

Application of a Nursing Care Protocol Based on King's Theory of Goal Attainment: a Pre-Experimental Study

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ABSTRACT

Objective: Peripheral Intravenous catheterization is a common clinical procedure that demands a high level of nursing competency. This study intends to assess the effect of nursing care protocol for peripheral intravenous therapy on knowledge and practice of registered nurses and the association between pretest knowledge scores and selected socio-demographic variables using King's conceptual framework and Goal Attainment Theory.

Methodology: One group- pretest-posttest design, was used with self - reports and observation methods to collect knowledge and practice data from 30 registered nurses selected by simple random sampling (lottery method). Structured questionnaire and checklist based on personal, interpersonal, and social system of king's conceptual system was used to assess the knowledge and practice of registered nurses, respectively.

Results: Even though 30% of the nurses had attended previous continuing education on peripheral intravenous therapy, only 3.3% had very good knowledge. There was a significant difference in the knowledge and practice after implementation of the nursing care protocol. The pre-test knowledge scores have association with attendance in previous continuing nursing education.

Conclusion: Study findings reveals the advantages of protocol development and improved knowledge and practice of nurses, which in turn obviously increase the health status of the patients and quality index of the hospital.

Recommendation: The novice nurses can be educated on the protocol as a hospital policy enhancing the effectiveness of nursing care. Its implication can be evaluated using nursing audit at periodic intervals.

Keywords: King's conceptual framework, Goal Attainment Theory, nursing care protocol, peripheral intravenous therapy, knowledge, and practice.

INTRODUCTION

Nursing today has moved away from its historical conception as nearly being a part of medical science to a human science having innovative perspectives on person, nursing, and knowledge based on values and beliefs. Nursing practice theories provide frameworks for nursing interventions and predict outcomes and periodically audit the impact of nursing practice. The aim of nursing theories is to improve practice by testing the usefulness of the theory in professional practice. King's conceptual system and transaction process in the Theory of Goal Attainment provides a framework for healthcare systems and healthcare providers, for effective and efficient case management with mutual satisfaction for patients, families, physicians, and administrators. The measure of nursing care outcomes results in enhancing the quality and cost-effective care; that is, goals are set, and goals are attained (King I. M. (1996).

Among common nursing procedures, intravenous catheterization is one of the most common invasive procedures among patients admitted to hospital, with about half receiving intravenous therapy during their stay (Ellis I, 2005). The importance of asepsis has become an integral part of modern patient care, as the number of patients who require intravenous therapy has increased due to changes in the prescribing patterns and the acute nature of today's illnesses. Many complications are often associated with intravenous catheter site, which includes phlebitis, infiltrations, extravasations, and infections that lead to increased hospital stay and additional cost to the patient (Rodríguez, 2020). A very good knowledge and practice among registered nurses can limit these complications and ensure good patient outcome.

Qamar et al. (2017) in their study stated that nurses have fair knowledge but unsatisfactory practice of intravenous therapy and a protocol helps ineffective intravenous therapy. The mean knowledge score of nurses regarding intravenous therapy was 14.16 % and practice mean score was 38.84 % in that study. There are discrepancies in clinical practice especially in areas demanding asepsis.

Nursing care protocol is the sequence of steps followed from preparation to the insertion of peripheral intravenous catheter, its

maintenance, administration of medications, and removal of peripheral intravenous catheter. Implementations of protocols are found to be effective in many studies, and it has improved nurses' knowledge and performance of intravenous infusion therapy. The incidence rate of phlebitis has decreased from 0.77% in 2010 to 0.17% in 2011, with an annual curve of negative tendency after adopting the intravenous protocol and training of the entire staff nurses (Santolim, 2012).

Disparities in the practice of intravenous therapy among nurses in the same hospital are of common concern. Appropriate training, continued support and maintenance of skills are vital to practice the techniques of venipuncture and cannulation. A high standard of performance contributes to non-traumatic vein puncture, conservation of veins for future use and the reduction of routine complications that demands the need for implementation of the nursing care protocol on peripheral intravenous therapy (Yadav, 2020).

Ellis et al. (2005) portrayed that with the current trends in nursing especially in terms of evidence-based nursing practice, King's Conceptual system and theory of goal attainment has a great role in improving the knowledge and practice of nurses. King's theory emphasized the need to focus on and organize the existing knowledge in nursing, as well as to expand the knowledge base for nursing practice:

Hence, the researcher(s) focused on the effectiveness of nursing care protocol on peripheral intravenous therapy among registered nurses by determining the objectives:

- Assess the knowledge and practice on peripheral intravenous therapy
- Assess the effectiveness of nursing care protocol
- Assess the association between selected socio-demographic variables and pretest knowledge score.

MATERIALS AND METHODS

Quantitative research approach with one group pretest- posttest design was implemented to accomplish study objectives. The independent variable was protocol on peripheral intravenous therapy whereas the dependent variable was knowledge and practice of staff nurses on peripheral intravenous therapy. Using

simple random sampling (lottery method), 30 registered nurses were selected from medical surgical wards of a Private hospital in Kottayam district, Kerala.

Structured questionnaire was prepared on socio-demographic variables and knowledge assessment. The knowledge questionnaire included items on site selection, insertion of intravenous cannula, complications of cannulation, special considerations and fluid calculation and a practice checklist consisting of three sections: insertion of peripheral intravenous catheter, maintenance of the catheter and its removal. A nursing care protocol was developed on peripheral intravenous therapy. Eight experts in the nursing field did the content validation and the reliability of questionnaire was established using split-half technique of Spearman's Brown Prophecy formula. The practice checklist used the inter-rater technique. The correlation coefficient was found to be 0.81 for knowledge questionnaire and 0.71 for practice checklist. Clinical instructors observed the practice of staff nurses, to reduce the bias due to the researcher's presence. The data was collected in four sessions: first pretest for assessing knowledge and practice, then the nursing care protocol was introduced to the subjects individually followed by a posttest after two weeks.

The data were analyzed using descriptive statistics and inferential statistics.

1. Descriptive statistics:

➤ Frequency and percentage distribution was computed for analyzing demographic variables.

2. Inferential statistics:

➤ Paired 't' test was used to compare the pre and posttest knowledge and practice of staff nurses.

➤ Chi-square test was used to associate the selected demographic variables with knowledge and practice.

Application of King's conceptual framework and goal attainment theory: The conceptual framework for the present study is based on King's Conceptual system and the concept of Modified King's Goal Attainment Theory developed in 1981. According to it, "it's a process of human interaction between two individuals, whereby each perceives the other end and the situation and through communication set the goals, explore means and agree on the means to achieve the goal". The study elicited the effectiveness of nursing care protocol for peripheral intravenous therapy on knowledge and practice of registered nurses. King has interrelated the concepts of interaction, perception, communication, transaction, self, role, stress, growth and development, time and space into the theory of goal attainment. Her theory deals with a nurse-client dyad, a relationship to which each person brings personal perceptions of self, role, and personal levels of growth and development. The nurse and client communicate, first in interaction and then in transaction, to attain mutually set goals. The terms Researcher and registered nurses replace nurse and client respectively in the present study. The three systems which King constituted into her conceptual systems are personal, interpersonal and social which eventually provided the basis for her Theory of Goal Attainment (Alligood MR, 2010).

Personal system: It includes nurses' self-perception regarding personal growth and development. Nurse's perception of knowledge and practice regarding intravenous therapy depends on the professional experience and competency, experience during student period, the working environment and the workload (Primo CC, 2017). One reason for a negative self-perception is the limitation of training and the inadequate exposure acquired by the nurses during student period. The self is a person's total subjective environment. A low self-esteem is the resultant of poor academic background, nursing education from low profile institutions, lack of clinical experience and so on.

Pretest helps to reflect on their existing knowledge and practice. Irrespective of the knowledge related to intravenous therapy, an undesirable practice can result from constraints of time, increased turnover and increased workload with less

resources. It is obvious that a systematic well-defined protocol with adequate training empowers confidence to provide quality patient care.

A nurse's body image is the way each nurse perceives her body during the patient care and the reaction of others to her figure; it is dynamic, personal, and subjective and it can be altered due to disorganized as well as excessive workload. Most of the study participants are in the age group of less than 30 years; the developmental group as per Erickson, requires a break from service for marriage and parenting. This can affect their clinical performance. Duty time of 8 or more hours and workload prevents staff nurses from updating their knowledge (Róselyne et al. 2019).

Interpersonal system: According to Tahmouresi M (2018), interpersonal system is the goal directed component of the conceptual system wherein interaction, communication and transaction occurs between two or more people. King defines nursing as the interaction and relationship of the person with the environment to attain health and thereby improve human well-being. Researcher and registered nurse forms a dyad. It is very important to have mutual agreement among nurses to follow the protocol in order to improve their knowledge and practice. Communication is the cornerstone and the interaction with a common goal leads to transaction. While implementing the protocol, the communication is clear and systematic, while the interactions and roles are specific and unambiguous. Familiarity in using the protocol reduces stress and goal directed human behavior results from such transactions. It is important to identify the stress factors related to the learning process. To reduce the stressors and to make the interpersonal level effective, one-to-one education is provided to the nurses. The dynamic communication and the interaction reduce the stress related to knowledge and practice.

Social system: King believes that each human is an open system with unique needs, motivations, and wants which are different from those of other humans. She also noted that the needs, motivations, and wants might significantly affect transaction. The impact of protocol on the social system will be evident in patient care as one of the hospital's quality index. Power is the ability to use the organizational resources appropriately and a clear and accurate understanding of power helps in goal attainment. The organization of the working environment has a definite role in promoting the knowledge and practice among nurses. Organizational systems for the protection, promotion, and support of quality care by the nurses comprises of coworkers of the nursing community and other healthcare workers, hospital management and other resources. In addition, active systematic implementation of policy is ensured with regular auditing to monitor the alignment between policy and practice (Adib, 2018).

Among the three systems, the conceptual framework of Interpersonal system forms the basis for present study. This theory includes a human process of interactions that leads to transactions and to goal attainment (outcomes). This process is useful in any situation and in any culture. The six major concepts of this phenomenon include:

1. Perception: It refers to people's representation of reality. It is not observable but inferred here as, the investigators perception to improve the knowledge and practice of registered nurses on peripheral intravenous therapy.

2. Judgment: The investigator decides to assess the knowledge by structured questionnaire and practice by checklist.

3. Action: A sequence of behaviours involving mental and physical action. The sequence is first mental action to recognize the present conditions; then physical action of activities related to those conditions; and finally, mental action in an effort to exert control over the situation, combined with physical action seeking to achieve goals. Here the investigator plans to introduce nursing care protocol and to help them acquire and update their knowledge and practice.

4. Reaction: It might be considered in the sequence of behaviours described in action. Here the investigator assesses

whether the registered nurses are following the introduced nursing care protocol.

5. Interaction: This is a process of perception and communication between person and environment and between person and person represented by verbal and nonverbal behaviors that are goal-directed. Here the investigator evaluates the registered nurses' knowledge and practice based on post-test and interacts with them.

6. Transaction: A process of interactions in which human beings communicate with the environment to achieve goals that are valued; transactions are goal-directed human behaviors. Here, the investigator reassesses the results gained, whether the intervention is adequate or inadequate.

The process of perception and judgment can be inferred whereas interaction is directly observed, while transaction is dependent on the achievement of the goal (Khowaja K, 2006).

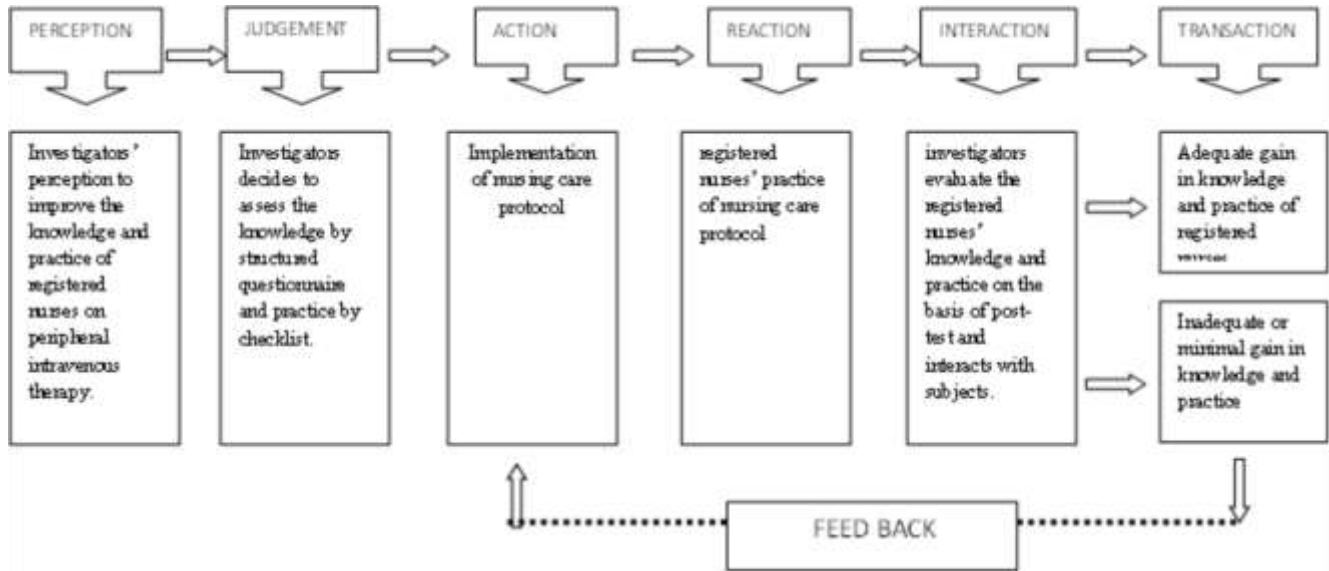


Figure 1: Schematic representation of the study framework incorporating Kings Model.

King additionally developed a documentation system, the goal-oriented nursing record (GONR), to enhance the Goal Attainment Theory, to record goals and outcomes. The GONR may be a methodology of collecting information, recognizing issues, and implementing and evaluating in every patient care setting. The strength of this is often that the nurses can formulate individualized plans of care with the active participation of the patient (Killen MB, 2007).

RESULTS

The study results demonstrate that more than 70 percentage samples are females within the age group of less than 28 years with the qualification of General nursing and Midwifery course (GNM) having experience ranging between 2-5 years and who have not undergone any continuing education related to IV therapy.

Table 1: Demographic details of study subjects

Variable	Category	Frequency	Percentage
Age	less than 28yrs	23	76.67
	more than 28	7	23.33
Gender	Male	6	20
	Female	24	80
Qualification	GNM	21	70
	BSN	7	23.33
	PBSN	2	6.67
Experience	2-5 years	21	70
	5-10 years	9	30
Continuing Education	Yes	7	30
	No	23	70

With the implementation of nursing care protocol, the knowledge level at very good level increased from 3.3% to 40% and the practice observation score from 23.3% to 40%, as shown in Table 2.

Table 2: Knowledge and practice at pretest and posttest

Knowledge	n=30 Pretest		n=30 Post test	
	Frequency	Percentage	Frequency	Percentage
Very good	1	3.3	12	40
Good	9	30	17	56.7
Average	17	56.7	1	3.3
Poor	3	10	0	0
Very poor	0	0	0	0
Practice				
Very good	7	23.3	12	40
Good	20	66.7	17	56.7
Average	3	10	1	3.3
Poor	0	0	0	0
Very poor	0	0	0	0

Table 3: Effect of nursing care protocol

	Mean	SD	t' value
Knowledge			
Pretest	11.67	2.34	7.66, Significant at p<0.001
Posttest	18.8	1.67	
Practice			
Pretest	73.1	8.71	6.07, Significant at p<0.001
Posttest	82.97	6.75	

Table 4: Association between pretest knowledge and practice score and selected variables

Variables	Chi-square		df	P value			
	Knowledge	Practice		Knowledge	Practice		
Age	8.94	0.39	9	2	0.44	0.82	
Gender	14.69	0.97	9	2	0.10	0.62	
Course	12.26	2.27	18	4	0.83	0.69	
Years of experience	10.39	0.02	9	2	0.32	0.99	
Continuing Nursing Education	15.75	0.39	9	2	0.07	Significant at p<0.05	0.82

The knowledge and practice pretest and post test score shows significance at $p < .001$ level as in Table 3.

Table 4 shows that there is no association between pretest knowledge and practice and the selected variables except participation in continuing nursing education and knowledge.

DISCUSSION

The study identifies the effectiveness of a nursing care protocol on knowledge and practice of registered nurses regarding peripheral intravenous therapy. In this study, majority of the nurses are female under the age of 28 years, which is similar to the study conducted in a Specialty Medical Hospital (Kousar R, 2017). From the investigator's observation of the practice of staff nurses in peripheral intravenous therapy, it was found that 23.3% nurses had very good practice, 66.67% had good practice and only 10% staff nurses had average practice. The findings revealed that the mean practice score of registered nurses increased from 73.1 to 82.97 after the implementation of nursing care protocol. It was concluded that there was significant difference in practice ($t=6.07$, $p<0.001$) after introduction of nursing care protocol. Similar results were observed in a couple of studies related to knowledge and performance of nurses after implementation of nursing protocol (Qamar Z, 2017). Test of association between knowledge and practice of the registered nurses regarding peripheral intravenous therapy with selected demographic variables was done using Chi square which revealed that there is significant association (p value=0.072, $p=<0.05$) with participation in previous continuing nursing education and pre-test knowledge scores of nurses regarding peripheral intravenous therapy.

Yadav P (2020) identified that there is no association of knowledge and practice with age, sex, previous experience and the training the staff had undergone. Contrary to this our present study revealed that there was an association with pretest knowledge and attendance in continuing nursing education. It again highlighted the importance of the need for a standard protocol in each clinical setting.

Messmer P. R. (2006) states that the conceptual framework will direct research to analyze the need for the development of a nursing care protocol. Implementation of nursing intervention with the backup of a conceptual model may not always be producing fruitful outcomes. This study tried to highlight the gap of unified practice in the same institution, wherein the personal, interpersonal, and social system should operate as a whole to guarantee better patient outcome.

Recommendations: The study can be conducted on larger samples for statistically significant results with periodic auditing. The nursing administration should formulate policies, protocols, and guidelines of care in collaboration with the Quality team. Adequate orientation programs need to be organized for the new nurses in order to familiarize them with the policies and procedures and to conduct audit for the existing nurses.

CONCLUSION

King's conceptual framework and theory of goal attainment serves as a beneficial structure for the present study to implement nursing care protocol and thereby increase knowledge and practice of nurses regarding peripheral intravenous therapy. The challenges of variation in practice regarding peripheral venous therapy can be overcome by adhering to nursing care protocols. Professional nurses bring knowledge and skills which influence their perceptions, communications, and interactions in carrying out the role described in King's goal attainment theory. With knowledge of the concepts and the process, nurse have a broader scientific base for effective practice which can be articulate and clear documentation to show cost-effective quality care.

Conflict of interest: The Author(s) declare(s) that there is no conflict of interest.

REFERENCES

1. Adib-Hajbaghery, M., & Tahmouresi, M. (2018). Nurse–patient relationship based on the Imogene King's theory of goal attainment. *Nursing and Midwifery Studies*, 7(3), 141. <https://doi.org/10.4103/2322-1488.235636>
2. Allgood M. R. (2010). Family healthcare with King's theory of goal attainment. *Nursing science quarterly*, 23(2), 99–104. <https://doi.org/10.1177/0894318410362553>
3. Ariya, O., & Abwalaba, R. (2019). Factors influencing nurses' competence of intravenous fluid therapy in under-fives with dehydration in Kakamega county hospitals, Kenya. *International Journal of Science Education*, 6, 257–266.
4. Ellis, I., Howard, P., Larson, A., & Robertson, J. (2005). From workshop to work practice: An exploration of context and facilitation in the development of evidence-based practice. *Worldviews on evidence-based nursing*, 2(2), 84–93. <https://doi.org/10.1111/j.1741-6787.2005.04088.x>
5. Fawcett, J. (2005) *Contemporary nursing knowledge: analysis and evaluation of nursing models and theories* (2nd ed.), PA: F. A. Davis Company.
6. Frey, M. A., Sieloff, C. L., & Norris, D. M. (2002). King's Conceptual System and Theory of Goal Attainment: Past, Present, and Future. *Nursing Science Quarterly*, 15(2), 107–112. <https://doi.org/10.1177/089431840201500204>
7. Furniss, D., Lyons, I., Franklin, B. D., Mayer, A., Chumbley, G., Wei, L., Cox, A. L., Vos, J., Galal-Edeen, G., & Blandford, A. (2018). Procedural and documentation variations in intravenous infusion administration: a mixed methods study of policy and practice across 16 hospital trusts in England. *BMC health services research*, 18(1), 270. <https://doi.org/10.1186/s12913-018-3025-x>
8. Khowaja K. (2006). Utilization of King's interacting systems framework and theory of goal attainment with new multidisciplinary model: clinical pathway. *The Australian journal of advanced nursing : a quarterly publication of the Royal Australian Nursing Federation*, 24(2), 44–50.
9. Killeen MB, & King IM. (2007). Viewpoint: Use of king's conceptual system, nursing informatics, and nursing classification systems for global communication. *International Journal of Nursing Terminologies and Classifications: The Official Journal of NANDA International*, 18(2) Retrieved from /z-wcorg/ database.
10. Kim, M. J. K. and Y. J. (2015). Variables Affecting Nursing Competency of Clinical Nurses. *Indian Journal of Science and Technology*, 8(26), 1–9. <https://doi.org/10.17485/ijst/2015/v8i26/80758>
11. King, I. M. (1981). *A theory for nursing: systems, concepts, process*. New York: J. Wiley.
12. King I. M. (1996). The theory of goal attainment in research and practice. *Nursing science quarterly*, 9(2), 61–66. <https://doi.org/10.1177/089431849600900206>
13. Messmer P. R. (2006). Professional model of care: Using King's theory of goal attainment. *Nursing science quarterly*, 19(3), 227–229.
14. Nurses' knowledge and practice regarding intravenous therapy in a teaching hospital, Bharatpur | *Journal of Chitwan Medical College*. (n.d.). Retrieved April 7, 2021, from <https://www.nepjol.info/index.php/JCMC/article/view/23777>
15. Panchal, N. K., & Yadav, P. (2020). A Study to Assess the Knowledge and Practices Regarding Administration of IV Therapy among the Staff Nurses Working in BIMR Hospital at Gwalior, M.P. *International Journal of Medical and Health Research*, 6(1), 56–64.
16. Primo, Cândida Caniçali, & Brandão, Marcos Antônio Gomes. (2017). Interactive Theory of Breastfeeding: creation and application of a middle-range theory. *Revista Brasileira de Enfermagem*, 70(6), 1191–1198. <https://dx.doi.org/10.1590/0034-7167-2016-0523>
17. Qamar, Z., Afzal, M., Kousar, R., Waqas, A., & Gilani, D.S. (2017). Assess Nurses Knowledge and Practices towards Care and Maintenance of Peripheral Intravenous Cannulation in Services Hospital Lahore , Pakistan.
18. Rizany, I., Hariyati, R., & Handayani, H. (2018). Factors that affect the development of nurses' competencies: a systematic review. *Enfermeria clinica*, 28 Suppl 1, 154–157. [https://doi.org/10.1016/S1130-8621\(18\)30057-3](https://doi.org/10.1016/S1130-8621(18)30057-3)
19. Rodríguez-Calero, M. A., Blanco-Mavillard, I., Morales-Asencio, J. M., Fernández-Fernández, I., Castro-Sánchez, E., & de Pedro-Gómez, J. E. (2020). Defining risk factors associated with difficult peripheral venous Cannulation: A systematic review and meta-analysis. *Heart & lung : the journal of critical care*, 49(3), 273–286. <https://doi.org/10.1016/j.hrtlng.2020.01.009>.
20. Santolim, T. Q., Santos, L. A. U., Giovani, A. M. M., & Dias, V. C. (2012). The strategic role of the nurse in the selection of IV devices. *British Journal of Nursing*, 21(Sup21), S28–S32. <https://doi.org/10.12968/bjon.2012.21.Sup21.S28>
21. Sobeih, H., Nabil Abd –Elsalam, S., Ramadan, S. (2018). Infection Control Measures for Patient with Central Line: Nurses' Performance. *Egyptian Journal of Health Care*, 9(2), 227–237. doi: 10.21608/ejhc.2018.20267