upper and lower gastrointestinal bleeding: The Gray hospital Experience.** Southern Medical J; 92:44-49.
- (17) Zink SI, Ohki SK, Stein, et al. (2008): **Noninvasive evaluation of active lower gastrointestinal bleeding:** AJR Am J Roentgenol; 191:1107-14.
- (18) Ohyama T, Sakurai Y, Ito M. et al. (2000): **Analysis of urgent colonoscopy for lower gastrointestinal tract bleeding.** Digestion; 61: 189–92.
- (19) Cave DR, Fleischer DE, Leighton JA, et al. (2008): **A multicenter randomized comparison of the EndoCapsule and the Pillcam SB.** GastrointestEndosc 68:487-94.
- (20) Talley NJ, Jones M.(1998):**Self-reported rectal bleeding in a United States community: prevalence, risk factors, and health care seeking.**Am J Gastroenterol. Nov; 93(11): 2179-83.
- (21) Czymek R, Kempf A, Roblick U. et al. (2008): **Surgical Treatment Concepts for Acute Lower Gastrointestinal Bleeding.** GastrointestSurg; 12:2212– 20.
- (22) Barnett J. and Messmann H. (2009): **Diagnosis and Management of lower gastrointestinal tract bleeding.** Nat. Rev. Gastroenterol. Hepatol. 6, 637–46.
- (23) Hoemeda RE. and Luchtefeld MA. (2005): **The Management of acute Lower Gastrointestinal Hemorrhage.** Dis Colon Rectum; 48: 2010–24.
- (24) Neumann S, Schoppmeyer K, Lang T. et al. (2007): **Wireless capsule endoscopy for diagnosis of acute LGIB.** Gastro IntestEndosc; 65:403-40.
- (25) Strate LL. and Syngal S. (2003): **Timing of colonoscopy: impact on length of hospital stay in patients with acute lower intestinal bleeding.** Am J Gastroenterol; 98: 317–22.
- (26) Smoot R, Gostout C, Rajan R. et al., (2003): **Is early colonoscopy after admission for acute diverticular bleeding needed.** Am J Gastroenterol; 98:1996-99.
- (27) Schmulewitz N, Fisher DA. and Rockey DC. (2003): **Early colonoscopy for acute lower GI bleeding predicts shorter hospital stay: a retrospective study of experience in a single center.** GastrointestEndosc; 58: 841–46.
- (28) Al Qahtani AR, Satin R, Stern J. et al. (2002): **Investigative modalities for massive lower gastrointestinal bleeding.** World J Surg; 26:620-25.
- (29) Lee j., Costantini TW. and Coimbra R. (2009): **Management of lower GI bleeding.** Scandinavian Journal of Surgery 98: 135–14

Reviewing Customer Satisfaction of After Sales Services Quality Case Study: Modiran Khodro Co. (MVM)

Sassan Eisazadeh Nashli, Ali Shahsavarian, Fatemeh Karimi, Mostafa Maleki

Student of Business Administration, Faculty of Marketing, Islamic Azad University of Firuzkuh, Iran
sasanisazadeh@yahoo.com

Abstract: Most of companies nowadays are aware of effectiveness of after sales services on customer loyalty & sales frequency. However, provided services are to meet customer needs. Present paper has measured customer satisfaction of after sales services provided for Modiran Khodro Co.; an Iranian representative for MVM branded cars, using questionnaires and through random sampling. Three measures for examining the quality of provided services were perceived technical quality of services by customer, after sales services personnel treatment with customers and costs of such services. The results were indicating that customers are satisfied with all three measures, though the satisfaction levels for all measures are not the same; such that perceived technical quality of services by customer stands higher than costs satisfaction and customer satisfaction of after sales personnel treatment is higher than costs satisfaction. (Gray&Densten,1987)

[Sassan Eisazadeh Nashli, Ali Shahsavarian, Fatemeh Karimi, Mostafa Maleki. **Reviewing Customer Satisfaction of After Sales Services Quality Case Study: Modiran Khodro Co. (MVM)**. *Life Sci J* 2013;10(1):1293-1297] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 196

Keywords: After sales services, customer expectations, quality, Modiran Khodro Co., Tehran Province

1. Introduction

Most of business organizations have set customer satisfaction as their main goal. However, caring current customers costs less than bring in new ones. Providing convenient services leads the customer to be sustained and customer satisfaction of such services makes him suggest the product/service to others. Achieving new sales amount via positive word of mouth by customers themselves, is definitely called value. Contrarily, customer dissatisfaction of provided services may lead to lower market share. Meeting customer needs and wants is ineluctable for keeping him satisfied. The fact that customers preferences are changing constantly implies that their satisfaction should be constantly examined and measured. Understanding customer's opinion is a dynamic marketing manner and may cause new amounts in overall sales. Companies have to compile their marketing strategies according to customers' needs & wants; otherwise they are to leave the competition. Present paper is structured to assess customer satisfaction of after sales services provided for Modiran Khodro Co.; an Iranian representative for MVM branded cars.

2. Literature Review

Handling Customers' needs is the basis of marketing. Organizations will not remain in the business unless assuring that they have undertook customers' preferences. However, before assuming marketing as a major science, many kinds of organizations took care of their customers. Therefore what is considerable in recent viewpoint, is viewing issues from customer side. Here should be note that caring customer differs from Customers Relationships

Management (CRM). CRM concentrates on what customers want.(Ranjbar&Soltani,2000) In other words, first it is identified that what customer needs are, then the means and procedures to realize them are concluded. Two main goals of CRM strategy involves differentiating the services provided to customers such that the difference is both notable and measurable and also can have its effects on what is done in organization as a whole. This vision is called CRM because of that it concerns organizational culture and that it requires managers to think of it as acceptance and obligation. Establishing these kinds of visions need a balance between organizational technology and structure(Kotler & Armestrang, 1991). Therefore, in order to achieve standards for providing of quality services, designing quality assurance schemes and training employees for succeed in their relations with customers, reviewing organizational tasks and activities is strongly required (Rosta.el.al,1995)

Services include intangible and impalpable activities which lead to gain and satisfaction but don't involve any kind of ownership. Marketing breaks services into 3 main groups: before sales services, at purchasing time services and after sales services. After sales services include any type of tasks companies do after products are sold, in order to win customer's satisfaction which leads to more value for goods. It could be said that after sales services are a kind of caring sold products and in fact is a sign of organizations future obligation to their customers (Hayes & Dredge, 1998).

Providing service to customers is something beyond placing order, taking back the returned goods or handling complaints. According to this vision,

servicing customers include all kinds of tasks companies perform in order to attain customers' satisfaction and assisting them to gain maximum value of products and services. Entirely, anything offered to customers' more than physical product, leading to a sensible differentiation from competitor companies, is a kind of service (Anderson et al, 1994).

Providing services to customers has been of main importance. However, today customers have more choices than past decades. This is a consequence of growing competition of products and services over market. In many of researches regarding consumption and industrial purchasing, it is concluded that providing appropriate services is of more importance for customers than price has. Providing fine services can lead to competitive advantage and skip other competitors (Flynn, 1997). Often, when customer is aware and assured of services and guarantees provided by previous seller, he never thinks of switching to a new provider, even with lower costs. However, customer satisfaction is the total amount of desirability and pleasure he gains while consuming the product. Satisfaction leads to customer loyalty and consequence increased fame and credit and also profitability for company. Customer is satisfied, provided that his needs are met in the time he needs and in the manner he prefers. Meanwhile it should not be neglected that customers trust on organizations because they believe they can get all they need; which is why leads companies to remain ethically responsible for meeting their needs and make them satisfied (Valarie et al, 1988).

Distinguished services are to be recognized by customers themselves. If a service provider perceives his services as distinguished but customer is not satisfied with those services, they cannot be referred as distinguished and important. Appropriate services are not always the same as those seller thinks. Sometimes customers have to call company for many times just because of a mistake happened in his bill.

Valarie et Al (1988) in their paper, has defined the dimensions of service quality as following:

1. Tangible aspects of services involving physical facilities, service structure, equipment or personnel.
2. Service reliability which means the ability to provide services according committed terms and conditions.
3. Accountability which implies company's tendency to assist customers and provide services as agreed.
4. Competence which is that personnel knowledge, skills and abilities make customers trust and rely.
5. Consent and harmony which involves caring customers through providing of value services.

Len Berry (L. Berry, 1986) offers 10 different factors for the dimensions of service quality, including:

1. Trustworthiness which means continue to offer services as agreed, namely accurate and just as the same as first time offered.
2. Responsibility which involves willingness and readiness to deliver services according to agreed terms.
3. Competency which emphasizes on enough knowledge and skills needed for providing services.
4. Availability implying ease of access to service at different times.
5. Courtesy meaning politeness, respect, consideration and maintaining of value relationship with customers.
6. Communication with customers which involves informing him via understandable expressions, listen to what he says, setting the conversations around what he needs, giving full description of services and offering him new solutions.
7. Reliability meaning company's fame, credit and personnel's trait of trustworthiness and honesty.
8. Dependability which refers to feeling of secureness from risks and dangers, physical and financial safeness and faithfulness.
9. Customer appreciation in striving to fulfill his needs and caring them (Teter & Dituro, 1994).
10. Tangible aspects including physical image of provided services, physical facilities, personnel appearance, equipments and tools.

In addition to above items it should be noted that providing high-quality services to customers requires his desires to be discovered and his future needs to be foreseen.

Having timely information leads to on time response to customers needs and reliable service delivery.

3. Research Methods

Present study is a survey research aiming to explain and examine the impact of after sales services of Modiran Khodro Co. on customers' satisfaction in Tehran Province. The main method for data gathering was conducting interviews and questionnaires (in 5 car sales representatives of 5 different regions of Tehran). Before designing and arrangement of questionnaires, interviews were held in order to examine Modiran Khodro's customers' view of company's services, and questionnaires were in order to measure their attitude about research hypothesis (Neuhaus, 1997). The questionnaire was set according to Likert's 5 point scale (strongly disagree, disagree, don't know, agree, strongly agree) and it's service quality identifying 10 factors proposed by Len Berry Et. Al, were broke into 3 groups, named: quality of technical services, employees treatment and service costs, by which customers' satisfaction levels were

measured. The questionnaire contains 30 questions, from which 16 are related to technical quality of services, 5 are about employees' treatment and remaining 9 are related to service costs.

The validity of questionnaires measured by Cronbach's Alpha (Cronbachs Alpha ,1895) is 94%. Statistical community of study is whole MVM users of Tehran Province, who has purchased their cars from one of official representatives of Modiran Khodro Co. In order to estimate the weight of sample, first 50 questionnaires are distributed random in whole community which has led to 250 customers as a sample.

With regard to three dimensions including technical quality of services, employees' treatment and costs of services, following hypothesis are tested to achieve customers' satisfaction levels of offered services:

1. After sales services provided by Modiran Khodro Co. satisfies customers in Tehran.
2. Customers are satisfied by technical quality of Modiran Khodro Co.'s after sales services.
3. Customers are satisfied by Modiran Khodro's after sales services employees' treatment.
4. Customers are satisfied by Modiran Khodro's after sales services costs.

4. Data Analysis

Before testing the hypothesis, we'll review the answer of each question in questionnaire:

Over 96 percent of respondents are in idea that employees at Modiran Khodro are ready to answer customers' questions and issues. 71 percent of respondents agree and strongly agree that offered trainings regarding car usage are sufficient. 78 percent of respondents agree that company acts for repairs and maintenance of products, as soon as receiving calls from customers and 71 percent of respondents agree that installed spare parts are of sufficient life.

84 Percent of respondents agree and strongly agree that Modiran Khodro's guys have got necessary expertise and skill to do the job.

For 81 percent of respondents, technical information presented by companies' servicemen leads to enhanced usage of cars and as 92 percent of them, servicemen are responsible of what they do and 97 percent of them believe that servicemen have got necessary skills and competence for doing their job.

80 percent of respondents have an idea that car servicemen are available as they need. 77 Percent of them agree that Modiran Khodro operates as agreed terms and conditions of contract, and 60 percent of them believe that company constantly measures customers' satisfaction of services' quality and 7 Percent of them believe that company applies customers' ideas in order to improve quality of services.

As 69 percent of respondents, Modiran Khodro promises to handle customers' complaints and solve their problems in order to fulfill customers' satisfaction. 54 Percent of customers assert that company doesn't follow-up their complaints. 60 Percent of them believe that company follows up to assure that cars are repaired successfully. 8 Percent of respondents hold the idea that the cost of spare parts supplied by company is not as satisfactory as competitors. However, for 54 percent of them, engine and hydraulic oil supplied by Modiran Khodro are more appropriate compared to others, and half of respondents suggest that cost of repair services provided by companies representatives are normal (so-so) compared to competitor companies.

Car stops due to servicemen unavailability has led to lots of costs for respondents and as 62 percent of them cost of provided services according to quality of them, is acceptable. 96 Percent of them agree that servicemen treat friendly and 88 percent agree that information regarding MVM cars usage is communicated via understandable expressions. 79 Percent of respondents believe that company follows their complaints and over 98 percent of them are convinced that companies' employees treat politely and courteously.

Though each of above mentioned dimensions relate to specific aspects, thinking of problems and shortages together with providing of value structural and organizational environment will lead to increased customers satisfaction.

Next we will review and test the hypothesis.

5. Hypothesis Tests

Hypothesis 1

H0: After sales services provided by Modiran Khodro Co. don't satisfy customers in Tehran.

H1: After sales services provided by Modiran Khodro Co. satisfy customers in Tehran.

Table1: Hypothesis 1 Questions' Answers Abundance & Percentage Distribution

	1	2	3	4	5	Mean	χ^2
Ab.	21	114	273	502	520	3.95	681.15
%	2.2	7.9	19	24.9	36.1		

All of questions included in questionnaire are related to this hypothesis. Due to the fact that with 99% significance and 4 degree of freedom, observed χ

² is higher than table's χ^2 (13.3), answers abundance has statistic significance. Or in other words, the abundance of answers isn't distributed equally, and

thus answers' t has got an unequal distribution. Therefore we can test whether sample mean belongs to community mean or not T test hypothesis are as below:

$$H_0 : M \leq 3$$

$$H_1 : M > 3$$

With regard to comparison of mean (3.95) and standard deviation (0.56), t is estimated 11.71, which is higher compared to table's t (2.42) with 99%

significance. Thus, hypothesis 1 is accepted with 99% significance, or it could be said that after sales services provided by Modiran Khodro Co. satisfy customers.

Hypothesis 2

H0: Customers are not satisfied by technical quality of Modiran Khodro Co.'s after sales services.

H1: Customers are satisfied by technical quality of Modiran Khodro Co.'s after sales services.

Table 2: Hypothesis 2 Questions' Answers Abundance & Percentage Distribution

	1	2	3	4	5	Mean	χ^2
Ab.	15	52	125	281	285	4	412.6
%	2	7	17	27	27		

The first 16 questions included in questionnaire are related to this hypothesis. Table 2 shows that with 99% significance, the estimated χ^2 is higher than critical value of table (13.3). Therefore, observed difference between abundance of answers is statistic significant and we would have following hypothesis:

$$H_0 : M \leq 3$$

$$H_1 : M > 3$$

With regard to mean (4) and standard deviation (412.6) of this hypothesis, t is estimated

equal to 10.96 which compared to table's t (2.42) and with 99% significance is higher. Therefore, sample's mean belongs to community's mean. Thus, H0 will be declined and H1 is accepted. In other words, customers are satisfied by technical quality of after sales services.

Hypothesis 3

H0: Customers are not satisfied by Modiran Khodro's after sales services employees' treatment.

H1: Customers are satisfied by Modiran Khodro's after sales services employees' treatment.

Table 3: Hypothesis 3 Questions' Answers Abundance & Percentage Distribution

	1	2	3	4	5	Mean	χ^2
Ab.	2	17	76	147	190	4.17	306.17
%	0.5	4	17.5	34	44		

5 Questions of questionnaire is associated with hypothesis 3. Table's χ^2 is higher (s=99%). So, observed difference is statistic significant. In order to exert T test, we have following hypothesis:

$$H_0 : M \leq 3$$

$$H_1 : M > 3$$

Mean of hypothesis is 4.17 and SD equals to 0.54. Therefore, estimated t will equal to 14.93. Due to the fact that observed t is higher than table's t , thus

it could be said that sample's mean belongs to mean of community and thus H0 will be declined and H1 is acceptable, which means that Customers are satisfied by after sales services employees' treatment.

Hypothesis 4

H0: Customers are not satisfied by after sales services costs.

H1: Customers are satisfied by after sales services costs.

Table4: Hypothesis 4 Questions' Answers Abundance & Percentage Distribution

	1	2	3	4	5	Mean	χ^2
Ab.	14	45	62	74	45	3.38	42.62
%	6	19	25	31	19		

Table5: Variance Analysis of Satisfaction Levels of Different Dimensions

Difference Source	Sum of Squares	DF	Mean of Squares	F	S Level
Between Groups	2.129	2	1.064	12.271	0.0005
Inter Groups	2.342	27	0.0867		
Total	4.47	29			

9 questions relates to this hypothesis. χ^2 in table is higher. Therefore, observed differences between abundance of answers are statistic significant. Hypothesis of T test are:

$$H_0 : M \leq 3$$

$$H_1 : M > 3$$

With regard to SD(79%) and mean of 3.38, t amount to 3.31 which is higher than t in table (2.42).

As a result, mean of sample belongs to mean in community. So, H_0 is declined and H_1 will be accepted. Thus, Customers are satisfied by after sales services costs.

We see that all 4 hypotheses have been accepted. Now we'll try to examine whether customer satisfaction of different dimensions of after sales services is the same or not.

$$H_0 : \mu_1 = \mu_2 = \mu_3$$

$$H_1 = \mu_1 \neq \mu_2 \neq \mu_3$$

6. Conclusions & Considerations

Present study has examined the impact of after sales services of Modiran Khodro Co. on customers' satisfaction in Tehran Province. Company's success is grounded in providing of quality services to customers. Customers need to services to be offered them together with sold products and they refer to this as a positive value. Therefore, suppliers should try to catch customers' satisfaction of provided services.

Complaint handling shapes a major part of after sales services. Companies should pay special attention to follow up and handle complaints, such that customers remain loyal. Complaints should be considered as opportunities to improve relations with customers and used as a manner to meet their changing needs.

Results driven from tests imply that customers are satisfied by all three dimensions of after sales services, namely: technical quality, employee treatment and costs; though levels of satisfaction are not the same for all dimensions. Such that, satisfaction of technical quality is higher than costs and satisfaction of employees' treatment shows higher level than costs.

Most of companies accept a defensive position against customers' complaints and this leads the customers to leave. It is so likely that a dissatisfied customer looks for new suppliers to switch. That is, these group of customers are the main goals of competitors and also easy to achieve one.

Thus, setting opportunities for customers to advice ideas and solutions is of main importance. This will result in identifying weaknesses and strengths of company, revising dissatisfaction causes, caring dissatisfactory points and providing the basis for a lifetime relationship with them. Building an efficient complaint handling system is the first step toward caring customers; since customers are inseparable

parts of organization; with no customers there will be no company, as there is no demand for any product. Results of study shows that customers are not satisfied by spare parts costs. It should be noted that in competitive businesses, costs are of critical importance and thus dissatisfaction of customers by spare parts costs will affect whole firm.

However, it is notable that as per results, employees' responsibility toward customers is considerable and also servicemen's polite treatment is recognized by customers. This could be referred as an advantage and attempts to be done in order to persist.

Resources

1. Tanner, Arthur, Ardutoro, Ayurnik, J. (1994), Total Quality Management (TQM) of Habibollah translation, printing of Publication pillars.
2. Ranjbarian, B. and M. Soltani (2000), "The establishment of a system to address customer complaints, suggestions and strategies in line with client hospitality" first seminar on administrative reform Bushehr University of Medical Sciences.
3. Roasta and Davar Venus A. and A. Ebrahimi (1995), Marketing Management, First Edition, Tehran: publisher side.
4. Anderson, Eugene W., Clacs Fornell, and Donald R. Lehman (1994); "Customer Satisfaction, Market Share and Profitability," Journal of Marketing, Vol. 58, pp.53-66.
5. Denis, walker (1990); Customer First, USA: Gower.
6. Fly nn, Jacqueline (1997); "The Odyssey of a Customer Inquiry", Journal of Management Review [MRV], Vol. 86, p. 62.
7. Hayes, Jenny & Frances Dredge (1998); Managing Customer Service. USA: Gower.
8. Kotler, Philip & Gary Armstrong (1991); Principles of Marketing (5rd ed.) New Jersey: Englewood Cliffs, pentic Hall International Inc.
9. Neuhans, Cynthia. A. (1997); "Flexible Forecasts: A Key to Better Customer Service", Journal of Hospital Material Management Quarterly [HMM], Vol.18, pp. 61-66.
10. Parker, Kevin (1996); "Ready to Go", Journal of Manufacturing System [MFS], pp. 18A-20A.
11. Valarie A., Zeithaml, Leonard L. Berry and A. Parasurman (1998); "Communication and Control processes in Delivery of Service Quality", Journal of Marketing, April, pp. 35-38.

Satire in Persian literature and poetryAli Rasoulzadeh¹, Nader Karimi²¹Associate and Faculty member of Tehran University, Tehran, Iran²PhD student of Arabic literature, Islamic Azad University, Abadan Branch, Abadan, Iranalirasoulzadeh@yahoo.com

Abstract: Satirical poetry is a technique that has always been a concomitant part of poetry. Its objective is to belittle the status and prestige of the one who is being subjected to ridicule. Satirical poetry is a way to decry and misrepresent someone, a community, or an aspect of life. Satirical poetry represents the implications of human circumstances and pertinence. It is the interactions stemming from the axiom of human existence reflecting conflict and struggle manifested in different forms. Satirical poetry is a long-established and original form of poetry in Arabic language. A group of literary scholars in any nation resorts to this type of poetry. They express their feelings and thoughts in this style of poetry as time and place call for. This study examines different styles of satirical poetry in Arabic language to reveal the motivations and objectives of the poets. The purpose of this study is to discover whether satirical poetry was a technique adapted by some poets as a profession or it was an inner propensity in certain individuals who have gone to the extreme in its development. A number of poets were considered and *Hatieh* was selected for this study as a well known satirical poet.

[Ali Rasoulzadeh¹, Nader Karimi². **Satire in Persian literature and poetry.** *Life Sci J* 2013;10(1):1298-1307] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 197

Keywords: Poem, Satire, Hatieh, Natural Propensity

The Position of Satire in Poetical Innovation

Satire (هجو / Hajv) has many applications in Arabic language in terms of its general meanings. These meanings have various degrees of positive or negative implications. They sometimes comply and sometimes contradict the intended meaning, in their descriptive and non-descriptive forms. Arabs have known satire from the very beginning and no part of Arab history was without common use of satire. The meanings of satire and its characteristics have gone through changes over time in cause of the essential development of poetry in general and the changes in political and social systems in Arabic society. In spite of all the changes, satire remains in its original form without taking any influence from all other changes.

In Lesan al-Arab words like «هجا يهجو، هجا، هجا» are all defined as insults in the form of poetry are antonym of eulogy. Layth was quoted as saying that satire is exaggeration of a defect in form of a poetry. The Prophet Mohammad (S) was quoted as saying: اللهم ان فلاناً هجانى فاهجه اللهم مكان ما هجانى. It means that: "such and such a person ridiculed us and I pray to God to ridicule him". This is an example of جزاء سيئه سيئه اخرى. Ibn Athir had said that the statement was in reference to Amr Ibn Aas. The Prophet Mohammad (S) prayed to God that Amr Ibn Aas had ridiculed him in spite of knowing that he was not a poet. So, he asked God to ridicule him and condemn him equivalent to his ridicule.

The following statements provide various applications of the word (هجو / Hajv) in Arabic language. When a poet is ridiculed (هجو) by another poet in the form of satire, he derides the other poet in return (مهجاه). When a woman (هجو/Hajv) her husband, she blames him. The word (هجا / Heja) means reading or a frog. When we use هجا for a house, it means it is open to reveal its content. Using (هجو / Hajv) for a "seeing eye" means zeal or jealousy. Ibn Arabi said that الهجى means "to eat a full meal to fill full" (Ibn Manzoor, Hajv root). The phrase هجت النار and words like هجا and تهجيجا mean the fire was inflamed. The phrase هجا البيت means it was destroyed. The phrase اهتمج رايه means "insisting on doing something without listening to any advice" (Ebrahism Anis, Al-Mojam al-Vasiteh, Hajv root). The phrase هجا يهجو means insulting and criticizing someone in a poem. The phrase هجوت القرآن هجوا means "I learned it" (Ahmad al-Novayri, Hajv root, p. 348). By doubling هجا in هجت الصبي القرآن هجا it turns into a transitive with two objects (Anviri, p. 348). Further study into the applications of هجا provides additional meanings that depend on time and place. All meanings of هجا outside the literary and poetic applications cannot be too different from its original meanings as used in poetry.

Poetry has gain a high standing in many nations because of the motivations and objectives involved in its composition. Poetry has pushed aside the rest of literary works in Arab world. It has such

high standing in Arab literature that other literary works have developed under its influence. So, poetry became the source of expression and the means of exercising one's imagination to present words and phrases in the most beautiful and difficult way.

It is an old saying that a poem has an opening, purpose(s), and a technique; some are primary and some are secondary. When we look at Arabic poetry, we find out that common poetry techniques have not changed beyond descriptive, eulogy, and satire from pagan state till present. We can claim that other existing poetry techniques are extensions of these three types. Literary experts and scholars disagree on the originality of several poetry techniques and non-originality of other techniques. One reason for the disagreement may be that former scholars were influenced by their own taste and aptitude; therefore, they remained indifferent to special taste, preference, and style prevalent in their own community. Consequently, the generalization of their views may not completely present the literary reality.

Abu Halal has said that: "Some Arabs were asked about the best poets. They answered Jarir because there are four types of poetry, i.e. eulogy, satire, glory, and lyric." (1945, p. 21)

Ibn Qotaybe did not clearly list poetry techniques but said: "poets have different taste for poetry, some concentrate on eulogy but have difficulty with satire. Others have problems with elegy and lyric (Tayekh, v. 1, p. 1). Ibn Salam has stated: "I saw an Arab from Bani Asad whom I enjoyed his delicacy of expression. I asked him what he considered as the best poetry. He answered that poetry had four techniques including glory, eulogy, satire, and Nasib." (Al-Mobarred al-Fazel, M., p. 109)

Ibn Rashigh believes that there are four basic poetry, namely, "desire, fear, joy, and rage" (al-Omdah Ibn Rashigh, p. 12)

Marzbani has said: "scholars and researchers agree on four types of poetry: eulogy, satire, simile, and glory" (al-Moosheh & al-Marzbani, 1965, p. 273).

When we look into the divisions made by scholars and literary individuals from Abi Tamam (230 A.H.) to Ghodameh Ibn Ja'far (310 A.H.) and from Abi Halal to Ibn Rashigh and others who have written scholarly about the art of poetry, we will find out that none of them considered satire as a secondary technique. They all mentioned satire as one of the basic types of Arabic poetry.

Other poetry techniques are sometimes combined with or substituted for other techniques except satire which is not related to any other types of poetry. In satire, mockery is the main purpose and objective of poetry. No doubt that satire is one of the main elements of Arabic poetry. It is possible to say that satire has a big share among the main poetry

types. Satire is the only one that is closely related to the reality of life.

The divisions and circumstances that a poet faces may determine his inherent and psychological inclination with respect to desire and greed, or fear and horror. In case of fear and horror, a poet may use his wording with apology, eulogy, false friendship, or superficial glory. Would it be possible that all the changes in psychological conditions would become fixed and permanent in poet spirit? The answer is certainly negative, because fear and horror are not permanent in a poet. Poet's mood changes once fear and horror is over. Therefore, a poem inspired by a condition of fear and horror does not constitute originality.

The desire or greed in a poet creates many opportunities to write new poetry types and techniques. Desire makes a strong contribution to poet's inner inclination. It also creates choices and selection for him. Desire is the peak of arrow in satire poetry. A poet cannot compose satire without desire and inner inclination; neither can he compose a satire against his will or desire. When a poet composes a satire he wants to put out an evil or peril. A poem is produced as the result of aroused feelings and emotions. When these feelings reach their highest point of pleasure or excitation, they are presented in form of poetry. Such poem naturally followed the feeling of poet at that given moment.

Poetry techniques depend on two types of feelings: 1) the first group includes poet's satisfaction, inclination, and happiness, and 2) the second group includes feelings of anger that pushes poet into some sort of resentment and animosity. These feelings are the driving force of the poet and encourage him to find a way to overcome them. There are many hidden aspects in one or both groups of feelings.

The examination of the relationship between poem and the feelings that created it is the most appropriate way to study poetry techniques. This relation is the connection between poet and his poem. Old poets emphasized on the relation between poem and the motivation for its composition. For example, Yoones Ibn Habib said in his famous statement: "When Amrul Ghays becomes angry, he climbs the horse; when he fears, he becomes an ingenious; when he desires, he becomes Zahir, when he is very happy, he becomes A'sha" (Bioomi Ojlan, A., p. 122).

Abu Hayyan Tohidi has spoken more about the subject and explained various feelings that may turn into motivation to compose poetry. "Poets are lunatics that are neither scholars nor wise men. They speak when greed and avarice is apparent in their words. Truth or untruth in their poetry depends on their desire or fear. Every one of them may overlook the truth by little greed. They may strick in vain with

the smallest desire and encouragement. These poets are not the type whose word is penetrating, whose wisdom is glowing, whose power is overcoming, or whose essence is purifying.” (Dar al-Raed, p. 126)

Satire is created by fear and prod. All poetry techniques generally relate to the public life. And, it is possible to say that satire is on the top of all poetry techniques. Satire conforms to an old saying that claims there is an evil for every poet who dictates poetry upon him. Wickedness fits better to satire than any other poetry techniques. This is because of the negative image satire projects. There is an advice in a Dar al-Raed poem not to befriend with a poet because he ridicules you for nothing and eulogizes you for money (Dar al-Raed, p. 126). Asma'ee believed the same when he said: “poetry is sinister and opens the door for mischief. It is weak when it enters the domain of good deed.” (Ibn Qotaybe, p. 311).

Poetry was a means of confrontation and animosity in Arab communities during pagan state and thereafter. Arab social system was built upon animosity and vindication from its early formation. It is, therefore, natural for such system to encourage satire as an acceptable and necessary form of expression. The building foundation of Arab social system was the main reason for Quran to frequently invite Arabs to good deeds and encourage them to follow Islamic teaching to change their social system for better.

Public shows insatiable hunger for disclosure of faults and shortcomings. This may be the reason for wide reception of satire compared to epical or eulogy poetry. Special desire and hunger to hear the disclosure of hidden life aspects of people and their vices is the reason why satire is the oldest form of poetry. This explains why Arabs have fear and hate for poets. Nevertheless, satire is a poetry principle with a special standing with the general public (Baynali, p. 133).

Satire poets enjoy the same standing as satire poems. Not everyone can compose satire, nor every poet can choose satire as his main line of works. From the poetry point of view, satire means criticizing a real part of life. The initial idea in a satire poem comes from an intelligent selection from the existing facts free of any poetic imagination or artistic abilities. Therefore, not everyone can engage in satire except those few noble individuals (Husseini Meh, M., p. 39). They are the individuals who were able to put together the proficiency, artistic ability, inner drive, and language fluency as the requirements of this poetry technique.

Not every gifted poet can undertake to compose satire without having the disposition and inclination that are required for satire. A poet needs to possess a given inner drive that motivates and

encourages the composition of satire. A poet with perfect literary aptitude and fame for superior poetic abilities may be incapable composing satire because of his overindulgence in literary techniques and lack of psychic requirements of satire.

هب من له شيء يريد حجاب

ما بال شيء عليه حجاب

Maybe someone has something to cover up. But, there is no need for cover when there nothing.

ما ان سمعت و لا اوانى سامعاً

ابداً بصحراء عليها باب

I have not heard and will never hear for wilderness and desert to have door.

من كان مفقود الحياء فوجهه

من غير بواب له يواب

Anyone who has lost pudency, his face has a door without a keeper.

Satire has always been present in Arab literary history including pagan state or Islamic period because of its high and special position in Arab poetry. Satire sometimes was written in the defense of one's soul, and other times represented going over boundaries into exaggeration, sometimes was just to earn a living, and the other times represented an inner motivation to confront a given psychological condition in a certain individual or in the society. Satire has a deep relationship with the time period it was written and the changes that took place in that period.

Satire Methods and Styles

Satire has many techniques and there are many ways to interpret it. The motivation to write satire also varies. A satire poet who feels committed to public values and complies with common ethical standards of society composes a different satire than another poet who does not feel any commitment or requirement to comply with the current conditions in terms of time and place. Both of them are still different from the poet who does not care about his personal and social status. The reason for such differences is that poets who have self-respect and respect others compose types of satire that are completely different from another poet who is indifferent to downfall and humiliation of self and others. These differences are projected into different styles of satire. The number of satire styles depends on the number of satire poets and the ethical, social, and political systems in a given society.

Perhaps, the oldest style of satire in most of Arabic world was developed by the poets who wanted to belittle and humiliate their target persons (مهجو). Such style of satire rooted in the whims and psychological intricacies that were manifested in the form of hatred that made the poet yearn to ruin the prestige of the target person in a poem.

Satire is either personal or public. In a public satire, the poet speaks on behalf of his community, tribe, or any other social group and assails another group or community by resorting to mockery. This type of satire was common in Arab communities, especially during the pagan state. Such satire appeared in defense of tribe's honor, for assailing rival tribes, or some other forms of confrontation. Public satire continued in Arab culture during Islamic period but with minor alterations.

The personal satire depended on the views and perspective of poet toward certain individuals. The difference between personal and public satires is clear.

Ibn Rumi was asked about ridiculing others in the form of satire. He responded with the following poem (al-Bagha'iee, I., p. 6). His prompt answer reflected his pessimistic view.

قيل لي: لم ممت كل البرايا
و هجوت الأنام هجواً قبيحاً
قلت: هب انتي كذبت عليهم
فاروني من يستحق البياحا

I was asked why I blamed others so much and ridiculed them so badly. I said let us assume that I have lied about them. But you tell me who deserves to be praised and eulogized.

Personal satire is more dashing, irresponsible, and insulting when compared to public satire. The reason is that the poet has a free hand and writes based on his own inclinations. A poet faces more restrictions when composing public satire because he relies on the group preferences. For example, Jorayre in scoring Bani Tayyem Tribe said: (Hussein Mohammad Mohammad, p. 36)

نري الأبطال قدكلموا و تيم
صحيحوا الجلد من أثر الكلام
تري التيمي يزحف كالقربني
الي سوداء مثل قذا القوم

You see heroes who were wounded in the conflict. But Bani Tayyem Tribe is safe and secure because they are no men of war. They only talk. Bani Tayyem men are like insects that crawl into palm trees of others.

The poet has belittled Tayyem Tribe by introducing them as a cowardly group. But this is done indirectly with no clear humiliation. Another example is what Najashi said about Bani Ajalan (Rafeiee, v. 3, p. 77).

و ماسمي العجلان الا لقولهم
القعب واحلب ايها العبد و اعجل

Ajalan Tribe is named so only because their motto is to stay behind and milk the animals with no hurry.

Other divisions of satire have been proposed. They are different in style and approach. One division groups satire into old and contemporary. The old group includes satire from pagan state to Abbasid Era. Contemporary satire uses a different approach compared to old satire. Contemporary satire uses prose style together with implied symbolism and innuendo.

There are further divisions based on context of satire like division into sincere (Sadegh) and egregious (Fahesh) satire. The strongest egregious satire is the one that highlights differences and superiority. In this type of satire, the poet introduces a certain tribe or person as being superior to another person or tribe. Moallem Betros Bostani stats that:

The strongest satire is the one that contains superiority and differences, especially in case of relatives who in fight with each other for leadership. One example is the satire made by Hatieh for scoffing at Zebarghan. Hatieh hurt Zebarghan by introducing Baghiz Ibn Amerhim as being superior to his cousin Zebarghan. This incident made Zebarghan complain about Hatieh to Omar Ibn Khattab. (Betros Bostani, p. 56)

Egregious satire is different in context and meaning relative to sincere satire. For example, sincere satire opposes activities that may be desirable and acceptable to other individuals, like scolding properties that are despised by Arabs such as treason, parsimony, reprimand, etc.

Some poets used satire as a source of income and lost their prestige as the result. They made a living by disclosing others fault and shortcoming. Arabs hated this type of satire poets and always tried to stay away from them. They did not accept this type of poetry for their tribes. Hatieh may have been one of the satire poets who made a living with his craft.

دع المكارم لاترحل لبغيتها
واقعد فانك الطاعم الكاسي

Forget about respect and good deeds. Do not go after them. Stay with what you are doing because you are a breadwinner (Hanafa Khoori, p. 246).

Some poets composed other styles of satire in different periods. These styles are clear (Sarih) satire and pesky (Ta'riz) satire. In clear satire, the poet assaults his target by mentioning his name without reservation. For example:

و يقضي الأمر حين يغيب يتيم
و لا يستأنون و هم شهود

When Tayyem members are absent, things get done. When they are present,

they get involved without asking permission.

Ibn Shigh Ghiravani in al-Omde stated that he believed pesky satire was stronger than clear satire because pesky satire involved lots of guessing to determine who the target was. And, the negativism in searching of the truth is quite obvious (Ibn Shigh Ghiravani, Al-Omde, p. 191). Two examples from Motenabbi collection:

إذا انت اكرمت الكريم ملكته
و إن اكرمت اللئيم تمردا

If you respect someone honorable, it is like making him part of you. And if you respect someone ignoble you are inviting him for obstinacy.

يا اعدل الناس الا في معاملتي
فيك خصائم وانت الخصم والحكم

How can you, the most righteous people, deal with me as you are both judge and complainant?

A number of satirical poets made short poems that included humorous depictions intended to make people laugh. Ibn al-Roomi in making fun of someone with a big nose, wrote: (Hassnin, A., p. 330)

لك انفا ابن حرب
انفت منه الأنوف
انت في القدي تُصلي
و هو في البيت يطوف

Ibn Harab, you have such a big nose that make other noses despise it. You pray at Qods (Jerusalem) and your nose goes to pilgrimage in Mecca.

There is another type of satire called *Naghayez* that deserves attention. This type of satire included all satire styles and techniques that were common in Arab literature during Omavi Era. Famous poets who used this style included Jorayr, Farzoogh, and Akhtal. They used to hold poetical contests in *Naghayez* poetry.

Hatieh: His Fame in Satire

His name was Hatieh Jrol Ibn Ous Ibn Malek Ibn Joobeh Ibn KHazoom Ibn Malek Ibn Ghatifeh Ibn Isa Ibn Baghiz Ibn al-Rith Ibn Azfan Ibn Ghilan Ibn Mozer Ibn Nazar. He was one of the dignitaries in town who was fluent in poetry. He was master in all poetry techniques including eulogy, satire, Nasib, etc. He was also a mischievous and ignominious person whose parentage would change from one tribe to another at his will (Isfahani, A. F., p. 27).

Hatieh was one of long lived poets of Makhzarem. He lived during the pagan state. Ibn Salam in Tabaghat al-Shoara has said that "he lived a long life during pagan state".

Historians disagree on his birth date. He may have been born at the end of 6th century A.D. because he

always accompanied Bashar Ibn Khazem every time he visited Hatam Ta'iee. He was mentioned in the history books to have made friends with Antareh. Antareh died in 615 A.D. at young age. Hatieh youth may have been during the last 20 years of 6th century (Taba', A.F., p. 7).

He was called Hatieh because he was very short and almost stood near ground. Hemad al-Ravaye quoted from Abu Nasr A'rabi that "He was called Hatieh because one day he fart in presence of others. He was asked what it was. He answered nothing but Hatieh."

His epithet was Abu Malikeh. Malikeh was the name of his daughter. His parentage is in doubt because he would associate himself with different tribes at will (Bostani, p. 237)

His parentage remained unknown. His mother's name was Zarra. His father was Ous who did not accept his son until his death because he had another wife from Zahal Tribe with two sons. Ous's official wife had a brother by the name of Afgham. When Hatieh was born, he resembled Afgham, so his mother related his son to Afgham instead of relating him to Ous. Consequently, Hatieh remained with unknown parentage. (Hussein, T., p. 296)

Taha Hussein stated that there is no doubt that Hatieh had two contrasting personalities. One personality was general with complete pagan characteristics. The other was his artistic-poetic personality. (Ziat, A. H., p. 159)

He was a Makhzarem poet who became well-known in Arab world during pagan state and early Islam. His mannerism was so ignoble and villainous that he became famous for his disregard of respect and prestige of others in his satires. He did not even show respect to his mother and father. He was making a good living by writing satire. He was the agent of fear and horror for everybody, young and old, public and private. He was one of the poets who earned a living in the lowest possible form. If it was not for his malignancy, ribaldry, and ignobleness, no other Makhzarem poets could surpass him in poetry. (Farooq, O., p. 16)

Hatieh's Motivation in Writing Satire

Before we engage in discussing what contributed to his satire fame, we would be better to discuss Hatieh's own confession about his ribaldry, wickedness, and misconduct: (Ibid)

ابت شفتاي اليوم الا تكلماً
بسوء فلا أدري لمن أنا قائله
اري لي وجهاً قبح الله خلقه
فقتبح من وجهه و قبح حامله

Today, my lips do not accept anything other than saying something abusive. I do not know to whom I should direct this

abuse. I have a face which is made ugly by God. What an ugly face and what an ugly person who could carry it.

What a better proof than the word of a person who selected satire as a source of daily living and whose tongue did not utter anything other than satire. If he did not find anyone to scorn he would ridicule himself. Is there anyone closer to oneself than himself? When a person does not feel mercy toward himself, would anyone else be safe from his tongue? A poet like Hatieh should have had very strong reasons to motivate him yearning to write satire so badly. In such a state, the poet cannot separate himself from satire.

The factors that may have motivated Hatieh to write satire could be as follows:

1. Unknown Parentage and Lack of Identity

Hatieh's mother was a woman by the name of Zarra who was a bondmaid of Ous ibn Malek. Omar al-Taba wrote: "Hatieh's mother became pregnant by Ous. Ous left her for his wife. His wife was a daughter of Ryah Ibn Omar Ibn Owf and had a brother by the name of Afgham. When Hatieh was born, he resembled Afgham. So, his mother related his son to Afgham instead of relating him to Ous. Zarra married a man from Bani Abas after Ous passed away. She had two sons from this man who were Hatieh's step brothers (Omar al-Taba, p. 6).

Abu al-Faraj Isfahani stated that when Hatieh grow up and realized his unknown parentage, asked his mother about his pedigree. He did not receive a clear answer from his mother and this was the beginning of his quandary (Isfahani, p. 155). Hatieh stated the case in the following poem:

تقول لي الضراء لست لواحد
ولا اثنين فانظر كيف شرك اولئك
وانت امرؤ تبغي أبا ظلتاه
هبلت، ألما تستفق من ضلالك

My mother Zarra says that I am not from anyone; not one, not two. See how she bemused the case. Now, you are a man who wants a father, but you will not understand till death and never can escape wandering.

Hatieh felt the pressure of life since he opened eyes to this world. He fate was sealed to become damned and rejected by people. He was sometimes related to Bani Zohal, and sometime to Bani Abas. When he asked Bani Zohal for inheritance from Afgham or when he asked Bani Abas for inheritance from Ous, he only met with ridicule and laughter. (al-Heja va al-Heja Ven, p. 123)

It seems that social fault and shortcoming inherited by Hatieh created permanent anxiety causing a deep and lasting animosity in him toward others. His feelings were reflected in his poetry and made him

a master in satire. He was so consumed with his craft that made a living by it. (Maktab al-Helal, p. 250).

Lack of identity and clear parentage together with the absence of nobility and family background deprived Hatieh from the dearest and most honorable means of self-esteem that Arabs proud themselves and bragged about in pagan state. Even in early Islam, lack of tribal identity would make anyone socially ignoble. This became a barrier for Hatieh to gain social standing, prestige, and honor; lack of which would mean nothing other than contempt and misery or even real and painful death to Arabs during pagan state.

2. Hideous Mannerism and Morality

There is no doubt that Hatieh faced an inferiority complex because of psychological and mental conditions he had to experience. An Hideous and disgusting face, a very short height, and an unfitting physique were all sufficient to make him pessimistic with corrupted mannerism and morality. His terrible mannerism and moral made him a symbol of horrors and disgust - someone to avoid and stay away. Some people even paid him to save themselves from his wicked words. (Hussein, T., p. 131)

His unpleasant mannerism and morality plus his scornful encounters would not differentiate between friends or enemies and familiar or stranger. Nobody was safe from his aggressive words even his family, mother and father. He is critical of his mother in the following poem without curtsy or reservation:

جزاك الله شراً من عجز
ولفك العقوق من البنين
فقد ملكت امر بينك حتي
تركيتهم ادق من الصالحين

I hope God punishes you for being such a hag with denounced sons. You brought up your children in such a way that they are crushed into little particles softer than flour.

Or he says in another occasion (Al-Aghani, p. 262)

اراح الله
تنحي فاجلس متي بعيداً
منك العالمينا
أغربالاً اذا استودعت سرا
و كانوا علي المتحدثينا
حياتك ما علمت حياه سوء
و موتك قد يسر الصالحينا

Move away and do not sit next to me. God saves the world from you. When a secret is entrusted up on you, it gets spread out everywhere. You had such a wicked life that your demise might make the righteous happy.

Or in another poem:

أري لي وجهاً شوه الله خلقه
فقبح من وجه وقبح حامله

*I have a face that God made it ugly.
What an ugly face and what a hideous
person is the one who carries it.*

3. Poverty and Neediness

He was born with a yoke on his neck. The lock on this yoke was poverty and indigence. He was to work hard to find the key to this lock in order to gain freedom. He was born in critical circumstances with unknown parentage. These circumstances brought him nothing other than poverty, neediness, deficiency.

He faced with closed doors. He had nothing to hang onto to earn a living and ease life's hardships. He had nothing to fall back on to make a living other than his offending tongue. His caustic words were frightening and made his greed to grow stronger. He could not be satisfied with anything other than high income. Yet, some believe that Hatieh used earning a living as an excuse to indulge into writing satire. The real reason may have been his inner propensity to torment others. That was the reason for Omar Ibn Khattab, the second Khalife, to pay him 3000 Dirham to save the public from his detriment. But, Hatieh started composing satire again after his death. Hatieh in making fun of Zebarghan and eulogizing his cousin said:

جار لقوم أطلوا هون منزله
وغادروه مقيماً بين ارماس
ملوا اقراه، و هرتة كلابهم
و جرحوه بانياب و اخراس
دع المكارم لاترحل لبغيتها
واقعد فانك الطاعم الكاسي

Khalifeh put Hatieh to jail because of this poem. Khalifeh asked him to make commitment not to write satire against any Moslem. Hatieh answered his wife would die of hunger if he would not write; it was his way of earning a living. (Al-Bostani, p. 241)

Hatieh's Satire Styles and Characteristics

Hatieh was master in using words. He could play with words in whatever ways he wished. He was very skillful in satire so he became the symbol of satire both during pagan state and early Islam. He turned his craft into a source of income. He would write poetry in various subjects in different styles. His satire styles were as follows:

1. Avoiding Profanity

Amro Ibn Ala was quoted as saying «خير» (Ibn Rashigh, p.189). It means the best satire is the one composed by girls because they do not use bad language. In spite of Hatieh's bad mouthing and wicked satire, his works meet public acceptance as if it was void of such language. Or, Hatieh so characterized it.

It is said that when Omar Ibn Khattab freed Hatieh from prison, told him not to say any egregious

satire. Hatieh asked what egregious satire was. Khalifeh answered to say this group is better, nobler, and more virtuous than that group or eulogizing one tribe and criticizing the rival one.

Hatieh responded by saying "you are more knowledgeable in poetry than me. But some people gave me gifts so I eulogized them. Some other people denied me of any gifts, so I mentioned them in my poetry without harming their prestige. I have not disgraced anyone. I just sent eulogy to those who wanted it and did not eulogize those who did not want". This is a reference to Hamzieh poem which says:

*I came to dinner tonight to Sohayl or to
Setareh She'ra that made me wait for so
long (Ibn Rashigh, p. 189).*

This showed that Hatieh did not intend to write an egregious satire and did not disgrace anyone. Though, his scorn was bitter and mortifying for the target person.

Although Hatieh composed the highest number of satire among poets of pagan state, but the number of his egregious satire was the lowest. In spite the fact that his satires were very painful, but they were rarely egregious. He attributed such characteristics as stingy, apathetic, and lethargic to his targets to highlight the difference between him and his opponent. It was like to ridicule and criticize the target individual because of his social position and nothing else. (Bostani, B. p. 248)

2. Walloping versus Speciosity

Walloping (Ta'riz) is a satire style used especially when the target has a social position or is very sensible. Such person may get hurt by smallest hint, allusion, or attack. Walloping may also be used in the case of a person who is a high official with lots of contact whom it would be difficult to scoff at by simply disclosing his faults or deficiencies. This style was commonly used during pagan state and Islamic era.

This style of satire is preferable because of unclear implication. Tasrih makes shorter targets. Talmih expands the scope of thinking. This style is very unpleasant when meaning and implication is not obvious. General public usually likes this style. (Biomi, A.)

Hatieh used this style and Ta'riz appears a lot in his poetry. This line about Zebarghan is famous. (al-Teba', O. F., p. 106)

دع المكارم لاترحل لبغيتها
واقعد فانك الطاعم الكاسي

There are many samples in Hatieh's satire that conform to Ta'riz style. This technique makes satire more attractive without attributing anything directly to the target person.

3. Prolongation in Satire

Satires prolongation was common during pagan state. A'sha, Shamakh, Hesan, and Hatieh are among pagan poets who used prolongation in their satires. The objective of prolongation was to explain the details of an event or to mention the faults and shortcomings of a community. Of course, the targets of such satire find themselves in an unpleasant situation.

A poet like Hatieh could not calm his anger and animosity with few lines of poetry. What could really satisfy him was a long pronouncement or a prolonged satire that humiliated and disgraced his targets so much so that they could not escape the consequences. This attitude may have stemmed from Hatieh's inferiority complex.

Hatieh might have used this style of satire with the intention to disarm his target to give in to his demands. He might have used this style to send warnings to those who did not recognize Hatieh or did not wish to give in to him and retreat. That may be the reason Hatieh satires were usually long and he was never satisfied with only few lines. His short satires were only a few compared to the number of long ones. These few short satires may have been composed under certain circumstances; or their subject were insignificant; or Hatieh may have composed them mostly for fun. The examples of the short satires were the ones he composed about himself, his mother and his step father and the like.

Most of his satires are long and limitless. The most notable elegies are about Zebarghan, especially his well-known Sinieh stated below (Hussein, T., p. 217):

والله ما معشرا لاموا امراء الجنبا
في آل لأبي بن شماس با كياس
و العيش علام كلفتنني مجد ابن عمكم
تخرج من اعلام أوطاس

When you read the whole poem you realize that Hatieh went into details on any account he wanted to emphasize to increase the inflicting effect on Zebarghan. He attributed such characteristics as stinginess and lack generosity to Zebarghan family. He compared them with a female camel that failed to lactate in spite of all the care and attention. Then, Hatieh eulogized Al-e Shamas who rivaled Zebarghan. He compared them with a rocky cliff that was so hard that no pick or any other tool could make a dent. He made a mockery of Al- Zebarghan because they did not heed to his demands and showed no generosity. Hatieh words were so effective that totally damaged the social standing and tribal prestige of Al-Zebarghan and put them to immediate verge of distinction. An example of his long satire is the one he wrote in 30 lines about Al-e Bajad and Bani Abas.

أقيما فلا من سالف العيش تذكر
احاديث لا يذسيكها الشيب و العُمر

*As the time passes by, would you
remember the saying that even old age
cannot forget.*

طربت الي من لا يؤايتيك داره
و من هو ناء و العبابه قد تضرد

*You yearn for someone whom you
cannot find because he is so far away
that is not clear where he is gone.*

الي طفله الاطراف زين جيدها
مع الحلبي و الطيب المجاسد و الخمر

*To those who have delicate and soft
fingers with ornamented necks and
wearing nice perfume.*

تري الزعفران الورد فيهن شاملا
و ان شئن مسكا خالصا ريحه نفر

*They resemble red flowers like saffron.
May be they are pure perfume musk that
its odor fills everywhere.*

بني عمنا ما أسرع اللوم منكم
الينا لا نبيغي عليكم و لا نجر

*You cousins, how quickly we
experienced your cowardliness and
lowliness while we have never
committed impertinence and audacity
against you.*

و كنا اذا دارت عليكم عظيمه
نهضنا قلم ينهض ضعاف و لاضجر

*When a huge calamity happened to you,
we supported you with all in our power.*

فاما بجاد رهط جحش فانهم

علي النانبات لاكرام و لاحير

*But you, Bajad Tribe, are like group of
donkeys with no magnanimity at the time
of big problems.*

تري اللوم في رقاب كأنها
رقاب جناح فوت أذانها الغفر

*They are so cowardly that cannot keep
their head up, they cover it instead with
a piece of cloth.*

Hatieh wanted to take away any magnanimity and worthiness from Bani Bajad by eulogizing self and his tribe by attributing magnanimity to them and belittling Bani Bajad. He gradually made his satire felt deeper and stronger by going into details and comparing them with his tribe. This approach is evident in most of his satire.

Conclusion

When we study satire as a high ranking descriptive form of expression we find out that from the technical point of view and as an art craft it is built up on feelings of rage, hate, and disgusts that the poet felt at the time of its composition. This fact is quite true about Hatieh's satire. Satire stems from hostility and rudeness of the poet from subject point of view; and it

stands at the highest complexity from technical point of view. A poet like Hatieh was able to present both aspects in his poetry.

Although, satire poetry is not in harmony in terms of meaning with other types of poetry techniques, but poet may use an opportunity to present his poetic ability in either case, and attract the attention of literary critics and scholars. It means a poet may be consumed with hate and hostility toward others. He may also have poetic abilities in techniques like eulogy, lamentation, Nasib, and the likes. So, it is possible for a poet who is fully versed with satire and has chosen this technique of poetry as his craft and profession to make progress in other poetry techniques that are totally different than satire and earn acclaim from critics.

It is rare to find a poet who is famous for his satire composition but show no competence in other poetry techniques. A poet, who is master in satire, is most likely competent in eulogy, elegy, lyric, glorifying, etc.

This was evident in poets like Hatieh, whether Makhzarmi or not, including Zohayr, Ka'b Ibn Zohayr, Abd al-Allah Ravahe, A'sha, Bashar, Da'bal, and the like. These poets have left excellent poetry in satire and in other poetic techniques.

Hatieh's position in different styles of poetry varied and depended on his motivation, style, and technique he was using in his composition.

At the end, we offer a part of Hatieh's famous satire about Zebarghan. In this poem, Hatieh subjected Zebarghan to very strong and hurting ridicule and offered eulogy to his cousin and rival by the name of Baghiz. Hatieh exclusively used this approach in many of his satires.

والله ما محشر لاموا امرأً جنباً
في آل لآي بن شماس باكياس

*Swear to God that those who rebuked me
for eulogizing Al-e La'ee were not
intelligent.*

ماذنب بغيض لا بالكم
في بانس جاء يحدوا آخر الناس

*Baghiz has not done anything wrong for
being kind to me - a poor man who asks
others for shelter and handout.*

لقد مرتيكم لو أن در تكم
يوماً يجي بها مسحي و ابساسبي

*I asked for your generosity and sought
your help. I was like a female camel that
was attended very well but provided no
benefit.*

و قد مدحتكم عمداً لارشادكم
كيما يكون لكم متحي و امراس

*I eulogized you and my eulogy was pure but
you did not accept it.*

وقد نظرتكم اعشاء صادرة
للخمس طال بها حبسي و تناسي

*I was expecting something good from
you like a shepherd who is waiting for
the return of hungry and thirsty herd of
cattle.*

كفارك
فما ملكت بان كانت لفوسكم
كرهت ثوبي و الباسي

*I have not been able to change your
anger and animosity for love and
friendship. You are like a husband who
does not like his wife.*

و لم يكن
لما بدامنكم غيب انفسكم
لجراحي منكم أنسي

*All his bottled up hate came out but my wounds
are not healed by you.*

و لن تري
ازمعت بأساً مينا من نوالكم
طارداً للخي كالياس

*I waited so long for your generosity but
disappointment was overwhelming
enough for a free man who is going
away.*

و غادروه
القوم أطالوا هون منزله
مقيماً بين أرماس

*When I was with you and you insulted
me and left me alone, it was like being
left in a cemetery.*

و جرحوه
ملوا قراه فهرته كلابهم
بانيت و افراس

*They became tired of my banquet and
left me alone for their dogs to wound
and bite me.*

واقعد فانك
دع المكارم لاترحل ليغيثها
الطاعم الكاسي

You will not feel degraded if you stay at home.

من آل لآي
ما كان ذنبي ان قلت معاولكم
صفاه اصلها أنسي

*What is my fault? Those whom I have
eulogized from al- La'ee are nobler and
more respectful.*

مجداً تليداً و
قد ناضلوك فسلوا من كنانتهم
نبلاً غير انكاسي

*They strike a blow at you with their
arrows because they are noble and great
for their arrows which never become
weak and deficient.*

References

1. Al-Askari, A. H., (1973), *Divan al-Ma'ani*, Cairo: Maktab al-Qods.
2. Al-Bagha'iee, I., *Ahla ma Qil fi al-Heja*, Beirut.
3. Al-Barghooghi, A. R., (1930), *Al-Mobtani Collection*, Egypt: Al-Rahmanieh Publishing.

4. Al-Bostani, B., *Arab Literary Scholars during Pagan State and Early Islam Era*, Beirut: Dar al-Jil.
5. Al-Fakhoori, *Hana: Al-Moojez*.
6. Al-Fioomi, A., *Al-Mesbah al-Monir*
7. Al-Isfahan, A. F., *Al-Aghani*, Beirut: Dar al-Ehya al-Torath al-Vabi.
8. Al-Marzbani, M., (1965), *A Research about Ali al-Bejari*, Cairo: Maktab Nehzat Mesr.
9. Al-Mobbared, M. F., (1996), *A Research about Abd al-Aziz al-Mayyeni*, Egypt: Al-Hay'at al-Mesrieh al-Ketab.
10. Al-Rafeiee, M. S., (1940), *Tarikh Adab al-Arab*, Cairo.
11. Al-Teba', O., Gh., Hatieh Collection, Dar al-Ghazeghem.
12. Al-Ziat, A. H., (1940), *Tarikh Adab al-Arab*, Cairo.
13. Biomi, A. A., (1981), *al-Heja al-Jaheli Soorah va Asalieh al-Fanni*, Alexandria: Moasseseh Shabab al-Jame'eh.
14. Ghamihe, M. M., *Hatieh Collected Edited by Ibn Sakit*, Cairo: Dar al-Kotob.
15. Hussein, T., *Fi Tarikh al-Vaba al-Asr al-Jaheli va al-Islami*, Beirut: Dar al-Qalam.
16. Hussein, T., *Hadith al-Arba'a*.
17. Hussein, A., *Makhzarmi Poets during Omayyad and Abbasids Eras*.
18. Ibn al-Shajari, (1992), *Mokhtarat She'r al-Arab*, Ali Mohammad al-Bajavi Editor, Beirut: Dar al-Jabil Publishing.
19. Ibn Manzoor, *Lesan al-Ghayb*, Beirut: Dar Sader.
20. Ibn Qotaybe, *Poem and Poets*, Ahmad Shaker Editor, Cairo: Dar al-Ma'aref.
21. Ibn Rashigh, (1935), *Al-Me'deh*, Mohyi al-Din Abd al-Hamid Editor, Cairo.
22. Jorji, Sh., (2000), *al-Mo'tamed*, Beirut: Dar Sader.
23. Moghnieh, H. Y., *Arab Literature from Early Islam till Rashedi Era*, Maktab al-Helel.
24. Mohammad Hussein, M., *Al-Heja va al-Hja'oon fi al-Jahelieh*, Cairo.
25. Tha'er, H. J., *al-Ebda' al-She'ri fi al-Naghd al-Adabi ela Nahayat al-Gharn al-Sabe' al-Hejri*, Beirut: Dar al-Raed.

1./8/2013

Cesarean Delivery on Maternal Request in Zanjan, Iran

Shakeri M, MS.c¹ (Corresponding author), Shakibazade E, Ph.D.², Arami R, MS.c¹, Soleimani M, MS.c¹

¹ Dept. of midwifery, Zanjan Branch, Islamic Azad University, Zanjan, Iran

²- Dept. of midwifery, Zanjan University of Medical Sciences, Zanjan, Iran

Abstract: Background and Purposes: Despite the national programs to reduce the rate of cesarean delivery, but it is increasing. Part of the increase in the cesarean delivery rate seems to be due to an increase in cesarean delivery requested by mothers in the absence of any medical or obstetric indications. This study aimed to determine factors affecting the rate of cesarean delivery on maternal request in Zanjan, Iran. **Materials and Methods:** In this cross-sectional study, a total of 1300 medical files of women referred to maternity hospitals in Zanjan in 2009 were randomly selected. Data were collected using a self-structured questionnaire via medical files recordings and interviewing with the women. Data were analyzed using the Chi-squared test, t-test, ANOVA and multivariate logistic regression. **Findings:** The results show that 42% of cesarean sections were elective. Most of the women (43.3%) had chosen the cesarean delivery due to fear of pain. The elective cesarean section was significantly correlated with the educational attainment, day of delivery, first birth, women's age, repeated cesarean section, and women's job ($P < 0.001$). **Conclusion:** Promoting public awareness and efforts towards applying cesarean sections only in necessary occasions can reduce unnecessary cesarean sections and its possible side-effects.

[Shakeri M., Shakibazade E., Arami R., Soleimani M. **Cesarean Delivery on Maternal Request in Zanjan, Iran.** *Life Sci J* 2013;10(1):1308-1311] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 198

Keywords: Cesarean delivery on maternal request, Elective, Caesarean, Birth

1. Introduction:

The rate of the Cesarean section (C-section) is considered as an index of healthcare coverage. According to the World Health Organization (WHO) report in 1985, the 15% rate is as an acceptable rate for performing C-section [1]. However, recent figures released by the WHO in 2009, revealed that the rate of the cesarean delivery has risen over the past few decades, worldwide [1].

In Iran, the rate of the C-section has reached to a risky level which needs more attention as an important issue [2]. The Demographic and Health Survey (DHS) conducted in Iran in 2000 reported the C-section rate in the country to be as high as 35% [3]. The 'Integrated Monitoring Evaluation System Survey' (IMES) conducted on women aged 10-49 years old also reported the rate of C-section to be as high as 40% [4]. In a study conducted by Shakeri et al (2009) to assess the rate of the C-section in Zanjan, they reported the rate of C-section is high (43%) [5]. The rate in Iran is higher than the rate reported in developed countries such as the US (30.2%) and England (22%) [4]. It is noteworthy that the C-section rate in the neighbouring developing countries varies from 4.7% in Azerbaijan to 27.6% in Egypt [6]. The high prevalence of this condition in Iran reveals that the procedure is performed without any medical indication in many cases which may be contributed to higher rates of complications in both mother and neonate [7].

The cesarean delivery on maternal request (CDMR) may be a main reason for increasing the rate of the C-section. The CDMR is the cesarean delivery requested by mothers in the absence of any medical or obstetric indications [8].

The CDMR ranges are from 4–18% of all cesarean deliveries [9], a rate that seems to be increasing [10] worldwide. The reasons that pregnant women request cesarean delivery are extreme tocophobia, or fear of child birth [11], a previous C-section, and previous negative birth experience [12] as well as smaller family size and insurance liability concerns [13].

Elective delivery may increase the risk of maternal mortality more than 3-times [14]. The risks of elective cesarean delivery to the mother are increased morbidity and mortality associated with surgery and possible complications in subsequent pregnancies (e.g. uterine rupture, placenta previa, and placenta accreta) [15]. An elective cesarean delivery may also increase the fetal risks of respiratory distress syndrome, persistent pulmonary hypertension, and fetal lacerations [15]. Some researchers have shown that a significant decrease in the cesarean rate can be achieved without an increase in mortality and prenatal complications [16].

There are no population-based data in Iran on the CDMR. This study aimed to examine the rate of CDMR in Zanjan, Iran.

2. Materials and Methods:

In this cross-sectional study, 1300 pregnant women's medical files were selected from

two maternity hospitals in Zanjan (533 medical files from Valiasr hospital and 767 medical files from Imam Hosein hospital) in 2009. These two hospitals are the main maternity hospitals in the city in which near 10000 deliveries occurs annually. The inclusion criteria for definition of the cesarean delivery on maternal request were singleton gestation, cesarean delivery based on "woman's request", live fetus prior to delivery, gestational age at 38 weeks or later, and C-section before onset of spontaneous or induced labor [17]; and the exclusion criteria were previous cesarean delivery, malpresentations, placenta previa, antepartum placenta abruption, antepartum severe preeclampsia/eclampsia, abnormal fetal heart rate before labor, suspected fetal growth restriction, and suspected large-for-gestational-age fetus [17]. Regarding the number of the clients of two maternity hospitals in Zanjan, the quota for each maternity hospital was determined. Then, we used proportional simple random sampling to select medical files.

Appropriate data were gathered using a self-structured questionnaire including personal characteristics of the women (14 items), reasons for elective C-section from women's view (6 items), and other reasons for elective C-section (19 items). The questionnaire was completed using the medical files records and telephone interviews with the women.

The content validity and reliability of the questionnaire was confirmed using the expert opinions (five obstetricians), and the split-half method and the Cronbach's alpha (89%), respectively. The study was reviewed and approved by the ethics committee of the Zanjan University of Medical Sciences.

Data were analyzed using the Chi-squared test, t-test, ANOVA, and multivariate logistic regression in the SPSS. Those variables which separately had significant relationships with the elective cesarean delivery in one-variable analysis were specified; then using logistic regression, a multivariate analysis was performed in order to evaluate the impacts of the variables together in the presence of each other.

3. Findings:

A total of 1300 medical files were included in this study. The results of the study showed that most of the pregnant women (38%) were aged 20-24 years. Moreover, 29% of their spouses were aged 25-29 years. Most of the women (83%) were housewives. Most of the women (67%) and their spouses (58%) did not complete their high school diploma. Near half of the women in the study (48%) were nulliparous women and 39% of them had experienced a previous normal delivery. Most of the women in the study (68%) had wanted pregnancies

and 3% had a history of abortion in their previous pregnancies.

As shown in Table 1, 43% (n=559) of the elective C-sections were performed on the maternal request. Most of the elective C-sections on maternal request (43.3%) were only due to fear of labor pain.

Table 1 - Reasons for elective cesarean sections (n=559) in maternity hospitals in Zanjan 2009.

Reason for C-section	Number of elective C-sections	Percent
Woman's request		
Fear of labor pain	243	43.3
Stress and Anxiety	82	14.7
Concerns about baby's health	186	33.4
Tubal ligation	9	1.6
Other Medical reasons	39	7
	741	57
Total	1300	100

The C-section showed significant relationships with the infertility history; 64% of mothers with a history of infertility (compared to 34% of mothers with no history of infertility) underwent C-section ($P<0.001$). The C-section also showed a significant relationship with history of stillbirth ($P<0.001$). Other maternity reasons for elective C-section - such as lack of progress of labor, multiple births, abnormal position, and cystocele- showed no significant relationships with the elective C-section.

There was a significant relationship between the educational attainment with C-section; the rate of the C-section increased in women with higher educational attainments ($P<0.001$). There was a significant relationship between the day of delivery with C-section; the rate of C-sections increased in weekends and holidays ($P<0.001$). Also, there were significant relationships between the first birth (CI 0.85-7.64; OR: 2.17; $P<0.001$), women's age over 30 (CI 4.07- 73.85; OR: 14; $P<0.001$), repeated cesarean (CI 6.8-120; OR: 20.91; $P<0.001$), and women's job (CI 5.4-70.6; OR: 3.03; $P<0.001$) with the elective C-section (Table 2).

Table 2- Factors affecting pregnancy termination with elective caesarean

Variables	Confidence Limits		P-value	OR
	Upper	Lower		
First birth	7.64	0.85	<0.001	2.17
Education Higher than high school	5.31	0.058	<0.001	3.76
Age over 30 years	73.8	4.07	<0.002	14
Repeated cesarean	120	6.8	<0.001	20.91
Mother's job	70.6	5.4	<0.004	3.03

There were no significant relationships between the spouse's jobs and previous unwanted pregnancies with the C-section.

4. Discussion:

Factors affecting the rate of cesarean delivery on maternal request in Zanjan were studied. Results showed that most of the elective C-sections were due to the maternal request and most of the women had chosen the cesarean delivery due to the fear of pain. The elective C-sections was significantly correlated with the educational attainment, day of delivery, first birth, women's age, repeated C-section, and women's job.

Caesarean section is not a preferred method of delivery, because like any other surgery, it may have many complications and risks for mother and baby. The risk of maternal death in elective C-section is reported to be eight times more than the vaginal delivery [18]. Despite the fact, the rate of C-section is increasing in Iran. The results of this study indicated that 43% of the C-sections were done electively, and from those, 43% were done due to women's request. In a study by Jackson et al. (2008) in London, they estimated the frequency of elective C-sections as 9.1% of which 38% were CDMR [19]. The results of a study conducted by Belizan et al. in 19 Latin American countries showed that C-section rate varied between 16.8 to 40 percent. They reported that over 850,000 unnecessary C-sections were performed annually in Latin America [20]. Guo et al (2000) reviewed 857 cesarean deliveries in two medical university-affiliated hospitals. Fifty-four percent of cesarean deliveries had appropriate indications, whereas the rest had inadequate indications (46%). The latter included no trial of labor for suitable patients, inappropriate timing and method of induction, insufficient time for trial of labor, and inappropriate diagnosis resulting in cesarean delivery. Twenty percent were attributed to the physicians, and 26% were requested by the women [21]. Fu et al. reviewed the rates of cesarean delivery and cesarean delivery for difficult labor in a university-affiliated hospital in China from 1989 to 2001. The overall cesarean rate increased from 17% to 63% in a decade. Among women who were diagnosed as having difficult labor, cesarean delivery was performed from 40% to 94% of the time, whereas use of forceps dropped from 52% to 4%. Vacuum was rarely used [22].

Regarding the reasons for the CDMR, the results of this study showed that 43.3% of mothers were willing to undergo cesarean delivery due to fear of labor pain and normal delivery complications. Other studies have also shown that negative attitudes and wrong beliefs determine the type of delivery [23].

In a study conducted in Brazil, Nurtall found that causes of the mother's request for elective C-section were fear of labor pain, and fear of harm to the fetus [24]. Social and cultural factors are main contributor to the high cesarean delivery rate in many countries [17, 25]. Nowadays, women in urban settings, desire a perfect baby having little tolerance for risk [17]. Furthermore, women are often inadequately informed about child birth. Some women fear labor pain and lack confidence in their ability to go through vaginal birth [25-26]. For example, Zhu et al. surveyed 50 pregnant women. Half of them were not informed of the birth process, 70% were not confident, and 65% thought that cesarean delivery was less painful and would not affect body shape [27]. Negative attitudes may influence women's or families' decisions regarding mode of delivery. The followings are some statements women made through interviews: "A baby delivered by cesarean delivery is smarter; the head is better shaped" and "Women's body shape and pelvic floor will be better protected by cesarean delivery." [17, 22, 25]. All these factors increase the demand for cesarean delivery despite the fact that the cost of a cesarean delivery is almost twice that of a vaginal delivery on average.

Regarding obstetric causes of elective C-section, the results of our study showed that most women (57.8%) had C-sections due to the repeated C-sections. Nowadays vaginal birth after cesarean delivery is recommended in many maternity centers worldwide. It is believed that a previous history of C-section is not a good reason to repeat it in the subsequent deliveries; and if the transverse cesarean incision is low and also there is no problem of obstetric indications in the recent pregnancy, a vaginal birth after cesarean delivery could be done, provided that sufficient expertise and appropriate facilities and equipment exist [28].

There were significant relationships between some individual characteristics with elective C-section. Murphy et al. suggested that as the mother's education level increases, willingness to cesarean and request for cesarean increase [29].

It should be noted that the rate of CDMR in our study is likely to be underestimated still. The "other" indications category for cesarean delivery is vogue and we were unable to identify it separately. Our findings can be generalized to other similar cities of the country.

Some reasons such as mothers' willingness to C-section and fear of legal issues have changed the nature of cesarean operation and have converted it into a tool for escaping from labor pain regardless of its complications and negative points. Therefore, policy makers should adopt strategies to reduce unnecessary cesareans using appropriate strategies

such as rising mothers' awareness about pregnancy termination methods and reducing the possible complications of C-section and encouraging mothers to choose the preferred delivery method.

Acknowledgements:

This study was founded by the Research Deputy of Zanjan University of Medical Sciences. We thank the personnel of the maternity hospitals in Zanjan for their cooperation. The authors declare that there is no conflict of interests.

References:

1. World Health Organization, Appropriate Technology for Birth. *Lancet*, 2008. 45: p. 436-7.
2. Bertra'n AP, et al., Rates of caesarean section: analysis of global, regional and national estimates. *Paediatr Perinat Epidemiol*, 2007. 21: p. 98-113.
3. Ahmadnia S, et al., Caesarean section in the Islamic Republic of Iran: prevalence and some sociodemographic correlates. *Eastern Mediterranean Health Journal*, 2009. 15(6): p. 1389-1398.
4. Yazdizadeh, B., et al., Caesarean section rate in Iran, multidimensional approaches for behavioral change of providers: a qualitative study. *BMC Health Services Research*, 2011. 11(1): p. 159.
5. Shakeri M, Mazlomzade S, and Mohammadian F, Factors Affecting the Rate of Caesarean Section in Zanjan Maternity Hospitals in 2008. *Zanjan University of Medical Sciences Journal*, 2011. 20(80): p. 98-104.
6. World Health Statistics, World Health Organization. 2009.
7. Hankins GDV, Clark SM, and Munn MB, Cesarean Section on Request at 39 Weeks: Impact on Shoulder Dystocia, Fetal Trauma, Neonatal Encephalopathy, and Intrauterine Fetal Demise. *Seminars in Prenatology*, 2006: p. 276-287.
8. American College of Obstetricians and Gynecologists, Surgery and patient choice, in *Ethics in obstetrics and gynecology*. 2004, ACOG: Washington, DC. p. 21-5.
9. National Institutes of Health State-of-the-Science Conference Statement: cesarean delivery on maternal request. March 27-29, *Obstet Gynecol*, 2006. 107: p. 1386-97.
10. Bettes BA, et al., Cesarean Delivery on Maternal Request: Obstetrician-Gynecologists' Knowledge, Perception, and Practice Patterns. *Obstet Gynecol*, 2007. 109: p. 57-66.
11. Wax JR, et al., Patient choice cesarean: an evidence-based review. *Obstet Gynecol Surv*, 2004. 59: p. 601-16.
12. Hildingsson I, et al., Few women wish to be delivered by caesarean section. *BJOG*, 2002. 109: p. 618-23.
13. Caughey AB, Elective cesarean delivery: when is it justified? *J Perinatol*, 2006. 26: p. 1-2.
14. Hankins, G., S. Clark, and M. Munn. Cesarean Section on Request at 39 Weeks: Impact on Shoulder Dystocia, Fetal Trauma, Neonatal Encephalopathy, and Intrauterine Fetal Demise. *Seminars in Prenatology*, 2006: p. 276 - 287.
15. Singer B and E.c.s.g. acceptance, Elective cesarean sections gaining acceptance. *CMAJ*, 2004. 170: p. 775.
16. Cunningham FG, et al., Cesarean Section and peripartum hysterectomy, in *Williams Obstetrics*, Cunningham FG, et al., Editors. 2010, McGraw-Hill: New York.
17. Zhang J, et al., Cesarean Delivery on Maternal Request in Southeast China. *Obstet Gynecol* 2008. 111: p. 1077-82.
18. Besharati F, et al., Effect of Educational Interventions Based on Theory of Planned Behavior in Selecting Delivery Mode among Pregnant Women Referred to Rasht Health Centers. *Journal of Zanjan University of Medical Sciences*, 2011. 19(77): p. 94-106.
19. Jackson NV and Irvine LM, The influence of maternal request on the elective cesarean section rate. *Journal of obstetric and Gynecology*, 2008. 18: p. 115-19.
20. Belzian JM and Althabe F, Rates and implications of cesarean section in Latin America ecological study. *BMJ*, 2007. 31(9): p. 1397-1400.
21. Guo HY, Xu LZ, and Zhuo YM, An analysis of factors affecting doctor's decision on the selection of caesarean section delivery. *Prac Obstet Gynaecol J*, 2000. 16: p. 32-4.
22. Fu L, Cui M, and Chen J, Analysis of the factors affecting cesarean section rates and indications. *Zhong Guo Shi Yong Fu Chan Ke Za Zhi (Chinese Journal of Practical Gynecology and Obstetrics)* 2003. 19: p. 405-7.
23. Vahid-Dastjerdi M, Assesment Indications, Mortality, Morbidity of C/S In Arash Hospittal. A quantitative Study. *Journal of Tehran University of Medical Sciences*, 2002. 1(3): p. 51-54.
24. Nutall CH, The cesarean caulture of Brazil. *BMJ*, 2009. 320: p. 1080-83.
25. Huang PQ, et al., The changing rate and indications of caesarean section over 12 years. *Acad J Guangzhou Med Col*, 2004. 32: p. 57-62.
26. Yao LW, A study on social factors affecting caesarean section delivery rate. *J People's Liberation Army Nurs*, 2003. 20: p. 17-8.
27. Zhu LP, et al., Investigation on current status of cesarean section and its effects on maternal and infant health in Shanghai. *China Matern Child Health*, 2001. 16: p. 763-4.
28. Shariat M and Majlesi F, Prevalence of cesarean section and its demographic correlates in Tehran. *Payesh*, 2002. 3(1): p. 5-6.
29. Murphy DJ, Stirrat GM, and Herong, The relationship between cesarean section and subfertility in a population-based sample 14541 pregnancies. *Hum Report* 2008. 17(7): p. 7-14.

The Contributing Factors Associated with Breastfeeding duration in Iranian Mothers, 2012Shakeri M, MS.c¹ (Corresponding author), Mojtahedi Y, MD², Rostamkhani F, MS.c¹, Moghadam R, MS.c¹¹Dept. of midwifery, Zanjan Branch, Islamic Azad University, Zanjan, Iran²Dept. of Pediatrics, Tehran University of Medical Sciences, Tehran, Iran

Abstract: Background and objective: Breast milk is an ideal nutrient for newborn babies not only during infancy to ensure health, but also in adulthood to reduce the risk of many chronic diseases. Since there are different breastfeeding patterns in every society, the present research was conducted to find out the contributing factors associated with breastfeeding duration in Iranian mothers, 2012. **Methodology:** In this analytical-descriptive cross-sectional study, a total of 1400 mothers with children of one to three years old (700 girls and 700 boys), who had visited the medical and healthcare centers in Zanjan for their 1-3 year medical care, were randomly selected through cluster random sampling. The data was collected by a questionnaire including individual characteristics and information about the mothers, their children, and feeding with breast milk. Data analysis was done using descriptive-inferential statistics and SPSS. At the first stage, Chi-Square Test, Fischer's Exact Test and ANOVA were used for unvaried analysis. At the next stage, the multiple logistic regression analysis was employed. **Findings:** According to the results, the mean of lactation period was 14±1.8 months and 58% of the mothers had begun breastfeeding their children at the first half-hour after childbirth. Moreover, 34% of the mothers had continued exclusive breastfeeding for 6 months. At 1, 3, 6, 12 and 24 months after childbirth, the breastfeeding rates were 90, 60, 45, 34 and 5 percent respectively. In this study, the lactation period had a significant relationship with mother's knowledge ($p<0.0001$), attitude ($p<0.001$), age ($p<0.001$) and the time supplementary feeding was started ($p<0.001$). **Conclusion:** According to the results, various factors contribute to the lactation period, which could be extended by planning and taking great measures for improvement.

[Shakeri M., Mojtahedi Y., Rostamkhani F., Moghadam R. **The Contributing Factors Associated with Breastfeeding duration in Iranian Mothers, 2012.** *Life Sci J* 2013;10(1):1312-1316] (ISSN: 1097-8135). <http://www.lifesciencesite.com>. 199

Keywords: Breastfeeding, Mothers, Lactation period

1. Introduction:

The main issue of children's health would ensure the future of health in every country all over the world. Proper and clean nutrition is essential in creating and maintaining such vital issue [Riva et al, 2009]. As an ideal nutrient for newborn babies, breast milk not only would safeguards the human health during infancy, but also ensures health and well-being throughout adolescence, young adulthood, adulthood and even old age [Scott et al., 2010]. Breast milk never loses its nutritional value over time and has a vital role as food source even for two-year-old infants, providing up to one-third of all their energy demand. Breastfeeding could make emotional relationship between mothers and their children. It can also prevent several infections and allergies, helping mothers to lose the extra weight gained during pregnancy, reducing the risk of several cancers and preventing osteoporosis and hip fractures [Yang et al, 2004]. In their study conducted on 15 to 18-year-old teenagers, New Zealand researchers intended to find out the effect of breast milk on psychosocial adjustment of adolescents. The obtained results suggested that children who were used breastfed for a longer time, built closer relationship and attachment with their parents [Kaneko et al.,

2006]. Even though great efforts have been made in Iran for encouraging young mothers to feed their children with breast milk, it is critical to annually examine the outcome of such efforts in different parts of the country to measure the breastfeeding rates and the contributing factors [Rostamnejad et al., 2004]. The number of mothers refraining from breastfeeding their babies for various reasons is much [Batal et al., 2006]. According to several studies, around 100% of mothers initially set to breastfeed their child. Within one month, however, this figure drops to 70%. After about 6 months, 20% of mothers continue breastfeeding, and by the end of one year, only 5% of them persist on this important issue [Chandrashekhar et al., 2007]. The breastfeeding trend varies in mothers depending on cultural, social and economic conditions [Scott et al., 1999]. The role of culture and habits of maternal nutrition, feeding and child care is vital and could not be ignored, since it ultimately leads to physical, mental and emotional health [Batal et al., 2006]. The investigation in Zanjan demonstrated that exclusive breastfeeding with mother's milk decreased from 60% in the first month to 26% within 4 months and then down to 12% by the end of 6 months after childbirth [Koosha et al., 2008]. Therefore, the present research was carried out to find

out the contributing factors to lactation period in mothers visiting the medical and healthcare centers in Zanjan during 2012.

2. Methodology

This analytical-descriptive cross-sectional study was conducted on a total of 1400 mothers with children of 1 to 3 years old (700 girls and 700 boys) who had visited medical and healthcare centers in Zanjan. The multistage cluster sampling was used in a way that Zanjan city was divided into four regions including North, South, East and west. Then, two medical centers were selected from each region. Finally, the study samples were randomly selected according to the contribution of each center, considering the sample size and the population covered by the centers. The information was collected by inquiring mothers through a questionnaire containing three sections about mothers' individual characteristics, information about children, and feeding them with breast milk. Validity of the questionnaire was determined through content validity and reliability using test-retest of 95%. Having been collected, the data were statistically analyzed through SPSS, in which the p-value was less than the significant level at 0.05.

First, Chi-Square Test, Fischer's Exact Test and ANOVA were used for unvaried analysis. Having been identified to be separately effective on the lactation period, the variables were next examined together through the multiple logistic regression analysis to observe their collective effect.

3. Findings

According to the results, the average age of the studied children was 12.8 months and standard deviation of sample society was 8 months, and also 64.8% of the mothers ranged from 20 to 30 years old (28.06 on average with standard deviation of 5.56 years). Moreover, 27.5% of them had primary education and 84% were housewife. As for their husbands, 41.8% ranged from 20 to 30 years old (32.63 on average with standard deviation of 6.43 years). 26.7% of had secondary education and 46% were self-employed. Furthermore, 56.8% of the families had one child and 63.5% of them fell under the middle-income class.

According to the results, the median duration of lactation was 14 ± 1.8 months and 58% of the mothers had begun feeding their children with breast milk at the first half-hour after childbirth. Moreover, 34% of the mothers had continued feeding their children exclusively with breast milk. 84.4% of them, breastfed their children (while the children were sick) to sleep at night. 98.8% of them breastfed their children when they were sick. The obtained results indicated that the lactation period dropped from 90% in one month after childbirth to 5% within 24 months. [Diagram 1]

The preliminary analysis of mothers' individual characteristics and their link to lactation period showed there was a significant relationship between the mother's age, education level, mother's knowledge and attitude, child's birth order, and the household size. (Table 1)

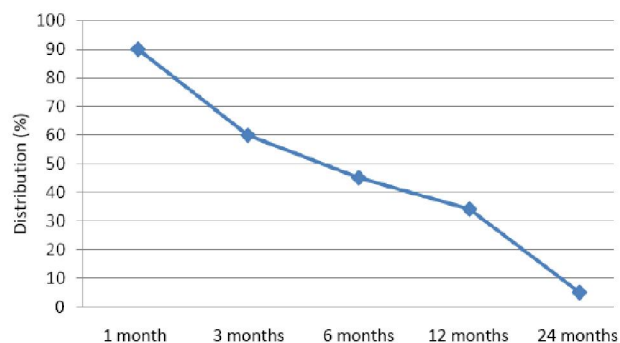


Diagram 1: the distribution of lactation period in mothers visiting the medical and healthcare centers in Zanjan

According to the results obtained from preliminary analysis, the lactation period had a significant relationship with the time that supplementary feeding was started ($p=0.01$), knowledge of correct breastfeeding techniques ($p=0.02$), benefits of breast milk ($p=0.01$), how to set the intervals to breastfeeding ($p=0.04$), the frequency

of breastfeeding in 24 hours ($p=0.000$). Similarly, there was a significant relationship between lactation period and the tool used for feeding the baby with milk powder ($p=0.01$), the use of pacifier ($p=0.01$), the frequency of breastfeeding in a day ($p=0.01$), breastfeeding children when they are sick ($p=0.01$) and breastfeeding to sleep at night ($p=0.01$).

Table 1: A number of contributing factors to lactation period of mothers visiting the medical and healthcare centers in Zanjan

Variable	The lactation period				P	
	Distribution of 6<	Distribution of 6-12	Distribution of 12-18	Distribution of 18-24		
Household size	1330 (95%) <4	911 (68.5%)	224 (16.9%)	106 (8.6%)	103 (7.8%)	0.001
	70 (5%) ≥4	44 (63.8%)	11 (17.3%)	8 (12.4%)	4 (5.5%)	
Child's birth order	896 (64%) 1-2	636 (71.3%)	161 (18.7%)	53 (6.2%)	26 (3.8%)	0.03
	504 (36%) ≥3	372 (74.3%)	60 (12.3%)	32 (7.8%)	20 (4.6%)	
Mother's occupation	Unemployed (5%) 70	50 (72.7%)	13 (18.3%)	4 (6.2%)	3 (2.8%)	0.006
	Employed (95%) 1330	970 (73%)	199 (15%)	93 (7.3%)	46 (4.7%)	
Economic status	Poor (36%) 504	352 (70.3%)	85 (17.5%)	35 (7%)	20 (5.2%)	0.439
	Average (55%) 770	569 (74.1%)	107 (14.7%)	53 (7.7%)	26 (3.5%)	
	Good (9%) 126	100 (80.7%)	12 (10.3%)	9 (6.4%)	3 (2.6%)	
Mother's BMI	Thin (6%) 84	64 (77.5%)	9 (11.9%)	5 (5.8%)	4 (4.8%)	0.231
	Normal (46%) 644	476 (74.5%)	96 (15.7%)	38 (6%)	18 (3.8%)	
	Overweight (32%) 448	331 (74.4%)	71 (16%)	24 (5.3%)	20 (4.3%)	
	Obese (16%) 224	181 (80.7%)	23 (10.5%)	13 (6.5)	4 (2.3%)	
Mother's education level	Uneducated (26%) 364	280 (77.1%)	40 (11.3%)	25 (7.2%)	14 (4.4%)	0.125
	Primary and secondary (6%) 84	71 (85%)	6 (8.7%)	3 (4.6%)	2 (1.7%)	
	High-school (68%) 952	847 (89.2%)	47 (5.6%)	28 (3%)	19 (2.2%)	
	University (6%) 84	59 (71.7%)	18 (22.8%)	3 (3.2%)	2 (1.7%)	
Mother's age	84 (6%) ≤25	57 (68.8%)	9 (18%)	6 (7.2%)	19 (2.2%)	0.0001
	938 (67%) 25-35	712 (76.9%)	121 (13.8%)	56 (5.7%)	2 (2.3%)	
	294 (21%) ≥36	232 (79.8%)	26 (9.8%)	20 (7.3%)	4 (5%)	
Father's age	70 (5%) ≤25	47 (68.8%)	12 (18%)	4 (7.2%)	28 (3.6%)	0.137
	924 (66%) 25-35	674 (73.9%)	101 (11.8%)	73 (8.7%)	10 (3.2%)	
	406 (29%) ≥36	312 (77.8%)	40 (10.8%)	28 (7.3%)	3 (6%)	
Father's education level	Uneducated (21%) 298	223 (75.1%)	38 (13.3%)	20 (7.2%)	46 (5.6%)	0.871
	Primary and secondary (7%) 98	83 (85%)	7 (6.7%)	6(5.6%)	4(2.7%)	
	High-school (70%) 983	874 (89.2%)	74 (7.6%)	58(6%)	24(2.2%)	
	University (23%) 322	228 (71.7%)	64 (20.8%)	16(5.2%)	7(2.3%)	

However, there's no significant relationship between the lactation period and the mother's occupation, BMI (mother's body mass index), education level (Table 1), the family's economic status, the child's gender ($p=0.128$) and whether the child's gender is favorable to parents or not ($p=0.238$). The analysis of variables a long with

using the multiple logistic regression indicate that lactation period had significant relationship with mother's knowledge ($p<0.0001$), attitude ($p<0.001$), age ($p<0.01$) frequency of feeding the child with breast milk ($p<0.01$), and the time supplementary feeding was started ($p<0.001$).

Table 2: the final factors contributing to lactation period of mothers visiting the medical and healthcare centers in Zanjan

Variable	OR	P-value	Confidence interval	
			Low	High
Employed mother	2.12	0.002	1.84	7.64
Unwanted pregnancy	2.34	0.01	2.73	71.8
Household size >5	3.27	0.001	2.34	7.34
Child's birth order ≥3	3.76	0.014	3.31	23.21
Age over 25 years old	14	0.001	10.27	34.67
Satisfactory knowledge of mother	27.3	0.000	34.21	41.2
Positive attitude of mother	56.7	0.001	45.17	50.56
Undernourished children	3.035	0.012	2.32	7.21
Breastfeeding baby to sleep	6.18	0.023	1.78	9.34
Breastfeeding when the baby is sick	5.45	0.012	4.12	7.23
Breastfeeding for more than 7 times a day	6.73	0.021	5.38	9.32
Use of pacifier	3.21	0.011	1.23	12.21
Supplementary feeding within before 6 months	3.23	0.001	2.01	8.71

4. Discussion

According to the results of this study, the mean period of lactation was 14 ± 1.5 months. The observed duration of breastfeeding was similar to case studies in other countries such as Saudi Arabia (Kordy et al., 2009) and Hawaii (Riva et al., 2009), while it was shorter in comparison with other Iranian cities such as Zahedan (Roudbari et al., 2006) and Mazandaran (Veghari et al., 2011). Furthermore, 58% of the mothers had begun breastfeeding their children at the first half-hour after childbirth, which was less than 98% and 85% previously reported by other researchers (Almasi et al., 2006 / Roudbari et al., 2006). The lactation period will be extended if the first breastfeeding is done within 2 hours after childbirth. In fact, mothers who breastfeed their babies within the first two hours after delivery and make early skin-to-skin contact are more likely to breastfeed longer than mothers who never manage to do so. Therefore, feeding new-born infants with breast milk should be started as soon after the birth as possible, since delay in the postnatal breastfeeding can contribute to shortening the lactation period. [Kordy et al., 2009] It is essential to properly train the involved personnel at the health centers, inform them of infant nutrition and offer prenatal educational courses in order to prepare mothers and newborn babies for early feeding with breast milk [Venancio et al., 2009].

According to the results, only 24% of the mothers spent 6 months feeding their children exclusively with breast milk, which is in contrast with what was reported in other studies done by Ayatollahi and colleagues (Almasi et al., 2006) as well as Roudbari et al., 2006. They had calculated the duration of 6-month exclusive breastfeeding to be 69% and 78% respectively. According to the results obtained from the present study, there was no significant relationship between individual characteristics such as the family's economic status, the mother's BMI, education level and the fetal gender. The above results were consistent with the reports given by Almasi et al, 2006 as well as Roudbari et al, 2006. It seems that factors such as the family's knowledge and attitude towards breastfeeding are more effective on lactation period as compared to economic issues. In this study, the duration of breastfeeding in young mothers under 25 years old was shorter than rest of the samples. Experts believe that young mothers tend to breastfeed their babies for a short period because of insufficient information about benefits of breast milk and correct methods of breastfeeding, which altogether leads to shortened lactation period [Camurdan et al, 2008].

Based on results obtained from the present study, housewife mothers are more likely to

breastfeed their babies as compared with employed mothers. Moreover, some researches have shown that lactation period is shorter in employed mothers than housewives [Camurdan et al., 2004]. One of the most common reasons why mothers stop breastfeeding is that they return to work [Chezem et al., 2009]. In this study, the lactation period had a significant relationship with the mother's knowledge about benefits of breast milk, physiology and techniques of breastfeeding. Studies indicate that mothers who are trained how to breastfeed during the prenatal care tend to breastfeed their babies for a longer time [Hoyer et al., 2010]. As researchers have declared, the postnatal breastfeeding education is highly essential for mothers who ought to be informed of several facts including the physiology of lactation, how breastfeeding period is lengthened, how to prevent and control common problems during pregnancy (including breast and nipple), how to treat the adverse events after discharge from hospital, frequency of breastfeeding as well as the law of supply and demand [Cropley et al., 2008]. The results showed a significant relationship between lactation period and proper attitude of mothers. It seems that improvement in attitude of mothers have corrected their attitude.

In this study, the increased frequency of breastfeeding led to extended lactation period, which was longer in children who drank breast milk for over 8 times a day as compared to other children. Furthermore, mothers who breastfed their babies for 10-15 minutes each time tended to have longer lactation period.

According to the results, the supplementary feeding within 6 month after childbirth would shorten the lactation period. As states, early supplementary feeding of infants can decrease the maternal milk production. Leung et al., (2008) believes the sooner supplementary nutrients are given to a child, the shorter lactation period becomes.

5. Conclusion

According to the results, the lactation period of mothers living in Zanzan is relatively short. In this study, various factors were contributing to the maternal lactation period. There are several measures to be taken including an emphasis on correcting the mentioned problematic factors through training mothers and their husbands so as to encourage the parents to feed their newborn babies with breast milk. Since the key to success in breastfeeding requires that we support the mother for acquiring useful knowledge and skills, the physicians, from the first place, ought to learn and trust their experience and then transfer it to others particularly mothers.

Acknowledgement

Authors would like to express their gratitude to all the employees who worked in *child control and vaccination sections* of the medical and healthcare centers and participated in this research project.

References:

1. Riva E, Banderali G, Agostoni C, Silano M, Radaelli G, Giovannini M. Factors associated with initiation and duration of breastfeeding in Italy. *Acta Paediatr.*, 2009; 88(4):411-5.
2. Scott JA, Aitkin I, Binns CW, Aroni RA. Factors associated with the duration of breastfeeding amongst women in Perth, Australia. *Acta Paediatr.* 1999; 88(4):46-21.
3. Yang Q, Wen SW, Dubois L, et al. Determinants of breast-feeding and weaning in Alberta, Canada. *J Obstet Gynaecol Can.* 2004;26(11):975- 81
4. Kaneko A, Kaneita Y, Yokoyama E, Miyake T, et al. Factors associated with exclusive breast-feeding in Japan: for activities to support child-rearing with breast-feeding. *J Epidemiol.* 2006;16(2):57-63.
5. Rostamnegan M, Amani F. Unsuccessful Breast Feeding among Women in Ardabil: Probing the Reasons, 2000-2001. *J Ardabil Uni Med Sciences.* 2004;3(12):31-5. (Persian)
- 6- Batal M, Boulghourjian C, Abdallah A, et al. Breast-feeding and feeding practices of infants in a developing country: a national survey in Lebanon. *Public Health Nutr.* 2006;9(3):313-9.
7. Chandrashekhar TS, Joshi HS, Binu V, et al. Breast-feeding initiation and determinants of exclusive breast-feeding- a questionnaire survey in an urban population of western Nepal. *Public Health Nutr.* 2007;10(2): 192-7.
8. Koosha A, Hashemi *Fesharaki* R., Mousavinasab N. *Breast-feeding* patterns and factors determining exclusive *breast-feeding*. *Singapore Med J* 2008; 49(12).
9. Kordy MN, Ibrahim MA, EL-Gamal FM, Bahnassy AA. Factors affecting the duration of breastfeeding in a rural population of Saudi Arabia. *Asia Pac J Public Health*, 1992-93; 6(1):35-9.
10. Riva E, Banderali G, Agostoni C, Silano M, Radaelli G, Giovannini M. Factors associated with initiation and duration of breastfeeding in Italy. *Acta Paediatr.* 1999; 88(4):411-5.
11. Roudbari M, Moosavi A, Asadi B. Factors associated with the duration of breastfeeding. *Semnan University of Medical Sciences & Health Services* 2006;7(2): 45-50(Persian).
12. Veghari G, Rahmati R. *Breast-feeding* patterns and factors determining *breast-feeding* in In Golestan. *Iran Journal of Nursing.* 2011;24(71):8-17.
13. Almasi H, Saberi H, Moravveji SA. The pattern of exclusive breast feeding in neonates under healthcares in health centers of Kashan city during 2006 Feyz, *Kashan University of Medical Sciences & Health Services* 2010;14(2): 163-168(Persian)
14. Venancio SI, Monteiro CA. Individual and contextual determinants of exclusive breast-feeding in São Paulo, Brazil: a multilevel analysis. *Public Health Nutr* 2006; 9(1): 40-6.
15. Camurdan AD, Ilhan MN, Beyazova U. How To Achieve Long-Term Breast Feeding: Factors Associated With Early Discontinuation. *Public Health Nutr.* 2008;18:1-7.
16. Slusser WM, Lange L, Dickson V, Hawkes C, Cohen R. Breast Milk expression in the workplace: A look at frequency and time. *J Hum lact* 2004;20:164-9.
17. Chezem J, Friesen C. Attendance at breastfeeding support meeting s: relationship to demographic characteristics and duration of lactation in women planning postpartum employment. *J Am Diet Assoc.* 2009;99(1):83-85.
18. Hoyer S, Horvat L. Successful breastfeeding as a result of a health education programme for mothers. *J Adv Nurs.* 2000;32(5):1158-116
19. Cropley L, Herwehe JC. Evaluation of institutional support for breastfeeding among low-income women in the metropolitan New Orleans area. *J Am Diet Assoc.* 2008;120(1):74-79
20. Leung GM, Lam TH, Ho L. Breast feeding and its relation to smoking and mode of delivery. *Obstet Gynecol.* 2002; 99(5 pt 1): 785 – 94.

New actors of international law, reality or dream? (The role of non-state international organizations at international level)

Pooneh Tabibzadeh

Rafsanjan Branch, Islamic Azad University, Rafsanjan, Iran

E-mail: p_tabibzadeh@yahoo.com

Abstract: One of the most important issues of international law is the international law actors. In international law, international organizations and governments are mentioned as active actors of international law and beside the active actors there are non-state organizations and people, freedom movements as passive actors. With the beginning of third millennium and the changes at international system and the importance of non-state organizations is added. Today, non-state organizations beside the intergovernmental organizations have unavoidable role in various international issues. It can be said that today, non-state international organizations including Red Cross, international amnesty and human rights watch have important role in formulation of international rules as war and peace rules and formation of international penalty and the supervision on good intention of the rules. It is believed that today, based on the role of non-state organizations, we can consider these actors at international system as active actors of international law. Finally, Iran as an applied example is investigated.

[Pooneh Tabibzadeh. **New actors of international law, reality or dream? (The role of non-state international organizations at international level)**. *Life Sci J* 2013;10(1):1317-1331] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 200

Keywords: International system; international law; international law actors; non-government organizations

1. The role of active actors in formation, execution and supervision of international rules

The role of countries at international level

According to classic theory, international law is dominating the relations of the countries with each other and international community identifies the countries as international community member and the only object of international law.

The formation of state and non-state international organizations and the development of their activities at international community weakened such theory and proved the unreality of classic doctrine with the change of people location at international law (Ziayi Bigdeli, 2005, 96).

The countries as the most complete political organization and legal institution are the main member of international relations and the only strong institution of the international community forming international relations and play an important role in creating international order.

The countries in formation of international rules are the main factors of international relations as if we view the existing resources of international law, we can trace the countries in its formation including international treaties and their variety and their obligating power based on the general extension of international treaties, the main principles of law, one-directional application of the countries with special conditions, etc.

In addition to the role of international rules, the countries are the main executors of these rules and

if the rules are not executed well by the countries, how we can refer to the legal personality of the countries and their international validity. Based on the consulting view of justice international court regarding the damage to the principles of UN (relating upon international law means having international personality and another one the qualification of having these rights and fulfilling the duties via international statement against the lack of observing these rights, the direct punishment as international law is added to the positive cases. Thus, public international order is arising from the fulfillment of defined obligations of the countries. Indeed, the countries are active in international order and guarantying it as conscious form) (Ziayi Bigdeli, 2008, 18), the countries of their relations with other members of international community with special guarantee including avoiding tension, retaliation or legally, referring to international legal courts and providing international responsibility and compensation of the damages.

The role of international state organizations at international level

State international organizations: They are international entities equal to the constituent countries can play an important role in execution of international rules by constitution formulated by founder countries with permanent principles, financial and human resources.

One of the main indicators of formation of these international organizations is concluding a contract between the founder countries to do a

common goal at international level. Considering the rules of statute, the countries can manifest their collaboration framework in international organization. Thus, the document of establishment of international organizations including the goals of the organization, the principles of behavioral rules of international organization, its limitations and the conditions by which can start and continue their activity (Bikzade, 2010, 120).

The state international organizations based on geography scope and their qualification activity are divided into various classifications but the important thing for them and international organization is benefiting the major part, the qualifications are including: 1- The authority of establishment of diplomatic relations, 2- The option of conclusion of international treaties, 3- The claim in international courts.

The role of passive actors at international level

The passive actors of international law

Based on the changes after first world wide war, the international relations were complete and at international arena, we observed some new personalities creating more stability in this regard. Some institutions as international non-state organizations developing the organized collaborations of people in solving international problems and changed the condition of world community actors as considerably for completion.

The new formations with international rank could be the actors of international stage as freedom movement groups. The difference of these institutions and formations from other intergovernmental organizations is their failure in determining international rules. It is believed that intergovernmental organizations are only organizations creating international rules and other international members as people, freedom movements and non-state international organizations are executors of the rules. Thus, they are considered passive actors (regarding the formation of international rules).

People

A balanced theory is accepted regarding the position of people at international level by which people are international law actors. As in the past, international law was based on the agreement between the countries and Georges Scelle considered people the main actors of international law and believed that people with legal entities and international law as regulating the relations between people.

The contemporary international law supports people rights considered as human rights and know a

person justified for the rights making the countries obligated without explicit or implicit satisfaction.

International law not only considers the people destiny, but also the society of people by relying on the right of people in determining their destiny. This principle is included at the beginning of charter and article 2, 1 with the content that one of the goals of the organization (developing the friendly relations between the nations based on respecting the equality of the nations and their rights in determining destinies, etc). This principle is repeated in article 55 of the chart. In the definition (the right of the nations to determine their destiny), the declaration about (giving independence to the colonial countries and nations) approved by general assembly in 1960 stated :(all nations can determine their destiny and by this right can determine their political condition freely and follow their economical, social and cultural development freely). This sentence is repeated in article 1 of international covenant of economical, social and cultural law and in international covenant on civil and political law. These documents in 1966 by all in general assembly.

Non-state international organizations

According to resolution 288 of social and economical council dated February 27, 1950(any international organization that is not created as the result of conclusion of the contracts between the governments, it is non-state international organization).

Non-state international organizations are divided into two groups:

- Non-state non-profit international organizations
- Profit non-state international organization

Among non-profit, non-state international organizations we can mention the following organizations:

- Red cross international committee
- World organization of supporting intellectual property
- International amnesty
- Trading international organization

But profit, non-state international organizations (multi-national companies) doing wide trading activities in the world.

National freedom movements

As freedom movements defend their rights in favor of them, they should have a good legal position in international system. Here, UN has special position for freedom movements. Now, freedom movement can enjoy the following rights:

- The possibility to attend in various principles of UN as observing member

- The possibility to attend the conferences to formulate international law as observing member
- Benefiting the UN support to observe freedom movements rights in their countries
- Benefiting the war guarantee rights in armed conflicts
- The possibility to be a member in regional international organizations

The governments with special condition

Some of the entities with no complete state legal entities can be the actor of international law as supported countries, supervising land, the countries with special condition as Vatican (Sarir Moqadas)

Non-state international organizations

The role of non-state international organizations in formation, execution and supervising the execution of international rules

According to the authorities of Iran international law: In the current community, the new issue in the current international life is the preparation of human being in all the fields, and common benefits and it is called unity. Unity now is the basis of the third item of human rights including the right on development, environment right, , peace right, the right of common human being legacy and right on communication. Despite two first and second items of human rights, civil, political and economical and social and cultural rights are individual rights and the third item is the collective and common rights (Beikzade, 1995, 15).

The effect of this unity is observed in creations of the organizations consisting of people or the groups of various citizens of other countries being active in the land of some governments. These organizations are non-state organizations. Now, there are 100 types of non-state international organizations in various economical, social, cultural, legal, political, administrative, scientific, technical, sport, tourism, and intellectual fields.

Non-state international organizations are the ones with international public benefit without any profit are created based on the internal rights of the countries by people or groups and have active presence in more than one country.

Regarding the legal entities of international law, non-state international organizations have different views.

Some of the law makers due to the formation of these organizations based on the internal rules of the countries consider without the international entity and some others know it with international entity.

Based on the consultative theory of justice international court in 1949 in damages to UN stated:

(Legal entities not because of the representatives of the governments in an organization but for some of the performances are given at international level).

According to this theory we can say that some of the non-state international organizations due to effective employments in international relations and the effective effects of this relation have some characteristics in consultative theory of justice international court (e.g. Red Cross international organization) with legal international entity. It can be said that the participation of non-state international organizations on international rules change due to their non-political characteristics and less consideration to political issues, it is possible to have the countries encountered with political problems in formulation of international rules, they can deal with this issue better. The relation of state international organizations with non-state international organizations show the increasing need of the state organizations to this relation as the consultative role of non-state international organizations for state international organizations means its international recognition and creates international validity for the organization. This validity causes the reliability and dependency of international community to non-state international organizations and it develops the activity of the organizations.

Information, intellectual, economical resources of non-state international organizations benefited them of special specialization that they claim the powers dedicating to the government's authority and claimed legibility beyond the governments as they know themselves as the direct representatives of people (Symbler, 168, 1999).

The influence of non-state international organizations in formation of international rules

Non-state international organizations by two ways can be effective in formation of international rules, first directly with ratification or formulation of second international rules as indirectly and collaboration with inter-governmental organizations. The participation of non-state organizations is direct in formation of international rules when they themselves present legal texts. Indeed, they play the role of state and governmental international organizations. As ratification of resolutions or formation of common rules. For example, the effect of Red Cross committee in formation of international rules regarding the armed conflict rights as this international non-state organization signed the draft of 10 international conventions regarding the improvement of wounded militants, the behavior with war prisoners, the improvement of the condition of wounded, patients

and drowned individuals of marine armed force and supporting civilians during war and now they are in force in international field. In addition, international Red Cross committee has important role in formation of legal rules on non-international armed conflicts. Since 1863, the international committee of helping the wounded militants raised the issue of helping the non-international armed conflicts wounded people. Civilian war of Spain in 1872 showed the interference of the committee in non-international armed conflicts. This trend was continued in the committee and did its missions in Balkan conflicts during the riot of three states: Bosnia, Herzegovina and Bulgaria without considering conflict.

Red Cross committee held various international conferences about civil wars including Washington (1921), Geneva (1921), London (1938) conferences (Ramezani Qavam Abadi, 2010, 19-28). Red Cross committee in 1937 invited the national population of Red Cross to participate in the commission of experts for review and development of conventions of 1929. The works of experts' commission 1937 was a basis for Red Cross international committee and this reference applied it as providing the draft to initial conference 1946. Indeed, the first draft of Geneva conventions was about non-international armed conflicts presented by international committee of Red Cross.

Red Cross international committee actively participated beside the governments in formation of non-international armed conflicts in diplomatic conferences about humanitarian international rights. Indeed, the first effective step in regulation of non-international armed conflicts at international level was four conventions of Geneva 1949. Since then, the mentioned committee continued its activities in regulating about non-international armed conflicts to 1977.

The indirect effect of non-state organizations in formation of international rules is considered in two cases. Sometimes non-state organizations have the role of counselor and have such influence in the form of collaboration with intergovernmental organizations. The best legal basis in indirect influence of non-state international organizations in consultation with article 71 of UN charter. This article mentioned that (social and economical council can take the required measurements for consultation with non-state organizations working in internal affairs in council qualification. These measurements can go to international organizations to national organizations after consultation with UN member).

The consultation with non-state organizations via conclusion of special agreements between the

organizations and economical and social organizations is done. These agreements are similar to the agreements concluded among the specialized UN institutions with UN organization. We can refer to the consultation agreements concluded between non-state organizations and Europe council and specialized institutions of UN as UNESCO.

These consultations are done as sending the observers of non-state organizations to inter-governmental organizations in the framework of concluded agreements. Deployment of these observers is of great importance specially when they give their comments can affect the rules they want to approve indirectly.

Non-state international organizations are good information source for inter-governmental organizations and governments and are active as collaborator with inter-governmental organizations. In Europe, there are many inter-governmental organizations participating in agriculture, fishing, industry and production with developing countries and African countries (Beikzade, 215,1995).

The role of non-state international organizations in supervision on international rules

The active actors of international law (inter-governmental organizations and countries) support international rules and they play the role of players of the rules. The countries benefit from political motivations in executing the international rules. Sometimes, they don't do the legal rules correctly and justify the lack of execution. The people in organized framework in the role of non-state international organizations watch the execution of legal rules and the performance of guilty governments. The non-state international organizations besides state international organizations and countries play the role of observer and are considered as rival in the field.

As they play the role as equally beside the state international organizations and countries, they obtain the permission of their activities from state international organizations and governments. The evident example is the execution of humanitarian international rules by Red Cross committee in accordance with the permission of Geneva conventions 1949 and additional protocols 1977 including:

- Negotiation with war prisoners without the presence of observer.
- Helping civilians in occupied countries.
- The proposal of participation to facilitate the healthy and secure regions.

Sometimes execution of international rules by inter-governmental organizations is the responsibility of non-state organizations. The evident example is resolution 666 dated 1990 of Security Council of UN.

The Security Council in this resolution gave the priority to non-state organizations including Red Cross international committee to execute humanitarian measurements as the exceptions to the punishments against Iraq after the attack of Kuwait. The main principles of UN in the resolutions issued in recent years asked non-state organizations beside inter-governmental organizations to approve them. The resolution 43/31 on March 20, 1989, 45/100 on January 29, 1991 of general assembly about the humanitarian helps to the victims of natural events, emergency conditions and resolution 794 on December 3, 1992 of Security Council about Somali.

Non-state organizations play their role as rivals and supervisors beside the state international organizations and countries. In case of the extreme activities of the governments to international rules, these activities are revealed and concentrate the international public opinion against them. Regarding the humanitarian fields, these organizations are against the governments and reveal the human rights violation as their serious rival in international communities as human rights council (previous human rights commission) or some reports (Still, Translated by Taqa, 2006, 55). Some of the law makers believe that non-state international organizations affect state factors policies. It means that these organizations play an important role as international supportive networks in changing the government policies via lobby in the measurements of special governments regarding human rights.

Non-state international organizations provide violation cases by various record methods of these images and then by them raise these problems for public opinion. By interview with the asylums, local authorities and medical staffs provide the interviews as reports giving the vital information as abstract to the state international organizations and countries. These organizations collect information from internal groups with the catastrophes. The publications of the information cause the gathering of internal group.

It can be said that to fulfill the rival role with non-state international organizations beside other actors and sometimes the activity of non-state international organizations was considerable and sometimes due to various limitations had some problems. For example, we can refer to two special cases of genocide.

First east Timor independence in 1975 and Rwanda

Non-state international organizations and east Timor

Regarding the independency movement of east Timor, there was a considerable difference

between the government conscious and its success in genocide in 1975 (The date of the first voting for east Timor independency) and the number of non-state international organizations for observing and report was little and in 1999 as non-state international organizations created small supervision network (in East Timor) and global one in this place.

On December 14, 1975 after the declaration of eastern part of small colony of Timor, Indonesian forces interfered to avoid more attracts between rival political forces and occupied the Island. Then, more than 200 thousands of East Timor residents were killed by professional and Indonesian quasi militants. Despite the presence of non-state organizations of Timor Island, some of them had required communication structure to supervise violation cases. International amnesty was present in Indonesia but its concentration was more on affecting Indonesia government via UN and USA with the aim of freedom of political prisoners.

Although Security Council of UN condemned the actions of Indonesia in 1975, 1976, the weak and inexact cover of the condition in America was surprising. In the years after the entrance of Indonesia, USA media imaged the condition only as "civilian war" between the initial groups to control the Island and Indonesia as the supervisor of the school. Since 1977, the media rarely mentioned about the humanitarian violation in that location and Indonesia successfully avoided the entrance of the observers of UN to east Timor.

Thus, due to the limited presence of non-state organizations and UN observers, the international community was not informed of the human rights violation after the attack of Indonesia. In the next decade, non-state human rights organizations formed a global network to publish the information effectively. This increased the consideration of media and the increase of their presence in east Timor.

Then, Indonesia army with voting for independency to east Timor was disagree. Some plans were applied to complete the elections for the benefit of integration of east Timor in Indonesia or don't hold voting. In the previous days before holding independency elections on August 30, 1999, actors of Indonesia by supporting Indonesian authorities threatened the residents of East Timor and after the elections; Indonesian quasi militants and other quasi militants entered East Timor. Thus, ten thousands of eastern people left their houses and most of the houses were destroyed with other infrastructures.

In 1999, despite 1975 UN reacted to these events and on September 20, a peace force with the commandship of Austria was deployed. Despite the

physical costs including humane, etc the condition was different after the attack of 1975 regarding the human rights violation. Indeed, the media play important role in this case because their presence in 1999 in east Timor was more emphasized than 1975.

We don't view the media as playing this role better than non-state organizations; we consider them as an institution that is with non-state organizations interacting with them. First, the presence and improvement of coordination of international organizations in east Timor was since the end of 1970 as the media had direct outputs to publish the collected information by non-state organizations and motivated the international community in involving in east Timor in 1999. However this is true. Some aspects of this issue are important as 1) The presence of a strong NGO network could have the eyes of the international state organizations to know what is happening. 2) Indonesian quasi militants in 1999 despite 1975 by Jakarta authorities found that their behavior is changed.

Rwanda, 1994

To identify the limitation of a supervising system of human rights about Rwanda is good. While Indonesia events observed the efficiency of human rights supervision. Rwanda events showed that supervision is limited.

In 1994, Rwanda government in Arusha agreement, the agreement to share power between Hutu and Tutsi and the Burundi president plane was shot and fell and both them were killed. After this event, extremist Hutu planned an organized genocide against moderate Tutsi and Hutu and after killing 10 Belgian peace supporters by Hutu, Belgium took out the people and UN ignored the completion of UNAMIR force to help Rwanda to execute Arusha agreements in the place and finished the work of the force. Hutu by having the less presence of peace forces massacred 800 Tutsi people within 100 days. The information of non-state human right organizations showed the certainty of genocide but western governments didn't do adequate measurements to avoid or respond it.

As some actions were done in Rwanda, it was late to control mascara. Non-state human rights organizations are informed of their challenges in avoiding human rights violation and they know there are some factors avoiding their care attempts (Still, Translated by Taqa, 2006, 58).

Non-state international organizations and international legal courts

Recent changes of international law showed the increase of international legal courts and extension of new scopes of the new actors affecting the

international relations. The mentioned changes proved this claim that international law is inclined to legalization. Here it created new and non-state norms. It can be said that the activity of these organizations in international and regional proceeding in direct or indirect intervention.

The direct intervention is when the organization is the violation victim of one of the organized rights. The indirect intervention of statute or internal code of some of international courts provided such intervention. The victim can benefit the support of the consultation of these organizations and fulfill in the form of court friends in their participation. The identification of claimants for non-state organizations is depending upon the statute or the rules of legal procedure of international courts.

Non-state international organizations as court friends can participate international legal procedures and their presence not as claimant as "friend" is used and give additional information for the court. We should separate the third intervention in procedure of friends intervention court because the third party is personal not as claimant or working for the behalf of any person. It can participate for a special or general benefit in the legal procedure. The non-state organizations in the role of court friends participate not only in legal procedure but also to search decision making for the case.

These organizations give the information for the definite subject required by the court and in the form of written or oral reports show their comments about contradictory subject. The important point is such that court friend procedure doesn't include the validity of closed affair as it is not considered the claimant organization.

Now, the information of non-state actors is a good source for legal organs as penal court for Yugoslavia and human rights Europe.

The role of international amnesty as the court friend in soaring is considerable because human rights Europe by accepting the comments of this institution was sure about using the applied terms by this institution. Thus, using this procedure and using the information of the organizations in various fields play an important role in guiding the judges and formation of international legal procedure.

Also, justice international court in its consultative comments repeatedly used the comments of non-state international organizations. The court in south western issue directly didn't reject the request of international human rights league in accordance with paragraph 2 article 66 of the statute. This organization on March 7, 1950 required the use of the condition of court friend to present written and oral reports.

The European and American mechanisms of human rights are developed and the intervention of non-state organizations is considered. Despite 1000 non-state active organizations in human rights in the world, some of them give their information to regional courts and this makes court friend employment exclusive.

Now, European court of human rights, African commission of human rights and people, Africa court and European court can directly refer for complaint to these organizations as in cases being the direct victim of human rights violation (ann, Karin, op,pp, 162-164). The comparison of regional legal courts with other legal courts as international justice court or legal branches as trading world organization resolution show the development of court friends trend for regional human rights courts. It is because the classic international legal courts are considered only for the governments.

Human rights European court is an interesting example in which non-state organizations as Rom legal European center in various cases of their participation are applied via court friend institution. Valid non-state organizations can give valid information for the court and European court of human rights in their vote in soaring are referred to the comments by amnesty international.

In American human rights court, non-state organizations can not claim for procedure. These organizations can not ask for consultative vote despite the lack of explication of human rights American convention and internal procedure of statute to court friend institution.

a. The office expert presented a statement for consultative vote to all the governments with claiming right in the court.

b. In addition, the office expert should state directly to any government with claimant right in the court with an international organization with the qualification of giving required information and the court is prepared to receive written statements about the time the chairman determines or hear their statements in the open meeting.

These organizations can present the written comments as court friends. Finally, we can say that non-state organizations participation regarding the execution of international norms of human rights in international proceeding is increased. Non-state organizations are successful to affect international legal procedure. But the participation of these organizations in legal proceeding is not adequate to change their condition and this participation can be considered as a small step to identify international

rights but it is not adequate (Ramezani Qavam Abadi, 2008: 153-172).

2. The role of Red Cross international committee in formation of international penal court

General assembly of UN in accordance with resolution 47/33 on November 25, 1992 asked international law commission of UN to provide international penal statute. The mentioned commission presented its plan on September 1994 to general assembly. In 1995, the assembly decides that by creating an initial committee to establish the court investigates the commission plan. The Red Cross international committee with other actors of court founders attempted to create an effective reference and emphasized on the main point of defining war crimes, applying court qualifications and having an independent prosecutor. Indeed, Red Cross international committee of the initial works followed the definite goals along Geneva four conventions 1949 and additional protocol. It was one of the most important positions of Red Cross international committee to war crimes. This committee on February 14, 1997 presented a document regarding the establishment of international penal court. The recommendations of Red Cross international committee were good, because these recommendations were useful in formulating the statute of international penal court and the recommendations of the mentioned committee entered the court statute (Ramezani Qavam Abadi, 2010, 96-99).

The variety of the activities of non-state international organizations

The activity and performance of non-state international organizations in all economical, social, cultural, etc fields and at international level are observed. If we want to consider the activity of non-state international organizations in a general view, it seems that the most important scopes in which the non-state international organizations are active are human rights, friendly human rights, sustainable development and environment. We attempted to investigate some of the activities.

The performance of non-state organizations regarding human rights

The oldest non-state international organization is anti-slavery association created in 1839. It is the first active non-state organization in human rights. After the Second World War, there were many non-state international organizations of human rights. We can refer to international amnesty, human rights international federation, international commission of law makers and children support association.

We can refer to the role of non-state organizations regarding human rights, improving knowledge about human rights, the attempt for law making and its application in various countries and supervising role on

execution of contracts and agreements, the formation of political groups (Symbler, 1999, 174-175).

The limitations of non-state international organizations of human rights

These organizations due to their specific characteristics, helping people had state limitations, respecting human rights in the countries depend upon its political development of the countries and democracy development. Although legal government can not avoid all forms of human rights violation, this is possible that violation cases are revealed and are compensated. In this trend, human rights non-state international organizations can not be impartial as they don't accept the existing condition in the countries about human rights violation. They want to modify the governments and some rules should be observed that are accepted in obligating documents. Most of the governments rejected of accepting these responsibilities and can not compensate it (Beikzade, 2000, 31-32).

The performance of non-state international organizations in human rights

The international human rights is the set of some rules limiting the benefit of violence in international and non-international armed conflicts (Seyed Fatemi, Seyed Mohammad Qari, 2010, 433).

The major activity of non-state human rights organizations beside state international organizations and people is helping humanitarian aids. The humanitarian aid is consist of providing food, cloth, residency, drug and medical care to the needy or financial support to the organizations doing such actions.

These organizations attempt to help the needy, patients, wounded people, refugees, obligatory migrants, natural events victims and victims of ruthless actions of other people without considering the state limitations as barriers. Because the governments are obliged to accept humanitarian helps. This attitude with international changes regarding humanitarian helps as life right is included in human rights international documents are fundamental human rights and we should add health right. It seems that intervention in a government means humanitarian helps with legal entity (Beikzade, pamphlet, Shahid Beheshti University).

The first human rights international convention in Paris in 1987 titled humanitarian help and the right of this help for all the governments of world community in an international document as the right of victims on humanitarian helps and the obligation of the governments in such helps are recognized. A resolution in 1990 was ratified in general assembly and the governments with the problems of natural events and such conditions were encountered. By the coordination of other governments, inter-governmental

and non-state organizations and it is asked that by the collaboration of other governments, inter-governmental and non-state organizations created immediate ways to distribute drug or food aids.

In addition to the approval of general assembly, security council of UN after the second war of Persian Gulf (the attack of Iraq by Kuwait) by ratification of the resolution in 1991 condemned the civilian riot of Iraq by the authorities of the country emphasized on this fact that Iraq administration should have immediate access to humanitarian international organizations to all the people requiring help in all Iraq and give the required facilities for free action. As:

The ratification of security council in accordance with article 25 of chart is enforced for all members of UN. Regarding the ratifications of general assembly, there are some different views. Some of the law makers considered it as not enforced and know it as a recommendation and it is important. According to item 7 of article 2 of UN charter, it is based on the lack of intervention in domestic affairs of the countries.

Some others by separating the state and non-state international organizations predicted the middle solution. Thus, first group in accordance with item 7, article 2 without humanitarian intervention right. While such prohibition is not considered for non-state international organizations.

One of the humanitarian non-state international organizations is international committee of Red Cross and Red Crescent and humanitarian non-state organizations (Beikzade, 2000, 31-32).

The performance of non-state international organizations regarding sustainable development (environment)

Western law makers divided human rights inspired by conventions to first item or freedom rights, second item or equality right, third item or equality item. Despite two other items, achieving the third issue of human rights besides reference of the governments required the attempts of all people, governments, public and private units and whole international community. The right of healthy environment is one of the important examples of this issue showing the collective participation of all national and international actors and their obligation.

The term environment is the location in which including human being and making the human being in this definition is the first thing attracting the attention of every person.

Historically, there are different views to environment classified into three groups.

1. Serious human center approach: It is immediate benefit of natural resources. In this approach, the view of human being to environment is only for economical needs and it seems that healthy environment right is one of the examples of human

rights item or unity rights and it is one of the examples of human-centered approach.

2. Human centered approach: Despite serious human centered approach, in this approach human being is considered as a part of environment that should be supported as all life forms without considering the benefit for human being. In this method, human being is beside other creatures.

3. Environmental justice: Environmental justice emphasizes on three aspects of justice between human being in dividing the benefit of environment, the justice between current and future generations of human being between all the forms (human being and other types), thus, environment approach is respecting environment only for environment itself not for the benefit for human being (Ramezani Qavam Abadi, 2009, 54).

20 years after the ratification of human rights universal declaration, resolution 2398 on December 3, 1968 of UN general assembly, formation of global convention regarding environment of human being was predicted.

After initial works and considerable experts of UN conference in environment on 5 to 16 June, 1972 was held in Stockholm. The evident characteristic of this conference is universal support of it. The participation of 6000 people including the representatives of 113 governments were the representatives of all international great organizations and 700 observers of 400 non-state organizations and 1500 journalists in this conference turned it to the greatest international event. The position of Stockholm declaration in environment rights and in development field is like the value of human rights universal declaration in human rights field and fundamental rights (Eftekhar Jahromi, 2009, 10). According to the first principle of this declaration, human being should have fundamental rights to have freedom, equality and good life conditions in the environment giving the permission of dignified life. Human being is responsible to improve environment for current and future generations (Amir Arjmand, 2008, 54).

The benefit of having healthy environment and development and their fulfillment requires sustainable development, it is one of the human being dignity completing human rights for current generation and its fulfillment for future generations.

The benefit of having healthy environment with the attempt of 40 years of non-state organizations, international organizations and scientific community as recognized at international, regional and national level.

By identification of the right of environment at international level we observe this right in internal rules of the countries in constitution and internal rules. The governments to do this right should consider four components.

The participation right of the citizens in taking environmental decisions

The right to access to environmental information

The right to environmental education

The right for environmental claim

Sustainable development is the development fulfilling our current needs without making the ability of future generations in fulfilling their needs limited. Thus, in sustainable development, two characteristics are considered.

a. Fulfilling the fundamental needs of human being namely poor people and nations

b. Considering future generation rights in having environmental facilities based on the pressures of social organizations and technology condition on environment.

Sustainable development in international justice was mentioned “ The term sustainable development in the world is the necessity of the peace between economical development and environment protection” (Eftekhar Jahromi, 2009, 12-23).

To achieve sustainable development and under development, not only the governments have important role, but also citizens are active representatives in their development field. The manifestation of the organized participation of the citizens is non-state organizations in development field.

One of the non-state international organizations is “international actions against hunger and international council of environment council of environment rights”. The active non-state organizations in development field has major problem and it is the lack of a strong political administration from the governments in development and it reduces the productivity of non-state organizations in development scope.

In universal report about development in 1991, it was stated that the increase of military budgets, the inefficiency of state companies, the great number of the plans showing a political gesture that a reality, brain drain and capital, extensive improvement destroy the required resources in development scope. The governments by providing a space to release energy of people and required facilities for social and economical development as the first priority and they should develop the goals and use all human capacities. Non-state organizations in development should support such an issue. It seems that only in such a condition, there is the possibility to change (Beikzadeh, 2000, 118-120).

The function of non-state international organizations at international level

The international function of international non-state organizations

UN as the most important global organization at international level is with extensive activity. As previous national community of non-state international

organizations is one of the consultative organs in the framework of their qualification.

Before San Francisco conference regarding the non-state organizations and institutions, there was no organized classification. As general assembly of UN by ratification of resolution 4 in 1946 asked economical and social council to determine an expert committee to classify non-state organizations as some regulations for giving consultative position to non-state organization. The criteria of this committee for non-state organizations of consultative are as following:

1- The organization should be related to the issues in social and economical council qualification and its sub-principles.

2- The goals of the organization should rely on the goals of UN charter.

3- The organization should be obliged to support the activity of UN and according to the goals of nature and its qualifications, the information about the UN activities is increased.

Four main institutions are predicted to coordinate service giving to non-state international organizations in UN.

General information office of UN

The committee of non-state organizations of social and economical council

Communication office of non-state organizations

Communication service of non-state organizations

Social and economical council of UN with investigating the issue, the consultative relations with a non-state organization based on the nature and field of the activities and the aids of the organization to the council or organizations, these organizations are classified into three groups.

The organizations with general consultative position

The organizations with specific consultative position

Roster group

The organizations with general consultative position: The organizations their activities are in line with the economical and social council activities and showed that they can have some aids to achieve the goals of UN. This organization has the right to participate in council meetings and related organs and if there are some suggestions about including an article in the draft, they can present via non-state organizations committee. Some of the organizations are:

The international union of women- rights equality, responsibility equality.

Women international council

International federation of Red Crescent and Red Cross Inter-Parliamentary Union

The organizations with specific consultative position:

It is the organization with limited responsibilities and qualifications and can be active in the issues related to the duties of economical and social council duties. These organizations can attend in open meetings of the council and present their oral and written statements about the related issues in their qualifications and one of the organizations is:

Amnesty international

International council of environment rights

International federation of human rights

Roster group: The organizations with no consultative position with socio-economical council but the UN council with consultation with non-state organizations of the council believe that the mentioned organizations can be useful aids for organs of UN. Non-state international organizations in Roster group list including international association of the teachers of international union of fighting against cancer (Mosazade, 2010, 65-75).

The important achievements of UN in human rights

NO	Date	Subject
1	June, 26, 1945	Assigning UN charter and international justice court statute in San Francisco
2	June 21, 1946	The establishment of human rights commission and women position commission by socio-economic council
3	December 9, 1948	The ratification of convention of genocide punishment by general assembly (entering the enforcement stage in1951)
4	December 10, 1948	Ratification of universal declaration of human rights in general assembly
5	August 10, 1949	Diplomatic conference to conclude international conventions of supporting war victims, ratification of four Geneva conventions about eh improvement of the conditions of wounded and armed force patients in land and sea, behaving with prisoners of war and supporting civilians during war (enforced in 1950).
6	November 20, 1959	Ratification of children rights declaration by generally assembly
7	December 21, 1965	Ratification of international convention of eliminating all forms of racism by general assembly (entering into force in 1969). This convention predicted the establishment of the committee of eliminating racism.
8	December 16, 1966	Ratification of international covenant on Economic, Social and Cultural Rights (entering into force on January 3, 1976) and international convention of civil and political rights with optional protocol by general assembly (entering into force on March 23, 1976) and this covenant stated the establishment of human rights committee (See May 28, 1985).

NO	Date	Subject
9	June 9, 1967	The ratification of resolution (42) 1235 by social economic council and permitting human rights commission and sub-commission of preventing discrimination and supporting the minorities investigating the information of serious violation of human rights and fundamental freedom.
10	November 7, 1967	Ratification of the declaration of eliminating discrimination against women by general assembly
11	May 13, 1968	Ratification of declaration of Tehran by human rights international conference
12	November 26, 1968	The ratification of the convention of not using the time rule for war crimes against humanity by general assembly (entering into force in 1970)
13	December 11, 1969	Ratification of social development by generally assembly
14	November 30, 1973	Ratification of international convention of punishment of racism crimes by general assembly (entering into force in 1976)
15	December 9, 1975	The ratification of the declaration of supporting all people against torture and other behaviors and degrading punishments by general assembly.
16	March 23, 1976	By entrance of international covenant on civil and political rights, international covenant of social, economical and cultural covenant, 10 years after them for governments sign to enforcement (see December 16, 1966), human rights international bill is coming true.
17	December 18, 1979	The ratification of the convention of eliminating all forms of discrimination against women by general assembly (entering into force in 1981). This convention stated the establishment of committee against discrimination against women.
18	November 25, 1981	The ratification of the declaration of eliminating all forms of intolerance and discrimination based on religion and belief by general assembly.

No.	Date	Subject
19	December 10, 1984	The ratification of the convention against torture and other behaviors and ruthless punishments and degrading by general assembly (entering into force in 1981). This convention stated the establishment of the committee against torture.
20	May 28, 1985	The establishment of economical, social and culture rights supervising the execution of international covenant on economical, social and cultural by socio-economical council.
21	December 4, 1986	Ratification of declaration of development right by general assembly.
22	December 9, 1988	The ratification of the support of all people under arrest and women by general assembly.
23	May 24, 1989	Ratification of the principles of effective prevention and researches about automotive capital punishments and condemnations by social and economical council.
24	November 20, 1989	The ratification of children rights by general assembly (entering into force in 1990). This convention stated the establishment of children rights committee.
25	December 18, 1990	The ratification of international convention of supporting the rights of all immigrant workers and their family members by general assembly.
26	December 18, 1992	The ratification of the declaration of people rights of national or ethnical, religious and language minorities by general assembly.
27	May 25, 1993	Ratification of resolution 1993(827) and international penal court to prosecute violation of international human rights in Yugoslavia since 1991 by security council determined in Netherland Hague.
28	June 25, 1993	The ratification of declaration of Vienna by universal conference of human rights.
29	December 20, 1993	The ratification of resolution 141/48 by general assembly to create high united commissar position for human rights.
30	December 21, 1993	The declaration of (1994-2004) of local people by generally assembly.
NO.	Date	Subject
31	February 14, 1994	Declaration of the third (1993-2003) fighting against racism and race discrimination by generally assembly.
32	April 5, 1994	Appointing Mr. José Ayala Lasso José Ayala from Ecuador as the first high commissioner of UN for human rights.
33	November 8, 1994	The ratification of resolution 1994(995) and establishment of international legal court for prosecute massacre and other serious crimes against humanitarian international rights in Rwanda in 1994 by Security Council located in Arusha, Tanzania.
34	December 23, 1994	Declaration (1995-2004) of UN for teaching human rights by generally assembly.
35	January 26, 1996	Declaration (1997-2006) of UN to eliminate poverty by general assembly.
36	September 12, 1997	Appointing Mrs. Mary Robinson from Ireland as the second high commissioner of UN for human rights.
37	June 17, 1998	The ratification of Rom statute for international penal court and establishment of the court located on Hague, by diplomatic conference consisting of Plenipotentiaries.
38	November 19, 1998	Declaration (2001-2010) peace culture for children in the world by general assembly.
39	March 22, 2001	Declaration (2001-2010) of eliminating colonialism by general assembly.
40	August 31 to September 7, 2001	Women's Human Rights Approach to the World Conference Against Racism, Racial Discrimination, Xenophobia and Related Intolerance
41	September 12, 2002	Appointing Sergio Vieira de Mello from Brazil United Nations High Commissioner for human rights.

42	September 8, 2003	Declaration (2003-2012) of literacy of UN, by UNESCO. (Mosavifar, 2003, 63-67)
----	-------------------	---

The regional function of non-state international organizations

Europe and non-state organization council

The collaboration between non-state organizations and Europe council since 1951 was started in the committee for the ministries of Europe council. In this committee, the importance of non-state organizations in promoting Europe council activities was referred. The rules of council relations and non-state organizations were ratified in 1954 and revised in 1960.

Now, consultative position regulation was ratified on October 16, 1972 by council ministries and it is ruling the relations of this council and non-state organizations. According to this code, there is only one non-state organization for consultation of the council. The consultative position can be granted to international non-state organizations specifically showing a non-state organization in their qualification scope and by its activities in a definite section can participate in a organized union with member governments and Europe council to achieve a common aim.

Non-state organizations with consultative position in Europe council should oblige that they apply their maximum attempt to achieve the goals of council and inform the council the secretary of council of their activities considered by the council and give him the required comments and documents in their qualification scope.

Non-state organizations lose their consultative position in the council. When it is proved there is no benefit in fulfillment of the goals of council giving and losing consultative position in the council, when it is proved there is no benefit and role in fulfillment of the council goals or when they ignore their obligations, the giver and rejecting position of consultative position in Europe council is secretary of council unless there is a disagreement from the ministries council or council consultative assembly.

At the beginning of 80s, 244 non-state organizations had consultative position in Europe council.

Non-state organizations participated in the activities of Europe council namely in social, economical, information, environment, culture and human rights fields.

The development of non-state organization activities in Europe council caused that on April 24, 1986 of Strasburg convention was concluded about legal entities of non-state organizations in accordance with council.

Europe Union and non-state organizations

From the end of 70s, the relations between European communities commission (then EU) and non-state organizations are established. The economical community of Europe since 1976 used non-state organizations in its development plans. Europe economical community besides exaction of common plans with non-state organizations gave the immediate food aids with the help of non-state European Union countries in its general assembly being held in Brussels. They determine their representatives in common committee of EU and non-state organizations and in Europe commission. This committee gives 600 non-state organizations to interact with each other and negotiate with Europe parliament and commission.

Non-state organizations and Iran

The condition of non-state international organizations activities in Iran

Any non-state international organization registered with non-profit and non-political goals or humanitarians in a foreign country and request for obtaining an official permission of activity in Iran, in case of having the following conditions can obtain license from the coordinating committee of non-state international organization consisting of ministries, foreign ministry and information.

- a. The mentioned institution with definite statute and responsibility is registered in a foreign country with central office.
- b. A definite plan with acceptable budget.
- c. With no organic dependency upon the governments.
- d. With clear auditing system.

The international non-state organizations with their collaboration or state international institutions execute their plans after ratification in the committee. The institutions are obliged to state the list of their staffs from local and foreign each year to the committee.

These organizations based on their non-profit nature were excepted of paying direct taxes and in case of importing the given goods, the virtual items being imported along the execution of approved plans, after proving the committee from paying the custom rights profit and other tolls are exempted.

Some of the active non-state international organizations in Iran are including:

1- Islamic human rights commission

Islamic human rights commission in winter 1994 was established as a national institution with unlimited legal entities.

The mentioned commissions in accordance with its statute are based on Islamic human rights theoretically

and this doesn't avoid the activities regarding international human rights.

According to the statute, the commission center in Tehran and its branches can be in any region of the world and country.

The goals of commission are including as:

- Determining, education and developing human rights from Islam view
- Supervising the observing of Islamic human rights by real or legal entities
- The presentation of a good solution for taking position against human rights violation namely to the Muslims in all the countries.
- The survey of human rights violation items reaching this commission by various ways.
- The collaboration with national and international organizations of human rights namely the survey of the issues of Islamic Republic of Iran.
- The survey of the condition of Islamic Republic of Iran to the international covenants and conventions regarding human rights of Islamic human rights committee as consisting of four committees as following:

1- Scientific committee

The predicted duties for scientific committee consisting of 8 clergy men and lecturers regarding Islamic rights issues and international law basics as:

- The determination of similarities and differences of human rights in Islam and international human rights rules.
- Determining human rights basics in Islam and providing scientific journal
- Teaching human rights rules
- Responding scientific questions to human rights

1- The committee of internal care

This committee with 10 members and legal authorities familiar with human rights issues has the following duties:

- The planning and formulation of supervision solutions to promote people rights in Islamic Republic of Iran.
- The survey of complaints and reports regarding the quality of observing human rights in Islamic Republic of Iran and detecting the nature of the issue with documents and following them with the collaboration of the secretarial and stating the result to high commission council.

1- The committee of foreign follow up

This committee with 7 members familiar with human rights international issues is formed. This committee is responsible to investigate the quality of human rights actions in various countries in the world.

2- Women committee

The above committee with 8 members of Islamic human rights authorities and women individual and

social rights of women to investigate women problems with the collaboration of scientific committees and follow up.

The Islamic human rights commission in addition to periodical reports to all people each year provided a report on evaluation of the condition of human rights in Islamic Republic of Iran and presented with the recommendations to improve the affairs to President as responsible for execution of constitution to Islamic Republic parliament and present the evaluation report of human rights annually to international institutions including UN and Islamic conference organization (Mosavifar, 2003, 30-32).

1- Humanitarian rights national committee

The necessity of humanitarian rules observing the problems of international and non-international armed conflicts to limit the conflict parties in using the war methods lead into the formation of humanitarian rights national committees in most of the countries in the world including Iran.

The license of formation of humanitarian rights national committee on February 1, 1998 from ministry board of Islamic Republic of Iran was issued during which Red Crescent was a qualified reference for the head of committee chairman.

The committee code was provided by legal office of Red Crescent and was held on September 11, 1999.

This committee was a non-profit institution with independent legal entity with the aim of promotion for executing humanitarian rights at national level and participation and observing humanitarian rights at international level.

The principles of the committee are including:

- Chairman
- Secretaries
- Council
- Secretariat

The duties of the committee are including the following:

- 1- The decision making about the execution of humanitarian rules at national level and in the frame work of current rules
- 2- The supervision on observing humanitarian rights at national level
- 3- Educating and promotion of humanitarian concepts among armed forces, people at various academic levels.
- 4- Presenting the recommendation of approving the rules to observe humanitarian rights and the recommendation of joining of Islamic Republic of Iran to international contracts.
- 5- Presenting consultative comments regarding the determination of humanitarian rules
- 6- Following up supporting affairs of all people including international humanitarian rights including the following:

- a. Following the affairs of entrance, residency and deport of the refugees
- b. Following the affairs of foreign prisoners in Iran and prisoners and Iranian prisoners in the abroad
- c. Following the affairs of war wounded people namely the victims of mass destruction weapons
 - 1- Explanation and promotion of the comments of Islamic Republic of Iran for humanitarian rights to present to national and international institutions with coordination of foreign ministry.
 - 2- The collaboration with regional and international organizations to promote humanitarian rights with the collaboration of foreign ministry.
 - 3- Following humanitarian rules violation cases at international level and presenting the report to international communities.
 - 4- The collaboration and exchanging scientific and research information with local and international courts about humanitarian rights.

3. Conclusion

From the view of classic international rights of the countries and intergovernmental organizations are the only active actors of international field. But it seems that beside the important law makers, there are other actors their nature is different from previous policy makers but their aim is close and similar to governmental international organizations and countries. Based on consultative comments of international court in compensating the damages to UN “ following international law doesn’t depend upon the structure and nature of legal entity and depends upon the employments and the influence of their performance at international level”.

Thus, by reviewing the non-state international organizations without state nature or contaminated with political motivations, with higher goal as supporting international environment security and they entered the international field and for regulating international relations dealt with the international rules, supervising the correct execution of the rules. By reviewing the non-state international organization activities like international Red Cross committee, international membership organization, inter-parliamentary union, etc found that non-state international organization is a community of the people in accordance with internal law of the country, formed an institution with public interest regarding various economical, social, humanitarian, environment protection fields that can be at level with state international organizations and countries as collaborator and rival to form international rules ad directly as the role of Red Cross committee in forming four conventions of Geneva and the rights of non-international armed conflicts or indirectly as consultant in decision taking of other international institutions (intergovernmental organizations and countries). For

example, the attempts of international amnesty in encouraging convention 1984 against torture.

Thus, from international aspects, non-state international organizations affect political considerations of the countries and intergovernmental organizations and put on agenda some of the issues at national and international level. Thus, in decision making and creation of new rules, they participate and supervise the execution of these rules and resolution of the differences of them. For example, international amnesty regarding organized human rights violation in the country is occurred and international amnesty takes the attention of public opinion over the world about that country. It asks UN inputs to take position to that country and put pressure on the authorities of the country. We can refer to the performance of amnesty international in 90s about Sudan, Chad, southern Korea and etc.

Non-state international organizations construct various networks and deal with the data analysis and collection and oblige state international organizations and governments to achieve their goals.

From the view of UN, non-state international organization participates increasingly in the activities of the organization namely in humanitarian issues, human rights, environment and development and regarding the ratification of universal conventions (Universal conventions of cluster weapons in 2008) negotiate effectively with UN. We can say that authorities in the world in item 30 of millennium declaration stated that we are determined to dedicate more facilities to non-state organizations and civil community to help more in fulfillment of UN plans. Thus, we observe good preparation for more collaboration of these institutions with UN.

In terms of the participation of non-state international organizations in international legal courts, the mentioned organizations in the form of court friends entered the investigation and by presenting information and explaining the issues helped the clarification of the realities and achieving just vote to supervising court.

Locally: Non-state international organizations have unavoidable role in various aspects of development, supportive, service, empowerment and information fields. Thus, the governments should view them as powerful execution organs to fulfill social, economical and cultural development. Thus, presenting solutions for active role of the organizations in the internal arena. For example, presenting good models about the presence of these organizations with state principles and organizing their relations among government sovereign institutions and their interference in fundamental decision making as directly and presence in resolving the problems for non-state international organizations in the internal

courts of the governments can facilitate the international activities of the organizations and promoted the role of civil community at international level (it can be said that Iran is not an exception).

It seems that it is better beside intergovernmental organizations and countries use non-state international organizations as active actors and paved the way to manifest the effects of these institutions and encouraged the countries to interact as co-worker not rival with these institutions.

Corresponding Author:

Pooneh Tabibzadeh
Rafsanjan Branch, Islamic Azad University,
Rafsanjan,
Iran
E-mail: p_tabibzadeh@yahoo.com

References

- 1- Eftekhari Jahromi, Gudarzi, Human rights, Environment and sustainable development, Legal research journal. 2009. No. 50.
- 2- Aqayi, Seyed Davood. International organizations. Edalat publications. Edition 6. 2008.
- 3- Amir Arjmand, Ardeshtir, Environment protection and international unity. Legal research journal. 1995. No. 15.
- 4- Brent, Still. Translated by Ahmad Reza Taqa. Non-state international organizations and supervising genocide. Human rights research. 2006.
- 5- Beikzadeh, Ebrahim, Non-state organizations and international law. Legal research journal. Law school of Shahid Beheshti. No. 31, 32. 2000.
- 6- Beikzadeh. Ebrahim. The international rights of organization. Majd publications. First volume. Tehran. 2010.
- 7- Beikzadeh, Ebrahim. The influence of non-state organizations in formation of international rules. Legal research journal. Law school of Shahid Beheshti University. No. 15. 1995.
- 8- Beikzadeh. Ebrahim. General international law 2. Pamphlet. Law school of Shahid Beheshti University.
- 9- Taqizadeh Ansari, Mostafa. The rights of international organizations. Tehrna. Qumes. First edition. 2001.
- 10- Ramezani Qavam Abadi, Mohammad Hossein. The presence of non-state organizations in legal international courts. Law journal. Law and political sciences school. 2008. No. 38.
- 11- Ramezani Qavam Abadi, Mohammad Hossein. The participation and role of women in environment international law. Women studies.2009. No. 37.
- 12- Ramezani Qavam Abadi, Mohammad Hossein. The role of international committee of Red Cross in formulation of non-international conflicts. Khorsand publications. 2010.
- 13- Seyed Fatemi Seyed Mohammad Qari, Human rights in contemporary world. Second office. Shahr Danesh. 2010.
- 14- Symber, Reza. Non-state organizations and their penetration in world community. Political, economical information journal. 1999. No.147.
- 15- Ziayi Bigdeli, Mohammad Reza. General international rights. Ganj Danesh. Tehran. 17th edition. 2002.
- 16- Ziayi Bigdeli, Mohammad Reza et al. The consultative comments of international justice court. First volume. Allameh Tabatabayi University.2008.
- 17- Askari, Poria, The relations of UN and non-state organizations in the view of change. Legal research journal.2009. No. 15.
- 18- Maqami, Amir. The influence of non-state international organizations on internal rights with emphasis on FIFA. Legal research journal. 2009.No. 15.
- 19- Mosavaifar, Razieh, Human rights institutions in Islamic Republic of Iran and UN. Law and political sciences publications. Tehran. University. Fall 2003.
- 20- Mosazadeh, Reza. International organizations. Mizan rights foundation. 2010. Edition 15.
- 21- Vaezi, Tayebe and Mohsen Sadeqi, The barriers of formation and efficiency of non-state organizations in Iran. Law research journal. 2009. No.15.
- 22- Hashemi, Mohammad. Human rights and fundamental freedom. Mizan. Tehran. First edition. 2005.
- 23- Ann-Karin Lind bbm . op pp 162-164
- 24- http://www.hoqouq.com/low/aryicle_464.html 2007-02-21
- 25- http://www.uia.org/legal/app_411.php 2007-02-21
- 26- <http://www.un.org/news/press/docs/2008/sgsm11774.doc.htm>
- 27- <http://www.hawzah.net/per/magazine/nm/014/nmo14/3.asp> 2008-02-25
- 28- <http://www.ostan-kh.ir/default.aspx/tabid-99>
- 29- Muller a .s :international organizations and their host states aspects of their legal relationship “ kluwer .the Hague 1995
- 30- Ngo 89 international non governmental organizations enjoying consultative status with the council Europe Strasbourg 1989, 232 page
- 31- Report of the secretary general: arrangements and practice for the interaction of non governmental organization in all activities of the united nation “un.doc a/53/170.10 july.1998.

11/6/2012

Evaluation of Some Material Properties of Cercon Fixed Partial Dentures

Yaser M. Alkhiary

Oral and Maxillofacial Department, King Abdulaziz University, Faculty of Dentistry, , Jeddah, Saudi Arabia
yalkhiary@kau.edu.sa

Abstract: Purpose: Metal-ceramic fixed partial dentures (FPDs) are limited in actual application due to the aesthetic appearance; in fact, they do not satisfy the current market demands for increased aesthetics. In contrast, new ceramics, such as Cercon[®], meet these market needs for FPDs. The use of Cercon FPDs has increased substantially to avoid the aesthetics problem associated with metal-ceramic restorations. **Methods:** The present study was designed to evaluate a new generation of zircon-ceramic material (i.e., Cercon[®]) recommended for three- and four-unit FPDs. More specifically, marginal accuracy, fracture strength, and the nature of interaction between the resin cement and the zirconia core material were investigated. **Results:** The results revealed no significant difference in the marginal gap between the premolar and molar in the case of three- and four-unit FPD. However, a significant difference was observed in the interaction of the gap distance between the molars in three- and four-unit FPDs. Moreover, the fracture strength was increased by sandblasting the Cercon[®] material. **Conclusions:** In this in-vitro study, we concluded that Cercon FPDs can be easily milled with marginal accuracy and sandblasting the Cercon FPDs increase the fracture strength than treating the material with phosphoric acid.

[Yaser M. Alkhiary. **Evaluation of Some Material Properties of Cercon Fixed Partial Dentures.** *Life Sci J.* 2013; 10(1):1332-1337] (ISSN: 1097-8135). <http://www.lifesciencesite.com>. 201

Keywords: Zirconia ceramic , CAD/CAM, Marginal discrepancy ,artificial aging ,Fracture strength

1. Introduction

Currently, the interest in computer-aided design (CAD)/computer-aided manufacturing (CAM) systems in dentistry is growing because these systems can decrease the costs associated with manpower and labor-intensive laboratory processes related to the traditional means of producing dental restorations. Also, these systems are used today in the processing of high-strength ceramics, such as zirconia or alumina. The intrinsic advantages of this technology for dental restorations include the ability to produce a precise fit and customized design, simple handling characteristics, and time saving production processes. In addition, the CAD/CAM components are extremely homogenous and biocompatible.¹

Metal restorations can cause gingival discoloration, and the surrounding soft tissue may have an unnatural appearance; therefore, demands for dental restorations that offer a better aesthetic appearance and fear among the public concerning alleged adverse effects of dental metals and alloys have increased demand for aesthetically improved and biocompatible materials. As such, ceramic restorations are preferred due to their biocompatibility and aesthetics. Multiple clinical studies on the use of all-ceramic crowns and resin bonded FPDs have been documented. The use of a strong durable resin bonded to all-ceramic FPDs provides high retention.²⁻⁶ Restoration provides good marginal adaptation, prevents microleakage, and increases the fracture resistance of the restored tooth. Giordano⁷ concluded

that the successful use of an all-ceramic material is dependent on clinical conditions, and low stress areas could successfully use restorations made of low strength castable materials such as In-Ceram Spinell or Empress 2. High stress areas require restorations made of In-Ceram alumina and In-Ceram zirconia.

Indeed, the advent of zirconia ceramics used in conjunction with computer technology has been a boon for dental science and the dental industry. This specific “zirconia dream” could be defined as “the general clinical application of a highly biocompatible zirconia ceramic material that is resistant on a long-term basis to all thermal, chemical, and mechanical impacts of the oral environment in a wide range of dental restorations.”⁸

Currently, yttrium oxide partially stabilized zirconia (Y-PSZ) is of special interest due to its superior mechanical properties as compared to other dental ceramics. Zirconia (ZrO₂) is a ceramic material with adequate mechanical properties for manufactured medical devices. Zirconia is a crystalline dioxide of zirconium. Its mechanical properties are very similar to those of metals, but its color is similar to that of a healthy tooth. Yttrium oxide is added to zirconia as a phase stabilizer to maintain the high temperature tetragonal phase (t), thereby reducing spontaneous transformations into the monoclinic phase (m) at room temperature. The spontaneous transformation of t into m is known as “aging,” and the t→m transformation is believed to cause the degradation of mechanical properties of the

material.^{9,10} Therefore, the addition of this material has improved the optical and mechanical properties of the ceramic and has created differences in the microstructure and mechanical properties of the resulting ceramic due to the reduction of the undesirable transformations (i.e., from the tetragonal to the monoclinic phase), thereby protecting against flaw propagation and fractures under a load.^{9,10}

Some physical properties of zirconia must be considered. Indeed, in addition to the inherent color that is similar to teeth, the material is also opaque.¹¹ This can be advantageous for the technician; i.e., when a dyschromic tooth or a metal post must be covered, a zirconia core can be used to conceal this undesirable aspect. Also, this material is very useful when monitoring the marginal adaptation through radiographic evaluation.¹²

An *in vitro* evaluation confirmed that zirconium oxide is not cytotoxic.^{13, 14} No allergic reactions to ZrO₂ are expected, making it an ideal option for patients who suffer from a metal allergy. Moreover, there is no danger of corrosion, and this material is a very poor chemical and electrical conductor and withstands changes in temperature. Additionally, restorations made of all-ceramic material are suitable for restorations in the anterior and posterior regions.^{13, 14} The use of ceramic restorations to restore missing posterior teeth is certainly desired by all practitioners. Zirconium oxide is the material of choice and will resist forces beyond that of typical mastication.¹⁵

Koutayas *et al.*¹⁶ and McLaren¹⁷ evaluated the influence of the design and the mode of loading on the fracture strength of all-ceramic FPDs bonded with resin cement and concluded that a dynamic load significantly affected the fracture strength due to microleakage at the interface between the restoration and the cement. Rosentritt *et al.*¹⁸ evaluated the fracture strength of different all-ceramic FPDs and concluded that zirconium oxide ceramic showed the highest fracture strength value as compared to that of In-Ceram and Empress 2 fixed restorations.

The geometrical design of long span FPDs and the difficulties associated with the milling process of brittle ceramic materials contribute to significant differences in the marginal discrepancies of these restorations. Yet, the level of marginal fit in alumina and zirconia FPDs created with the direct ceramic system meet clinical requirements. Tinschert *et al.*¹⁹ and Hauptmann and Reusch²⁰ revealed that the glass ceramic for posterior three-unit FPDs should have a connector cross section of 16 mm² at minimum. Interestingly, zirconia overcomes these limiting factors, they also concluded that posterior FPDs made of zirconium oxide with a cross section of 9/12/9 mm² at the connector areas can be used for FPDs while still

providing sufficient mechanical properties. Luthy *et al.*²¹ concluded that zirconia stabilized with yttria in 3 mol% frameworks demonstrated high load leaving capacities. In four-unit posterior FPDs, the framework required a connector size that was greater than 7.3 mm².

White *et al.*²² found that zirconia offers many advantages when compared to existing core materials. The performance of layered zirconia had not been previously evaluated. A significant difference in leakage was found between all-ceramic groups cemented with different luting agents. The least amount of leakage was found in groups cemented with adhesive resin composites, followed by compomer cement. The highest amount of leakage was found in groups cemented with zinc phosphate cement. Ultimately, adhesive composite luting cement demonstrated acceptable clinically marginal discrepancies.²³

The margins in the Cercon system were also satisfactory for clinical use. The dimensional stability of Cercon was maintained during the firing and glazing of the porcelain.²⁴ Scanning Electron Microscopy (SEM) and infrared spectrophotometry of the ceramic surface treated with silicate, aluminum oxide, and zirconium oxide ceramics revealed a good bond to the luting composite.²⁵ Chepman *et al.*²⁶ evaluated the flexural strength of high temperature ceramics after restoration and concluded that the flexural strength is not affected by sandblasting. The heat treatment of the zirconia core reduced the flexural strength of the core after the first firing, but the untreated specimens showed a statistically significant higher flexural strength and no significant surface roughness.²⁷ The cyclic fatigue behavior of zirconia in water makes it an appropriate material for the fabrication of all-ceramic, multi-unit posterior FPDs.²⁸ Moreover, zirconia based ceramics possessed significantly higher flexural strength than lithium disilicate ceramics.

The failure loads of different zirconia based, all-ceramic FPDs were evaluated before and after artificial aging.²⁹ Forty-eight zirconia frameworks for three-unit FPDs were fabricated using three different manufacturing all-ceramic systems. No significant differences were found in comparisons between the groups before artificial aging; indeed, all tested restorations have the potential to withstand occlusal forces that are applied in the posterior region and could be an alternative to metal-ceramic restorations.²⁹ Oh and Gotzen³⁰ stated that the fracture of ceramic FPDs tend to occur in the connector areas because these stress concentration fractures of all-ceramic restorations are initiated at the center of the gingival embrasure toward the occlusal loading on the pontic. Since this issue is very

important, the aim of our study was to evaluate some properties of CAD/CAM Cercon FPDs (i.e., the marginal discrepancy, fracture strength, and the interaction between the resin cement and the zirconia core material).

2. Materials and Methods:

A copper metallic master model was designed for three- and four-unit posterior FPDs. The diameter of the abutment was 7.0 mm or 11.0 mm corresponding to the premolar or the molar, respectively. The preparation of the abutment included designing an axial surface that had a taper of 7 degrees, and the abutment periphery was designed as a round shoulder finishing line that was 1mm in thickness. An edentulous area of 8mm simulated three-unit FPDs, while an edentulous area of 17mm simulated four-unit FPDs. The occlusal surface was designed as a flat surface. All connectors were fabricated with a gingival curvature of 0.45 mm to standardize the influence of the connector design on the fracture strength of the Cercon FPDs.

The metallic master model for the posterior FPD abutment was duplicated with additional silicone

rubber material (Rapid, Coltene AG, Altstätten, Switzerland) to make a working cast made of hard stone (Dentstone KD plaster All Packing company, UAS) for the CAD/CAM system to follow for the computerized design of the framework. A Cercon machine (Degudent GmbH, Hanau-Wolfgang Dentsply International Co., Germany) was used to fabricate Cercon FPDs. It consisted of Cercon art software and a scanner in the Cercon brain unit used for milling Cercon FPDs (Figures 1a, b, c).

The Cercon heat unit is a sintering furnace. Cercon recommends a sinter temperature of 1350°C for 6 hours. A pre-sintered Cercon base with length of 30 mm and 38 mm length were used for three-unit and four-unit FPDs, respectively. The scanning and milling Cercon procedure takes about 50 or 65 minutes for three- and four- unit FPDs, respectively. The Cercon base is secured in the milling frames, and the milled framework of the FPDs is about 30% larger than the final restoration to compensate for sintering. Sintering is required to achieve maximum strength for the presented blocks.



Figure (1 a, b, c): Cercon machine

Measuring of marginal accuracy

Twelve frameworks were prepared for each FPD design (i.e., three- and four-unit FPDs). The sintered frameworks were checked on each die to see that it fit at the margin (Fit checker, GC, Tokyo, Japan) in order to achieve the best possible fit. A stereomicroscope (Olympus Zoom Stereo Microscope, Japan, Model NO. 521145 TRPT) was used to measure the marginal gap at the premolar and molar for three- and four-unit FPDs.

Measuring of fracture resistance

A total of twenty Cercon frameworks were divided into two groups. Group I was three-unit FPDs, and group II was four-unit FPDs. Then groups I and II were subdivided into subgroups (i.e., group I subgroups a and b and group II subgroups c and d). Group I subgroup a and group II subgroup c were treated with 37% phosphoric acid for 2 minutes, while group I subgroup b and group II subgroup d were sandblasted with 50-micron aluminum oxide. After the surface treatment step, all groups were then covered with Cercon ceram. To the test model, the frameworks were cemented with resin cement Panavia F (Kuraray Co, U made, Kita Ku Osaka 530,

TaPan). Then, the castings were embedded in epoxy resin blocks (Kemapoxy 165, Egypt).

The fracture strength was measured using a universal testing machine (Comenten Industries, Inc., St. Petersburg, Florida, USA). The load was applied in the middle of the pontic or connector area of the three- and four-unit FPDs at a cross head speed of 5 mm/sec for all groups until fracture. The results were collected for all groups, and readings were taken at the peak value.

Analysis of Interfaces

The interaction between the Cercon core and the resin cement was studied using infrared spectroscopy (Bruker Vector spectrophotometer, Biodirect, Taunton, MA). Samples of the Cercon core, the resin cement, and the Cercon core with resin cement were ground into fine particle powders. Each powder was mixed with 2% potassium bromide using a hydraulic press to form a disk from each sample. The samples were analyzed using infrared spectroscopy to obtain absorbance bands between 4000 cm^{-1} and 400 cm^{-1} . The results were recorded photographically to study the nature of the interface.

Statistical analysis

All statistical analyses were performed using the Statistical Package for Social Sciences (SPSS/ version 17) software. More specifically, the means, standard deviations, and standard errors of means were determined. Comparisons between groups were done using the Student t-test value of significance at 5 percent.

3.Results

The mean marginal gap for milled ceramic three-unit FPDs with the master die at the premolar and the molar region was 58.50 ± 2.0 and 58.76 ± 3.41 microns, respectively. In contrast, the mean value for the four-unit FPD at the premolar and molar region was 65.24 ± 5.40 and 68.34 ± 4.52 microns, respectively, which was not significantly different as shown in Table 1.

Table 1: Mean marginal gap (microns) for the three-unit and four-unit milled ceramic FPDs

FPD units	Mean \pm SD	SEM	<i>p</i>
Three-Unit			0.887
Premolar	58.50 ± 2.0	0.89	
Molar	58.76 ± 3.41	1.53	
Four-Unit			0.354
Premolar	65.24 ± 5.40	2.41	
Molar	68.34 ± 4.52	2.02	

p = *p* value for Student t-test

A comparison of the premolars in the milled ceramic three- and four-unit FPDs showed no significant changes between the two, while a comparison of the molar region in three- and four-unit FPDs showed a statistically significant difference at the 5% level (i.e., *p* = 0.002) as shown in Table 2.

Table 2: Mean marginal gap (microns) of the premolar and molar in milled ceramic FPDs

FPD units	Mean \pm SD	SEM	<i>p</i>
Premolar			0.053
Three-Unit	58.76 ± 3.41	1.53	
Four-Unit	65.24 ± 5.40	2.41	
Molar			0.002*
Three-Unit	58.50 ± 2.0	0.89	
Four-Unit	68.34 ± 4.52	2.02	

p = *p* value for Student t-test

*: Statistically significant at *p* \leq 0.05

The mean fracture strength for the three-unit FPDs in group I (a) and the four-unit FPDs in group II (c) (i.e., dentures treated with 37% phosphoric acid) was 1977.60 ± 5.32 N and 1175.80 ± 5.81 N, respectively. A comparison of these groups revealed a statistically significant difference at the 5% level (i.e., *p* = 0.001). A comparison between group I (b) and group II (d) (i.e., dentures sandblasted with 50 micron

aluminum oxide) showed no statistically significant differences (Table 3)

Table 3: The mean and standard deviation of the fracture load in Newtons (N) for milled ceramic three- and four-unit FPDs

Phosphoric acid treatment		Mean \pm SD	SEM	<i>p</i>
3-unit	Group I (a)	1977.60 ± 5.32	2.38	<0.001*
	Group II (c)	1175.80 ± 5.81	2.60	
Sandblasting treatment	Group I (b)	2295.80 ± 4.97	2.22	
	Group II (d)	1289.34 ± 3.01	1.35	

p = *p* value for the Student t-test

*: Statistically significant at *p* \leq 0.05

A comparison of the fracture strength in three-unit FPDs treated with phosphoric acid and sandblasting showed a significant difference (*P*=0.001). Also, significant changes were observed between group II (c) and (d) (*P*= 0.001) as shown in Table 4 .

Table 4: Comparison between the fracture load (N) of FPDs treated with phosphoric acid versus those treated with sandblasting

No. of units	Groups	Mean \pm SD	SEM	<i>p</i>
3-unit	Group I (a)	1977.60 ± 5.32	2.38	<0.001*
	Group I (b)	2295.80 ± 4.97	2.22	
4-unit	Group II (c)	1175.80 ± 5.81	2.60	
	Group II (d)	1289.34 ± 3.01	1.35	

p = *p* value for the Student t-test

*: Statistically significant at *p* \leq 0.05

Infrared Spectroscopy

Infrared spectroscopy was done to study the interaction of Cercon with Panavia cement and Cercon with veneer. The results were recorded photographically and shown in Figures 6, 7, and 8.

The infrared spectrum revealed the disappearance of some bands, minor shifts in some with increasing intensity bands, and minor shifts in others. Only a minor percentage appeared in the range of 1088cm^{-1} and 1014cm^{-1} .

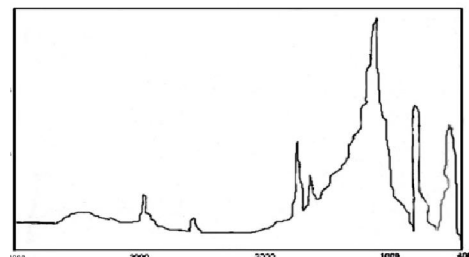


Figure 6: Infrared spectrum of the Cercon framework

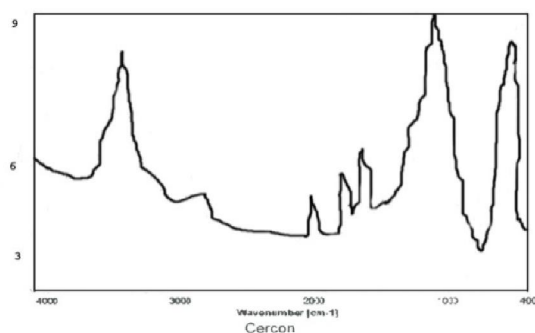


Figure 7: Infrared spectrum of the Panavia cement

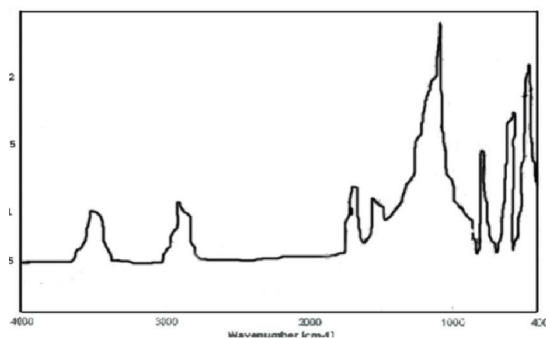


Figure 8: Infrared spectrum of the Cercon and cement

4. Discussion

In recent years, the clinical use of all-ceramic crowns has increased due to their excellent qualities in terms of aesthetics and biocompatibility. The success of all-ceramic crowns has led to the use of three- and four- unit all-ceramic FPDs. Advances in CAD/CAM systems have allowed dentists to use 3 vol% yttrium stabilized tetragonal zirconia polycrystals (Y-TZP). In our study, yttrium oxide was added to pure zirconia as a stabilizer and to form a new material known as Y-PSZ, which is sufficiently hard to be used in the molar region.³¹ This material has improved optical and mechanical properties and differences in its microstructure and mechanical properties due to the reduction of undesirable transformations (i.e., from the tetragonal to the monoclinic phase), thereby protecting against flaw propagation.³² Also, Y-PSZ has a polycrystalline microstructure that resists crack propagation. For the construction of Cercon fixed partial dentures, a wax pattern constructed by laser beam amplified the size by about 30% to compensate for the shrinkage from sintering. The Cercon block was partially sintered to facilitate a faster milling process. Then, the block was sintered after milling to increase the strength properties.^{32, 33}

The results of this study revealed that the differences in fracture load was significant between three- and four-unit FPDs treated with phosphoric

acid, but no significant changes were observed in three- and four-unit FPDs that were sandblasted. The increase in the fracture load in the case of sandblasting the Cercon core may be caused by the increase in the surface area of the Cercon core. More specifically, the increased surface area may permit a more intimate contact between The Cercon core and the Cercon crown. These results are in agreement with the results of Champman *et al.*²⁶ who evaluated the fracture resistance of Y-TZP FPDs under static load and found that failures under loads for all-ceramic FPDs typically were initiated at the gingival embrasure. Therefore, the radius at the gingival embrasure must be increased and standardized in all specimens.³⁰ Also, he found that the crown margin; shoulder or chamfer, types of cement, cement thickness, direction of load, and magnitude of load affect the stress distribution within the luting cement.²⁶ Stress at the margins was higher than in the shoulder margins. The cement film thickness minimally affected the magnitude of stress as well as the stress distribution.

Infrared spectroscopy showed the appearance of new bands, the disappearance of other bands, and the minor shifting of yet other bands. Infrared spectroscopy was also done for Panavia cement and Cercon to assess the chemical reaction of resin cement with the silica oxide with the band appearing at 1041cm. However, silica is a minor component of the ceramic (i.e., the Cercon framework), and the results indicated that the bond between the resin cement and the Cercon is mainly mechanical. Infrared spectroscopy of the resin cement and Cercon showed a minor shift in some bands, which indicates a minor chemical reaction between them. The bond strength is mainly from mechanical interlocking; i.e., the resin cement flows into the surface irregularities of core ceramic material. This clarifies the importance of sand blasting the Cercon core before cementing.

5. Conclusions:

From the previous results, we concluded the following:

- Cercon FPDs can easily be milled with a high degree of marginal accuracy.
- Sandblasting the Cercon core increases the fracture strength better than treating the surface with 37% phosphoric acid.
- The bond between the Cercon core and the resin cement is mainly due to mechanical interlocking.

References:

1. Tinschert J, Natt G, Hassenpflug S, Spiekermann H. Status of current CAD/CAM technology in dental medicine. *Int J. Comput Dent* 2004;7:25-45.

2. Raigrodski AJ. Contemporary materials and technologies for all-ceramic fixed partial dentures: A review of the literature. *J Prosthet Dent* 2004;92:557-62.
3. Mc Laughlin G. Porcelain veneers. *Dent Clin North Am* 1998;42: 653-656.
4. Hayushi M, Tsuchitani Y, Miura M, Takeshige F, Ebisu S. 6 year clinical evaluation of fixed ceramic inlays. *Oper Dent* 1998;23:318-326.
5. Roulet JF. Longevity of glass ceramic inlays and amalgam results up to 6 years. *Clin Oral Invest* 1997;1:40-46.
6. Mormann W, Krejci I. Computer designed inlays after 5 years in situ: Clinical performance and scanning electron microscopic evaluation. *Quint Int* 1992;23:109-115.
7. Giordano R. A comparison of all-ceramic restoration systems. Part 2. *J Gen Dent* 2000;48:38.
8. Manicone PF, Rossi Iommetti P, Raffaelli L. An overview of zirconia ceramic: Basic properties and clinical applications. *J Dent* 2007;35:819-826.
9. Sundh A, Molin M, Sjögren G. Fracture resistance of yttrium oxide partially-stabilized zirconia all-ceramic bridges after veneering and mechanical fatigue testing. *Dent Mater* 2005; 21:476-82.
10. Denry I, Kelly R. State of the art of zirconia for dental applications. *Dental Mat* 2008;24:299-307.
11. McLaren EA, Giordano RA. Zirconia-based ceramics: Material properties, esthetics, and layering techniques of a new veneering porcelain. *Quintessence Dent Technol* 2005;28:99-112.
12. Hauptmann H, Suttor D, Frank S, Höscheler, H. Material properties of all-ceramic zirconia prosthesis. *J Dent Res* 2000;79:507.
13. Lohmann CH, Dean DD, Köster G, Casasola D, Buchhorn GH, Fink U, et al. Ceramic and PMMA particles differentially affect osteoblast phenotype. *Biomaterials* 2002;23:1855-63.
14. Suttor D. Lava Zirconia crowns and bridges. *Int J Comput Dent* 2004;7:67.
15. Ashizuka M, Kiyohara H., Okuno T, Kubota Y. Fatigue behavior of tetragonal zirconia polycrystals containing 2 and 4 mol % Y_2O_3 (Part 2). *J Ceram Soc Jpn Inter ED* 1988;96:731.
16. Koutayas S, Kern M, Ferrarwso F, Strub JR. Influence of design and mode of loading on the fracture strength of all-ceramic resin bonded fixed partial dentures. An in vitro study in a dual-axis chewing simulator. *J Prosthet Dent* 2000;83:540.
17. McLaren EA. All-ceramic alternatives to conventional metal-ceramic restorations. *Compend Contin Educ Dent* 1998;19:307-8.
18. Rosentritt M, Behr M, Gebhard R, Handel G. Influence of stress simulation parameters on the fracture strength of all-ceramic fixed partial dentures. *Dent Mater* 2006;22:176.
19. Tinschert J, Natt G, Mautsch W, Spiekermann H, Anusovice KJ. Marginal fit of alumina and zirconia based fixed partial dentures produced by a CAD/CAM system. *J Oper Dent* 2001;26:367-374.
20. Hauptmann H, Reusch B. Investigation of connector cross-sections for four-unit zirconia oxide bridges. *JADR* 2003;723.
21. Luthy H, Filser F, Loeffel O, Schumacher M, Gauckler L, Hammerle CH. Strength and reliability of four-unit all-ceramic posterior bridges. *J Dent Mater* 2005;21:930-937.
22. White SN, Miklus VG, McLaren EA, Lang LA, and Capute AA. Flexural strength of a layered zirconia and porcelain dental all-ceramic system. *J Prosthet Dent* 2005;94:125-131.
23. Gu XH, Kern M. Marginal discrepancies and leakage of all-ceramic crowns: Influence of luting agents and aging conditions. *Int J Prosthodont* 2003;16:109-16.
24. Ariko K. Evaluation of the marginal fitness of tetragonal zirconia polycrystal all-ceramic restoration. *Kokubyo- Gakkai Zasshi* 2003;70(2):114-123.
25. Janda R, Roulet JF, Wulf M, Tiller HJ. A new adhesive technology for all ceramics. *J Dent Mater* 2003;19:567-573.
26. Chapman JL, Bulot DA, Sadam A, Blatz MB. Flexural strength of high strength ceramics after sandblasting. *IDAR* 2005;1757.
27. Olio M, Gierdet NR, Tvinnereim HM. The firing procedure influences properties of a zirconia core ceramic. *Dent. Mat* 2007;24:471.
28. Studart AR, Filser F, Kocher P, Gauckler LJ. Fatigue of zirconia under cyclic loading in water and its implications for the design of dental bridges. *Dent Mater* 2007;23:106.
29. Att M, Grigoriadou M, Strub JR. ZrO_2 three-unit fixed partial dentures: Comparison of failure load before and after exposure to a mastication simulator. *J Oral Rehabil* 2007;34:282.
30. Oh W, Gotzen N, Anusovice KJ. Influence of connector design on fracture probability of ceramic fixed partial dentures. *J Dent R* 2002;81:623.
31. Onodera K, Sato T, Nomoto S, Miho O, Yotsuya M. Effect of connector design on fracture resistance of zirconia all-ceramic fixed partial dentures. *Bull Tokyo Dent Coll* 2011;52:61-67.
32. Christel P, Meunier A, Heller M, Peille CN. Mechanical properties and short term in vivo evaluation of yttrium-oxide-partially-stabilized zirconia. *J Biomed Mater Res* 1989;23:45-61.
33. Heintze SD, Cavalleri A, Zellweger G, Buchler A, Zappini G. Fracture frequency of all-ceramic crowns during dynamic loading and luting protocols. *Dent Mater* 2008;24:1352-1361.

Application of ICT in Psychological Operations and War

Mohammad Abolfathi¹, Bahram Moradi, Shapoor Amrai, Bakhtiar-Maleki-Tulabi

¹Department of Political Science, Razi University, Iran

Abstract: The main objective of this paper is to explain the concepts and theories of the incidence of psychological warfare and war and war is the application of information and communication technology. The article described the history of psychological warfare and the war of the revolution in communications and is focused on communication. The concepts related to the psychological warfare and use of new communication technologies are described in psychological operations and psychological operations evening features Community - Information expressed. The functions of negative media during the war of topics that examined the relationship between wars, psychological operations and media communication has been described in detail. Finally, a number of techniques, media and soft war, psychological operations are analyzed.

[Mohammad Abolfathi, Bahram Moradi, Shapoor Amrai Bakhtiar-Maleki-Tulabi. **Application of ICT in Psychological Operations and War.** *Life Sci J* 2013;10(1):1338-1346] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 202

Keywords: War, psychological operations, media, information technology, soft power

1. Introduction

Learning unprecedented control nowadays people are more modern and innovative media and mass communication. They are therefore subject to intense media waves. The media have a double function, but also by the media and bridges dominate the mind, will and emotions of humanity in modern times are considered. Industry emerged in the sixteenth century AD and left, using the information in this completely transformed psychological operations were the result of that paper was already popular, was notable. At this juncture, especially in recent times the use of books and journals in the field of war, it was common to demoralize the opponent. (Rafei, 2004, pp. 19-13) Major changes in the communications - information on mental operation took advantage of the invention of radio electronic media (about a century ago) was a new phase. As radio series called, or what is often called black radio, World War II was widespread. At that time, the Germans occupied the country after the invasion of that country radio stations to deceive their enemies were using it, then Americans using these sites, were ahead of the others. For example, in Vietnam, the mobile station called Radio Free Vietnam. Americans sought to exploit this name going to Ho Chi Minh's North Vietnam and the Soviet people's opinions and attitudes to change. Evidence for a decade, the Vietnam War, some American radio show success in achieving some tactical and operational objectives in Vietnam (Elyasi, 2004, p 239).

Limit the use of the media during the wars in the 80's by the U.S., were followed. The climax of communication technologies - information on PSYOP in the first Persian Gulf War (1991) took place. Occurrence of an event-based synchronization

technology in broadcast reports) The advent of 24-hour television news service of global and cable news networks, the Persia Gulf War incident, media coverage about it on a large scale and become massive and rapid manufacturing (German, McLean, 2004). In the U.S. war against Afghanistan and then the U.S. invasion of Iraq and Gulf War III, and the role of mass media to influence public opinion with the world. This can be important in how to report information related to human tragedies, receive, since the attacks on coalition forces throughout the world and most popular opposition to the war, allied forces to fight censorship of news and information, clearly showed that in conditions of war news agencies and the media want to serve the interests of all of them. During the recent conflict, and communication technologies - new information, played a significant role in psychological operations. In this war, the use of satellite television and the Internet (sending threatening emails) on the radio and other traditional media, the attention of Americans, was used.

Revolution in communication technologies - information, especially the emergence of new electronic media, has affected all aspects of your life. Nowadays, information transmission and exchange of ideas through mass media play a major role in shaping world opinion. Accordingly, we can say that humans are now confined to communications and information through various means, their minds will move their pre-determined goals. Communication technologies - information found in psychological operations in many applications. In other words, psychological operations, or to influence the thoughts and actions of other governments and UN agencies will pass it on to our purposes today, the communication technologies - information novin the

media confronting the based expand . These technologies, methods and mechanisms revolutionize PSYOP psychological operations have entered a new phase. This paper tries, the role of new communication and information technologies to examine psychological operations, the operational definition of the main concepts, a brief history of communications - the information mentioned in psychological operations and, ultimately, the impact of these technologies in operation, a few examples are mentioned psychological evaluation.

1.1. Communication concept

According to Adomian connections in the general sense of "technology transfer, information, thoughts and human behaviors from one person to another (Sarookhani, 1993, p 19) Charles E. coli, which considers the communication mechanism through which human relations exist and spread. (Ibid, p 20) The relationship, signaling the formation of human society to another, and it is defined based on the nature of current societies. Human relations and all aspects of the relationship arise intellectual and tools based on the location and time of the transmission mechanism developed (Ibid, p 18). Mickey Smith also useful and concise communication is defined as "the process of transmission of information, feelings, memories and thoughts of the people (Mohssenian Rad, 1983, p 45). In general, "Communication involves the exchange of information in a general sense or as a way to link community and the tools and techniques for data transfer is considered.

2.1. Evolution of Communication

After the industrial revolution and the growth of technology, the concept and practice of communication were varied, as the final third of the twentieth century in the field of communication technology and the widespread availability of quality information, it is also revolutionary and unprecedented manner will cause the rise of electronic media worldwide. (Souri, 2002, p 6) The main essence of contemporary culture, a combination of technology, global communication systems with the production, transmission and processing of information, so deep and widespread changes in the communications revolution have created life. (Akhavan Zanjani, 2003, pp. 119-121), Manuel Castells believes: "In this age, the duration and spatial extent and complexity by eliminating informatics tools or frameworks old days of mechanical industrial world and the natural order of the Yemen, information from it. So there's a new sense of space that can be used to determine a person's relationship to society rejected and removed from the network or ubiquitous as possible and at the

same time exclusive. (Nasri, 2003, p 355) that the centrality of the media - is information.

3.1. Communication technologies - new information

Communications technology - the new information, the most dynamic force in promoting the globalization process and the ongoing changes in human activities, especially the globalization of electronic networks that kind of infrastructure, are considered. So argues David Held and Anthony M.C. globalization groups and many other researchers, these technologies are important elements in determining the configuration of globalization. As was pointed out, revolutionize around communication technologies - information occurred, the underlying paradigm shift in technology, the technology industry information technology are; (Sadoughi, 2002, p 31), so that today the rate of states of information and communication technologies represent the amount of power in the international arena. Therefore, it should be stated that information and communication technologies, perhaps the most important source of national power and national power tools are considered. The definition of communication technologies - information is the "set of machines, i.e. computers, phones, processing, robots, satellites, cable television, etc. It is believed that the software will be activated." Manuel Castells and communication technologies - information, "a series of converging technologies and microelectronics, Computing (including machines and software), telecommunications, electronics, optics transmission and distribution knows." (Ibid, pp. 55-54).

4.1. The concept of psychological operations

Thinkers, have different views about psychological operations, define or limit specific reason for this operation is not easy. Meaning of psychological operations, to activities which in the territory and jurisdiction of the armed forces is typically limited to people so they know that it is an attempt to more specific audiences and advertisers to support specific military missions, focuses (Shahmohammadi, 2004, pp. 45-44). One of the early definitions of mental operations, in 1950, was provided by the U.S. Department of Defense. They use "principles of advertising and communication activities by a state or set of states, in order to influence the opinions, emotions, and behavior of the party's position, friend, enemy or neutral, in order to achieve their goals and policies of the state government or the 'called psychological operations (Nasr, 2002). Paul Laynbrgr book Psychological Warfare, believes that "the use of propaganda, psychological operations against the enemy, along with practical measures that the nature of military,

economic or political." But he was widely regarded as psychological operations "of some areas of psychology, to assist efforts in the field of politics, economy and military are "important. (Ibid, p 90) Some believe that the mental operations measures of impact and influence on the beliefs and behavior of a country that the government and people of other countries in the desired direction by means other than military means, political and economic place. Proponents of this approach argue that the most essential part of psychological operations propaganda, but not all of it (Shahmohammadi, 2004, p 45). Many synonyms used instead of psychological operations that Salah Nasr in his famous book, psychological warfare refers to eighteen as we, in this paper we present two of the most famous.

The term "political war" the first time the British during World War II was used. An official English newspaper, the concept of political warfare is defined as "a form of political warfare conflict between the governments of each of the parties involved, try using non-military means, to impose its will, the major weapon in the political war activity is a common diplomacy and propaganda. " Later the term was used in American academic circles. The main purpose of a political war: destruction, weaken and if possible - to destroy the enemy by diplomatic maneuvers, accurate information to stimulate economic pressure, intimidation, vandalism, causing fear and deprive the enemy of his friends and supporters (Ibid, pp. 89-88). Another alternative is the so-called psychological warfare was widely used today, the term "psychological operations" which include: "Special operations to a selection information to the audience, to influence the emotions, motives, reasoning method, and finally the behavior of governments, organizations, groups and individuals targeted. "(Elyasi, 2004, p 238) Glenn said the main purpose of psychological operations, changes in attitudes and behavior towards the goals and targets of PSYOP agents. His principles of psychological operations are defined as "a preparation messages based on what is perceived as reality and the selection and preparation of the formation of a positive message to the target audience" (Ibid). Two decades after the Second World War, psychological operations doctrine concerning the nature, function and role in modern international relations in the U.S. and Europe was moving toward a consensus. Thus, experts have accepted that the basic concept of psychological operations to manipulate opinion through the use of multimedia communication and the expression of one or unable to act and react to the enemy. Based on what you mentioned, psychological operations, including most modern weapons of war

against thought, belief, courage, confidence and willingness to fight is. It is worth noting that psychological operations, the war is not in the traditional sense. It is a means to realize the national strategy, whether in peace or in time of war helps. In this battle, all of the potential political, economic, military and other forces that shape their interactions with each other and the existence of society, they are used to. Psychological operations objectives through communication technologies - information, especially the media is available. The objectives are: (Soltanifar, 2004, p 159)

1. Eliminate or faction hopes the audience;
2. Mistrust of the opposite faction leaders;
3. The gap between the audiences;

5.1. Communication technologies - information and psychological operations

Today, in the light of science and technology, many changes that expand the possibilities of their relationship is headed. In such circumstances, the Internet, satellites and various media with simultaneous data transfer, information and exchange thoughts and ideas on the evolution of the political, economic, cultural and social. (Rafiei, 2004, p 13) progress towards the development of technology and communications - data, people who have a relationship with and influence on public opinion, reflecting its importance in all aspects of global society. According to the expert, the present century is the era of information exchange. Today the country to achieve its interests in other parts of the world, these technologies has great interest. These technologies are used in such cases, mental operations (Shahmohammadi, 2004, p 44).

6.1. Communications technology - information as Soft Power

Information revolution - communication technology, which is cool cause major changes in the power structure of the three pillars of the industrial revolution, which included sovereignty and national economic and strategic military power had changed. Khoini Robert and Joseph Nye argue that information and communication revolution as a real phenomenon, pervasive and influential, as this has a major impact on power in the 21st century, perhaps information technology - communication will be the main source of power. The power of persuasion through the intuitive software so there is no doubt that television is an effective mechanism of communication technologies - information, such as satellite and invisible light waves in global electronic networks, future civilizations will form the fabric. (Keohane. and Josephs, 1998, pp.81.95) So in the age of information revolution - communication technology to access the information, having the main tool of soft power and hard power and violence against the

peaceful or spiritual power or strength of the material. It is worth noting that the performance of hard power to force anyone to do anything violent, through the use of threats or concession stands while soft and gentle power of persuasion by others to the followers and the accept absorbed values principles rules The power of symbols to achieve national and international goals (Ibid, p 81).

Based on what you mentioned with the emergence and spread of information - communication patterns of nature, politics and power, and the necessity of changing the electronic and computerized methods have been obvious to everyone, because it enables users to make the best possible use Enough said. Dramatic developments in communication technologies - information occurred, such as the explosion of information and global information revolution and the effects of the media in shaping public opinion have (especially after the huge communication technologies), the development of the information society and other matters appear normal no need for further discussion. Computer networks, and satellite TV in the world, many of the assumptions and principles of the past to challenge Tlbydhand (Hyblzry, 2003) and as a new geography of power relations in the world have created even imagine that it was impossible to twenty years ago. New geography, geographical, political and cultural resistance Bnmayh virtual and electronic space as will inevitably be the same. (Kharrazi, 2003, p 264) Today, the importance of communication technologies - information about new media work, especially his own, as channels comes from the politicians and statesmen of them try to audiences beyond the boundaries of influence, because the media Soft power tools are required and the ability to have an effective influence on public opinion across borders. (Karouser, 2003, p 193) This means of communication - new information underlying the widespread and increasing use of psychological operations and public persuasion target countries (target).

7.1. Characteristics of PSYOP in the Age of Communication – Information

Today, the use of tools and methods to fight a new battle, such as information warfare, neo-colonialism, apartheid, information, policies, and other electronics in power apparently benevolent and healthier, but at the same time with the power and the more damage is done. (Pourahmadi, 2003, p 52) in Virilio Paul says: "Now the war without representation and other sophisticated weaponry without psychological impact is meaningless. Equally devastating is the weapons feature also is linked with perception. "(Hyblzry, 1381, p 48) Here Virilio the use of new technologies and their use in

psychological operations, in addition to physical conflict arises. It was the progress of science and the changing nature of the information to the extent that a few minutes after the incident part of the world, can only help Internet News was informed of all the details. (Kia, 2004, p 74) and influences the types of modern media, especially satellite news networks and the Internet to conduct psychological operations by governments, they returned to the new features. In the age of information and communication, new media, has expanded the geography of the war. To put it more clearly, the war is not limited to the field of conflict, but the people who live images of the battle to get the receptor, it's kind of feel the same space. Able media images, news, reports and interviews that the selection and distribution of international public opinion in the direction of your steering and an even more rose than ever, play. The impact of the media during the Gulf War was clear. Occupation of Kuwait by Iraq and then release that a government that can survive even if it is physically occupied by another country. There is a state on the screen, and players being able to continue. Kuwait was occupied territories, but the government still remains in the realm of media. Emir of Kuwait during the Iraqi occupation of their country had become a country-Hill Companies - Nolton with a cost equal to 8/10 million dollars was served. Kuwait's regime was responsible for the transmission of messages, with the aim of increasing hatred of Saddam and his sympathy with the victims of the Iraqi invasion, a psychological operations, programs about the sexual abuses of children of Iraqi soldiers broadcast Kuwait, Saddam Hussein These types of programs Hitler was effective. (Asgari, 2004, p 63).

The other features of the new psychological screening process, distortion and manipulation of information by the media. Waltz believes that in today's world, effective psychological operations, media, more than anything, which is subject to a screening of the high data sources are collected on the target groups and nations. For example, screening, distortion and manipulation of data is typical psychological tricks that the media campaign against Marcos in the Philippines and the United States in its operations in Haiti, Panama, Libya air assault, Operation Desert Storm and the recent invasion of Iraq. They took great interest. According to Patterson, media manipulation and distortion of information, black, white, ugly, beautiful, occupation, liberation, freedom, and surprisingly it's called terrorism and public opinion also charmed unconscious mental operations are fraudulent. (Elyasi, 2004, pp. 246-242). Given the important role of communication technologies - information on PSYOP government now using these tools in various

ways to undermine the morale of the opponent. Send a message via email to persuade militants to surrender to authorities and receive money, false news of the surrender of the leaders and commanders and sample solutions. The governments of communication technologies - psychological operations utilize information. It is worth mentioning that the recent invasion of Iraq also used this method (Asgari, 2004, p 61). The role of communication technologies - new information developed by experts in psychological operations such terms are used in the media war. The current situation in psychological operations, military strategists resort to the media.

8.1. Function of negative media during the war

Despite the positive performance of the media in creating psychological operations against the enemy, and the convergence of domestic public opinion, they can also function in the context of negative affect instead. Media broadcast images of the war, the war damage and hit and killed the wounded in the demoralization of the people affected. For example, exposure to mass media worldwide, the use of weapons containing depleted uranium from NATO members, particularly the United States during the bombing of Serbian positions in Kosovo, a wave of anger and hatred towards Washington inhumane strategies around the world even in Europe, was created. During the American invasion of Vietnam, American reporter and coordination between the forces of disorder, multiple reports prepared and submitted in opposition to public opinion that the war was a major contribution. This is one of the reasons for failure of U.S. leaders knew in Vietnam (Stoler, 1986, pp. 57-63). In the Persian Gulf War, the White House's support for protecting the American people sought to induce the media to the public that the war is no bleeding. Meanwhile, Saddam Hussein, within thirty contracts. It. Ann (worth 15 thousand dollars a week) was trying to work Iraq attacks on residential areas in the international level so that people view the United States and other countries to change. In this regard, some of Reporters Without networks. No. C and C. It. Ann, including Simpson Sdlr and Arendt Arendt so that gradually they advertise for Saddam Hussein were nicknamed Goebbels. (Corruthers, 2000. P. 133) So the Pentagon during the Gulf War (1991), not only to organize the flow of information, but also to restrict the access of photographers, reporters and journalists and military battle, so that did extensive work in television period Panavision became the smart bombs hit their intended targets and civilian casualties error did not load.

9.1. War, psychological operations, media

Mainly to a few categories of visual media, audio, written, and electronic communication divide.

In each of these categories are used in many devices. TVs are one of the most important means of psychological warfare in the media; the regular television, news and special are divided. National or transnational regular TV screens are less likely to engage in public policy issues underlying this type of media or supplemental media are more politically, this means that without addressing the core issue of the case, the audience thinking about the form and when the case arises, later in the study of media audiences do. For example, conventional television, movies and serials that are aired are subject to the brutality of the terrorists thus the mind of the audience is ready to tackle any terrorist when a terrorist group or individual or country, regardless of the truth or falsity is to contact the relevant party condemns. But television news and in order to highlight some of the issues in the world, be made a matter of public concern and thus highlighting the issue too, against the target of unfavorable weather may cause. Al-Hurra TV, satellite TV and VOA especially like the first and second Iraq to Iran by America has been trying to get public opinion on their side of the target. Shortwave Radio also be divided into two categories: normal or special, Regular and long-wavelength radio for the public along the country of origin for international action and short-wave radios, most of which is common in third world citizens to influence the target and much less to the needs of the citizens of a country should be considered, Shortwave radios will be affected most, and vice versa if the press does not impact directly on the target countries. But the first step is the most important factor in building public opinion to intervene in the target country of origin. In the second stage certain countries, such as America, England, France and Germany are the world's press, Newsweek reports in the press that such a world authority on public opinion and elite opinion leaders to influence their communities This means that adverse effects against third countries. Although the Internet is a new phenomenon that even two decades old, but it also does not appear, media influence media has on psychological warfare and diplomacy. Internet is known as a diverse media that there are hundreds of sites but they are all there for everyone to have access to the Internet is somehow, world of global citizens Sites like CNN, BBC, Al Jazeera, etc. It is widely known that are of interest. So news sites can be recognized as a global influence and psychological operations, information published in the interest of the country of origin and the destination country and the world to the detriment of their shift. Created especially for the target sites, another media measures media diplomacy. Example or info USA Persian BBC Persian or VOA Persian

news websites that are made especially for Iranians and Iranian users of these sites can be induced to do any thinking. Search engines such as Yahoo and Google etc. headquarters are in America can you find the contents of the application, the materials for their own benefit and to the detriment of the target search or information related to the target at the end of the list are less users. Public use of the Internet, such as sending e-mail to officials, the proxy filters or hacking of government web sites, certain other cases of Internet abuse is psychological warfare (Sebilan, 2004)

A number of techniques and media psychological operations are as follows:

1.9.1. Use anti-missionary methods:

The Anti-Advertising: special advertising campaign to deny or neutralize or exploit the enemy's propaganda against the enemy. There are two approaches to counter-advertise:

- 1 - Promote and hostile behavior against the target;
- 2 - The facility is operated by the target of anti-propaganda.

For example, America's war in Iraq claimed the capture of Baghdad, but Saddam's Information Minister Saeed Alshahaf with the front camera and to show areas of Baghdad, advertising, America was neutral.

2.9.1. Removal and Denial

Some critics believe that the press is inherently noisy, controversial and stimulate feelings, but the truth is that in many cases the quiet, conservative and find neutral. Perhaps because of the clever avoidance of certain events, the safer practice is controversial (Michel Pernet, 1986, p 23). Unlike so many exciting adventures, but controversial than ordinary events and how many events they have the only key details, but the whole story is ignored, even those whose importance is overwhelming. For example, in 1965 the Indonesian army with advisory support, weapons, training and funding the CIA and America's Army, the overthrow President Sukarno, the Indonesian Communist Party and its allies had disappeared altogether from politics and the destruction of half million (though some estimates suggest that more than one million people) commit political genocide since the Nazis were Hvlnaktryn. Hundreds of Indonesian military hospitals, libraries, schools and public buildings destroyed. But a terrible accident, and miserable that it could certainly affect public opinion and international organizations immediately noticed and, after three months and one month after the New York Times Magazine (April 1965 V) was reflected. Interestingly, the New York Times editorial, "Indonesia's army of tactful and decisive action" was praised (ibid. p 6).

3.9.1. Attack and destroy the target

As long as the removal of censorship practices, inefficient deemed the incident to be disseminated among the population considerably, avoided and avoided the press to force the target to turn out invasion to discredit the event or events are mentioned.

4.9.1. Uneven implementation

According to the official rules of journalism in America, the press should publish the facts on both sides competing equally, but this rarely happens. For example, supported the wars in Guatemala and El Salvador in the Eighties America who noted the village was set on fire and those villages burned were equally responsible for the bloodshed and slaughter. Thus, the appearance of the drawing, a neutral and impartial in this case, the sensitivity decreased public attention to the disaster and was later completely forgotten (Pernet p. 76)

5.9.1. Default stora

Media often dictate policies that limited their validity require serious review, obviously, as well. For example, if the White House has proposed a budget increase in military spending, Discussion will be limited to how much of the media budget increase is needed? How much should be invested in updating the weapons? Is this enough of an increase in military spending, or should we adopt additional measures? Strong opinions and the reasons for any media Documentary those who believe that America's military spending for years and now is the largest contributor to the budget need to be reinforced, it is not swallowed, do not reflect. Suppose it is almost certain that U.S. troops should be deployed around the world and hundreds of billions of dollars a year is spent on the military system.

6.9.1. Making title

Like other advertising media, try a title or tags to our basic understanding of positive and negative affect than subjects. Yes to some of these topics, see: Sustainability, rattling defense and a healthy economy. Such titles and captions to avoid any real property that might have led us to a different conclusion, we look at the type of person to make or influence a particular concept. Some negative headlines are leftist guerrillas, axis of evil, conspiratorial theories and urban riots. Clearly, the scope of application of this mostly limited to media relations and social media are seldom. Interestingly, the masterful use of the media headlines, sometimes to the extent they would establish an independent and not related to the conceptual nature of the subject is discussed. For example, the reform of the glamorous titles that completely distorted the real meaning and often refers to a policy that seeks to negate and reverse the reforms and achievements that have been

achieved after years of national struggle. Therefore, it is not surprising that the elimination of programs to assist families in America, welfare reform, and is named after the collapse of the USSR in the years and to date the reforms in Eastern Europe, the former communist countries are cruel process is completely true.

7.9.1. Promotion of formal concepts

Many of the concepts and values, rather than by the news media, but America counterfeit and confiscated by the press and the public accepted without criticism they are published, to examine these concepts without any real content. Media products in both domestic and foreign policy, which is often filled with the apparent values of the bureaucratic system, become employed, concepts such as globalization, economic liberalization, public safety, cultural pluralism, free markets, and the New World Order.

8.9.1. Removal of content

Smaller, more accurate picture of the issues and events that we often give to the world and this is one of the ways to remove content without carrying out the commitment! In other words, media owners always talk of a bigger picture, but the reality is that they are able and willing to communicate issues and wider social relations are not independent events. (John Henrik Clarke, 1989, p 1).

9.9.1. Loaded out

More effective advertising, rather than the false and lying on the news and events targeted direction dependent, meaning that using emphasis and other auxiliary tools to express, no one can deny the fact, shaped it to their advantage, the desired effect the audience's mind, obviously in no way advocating or directly away from the subject is not too far from reality. Loaded news can be performed based on the following: selected priorities publish it here (or on the first page of the first report), speech language news (effusive or through neglect), the use of headlines and images and other media in print, audio and visual elements. Even when news reporters and announcers to express their utility become. They usually speak a certain song structure and a sense of credibility, reliability, or ignorance to inspire the audience who wisely. Statements such as: "This is where the story leads? Only time can answer that question. "If the protests and strikes continue tensions and clashes between the two sides will intensify" Or "If the organization does not act quickly, we will continue to see incidents like this." Encountered in the daily news with such a proposition. In addition, a number of issues that are reflected in the news just a few of them are expounded, since selecting a prevailing social order, and the news did not develop, often, in a world full of

events and behaviors spread just find events and behaviors that apparently happened, environment, disturbing fantasies, negligence and personal ambitions rise. Passive and active specific grammatical structure of sentences they do not understand journalism rhetoric to avoid and evade the rush to get worse. So every day we read and hear a lot similar to the following statements: "Fighting broke out in the region", "many people were killed in unrest ' "Famine and poverty is increasing." Moreover, by promoting a vision of the master media algebraic bad phenomena like global appeal as a natural and inevitable development are embedded in the minds of your audience while globalization and devise ingenious contrivance of multinational companies that national sovereignty does not lead the world. Also, the media, deliberately exposing the fact that the elusive World Trade agreements such as GATT, NAFTA and the centralization of political power over economic giant multinational corporations, the globalization of the world except the before use, the coup that deprives the world of law and national authorities. Obviously, these trends in professional journalism specifically defined as techniques that are performed to complete the content before, not to mention some of them unpleasant, In particular, it can be a critical assessment tool was used effectively to media production. What follows is a selection of Appendix 1: techniques of psychological operations, psychological operations of the Military Regulations (No. 1-33), Ground Force America. America's Army has published a document, the techniques introduced for all those who deal with media advertising, and obviously it seems quite familiar (Dorjy Carl 1,996th, p. 1). In many cases, adding more information to understand the message, not necessary. Techniques that are considered in this regard include:

1.9.9.1. Statements

Decisive statements that are stated as fact. Using explicit statements that may be true or false, it carries the connotation that they were in reality of course, needing not be proved.

2.9.9.1. Conformity with the congregation

It is a technique of introducing a mechanism for the collective, universal and particular; the target population is persuaded to adopt it. In this technique, the natural propensity toward winning side (or the party that has won all say) is amenable. To put it simply, is to inspire the audience about the program, call the inevitable expression of the masses and thus to benefit the people who join. Thus, it is recommended that those who have yet to win a train rushing and who are at the zenith ensure that the right solution.

3.9.9.1. Ugly building techniques

This technique is supported by advertising a particular position or view groups that hatred, enmity or competitions to raise the audience's population, Areas of dissatisfaction and opposition to the attitude or perspective provides. So, if one of these groups to support specific policies, regardless of right or wrong, it is believed that the policy of strengthening the protection of poor people, rebellious and society. Thus, respondent population may change its position

4.9.9.1. Generalized Extreme

Words and expressions used are essentially the generalized extreme which evokes an emotionally and virtual concepts needed to prove the value of the firm belief that there is no information or argument. Of course, such words and terms of perceptions in the minds of different people being raised, but the connotation is always favorable and effective.

5.9.9.1. Ambiguity

It is another technique which the skillful and deliberate generalization, and generalizations of the concept of the intended audience in mind is vague and ambiguous, everyone is unique so that the message is removed. Excite audiences with unknown words without analyzing their validity and purpose of these techniques is warranted.

6.9.9.1. Universality

When individuals and groups for the popularization of rationalizing beliefs and practices as well as to simplify the answer to the controversial question of the complex problems in the social, political, economic or military are serving

7.9.9.1. Blaming others

In many cases, the negative and positive qualities (praise or blame) of a person, entity, object, or value are projecting to the opposite side to make it acceptable or distasteful. This technique is known mainly for denying the transfer, or projecting from one side to the other side of the fault is being disputed. This technique can evoke emotional reactions of the crowd, they can sync with official positions.

8.9.9.1. Switch name or the names or titles of ethics

This technique can easily stimulate audience bias and prejudice, the shape of the desired topic or topics to be introduced to the sense of fear, disgust and unease they provoke. Various examples of this technique include:

1. Direct naming, especially when the audience may agree or neutral officials. In this case, attacking the opponent or opposing idea is simple and Bydrdrsr.
2. Indirect naming names when it is applied directly to the negative reaction of the crowd. Sarcasm and ridicule are used in this technique.

3. Cartoon, images and photographs of the samples are labeled, often leave a deep impact.

9.9.9.1. Flagrant enemy

It is a simplification of a complicated situation deteriorated to a level where it appears that a clear enemy. For example, a president of the people to protect themselves against militant pacifist groups gaining considerable costs of violent internal conflict, the country has declared a state of emergency.

10.9.9.1. Customary building

Technique to convince the audience by promoting the notion that the position represents common sense and common sense people. With people you trust to read it drew particular approach.

11.9.9.1. Social criticism

Psychological propaganda techniques that designers try to use it to gain admission to the group: Inconsistent with the views expressed attitudes and actions can lead to social rejection or criticism. These techniques as control measures, mainly in traditional societies applications

12.9.9.1. Documentation

The technical documentation is usually quoted to refute or support a policy, practice, program, or have a certain personality. In this technique, the validity or status of the person referred to (an authority or an expert, respected public figure) is costly, thus addressing the crowd his view is consistent with the official opinion.

2. Discussion

Communication technologies - new information, concepts and methods of psychological operations and transform it into a new phase, which have been known media for information warfare or war. Basically, one of the pillars of development in the history of psychological operations, communication tools - has information, so that the First World War newspaper War, World War II Radio War, the Vietnam War, black and white television, the Gulf War II war, the Gulf war III satellite television and modern media, called war. This process step is followed by a broader range of mechanisms and complex mental operations. In this era of information and communication, with a significant leap in the use of communication technologies - information on mental processes are followed because communication technologies - new information increases the efficiency and effectiveness of psychological operations in pursuit of our goals and objectives are . Now, the derivation of the material, the following conclusion is important:
- Communication technologies - new information, the complexity of mental operations. Thus, understanding the mechanisms of coping with it requires very careful.

- Psychological operations today, according to the characteristics of the means of communication - new information (speed, world-wide broadcasting capability, cost and availability) is no longer confined to times of war but also in peacetime psychological operations are enabled.

- Psychological operations now, very subtle, indirect and intangible, yet is deeper than before and policies.

- With regard to the above points, necessity and use of communication technologies nations - Information for psychological operations, or to deal with the inevitable

Acknowledgements:

Authors are grateful to the Department of Political Science, Razi University, Iran for financial support to carry out this work.

Corresponding Author:

Mohammad Abolfathi
Department of Political Science, Razi University,
Iran

References

1. German Lynn and David McLean, (Summer 2004), media, war and international relations, translation, and R. higher Shkrbygy Ghndaly, Tehran: Journal of Research and Evaluation, Year I, No. 34.
2. Sarookhani, Mohammad Bagher, (1993), sociology, communications, Tehran: Publication of information.
3. Mohssnian Rad, Mahdi, (1983), Artbatshnasy, Tehran: Soroush.
4. Akhavan-Zanjani, Daryoush, (2003), Globalization and Foreign Policy, Tehran, political and international studies office.
5. Nasri, Ghadir, (Summer 2003), meta-narratives in the information age, Castells, Tehran: Strategies Journal, No. 24.
6. - Castells, Manuel, (2002), The Information Age: Rise of the Network Society, translated by Ahmad Lyqlyan and A. Khakbaz, Tehran.
7. Sadoughi Morad Ali, (2002), information technology and national sovereignty, Tehran: Bureau of Political and International Studies.
8. Shahmohammadi, AR, (Summer 2002), modern warfare field of military communications, Journal of Research and Evaluation, Year I, No. 34.
9. Elias, MH, (Summer 2002), psychological operations, media mind control, Journal of Research and Evaluation, Year I, No. 34.
10. Soltanifar, M., (Summer 2002), a war bed comprehensive information age, Journal of Research and Evaluation, Year I, No. 34S.
11. Moses, R.1998. "Law of international organizations", Tehran Pazhang Press, second edition.
12. Rafiee, A., (2002), governments and public opinion, psychological operations, Tehran: Publication dadar.
13. Hyblzgry, Chris, (2002), modern warfare, modern politics involved, AR translation Tqa' Tehran: Publication of Supreme War.
14. Kharrazi, left, (2009), the digital angle: a new order and political restructuring in the Age of Information, Research and Assessment.
15. Karousar, Susan, (2002), media and communications technologies, global policy issues (proceedings) edited Brian White, Richard Little and Michael Smith, translated by Mohammad Kamal Savarian, Tehran: Publications Institute for Strategic Studies.
16. Pourahmadi, H., (2002), The Political Economy of the Information Revolution - Communication: Globalization and a new explanation of the sources of national power, Tehran Journal and international policy approach.
17. Kia, AA, (Summer 2002), War, Terrorism and the Media: with emphasis on the role of media in the United States and the Iraq War, Tehran: Journal of Research and Evaluation, Year I, No. 34.
18. Asgari, Mahmoud, (Summer 2002), and the media, a framework for analysis, Journal of Research and Evaluation, No. 34 Tenth year.
19. Toffler, Alvin, (1994), shift in power Shhyndkht Translate Kharazmi, Tehran: Publication interpreter report.
20. Masoudi, A., (Summer 2002), new methods of news of Gulf War II: Angarhsazy and absorbed in the game, Tehran: Journal of Research and Evaluation, Year I, No. 34.
21. Roberto. Keohane. And Josephs. 1998. Nye Power and Interdependence in the the Information Age, foreign Affairs, (September / October, 1998), PP. 81. 95.
22. Michael Parenti.2001. Political Archive: "Monopoly Media Manipulation.
23. Appendix I: PSYOP Techniques, Psychological Operation Field Manual No. 33 , ' – Department of the Army, Washington DC, 31 August 1979.

1/8/2013

Educational Needs Assessment for Warehouse Workers (Case of Govah Company)

Shokouh Alamati

School of Management, Islamic Azad University, Central branch, Tehran, Iran
Tel: +989122467865

Abstract: The purpose of this study is to perform a training needs assessment to find out if training will improve the warehouses performance problem and if changes need to be made with the warehouse's training procedures. With a goal for companies to reduce slack and to stream line inventory by moving to more modern practices such as just-in-time inventories it looked like warehousing was going to be superseded. The goal to streamline inventory is still intact, but warehousing has not only survived, it has picked up steam as a strategic logistics tool. Many things have allowed warehouses pick up business. Another reason has been their ability to justify their existence by finding better ways to meet the needs of their customers. In order to ensure better customer service warehouses have worked on their efficiency and accuracy. There are many ways to become more efficient; such as, order picking, operator training, and warehouse layout just to name a few.

[Shokouh Alamati. **Educational Needs Assessment for Warehouse Workers (Case of Govah Company)**. *Life Sci J* 2013;10(1):1347-1351] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 203

Keywords: Training, Need assessment, Warehousing, Govah, Iran

1. Introduction

An important issue effecting warehouses today is competition in the marketplace. With all of the choices that consumers have the marketplace has become very competitive. In an effort to contend with their competition warehouses have had to make many changes in order satisfy their customer's needs. Some changes include updating processes, technology and warehouse procedures. Ray Gillen, author of the article *Distribution Centers Leap Ahead with Upscale Training* stated that "Warehousing and distribution centers have been transformed in recent years by an explosion of technology, changing how business is conducted"(Gillen, 2001). Training is important and the need for training is growing as a result of more modern technologies being used and the need for skilled workers in the warehousing industry rising. Warehouses most commonly use training to implement warehouse management systems and to cross train employees on several tasks rather than to a discreet task. Warehouses may also use training for mobile equipment operation such as fork trucks. Training has long been an issue for companies even more so for smaller facilities mostly because of the cost and the times associated with training. Smaller employee operated companies cannot afford the lost time from production and do not have the number of employees required for people to be training during working hours without losing production (Carnevale, 1990). A training needs assessment will help to make sure that time and money are not wasted on inefficient training and it will provide the training department a proposal showing the need for training (Nowack, 1991). With small training budgets and the need for skilled employees it is important that the training be focused

and appropriate. A educational needs assessment will be able to identify if there is a need for training and what training objectives should be covered.

2. Literature Review

A report, done by Georgia Tech, based upon a survey in which more than 150 warehouses participated showed that less than 30% of the warehouses are efficient and that a large proportion of warehouses are operating at or below 50% efficiency (2002). The manager of the warehouse that is being researched has identified that they have a problem with their efficiency; the largest issue affecting their efficiency is stocking kit carts. As a means to find out what in particular is affecting their ability to produce kit carts efficiently a needs assessment is going to be conducted. This chapter reviews what a needs assessment is, some benefits and roles of needs assessments, defines training, examines types of employer provided training and what makes training effective.

1.2. Warehousing

Warehousing has grown in Iran due to its ability to be used as a strategic logistics tool. As more and more companies continue to move their manufacturing facilities to Asia warehouses have become vital in an effort to control product availability and consistency in delivery. With manufacturing operations being located in Asia the distance between suppliers and consumers in Iran has grown thousands of miles. The distance, inadequate transportation infrastructures, and the multiple terrains being crossed have caused different forms of transportation methods to be used making delivery unpredictable. By establishing warehouses in Iran it has allowed companies to regain control over the availability of products and consistency of delivery (Saxena, 2005).

2.2. Needs Assessment

Needs assessment: "a process for pinpointing reasons for gaps in performance or a method for identifying new and future performance needs" (Gupta, 1999). Third Party Logistics Provider: "is a firm that provides outsourced or "third party" logistics services to companies for part or sometimes all of their supply chain management function (Wikipedia, n.d.) Needs assessments can fulfill a number of different roles. They are often used to identify the value that training or an education program will have on fixing a performance problem. The following functions were identified as being performed in a needs assessment (Lee & Nelson, 2006)

- Gathers data on perceived needs
- Identifies knowledge, skills, and behavior discrepancies
- Assists trainers, human resource development personnel, administrators, and instructors in developing relevant curriculum materials
- Gathers information that brings beneficial change to an organization or community
- Assesses organizational needs
- Promotes buy-in by participants

Needs assessments can produce important data, without performing a needs assessment the correct solution might

not get implemented. Some reasons and benefits of performing a needs assessment are: (Gupta, 1999)

- Determine if the disbursement of money for the training is worth the return on investment
- Determine who and how many will benefit from the training
- Determine if the training will be used in the workplace
- Specific expectations and goals will be set for behavior and performance improvements
- Greater chance of achieving desired results
- Less of a chance of causing frustration that comes with using the wrong solution. and failing to meet the desired achievements.

A needs assessment is compiled of a set of activities and procedures. There are a number of different needs assessment models that can be used to guide you through the process. Gupta (1999) identifies six needs assessment models:

- Human competence model
- Front-end analysis
- Organizational elements model
- Analyzing performance problems
- Training needs assessment
- Performance improvement by managing the white space

The human competency model was created by Thomas Gilbert. This model examines six principles believed to affect human performance; information,

resources, incentives, knowledge, capacity, and motives (Gupta, 1999).

The Training needs assessment model created by Allison Rossett is a purpose-based model. In this model five types of information are gathered: optimal performance or knowledge, actual or current performance or knowledge, feelings of trainees and significant others, causes of the problem from many perspectives, and solutions to the problem of many perspectives. These five types of information are used to find a gap between an optimal and actual situation (Gupta, 1999).

3. Research Objectives

The purpose of this study is to perform a training needs assessment to find out if training will improve the warehouses performance problem and if changes need to be made with the warehouse's training procedures. The completion of this training needs assessment and the results generated will provide data which should insure whether or not training would be appropriate to fix the performance problem. If the assessment found that there was a need for training it would also insure that the training exercises are focused and appropriate. The training needs assessment is important because some problems are often perceived as training problems when they are not, and no organization can afford to do training for the sake of training.

4. Methodology

1.4. Subject Selection and Description

The training needs assessment took place starting in July of 2011 and finished in March of 2012. Determining the population was trouble-free. There is only one warehouse facility that directly impacts the production of the kit carts. That warehouse employs fourteen employees, twelve operators, one supervisor and one warehouse manager.

All of the employees were chosen to be involved in the needs assessment.

2.4. Instrumentation

The method chosen to collect data for the assessment was in the form of a survey questionnaire. The survey was comprised of 17 questions, they were all multiple choice. The survey instrument collection process was done during the month of February 2012. An identical survey was given to each employee. Multiple choice questions otherwise known as close-ended questions were chosen in hopes that there would be less of a need for extensive coding and fewer non responses to questions. The questions were designed to be answered with little effort and the number of questions was limited so that the survey could be answered within twenty minutes.

3.4. Procedures

The surveys were handed out individually to each employee by the researcher. Employees in Govah company were given three days to answer the survey, the employees were instructed to place completed surveys into a locked box that was then emptied by the researcher at the end of the three days period.

4.4. Data Analysis

After the completion and the collection of the survey the researcher evaluated the responses. The assessment process was analyzed using statistics by question. Frequency of the responses was determined and a corresponding percentage was calculated.

5. Results

The goal of this study was to conduct a training needs assessment which would allow for the collection and analysis of data regarding the training needs within the warehouse. The study looked at the training procedures used at the warehouse along with the information being presented, and the times and locations that it was presented. The desired outcome was to identify if training deficiencies do exist and, if so, to identify the common training needs. The survey was split into four sections; demographics, training, communication and knowledge and skill. The first three questions in the survey asked demographic information which was used to gain some background information on the participants.

Question one asked about the number of years that they have been employed at the warehouse. The warehouse has been open for ten years. There was distribution in each group, and the responses were evenly dispersed across the four categories. (Table 1).

Question two allowed for the participants to be grouped by educational level. The results of this question will be particularly important for determining the level at which written training and communication should be administered. The large majority of the respondents fell in the high school graduate group. (Table 2)

The third question asked about the length of time the respondents have been at their current positions. Similar to question one there was distribution in each group, and the responses were evenly distributed across all of the categories. (Table 3)

The next series of questions investigated aspects of the warehouses training regimen and the training preferences of the employees. Question number four asked if the respondents had received job specific training. 100% of the respondents replied that they had received job specific training. (Table 4)

Next the respondents were asked when the last time was that they had received job specific training. This information will be linked to question number three to compare how long they have been at their current position.

Two-thirds of the respondents fell into the category of having received training in the last three months. (Table 5)

Question number six asked what sources of training are currently used. This question will help to identify if there is training along with the methods that are used for training. It is possible that if they are training that maybe they are not receiving results because the training method does not fit the type of training they are trying to implement.

Everyone who participated in the survey acknowledged that there is some form of training being used. The percentage was close to being evenly distributed between the two types of training that were acknowledged as being used. (Table 6)

Question seven asked what the participant's preferred learning style or method of training is, this question is going to be cross referenced with question number six to make sure that the employees desired method of training matches the method being used. The preferred method of learning is hands on with face to face being the next preferred method of training. (Table 7)

Question eight was used to find out what influences the employees participation in training. The results of this question will help with being able to motivate employees to take a more invested interest in training. The distribution among all of the different groups shows that there are many things that influence the respondent's participation in training. (Table 8)

6. Discussion and Conclusions

A training needs assessment of a local warehouse was the focus of this study. The study was conducted in five phases that included research, planning, performing analysis, analyzing data, and preparing the report.

Preliminary data was gathered during meetings with the warehouse manager, supervisor of the workforce and by conducting a review of literature. Objectives along with the desired outcomes were put together and the survey instrument was designed. The questionnaires were distributed by the researcher to the fourteen warehouse employees. The results were tabulated and recorded with the use of tables. The data was then analyzed and assembled into this report. The demographic data provided the respondent's educational background. As a result of this data we were able to determine what the education level should be for instruction. The respondent's educational background was relatively close with 57% replying that they were high school graduates and 29% had some high school education, leaving only 14% with something other than high school educational experience. This data is good for instructional purposes because the respondent's educational level will affect how information is presented.

Analyzing warehouse training allowed the determination to be made about what the participant's preferred learning style or method of training is. 67% of the respondents replied that they preferred the method of hands on and 33% of the respondents preferred face to face. Warehouse communication was analyzed to determine if there was a lack of communication. Based on the results of the survey it is clear that there is communication going on and that it is

done with the use of three different methods, group meetings, newsletters and one on one conversations. The voluntary participation of the survey was a disappointment. Although there was 50% participation and for most surveys that response rate would be extraordinary, the researcher expected more people to respond. Possibly there was either bias because they were afraid or they are in denial.

Table 1. Year Employed at Warehouse Facility

	Frequency	Percentage
Less than 1 year	2	29%
1-3 years	1	14%
3-5 years	2	29%
5-10 years	2	29%

Table 2. Educational Background

	Frequency	Percentage
Some high school	2	29%
High School graduate	4	57%
Associate Degree	1	14%
Bachelors Degree		
Masters Degree		

Table 3. Length of Time at Current Position

	Frequency	Percentage
0-3 months	1	14%
3-6 months	1	14%
6-12 months	1	14%
1-3 years	2	29%
4-5 years	1	14%
More than 5 years	1	14%

Table 4. Received Job Specific Training

	Frequency	Percentage
Yes	7	100%
No		

Table 5. Last Times I Received Job Specific Training

	Frequency	Percentage
Within last 3 months 4	4	29%
Within last 6 months 1	1	57%
Within last 9 months 1	1	14%
Within last year		

Table 6. Sources of training currently used

	Frequency	Percentage
None	2	29%
Verbal	4	57%
Hands on	1	14%
Other		

Table 7. Preferred learning style/method of training

	Frequency	Percentage
Face to Face	3	33%
Just in Time		
Hands on	6	67%
Computer Tutorial		
Audio recordings		
Video tapes		
Workbook		

Table 8. Factors that influence participation in training

	Frequency
Time Notification	3
Lack of Monetary support	1
Time not convenient	2
Lack of training notification	1
Lack of interest in topic	2

Reference

- Carnevale, A.P. (1990). Training in America: the organization and strategic role of training. San Francisco, CA:
- Jossey-Bass/Pfeiffer. Dolliver, Sarah K. (1993). To train or not to train? Supervision, 54(10), 12.
- Gillen, Ray. (2001). Distribution Centers Leap Abroad with Upscale Training. Transportation & Distribution, 42(8), 62.
- Gupta, Kavita. (1999). A practical guide to needs assessment. San Francisco, CA: Jossey-Bass/Pfeiffer.
- Laff, Michael. (2006). what is effective training? T+D, 60(6), 12-13.
- Lee, Howard D., & Nelson, Orville W. (2006) Instructional analysis and course development. Homewood, IL:
- American Technical Publishers. McNamara, C. (n.d) Employee Training and Development: Reasons and Benefits. Retrieved January. 2007
- from website: http://www.managementhelp.org/trng_dev?basics/reasons.htm
- Nowack, Kenneth M. (1991). A True Training Needs Analysis. Training & Development Journal, 45(4), 69.
- Pomeranz, Kenneth. (1996). an Inventory of Success. World Trade, 9(9), 112.
- Saxena, Rajiv. (2005). Warehousing remains vital. Industrial Engineer, 37(4), 28.
- Werner, Jon M., & DeSimone, Randy L., (2006). Human resource development. Mason, OH: Thomas South-Western.
- Wikipedia, the free encyclopedia. (n.d.) Retrieved January 2007 from website: http://en.wikipedia.org/wiki/Thirdparty_logistics-provider (2002). How good is warehouse performance? Modern Materials Handling, 57(8), 1.

12/2/2012

Life Science Journal

Acta Zhengzhou University Overseas Edition

(Life Sci J)

ISSN: 1097-8135

Call for Papers

The academic journal "*Life Science Journal*" (ISSN: 1097-8135) is inviting you to publish your papers.

Life Science Journal, the Acta Zhengzhou University Overseas Edition registered in the United States, is an international journal with the purpose to enhance our natural and scientific knowledge dissemination in the world under the free publication principle. The journal is calling for papers from all of the world. Any valuable papers or reports that are related to life science - in their broadest sense - are welcome. Other academic articles that are less relevant but are of high quality will also be considered and published. Papers submitted could be reviews, objective descriptions, research reports, opinions/debates, news, letters, and other types of writings. Let's work together to disseminate our research results and our opinions.

Please send your manuscript to editor@sciencepub.net; lifesciencej@gmail.com

Address:

Life Science Journal - Acta Zhengzhou University Overseas Edition

Marsland Press

PO Box 180432, Richmond Hill, New York 11418, USA

Telephone: (347) 321-7172

Emails: editor@sciencepub.net; sciencepub@gmail.com; lifesciencej@gmail.com

Websites: <http://www.lifesciencesite.com>; <http://www.sciencepub.net>

Volume 10, Number 1 (Cumulative No.32) Part 9 March 25, 2013 ISSN:1097-8135

Life Science Journal

Acta Zhengzhou University Overseas Edition

Marsland Press
PO Box 180432
Richmond Hill, New York 11418, USA

Website:
<http://www.lifesciencesite.com>

Emails:
editor@sciencepub.net
lifesciencej@gmail.com

Phone: (347) 321-7172

Cover design: CAO, Zhaolong
Photograph: YANG, Yizhong; YOUNG, Mary

Copyright © 2013 Marsland Press / Zhengzhou University

