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Editorial

Dr. Sharif Kaf Al-Ghazal, *Editor in Chief*

Assalamo Alaikom

There is really only one topic at the top of peoples' minds at the moment; the new Covid19 vaccine. When we take a step back and consider the progress that has been made, it has been astounding. Amongst Allah's blessings is that we have discovered the vaccine and managed to make such strides in less than a year. Various diseases such as Malaria and HIV have been in circulation for far longer and little progress has been made on a vaccine for them so the strides on the Covid vaccine are extremely impressive.

No one denies the nightmare that is 2020, with just under 2 million dead worldwide and above 10,000 dying daily, those deaths equate to approximately 1 every 10 seconds. By the time you'll have read this editorial, around 30 people will have died from Covid worldwide. Those who have died are not merely numbers; they are parents, sons, daughters, husbands, wives, friends and loved ones. The immeasurable impact of their death will affect their families for a long, long time. As well as the fatalities it has brought upon us, the effect on daily life, peoples' livelihoods and the economy has been catastrophic. Covid has caused a huge rise in unemployment globally and has severely impacted the mental health of millions due to anxieties and forced social isolation. The importance of finding a vaccine is critical.

There is no doubt that we have to focus on the issue of the Covid vaccine and what is being spoken about it too. We are aware of social media amplifying stories and mistruths surrounding the vaccine which have no scientific basis whatsoever. As Muslims, we have a duty to ensure that what is being spoken about is accurate. There have been wild rumours which go beyond the scope of this editorial, but we need to admit that the so called "doctors of WhatsApp" are extremely problematic!

Allah (swt) says in the Quran that when you receive information from a distrusted source you cannot simply blindly accept it. You need to be sure about it and investigate:

"O you who have believed, if there comes to you a disobedient one with information, investigate, lest you harm a people out of ignorance and become, over what you have done, regretful"(Al Hujaraat, verse 6).

يَا أَيُّهَا الَّذِينَ آمَنُوا إِن جَاءَكُمْ فَاسِقٌ بِنَبَأٍ فَتَبَيَّنُوا أَن تُصِيبُوا قَوْمًا بِجَهَالَةٍ فَتُصِحُّوا عَلَىٰ مَا فَعَلْتُمْ نَادِمِينَ

Allah (swt) also says In the Holy Quran:

"And do not follow a thing about which you have no knowledge. Surely, the ear, the eye and the heart - each one of them shall be interrogated about." (Surat AL Israa, verse 36)

وَلَا تَقْفُ مَا لَيْسَ لَكَ بِهِ عِلْمٌ ۚ إِنَّ السَّمْعَ وَالْبَصَرَ وَالْفُؤَادَ كُلُّ أُولَٰئِكَ كَانَ عَنْهُ مَسْئُولًا

Although it is vital that a Muslim questions and reflects and does not take anything at face value. We do not just follow for the sake of following. It is necessary however to leave the scientific debate on the issue of the vaccine to the experts in the field.

As Allah swt says the Quran:

"So, ask the people of knowledge if you do not know".(Surat Al Nahl, verse 43)

فَاسْأَلُوا أَهْلَ الذِّكْرِ إِنْ كُنْتُمْ لَا تَعْلَمُونَ

Vaccine hesitancy is not new and people have questioned certain vaccines in the past. Questioning is not necessarily a bad thing but this debate should be left within the specialists of the field. It does not however mean that experts should not be listened to. We at BIMA through our national conference have brought together *Ulama* and experts in the field to discuss this issue. And we at BIMA have also [stated and published our evidence based position](#) towards the vaccine, which has been supported by a good number of Muslim organisations and *Ulama* in Britain. It is important to stress that experts in this field need not be Muslim. The Medicine and Healthcare product Regulatory Agency (MHRA) in the UK as well the Food and Drugs Administration (FDA) in

the USA have given the all clear for the vaccine to go ahead. Medicine as a profession is fundamentally evidence based, and this is what gives doctors and experts legitimacy and ensures that the public trust in them is maintained. Doctors and other experts are trusted with their knowledge to provide the treatments and cures for so many diseases, so why should Covid be any different?

There is no doubt that the efforts of the *Ulama* and doctors have been heroic and we at BIMA have worked with both sides to solve many problems over the last 10 months and the issue of the vaccine is no different.

The vaccine may not prevent Covid itself, but most likely prevents the severe form of the disease and significantly decreases the risk of death. Vaccines have fully eradicated Smallpox and have decreased Polio, to the extent that the CDC (USA) predicted that by 2013, an additional 17 million people would have been infected and paralysed if it were not for a vaccine. Unfortunately, Polio is still an epidemic in 3 countries and sadly, all 3 are Muslim-majority (Pakistan, Afghanistan, Nigeria). So many of the sufferers of Covid are of BAME background so it is even more crucial that the vaccine is delivered. There needs to be a lobbying effort to ensure that BAME people are vaccinated quickly and early.

There is an oft-quoted argument by vaccine sceptics that herd immunity can be achieved by having 60% of the population infected therefore making the vaccine redundant. This would mean another 2 years of this existing nightmare and hundreds of thousands more dying and the lives of loved ones affected.

Amongst the most significant challenges is the delivery of the vaccine and actually vaccinating people as well as ensuring that states can even buy vaccines. Plenty of

states in the Global South with less developed healthcare systems will likely struggle with this. Another is to ensure that a vaccine covers all strains after inevitable viral mutations.

As Muslims, we believe in the Hadith of the prophet PBUH: "There is no disease that Allah has created, except that He also has created its treatment". What we understand from this Hadith is that we are encouraged to go out and make the effort to search and develop a cure as the protection of life is amongst the main 5 purposes of the Shariah.

It is worth mentioning that amongst the 2 most well-known scientists working on the recently developed Pfizer BioNTech vaccine are of Turkish and Muslim descent. They have left a remarkable imprint on the world; it is hoped that Muslim doctors, pharmacists and scientists can continue to do the same. Muslims have the ability to spread good, it is up to us to take it.

We as Muslims have to go beyond conspiracy theories. Our goals in life are so much bigger. The scholars in the Muslim golden age would never have been side-tracked by conspiracies and misinformation, their aims were so much higher. We have to aspire to be like them. It is our duty as Muslims.

Very best wishes,

Wassalam Alaikom.

Dr Sharif Kaf Al-Ghazal
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Vaccines: Religio-cultural arguments from an Islamic perspective

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Abstract

As of December 29, 2020, more than 70,750 deaths had been reported in the UK to have been caused by COVID-19. Although efforts are being made worldwide to develop a vaccine, the question British Muslims face is regarding the Islamic ruling on the Pfizer-BioNTech COVID-19 vaccine. For this purpose, this article provides an analysis of the research into the main arguments made from an Islamic perspective concerning vaccines. These arguments are extrapolated from the discourse on vaccination by examining key fatwas and events since the late 1980s. My research finds that the 57 member states of the Organisation of Islamic Cooperation (OIC) have been and continue to be strongly in favour of eradicating infectious diseases through the use of vaccines. The arguments made against vaccines are based on a) an interpretation of the Qur'an that the human immune system is not designed to be vaccinated through intramuscular (IM) or oral vaccines and b) that vaccines contain dangerous ingredients. Moreover, in war-ravaged Muslim countries, notions have emerged that vaccines are adulterated to sterilise Muslim women. This article is aimed to help British muftis, Muslim faith leaders, healthcare professionals in the UK, the NHS and PHE to help contextualise the arguments put forward against vaccines in the effort to overcome challenges in introducing the new Pfizer-BioNTech COVID-19 vaccine.

Introduction

The information in this article is intended to inform British muftis, Muslim faith leaders, healthcare professionals in the UK, the NHS and PHE - of the Islamic perspective on vaccination and the approaches Muslim jurists around the world have taken towards vaccination. The findings could help to discuss and combine efforts to best advise the British Muslim community with regard to the Pfizer-BioNTech COVID-19 vaccine. The proposed use of this vaccine is 'for active immunization for the prevention of COVID-19 caused by SARS-CoV-2 in individuals 16 years of age and older' [1][2]. For this purpose, some of the underlying arguments for vaccine hesitancy based on theological and socio-cultural factors are explored.

1.1 Methodology and scope of the article

An analysis of existing fatwas on vaccination is provided in this article. However, as Padela [3] points out, 'it is impossible to gather all fatwas on any issue as they are rendered verbally or in writing and in various languages and are found in diverse media sources including radio and television programs, websites, newspapers, book collections, policy reports, and academic papers'. As such, my research is limited to key fatwas written in English, Urdu, and Arabic on vaccination since the late 1980s. Likewise, the arguments made against using vaccines discussed in this article are not exhaustive, but ones that have been seen to give significant rise to vaccine hesitancy among Muslim populations in

Afghanistan, Pakistan, Nigeria and Johannesburg, South Africa.

At the time of writing this article, the rolling out of the Pfizer-BioNTech COVID-19 vaccine was imminent. Now that this vaccine is made available, this article could help provide an understanding of why some Muslims may hesitate and refuse this vaccine unless certain religio-cultural requirements are met.

1.2 Outline

To support vaccination, Muslim jurists have over the past few decades put forward arguments in favour of vaccines. On the other hand, there have emerged arguments against intramuscular (IM) and oral vaccines from non-jurists. Section 2 highlights the efforts of the member states of the OIC to eradicate deadly diseases using vaccines. Section 3 explores key arguments made in favour of vaccines. These arguments include not allowing harm to oneself or others; as well as ensuring that harm to others is prevented. This section also highlights the differences among Muslim jurists concerning the permissibility of the use of gelatine in vaccines. Section 4 examines the arguments and criticisms levelled against vaccines. Arguments selected in this section are ones that appear to have influenced anti-vaccination campaigns among Muslims. Such arguments promote the idea that humans are designed to be treated by natural means such as breast milk and other natural foods. Additional arguments explored in this section include the notion that vaccines contain dangerous ingredients and that they could be adulterated to cause infertility. Section 5 provides a summary of the main arguments for and against vaccines and also contains recommendations for British muftis and medical professionals in the UK to help address vaccine hesitancy now that the Pfizer-BioNTech COVID-19 vaccine is available.

2. Promotion of vaccination by member states of the OIC

This section highlights the efforts and campaigns by different Muslim organisations to eradicate known deadly viruses. Different nations continue to tackle this threat in their different ways. Such viruses pose a threat to Muslims in the UK as they do to the rest of the world. Given the statistics of the pandemic, the British Muslim community have been reported to have suffered excess cases and deaths as a result of the SARS-CoV-2 [4]. The efforts and campaigns by different Muslim organisations

can help to inform and inspire British Muslims on different ways to handle the COVID-19 crisis.

In February 2014, an Islamic Advisory Group for Polio Eradication (IAG) was launched. This group consisted of the International Islamic Fiqh Academy (IIFA), the Islamic Development Bank (IsDB), and the Organisation of Islamic Cooperation (OIC). The campaign mustered 57 member states of the OIC intending to eradicate polio [5]. The eradication program included promoting the use of intramuscular and oral vaccines, which have proven to be effective. Sheikh Yusuf Al-Qaradawi, Chairman of the International Union of Muslim Scholars, stated that the polio vaccine has been effective in over 50 Muslim countries and that its lawfulness in Islamic law is '*clear as sunlight*' [6].

Vaccination, as a process, gained trust because of the success it showed. In the first half of the 20th century, vaccines had been made available against pertussis (1914), diphtheria (1926), tetanus (1938), and influenza (the 1940s). In 1948, pertussis, diphtheria, and tetanus had been combined into one vaccine. Oral polio vaccines (OPV) were made available in 1955 followed by vaccines for measles (1963), mumps (1967), and rubella (1969). In 1971, the MMR vaccination was made available. Over the next two decades, the smallpox vaccine was discontinued because the disease has been effectively eradicated. The Hepatitis B vaccine was made available in 1981 and a vaccine for Haemophilus influenzae type b was made available in 1985.

Bearing in mind that vaccines are effective, the question that requires answering is – is providing or receiving vaccination a religious obligation? A difference of opinion exists regarding this question. The two major opinions worthy of mention include a) One is not required to take medication, especially if taking medication would bring unwanted side effects, and b) giving and receiving medication is praiseworthy and an act that is viewed to be honourable as well as seen to be making skilful use of the knowledge applied by humans. Whilst these two opinions are easily applicable to many diseases and illnesses, the circumstances during a pandemic are different. This difference is based on the fact that if an infected individual does not seek a cure, there is a risk of transmitting the disease to others simply through touch and exhalation.

On this note, in 1992, the International Islamic Fiqh Academy (IIFA) discussed medical treatments including vaccination. Resolution 67 states that among the objectives of Islamic law is the preservation of life.

Accordingly, when not seeking medical treatment may lead to infecting others or causing death to others, then in such cases seeking medical treatment may be considered a religious obligation. The resolution further states that *'A ruler may impose medication in certain cases, as in the case of infectious diseases and preventive health measures'* [7].

Consequently, in 2016, the Fatwa Committee of Perlis in Malaysia [8], which is one of the member states of the Parliamentary Union of the OIC (PUOICM), stated that vaccination is an Islamic obligation:

'Parents have the duty to protect their children from any form of harm. As of date, the vaccination of children has been proven the most effective ways in protecting children from infectious bacterial diseases such as measles, polio, influenza, meningococcal, diarrhea and others. It is considered a religious obligation (wajib) for parents or guardian to protect their children against these illnesses through vaccinating them. Any negligence of this duty on the part of the parents or guardian that may lead to any form of harm to the child is considered committing a sinful act. In addition, refusing to take any preventive measure to protect the society from such illnesses is also another form of sinful act.'

Although obligatory vaccines may be viewed as impinging on individual freedoms, an alternative approach to ensure public safety could be to restrict certain privileges. For instance, to obtain a Hajj or Umra visa, vaccination against certain viruses are required by the Saudi government. Likewise, Qantas Airways Limited, for instance, announced that vaccination will be required for passengers to fly on their airline [9].

Furthermore, Muslim organisations reacted to the rise in vaccine hesitancy in South Africa. Anti-vaccination sentiments among South African Muslims appear to have been introduced by Dr Abdul Majid Katme (2011), a British retired psychiatrist who argues that immunising children by means of vaccines is a form of *'medical assault'*. Katme also argues that IM vaccines could lead to a permanent loss of the immune system in children as a direct result of vaccination being a *'fatally-flawed system of intervention'*. Katme's ideas are further disseminated through the 'MajlisUlema - Voice of Islam' website. Paradoxically, this website does not quote Muslim jurists on the topic of vaccines. Moreover, the articles describe vaccines to be *'dirty'* [10], *'toxic'* [11], and *'satanic'* [12] as well as vaccine manufacturing as *'witchcraft'* [10] and manufacturing companies as *'devils'* [12]. Moreover, pamphlets containing Katme's

ideas were circulated in print among the Muslims of Johannesburg.

In response, Dr Ebrahim Khan, president of the Islamic Medical Association of South Africa (IMA SA) stated that *'The IMA distances itself from any of these campaigns that advise people not to vaccinate The IMA position is that vaccination is an essential tool in the prevention of disease'* [13]. Additionally, three more fatwas were issued by Mufti Ebrahim Desai of South Africa in support of vaccination in 2012. The debate on vaccination was mostly academic in South Africa, however, the anti-vaccination campaigns in Pakistan had resulted in the killing of health workers attempting to administer polio vaccines.

Consequently, in 2013, meetings on the theme of 'Polio Eradication in the Light of Islam' were held at the International Islamic University in Islamabad in collaboration with Al-Azhar University. The consultation report concluded that the OPV available in Pakistan do not contain any 'haram' content. It was also concluded that vaccines do not have any content that causes infertility, early adulthood, or lead to any other health disorders [14]. The consultation was also followed by a fatwa issued by Jamia Dar-ul-UloomHaqqania permitting vaccines - in light of recommendations from Muslim physicians [15]. Likewise, Mufti Muhammad Naeem of JamiaBinoria, Karachi is also reported to have said in relation to OPV that *'In the past, I too had suspicious [sic] about the vaccine, but not anymore ... This vaccine saves children from lifetime disabilities and other preventable diseases'* [16].

The efforts to support vaccination campaigns to eradicate viral diseases mentioned in this section illustrate the value of vaccines to the Muslim states that are members of the OIC.

3. Arguments in favour of preventative measures

'La dararwa la dirar' – 'One should neither suffer harm nor cause harm to others'. This Islamic jurisprudential maxim serves as the underlying argument in favour of finding solutions to eradicate infectious diseases. Since medication and treatment involve a degree of pain and discomfort, this maxim refers to serious harm. In relation to SARS-CoV-2, according to this maxim, an individual should not suffer from the virus as a result of negligence in safety procedures. Likewise, an individual showing symptoms of COVID-19 must take every precaution by maintaining social distancing and self-isolation to ensure

that the virus is not transmitted to another individual. As COVID-19 is a novel case, precedents of implementing this maxim can be found in relation to other diseases.

3.1 Offering medical treatment

Muhammad Rasulullah, the Prophet of Islam (Peace be upon him), himself often encouraged people to seek medical treatment and prescribed exact steps that needed to be taken. A compilation of such medical advice forms the '*Al-Tibb an-Nabawi*' literature - meaning 'Prophetic medicine'. Such encouragement of seeking medication is also in agreement with the Qur'an wherein the prophet Ayyub (Job), who had been patient with his illness, was instructed to seek a cure [17].

This aspect of Muhammad Rasulullah's teachings served as the basis for a fatwa by Sheikh Bin Baz [d.1999] in favour of vaccines. By 1988, polio was endemic in 125 countries [18]. Bearing in mind the success of the smallpox vaccine and the spread of polio, a timely fatwa was issued in 1989 by the then grand mufti of Saudi Arabia Abdullah Bin Baz. This fatwa was presented at the King Faisal Hospital in Ta'if and encouraged immunisation before the onset of diseases [19]. The fatwa was based on the teaching of Muhammad Rasulullah that eating seven dates in the morning could prevent one from harm [20]. This hadith also supports another hadith, which states that '*We are a people who do not eat until we are hungry. And if we eat, we do not eat to our fill*'. Pieces of advice such as these from the hadith literature reinforce the legal aphorism *sadd-ul-dhara'i* meaning blocking the means to something harmful and further establishes the medical maxim 'prevention is better than cure' [21]. Also, based on the fact that Muhammad Rasulullah himself advised preventative measures such as 'hijama' meaning cupping, seeking such measures is evidently praiseworthy for Muslims [22]. Taking preventative measures is also strongly recommended in the Qur'an - '*be fully prepared against dangers*' [23]. Having discussed in this subsection, the first part of the maxim, which dictates 'One should neither suffer harm', the following subsection discusses the second part of the maxim that dictates 'nor cause harm to others'.

3.2 Avoiding causing harm

In terms of prevention, using intramuscular and oral vaccines is a novel manner of immunising the body, an option that did not exist in the 7th century, during the lifetime of Muhammad Rasulullah. Given this background, there is no mention of IM or oral vaccines in

the Qur'an. Nevertheless, in the hadith literature, which is the collection of texts believed to contain sayings, traditions, and the recorded actions of Muhammad Rasulullah, there exists advice in relation to personal hygiene. Strong emphasis can be found on thoroughly washing the hands after defecating, before ingesting any food, and before congregating with others to pray. In relation to infectious diseases, Muhammad Rasulullah instructed 'not going to a region where an epidemic has broken out, nor to leave from a place where an epidemic has already spread'. Accordingly, one of the most important messages in the Shari'a is to prevent harm – in order to preserve human lives.

A collective public effort is valued more than individual choices during pandemics according to Islamic law. This collective effort focuses on the best possible outcome for the public as could be implied from Muhammad Rasulullah's advice wherein he instructed his followers to not leave an infected place - to help prevent the spread of infection to others. Muhammad Rasulullah also recommended keeping a spear's distance from an infected person; this distance is about two meters [24]. Likewise, when individuals become a health risk for other worshippers, then such individuals may need to be prevented from attending mosques. Camels are among the most valued possessions of the Arabs, especially the bedouins, and within this context, Muhammad Rasulullah emphasised that 'no diseased camel should come near a healthy one' [25]. The legal maxim derived from such instructions is that one should neither expose oneself nor others to any harm.

Based on the maxim of avoiding serious harm, Ja'far al-Sadiq [d.765] advised that when an epidemic strikes a congregation of a mosque, then those who did not attend the mosque - must distance themselves from those who did attend the mosque. As for those in the congregation who are already infected, they should be quarantined [26]. In relation to Friday prayers, Al-Naysapuri [d.875] states that scholars unanimously agree that Friday prayers are neither required for women nor the sick [27]. The ruling is perhaps because women would tend to the care of children and the elderly in the family, who would have been most vulnerable to infections. In extreme cases, where a disease is characterised as epidemic or pandemic, stricter measures may be required by authorities. An example of such a measure is to distance infected individuals from the healthy public. Ibn Battal [d.1057] adds that lepers can be prevented from entering mosques and Suhun [d.854] stated that the Friday prayers are waived for the leper [28].

Such ethico-legal constructs are employed by jurists to ensure actions do not lead to reprehensible ends [29]. Dispensations for the leper demonstrate that although leprosy is not highly contagious, the mental well-being of the leper, as well as that of the general public, is equally worthy of consideration. Furthermore, keeping a physical distance between the leper and the public also sends out a message of caution. By contrast, the other extreme would be to deny infectious diseases altogether – possibly leading to negligence in hygiene and increasing the risk of spreading contagious diseases. In relation to known infectious diseases like measles and polio, a nation could be divided into those who have been vaccinated and those who have not. Such division can give rise to fears of infections spreading between those that have not been immunised by vaccination.

The importance of avoiding causing harm to others can be seen from the teachings of Muhammad Rasulullah wherein individuals are taught to respect each other in mosques by avoiding bringing in foul smells. Ibn Abd al-Bar [d.1071] explained that some individuals who ate an onion would be asked to distance themselves as far as Al-Baqi cemetery [30]. One of the reasons for such distancing could be to avoid causing discomfort to the congregation. Reason would necessitate then that an individual could be asked to distance from the congregation for a number of reasons. Among the reasons could be that an individual suffers from an infectious disease or exhibits behaviour or symptoms and thereby causing fear or inconvenience to a congregation. Applying this reasoning to curb the spread of SARS-CoV-2, the Secretary-General of the Muslim World League Mohammed al-Issa highlights that *'The Islamic Sharia advises people whose mouths smell after eating to not go to communal prayer let alone if they were infected with a fatal virus which everybody has been warned about with no exceptions'* [31].

3.3 Autism in children

Based on the maxim of 'causing no harm', an argument made against vaccines is that they are believed to potentially cause autism in children. Hussain et al. [32] and Hotez [33] point out that a publication in 'The Lancet' by a former British doctor and researcher, Andrew Wakefield [34] is responsible for the belief that autism can be caused by the MMR vaccine. However, the British Medical Association ethics committee and the House of Commons Science and Technology Committee found Wakefield's conduct to be *'unethical'* and found *'equally strong evidence of failure and incompetence by the research ethics committee'* [35]. Furthermore, a

conflict of interest was discovered whereby Wakefield had received funding from litigants against vaccine manufacturers [32]. The editor of The Lancet also retracted Wakefield's study declaring it *'utterly false'* and, consequently, the UK Medical Registry banned Wakefield from practising medicine in the UK [32]. Hussain et al. [32] argue that such *'demonisation of vaccines'* has spread through social media and television talk shows and have resulted in a drop in vaccination in some Western countries. Furthermore, Hussain et al. [32] describe Wakefield's claims to be *'the most damaging medical hoax in 100 years after bringing about outbreaks of diseases otherwise eradicated'*.

Subsequently, over 5,000 cases were raised with the National Vaccine Injury Compensation Program (NVICP) in which the cause of autism was believed to have been vaccination. These complaints led to the Omnibus Autism Proceeding in which six of the strongest cases were examined. The cases were heard by the Special Masters of the United States Court of Federal Claims, who in 2009, concluded that there was no link between vaccines and autism [36].

Additionally, Bukhari et al. [37] point out that the belief that autism is caused by vaccination is based on the use of a very small quantity of mercury and aluminium. The Children's Hospital of Philadelphia states that *'breast-fed infants ingest about 7 milligrams, formula-fed infants ingest about 38 milligrams, and infants who are fed soy formula ingest almost 117 milligrams of aluminium during the first six months of life'*. By contrast, *'infants receive about 4.4 milligram of aluminium in the first six months of life from vaccines'* [38].

Additionally, the OVG states that thimerosal had been used in vaccines as a preservative to stop the growth of bacteria and fungi but has been removed as a precaution since 1999 [39]. Rahman [40] highlights that in 2014, a study involving over a million children in Australia found that there was no evidence to show that thimerosal causes autism. Moreover, the American Academy of Paediatrics has compiled a comprehensive list of research on studies about the general safety of vaccines [41].

In terms of risks that vaccination may carry, the CDC [42] concedes the fact that although *'Vaccines are the best defence we have against infectious diseases ... no vaccine is actually 100% safe or effective for everyone because each person's body reacts to vaccines differently'*. The CDC highlight that *'serious side effects are very rare and occur in about 1 out of every 100,000 vaccinations and typically involve allergic reactions that*

can cause hives or difficulty breathing' [42]. Regarding the Pfizer-BioNTech COVID-19 vaccine, studies involving 42,000 people indicate high efficacy without any serious side effects reported [43].

Vaccines today are believed to be the safest they have ever been and clinical trials are believed to be rigorously monitored by the FDA prior to approval [42]. The Joint Committee on Vaccination and Immunisation (JCVI) stated: *'Given the lack of evidence, the JCVI favours a precautionary approach, and does not currently advise Covid-19 vaccination in pregnancy'* [44]. The Medicines and Healthcare products Regulatory Agency also advised that *'Any person with a history of a significant allergic reaction to a vaccine, medicine or food (such as previous history of anaphylactoid reaction or those who have been advised to carry an adrenaline autoinjector) should not receive the Pfizer/BioNTech vaccine'* [45]. The Pfizer-BioNTech vaccine has also been added to the Vaccines Damage Payment Scheme and any adverse reactions experienced can be recorded for monitoring purposes via the Yellow Card Scheme [46]. The 'vaccine damage payment' scheme in the UK is designed to pay a £120,000 tax-free payment to individuals who are severely disabled as a result of vaccination [47].

Nevertheless, case studies do matter. One failed vaccination can affect a large number of families when they have witnessed a negative experience first-hand. For instance, if a child is affected by a vaccination directly or by coincidence, parents, family members, and friends may focus on the statistics related to those that are affected by vaccines rather than focus on the number of successful vaccinations. However, there appears to be a greater risk of the population being killed by an infectious disease than being seriously affected by a vaccine.

3.4 Concerns over vaccine contents

From the foregoing discussion, the importance of preventing harm to oneself and others is an established notion in Islamic jurisprudence. Nevertheless, before a form of treatment is promoted, Muslim jurists examine the details of the treatment to determine whether it is Shari'a-compliant. As such, Muslim jurists differ over which vaccines are Shari'a-compliant. Although subsections 3.4.1 and 3.4.2 discuss the ruling of gelatine and human cells in vaccines, the MHRA confirms that the Pfizer-BioNTech COVID-19 vaccine does not contain any components of animal origin. Likewise, no product used in the vaccine is derived from foetal cell lines [48].

3.4.1 Concerns over gelatine use in vaccines

Regarding vaccines, Muslims are concerned with the contents. These concerns include ensuring that vaccines do not contain 'haram' ingredients, meaning ingredients prohibited in Shari'a law. However, classifying an ingredient may result in different scenarios. On the one hand, there is a possibility that all Muslim jurists unanimously agree that an ingredient is haram. Alternatively, there could exist a difference of opinion on whether an ingredient is halal or haram. Moreover, another layer that is added to the discussion is the degree of need – that is the repercussions that would follow if the ingredient was not used. If the need is shown to be extreme, then the impermissibility of the ingredient may be exempted under the circumstances and would be allowed for use in medication.

One such contentious ingredient is porcine gelatine or gelatine from an animal that was not slaughtered according to the criteria required to make the product 'halal' meaning permissible. Additionally, another factor with regard to allowing denatured porcine gelatine is the manner in which the vaccine is taken. Nasal sprays or oral vaccines may be viewed by some Muslims as resembling the act of consuming gelatine and, therefore, may observe greater caution. Other factors that are considered by Muslim jurists include the severity of a disease, the reproduction rate of a virus, and the effectiveness of vaccines. Furthermore, even if an ingredient like denatured porcine gelatine was permitted or made an exception due to lack of alternatives, unwanted health risks are still assessed before treatment is encouraged.

The European Council for Fatwa and Research (ECFR) allowed the use of trypsin given the fact that not using it would have major repercussions. Trace amounts of trypsin, an enzyme derived from pork pancreas, had been used in vaccines to help immunise children against polio [49]. In 2003, this issue was discussed at the 11th Ordinary Session of ECFR that was held in the Islamic Center (Stockholm, Sweden) under the presidency of Sheikh Yusuf al-Qaradawi, the President of the Council. The fatwa concluded that the vaccine could be used *'therapeutically and preventively'* and added that *'the prevention of its use would lead to major evil and destruction'* [50]. The inference that could be made from this fatwa is that the use of trypsin is haram but has been allowed due to the lack of an effective alternative. On the other hand, the discussion on denatured porcine gelatine differs in nature.

Whereas the starting point for the ECFR with regard to trypsin is haram, the starting point of denatured porcine gelatine depends on different points of view. On the one hand, porcine gelatine is viewed as haram whereas, on the other, denatured porcine gelatine is viewed as halal. In the latter case, there is no question of need or circumstances because the ingredient is regarded to be permissible *ab initio*. In 1995, in the 8th Medical Fiqh Seminars organised by the Islamic Organization for Medical Sciences Kuwait, clarification was provided that gelatine and pig fat are permissible when their properties have been transformed [51]. This view was also reiterated at the 9th medical fiqh seminar [51] as well as at the 23rd Ordinary Session of the ECFR held in Sarajevo [50].

Moreover, in Kuwait 1995, WHO convened a seminar to discuss 'The judicially prohibited and impure substances in foodstuff and drugs'. 112 Muslim jurists and experts attended the seminar including Sayed Tantawi (the then grand mufti of Egypt), Mohammad Al-Habeeb Ben Al-Khojah (Secretary-General of the Islamic Fiqh Academy in Jeddah), Mufti Mohammad Taqi Uthmani (Head of the Judicial Council in Pakistan) as well as the late Ayatollah Sheikh Mohammad Mahdi Shamseddine (then Head of the Supreme Islamic Shiite Council in Lebanon) [52]. The conclusion was that *'The Gelatin [sic] formed as a result of the transformation of the bones, skin and tendons of a judicially impure animal is pure, and it is judicially permissible to eat'* [51]. Accordingly, vaccines containing denatured porcine gelatine was considered to be permissible. Although 'permissibility' was the starting point for the scholars at the abovementioned seminar, this view continues to be contentious [53]. Perhaps further evidence would help to clarify that complete transformation takes place. However, the ECFR put forward the argument that in order for gelatine to be permitted, a complete transformation is not required.

The ECFR fatwa alludes to the Islamic ruling that when *'water exceeds the amount of two qullas (a measure) it carries no filth'*. Bearing this maxim in mind, the IIFA declared that *'the very tiny amount of the added trypsin [assuming it was unlawful] is too little to have any effect, according to the rule, while filth exists in it'* [50]. The Islamic Fiqh Academy India also reiterated in their 14th fiqhi seminar that was held in 2004 that when gelatine transforms into a distinctly different substance from its parent substance, then it is permissible for use [54]. On this note, even vinegar, which is a chemical transformation in which ethanol is converted to acetic

acid, can still contain trace amounts of alcohol [55] yet vinegar is permitted by Muslim jurists

3.4.2 Human cell strains in vaccine development

According to Olshansky and Hayflick [56], possibly over 4.5 billion cases of polio, measles, mumps, rubella, chickenpox, shingles, adenovirus, rabies and hepatitis A infections worldwide were averted by using the cell strain WI-38, saving 10.3 million lives. The cell line was created from a human foetal lung that was derived by Leonard Hayflick at the Wistar Institute in Philadelphia after a surgical abortion. A cell from the lung was then replicated to produce healthy and stable human cells to make vaccines. Similarly, the MRC-5 cell line was also taken from an abortion in 1966. With nearly 50 years passing, Dr Paul Offit [57], the director of the vaccine education center at the Children's Hospital of Philadelphia stated that *'There are perhaps nanograms of DNA fragments still found in the vaccine, perhaps billionths of a gram... You would find as much if you analyzed the fruits and vegetables you eat'*.

Despite the widespread benefit of the procedure used over nearly half a century ago, it continues to receive criticism. Although the abortion was elective, the consent to use cells in vaccine research was presumed. As such, this approach raises ethical concerns over using human cells without explicit consent and whether the use of vaccines containing newer generations of the cell is Shari'a-compliant.

In relation to the use of foetal cells, the Islamic jurisprudential maxim *'yughtafarufi'lbaqaa ma la yughtafarufi'libtida'* may be applied [58]. The maxim means - that which was initially disallowed to commence may be permitted once commenced. This maxim means that an action may be prohibited, however, once the action has commenced, benefitting from the after-effects of the action is not prohibited. An application of this maxim can be found for instance in rulings pertaining to an individual intending to perform pilgrimage. Upon intending to become a 'muhrim' (pilgrim), hunting is prohibited. However, if one hunted first and then intended to become a pilgrim, the individual would still be permitted to slaughter and eat of the animal. Although it was prohibited for the individual to commence hunting after intending pilgrimage, consuming the meat after intending pilgrimage is permitted.

Likewise, another example can be found in Muhammad Rasulullah himself applying the rule. Muhammad Rasulullah himself was not permitted to receive charity.

As such, any meat that was offered by way of charity was not permitted for him. On one occasion, Muhammad Rasulullah asked if there was food and he was informed that the only meat available was that which was given to a lady by way of charity. Muhammad Rasulullah responded that the meat was given in charity to the lady but should this lady offer the meat now as a gift, then this would not be forbidden for him [59]. Applying this rule to vaccines, although the manner in which the foetal cells were derived to create the WI-38 and MRC-5 cell lines is questionable, the use of the reproduced cells would be permitted according to the maxim in focus.

This discussion around the use of gelatine and human cells challenge only the procedure of how vaccines are manufactured and do not challenge the permissibility of using vaccines per se i.e. vaccines are permissible provided that its contents are permissible. The next section explores arguments that view IM and oral vaccines as impermissible irrespective of their ingredients.

4. Arguments against intramuscular and oral vaccines

Several key arguments and criticisms have been levelled against IM and oral vaccines. These include the idea that humans are designed to naturally develop immunisation through natural means only; that breast milk is a safer alternative, and that IM and oral vaccines are dangerous. Each of these arguments will be discussed and critiqued in this section.

4.1 Developing immunity through natural means

The argument that humans require no intramuscular or oral vaccines is based on the idea that humans are designed to naturally develop immunisation against viruses without the need to resort to such artificial means [60]. The idea stems from the verse in the Qur'an: *'We have indeed created man in the best of moulds'* [61]. As such, Hamdan argues that the human body is believed to be *'miraculous in nature and more amazing than any scientific advancement that man can achieve'*. Accordingly, Hamdan implies that immunisation via IM or oral vaccines is to assume that the human body is not *'perfect'* [60]. Hamdan's interpretation of the Qur'an is that God has created humans perfectly. Hamdan claims that administering IM or oral vaccines implies that *'the body is not "perfect" enough to withstand infectious diseases'*. Furthermore, Hamdan adds that *'chances are that they will only disturb the system and introduce an*

imperfection'. As an alternative, Hamdan argues that breast milk is the best form of vaccination.

4.2 Breast milk

Based on the Qur'an [62], Hamdan argues that breast milk for two complete years is the most beneficial substance for a baby. Breast milk contains essential nutrients and provides antibodies to strengthen the immune system to protect against diseases. Hamdan also recommends healthy and pure foods such as honey, black seed, dates, and olive oil.

Furthermore, Hamdan's main contention with vaccines appears to be that they contain toxic chemicals. These chemicals include formaldehyde, mercury (thimerosal), and aluminium phosphate, all of which Hamdan claims could accumulate within the body leading to cancer, neurological damage, and even death. In support of this view, Katme [63] argues that as long as one observes personal hygiene and consumes a healthy diet, the natural design of the body would destroy viruses.

Whilst breast milk appears to be the purest and the healthiest form of vaccination, it may not be possible for all babies. Moreover, breast milk itself may also transfer viruses. For instance, HIV and Hepatitis B could be transmitted via breast milk. Furthermore, not all babies may have the option of consuming healthy breast milk. On the other hand, Ebrahim [64] points out that although there are great benefits in breast milk, vaccination by injection provides additional protection. As for the use of toxic chemicals in vaccines, these chemicals are used in amounts that are known to not cause any serious harm. Three chemicals that are highlighted as being most harmful in vaccines include formaldehyde, thimerosal, and aluminium phosphate.

4.3 Dangerous chemicals

Formaldehyde is used to kill and inactivate germs and viruses. When a germ or a virus strain is used in a vaccine, it needs to be killed or weakened prior to adding it into the vaccine. For instance, in the polio vaccination, the poliovirus strains are inactivated using Formaldehyde (FA). According to a study by Nei et al. [65], *'low concentrations (0.01–0.1%) of formaldehyde are sufficient to induce formation of amyloid-like tau aggregates, which can induce apoptosis of both SH-SY5Y and hippocampal cells'*. However, after the creation process of the vaccination, only 0.02% FA or less may remain in the vaccine and that too in a liquid form known as formalin. Furthermore, a study by East Carolina

University found that a single dose of 200 µg of formaldehyde *'in a model 2-month-old infant'* is *'completely removed from the site of injection within 30 min [sic]'* [66].

In relation to the mercury-based chemical thimerosal, the OVG [67] clarifies that it was present in the Swine Flu (H1N1) vaccine Pandemrix used between 2009-2011. However, the OVG declare that thimerosal is no longer found in most standard UK vaccines. According to a study by Pichichero et al. [68], thimerosal was found to clear from the blood in 30 days of even very small babies. Even though no evidence suggested that thimerosal caused any serious harm, it was removed from most standard vaccines in the UK, the US and Europe *'as a precaution'* [69].

Lastly, to help strengthen and lengthen the immune response to vaccines as well as to slow down the release of the ingredients from a vaccine, aluminium phosphate is used. Aluminium is found in breast milk as well as formula milk for babies. According to the Oxford Vaccine Group (OVG) [67], *'In the UK, the highest dose of aluminium that babies receive in one go from vaccines is just under 1.5 milligrams (from the 6-in-1, PCV and MenB vaccines at 8 weeks and 16 weeks)'*. This amount is not known to cause any serious harm.

Aside from the argument that humans are designed to develop immunisation through only natural means, and that the use of the above-mentioned chemicals may be harmful, another argument that is put forward is that vaccines may have been adulterated to cause infertility.

4.4 Infertility and depopulation

The Centers for Disease Control and Prevention (CDC) [70] has addressed concerns related to infertility stating that *'There is no current evidence that HPV vaccines cause reproductive problems in women'*. The CDC also stated that there are a number of reasons for primary ovarian insufficiency (or POI), which is a condition in which the ovaries prematurely stop functioning before a woman is of age 40. The CDC [70] in collaboration with the Food and Drug Administration (FDA) has not found any proof that HPV vaccines cause POI. Pertaining to infertility, Al-Azhar University senior official Abbas Chouman also remarked, *'The whole world rejects such fatwas that polio vaccines cause infertility'* [71].

Nevertheless, Katme argues that *'According to many scientific reports, there is additional concern that some vaccines cause infertility and are used for clandestine*

population control'. The origin of such beliefs perhaps originates from political tensions in Afghanistan, Pakistan, and Nigeria. Kennedy highlights that *'Hostility and suspicion towards polio campaigns in northern Nigeria and north-west Pakistan must be understood in the context of broader political conflicts between marginalised groups - Muslims and Pashtuns respectively - and the federal state and their Western allies'* [72]. In 2012, there were 223 reported cases of polio worldwide compared to 350,000 reported cases in 1988 [73]. According to the CDC [74], this rate had decreased by 99% by 2013 when polio had been eradicated from all save three countries: Afghanistan, Pakistan, and Nigeria. In 2014, of the 359 polio cases that were recorded worldwide, 306 were in Pakistan alone while the remaining cases were in Afghanistan, Nigeria, and Somalia [75].

Riaz et al. [49] highlight that *'instability and terrorism'* have hampered the progress of healthcare owing to the fact that *'war-ravaged states are inaccessible, inhospitable, and brewing with fundamentalism and violence'*. Kennedy also illustrates that the rise in vaccine hesitancy and refusal in Pakistan correlated with the frequency of drone attacks between 2004 and 2011 [72].

Mullah Fazlullah, the former Pakistani Taliban leader, began a campaign against immunisation. Consequently, two questions can be found on the South African based online fatwa site Ask-imam. Both questions had come from Pakistan in 2007 in relation to the ruling of polio vaccines. Mufti Ebrahim Desai responded that *'If medical experts regard taking polio vaccine to be necessary to prevent future occurrences, it will be permissible'* [76]. Despite this fatwa, the Mujlisul Ulama of South Africa issued an alternative fatwa stating that vaccines containing any haram substance are impermissible. Moreover, the Mujlisul Ulama of South Africa added that even if such vaccines are required by the Saudi Arabian authorities for Hajj and Umra purposes, such vaccines are impermissible and going for hajj or umrah itself would be impermissible [64].

Furthermore, controversial news broke out in the Waziristan region of northwest Pakistan that the CIA had used a fake vaccination campaign to acquire DNA from Osama bin Laden's relatives. The spread of this news resulted in a violent boycott of polio vaccines [77], [72]. Some factions of the Taliban also believed that the vaccination campaign was a plot to kill or sterilise Muslims [77]. Nevertheless, The Islamic Emirate of Afghanistan supported the WHO and UNICEF's initiative for the eradication of polio [78].

In Nigeria, Ibrahim Shekarau, Governor of Kano State, refused the polio vaccine in the state believing it to be a Western Christian plot to try and reduce the Muslim population in Nigeria [79]. Shekarau commented that *'it is lesser of two evils, to sacrifice two, three, four, five, even ten children (to polio) than allow hundreds of thousands or possibly millions of girl-children [sic] likely to be rendered infertile'* [81]. Datti Ahmed, a Kano-based physician who heads the Supreme Council for Sharia in Nigeria (SCSN), is quoted as saying in relation to polio vaccines that vaccines are *'corrupted and tainted by evildoers from America and their Western allies'*. Ahmed adds that *'We believe that modern-day Hitlers have deliberately adulterated the oral polio vaccines with anti-fertility drugs and ... viruses which are known to cause HIV and AIDS'* [80].

The vaccine boycott in northern Nigeria, as Jegede argues, must be understood in its historical and political context [81]. In the 1980s, under President Babangida's administration, the population policy was limited to four children per woman. As the polio vaccination campaign incidentally followed this policy, this resulted in suspicions of depopulation. In addition to this policy, the attitude of the Nigerian population towards door-to-door immunisation was viewed as an act of aggression against them. Their suspicions were related to reasons as to why they were being given free vaccination instead of the more basic medicines and treatment they required [82]. Moreover, the different Nigerian states have different colonial experiences, which has resulted in different attitudes to medicine in Nigeria [81].

This section highlighted three main arguments against using IM and oral vaccines. These include the idea that breast milk is the most natural way to develop immunisation against viruses; IM and oral vaccines are a form of medical assault; and that some forms of vaccines are adulterated to reduce the Muslim population. Counter-arguments suggest that IM and oral vaccines provide additional protection; the ingredients used in such vaccines are safe; and that the fear of vaccines being used for population control is borne in the context of political conflict and as such, should not be generalised – as incorrect information and rumours could have serious consequences on vaccine uptake as well as give rise to outbreaks of disease in such affected areas. Bearing these arguments in mind, the next section provides advice and recommendations for British muftis and medical professionals in relation to the Pfizer-BioNTech COVID-19 vaccine as well as other routine vaccines.

5. Discussion for the British context

British muftis and medical professionals in the UK now face the challenge of advising British Muslims in relation to vaccination against various diseases including COVID-19 now that the Pfizer-BioNTech COVID-19 vaccine is available. Owing to the fact that the fatwas on vaccination date back to the 1970s, Muslim jurists are required to critically analyse and apply a fatwa that is in the best interest of not only British Muslims but of all who reside in the UK as well as the rest of the world. British muftis and medical professionals in the UK must bear in mind that the member states of the OIC support vaccination.

5.1 Summary of arguments

To summarise the spectrum of views on vaccination, the discussion begins with silence on the matter since vaccination did not exist during the time of Muhammad Rasulullah. As such, vaccination is a matter of 'legal discretion', whereby a plurality of opinions is inevitable. For instance, another bioethical issue that requires legal discretion is organ donation. Seven different opinions are found in relation to organ donation, as such, the manner in which an issue is argued depends on who is interpreting it [83]. Nevertheless, in relation to vaccination and pandemics, collective deliberations such as those at conferences held by the IIFA, ECFR, and other Islamic organisations led to *ijtihad jama'i* meaning 'collective legal reasoning' [84]. *Ijtihad jama'i* is a helpful approach to reach decisions related to bioethics and is more likely to have an impact to clarify, permit, and legalise medical treatments. For instance, the IIFA of Jeddah in 1988 led to the Saudi Government supporting organ transplantation [94]. As the issue of vaccination is absent in classical Islamic texts, a difference of opinion exists.

On the one hand, vaccination may be viewed as a form of 'medical assault' and is believed to cause more harm than good. According to this perspective, vaccination should be avoided altogether and breast milk and other natural substances are to be used to strengthen the immune system. On the other hand, vaccination is not viewed negatively, however, based on theological concerns there are reservations. Such theological concerns include the notion that IM and oral vaccines are unnatural and bring into question the design of the human immune system. The impact of these arguments are not yet fully known or whether or not they are causing a rise in vaccine hesitancy among British Muslims. However, as they have gained attention to a degree, awareness of these

theological arguments could help make informed decisions with regard to vaccine hesitancy among British Muslims. Nevertheless, the 57 Muslim states that form the OIC advise seeking immunisation against viruses through IM and oral vaccines.

The use of porcine gelatine in the nasal flu spray and other vaccines warrant attention due to their contents. The Pfizer-BioNTech COVID-19 vaccine, on the other hand, as stated by the Medicines and Healthcare products Agency, 'does not contain any components of animal origin'. [85] As such, at the time of writing, this vaccine was not regarded as 'haram' by several British muftis of Hanafi Deobandi affiliation [86], rather, it was considered 'halal' [87][88][89].

Nevertheless, in relation to other vaccines, the severity of porcine gelatine is intensified if the vaccine is consumed orally or used as a nasal spray. However, the reservation is slightly lower if injected as in the case of Zostavax shingles vaccine - owing to the resemblance of consuming gelatine in nasal sprays and oral vaccines. However, British Muslims may avoid the MMRVaxPro vaccine, which is gelatine based, because the non-gelatine based Priorix is available in the UK [90]. As for vaccines that are gelatine based but have no alternative, British muftis have permitted their use if there is a fear of contracting diseases [91]. However, not all Muslims agree that denatured porcine gelatine is prohibited. As such, not all Muslims seek an alternative vaccine. Another factor that may contribute to vaccine hesitancy could be due to individuals not viewing certain diseases as threatening as measles or COVID-19. For instance, vaccination for the seasonal flu and rotavirus may not be viewed as necessary as receiving vaccination against MMR or shingles.

Given the spectrum of views on vaccination, there is no compulsion in Islam nor by the UK government as of January 2021, to be vaccinated. The NHS Leaflet 'Vaccines and porcine gelatine' (2016) reads '*The final decision about whether or not to be vaccinated, or have your child vaccinated, is yours*'. On the other hand, British Muslims may choose to be vaccinated themselves or have vaccinated those in their care. Abundant scientific evidence exists that suggests that vaccines work. Moreover, a plethora of fatwas exists, which permit and encourage the use of vaccines. Protecting oneself and others by raising herd immunity may be viewed as a meritorious act based on the Qur'an, which states that '*anyone who saves a life, it is as though he has saved the whole of humanity*' [92].

5.2 Vulnerable Muslims

The vulnerable group include individuals that are influenced by the arguments against IM and oral vaccines. On the one hand, this group sees the benefits of vaccination yet is discouraged from vaccination based on notions of gelatine being haram or that vaccination is adulterated to cause harm. Muhammad Rasulullah explained that 'A Muslim is one by whose hands and tongues other people stay safe' [93]. Accuracy of information is, therefore, vital. British muftis are urged to consider the context of fatwas and campaigns that are against vaccination. A fatwa on vaccination needs to be in light of the way vaccination is approved, monitored, and administered in the UK. Moreover, for the British context, a fatwa itself needs to be presented clearly as a fatwa to avoid confusing it with other forms of guidance documents [94].

The chances of an individual dying from infectious disease are much greater than the chances of being seriously affected by a vaccine. On this note, British muftis are reminded of the value of life according to the Qur'an, which states that '*whoever kills another person ... it is as though he has killed the whole of humanity*' [92]. The late Saudi Sheikh Bin Baz compared the risk of vaccination to circumcision. The latter is not a medical necessity and yet carries the risk of serious complications. Bin Baz argues that the temporary pain and discomfort felt by a circumcised boy is outweighed by other benefits. Irrespective of the pros and cons of vaccination, as of 2021, no law in the UK states that vaccination is compulsory [95]. As such, British Muslims are advised to make an informed decision regarding vaccination for themselves as well as for those for whose health care they are responsible.

6. Concluding remarks

The Pfizer-BioNTech COVID-19 vaccine could be an effective treatment against SARS-CoV-2 and part of the solution to COVID-19. At the time of writing, the vaccine was not known to contain any haram ingredients or cause any serious side-effects. On the other hand, the vaccine has shown high efficacy based on trial studies and as such, bearing in mind that according to the Qur'anic value - saving one life is to save all of humanity - this vaccine has been considered to be halal and appears to be a solution. This vaccine may allow British Muslims to once again socialise safely, conduct regular Friday prayers at the mosques, and continue to attend the Hajj and Umrah.

The arguments made for and against vaccines discussed in this article are not exhaustive. The theological arguments made in favour of vaccines are made by renowned Muslim jurists. Moreover, vaccination programs are endorsed and implemented by the 57 member states of the Organisation of Islamic Cooperation. The theological arguments made against vaccines, on the other hand, appear to originate from non-Jurists and such arguments have been noted to spread in parts of the Muslim population around the world. Given the negative impact of political strife in Afghanistan, northwest Pakistan, and northern Nigeria, arguments made against vaccines in these regions need to be examined within their contexts.

Bearing this information in mind, British muftis and Muslim faith leaders are advised to have discussions on vaccination with British Muslims by being informed of the existing literature of the fatwas on vaccines. Healthcare professionals, Muslim and non-Muslim, need to be aware of the impact the Islamic faith has on Muslim patients with regard to the decision-making process to inoculate against COVID-19. The information provided in this article is aimed to help deliver appropriate health care advice to Muslims in a culturally sensitive manner. As for the policy makers, the NHS and PHE, the nuances in this article in relation to the gelatine and other contentious ingredients used in vaccines need to be noted to help manufacture and provide suitable vaccines for Muslim communities in the U.K. More data from trials that are representative of ethnic populations could be made more transparent to help increase trust and more informed decision-making. Additionally, there is a need for closer consultation by policy makers with the growing body of Muslim scholarly and medical organisations that are increasingly involved in educating the British Muslim public.

References

- 1 Pfizer-BioNTech. Vaccines and Related Biological Products Advisory Committee Meeting December 10, 2020 [pdf]; 2020 Dec 9 [cited 2020 Dec 9]. Available from: <https://www.fda.gov/media/144245/download>
- 2 Pfizer-BioNTech COVID-19 Vaccines and Related Biological Products Advisory Committee briefing document [pdf]; 2020 Dec 9 [cited 2020 Dec 9]. Available from: <https://www.fda.gov/media/144246/download>
- 3 Padela, A. I. Islamic Bioethical Positions on Organ Donation and Transplantation: Stressing Rigor and Caution in Fatwa Reviews. *Transplantation Direct*. 2020. 6(8): e586.
- 4 Office for National Statistics. Coronavirus (COVID-19) related deaths by religious group, England and Wales. [Internet]; 2020 June 19 [cited 2020 Dec 5]. Available from: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/coronaviruscovid19relateddeathsbyreligiousgroupenglandandwales/2marchto15may2020#religious-group-differences-in-deaths-involving-covid-19-adjusted-for-sociodemographic-factors>
- 5 EMRO Jeddah Declaration [Internet]; 2019 [cited 2020 July 17]. Available from: <http://www.emro.who.int/polio/information-resources/jeddah-declaration.html>
- 6 Ghaly, M. M. Physical and Spiritual Treatment of Disability in Islam: Perspectives of Early and Modern Jurists. *Journal of Religion, Disability & Health*. 2008. 12(2): p. 105-143.
- 7 Babakr, A. K. Second Declaration of the International Islamic Fiqh Academy (IIFA) on the Obligatory Nature of Polio Vaccination. *Organisation of Islamic Cooperation International Islamic Fiqh Academy* [pdf]; 2013 [cited July 15, 2020]. Available from: http://polioeradication.org/wp-content/uploads/2013/05/20130514_IslamicFiqh_FA_TWA_ENG.pdf
- 8 Ismail, N. The Mufti and the State Administration of Islam: Some Selected Fatwas in Contemporary Perlis, Malaysia (Mufti dan Pentadbiran Islam Negeri: Beberapa Fatwa Terpilih di Perlis, Malaysia). *Journal of Islam in Asia*. 2019. 16(3): p. 344-373.
- 9 BBC.Covid: Vaccination will be required to fly, says Qantas chief [Internet]; 2020 Nov 23 [cited 2020 Nov 23]. Available from: <https://www.bbc.co.uk/news/world-australia-55048438>
- 10 Wells, S. D. Vaccine witchcraft: Covid-19 vaccine will contain aborted human fetal cells, gmos, causing cancer, etc. [Internet]; 2020 May 25 [cited 2020 Nov 15]. Available from: <http://www.themajlis.co.za/index.php?view=article&>

- catid=34%3amajlis-articles&id=2025%3avaccine-witchcraft
- 11 Muslim Health Watch and the Majlisul Ulama. Truth about vaccines [pdf]; 2020 Feb 15 [cited 2020 Nov 15]. Available from: <http://themajlis.co.za/books/leaflet%20002.%20the%20truth%20about%20vaccines.%202015.02.pdf>
- 12 The Majlis – Voice of Islam. Cannibalism of the satanic vaccine industry [Internet]; 2017 Oct 4 [cited 2020 Nov 15]. Available from: http://www.themajlis.co.za/index.php?option=com_content&view=article&id=1125:cannibalism-of-the-satanic-vaccine-industry
- 13 Mail & Guardian. Muslim doctors denounce anti-vaccination drive [Internet]; 2020 March 19 [cited 2020 July 17]. Available from: <https://mg.co.za/article/2012-03-19-muslim-doctors-denounce-anti-vaccination-drive>
- 14 EMRO. Consultation meeting report - Islamabad 5-6 June [pdf]; 2013 [cited 2020 July 21]. Available from: http://www.emro.who.int/images/stories/pakistan/consultation_meeting_report_-_islamabad_5-6_june_-_english_2.pdf
- 15 End Polio. Maulana Sami ulHaq's Fatwa on End Polio (2013). Maulana Sami ulHaq's Fatwa on polio vaccination [Internet]; 2020 [cited 2020 July 17]. Available from: <https://www.endpolio.com.pk/media-room/media-releases/83-maulana-sami-ul-haq-s-fatwa-on-polio-vaccination>
- 16 SAMAA. Mufti Naeem backs anti-polio vaccination [Internet]; 2014 [cited 2020 July 16]. Available from: <https://www.samaa.tv/news/2014/02/mufti-naeem-backs-anti-polio-vaccination>
- 17 The Qur'an; Al-Ambiya 21: 84.
- 18 Oberste, M. S. and Lipton, H. L. Global polio perspective. *Neurology*. 2014. 82(20): p. 1831–1832.
- 19 Bin Baz, A.A. Majmuafatawa al-Allama Abd al-Aziz bin Baz (vol 6): Wujubibadat Allah wataqaa; as'ilawaajwibatabi'atanli'lmuhadara; at-tadaawibi'ttat'eem [Internet]; 1989 [cited 2020 May 12]. Available from: <https://binbaz.org.sa/fatwas/1552/>
<http://www.binbaz.org.sa/fatwas/1552/>
[حكم التداوي بالتطعيم قبل وقوع الداء](http://www.binbaz.org.sa/fatwas/1552/)
- 20 Al-Naysapuri, M. H. Sahih Muslim. Kitab al-Ashriba; Bab fadltamr al-madina. Beirut, Lebanon: Dar al-Kutub al-'Ilmiyah; 1998.
- 21 Nordin, M. M. The Permissibility of Using Rotavirus Vaccines – Lessons from Oral Poliovirus Vaccines. *KPJ Medical Journal*. 2016. 6(1): p. 60-64.
- 22 Al-Naysapuri, M. H. Sahih Muslim. Kitab al-Musaqaa; Bab hilluurjrat al-hijama. Beirut, Lebanon: Dar al-Kutub al-'Ilmiyah; 1998.
- 23 Ahmed, D. S. The Qur'an - As It Explains Itself; SuraNisa 4: 71. Florida: Lighthouse. 2007.
- 24 Al-Isfahani, A. A. Al-Tibb al-Nabawi: Fusulfi'Imaqala al-thalitha fi asma'ililalwatadbiralmaridh; Bab tawaqqikualam al-majzhum. Al-Riyadh, Saudi Arabia: Dar Ibn Hazm; 2006.
- 25 Al-Bukhari, M. I. Sahih al-Bukhari; Kitab al-Tibb; Bab la Hamma. Beirut, Lebanon: Dar Tauq al-Naja; 2001.
- 26 Al-Amili, H. Wasa'il al-Shi'a; Abwaab al-ihthidar wa ma yunasibuh; babjawazu'lifirar min makan'ilwaba' watta'ounillama'awujub'iliqamatifihikalmujahidiwa' Imurabit Qom, Iran: Mu'assasaAal al-Bait li Ihya al-Turath; 1993.
- 27 Al-Naysapuri, A. M. Al-Ijmaa; Kitab as-salah. Cairo, Egypt: Dar al-Athaar linnashr wat tawzee'; 2004.
- 28 Ibn Battal, A.K. Sharh Sahih al-Bukhari li Ibn Battal; Abwaabsalat al-jama'awa'limama; Baabmaaja'afiththauminniyyi' wa'l basal wa'lkurraath. Riyadh, Saudi Arabia: Maktaba al-Rushd; 2003.
- 29 Kamali, M. H. Principles of Islamic Jurisprudence. Cambridge, UK: The Islamic Texts Society; 2003.
- 30 Ibn Abd al-Bar, Y. A. Al-Tamhid lima fi al-Mu'attamin al-Ma'ani walAsanid (vol 6). Kuwait: Wizara al-Awqaf wal-Shu'un al-Islamiyya; 2012.
- 31 Alfaisal, L. and Naar, I. Closure of mosques amid coronavirus a religious duty: Muslim World League [Internet]; 2020 [cited 2020 July 12]. Available from:

- <http://english.alarabiya.net/en/features/2020/03/18/Closure-of-mosques-amid-coronavirus-a-religious-duty-Muslim-World-League.html>
- 32 Hussain, A., Ali, S., Ahmed., M. and Hussain, S. The Anti-vaccination Movement: A Regression in Modern Medicine. *Cureus*. 2018. 10(7): e2919.
 - 33 Hotez, P. J. Vaccines Did Not Cause Rachel's Autism: My Journey as a Vaccine Scientist, Pediatrician, and Autism Dad. Johns Hopkins University Press; 2018.
 - 34 Wakefield, A. J., Murch, S. H., Anthony, A., Linnell, J., Casson, D. M., Malik, M., Berelowitz, M., Dhillon, A. P., Thomson, M. A., Harvey, P. and Valentine, A. [RETRACTED] Lileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children. *The Lancet*. 1998. 351(9103): p. 637-641.
 - 35 Ferriman, A. MP raises new allegations against Andrew Wakefield. *BMJ*. 2004. 328: p. 726.
 - 36 Keelan, J. and Wilson, K. Balancing vaccine science and national policy objectives: lessons from the National Vaccine Injury Compensation Program Omnibus Autism Proceedings. *American journal of public health*. 2011. 101(11), p. 2016-2021.
 - 37 Bukhari, S. N., Isa, S. M. and Nee, G. Y. Halal vaccination purchase intention. *Journal of Islamic Marketing*. 2020. Available from: <https://www.emerald.com/insight/content/doi/10.1108/JIMA-10-2019-0209/full/html>
 - 38 Children's Hospital of Philadelphia (CHOP). Vaccine Ingredients – Aluminum [Internet]; 2018 March 22 [cited 2020 Oct 6]. Available from: <https://www.chop.edu/centers-programs/vaccine-education-center/vaccine-ingredients/aluminum#.VmdqduMrKL4>
 - 39 CDC. Thimerosal and Vaccines [Internet]; 2020 [cited 2020 July 13]. Available from: <https://www.cdc.gov/vaccinesafety/concerns/thimerosal/index.html>
 - 40 Rahman, G. The mercury-based chemical found in some UK vaccines is not dangerous [Internet]; 2019 May 10 [cited 2020 July 3]. Available from: <https://fullfact.org/online/thiomersal-mercury-vaccines>
 - 41 American Academy of Pediatrics (AAP). Vaccine Safety: Examine the Evidence [Internet]; 2018 [cited 2020 July 3]. Available from: <https://www.healthychildren.org/English/safety-prevention/immunizations/Pages/Vaccine-Studies-Examine-the-Evidence.aspx>
 - 42 CDC. Overview, history and how it works [Internet]; 2020 [cited 2020 July 13]. Available from: <https://www.cdc.gov/vaccinesafety/ensuringsafety/history/index.html>
 - 43 Pfizer.com. Pfizer and BioNTech Conclude Phase 3 Study of COVID-19 Vaccine Candidate, Meeting All Primary Efficacy Endpoints [Internet]; 2020 [cited 2020 Dec 4]. Available from: <https://www.pfizer.com/news/press-release/press-release-detail/pfizer-and-biontech-conclude-phase-3-study-covid-19-vaccine>
 - 44 JCVI. Joint Committee on Vaccination and Immunisation: advice on priority groups for COVID-19 vaccination [pdf]; 2020 Dec 2 [cited 2020 Dec 2]. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/940936/Priority_groups_for_coronavirus_COVID-19_vaccination_-_advice_from_the_JCVI_2_December_2020.pdf
 - 45 Boseley, S. and Campbell, D. NHS told not to give Covid vaccine to those with history of allergic reactions [Internet]; 2020 Dec 9 [cited 2020 Dec 9]. Available from: <https://www.theguardian.com/world/2020/dec/09/pfizer-covid-vaccine-nhs-extreme-allergy-sufferers-regulators-reaction>
 - 46 Department of Health and Social Care. Government to add COVID-19 to Vaccine Damage Payments Scheme. [online] GOV. UK [Internet]; 2020 [cited 2020 July 13]. Available from: <https://www.gov.uk/government/news/government-to-add-covid-19-to-vaccine-damage-payments-scheme>
 - 47 Gov UK. Vaccine Damage Payment [Internet]; 2020 [cited 2020 July 18]. Available from: <https://www.gov.uk/vaccine-damage-payment>
 - 48 Medicines and Healthcare products Regulatory Agency. Regulatory approval of Pfizer / BioNTech vaccine for COVID-19. [online]; [Internet]; 2020

- [cited 2020 Dec 5]. Available from:
<https://www.gov.uk/government/publications/regulatory-approval-of-pfizer-biontech-vaccine-for-covid-19>
- 49 Riaz, F. and Waheed, Y. Islam and polio. *The Lancet Infectious Diseases*. 2014. 14(9), 791-792.
- 50 European Council for Fatwa and Research. Eleventh Ordinary Session of the European Council for Fatwa and Research [Internet]; 2017 Nov 4 [cited 2020 July 16]. Available from: <https://www.e-cfr.org/blog/2017/11/04/eleventh-ordinary-session-european-council-fatwa-research>
- 51 Islamic Organization for Medical Sciences (IOMS). Recommendations of the 8th Fiqh-Medical Seminar, Kuwait [Internet]; 1995 [cited 2020 July 15]. Available from: <http://207.21.239.40/bioethics/8thfiqh.html>
- 52 World Health Organization, Regional Office for the Eastern Mediterranean. Statement arising from a seminar held by the Islamic Organization for Medical Sciences on 'The judicially prohibited and impure substances in foodstuff and drugs' [pdf]; 2001 [cited 2020 July 21]. Available from: www.immunize.org/concerns/porcine.pdf
- 53 Khan, M. A. and Judge, R. Islamically Permissible Influenza Vaccines Available in the US for 2020-2021 Season [Internet]; 2020 Sep 11 [cited 2020 Sep 20]. Available from: <https://muslimmed.org/category/vaccines>
- 54 Siddiqi, A.R. Fiqhi decisions - IFA. New Delhi, India: IFA Publications; 2010.
- 55 Jafari, M. and Rezaei, M. Measuring and comparing the ethanol level in traditional and industrial vinegars in Halal food industry. *Islam and Health Journal*. 2020. 5(2); p. 7-12.
- 56 Olshansky, S. J. and Hayflick L. The Role of the WI-38 Cell Strain in Saving Lives and Reducing Morbidity. *AIMS Public Health*. 2017. 4(2): 127-138.
- 57 Neporent, L. What Aborted Fetuses Have to Do With Vaccines [Internet]; 2015 Feb 17 [cited 2020 Nov 28]. Available from: <https://abcnews.go.com/Health/aborted-fetuses-vaccines/story?id=29005539>
- 58 Al-Zarqa, A. S.M. Sharh al-qawa'id al-fiqhiyya. Damascus, Syria: Dar al-Qalam; 1989. See also, Kasule, O. H. 0604-Rulings on euthanasia from the perspective of purposes and principles of the law. In: Hossam E. F., Muhammed, A. A. K. and Aly, A. M. eds. FIMA Year book 2005-2006. Amman, Jordan: Jordan Society for Islamic Medical Sciences; 2006. p. 89-94.
- 59 Al-Bukhari, M. I. Sahih al-Bukhari; Kitab al-hibawafadhliha wat tahreedhalaiha; babqubul al-hadiyyakhari. Beirut, Lebanon: Dar Tauq al-Naja; 2001.
- 60 Hamdan, A. Vaccines: A Religious Contention [Internet]; 2013 [cited 2020 July 3]. Available from: <http://vaccineriskawareness.com/vaccination-a-religious-contention>
- 61 The Qur'an; Sura al-Tin; 95: 4.
- 62 The Qur'an; Sura al-Baqara; 2: 233.
- 63 Katme, A. M. Islam, Vaccines and Health [Internet]; 2011 [cited 2020 July 16]. Available from: http://www.hizbululama.org.uk/highlights/1432ah/shawwal/Islam_Vaccines_and_Health.html
- 64 Ebrahim, A. F. M. Islam and Vaccination. Overport, RSA: Islamic Medical Association of South Africa; 2013.
- 65 Nie, C. L., Wei, Y., Chen, X., Liu, Y. Y., Dui, W., Liu, Y., Davies, M. C., Tendler and He, R. G. Formaldehyde at low concentration induces protein tau into globular amyloid-like aggregates in vitro and in vivo. *PLoS One*. 2007. 2(7); p. 1-13.
- 66 Mitkus, R. J., Hess, M.A. and Schwartz, S.L. Pharmacokinetic modeling as an approach to assessing the safety of residual formaldehyde in infant vaccines. *Vaccine*. 2013. 31(25): p. 2738-2743.
- 67 OVG. Vaccine ingredients [Internet]; 2019 [cited 2020 July 14]. Available from: <https://vk.ovg.ox.ac.uk/vk/vaccine-ingredients>
- 68 Pichichero, M. E., Gentile, A., Giglio, N., Umido, V., Clarkson, T., Cernichiari, E., Zareba, G., Gotelli, C., Gotelli, M., Yan, L. and Treanor, J. Mercury levels in newborns and infants after receipt of thimerosal-

- containing vaccines. *Pediatrics*. 2008. 121(2), e208-e214.
- 69 CDC. Autism [Internet]; 2020 [cited 2020 July 12]. Available from: <https://www.cdc.gov/vaccinesafety/concerns/autism.html>
- 70 CDC. Questions about HPV vaccine safety [Internet]; 2020 [cited 2020 July 15]. Available from: <https://www.cdc.gov/vaccinesafety/vaccines/hpv/hpv-safety-faqs.html>
- 71 Alarabiya. Islamic group slams anti-polio vaccine fatwas [Internet]; 2014 Feb 27 [cited 2020 July 18]. Available from: <https://english.alarabiya.net/en/News/middle-east/2014/02/27/Islamic-group-criticizes-fatwas-against-polio-vaccines.html>
- 72 Kennedy, J. Vaccine hesitancy is not a ‘Muslim’ problem [Internet]; 2019 Feb 24 [cited 2020 July 17]. Available from: www.aljazeera.com/indepth/opinion/vaccine-hesitancy-muslim-problem-190218092533092.html
- 73 Oberste, M. S. and Lipton, H. L. Global polio perspective. *Neurology*. 2014. 82(20): p.1831–1832.
- 74 CDC. Our progress against polio [Internet]; 2017 [cited 2020 July 1]. Available from: <https://www.cdc.gov/polio/progress/index.htm>
- 75 CDC. Progress Toward Polio Eradication — Worldwide, 2014–2015 [Internet]; 2020 [cited 2020 July 12]. Available from: <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6419a5.htm>
- 76 Desai, E. Fatwa: # 14948 [Internet]; 2007 March 12 [cited 2020 July 14]. Available from: http://dar60-nix1.wadns.net/public/question_detail/14948
- 77 Aizenman, N. Pakistan raises its guard after 2 Polio vaccinators are gunned down [Internet]; 2018 [cited 2020 July 20]. Available from: <https://www.npr.org/sections/goatsandsoda/2018/01/23/580002283/pakistan-raises-its-guard-after-two-polio-vaccinators-are-gunned-down>
- 78 Polio Global Eradication Initiative (PGEI). Afghanistan Taliban’s ‘Declaration regarding Polio Eradication’ [Internet]; 2013 [cited 2020 July 2]. Available from: <http://polioeradication.org/news-post/afghanistan-talibans-declaration-regarding-polio-eradication>
- 79 Sulaiman, K. D. An assessment of muslims reactions to the immunization of children in northern Nigeria. *Medical Journal of Islamic World Academy of Sciences*. 2014. 109(1567). p. 123-132.
- 80 News24. Vaccine boycott spreads polio [Internet]; 2004 [cited 2020 July 10]. Available from: <https://www.news24.com/News24/Vaccine-boycott-spreads-polio-20040211>
- 81 Jegede, A. S. What Led to the Nigerian Boycott of the Polio Vaccination Campaign? *PLoS Medicine*. 2007. 4(3), e73.
- 82 Murphy, J. Distrust of US foils effort to stop crippling disease. *Baltimore Sun* [Internet]; 2004 [cited 2020 July 16]. Available from: <https://www.baltimoresun.com/news/bal-polio0104-story.html>
- 83 Ali, M. and Maravia, U. Seven Faces of a Fatwa: Organ Transplantation and Islam. *Religions*. 2020. 11(2), 99.
- 84 Caeiro, A. Facts, Values, and Institutions: Notes on Contemporary Islamic Legal Debate. *American Journal of Islam and Society*. 2017. 34(2), 66-98.
- 85 Medicines and Healthcare products Regulatory Agency. Regulatory approval of Pfizer / BioNTech vaccine for COVID-19 [Internet]; 2020 Dec 2 [cited 2020 5 Dec]. Available from: <https://www.gov.uk/government/publications/regulatory-approval-of-pfizer-biontech-vaccine-for-covid-19>
- 86 Wifaqululama. Pfizer / BioNTech COVID-19 Vaccine; Fatwa ID: 00029 [pdf]; 2020 Dec 6 [cited 2020 Dec 6]. Available from: <https://www.wifaqululama.co.uk/wifaq-pfizer>
- 87 Limbada, A. Is Covid-19 Vaccine Halal? [Internet]; 2020 Dec 6 [cited 2020 Dec 6]. Available from: <https://www.tafseer-raheemi.com/covid-19-vaccine-halal>
- 88 Shabbir, Y. Is the Pfizer BioNTech Covid-19 Vaccine Halal? [Internet]; 2020 Dec 5 [cited 2020 Dec 5]. Available from:

<https://islamicportal.co.uk/is-the-pfzier-biontech-covid-19-vaccine-halal>

- 89 5 Pillars UK. Fatwa: Pfizer COVID-19 vaccine declared 'halal' [Internet]; 2020 Dec 7 [cited 2020 Dec 7]. Available from: <https://5pillarsuk.com/2020/12/07/fatwa-pfizer-covid-19-vaccine-declared-halal>
- 90 Shabbir, Y. MMR Vaccine and Porcine Gelatine [Internet]; 2018 Nov 26 [cited 2020 July 20]. Available from: <https://islamicportal.co.uk/mmr-vaccine-and-porcine-gelatine>
- 91 Fatwa Council Birmingham (FCB). Question 54 [Internet]; 2020 [cited 2020 July 15]. Available from: <http://www.fiqhcouncilbirmingham.com/page/question/54>
- 92 Hussain, M. The Majestic Qur'an: A plain English translation; Sura al-Ma'ida; 5: 32. Nottingham: Invitation Publishing. 2018.
- 93 Al-Khurasani, A. S. As-Sunan as-Sughralin-Nasa'I; Kitab al-Iman washara'i'ah; Bab sifat al-mu'min. Aleppo, Syria: Maktab al-matbu'at al-islamiyya; 1986.
- 94 Maravia, U., Bekzhanova, Z. Ali. M. and Alibri, R. (forthcoming). British Muslims caught amidst FOGs: A discourse analysis of religious advice and authority.
- 95 Goodman, J. Coronavirus: Compulsory vaccines in the UK and other rumours fact-checked [Internet]; 2020 May 8 [cited 2020 July 13]. Available from: <https://www.bbc.co.uk/news/52565764>

“Cautery” a modality of treatment, Islamic views and contemporary practice

Abstract of poster which was presented at the BIMA National Conference, 6th December 2020

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Aim:

To evaluate the practice of cautery for medical use in the light of Shari'a rules .

Method:

The history, evolution and current practice of cauterisation for medical purpose were examined. The principles of Islamic Jurisprudence and prophetic practices were reviewed. The decree (*fatawa*) of the Islamic Jurists were collected. The objectives of the use of cauterisation were analysed in the light of Islamic legal maxims.

Result:

There are few contradictory Ahadiths. The one where Prophet Muhammad has used cauterisation to stop bleeding from an injury¹. In another hadith he has mentioned that he would not prefer his followers to use cautery² and the third hadith where those people have been praised who did not use the cautery³. Moreover, in those days people used to rely on this practice and well-known belief was that the “ultimate remedy is in the cautery”⁴.

The traditional practice of cautery with hot metal was well recognised before the invention of electricity and development of electrocautery equipment. This is a painful procedure often resulting in infection, sepsis and risk of deformity and death. However, the current common practice of cautery is termed

“electrocautery” whereby high frequency electric energy is used to convert into heat energy in a control fashion to achieve the desirable effects which include cutting, coagulation, vaporization, desiccation, and fulguration.⁵ This is always performed under some type of anaesthesia either local, regional or under general anaesthetics. The objective is to make the surgical procedure safe and comfortable.

The preferred Islamic view point is that it is a permissible method of treatment, the way it has been used in the current surgical practice. Moreover, the faith must be on Allah who is the ultimate healer and not on the means like cautery.

Conclusion:

According to Islamic legal maxims, if the use of electrocautery for surgical procedure is necessary and is carried out to benefit patients in order to eliminate the harm of the disease, make life more comfortable and the benefits outweighs the risk of complication then there is no element of dislike in such practice.⁶

References:

1. Abū Dā'ūd Sulaymān ibn al-Ash'ath al-Sijistānī. Sunan Abu Dāwūd, Book of Medicine, Chapter Regarding cauterization Hadith No. 3866o. In.
2. Muhammad ibn Isma'il al-Bukhari. Sahih al-Bukhārī, Book of Medicine, Chapter: There is cure in three things, Hadith No. 5680o Title. In.

3. Al-Bukhari M ibn I. Book of Medicine, Chapter: Whoever does not treat or get treated with a Ruqya, Hadith No. 5752No Title. In.
4. Āminah Fitnat Missīkah Barr. waka' almra'ahalhdhari fi thlalislam ,pp.213No Title. In.
5. Shrestha MA, Ling Au-Yeung MK, Wales S. Doctors Academy. In: WJMER [Internet]. 2014 [cited 2020 Nov 30]. Available from: www.doctorsacademy.orgwww.wjmer.co.uk
6. 'Ali ibn Sultan Muhammad al-Qari. Mirqat al-Mafatih, , Book of Medicine, 1st Chapter,pp.346/8.

The contribution of Islamic culture to the Development of Medical Sciences

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Abstract

The impact of Islamic civilization on Western science and medicine between the 9th and 13th centuries is not well remembered by many in the West. While Europe was in the so-called Dark Ages, Muslim physicians like Avicenna, Al-Razi, Al-Zahrawi and others, were building on the work of the Greeks and Romans, making discoveries that continued to influence the medical practice for several centuries. Islam stressed the importance and respect of knowledge and culture prohibiting the demolition and destruction of previous cultures. Islamic civilization has played an invaluable role in preserving the continuity of scientific progress of other nations, contrary to what was done by Mongols and others. For many centuries, Arabic remained the most important scientific language of the world and preserved the knowledge and culture that might otherwise have been lost forever.

Introduction

In the history of medicine, Islamic medicine, refers to the science of medicine developed in the medieval Age, and written in Arabic.¹ Buildings in Andalusia such as the Alhambra in Granada, and the Mezquita in Cordoba are reminders of the architectural imprint of Islamic civilization left on Western Europe. Less well remembered, however, is the impact of this civilization on Western science, technology, and medicine between the years 800 and 1450.² Many Western historians underestimate the contribution of the physicians of the medieval Islamic world. By some, they are perceived as purveyors of the Greek science to the scholars of the Renaissance. However, the facts show completely the opposite.³ Islamic civilization' greatest contribution was in the preservation of knowledge and culture in a critical period for humanity, when numerous barbarians

destroyed the world's cultural heritage. Rescuing the original books of ancient civilizations, Muslims, unlike many conquerors, showed a remarkable respect for the human knowledge. These books were accumulated on the soil of this Empire, translated into Arabic and consequently, built magnificent advances on these foundations.¹ However, when the Islamic Empire became weak, most of the contributions in medicine and science were destroyed. The Mongols burnt Baghdad (1258 A.D.) out of barbarism, and the Spaniards demolished some of the Islamic heritage in Spain out of hatred. Muslim scholars, later, hit the source ball of knowledge over the fence to Europe.⁴ During this period, many students and professionals residing in a country outside the Islamic Empire, dreamed to go to the Arabian universities to learn, and then work and live in the most advanced and civilized society.⁴

What lead to Golden Age?

Arabic language became a unifying factor, and translations from Greek & Latin into Arabic were innumerable, removing language barrier for scholars.

Besides, major libraries were established in Cairo, Aleppo, Baghdad, central Asia, and Spain and bookshops with thousands of titles opened in several cities.^{5, 6}

Muslim physicians and scholars also laid down the basis for medical practice in Europe. Before the Arabian era, medical care was largely provided by priests in sanatoriums and annexes to temples.

For centuries, the main Arabian hospitals were centers of medical education and introduced many of the concepts that we encounter in modern hospitals, such as separate wards for men and women, medical records, pharmacies and personal and institutional hygiene.² Famous Muslim physicians defined medicine as skill that dealt with keeping good health, coping with illness and aiming at health recovery. They modified many Greek writings and established the pillars of the art of medicine. What is significant is that, regardless of historical past and modern technological presence, these principles are still accurate for the understanding of medical science nowadays.¹

Licensing Examinations

Many historians claim that the Western world pioneered in the setting of ethical, legal and professional standards in the practice of medicine.⁷ In Baghdad, in 931 A.D. Caliph Al-Muqtadir learned that a patient had died as the result of a physician's error. He then ordered the chief physician, Sinan-ibn Thabit bin Qurrah to examine all those practicing the art of healing. In the first year, more than 860 were examined in Baghdad alone. Licensing examinations were required and administered in various places. Licensing Boards were set up under a government official called "Muhtasib" or "Inspector General" who monitored qualifications, ethics and legal standards.^{7, 8} The chief physician gave the young physician full practical examination, and if successful, the "Muhtasib" would administer the Hippocratic Oath and issue him the license to practice. After 1000 years, licensing of physicians has been implemented in the West, such as the State Licensing Board in Medicine or surgery etc.⁴

Medical Ethics

Informed medical consent is proposed by some as a new invention. Others claim that patient rights and legal protection have been stated in the early decades of the 20th century. Al-ajlouni clearly demonstrated that during the golden era of Islamic world, the qualification of physicians was made according to a well-designed curriculum covering the science and humanity of medicine. The rules governing the quality control of health care delivery system were laid down.⁷

The principles of bioethics in the Western world were developed and outlined in 1979 by two American philosophers and bioethicists, Beauchamp and Childress in their book "Principles of Biomedical Ethics".⁹ Since then, the concept of bioethical principles has been regarded as a "Western" invention. These bioethical principles: autonomy, beneficence, non-maleficence, and justice have been basically legitimized by Muslims jurists as falling into the sphere of Islamic law.¹⁰ Many prominent physicians of the Arabic civilization involved themselves with professional ethics. In his book "Akhlaq-Al-Tabib" (Medical Ethics), Al-Razi and his peer Al-Ruhawi, who authored "Adab Al Tabib", are credited with laying the foundations of medical ethics a millennium before modern Western ethical medical principles were recorded.¹¹

Famous Medieval Physicians

There are many worldwide famous Muslim Physicians: Al-Razi, Ibn Sina, Al-Zahravi, Ibn Zuhr, Ibn Ruzd etc. These names, among several hundreds of physicians, attributed to the "Golden Age" of Islamic science. That is why we have to be grateful to them.¹²

Al-Razi (865-925 CE) wrote a masterpiece entitled: "Kitab al-Hawi" (The comprehensive book on medicine), known also as "The large comprehensive or Continens Liber", a 23-volume textbook that provided the skeleton of medical curriculum for the European schools until the 14th century.

Ibn Sina (980-1037 CE), an exceptional physician, wrote al "Qanun fi al-Tibb" (The Canon of Medicine), which is considered as major encyclopedia of medicine, in which he combined his own observations with the medical knowledge he acquired from Galen, and the philosophy learned from Aristotle.¹³ Manṣūr ibn Ilyās (1380-1422 CE) wrote the first color illustrated book of anatomy.¹⁴ These books and ideas provided the basis for medical care in Europe during its recovery from the Dark Ages.

Al-Razi (865-925 AD)

Abu Bakr Muhammad ibn Zakariya al-Razi, known also as "Rhazes", stands among the Arabo-Islamic physicians as the most important medical figure of his time. Al-Razi wrote several medical books. In his masterpiece "Al-Kitab al Hawi" (The Comprehensive book on Medicine), al-Razi established gynecology, obstetrics and ophthalmic surgery during the medieval times (Fig1). He also wrote a 10-volume epic "Al-Mansuri", complementing "Kitab al-hawi" as a reference in medical teaching. In his landmark "A Treatise on the Small-Pox

and Measles”, al-Razi recognized that the two were separate diseases.(Fig.2)This book was printed forty times in English between 1498 –1866.¹⁵ His books *Qarabadain Kabir* (The Great Book of Formulary), and *Qarabadain Saghir* (The Little Book of Formulary) introduced over 800 novel drugs.

Al-Razi thoroughly studied many diseases including cancer, discussing its diagnosis and treatment. He was among the pioneers to introduce the notion of chemotherapy by combining chemical, medical and pharmaceutical knowledge.¹⁶ Besides, he emphasized the importance of psychological factors on health. Al-Razi wrote the first treatise on allergy and immunology. He was the first to attribute hay fever to the smell of roses at springtime in his manual on coryza (rhinitis). Al-Razi is considered the first who described what is called now Baker’s cyst which is attributed to English surgeon William Baker (1839-1896) who described it in 1877. He is considered as one of the game changers in the field of dermatology.¹⁷

Al-Razi cared a lot for the poor, and he wrote a treatise to support them entitled: “For one who has no physician to attend him”. He was the first to write a book on home remedies. In its 36 chapters, he described diets and drugs that can be found in the kitchens, pharmacies, and military camps. ¹⁷ In his book “*Akhlaq-Al-Tabib*”(Medical Ethics), he stressed the triumvirate of ethical responsibility—the physician to his patient, the patient to his physician and the physician to himself. His paradigm of an ethical physician, which was based on characteristics such as appearance, voice modulation, virtuosity, behaviour as a “role model” and a life-long desire to update his knowledge, resonate with our current 21st century ideas of “professionalism”. Empathy, confidentiality, and psychological counselling were to him, essential components for healing and ethical practice. It is remarkable that he made special mention of the social nuances of medical ethics by preaching physicians to treat rich and poor alike and to treat women with respect.^{11,18}

Ibn Sina (Avicenna) (980-1037 AD)

Ibn Sina is the most eminent Muslim physician, brilliant philosopher, and great thinker, and regarded as the "Father of Early Modern Medicine" and the "Father of Clinical Pharmacology".¹⁹ By the age of eighteen, he was a physician who took care of the king. He wrote his first book at the age of twenty-one, and excelled in both Medicine and Philosophy. The "*Kitab al-Qanun fi-al-Tibb*", commonly known as the "Canon Medicine" is the

most famous book in the history of medicine, and considered as "The First Textbook of Medicine on the Earth". It is the final act of all Greco-Arabic medical thoughts up to his time, enriched with his own contributions. The “Canon” was translated into Latin in the 12th century, and by the 16th century it was in its 35th edition. It remained an essential reference by medical schools in Europe from the 12th-17th century.^{19, 20}(Fig.3)

Ibn Sina also wrote “The treatise on cardiac drugs”.(Fig.4)His description of cardiac diseases was logically presented, perhaps for the first time in the history of medicine. He was a pioneer in pulsology and the first correct explanation of pulsation was given by Avicenna, after he refined Galen’s theory of the pulse.²¹ He also created a system of medicine that we call it today “holistic”, in which physical and psychological factors, drugs, and diet were combined in treating patients.^{2,20}

Ibn Sina's poem on medicine (“*Al-Urjuzah Fi Al-Tibb*”) consist of meticulous 1326 verses, and was considered as a summary of his great textbook “The Canon of Medicine”; hence it achieved its popularity as a tool in transmitting medical knowledge.(Fig.5) Since first translated by Gerard of Cremona (1114-1187), in the middle of the 12th century, the Latinized poem was frequently published in Medieval Europe.²² Avicenna's definition and treatment approaches of migraine, for example, were considered to be based on the current concepts and findings. Most of the plants mentioned by Avicenna for the treatment of migraine may have potentially significant effects on the central and peripheral sensitization.²³ Although most descriptions of senile dementia date back to Alois Alzheimer, who in 1906 described the first patient who suffered from this disorder, the contributions of Avicenna to the development of diagnosis and etiology of different forms of dementia cannot be ignored.²⁴ The importance of studying anatomy by the surgeons in training was greatly emphasized by Avicenna. He also advised surgeons to treat cancer in its earliest stages, ensuring the removal of all the diseased tissue.²⁵

Al-Zahrawi (Albucasis) (963-1013 AD)

Abu al-Qasim Al- Zahrawi, called the father of surgery wrote an encyclopedia on surgery and developed many surgical instruments used in operations.

Al- Zahrawi summarized the works of ancient Greek and Roman physicians, with magnificent additions through his great discoveries. His descriptions and innovations

remained a work of reference in the West and East for many centuries to come.²⁶ Surgeons all over the world practice today, unknowingly, several surgical procedures that Al-Zahrawi introduced 1,000 years ago. He developed new surgical technologies such as “catgut sutures”, and wrote “Al-Tasrif” book that described surgical procedures, and gave detailed illustrations of about 200 surgical instruments, many of which were devised by al-Zahrawi himself. (Fig.6) We owe it to al-Zahrawi that surgery became integrated into scientific medicine, instead of being a practice left to cuppers and barbers.^{2,3}

Al-Zahrawi is thought to be the first surgeon in history to use “cotton” in surgical dressings, to control hemorrhage, or as padding in splinting of fractures, as well as vaginal padding in state of fractures of the pubis. He introduced the method for removal of kidney stones by cutting into the urinary bladder.

He was the first to advocate the “lithotomy position” for vaginal operations. Al-Zahrawi's treatise contained an illustration of a vaginal speculum and two types of forceps for extracting a dead fetus. (Fig.7) The description of varicose veins stripping by Al-Zahrawi ten centuries ago, is almost like what is encountered in modern surgery. Besides, he invented a cauterizing iron to control bleeding.^{27,28}

In orthopedics, al-Zahrawi introduced what is known today as Kocher's method of shoulder dislocation reduction, over 1,000 years before Dr. Brooke reintroduced it in 1937.²⁷ He also described “tracheotomy” and distinguished between goiter and cancer of the thyroid.²⁹

Al-Zahrawi pointed out that there is no good practice in surgery without a sound knowledge of anatomy. He and many other great physicians, considered that studying anatomy is not only indispensable to the profession, but also is a way to understand the perfection of the human being, God's supreme creation.³

Ibn al-Nafis (1210-1288 AD)

Alauddin Ibn al-Nafis was the first to discover the “circulation lesser” and describe the blood flow from the right ventricle to the lungs, then back to the left ventricle, 300 years before William Harvey.^{30,31} Citations in majority of western literature mention the other two “describers” or “discoverers” of pulmonary blood circulation: Miguel de Servet (1511-1553), and William Harvey (1578-1657).^{32,33} The historical observations that

the pulmonary circulation was discovered by European scientists in the 16th century should be changed.³² Ibn Al-Nafis bravely rejected the theory of Galen (130-200 AD) and Avicenna (980-1037 AD), which stated that the blood from the right ventricle passes through “invisible” holes in the ventricular septum to the left ventricle.^{30,31} His description included the observation that the wall of the septum is not porous, as was believed by earlier scholars. He stated that the blood from the “venous side” was directed through the pulmonary artery to the lungs, where it is “mixed with air” and drained back to the left side of the heart through the pulmonary veins.³¹ (Fig.8) In his book “Sharh Tashreeh Al-Qanun”, we find that he was the first to note that the nourishment of the heart muscle is coming from the coronary arteries, rather than from the inside of the ventricular cavity, as described by earlier scholars.^{30, 33} He also stated that there must be small communications or pores (“manafidh” in Arabic) between the pulmonary artery and vein, a prediction that preceded by 400 years, the discovery of the pulmonary capillaries by Marcello Malpighi.³⁴ Ibn Al-Nafis also wrote a book “Kitab Al-Mujaz Fi Al-Tibb” which was meant to be a “handbook” for medical students and practitioners, not as an epitome of “Canon Medicine” of Ibn Sina.³⁵

Ibn Zuhr (Avenzoar) (1092–1162 AD)

Merwan Abd al-Malik ibn Zuhr, a Muslim physician from “Al-Andalus”, also known as “Avenzoar” by the Europeans. His most distinguished work was the “Al-Taysīrfī al-Mudāwātwa al-Tadbīr (On Preventive Regimen and Treatment), which was in use for centuries in Europe, and was influential to the progress of surgery³⁶ (Fig.9). In his book, Ibn Zuhr enriched surgical and medical knowledge by describing many diseases and treatment innovations, not ever described before him. He provided the first clinical description of a “polypoid colorectal tumor” as well as the case of a “uterine cancer” and a “basal cell carcinoma”.³⁷ He drew the redlines where the physician should stop, in his management of a surgical condition; a stage toward recognizing general surgery as a specialty on its own.³⁶

Ibn Zuhr's unique experiment in performing “tracheotomy” on a goat, proved the safety of this operation in humans.²⁹ Avenzoar might have made one of the earliest records on the clinical state called “idiopathic adult hydrocephalus” and postulated liquid collection in the ventricles of the brain in hydrocephalus well before Vesalius.³⁸

The Jewish physician “Maimonides” expressed his admiration of Ibn Zuhr, describing him as "unique in his era and one of the great thinkers" and he frequently quoted him in his medical texts. Both Ibn Zuhr’s daughter and grand-daughter also became physicians, specializing in obstetrics.³⁹

Ibn Rushd (Averroes) (1126-1198 AD)

Another Andalusian Muslim polymath, Abu al-Walid Muhammad ibn Rushd, or “Ibn Rushd”, a noticeable figure during emergence of the European Renaissance. Ibn Rushd wrote a number of medical treatises. The most famous was “al-Kulliyat fi al-Tibb” (The General Principles of Medicine), known in the west as the “Colliget” or (Generalities in Medicine), which was a medical encyclopediawidely used in European universities.(Fig.10) Ibn Rushd showed interest in “Ibn Sina’sUrjuza fi ‘I-tibb” (Poem on Medicine, Canticum de medicina), mentioned earlier, on which he wrote a commentary, “SharhUrjuzat Ibn Sina”.^{40,41}

Conclusion

Modern medicine is not purely the result of efforts of one civilization, but is the cumulative product of all cultures at all stages of history. Muslims, like other people have had their share in establishing its foundations, to alleviate the suffering of human beings.

Islamic medicine was not a passive conveyance of the Greek knowledge.The Muslim scholars preserved the knowledge and culture of the conquered lands. One thousand years ago, the Muslims were the great torchbearers of the international scientific research, and between the 9th to the 13th centuries, the Arabic language became the language of intellectual progress throughout the middle Ages. We hope that this review will be another call to all humanity-loving people to end prejudices against other people and to stop preconceived notions about of nations.

References

- 1- Masic I, Skrbo A, Naser N, Tandir S, Zunic L, Medjedovic S, Sukalo A. Contribution of Arabic Medicine and Pharmacy to the Development of Health Care Protection in Bosnia and Herzegovina - the First Part. *Med Arch.* 2017 ; 71(5): 364-372
- 2- Majeed A. How Islam changed medicine. Arab physicians and scholars laid the basis for medical practice in Europe.*BMJ.* 2005 Dec 24; 331(7531): 1486–1487
- 3- Hehmeyer I, Khan A. Islam's forgotten contributions to medical science. *CMAJ.* 2007 May 8; 176(10): 1467–1468.
- 4- Syed IB. Islamic Medicine 1000 years ahead of its time. *JISHIM* 2002,2: 2-9
- 5- Halilović S. Islamic Civilization in Spain - a Magnificent Example of Interaction and Unity of Religion and Science. *PsychiatrDanub.* 2017 Apr; 29 Suppl 1:64-72.
- 6- Falagas ME, Zarkadoulia EA, Samonis G Arab science in the golden age (750-1258 C.E.) and today. *FASEB J.* 2006 ;20(10):1581-6.
- 7- Ajlouni KM. Values, qualifications, ethics and legal standards in Arabic (Islamic) medicine. *Saudi Med J.* 2003 Aug;24(8):820-6.
- 8- Al-Bar MA, Chamsi-Pasha H. Contemporary Bioethics: Islamic Perspective. New York (NY): Springer; 2015. <http://link.springer.com/book/10.1007/978-3-319-18428-9>
- 9- Beauchamp TL, Childress JF. Principles of Biomedical Ethics. 7th ed. New York (NY): Oxford University Press; 2013.
- 10- Chamsi-Pasha H, Albar MA. Western and Islamic bioethics: How close is
- 11- the gap? *Avicenna J Med.* 2013 Jan; 3(1): 8-14
- 12- Chamsi-Pasha H, Albar MA. Islamic medical ethics a thousand years ago. *Saudi Med J.* 2013 Jul;34(7):673-5.
- 13- Masić I, Domres BD, Hadziahmetović Z, ToromanovićS.[Abu al-Qasim Az-Zahrawi--a great Arab surgeon] . *Med Arh.* 2000;54(3):187-8.
- 14- Edriss H, Rosales BN, Nugent C, Conrad C, Nugent K. Islamic Medicine in the Middle Ages. *Am J Med Sci.* 2017 Sep;354(3):223-229.
- 15- Zarshenas MM, Zargaran A, Mehdizadeh A, MohagheghzadehA.Mansur ibn Ilyas (1380-1422

- AD):A Persian anatomist and his book of anatomy, T ashrih-i Mansuri. *J Med Biogr.* 2016 ;24(1):67-71.
- 16- Band IC, Reichel M. Al Rhazes and the Beginning of the End of Smallpox. *JAMA Dermatol.* 2017 May 1;153(5):420.
- 17- Tsoucalas G, Karamanou M, Laios K, Androustos G. Rhazes' (864-925) views on cancer and the introduction of chemotherapy. *J BUON.* 2019; 24(2):868-871.
- 18- Hashempur MH, Hashempour MM, Mosavat SH, HeydariM. Rhazes-His Life and Contributions to the Field of Dermatology. *JAMA Dermatol.* 2017 Jan 1;153(1):70.
- 19- Lakhtakia R.A trio of exemplars of medieval Islamic medicine: Al-Razi, Avicenna and ibn Al-nafis. *Sultan Qaboos Univ Med J.* 2014 Nov;14(4):e455-9.
- 20- Khan MA, Raza F, Khan IA. Ibn Sina and the roots of the seven doctrines of preservation of health. *Acta Med Hist Adriat.* 2015;13 Suppl 2:87-102.
- 21- Zahabi SA. Avicenna's Approach to Health: A Reciprocal Interaction between Medicine and Islamic Philosophy. *J Relig Health.* 2019 Oct;58(5):1698-1712.
- 22- Chamsi-Pasha MA, Chamsi-Pasha H. Avicenna's contribution to cardiology. *Avicenna J Med.* 2014 Jan;4(1):9-12.
- 23- Rabie El-Said Abdel-Halim. The role of Ibn Sina (Avicenna)'s medical poem in the transmission of medical knowledge to medieval Europe. *Urol Ann.* 2014 Jan-Mar; 6(1): 1–12.
- 24- Zargarana , Borhani-Haghighi A, Faridi P, Daneshamouz S, Mohagheghzadeh A. A review on the management of migraine in the Avicenna's Canon of Medicine. *Neurol Sci.* 2016 Mar;37(3):471-8.
- 25- Taheri-Targhi S, Gjedde A, Araj-Khodaei M, Rikhtegar R, Parsian Z, Zarrintan S, Torbati M, Vafae MS. Avicenna (980-1037 CE) and his Early Description and Classification of Dementia. *J Alzheimers Dis.* 2019 Sep 9
- 26- Behbahani FA, Dadmehr M, BahramiM. The importance of anatomy on viewpoint of Avicenna. *Int J Cardiol.* 2017 Nov 15;247:46.
- 27- Markatos K, Mavrogenis A, Brilakis E, Korres D, Karamanou M, ChronopoulosE. Abulcasis (936-1013): his work and contribution to orthopaedics. *IntOrthop.* 2019 Sep;43(9):2199-2203
- 28- ElgoharyMA. AlZahrawi: The Father of Modern Surgery. *Annals of Pediatric Surgery, Vol 2, No 2, April 2006, PP 82-87*
- 29- NabriIA. El Zahrawi (936-1013 AD), the father of operative surgery. *Ann R Coll Surg Engl.* 1983 Mar;65(2):132-4.
- 30- Golzari SE, Khan ZH, Ghabili K, Hosseinzadeh H, Soleimanpour H, Azarfarin R, Mahmoodpoor A, Aslanabadi , Ansarin K. Contributions of Medieval Islamic physicians to the history of tracheostomy. *AnesthAnalg.* 2013 May;116(5):1123-32.
- 31- Numan MT. Ibn Al Nafis: his seminal contributions to cardiology. *PediatrCardiol.* 2014 Oct;35(7):1088-90.
- 32- Loukas M, Lam R, Tubbs RS, Shoja MM, ApaydinN. Ibn al-Nafis (1210-1288): the first description of the pulmonary circulation. *Am Surg.* 2008 May;74(5):440-2.
- 33- MasicI. On occasion of 800th anniversary of birth of Ibn al-Nafis--discoverer of cardiac and pulmonary circulation. *Med Arh.* 2010;64(5):309-13.
- 34- Bestetti RB, Restini CB, Couto LB. Development of anatomophysiology knowledge regarding the cardiovascular system: from Egyptians to Harvey. *Arq Bras Cardiol.* 2014 Dec;103(6):538-45
- 35- West JB. Ibn al-Nafis, the pulmonary circulation, and the Islamic Golden Age. *JAppl Physiol.* 2008 Dec; 105(6): 1877–1880.
- 36- Abdel-Halim RE. Contributions of Ibn Al-Nafis (1210-1288 AD) to the progress of medicine and urology. A study and translations from his medical works. *Saudi Med J.* 2008 Jan;29(1):13-22
- 37- Abdel-Halim RE. Contributions of Ibn Zuhr (Avenzoar) to the progress of surgery: a study and

- translations from his book Al-Taisir. Saudi Med J 2005 Sep;26(9):1333-9.
- 38- Karamanou M1, Tsoucalas G, Saridaki Z, Iavazzo C, Androutsos G.
- 39- Avenzoar's (1091-1162) clinical description of cancer. J BUON. 2015 Jul-
40- Aug;20(4):1171-4.
- 41- Aciduman A, İlgili Ö, Aşkit Ç, Tuzcu K. Did Ibn Zuhr (Avenzoar) postulate before Vesalius that liquid collects in ventricles in the Hydrocephalus? World Neurosurg. 2019 Mar;123:363-370
- 42- Azar H. The Sage of Seville: Ibn Zuhr, His Time, and His Medical Legacy. 2008. Cairo: American University in Cairo.
- 43- Delgado F. The neurosciences in Averroes principles of medicine. Ann Saudi Med. 2012 May-Jun;32(3):327-31
- 44- Tbakhi A, Amr SS. Ibn Rushd (Averroës): Prince of Science. Ann Saudi Med. 2008 Mar-Apr;28(2):145-7.

The Figures



Fig.1 Kitab al Hawi (The Comprehensive book on Medicine) by al-Razi

الحَاوِي
فِي الطَّبِّ

تأليف
أبي بكر محمد بن زكريا الرازي الطبيب
المفوض سنة ٤٢٣ هـ

مراجعة وتصحيح
د. محمد محمد إسماعيل

المجلد الأول
والمترجم

الجزء الأول ، في أمراض العيون
الجزء الثاني ، في أمراض السنين
الجزء الثالث ، في أمراض الأذن والأنف والحنجرة

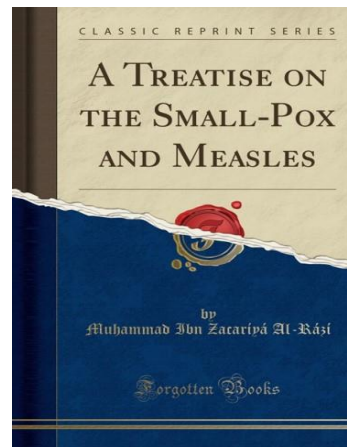


Fig.2 A Treatise on the Small-Pox and Measles by al-Razi

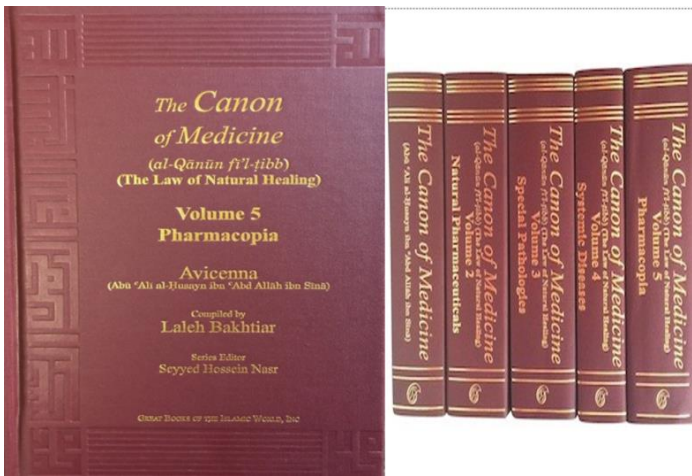


Fig.3 The Canon of Medicine by Avicenna



Fig.4 Avicenna poem on Medicine

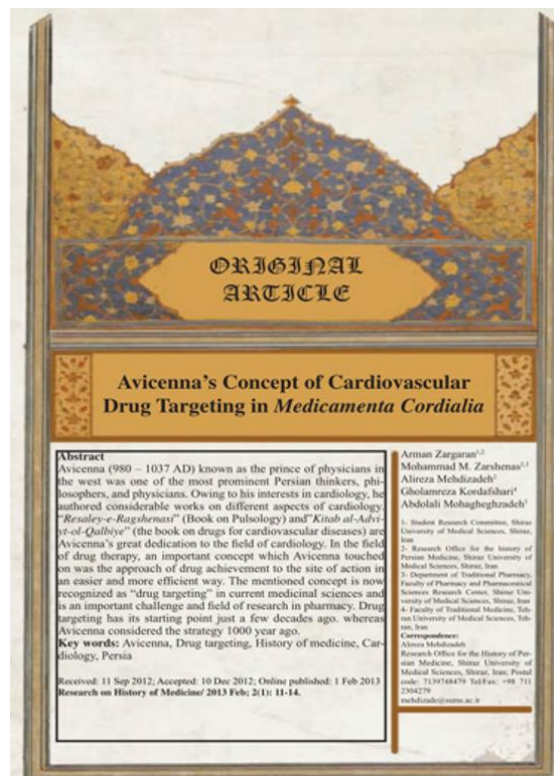


Fig.5 The treatise on cardiac drugs by Avicenna

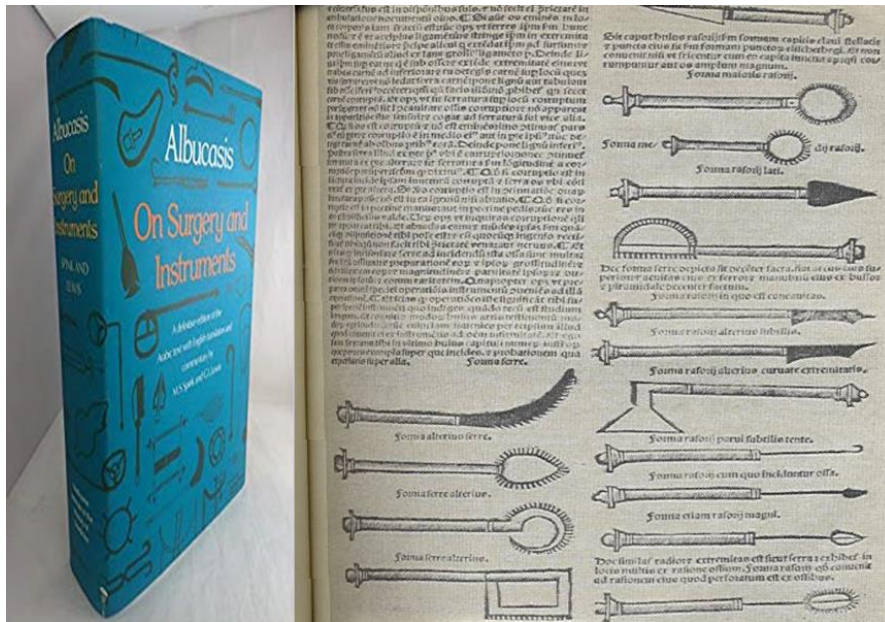


Fig.6 Surgical instruments described by Al-Zahrawi

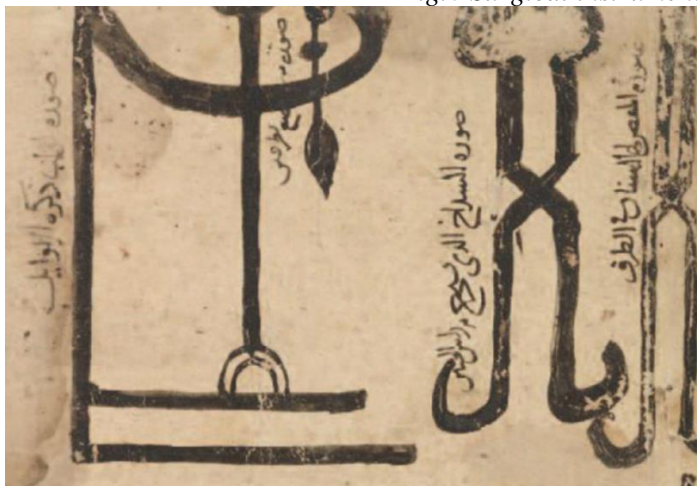


Fig.7 Vaginal speculum described by Al-Zahrawi

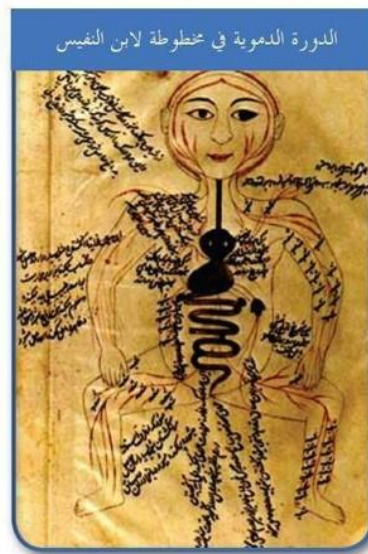


Fig.8 Pulmonary circulation described by Ibn al-Nafis

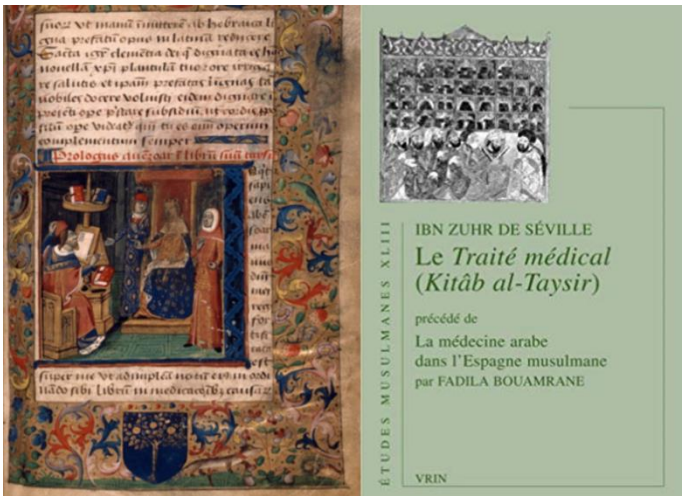


Fig.9 Al-Taysir book by Ibn-Zuhr (Avenzoar)



Fig.10 The Colliget book by Ibn Rusd (Averroes)

The Pandemic of Islamophobia

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Keywords: Islamophobia, Muslims, COVID-19

The COVID-19 pandemic has shone a spotlight on pre-existing intersecting and compounding inequalities and injustices. Data shows that Muslims in the UK are more likely to die from COVID-19¹. However, when social deprivation and ethnicity are controlled for, this excess risk diminishes¹. This is consistent with structural discrimination and racism being key drivers of health disparities from COVID-19 among Muslims in the UK. A syndemics approach² is a useful lens to illustrate the “biosocial complex” that enables the dual pandemics of Islamophobia and COVID-19 to interact, converge and amplify health inequities.

Islamophobia is often seen through the lens of discrimination or race-based oppression (racism) as expressions of racism move away from biological differentiation to more socially acceptable cultural racism within postcolonial and Orientalist narratives. Islamophobia is, however, more than this; it is a complex intersectional form of discrimination and oppression that operates along and between axes of religion, race, culture, gender, class and citizenship within structures of power and privilege. It produces differential inequities and exclusion, interacts at multiple levels, and multiple axes of oppression are simultaneously embodied by Muslims who are racialized by society. Both the Runnymede Trust³ and the APPG⁴ define Islamophobia as an expression of racism.

Although the origins of Islamophobia can be traced back to the Crusades, it has increased in global prominence with a series of “moral panics around British Muslims”³. These include the Satanic Verses affair and Gulf War in the 1980s and 90s and anti-Muslim sentiments have become acutely accentuated after 9/11 with discourses on the “War on Terror”, “home-grown” terrorism and ISIS ‘jihadis’³. This has led some to portray Islam as an ideological and cultural pathogen in need of quarantine and elimination. In the UK, these

global norms are “glocalised” to reproduce health and social inequities.

In the context of COVID-19, and drawing on Singer’s work on syndemics², Islamophobia and COVID-19 interact synergistically at the population level and contribute to excess burden of illness in the Muslim community. At the biological level, the convergence of the pathophysiological processes of SARS-CoV-2 and embodiment of Islamophobia produces excess morbidity and mortality.

It is well known that almost half of Muslim households in the UK live in poverty⁵, an indicator of structural discrimination against Muslims. Social deprivation is one of the strongest risk factors associated with poorer outcomes from COVID-19⁶. Austerity policies therefore disproportionately impact Muslim families and the pandemic has further increased financial hardship especially for Muslim-majority Pakistani and Bangladeshi families where individuals are more likely to be working in shut down sectors and in insecure employment⁷. Inequities and exclusion produce socially patterned and trauma-embodied diseases associated with high allostatic load (“weathering”) such as diabetes, ischaemic heart disease and obesity⁸ as well as increased inflammatory markers⁹. These cardio-metabolic and chronic inflammatory disorders are higher in Muslim-majority ethnic groups¹⁰ and are known to be strong predictors of serious illness and mortality and may be associated with the cytokine storm observed in severe COVID-19^{9,11}. Additionally, living in urban areas with high neighbour density¹², poor quality and insecure housing and household overcrowding with multi-generational occupancy^{5,13} found among Muslim communities increase exposure, reduce opportunities for self-isolation, and facilitate onward transmission of COVID-19.

The hostile environment further institutionalises Islamophobia and worsens COVID-19 outcomes through policies on immigration and security. Just under 50% of Muslims are born outside the UK¹⁰ and are therefore disproportionately impacted by immigration policies which create a barrier to accessing healthcare due to surcharges or fear of deportation¹⁴. This can lead to a delay in accessing care, with Muslim patients more likely to present sicker and with more advanced disease. Security policies such as Prevent similarly create a climate of suspicion and surveillance¹⁵ and discrimination by healthcare professionals has also been reported by Muslim patients¹⁶. This may account for lower uptake of preventative health programmes by Muslims essential to optimise health¹⁷.

The media is a particularly important institutional force that entrenches Islamophobia through shaping public perception. During the pandemic, divisive media narratives that blame and scapegoat Muslims for transmitting infection were widespread¹⁸. This is in addition to fake news and conspiracy theories on social media which have been linked with increased levels of Islamophobia during the pandemic¹⁹. Stereotypes and stigma through the creation of a socially devalued identity of Muslims through public policy and the media not only create a barrier to accessing healthcare but create mistrust in mainstream services and information and are a public health risk for all. They encourage alternative systems of healthcare and information, reduce compliance with public health measures, and threaten community cohesion which is essential to successfully manage a pandemic.

Muslims are also more likely to face discrimination and exclusion in the labour market and workplace. They are more likely to work in key worker roles, in insecure employment and in the gig economy²⁰. This has increased exposure risk to COVID-19 and in the absence of adequate statutory sick pay creates a financial penalty and deterrent to self-isolate when sick thus increasing individual, household and community risk.

The NHS is a microcosm of social norms and values where Islamophobia is internalised and inequities reproduced. Over 95% of doctors who died from COVID-19 were from an ethnic minority background²¹ and the first four doctors to die were Muslim²². Muslim doctors have reported difficulty with accessing PPE²³ which increases exposure risk. This is against a backdrop of well-known discrimination against Muslims in the NHS²⁴, a Triple Penalty affecting Muslim doctors where doctors feel vulnerable, excluded, judged, stigmatised,

bullied and discriminated²⁵, a dress codes policy which discriminates against Muslim doctors, and the Prevent policy which creates a culture of fear and suspicion of Muslim colleagues²⁷. A recent survey by the Huffington Post and British Islamic Medical Association showed that over 80% of medics in the NHS have experienced Islamophobia with detrimental impacts on their wellbeing and careers²⁸. A large survey conducted by ITV, of which over 50% of respondents were Muslim, highlighted that during the COVID-19 pandemic, ethnic minority doctors have felt less likely to raise concerns and are more likely to be discriminated and bullied into taking higher risk roles, contributing to stress, burnout, excess illness and deaths²⁹. This is consistent with institutional Islamophobia in the NHS which must be addressed.

Muslims have a long history of contributing to British society. Initial migration of Muslims began when workers from the British Empire, which covered 50% of the world's Muslim population at its peak³⁰, were recruited from the Indian subcontinent to work for the British East India Company³¹. The inequities currently experienced by Muslims in the UK are an embodiment of necropolitics, a system of social and political power that determines who lives and who dies³², and which replicates the colonial legacy of oppression and exclusion. In order to eliminate health inequities among Muslims from COVID-19 and beyond, it is imperative that a multi-level multi-sectoral and interdisciplinary approach is adopted which addresses the "causes of the causes"³³ in a holistic and integrated way.

Action must begin with the government adopting a definition of Islamophobia, committing to addressing its urgent and long term impact, and collecting data on religion, a legally protected characteristic³⁴, across public health programmes and NHS services to monitor health inequities. Action must include reforming laws and policies on immigration, security, austerity, social mobility and social security, improve media regulation and accountability, provide affordable housing and secure employment, and address discrimination in educational, employment, housing and criminal justice systems against Muslims. Within the NHS, a zero tolerance policy against Islamophobia must be implemented along with a culture of inclusion and compassion, and psychological safe routes for raising concerns. Improved faith literacy and faith networks which support and empower Muslim healthcare professionals and culturally sensitive opportunities for networking and mentoring should be made available.

The hallmark of a civilised society is the protection of its most vulnerable groups and supporting individuals to realise their capabilities³⁵ and achieve self-actualisation³⁶ and holistic wellbeing. It is this combined rights-based, social determinants and wellbeing approach centred on core values of justice, equity and compassion that can address the syndemic of COVID-19 and Islamophobia to ensure optimal health, peace, safety and security for all.

References

- Office for National Statistics. Coronavirus (COVID-19) related deaths by religious group, England and Wales: 2 March to 15 May 2020, retrieved from <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/article/s/coronaviruscovid19relateddeathsbyreligiousgroupenglandandwales/2marchto15may2020>
- Singer M, Bulled N, Ostrach B, Mendenhall E. Syndemics and the biosocial conception of health. *The Lancet*. 2017 Mar 4;389(10072):941-50.
- Elahi F, Khan O. Islamophobia: Still a challenge for us all, A 20th-anniversary Report. Runnymede: Intelligence for a Multi-ethnic Britain. 2017.
- All Party Parliamentary Group, Islamophobia defined, 2017. Retrieved from <https://static1.squarespace.com/static/599c3d2feb1a90cffdd8a9/t/5bfd1ea3352f531a6170ceee/1543315109493/Islamophobia+Defined.pdf>
- Ali S. British Muslims in Numbers: A Demographic socioeconomic and health profile of Muslims in Britain drawing on the 2011 census. MCB; 2015.
- Caul, S., 2020. Deaths involving COVID-19 by local area and socioeconomic deprivation - Office for National Statistics. Office for National Statistics.
- Platt L, Warwick R. Are some ethnic groups more vulnerable to COVID-19 than others. Institute for Fiscal Studies, Nuffield Foundation. May 2020 May.
- Geronimus, A.T., Hicken, M., Keene, D. and Bound, J., 2006. "Weathering" and age patterns of allostatic load scores among blacks and whites in the United States. *American journal of public health*, 96(5), pp.826-833.
- Vepa A, Bae JP, Ahmed F, Pareek M, Khunti K. COVID-19 and ethnicity: a novel pathophysiological role for inflammation. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*. 2020 Sep 1;14(5):1043-51.
- Hanif, R.W. and Susarla, R., 2018. Diabetes and cardiovascular risk in UK South Asians: an overview. *The British Journal of Cardiology*, 25(2), pp.S8-S13.
- Yadav UN, Rayamajhee B, Mistry SK, Parsekar SS, Mishra SK. A syndemic perspective on the management of non-communicable diseases amid the COVID-19 pandemic in low-and middle-income countries. *Frontiers in Public Health*. 2020 Sep 25;8:508.
- Office for National Statistics, 2011 Census. 2011. Retrieved from <https://www.ons.gov.uk/census/2011census>
- Perry J & El-Hasan AA., A guide to engaging Muslim communities, Matrix Housing Partnership, 2008. Retrieved from <https://lemosandcrane.co.uk/resources/CIH%20-%20Engaging%20Muslims.pdf>
- MedAct, Patients Not Passport: Migrants access to healthcare during the Coronavirus crisis, June 2020, retrieved from <https://www.medact.org/wp-content/uploads/2020/06/Patients-Not-Passports-Migrants-Access-to-Healthcare-During-the-Coronavirus-Crisis.pdf>
- MedAct, False positives: the Prevent counter-extremism policy in healthcare. July 2020, retrieved <https://www.medact.org/2020/resources/reports/false-positives-the-prevent-counter-extremism-policy-in-healthcare/>
- Laird LD, Amer MM, Barnett ED, Barnes LL. Muslim patients and health disparities in the UK and the US. *Archives of disease in childhood*. 2007 Oct 1;92(10):922-6.
- Chang KC, Soljak M, Lee JT, Woringer M, Johnston D, Khunti K, Majeed A, Millett C. Coverage of a national cardiovascular risk assessment and management programme (NHS Health Check): Retrospective database study. *Preventive medicine*. 2015 Sep 1;78:1-8.
- Centre for Muslim Media Monitoring, Report on COVID-19: the impact on British Muslim communities, retrieved from <https://mcb.org.uk/wp-content/uploads/2020/09/CfMM-Submission-to-APPG-British-Muslims-Report-on-Covid19-impact-on-British-Muslims.pdf>
- Chang KC, Soljak M, Lee JT, Woringer M, Johnston D, Khunti K, Majeed A, Millett C. Coverage of a national cardiovascular risk

- assessment and management programme (NHS Health Check): Retrospective database study. *Preventive medicine*. 2015 Sep 1;78:1-8.
20. Awan I, Khan-Williams R. Research Briefing Report 2020: Coronavirus, fear and how Islamophobia spreads on social media. 2020. Retrieved from <https://tandis.odihr.pl/handle/20.500.12389/22653>
 21. British Medical Association, COVID-19: the risk to BAME doctors, Updated 2020 Nov 13. Retrieved from, <https://www.bma.org.uk/advice-and-support/covid-19/your-health/covid-19-the-risk-to-bame-doctors>
 22. Khan A. Muslim minority doctors first to die on frontline of UK pandemic. Al Jazeera News. April 2020. Retrieved from <https://www.aljazeera.com/news/2020/4/1/muslim-minority-doctors-first-to-die-on-front-line-of-uk-pandemic>
 23. Hamed A, Latif A, Haris M, Patel S, Patel M, Mustafa SAR, Khan O, Shoaib A, Waqar S, The impact of keeping a religious beard in the COVID-19 pandemic: an online cross-sectional survey study exploring experiences of male medicalhealthcare professionals, November 2020, retrieved from <https://www.medrxiv.org/content/10.1101/2020.11.01.20224022v1.full.pdf>
 24. West M, Dawson J, Kaur M. Making the Difference. Diversity and inclusion in the NHS. King's Fund, London. 2015 Dec.
 25. Muslim Doctors Association. The triple penalty: Muslim doctors in the NHS. 2018. Retrieved from https://e1fde7e6-1b02-480b-ac50-578a258eda2a.filesusr.com/ugd/a2f294_69e206a4fe65478cb75b2d558fefb24e.pdf
 26. Malik A, Qureshi H, Abdul-Razakq H, Yaqoob Z, Javaid FZ, Esmail F, Wiley E, Latif A. 'I decided not to go into surgery due to dress code': a cross-sectional study within the UK investigating experiences of female Muslim medical health professionals on bare below the elbows (BBE) policy and wearing headscarves (hijabs) in theatre. *BMJ open*. 2019 Mar 1;9(3):e019954.
 27. Younis T, Jadhav S. Keeping our mouths shut: the fear and racialized self-censorship of British healthcare professionals in PREVENT training. *Culture, medicine, and psychiatry*. 2019 Sep 15;43(3):404-24.
 28. Day A. "Uncovering the reality of Islamophobia in the NHS shocked me in a way I wasn't expecting". Huffington Post. September 2020. Retrieved from https://www.huffingtonpost.co.uk/entry/islamophobia-nhs_uk_5f5b4cbdc5b62874bc1b8c07
 29. ITV News. "Discrimination on frontline of coronavirus outbreak may be factor in disproportionate BAME deaths in NHS staff. May 2020. Retrieved from <https://www.itv.com/news/2020-05-13/discrimination-frontline-coronavirus-covid19-black-minority-ethnic-bame-deaths-nhs-racism>
 30. Robinson F. The British empire and the Muslim world. *The Oxford History of the British Empire*. 1999;4:398-420.
 31. Ansari H. "The infidel within": Muslims in Britain since 1800. Oxford University Press; 2018 Aug 1.
 32. Mbembe A. Necropolitics, in *Foucault in an Age of Terror*. 2008 (pp. 152-182). Palgrave Macmillan, London.
 33. Marmot M. Inclusion health: addressing the causes of the causes. *The Lancet*. Jan 2018 20;391(10117):186-8.
 34. Equality Act2010. Retrieved from <https://www.gov.uk/guidance/equality-act-2010-guidance>
 35. Sen A. Capability and well-being. *The quality of life*. 1993 Mar 11;30:270-93.
 36. Maslow AH. A Dynamic Theory of Human Motivation. 1958

Risk Communication Messaging in the Midst of the Covid-19 Pandemic and the FIMA Experience

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Introduction

COVID-19 affects different cohorts in the population differently and disproportionately. Older people, the male sex, certain ethnic groups, and certain geographical regions have a higher risk of acquiring the infection, experience a more severe form of the disease and have a higher risk of death.

In the UK, the highest age standardised diagnosis rates of COVID-19 was 486 and 649 per 100,000 population in ethnic Black females and males respectively compared to 220 and 224 in the Caucasians. The risk of dying from COVID-19 is much higher among Black, Asian and Minority Ethnic (BAME) groups.

Their lower socioeconomic status, large family members living under one roof and lack of health-seeking behavior are some of the contributory factors. Persons from the BAME communities were more likely to hold jobs and use public transport to their place of work which makes them more likely to be exposed to COVID-19.

COVID-19 exposed the chronic inequalities affecting BAME communities in the UK and further amplified them. Their poorer socioeconomic circumstances led to poorer health outcomes which was compounded by the increased prevalence of smoking, obesity, non-communicable diseases and their complications.

In the short term, the disproportionate impact of COVID-19 on the BAME communities demands interventions to mitigate the deleterious effects of the pandemic by

promoting health protective behaviour which can minimize the risk of the coronavirus.

COVID-19 health messaging to BAME communities needs to be culturally sensitive to trigger behavior modification and improve their health outcomes. This is because their beliefs and attitudes is influenced by socio-cultural factors different from their Caucasian countrymen.

Behavior changes occurs as a consequence of the interplay of 3 factors namely; baseline knowledge and skills, the available resources and opportunities and the motivation to change old ways and habits.

A successful communication strategy will target all these 3 situations to enhance knowledge and skills, increase resources and drive motivation.

A community leader or NGO known to the BAME communities will more likely earn their respect and trust and would be more receptive to their health messages. In this respect the British Islamic Medical Association (BIMA) and their partners (e.g. Muslim Council of Britain - MCB) have been very smart and savvy in their health messaging on various health, ethical and religious issues related to COVID-19 and this was acknowledged by the Scientific Pandemic Influenza Group on Behaviors (SPI-B) for the Scientific Advisory Group for Emergencies (SAGE) (see Example 6).

BIMA's key health messages, infographics (see below in the Appendices) and a template sermon (*khutbah*) have been shared with 50 other affiliates in the Federation of

Islamic Medical Associations (FIMA) fraternity. They have been translated into their respective national languages.

In Malaysia, the Islamic Medical Association (IMAM) has shared them with the religious authorities in the various states which has helped to make it more easily understood and comprehensible to the lay public and ensuring compliance to mitigate the effects of the coronavirus.

The following are graphs (see below in the Appendices) which summarizes the COVID-19 situation in FIMA affiliate countries as at 13 October 2020. It was not possible nor smart to capture all the data on one graph due to overcrowding. So we divided them into 4 regions, namely Asia Pacific, Middle East, Europe with the US and Africa. There was no online data from Jordan, Khmer and Tanzania.

The first set of graphs looked at new daily confirmed COVID-19 cases. It is on a log scale (not linear), so we

are able to compare large populations with smaller populations with smaller case numbers. More important is the trending of the curve for each country- flattening or bending the curve or a rise after an initial plateau/decline (new wave). The colour of the curve tells the positive rate of testing. Best countries doing appropriate testing are <3% (blue and blacklines) while grey means no testing data.

The second set of graph examines the new daily confirmed COVID-19 deaths. The WHO COVID-19 dashboard (2) reports 38.0 million cases and 1.08 million deaths as of 10:00am EDT on 14 October 2020.

References

- 1- <https://www.gov.uk/government/publications/spi-b-consensus-on-bame-communication-22-july-2020>
- 2- <https://covid19.who.int>

Appendices

Example 6: information shared via faith organisation that is more trusted by some BAME groups

3 Hadith/Aya to protect against CORONAVIRUS (COVID-19)

1 The Prophet (ﷺ) said: *Cleanliness is half of faith.* (Muslim)

- The virus is spread by saliva from infected people sneezing, coughing, and it landing on your eyes, nose or mouth
- Wash your hands with soap for 20 seconds frequently
- Avoid sharing cups and drinks
- Avoid touching your face / eating or drinking without washing hands
- Avoid hugging and shaking hands for the near future
- Avoid touching communal areas like armrests on public transport

2 The Prophet (ﷺ) said: *If you hear of a plague in a land, do not enter therein. If it befalls a land and you are in it, then do not go out of it.* (Muslim)

- If you have come back from an area where it is prevalent, self-isolate
- If you have even mild cold or flu like symptoms, stay away from the public including mosques/ jama'ah/ work (there may be a difference of opinion amongst scholars)
- Avoid visiting those who are unwell until they are better

3 Allah (ﷻ) says: *They ask those who possess the expertise (ahl ul-hikmah) if you do not know.* (al-Baqara)

- There is much misinformation about Covid-19 online
- Masks aren't particularly helpful
- Please do not spread unverified information
- If you are worried you may have it, call 111
- For genuine information, see www.bima.co.uk/covid19/britishislamic-coronavirus-covid-19
- For more info, contact: covid@britishbima.org or visit: www.mcbr.org.uk/coronavirus

THE VIRUS IS RARELY FATAL, SO LET US TAKE PRECAUTIONS AND MAKE DUAA

This guidance is current as of 10 March 2020 and may be subject to rapid and substantial change. Check the BIMA and MCB websites regularly for the most recent evidence and guidance.

This is a public service message by British Islamic Medical Association & the Muslim Council of Britain

MCB The Muslim Council of Britain

Information that draws on aspects of personal identity which increases likelihood of following guidance

Faith based credible source more trusted than HM Government for some Muslim communities

#SmartLockdown FOR MUSLIM INDIVIDUALS

PHYSICAL DISTANCING
2metres or 6 feet apart at all times

AVOID TOUCHING
Door handles, trolleys etc..

CLEAN PHONE
Keys & other objects we touch regularly

NO HANDSHAKE
Say salaam verbally with hand on heart

WASH HANDS
Regularly for 20 seconds

WEAR MASKS
When going out or cover with cloth or scarf

AVOID VISITING
Sick people unless allowed by Doctors

HIGH RISK
If you are >65 years old or have illnesses that make you high risk, continue to self-isolate

All information here is general advice and should be applied in context and with the input of local medical experts and scholars
[W] fimaweb.net [F] fb.com/FIMAWeb [T] @FIMAWeb

Designed by the Muslim Council of Britain and British Islamic Medical Association

#SmartLockdown 3 HADITHS TO REFLECT

- The Prophet ﷺ said, "A believer should not be stung twice from the same hole." [Bukhari]

Between the lockdown being eased and a COVID-19 vaccine, we are at increased risk of a 2nd wave. We must protect ourselves and learn to live the "new normal" life until a vaccine is developed.
- The Prophet ﷺ said, "There is no wisdom equal to good planning." [Mishkat]

Certain ethnic or socio-economic groups may be more impacted. We must plan at all levels to protect the high risk groups.
- The Prophet ﷺ was walking around the Kaaba and said, "The sanctity of a believer's blood and property in the sight of Allah is greater than your (the Kaaba) sanctity." [Ibn Majah]

Post-lockdown & pre-vaccine, we must ensure our Lifestyle and choices we make do not endanger the safety & lives of others. Stick to activities that would prevent a 2nd wave.

All information here is general advice and should be applied in context and with the input of local medical experts and scholars
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#SmartLockdown WHY DO MUSLIMS NEED THIS?

2nd wave

- Often **more deadly** than the 1st because of complacency & risk taking

More affected

- Lower socio-economic & vulnerable group **disproportionately impacted**. We must protect them

Unique features

- We have a few unique features e.g. multi-generational households, mosques and **socio-economic disadvantages**

All information here is general advice and should be applied in context and with the input of local medical experts and scholars
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#SmartLockdown FOR MOSQUES & MADRASAHs

The authorities decide when a Mosque or Madrasah re-opens. Here are 8 steps to improve safety in post-lockdown, pre-vaccine period if it is re-opened

COVID SAFETY OFFICER
A volunteer entrusted to ensure compliance with safety rules

MOSQUE TIMES
Very restricted opening hours

OWN PRAYER MAT
To avoid touching Mosque carpet

DOORS OPEN
Separate entrance & exit + open doors

MARK SPACES
2 meter apart in ALL directions with tape

ONLINE MADRASAH
and Quran classes to remain if possible

WUDHU AT HOME
To avoid touching the taps

DO NOT COME!
If you are high risk, sick, live with a high risk person or a frontline healthcare worker seeing patients

All information here is general advice and should be applied in context and with the input of local medical experts and scholars
[W] fimaweb.net [F] fb.com/FIMAWeb [T] @FIMAWeb

Designed by the Muslim Council of Britain and British Islamic Medical Association

#SmartLockdown 10 STEPS FOR MOSQUES

The authorities decide when a Mosque or Madrasah re-opens. Here are 10 steps to improve safety in post-lockdown, pre-vaccine period if it is re-opened

- DO YOU FEEL IT IS SAFE?** If your committee does not feel it is safe, then you are under no obligation to open.
- WUDHU AT HOME** To avoid touching the taps please do wudhu at home
- COVID SAFETY OFFICER** Ideally each Mosque should have volunteer who ensures compliance with safety advice
- MARK SPACES** Mark 2 meter gaps clearly in all directions using tape or other means, not just between rows
- DO NOT COME!** If you are high risk or live with someone who is, if you are sick or see patients
- OWN PRAYER MAT** From home to avoid touching Mosque carpet. Also bring own Quran/ use App
- LIMITED TIMES** Please shorten opening times considerably
- ONLINE MADRASAH** If possible, we advise Madrasah & Quran classes to remain online
- DOORS OPEN** Use door stop so no touching door handles. Try different entrance/ exits
- FINANCIAL STABILITY** Consider starting campaign to donate money to Mosque for financial stability

All information here is general advice and should be applied in context and with the input of local medical experts and scholars
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8th May 2020

#SmartLockdown SHOULD I GO TO THE MOSQUE?

The authorities decide when a Mosque or Madrasah re-opens. Here's how you decide whether you go to Mosque in post-Lockdown, pre-vaccine period.

If your Mosque is not taking precautions to prevent infections	If your Mosque is putting in place measures to protect public
If you are bringing kids too young to keep physical distancing	> 10 years old able to understand importance of physical distancing
If at risk group or live with a high risk person	If neither you or anyone in your household are in a high risk group
If any symptoms of COVID-19 e.g. Fever, Cough or flu	If feeling well with no symptoms
If you are frontline health care worker exposed to COVID-19	If you are not exposed to patients regularly

All information here is general advice and should be applied in context and with the input of local medical experts and scholars
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8th May 2020

#SmartLockdown FOR MUSLIM COMMUNITIES

SAFE BURIALS Continue with COVID protocol ghusl, limited to immediate non-isolating family members

RESTAURANTS Takeaway service rather than dine in

ONLINE MEETINGS Avoid physical meetings

NO CASH Use card payments if possible

AVOID TRAVEL Unless absolutely necessary

SMALL CELEBRATIONS Weddings etc... limited to immediate family only

SHOPPING Once a week max Try online shopping

CHOOSE YOUR BUBBLE Decide on which small group of people (ideally family) will interact with each other

All information here is general advice and should be applied in context and with the input of local medical experts and scholars
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8th May 2020

EID AL ADHA PRAYERS

ADVICE TO MUSLIM COMMUNITIES

OUTDOORS Work with your Council to see if a suitable outdoor venue can be used	APPROVAL Make sure outdoor space is approved by the local council and police	MULTIPLE Hold multiple congregations if you cannot organise an outdoor space
TIME Allow enough time between congregations and keep khutbahs short		EID TAKBEER One person to recite takbeer loudly indoors, and only a few if outdoors. Others to recite quietly
NO HUGS Give Salaam or Eid greetings without hugging or shaking hands	GATHERINGS If you are meeting other families, keep the numbers to a minimum and meet outdoors	UDHIYA Consider Udhiya to help those in need in the UK or abroad. If sharing locally, make contactless drop offs

This is general advice based on public health and government guidance. It needs to be implemented according to local context with local scholars & medical input. Rules differ in Scotland & Wales so follow guidance from MCS or MCW respectively
mcb.org.uk/coronavirus covid@mcb.org.uk





MCS The Muslim Council of Britain

BRITISH ISLAMIC MEDICAL ASSOCIATION

21st July 2020

MUSLIMS & COVID-19 WHAT EXPLAINS THE SPIKES?

Some are saying that BAME or Muslim communities (which make up at least 1 in 3 BAME) have increased rates of COVID-19 because they are "not taking it seriously." **Here are some facts:**

- FACT**  20% healthcare staff are BAME/ Muslim
33% of all medical staff are BAME/ Muslim
These are on frontline and most exposed.
- FACT**  53% of all taxi drivers and 53% of London bus drivers are BAME/ Muslim. Along with delivery drivers they are more vulnerable.
- FACT**  30% of Bangladeshi & 15% of Pakistani households are overcrowded. Also more risk in Multigenerational households.
- FACT**  Discrepancies in testing make figures difficult to interpret. There are reports that Blackburn testing 4x more than rest of UK.
- NO EVIDENCE**  While there are some who do not adhere to guidance, there is no evidence that BAME / Muslim communities in general are not taking the pandemic seriously.

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BRITISH ISLAMIC
MEDICAL ASSOCIATION

1st Aug 2020

MUSLIMS & COVID-19 ASSUMPTIONS ARE DANGEROUS

Making unsubstantiated assumptions about how COVID-19 is spread is not just wrong, it's irresponsible. **Here are examples:**

- ASSUMPTION**  There is a genetic susceptibility to COVID-19 in BAME populations. → There is no evidence of this.
- ASSUMPTION**  Cases of BAME individuals breaking COVID-19 guidance can be generalised to the entire community → You can't.
- ASSUMPTION**  BAME and Muslim communities are breaking social distancing by visiting each others homes → No evidence of this.
- FACT**  Discrepancies are due to many factors especially socio-economic. Making assumptions or oversimplifying is inaccurate & dangerous. It also gives a false sense of reassurance to other communities.

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BRITISH ISLAMIC
MEDICAL ASSOCIATION

1st Aug 2020

MUSLIMS & COVID-19 WHAT ARE THE FACTS?

Unfortunately, there are people attributing the current spike in COVID-19 cases on BAME communities in general and Muslim communities in particular. **Here are some of the facts:**

- FACT**  We were the first to voluntarily close our places of worships - more than 1 week before the Government ordered it.
- FACT**  We proactively suspended many events during lockdown - daily prayers and Friday congregations, Ramadan, Eid Al-Fitr, and even cancelled our Hajj delegation.
- FACT**  BIMA along with the MCB had advised face coverings in mosques before officials mandated them. Many are still observing 2m distancing.
- FACT**  Many members of the Muslim community are key workers / on front line working in healthcare so are more exposed to COVID-19

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BRITISH ISLAMIC
MEDICAL ASSOCIATION

1st Aug 2020



HOW TO CELEBRATE EID AL-FITR IN LOCKDOWN

Do..

-  Pay Zakat in advance
-  Perform Salah at home, either Eid/Nafi prayer
-  Call out Eid Takbiraat at home
-  Wash, wear your best clothes and wear perfume
-  Eat something sweet (dates) in the morning
-  Connect virtually with others
-  Exchange gift within households
-  Enjoy home-cooked food

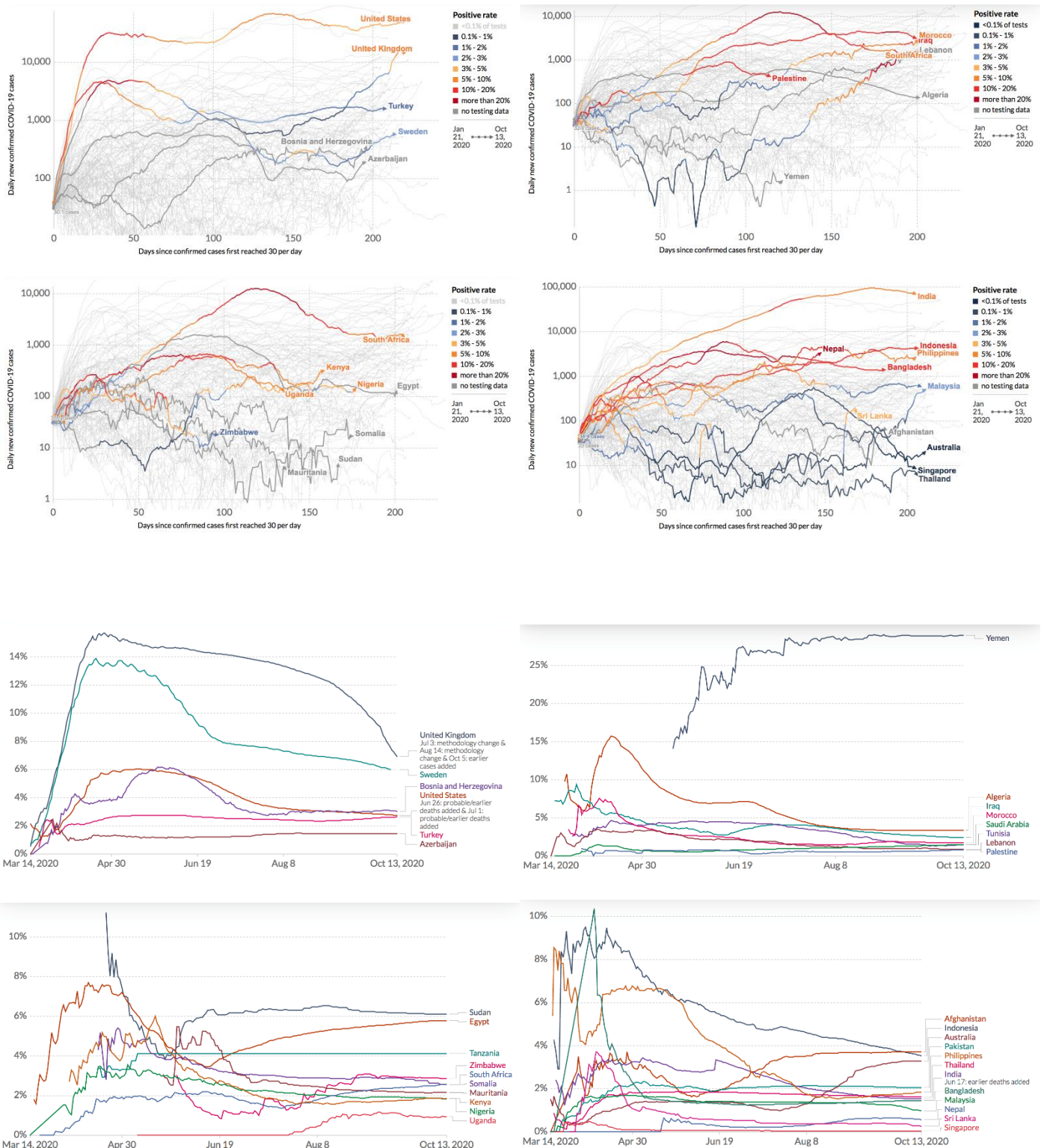
Do Not..

-  Go to the mosque. Community gatherings are not permitted
-  Visit non-family members in their homes
-  Gather in a group of >20, or with those who are not from your household

f Persatuan Perubatan Islam Malaysia -IMAM

Instagram: imamalaysiaofficial

Website: imamalaysia.org



Eight Graphs which summarize the COVID-19 situation in FIMA affiliate countries as at 13 October 2020

Sacrifices in the face of the pandemic: Fit testing and facial hair for Muslim healthcare professionals

Abstract of poster which was presented at the BIMA National Conference, 6th December 2020

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Abstract

During the first wave of the COVID-19 pandemic, healthcare workers were asked to clean-shave their facial hair in order to comply with PPE regulations. This proposed a challenge for Muslim male healthcare workers sporting facial hair as it is intimately associated with male-Muslim identity (1). All four Sunni jurisprudence schools consider the maintenance of a beard an obligatory requirement for males (2); although it is commonly accepted under Islamic law that exceptions can be made in times of necessity (3).

This study involved the cross-sectional survey of healthcare workers in 19 different UK trusts. The survey comprised 11 questions. The survey was disseminated through online platforms to healthcare workers. There were a total of 34 responses collected between 18/10/2020-04/11/2020.

From the 34 survey responses, 35% of respondents clean shaved in order to pass their fit test. 32% felt forced to shave by their trust. Only 25% of respondents felt that their trust had alternatives such as hoods. Of those respondents who clean shaved (n=12), 50% felt forced to shave by their trust; 41.6% felt their Muslim identity was negatively affected; 50% felt their concerns were disregarded during the pandemic; 50% did not feel they could raise their religious concerns with their trust. Of those respondents who did not clean shave (n=22), 45% missed out on learning opportunities; 40.9% felt their working environment was made hostile by their decision.

This study concludes that a significant proportion of Muslim healthcare workers who complied with fit-testing requirements felt they were compelled to do so and likely did not receive appropriate consultation and communication from their respective employing trusts. Too few trusts offered alternatives such as hoods. Greater organisational awareness is required to highlight the importance of beards for Muslim men, so trusts can offer more effective support.

This study was limited by small sample size and narrow sampling demographics (i.e. lack of non-medical healthcare workers responded to the survey). A repeat survey at a later date will provide further insights into the evolving experiences of bearded Muslim healthcare workers during the ongoing pandemic.

References

1. Peterkin A. *One thousand beards*. Vancouver: Arsenal Pulp Press; 2001.
2. Ibn Adam, M. *Ruling On Growing A Beard And Moustache*. [Internet] Daruliftaa. [cited 22 November 2020]. Available from: <https://daruliftaa.com/miscellaneous/ruling-on-growing-a-beard-and-moustache>
3. Nadwi A. *Two Rulings Related to Prayers & Beards During the Covid -19 Pandemic – Cambridge Islamic College* [cited 6.11.2020]. Available from: <https://www.cambridgeislamiccollege.org/two-rulings-related-to-prayers-beards-during-the-covid-19-pandemic/>

A Thematic Analysis of Human Nutrition as Described in the Holy Qur'an

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Keywords: *Qur'an, Food, Nutrition, Guidance*

Abstract

The Qur'an is the basis of the Islamic belief system and is believed by Muslims to not only contain divinely inspired spiritual guidance, but also guidance on daily affairs including nutrition. This narrative study details the verses identified within the Qur'an that provide principles and advice regarding nutrition. Of the Qur'an's 6236 verses, 74 verses were identified to contain some reference to nutrition. A thematic analysis of these verses has been performed and categorised into four groups; principles of nutrition, permissible food, impermissible food and breast feeding.

Introduction

The Qur'an is a script in Arabic language revealed to Muhammad (the Prophet of Islam) circ. 610 AD and is believed by Muslims to be the divinely inspired words of God (Allah). Muslims believe that the Qur'an is the immutable word of God, however, flexibility is given to the interpretation of the verses, and even encouraged.

The Qur'an contains 6236 verses in 114 chapters. Numerous verses are relevant to concept of health(1), guidance and principles of healthy lifestyle (2), nutritional concepts(3), description of various types of food and nutrition (4–7). Many verses of the Qur'an also describe multiple aspects of lifestyle in a single verse, however, in this study, author will focus only on the nutritional aspect of relevant verses.

According to the Muslim belief system, submission to the words of the Qur'an is the most essential part of getting guidance from the Qur'an as its stated in the verse 2:5. Allah has made the Qur'an easy to understand and in fact asks mankind to ponder on the verses of Qur'an, four times in chapter 54 verses 17,22,32 and 40, and twice in verses 4:82 and 47:24, so human being may understand (verse 6:65), and consider and think about

these verses (2:266, 6:50,2:219). Furthermore, the verses of Qur'an are constant and will never ever change as these are protected by Allah, according to verse 15:9.

The interpretation of the certain verses of Qur'an can sometimes vary according to certain schools of Muslim jurisprudence (*fiqh*). Rulings have therefore changed throughout the ages depending on the contemporary knowledge and the cultural era Muslim's reside in. Regardless, obeying the different rulings based on the guidance provided in the Qur'an is obligatory and is incentivized with either rewards or punishments in the afterlife. Secondary to the spiritual effects of obeying the rulings, Muslims believe that there are additional material effects and benefits of following the rulings and guidance which they might not even comprehend.

Nutrition has a vital role in the development of human growth and wellbeing. It has a significant role in prevention and treatment of certain acute and chronic health conditions, infections and cancers which can contribute to the "burden" of society(8). Various types of food components like carbohydrates, fats and protein and a variable quantity of certain types of food consumed is implicated in diseases of malnutrition and obesity.

Method:

The Qur'an is a significant religious text written in classical Arabic. The original Arabic and multiple English translations of Qur'an (9) including translations by Mufti TaqiUsmani, Muhsin Khan, Sahih International, Sayyid Abdul Ala Maududi and Yusuf Ali were reviewed to identify key phrases, terms and messages related to the promotion of health and guidance pertaining to food and nutrition. Many verses were identified using cross references of relevant verses. The English translations of all relevant verses were analysed qualitatively for thematic content and tabulated by topic and citation. Verses were then categorised into four groups; principles of nutrition, permissible food, impermissible food and breastfeeding.

Results:

Of the Qur'an's 6,236 verse, a total of 74 relevant verses were categorised by chapter name (Surah) and location (Table 1) and categorised by group (Table 2). "Principles of nutrition" (Group 1) included 30 verses. This was further subcategorised into "God (Allah) as the sustainer" (Group 1a = 17 verses), "Permissible and impermissible foods" (Group 1b = 10 verses) and "Avoiding excess food" (Group 1c = 3 verses). "Permissible food" (Group 2) included 31 verses. This was further subcategorised into "Vegetarian food" (Group 2a = 19 verses) and "Non-vegetarian food" (Group 2b = 12 verses). "Impermissible food" (Group 3) included 11 verses. "Breastfeeding and lactation" (Group 4) included 5 verses. Three verses (20:81, 6:141 and 6:118) have been included in more than one group as these verses cover multiple categories.

Table 1: Verses categorised by chapter name (Surah) and location within the chapter

Chapter (Surah) No.	Name of Chapter (Surah)	Verse numbers	Total number of verses in each Chapter (Surah)
2	Al-Baqarah(The Cow)	168,57,172,233,173,219,183, 184,187,	9
23	Al-Muminun (The Believers)	51, 18,19,20,21	5
5	Al-Maidah(The Table Spread)	88,87,96,4,3,90,91,	7
7	Al -Araf (The Height)	160,31,157	3
20	Taha (Taha)	81,53, 54	3
6	Al-Anam(The Cattle)	95,118,141, 99,142,145,119	7
36	Ya-sin (YASIN))	33,	1
16	Al-Nahl((The BEE)	114,5,10,11,14,66,67,69,115,	9

50	Qaf(The Letter “QAF”)	11,10,	2
19	Maryam(Mary)	25	1
80	Abasa(He Frowned)	24,25,26,27,28,29,30,31,32,	9
35	Fatir (Orginator)	12	1
13	Ar-Rad(The Thunder)	4,	1
55	Al-Rahman (TheBenefcent)	11,12,	2
21	Al-Anbya(The Prophets)	30	1
56	Al-Waqi ah (The Inevitable)	68	1
24	Al-Nur (The Light)	45	1
25	Al-Fuqan (The Criterion)	54	1
31	Luqman (Luqman)	14	1
46	Al-Ahqaf (The Wind-curved sandhill)	15	1
28	Al-Qasas (The Stories)	7,12	2
18	Al-Kahf(The Cave)	45	1
22	Al-Haj	28,30,36,63	3

Table 2: Verses of Qur'an in groups for cross references

Group	Verses
Group 1: Principles of Nutrition	
Group 1a: Concept of Allah as a sustainer	<p>“Surely, Allah is the one who splits the grain and the date-stone (for sprouting). He brings forth the living from the dead, and He is the One who brings forth the dead from the living. That is Allah! To where, then, are you being turned away (by your desires)?”</p> <p>6:95 Al-Anam (The Cattle)</p>
	<p>“And a sign for them is the dead land. We gave it life and brought forth grain from it; so, from it they eat.”</p> <p>36:33 Ya-sin (Yasin)</p>
	<p>“as a provision to the servants (of Allah). And We gave life with it to a dead land. Similar will be the exit (of the dead from their graves).”</p> <p>50:11 Qaf (The Letter “Qaf”)</p>
	<p>“He is the One who sent down water from the heavens, of which you have your drink; and with it (you grow) plants on which you pasture your cattle.” 16:10 Al-Nahl (The Bee)</p>
	<p>“And We sent forth winds carrying the clouds, then sent down water from the sky and gave it to you to drink, and you are not able to store it.”</p> <p>15:21 Al-Hijr (The Rocky Tract)</p>
	<p>“So, the man should consider his food.”</p> <p>80:24 Abasa (He Frowned)</p>
	<p>“then how nicely We split the earth”</p> <p>80:26 Abasa (He Frowned)</p>
	<p>“And He is the One who created man from water, then made of him relations created by lineage and relations created by marriage. Your Lord is All-Powerful.”</p> <p>25:54 Al-Furqan (The Criterion)</p>
	<p>“Did the disbelievers not observe that the heavens and the earth were closed, then We opened them? And We created from water every living thing. Would they still not believe?”</p> <p>21:30 Al-Anbya (The Prophets)</p>
	<p>“Again, tell Me about the water you drink:”</p> <p>56:68 Al-Waqi'ah (The Inevitable)</p>

	<p>“Allah has created every moving creature from water. So, some of them move on their bellies; and some of them move on two legs, and some of them move on four. Allah creates what He wills. Surely, Allah is powerful over everything”</p> <p>24:45 Al-Nur (The Light)</p> <p>“(He is) the One who made the earth a cradle for you, and made in it pathways for you to move, and sent down water from the heavens; and We brought forth with it pairs of different vegetations”</p> <p>20:53 Taha (Taha)</p> <p>“Eat [therefrom] and pasture your livestock. Indeed, in that are signs for those of intelligence.”</p> <p>20:54 Taha (Taha)</p> <p>“Give them the example of the worldly life; it is like water We sent down from the sky, then the vegetation of the earth was mingled with it, and then it turned into chaff that is blown by the winds, and Allah is powerful over everything.”</p> <p>18:45 Al-Kahf (The Cave)</p> <p>“Did you not see that Allah has sent down water from the sky, whereby the land becomes green? Surely, Allah is All-Kind, All-Aware.”</p> <p>22:63 Al-Hajj (The Pilgrimage)</p>
<p>Group 1b: Concept and philosophy of Permissible (Halal) and Impermissible (Haram) food</p>	<p>“O people, eat permissible good things out of what lies in the earth, and do not follow the footsteps of ShaiTān (Satan); indeed, he is an open enemy for you.”</p> <p>2:168 Al-Baqarah (The Cow)</p> <p>“O messengers, eat from the good things, and act righteously. Of whatever you do, I am fully aware”</p> <p>23:51 Al-Mu’minun (The Believers)</p> <p>“Eat from what Allah has provided you as good and lawful, and fear Allah in whom you believe.”</p> <p>5:88 Al-Maidah (The Table Spread)</p> <p>“And We made the cloud give you shade, and sent down to you Mann and Salwā: “Eat of the good things We have provided to you”. And they (by their ingratitude) did Us no harm but were harming only themselves.”</p> <p>2:57 Al-Baqarah (The Cow)</p>

	<p>“And We divided them into twelve tribes, as separate communities, and We revealed to Mūsā when his people asked him for water, “Strike the rock with your staff.” Then twelve springs gushed forth from it. Each tribe came to know their drinking place. We shaded them with the shadow of the clouds. And We sent down to them Mann and Salwā (saying), “Eat of the good things we have provided you.” And they did us no harm, rather they have been harming their own selves.”</p> <p>7:160 Al-A’raf (The Height)</p>
	<p>“So, eat (the flesh) of that (animal) upon which the name of Allah has been invoked (when slaughtering), if you do believe in His verses.”</p> <p>6:118 Al-Anam (The Cattle)</p>
	<p>“O you who believe, do not hold as unlawful the good things that Allah has made lawful for you, and do not transgress. Verily, Allah does not like the transgressors.”</p> <p>5:87 Al-Maidah (The Table Spread)</p>
	<p>“O you who believe, eat of the good things We have provided to you and be grateful to Allah, if it is He whom you worship (in real terms).”</p> <p>2:172 Al-Baqarah (The Cow)</p>
	<p>“So, eat the permissible and pure things from what Allah has provided you, and be grateful for the bounty of Allah, if you worship Him alone.”</p> <p>16:114 Al-Nahl (The Bee)</p>
	<p>“those who follow the Messenger, the Ummiyy (unlettered) prophet whom they find written with them in the Torah and the Injīl , and who bids them what is fair and forbids what is unfair, and makes lawful for them good things, and makes unlawful for them impure things, and relieves them of their burden, and of the shackles that were upon them. So, those who believe in him and support him, and help him and follow the light sent down with him, - those are the ones who are successful.”</p> <p>7:157 Al-A’raf (The Height)</p>
Group 1c: Avoidance of Excess food	<p>“Children of Adam! Take your adornment at every time of Prayer, and eat and drink without going to excesses. For Allah does not like those who go to excess.”</p> <p>7:31 Al -A’raf (The Height)</p>
	<p>“Eat from the good things We have provided to you, and do not exceed the limits in it, lest My wrath should descend on you. The one upon whom My wrath descends certainly falls into destruction.”</p> <p>20:81 Taha (Taha)</p>
	<p>“He is the One who has created gardens, trellised and untrellised, and date-palms and crops with a variety of edibles, and the olive and the pomegranate, (some) similar to one another, and (some) dissimilar. Eat of its fruit when it bears fruits, and pay its due on the day of harvest, and do not be extravagant. Surely, Allah does not like the</p>

extravagant.”

6:141: Al-Anam (The Cattle)

Group 2: Permissible food

Group 2a: Vegetarian food

He is the One who has created gardens, trellised and untrellised, and date-palms and crops with a variety of edibles, and the olive and the pomegranate, (some) similar to one another, and (some) dissimilar. Eat of its fruit when it bears fruits, and pay its due on the day of harvest, and do not be extravagant. Surely, Allah does not like the extravagant.

6:141 Al-Anam (The Cattle)

And a sign for them is the dead land. We gave it life and brought forth grain from it; so from it they eat.

36:33 Ya-sin (Yasin)

“He causes the crops therewith to grow for you, and olives, and date palms, and grape vines, and all the fruits. Surely, in that, there is a sign for a people who ponder.”

16:11 Al-Nahl (The Bee)

“And from the fruits of date palms and grape vines, you obtain intoxicants, and good provision. Surely, in that there is a sign for a people who understand.”

16:67 Al-Nahl (The Bee)

“Shake the trunk of the palm-tree towards yourself and, it will drop upon you ripe fresh dates.”

19:25 Maryam (Mary)

“then We grew in it grain”

80:27 Abasa (He Frowned)

“and grapes and greens”

80:28 Abasa (He Frowned)

“and olive and date-palms”

80:29 Abasa (He Frowned)

“and gardens, full of thick trees”

80:30 Abasa (He Frowned)

“and fruits and fodder”

80:31 Abasa (He Frowned)

	<p>“ Then, eat from all the fruits, and go along the pathways of your Lord made easy for you.” From their bellies comes out a drink of various colors in which there is cure for people. Surely, in that there is a sign for a people who ponder.”</p> <p>16:69 Al-Nahl (The Bee)</p>
	<p>“He is the One who sent down water from the heavens. Then We brought forth with it vegetation of all kinds. Then from it We brought grains set upon one another. From the palm-trees, from their spathes, come forth the low hanging bunches. (We produce) vineyards and the olive and the pomegranate, either similar or not similar to each other. Look at its fruit when it bears fruit, and at its ripening. Surely, in all this there are signs for the people who believe.”</p> <p>6:99 Al-Anam (The Cattle)</p>
	<p>“And in the earth there are tracts of land neighbouring each other, and gardens of grapes, and farms and date palms, some having twin trunks and some having a single one. (Although) all of them are irrigated with the same water, We make some of them better than others in taste. Surely, in that there are signs for a people who understand.”</p> <p>13:4 Ar-Rad (The Thunder)</p>
	<p>“in which there are fruits and date palms having sheaths,”</p> <p>55:11 Al-Rahman (The Beneficent)</p>
	<p>“and the grain having chaff, and fragrant flowers”</p> <p>55:12 Al-Rahman (The Beneficent)</p>
	<p>“And lofty palm trees having fruit arranged in layers”</p> <p>50:10 Qaf (The Letter “Qaf”)</p>
	<p>“Then We produced with it gardens of date-palms and vines for your benefit. For you there are many fruits in them, and of them you eat.”</p> <p>23:19: Al-Mu’minun</p>
	<p>“and (We produced) a tree (of olive) that comes forth from the (mount) Tūr of Sinai, which grows with oil and with a dressing for those who eat.” 23:20: Al-Mu’minun</p>
<p>Group 2: b: Non-Vegetarian Food: / Sea food</p>	<p>‘Made lawful for you is the game of the sea and eating thereof, as a benefit for you and for travellers. But the game of the land has been made unlawful for you as long as you are in the state of IHRām. Fear Allah (the One) towards Whom you are to be brought together.’</p> <p>5:96 Al-Maidah (The Table Spread)</p>

“ He is the One who has subjugated the sea, so that you may eat fresh meat from it, and may take out from it ornaments you wear, and you see the boats cleaving through it, and so that you may seek His bounty, and that you may be grateful”

16:14 Al-Nahl (The Bee)

“He has created cattle in which there is warmth and other benefits for you; and from them you have food;”

16:5 Al-Nahl (The Bee)

“The two masses of water are not alike. The one is sweet, sates thirst, and is pleasant to drink from, while the other is salt, bitter on the tongue. Yet from both you eat fresh meat, and extract from it ornaments that you wear; and you see ships cruising through it that you may seek of His Bounty and be thankful to Him.”

35:12 Fatir (Originator)

“Surely there is a lesson for you in the cattle. We provide you, out of what lies in their bellies between faeces and blood, the (drink of) milk, pure and pleasant for those who drink”

16:66 Al-Nahl (The Bee)

“as a benefit for you and your cattle.”

80:32 Abasa (He Frowned)

“Among cattle (He has created) those fit for loading and those fit for laying on the floor. Eat of what Allah has provided you, and do not follow the footsteps of Satan. Surely, he is an open enemy to you”

6:142 Al-Anam (The Cattle)

“They ask you as to what has been made lawful for them. Say, “Made lawful for you are good things, and (hunting through) birds and beasts of prey that you train, teaching them out of what Allah has taught you. So, eat of what they hold for you, and recite the name of Allah upon it.” Fear Allah. Surely, Allah is swift at reckoning.”

5:4 Al-Maidah (The Table Spread)

“so that they witness benefits for them, and recite Allah’s name in specified days, over the provision He gave them from the cattle. “So, eat thereof and feed the distressed, the poor.”

22:28 Al-Hajj (The Pilgrimage)

“Having said that, whoever observes reverence of the things sanctified by Allah, it is good for him with his Lord. And permitted to you are the cattle, except those mentioned to you through recitation (of the verses). So refrain from the filth of the idols and refrain from a word of falsehood,”

22:30 Al-Hajj (The Pilgrimage)

“The big animals of sacrifice (like camels and cows) are made by Us among the symbols of Allah for you, in which there is much good for your benefit. So recite the name of Allah over them as they are lined up (for sacrifice). Then, once their flanks fall down (after slaughter), eat of them and feed the one who is content and the one who wishes to receive. Thus We have made them (the animals) subjugated to you, so that you may be grateful.”

22:36 Al-Hajj (The Pilgrimage)

And indeed there is a sure lesson in the cattle for you. We give you a drink from that which lies in their bellies, and for you there are many benefits in them, and of them you eat,”

23:21 Al-Mu’minun

Group 3: Impermissible food

“What should cause you to avoid eating of that upon which the name of Allah has been invoked, while He has spelled out to you all that He has made unlawful for you, except that to which you are compelled by extreme necessity? Surely, there are many who misguide people on the basis of their desires without having knowledge. Surely, your Lord is the best knower of those who cross the limits.”

6:119 Al-Anam (The Cattle)

“Prohibited for you are: carrion, blood, the flesh of swine, and those upon which (a name) other than that of Allah has been invoked (at the time of slaughter) , animal killed by strangulation, or killed by a blow, or by a fall, or by goring, or that which is eaten by a beast unless you have properly slaughtered it; and that which has been slaughtered before the idols, and that you determine shares through the arrows. (All of) this is sin. Today those who disbelieve have lost all hope of (damaging) your faith. So, do not fear them, and fear Me. Today, I have perfected your religion for you, and have completed My blessing upon you, and chosen Islam as Dīn (religion and a way of life) for you. But whoever is compelled by extreme hunger, having no inclination towards sin, then Allah is Most-Forgiving, Very-Merciful”

5:3 Al-Maidah (The Table Spread)

“He has only prohibited for you carrion, blood, the flesh of swine and that upon which a name of someone other than ‘Allah’ has been invoked. Then, whoever is compelled by necessity, neither seeking pleasure nor transgressing, there is no sin on him. Verily, Allah is Most-Forgiving, Very-Merciful.”

2:173 Al-Baqarah (The Cow) 16:115 Al-Nahl (The Bee)

Say, "I do not find, in what has been revealed to me, anything (out of the cattle under discussion) prohibited for anyone who eats it, unless it be carrion or blood that pours forth, or flesh of swine - because it is impure - or there be an animal slaughtered sinfully by invoking on it the name of someone other than Allah. However, if anyone is compelled by necessity, neither seeking pleasure nor crossing the limit, then your Lord is Most-Forgiving, Very-Merciful."

6:145 Al-Anam (The Cattle)

"O you who believe! Wine, gambling, altars and divining arrows are filth, made up by Satan. Therefore, refrain from it, so that you may be successful."

5:90 Al-Maidah (The Table Spread)

"Satan only wants to cause between you animosity and hatred through intoxicants and gambling and to avert you from the remembrance of Allah and from prayer. So, will you not desist?"

5:91 Al-Maidah (The Table Spread)

"They ask you about wine and gambling. Say, "In them is great sin and [yet, some] benefit for people. But their sin is greater than their benefit." And they ask you what they should spend. Say, "The excess [beyond needs]." Thus Allah makes clear to you the verses [of revelation] that you might give thought."

2:219 Al-Baqarah (The Cow)

"O you who believe, the fasts have been enjoined upon you as they were enjoined upon those before you, so that you may be God-fearing. [Fasting for] a limited number of days."

2:183-184 Al-Baqarah (The Cow)

"eat and drink until the white thread of the dawn becomes distinct from the black thread; then complete the fast up to the night"

2:187 Al-Baqarah (The Cow)

Group 4: Breast Feeding

"Mothers (should) suckle their children for two full years, for one who wants to complete the (period of) suckling. It is the obligation of the one to whom the child belongs that he provides food and clothing for them (the mothers) with fairness. Nobody is obligated beyond his capacity. No mother shall be made to suffer on account of her child, nor the man to whom the child belongs, on account of his child. Likewise, responsibility (of suckling) lies on the (one who may become an) heir (of the child). Now, if they want to wean, with mutual consent and consultation, there is no sin on them. And If you want to get your children suckled (by a wet-nurse), there is no sin on you when you pay off what you are to give with fairness, and fear Allah, and be assured that Allah is watchful of what you do"

2:233 Al-Baqarah (The Cow)

	<p>“And We have enjoined upon man to do good to his parents. His mother carried him with difficulty and delivered him with difficulty. And his carrying and his weaning is (in) thirty months, until when he attains his maturity and reaches forty years, he says, “My Lord, grant me that I offer gratitude for the favour You have bestowed upon me and upon my parents, and that I do righteous deeds that You like. And set righteousness, for my sake, in my progeny. Of course, I repent to you, and truly I am one of those who submit to You.”</p> <p>46:15 Al-Ahqaf (The Wind-curved Sandhill)</p>
	<p>“We commanded man (to be good) in respect of his parents. His mother carried him (in her womb) despite weakness upon weakness, and his weaning is in two years. (We said to man,) “Be grateful to Me, and to your parents. To Me is the ultimate return.”</p> <p>31:14 Luqman (Luqman)</p>
	<p>“We inspired the mother of Mūsā saying, “Suckle him (Mūsā). Then once you fear about him, cast him in the river, and do not fear, and do not grieve. Surely We are going to bring him back to you and appoint him one of (Our) messengers.”</p> <p>28:7 Al-Qasas (The Stories)</p>
	<p>“And We had already barred him (Mūsā) from (accepting) any suckling women, so she (his sister) said (to Pharaoh’s people), “Shall I point out to you a family who will nurse him for you, and they will be his well-wishers?”</p> <p>28:12 Al-Qasas (The Stories)</p>

Discussion:

Muslims believe that the Qur’an is a divinely inspired text that describes not only spiritual advice but also advice on daily affairs including nutrition. Revealed in classical Arabic, a word in the Qur’an may have multiple different meanings and connotations depending on the context within the verse, which sometimes makes translation problematic and controversial. Certain words in English language do not represent the exact meaning of Arabic word for example the word “*tayyub*”. Whilst multiple translations were reviewed as described in the methods, a single translation provided by Mufti TaqiUsmani has been cited for simplicity and consistency (10).

In this study, 74 relevant verses were identified which are related to nutrition within the Qur’an. There are limited studies on the nutritional concepts described in the Quran. Therefore, it’s difficult to compare. Some authors in another study have identified 257 verses using databases in Persian language. They have used 64 key

words and have identified more than 30 food principal food stuffs. They have found that some of these keywords like cattle, poultry, vegetables and fruit were repeated more than 20 times (3).

Other studies which purely looked at fruits and plants mentioned in the Qur’an have identified names of 18 fruits and plants. in the Qur’an(11). Another study has provided botanical characteristics of the 22 identifiable fruits and plants which are described in the Qur’an (7) .

Out of 74 identified verses in this study, nutrition is often described in the context of God (Allah) as the creator, provider and sustainer. The Qur’an states that living beings are created from water (21:30 and 24:45) and states that God (Allah) has sent down the water from the sky for humans to drink (16:10, 56:68, 15:21, 20:53,) and for the earth to produce various types of food (36:33, 16:10, 6:99,18:45, 22:63,23:18) and has described water as an essential component of diet to maintain life and nutrition (56:68). Specific examples cited include grains,

fruits, vegetables nutritional plants
(6:95,36:33,16:10,6:141, 16:11, 16:67,
16:11,80:27,80:28, 80:29, 80:30, 80:31,6:99, 13:4,
55:11,55:12, 50:11,23:19, 23:20) which in turn provide
nutrition for human and cattle which are also consumed
by humans (16:5,16:66, 80:23,6:142, 20:53, 20:54, 22:28,
22:30, 22:36, 23:21).

The concept of food being “*tayyub*” has been described in 8 verses (2:168, 23:51,5:88, 2:57, 16:114, 7:160 2:172, 20:81,) and is translated with connotations of “pure”, “good” and “clean” and is described as the food that is to be recommended and preferred to be consumed. To satisfy the condition of “*tayyub*”, the Qur’an applies two conditions; the food must be permissible (Group 2) and not among food which is impermissible (Group 3).

Clear examples of food that are classified as permissible for human consumption include meat of cattle, fish, milk, grains, plants, fruits and vegetables. Further specific examples have been provided for certain foods including grains, dates, grapes, pomegranate, olives and honey. The Qur’an states that one should not hold as unlawful what God (Allah) has made lawful (5:87). The Qur’an allows for the consumption of both vegetarian and non-vegetarian food. However, there are certain types of food like the flesh of swine, carrion, blood, that upon which a name of someone other than ‘Allah’ has been invoked and substances which causes intoxication like alcohol that are explicitly declared impermissible (Group 3).

To clarify the interpretation of verses of the Qur’an and to derive rulings (fiqh), Muslims turn to the practice and teachings of Muhammad, codified and classified through a system of “hadith”. Global rulings about the guidance about permissible and impermissible food is obtained through interpretation of both the Qur’an and the Hadith to develop a consensus amongst the Muslim jurists (ijma). According to one such hadith, it has been reported that “Both legal and illegal things are evident but in between them there are doubtful (suspicious) things and most of the people have no knowledge about them. So, whoever saves himself from these suspicious things saves his religion and his honour. And whoever indulges in these suspicious things is like a shepherd who grazes (his animals) near the Hima (private pasture) of someone else and at any moment he is liable to get in it.”(12).

Three verses describe the word “*al-khmar*”, that is described for the substances causing more harm than good (2:219), “an act of evil” (5:91) and as impermissible (5:90). Whilst often referring to fermented drinks containing alcohol, its interpretation as

“intoxication” is extrapolated to include multiple other non-alcoholic intoxicating substances (5:91). Certain stipulations have been declared where impermissible foods become permissible. In a matter of life and death, the Qur’an provides allowance for an impermissible food to become permissible, in an amount that is required to preserve life (6:119,2:173). In the state of fasting, which is mandated in the month of Ramadan for most healthy adult Muslims (2:183, 2:184), the permissible food becomes impermissible (2:187).

With regards to the excess of food consumption, the Qur’an states to eat and drink what is permissible but to not exceed the limits (20:81). Further verses expand on this where God (Allah) is displeased with those who go to excess and transgress even for the permissible foods and drinks (6:141, 7:31,20:81). Eight verses describe breast feeding and nursing mother (Group 4). The Qur’an encourages mothers to suckle their children for two years (2:233, 31:14) or up to thirty months (41:15).

Conclusion:

This review provides a basis for further research. The critical analysis of the on-going and up-to-date medical literature about the nutrition would provide further understanding of the guidance about the human nutrition provided in the Qur’an.

Limitations:

This is a narrative analysis of the verses of Quran. The author reviewed the two formats of the Quran, which were read in Arabic and the translation in English. All efforts were made to identify as many verses possible where nutrition related subject has been mentioned. Therefore, there is potential that some verses might not have been picked up. The sources of data were from the English translation of the original Quran which is in Arabic. Therefore, the relevant citations might have been misinterpreted through semantics and syntax in the translation of chapters and verses.

Disclosures and declarations:

The author is a medical doctor and practising Muslim. There was no financial support or funding obtained. The work is purely author’s personal interest and understanding of the literature. The readers would be advised to use this as an academic material for understanding of the subject and as a base for further research.

References

1. Ibrahim MA, Shah ASM, Mohd RA. Concept of Shifa in Al-Quran: Islamic medicine approach in healing physical disorder. *International Journal of Islamic Studies*. 2017;6:1 . eISSN:2289-9944.
2. Aboul-Enein BH. Health-Promoting Verses as mentioned in the Holy Quran. *Journal of Religion and Health*. 2016;55(3):821–9.
3. Tarighat-Esfanjani A, Namazi N. Nutritional Concepts and Frequency of Foodstuffs Mentioned in the Holy Quran. *Journal of religion and health*. 2016;55(3):812–9.
4. Aboul-Enein BH. ‘The Quranic Garden’: Consumption of Fruits, Vegetables, and Whole Grains from an Islamic Perspective. *International Journal of Multicultural and Multireligious Understanding*. 2017;4(4):53.
5. Farhangi H, Ajilian M, Saeidi M, Khodaei GH. Medicinal fruits in Holy Quran. *International Journal of Pediatrics*. 2014;2(3):89–102.
6. Firoozabadi M, Sheikhi M. Breastfeeding from Quran to Medical Science. *International Journal of Current Research and Academic Review* . 2015;3(7):134–7.
7. Khafagi I, Zakaria A, Dewedar A, El-Zahdany K. A voyage in the world of plants as mentioned in the Holy Quran. *International Journal of Botany*. 2006;2(3):242–51.
8. Health P, Bank W. Burden of Disease-WHO. 2004;2. Available from: http://www.who.int/foodsafety/foodborne_disease/Q&A.pdf
9. The Noble Quran - القرآن الكريم [Internet]. [cited 2020 May 23]. Available from: <https://quran.com/>
10. Usmani MMT. *The Meanings of The Noble Qur’an*. MaktabaMa’ariful Quran, Karachi; 2006.
11. Shafaghat A. Phytochemical investigation of qur’anic fruits and plants. *Journal of Medicinal Plants*. 2010;9(35):61–6.
12. Sahih al- Bukhari. *Book of Belief*, 52.

Ancient Remedy Revisited: Honey – a Possible Natural Cancer Vaccine

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Abstract

During ancient times, honey has been used for all kinds of ailments and for cosmetic purposes. This review focusses on characteristics of honey in combating cancer after understanding the risk factors of cancer. Honey could be considered the most sustainable food produced naturally. It contains sugars, vitamins, minerals and has high anti-oxidant activities. Cancer is on the rise in most countries. Carcinogenesis is a multi-step process and has multi-factorial causes. Among these are low immune status, chronic infection, chronic inflammation, chronic nonhealing ulcers, smoking, obesity etc. Published studies thus far have shown that honey improves immune status, has anti-inflammatory and anti-microbial properties and promotes healing of chronic ulcers and wounds and scavenge toxic free radicals. Recently several studies have shown that have anti-cancer properties in cell cultures and in animal models. The mechanisms suggested include induction of apoptosis, disruption of mitochondrial membrane potential and cell cycle arrest. Though sugar is predominant in honey which itself is thought to be carcinogenic, it is understandable that its beneficial effect as anti-cancer agent raises skeptics. With increasing number of people seeking therapy from nature, this area of research has recently gained attention. However, using honey alone as treatment without adequate treatment with established anticancer treatment for now is not ethical. Honey however could reduce the risk factors for cancer development thus it is a possible natural cancer vaccine.

Cancer – the Global Burden

According to the International agency against cancer [IARC, it is stated that the global cancer burden was 18.1 million cases and 9.6 million cancer deaths in 2018 [Figure 1]. Cancer was seen in one-in-five men and one-in-six women worldwide. The increase in populations was much more in developing countries than in developed countries. Even if the age-specific rates of cancer remain constant, developing countries would have a higher cancer burden than developed countries. Cancers which are associated with diet and life-style are seen more in developed countries while cancers which are due

to infections are more in developing countries. According to World Health Organization (WHO), death from cancer is expected to increase to 104% worldwide by 2020.

In order to understand the usefulness of honey in cancer, we need to understand the various factors which could cause cancer. Carcinogenesis is a multi-step process and cancer has multi-factorial causes. Development of cancers takes place long after initiation, promotion and progression steps have taken place. Cancer development could occur 10-15 years after exposure to the risk factors.

World Cancer Burden 2018

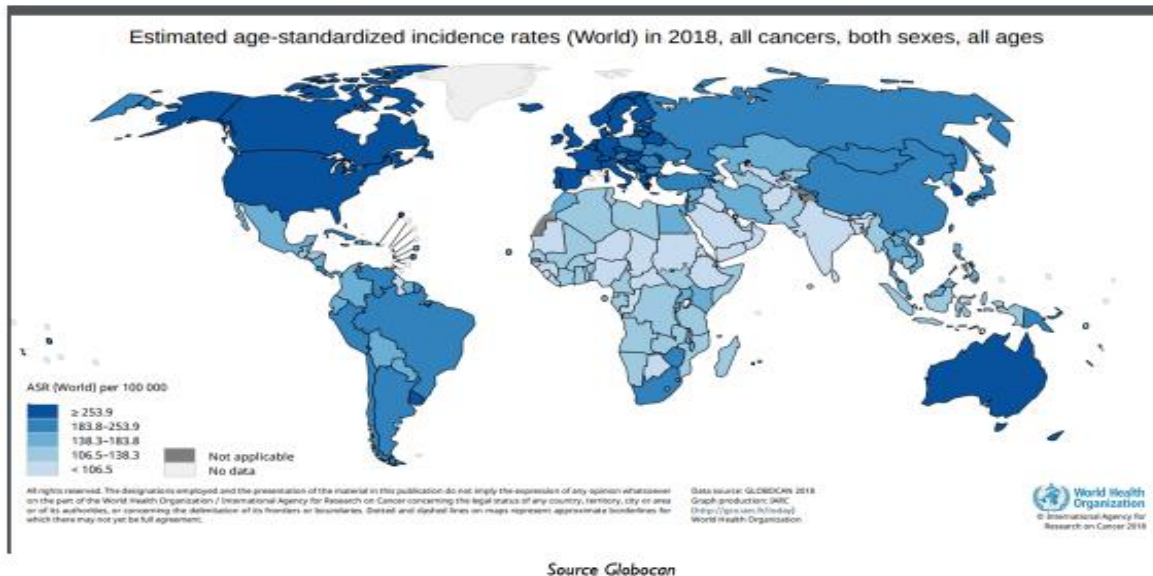


Figure 1. Estimated new cancer cases by world for 2018 (source: Globocan, 2018)

Causes of Cancer:

The causes of cancer can be categorized as follows:-

1. Low immune status eg due to diabetes, chronic illness, obesity and old age
2. Chronic infections such as by bacteria *helicobacter pylori* (cancer of the stomach), viruses such as Human Papilloma Virus (cancer of the cervix, skin and penis), Epstein Barr Virus (nasopharyngeal carcinoma), Hepatitis viruses such as Hepatitis B, C (hepatocellular carcinoma); parasites such as shistosomiasis (bladder cancer) and fungus such as *Aspergillus flavus* (hepatocellular carcinoma)
3. Chronic inflammation, for example colorectal cancer developing in patients with Crohns colitis and ulcerative colitis.
4. Chronic non healing ulcers, for example squamous cell carcinoma developing in patients with chronic traumatic ulcers of the skin.
5. Accumulation of toxic free radicals and oxidative stress secondary to smoking, alcohol, obesity and chronic inflammatory processes
6. Genetic inheritance
7. Unknown – there is still a lot we do not know and I term this GOK [God only knows] in this paper

Cancer is caused by genetic damage in the genome of cells. This damage is either inherited or acquired throughout life. The acquired genetic damage is often ‘self-inflicted’ through unhealthy lifestyles. Broadly one third of cancer is due to tobacco use, one third due to dietary and lifestyle factors and one-fifth due to infections. In developing countries, cancers caused by infections by micro-organisms such as cervical (by Human Papilloma Virus) (Parkin et al., 2008), liver (by Hepatitis Viruses) (Yuen et al., 2009), nasopharynx (by Epstein Barr Virus) (Chou et al., 2008) and stomach (by *helicobacter pylori*) (Kuniyasu et al., 2003) are more common than in developed countries (DCP2, 2007). Except for breast cancers, the top 5 cancers in males and females in developing nations are due to life-styles or infections (DCP2, 2007).

Why is Honey Useful in Preventing Cancer?

Honey is known for centuries for its medicinal and health promoting properties. It contains various kinds of phytochemicals with high phenolic and flavonoid content which contribute to its high antioxidant activity (Iurlina et al., 2009; Pyrzynska and Biesaga, 2009; Yao et al., 2003). An agent that has strong antioxidant property may have the potential to prevent the development of cancer as free radicals and oxidative stress play a significant role in inducing the formation of cancers (Valko et al., 2007). Phytochemicals available in honey could be narrowed down into phenolic acids and polyphenols. Variants of

polyphenols in honey are reported to have anti-proliferative property against several types of cancer (Jaganathan and Mahitosh, 2009).

Honey is a natural immune booster

Honey stimulates antibody production during primary and secondary immune responses against thymus-dependent and thymus-independent antigens in mice injected with sheep red blood cells and E-coli antigen (Al-Waili and Haq, 2004). Oral intake of honey augments antibody productions in primary and secondary immune responses (Fukuda et al., 2009). Honey also stimulates inflammatory cytokine production from monocytes (Tonks et al., 2003) via TLR4 (Tonks et al., 2007). Manuka, pasture and jelly bush honey significantly increased TNF- α , IL-1 β and IL-6 release from MM6 cells (and human monocytes) when compared with untreated and artificial-honey-treated cells ($P < 0.001$) (Tonks et al., 2003). Consumption of 80 g natural honey for 21 days raised prostaglandins level in patients with AIDS compared with normal subjects (Al-Waili et al., 2006).

Patients who have compromised immune systems are at risk for cancer development. This explains why diabetics and HIV patients are more at risk to develop epithelial and non-epithelial cancers. Such individuals are also at risk to develop multiple chronic infections implying the multiplicity in cancer genesis.

Aging is also associated with reduced immune system capability. Many cancers are associated with aging. Although age per se is not an important determinant of cancer risk, it implies prolonged exposure to carcinogen (Franceschi and La Vecchia, 2001). The most important change that would occur in the world population in the next 50 years is the change in the proportion of elderly people (more than 65 years); 7% in 2000 to 16% in 2050 (Bray and Moller, 2006). By the year 2050, 27 million people are projected to have cancer. More than half of the estimated number will be residents of developing countries (Bray and Moller, 2006). Improvement in immune status is key in prevention of cancer formation and honey has such potential.

Honey is a natural anti-inflammatory agent

In general inflammatory responses are beneficial, but at times, chronic inflammatory responses are detrimental to health. Honey is a potent anti-inflammatory agent. Infants suffering from diaper dermatitis improved significantly after topical application of a mixture

containing honey, olive oil and beeswax after 7 days (Al-Waili, 2005). Honey provides significant symptom relief of cough in children with upper respiratory tract infection (URTI) (Heppermann, 2009). It has been shown to be effective in management of dermatitis and psoriasis vulgaris (Al-Waili, 2003). Eight out of 10 patients with dermatitis and five of eight patients with psoriasis showed significant improvement after 2 weeks on honey-based ointment (Al-Waili, 2003).

A case report of a patient who had chronic dystrophic epidermolysis bullosa (EB) for 20 years healed with honey impregnated dressing in 15 weeks after conventional dressings and creams failed (Hon, 2005). Local application of raw honey on infected wounds reduced signs of acute inflammation (Al-Waili, 2004b), thus alleviating pain felt by patients.

Volunteers who chewed "honey leather" showed there were statistically highly significant reductions in mean plaque scores (0.99 reduced to 0.65; $p = 0.001$) in the manuka honey group compared to the control group suggesting a potential therapeutic role of honey for gingivitis, periodontal disease (English et al., 2004), mouth ulcers, and other problems of oral health (Molan, 2001b).

Chronic inflammatory process has risk of cancer development. Examples of cancers developing in patients suffering from chronic inflammatory processes include colorectal carcinomas developing in patients with Ulcerative Colitis and Chron's disease and thyroid cancers in patients with autoimmune thyroiditis.

Honey is natural antimicrobials

Honey is a potent natural antimicrobial. Antibacterial effect of honey is extensively studied. The bactericidal mechanism is through disturbance in cell division machinery (Henriques et al., 2009). The minimum inhibitory concentration (MICs) for *Staphylococcus aureus* by honey ranged from 126.23 to 185.70 mg ml⁻¹ (Miorin et al., 2003). Honey is also effective against coagulase-negative staphylococci (French et al., 2005). Antimicrobial activity of honey is stronger in acidic media than in neutral or alkaline media (Al-Waili, 2004b). When honey is used together with antibiotic gentamycin, it enhances anti-*Staphylococcus aureus* activity by 22% (Al-Jabri et al., 2005). When honey is added to bacterial culture medium, the appearance of microbial growth on the culture plates is delayed (Al-Waili et al., 2005). Mycobacteria did not grow in culture media containing 10% and 20% honey while it grew in

culture media containing 5%, 2.5% and 1% honey, suggesting that honey could be an ideal antimycobacterial agent (Asadi-Pooya et al., 2003) at certain concentrations.

Honey is also effective in killing hardy bacteria such as *Pseudomonas aeruginosa* and could lead to a new approach in treating refractory chronic rhino-sinusitis (Alandejani et al., 2009). Daily consumption of honey reduces risk of chronic infections by micro-organisms.

Chronic infections lead to greater risk in cancer development.

Bacteria which have been studied to have associations with cancer are *helicobacter pylori* infections (stomach cancer) (Kuniyasu et al., 2003), *Ureaplasma urealyticum* (prostate cancer) (Hrbacek et al., 2011) and chronic typhoid infection (gall bladder cancer) (Sharma et al., 2007).

There are three main mechanisms by which infections can cause cancer. They appear to involve initiation as well as promotion of carcinogenesis (Kuper et al., 2001). Persistent infection within host induce chronic inflammation accompanied by formation of reactive oxygen and nitrogen species (ROS and RNOS) (Kuper et al., 2001). ROS and RNOS have the potential to damage DNA, proteins and cell membranes. Chronic inflammation often results in repeated cycles of cell damage leading to abnormal cell proliferation (Cohen et al., 1991). DNA damage promotes the growth of malignant cells. Secondly, infectious agents may directly transform cells, by inserting active oncogenes into the host genome, inhibiting tumour suppressors (Kuper et al., 2001). Thirdly, infectious agents, such as human immunodeficiency virus (HIV), may induce immunosuppression (Kuper et al., 2001).

Chronic fungi infections have also been studied to be associated with cancer such as *candida* species in oral cancer (Hooper et al., 2009). Honey has been shown to have some effect on chronic fungal infections of the skin (Al-Waili, 2004a). Parasites such as *Schistosoma haematobium* are associated with carcinoma of the urinary bladder, liver flukes *Opisthorchis viverrini* and *Clonorchis sinensis* are associated with development of cholangiocarcinoma and hepatocellular carcinoma. Thus far, there are no published reports on effect of honey on parasitic diseases.

Besides bacteria, honey has also been shown to have anti-viral properties. In a comparative study, topical application of honey was found to be better than

acyclovir treatment on patients with recurrent herpetic lesions (Al-Waili, 2004c). Two cases of labial herpes and one case of genital herpes remitted completely with the use of honey while none with acyclovir treatment (Al-Waili, 2004c).

Common viruses which cause cancers (Carrillo-Infante et al., 2007) are Epstein-Barr virus (EBV) (Siddique et al., 2010) (nasopharyngeal carcinomas), Human Papilloma Virus (cervical cancers and other squamous cancers) and Hepatitis B viruses (liver cancers). Viruses are oncogenic after long period of latency (McLaughlin-Drubin and Munger, 2008).

Studies on the effect of honey on these specific viruses are required to affirm the usefulness of honey in combating cellular damage caused by these viruses.

Honey is a scavenging agent of toxic free radicals

The link between cancer and cigarette smoking is beyond doubt. It is due to generations of toxic free radicals and oxidative stress. Smoking is associated with a number of cancers such as larynx, bladder, breasts, oesophagus and cervix. Smoking increases the risk of colorectal carcinomas by 43% (Huxley, 2007). Long-term smokers were associated with an 8.8-fold increased risk of colorectal cancers (95% confidence interval, 1.7-44.9) when fed on well-done red meat diet if they have NAT2 and CYP1A2 rapid phenotypes (Le Marchand et al., 2001).

Antioxidants, abundant in natural honey, are free radical scavengers (Kishore et al., 2011). Jungle honey was shown to have chemotactic induction for neutrophils and reactive oxygen species (ROS) (Fukuda et al., 2009). The amino acid composition of honey is an indicator of the toxic radical scavenging capacity (Perez et al., 2007). The antioxidant activity of *Trigona carbonaria* honey from Australia is high at 233.96 +/- 50.95 microM Trolox equivalents (Oddo et al., 2008). Dark honey had higher phenolic compounds and antioxidant activity than clear honey (Estevinho et al., 2008). Some simple and polyphenols found in honey, namely, caffeic acid (CA), caffeic acid phenyl esters (CAPE), Chrysin (CR), Galangin (GA), Quercetin (QU), Kaempferol (KP), Acacetin (AC), Pinocembrin (PC), Pinobanksin (PB), and Apigenin (AP), have evolved as promising pharmacological agents in prevention of cancer (Jaganathan and Mandal, 2009).

Honey is a 'fixer' for chronic ulcers and wounds

Increasing numbers of antibiotic-resistant bacteria has made simple wounds become chronic and non-healing and as such honey provides alternative treatment options (Sharp, 2009). Honey absorbs exudates released in wounds and devitalized tissue (Cutting, 2007). Honey is effective in recalcitrant surgical wounds (Cooper et al., 2001). It increases the rate of healing by stimulation of angiogenesis, granulation, and epithelialization (Molan, 2001a). In a randomized control trial, Manuka honey improved wound healing in patients with sloughy venous leg ulcers (Armstrong, 2009). Honey was shown to eradicate MRSA (Methylene resistant *Staphylococcus aureus*) infection in 70% of chronic venous ulcers (Gethin and Cowman, 2008). Honey is acidic and chronic non healing wounds have an elevated alkaline environment. Manuka honey dressings is associated with a statistically significant decrease in wound Ph (Gethin et al., 2008).

Chronic ulcers are risk factors in developing cancer. The most common is Marjolin's ulcer (Asuquo et al., 2009) and they are common in developing nations especially in rural areas with poor living conditions (Asuquo et al., 2007). This risk factor is related to chronic infections as most if not all chronic ulcers are non-healing because of persistent infections.

Honey is a potential agent for controlling obesity

Obese individuals are at risk to develop cancer. There is a close link among obesity, a state of chronic low-level inflammation, and oxidative stress (Codoner-Franch et al., 2011). Obese subjects have an approximately 1.5-3.5-fold increased risk of developing cancers compared with normal-weight subjects (Pischon et al., 2008), (Rapp et al., 2008; Reeves et al., 2007) particularly endometrium (Bjorge et al., 2007; McCourt et al., 2007), breasts (Dogan et al., 2007; Ahn et al., 2007) and colorectal cancers (Moghaddam et al., 2007). Adipocytes have the ability to enhance the proliferation of colon cancer cells in vitro (Amemori et al., 2007). The greatest risk is for obese persons who are also diabetic, particular those whose body mass index is above 35 kg/m². The increase in risk is by 93-fold in women and by 42-fold in men (Jung, 1997). One of the most common cancers noted in community that has high diabetics and obesity is colorectal cancer (Othman and Zin, 2008; Yang et al., 2005; Ahmed et al., 2006; Seow et al., 2006).

In a clinical study on 55 overweight or obese patients, the control group (17 subjects) received 70 g of sucrose daily

for a maximum of 0 days and patients in the experimental group (38 subjects) received 70 g of natural honey for the same period. Results showed that honey caused a mild reduction in body weight (1.3%) and body fat (1.1%) (Yaghoobi et al., 2008). Beneficial effect of honey on obesity is not well established thus far.

Honey has potential use in 'cancer therapy'

Recent studies on human breast (Fauzi et al., 2011), cervical (Fauzi et al., 2011), oral (Ghashm et al., 2010) and osteocarcoma (Ghashm et al., 2010) cancer cell lines using Malaysian jungle Tualang honey showed significant anticancer activity. Honey has also been shown to have antineoplastic activity in an experimental bladder model in vivo and in-vitro (Swellam et al., 2003). Honey is rich in flavonoids (Gomez-Caravaca et al., 2006; Jaganathan and Mandal, 2009). Flavonoids have created a lot of interests among researchers because of its anticancer properties. The mechanisms suggested are rather diverse such as inhibition of cell proliferation, induction of apoptosis (Ghashm et al., 2010) and cell cycle arrest (Pichichero et al., 2010) as well as inhibition of lipoprotein oxidation (Gheldof and Engeseth, 2002). It has been shown to induce early (Ghashm et al., 2010) and late apoptosis (Fauzi et al., 2011) and disruption of mitochondrial membrane potential (Fauzi et al., 2011). Breast cancers developed in rats after DMBA induction show smaller tumor size and lesser number of tumors compared to controls when the rats were fed on various doses of honey (manuscript under review for publication). Honey is thought to mediate these beneficial effects due to its major components such as chrysin (Woo et al., 2004) and other flavonoids (Jaganathan et al., 2010). These differences are explainable as honeys are of various floral sources and each floral source may exhibit different active compounds. Though honey has other substances of which the most predominant are a mixture of sugars (fructose, glucose, maltose and sucrose) (Aljadi and Kamaruddin, 2004) which itself is carcinogenic (Heuson et al., 1972), it is understandable that's its beneficial effect on cancer raises skeptics. The mechanism on how honey has anti-cancer effect is an area of great interest recently. There is a lot we can learn from nature (Moutsatsou, 2007). For example, phytochemicals, such as genistein, lycopene, curcumin, epigallocatechingallate, and resveratrol have been studied to be used for treatment of prostate cancer (Von Low et al., 2007). Phytoestrogens, constitute a group of plant-derived isoflavones and flavonoids and honey belongs to plant phytoestrogen (Moutsatsou, 2007; Zaid et al., 2010).

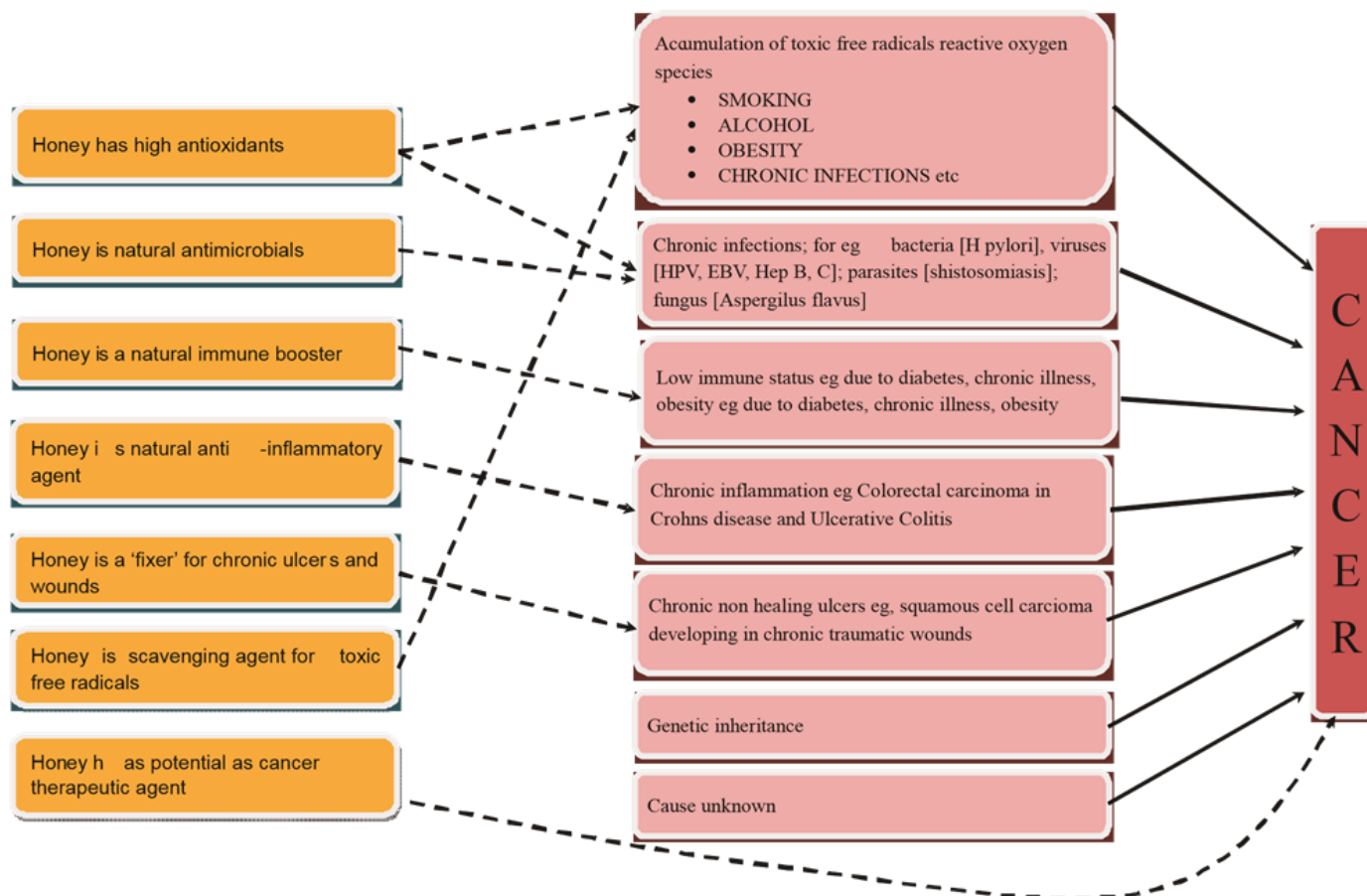


Figure 2. The diagrammatic relationship of honey and cancer (Key: solid line (→): arallel relationship; dotted line (---): inverse relationship)

Fairly recently, deeper understanding of honey and its anti-cancer effect was established (Ahmed and Othman 2017, Ahmed, Sulaiman et al. 2017, Ahmed, Sulaiman et al. 2018)

Limitations

Although the effect of honey as anti-inflammatory, antimicrobial and promotion of chronic ulcer healing is extensively studied, its effect on other causes of cancers such as smoking, obesity and alcohol is not well studied thus far. One of its strong limitation is, It is difficult to standardize honey. Honey from different regions may have variations in its health benefits because its efficacy depends on the floral source. Isolating the active fragment of honey does not produce as good effect as total honey.

Conclusion

There is now sizeable evidence that honey has a potential role in alleviating the causes of cancer and is thus a possible natural cancer vaccine. It is a natural immune booster, natural anti-inflammatory agent, natural antimicrobial agent, natural promoter for healing chronic ulcers and wounds and scavengers for toxic free radicals. Though it is essentially a sweet food and sugar is thought to be carcinogenic, its potential role in preventing cancer understandably raises skeptics. Improvement in immune status is key in prevention of cancer formation and honey has such potential. Recently, it has been shown to have direct anti-cancer effect on various cancer cell lines. Recent studies have established that wild honey has anti-cancer effect because it can cause shrinkage of cancer mass. With increasing number of people seeking therapy from nature, this area of research has recently gained attention.

References

- Ahmed, R.L., Schmitz, K.H., Anderson, K.E., Rosamond, W.D., Folsom, A.R., 2006. The metabolic syndrome and risk of incident colorectal cancer. *Cancer* 107, 28-36.
- Ahmed, S. and N. H. Othman (2017). "The anti-cancer effects of Tualang honey in modulating breast carcinogenesis: an experimental animal study." *BMC Complement Altern Med*17(1): 208.
- Ahmed, S., et al. (2018). "Honey as a Potential Natural Antioxidant Medicine: An Insight into Its Molecular Mechanisms of Action." *Oxid Med Cell Longev*2018: 8367846.
- Ahmed, S., et al. (2017). "Oral Administration of Tualang and Manuka Honeys Modulates Breast Cancer Progression in Sprague-Dawley Rats Model." *Evid Based Complement Alternat Med*2017: 5904361.
- Ahn, J., Schatzkin, A., Lacey, J.V., Jr., Albanes, D., BallardBarbash, R., Adams, K.F., Kipnis, V., Mouw, T., Hollenbeck, A.R., Leitzmann, M.F., 2007. Adiposity, adult weight change, and postmenopausal breast cancer risk. *Arch Intern Med* 167, 2091-2102.
- Al-Jabri, A.A., Al-Hosni, S.A., Nzeako, B.C., Al-Mahrooqi, Z.H., Nsanze, H., 2005. Antibacterial activity of Omani honey alone and in combination with gentamicin. *Saudi Med J* 26, 767-771.
- Al-Waili, N.S., 2003. Topical application of natural honey, bees wax and olive oil mixture for atopic dermatitis or psoriasis: partially controlled, single-blinded study. *Complement Ther Med* 11, 226-234.
- Al-Waili, N.S., 2004a. An alternative treatment for pityriasis versicolor, tinea cruris, tinea corporis and tinea faciei with topical application of honey, olive oil and beeswax mixture: an open pilot study. *Complement Ther Med* 12, 45-47.
- Al-Waili, N.S., 2004b. Investigating the antimicrobial activity of natural honey and its effects on the pathogenic bacterial infections of surgical wounds and conjunctiva. *J Med Food* 7, 210-222.
- Al-Waili, N.S., 2004c. Topical honey application vs. acyclovir for the treatment of recurrent herpes simplex lesions. *Med Sci Monit* 10, MT94-98.
- Al-Waili, N.S., 2005. Clinical and mycological benefits of topical application of honey, olive oil and beeswax in diaper dermatitis. *Clin Microbiol Infect* 11, 160-163.
- Al-Waili, N.S., Akmal, M., Al-Waili, F.S., Saloom, K.Y., Ali, A., 2005. The antimicrobial potential of honey from United Arab Emirates on some microbial isolates. *Med Sci Monit* 11, BR433-438.
- Al-Waili, N.S., Al-Waili, T.N., Al-Waili, A.N., Saloom, K.S., 2006. Influence of natural honey on biochemical and hematological variables in AIDS: a case study. *The Scientific World Journal* 6, 1985-1989.
- Al-Waili, N.S., Haq, A., 2004. Effect of honey on antibody production against thymus-dependent and thymus-independent antigens in primary and secondary immune responses. *J Med Food* 7, 491-494.
- Alandejani, T., Marsan, J., Ferris, W., Slinger, R., Chan, F., 2009. Effectiveness of honey on *Staphylococcus aureus* and *Pseudomonas aeruginosa* biofilms. *Otolaryngol Head Neck Surg* 141, 114-118.
- Aljadi, A.M., Kamaruddin, M.Y., 2004. Evaluation of the phenolic contents and antioxidant capacities of two Malaysian floral honeys. *Food Chemistry* 85, 513-518.
- Amemori, S., Ootani, A., Aoki, S., Fujise, T., Shimoda, R., Kakimoto, T., Shiraiishi, R., Sakata, Y., Tsunada, S., Iwakiri, R., Fujimoto, K., 2007. Adipocytes and preadipocytes promote the proliferation of colon cancer cells in vitro. *Am J Physiol Gastrointest Liver Physiol* 292, G923-929.
- Armstrong, D.G., 2009. Manuka honey improved wound healing in patients with sloughy venous leg ulcers. *Evid Based Med* 14, 148.

20. Asadi-Pooya, A.A., Pnjehshahin, M.R., Beheshti, S., 2003. The antimycobacterial effect of honey: an in vitro study. *RivBiol* 96, 491-495.
21. Asuquo, M., Ugare, G., Ebughe, G., Jibril, P., 2007. Marjolin's ulcer: the importance of surgical management of chronic cutaneous ulcers. *Int J Dermatol* 46 Suppl 2, 29-32.
22. Asuquo, M.E., Udosen, A.M., Ikpeme, I.A., Ngim, N.E., Otei, O.O., Ebughe, G., Bassey, E.E., 2009. Cutaneous squamous cell carcinoma in Calabar, southern Nigeria. *Clin Exp Dermatol* 34, 870-873.
23. Bjorge, T., Engeland, A., Tretli, S., Weiderpass, E., 2007. Body size in relation to cancer of the uterine corpus in 1 million Norwegian women. *Int J Cancer* 120, 378-383.
24. Bray, F., Moller, B., 2006. Predicting the future burden of cancer. *Nat Rev Cancer* 6, 63-74.
25. Carrillo-Infante, C., Abbadessa, G., Bagella, L., Giordano, A., 2007. Viral infections as a cause of cancer (review). *Int J Oncol* 30, 1521-1528.
26. Chou, J., Lin, Y.C., Kim, J., You, L., Xu, Z., He, B., Jablons, D.M., 2008. Nasopharyngeal carcinoma--review of the molecular mechanisms of tumorigenesis. *Head & neck* 30, 946-963.
27. Codoner-Franch, P., Valls-Belles, V., Arilla-Codoner, A., AlonsoIglesias, E., 2011. Oxidant mechanisms in childhood obesity: the link between inflammation and oxidative stress. *Transl Res* 158, 369-384.
28. Cohen, S.M., Purtilo, D.T., Ellwein, L.B., 1991. Ideas in pathology. Pivotal role of increased cell proliferation in human carcinogenesis. *Mod Pathol* 4, 371-382.
29. Cooper, R.A., Molan, P.C., Krishnamoorthy, L., Harding, K.G., 2001. Manuka honey used to heal a recalcitrant surgical wound. *Eur J Clin Microbiol Infect Dis* 20, 758-759.
30. Cutting, K.F., 2007. Honey and contemporary wound care: an overview. *Ostomy Wound Manage* 53, 49-54.
31. DCP2, 2007. Controlling Cancer in Developing Countries; prevention and treatment strategies merit further study on www.dcp2.org.
32. Dogan, S., Hu, X., Zhang, Y., Maihle, N.J., Grande, J.P., Cleary, M.P., 2007. Effects of high-fat diet and/or body weight on mammary tumor leptin and apoptosis signaling pathways in MMTV-TGFalpha mice. *Breast Cancer Res* 9, R91.
33. English, H.K., Pack, A.R., Molan, P.C., 2004. The effects of manuka honey on plaque and gingivitis: a pilot study. *J Int Acad Periodontol* 6, 63-67.
34. Estevinho, L., Pereira, A.P., Moreira, L., Dias, L.G., Pereira, E., 2008. Antioxidant and antimicrobial effects of phenolic compounds extracts of Northeast Portugal honey. *Food Chem Toxicol* 46, 3774-3779.
35. Fauzi, A.N., Norazmi, M.N., Yaacob, N.S., 2011. Tualang honey induces apoptosis and disrupts the mitochondrial membrane potential of human breast and cervical cancer cell lines. *Food Chem Toxicol* 49, 871-878.
36. Franceschi, S., La Vecchia, C., 2001. Cancer epidemiology in the elderly. *Crit Rev Oncol Hematol* 39, 219-226.
37. French, V.M., Cooper, R.A., Molan, P.C., 2005. The antibacterial activity of honey against coagulase-negative staphylococci. *J Antimicrob Chemother* 56, 228-231.
38. Fukuda, M., Kobayashi, K., Hirono, Y., Miyagawa, M., Ishida, T., Ejiogu, E.C., Sawai, M., Pinkerton, K.E., Takeuchi, M., 2009. Jungle Honey Enhances Immune Function and Antitumor Activity. *Evid Based Complement Alternat Med*.
39. Garcia, M., Jemal, A., Ward, E., Center, M., Hao, Y., Siegal, R., Thun, M., 2007. Global Cancer; Facts & Figures 2007. American Cancer Society.
40. Gethin, G., Cowman, S., 2008. Bacteriological changes in sloughy venous leg ulcers treated with manuka honey or hydrogel: an RCT.

41. J Wound Care 17, 241-244, 246-247.
42. Gethin, G.T., Cowman, S., Conroy, R.M., 2008. The impact of Manuka honey dressings on the surface pH of chronic wounds. *Int Wound J* 5, 185-194.
43. Ghashm, A.A., Othman, N.H., Khattak, M.N., Ismail, N.M., Saini, R., 2010. Antiproliferative effect of Tualang honey on oral squamous cell carcinoma and osteosarcoma cell lines. *BMC Complement Altern Med* 10, 49.
44. Gheldof, N., Engeseth, N.J., 2002. Antioxidant capacity of honeys from various floral sources based on the determination of oxygen radical absorbance capacity and inhibition of in vitro lipoprotein oxidation in human serum samples. *J Agric Food Chem* 50, 3050-3055.
45. Gomez-Caravaca, A.M., Gomez-Romero, M., Arraez-Roman, D., Segura-Carretero, A., Fernandez-Gutierrez, A., 2006. Advances in the analysis of phenolic compounds in products derived from bees. *J Pharm Biomed Anal* 41, 1220-1234.
46. Henriques, A.F., Jenkins, R.E., Burton, N.F., Cooper, R.A., 2009. The intracellular effects of manuka honey on *Staphylococcus aureus*. *Eur J Clin Microbiol Infect Dis*.
47. Heppermann, B., 2009. Towards evidence based emergency medicine: Best BETs from the Manchester Royal Infirmary. *Bet* 3. Honey for the symptomatic relief of cough in children with upper respiratory tract infections. *Emerg Med J* 26, 522-523.
48. Heuson, J.C., Legros, N., Heimann, R., 1972. Influence of insulin administration on growth of the 7,12-dimethylbenz(a)anthracene-induced mammary carcinoma in intact, oophorectomized, and hypophysectomized rats. *Cancer Res* 32, 233-238.
49. Hon, J., 2005. Using honey to heal a chronic wound in a patient with epidermolysis bullosa. *Br J Nurs* 14, S4-5, S8, S10 passim.
50. Hooper, S.J., Wilson, M.J., Crean, S.J., 2009. Exploring the link between microorganisms and oral cancer: a systematic review of the literature. *Head Neck* 31, 1228-1239.
51. Hrbacek, J., Urban, M., Hamsikova, E., Tachezy, R., Eis, V., Brabec, M., Heracek, J., 2011. Serum antibodies against genitourinary infectious agents in prostate cancer and benign prostate hyperplasia patients: a case-control study. *BMC Cancer* 11, 53.
52. Huxley, R., 2007. The role of lifestyle risk factors on mortality from colorectal cancer in populations of the Asia-Pacific region. *Asian Pac J Cancer Prev* 8, 191-198.
53. Iurlina, M.O., Saiz, A.I., Fritz, R., Manrique, G.D., 2009. Major flavonoids of Argentinean honeys. Optimisation of the extraction method and analysis of their content in relationship to the geographical source of honeys. *Food Chemistry* 115, 1141-1149.
54. Jaganathan, S.K., Mahitosh, M., 2009. Antiproliferative Effects of Honey and of Its Polyphenols: A Review. *Journal of Biomedicine and Biotechnology* 2009, 13.
55. Jaganathan, S.K., Mandal, M., 2009. Antiproliferative effects of honey and of its polyphenols: a review. *J Biomed Biotechnol* 2009, 830616.
56. Jaganathan, S.K., Mandal, S.M., Jana, S.K., Das, S., Mandal, M., 2010. Studies on the phenolic profiling, anti-oxidant and cytotoxic activity of Indian honey: in vitro evaluation. *Nat Prod Res* 24, 1295-1306.
57. Jung, R.T., 1997. Obesity as a disease. *Br Med Bull* 53, 307-321.
58. Kishore, R.K., Halim, A.S., Syazana, M.S., Sirajudeen, K.N., 2011. Tualang honey has higher phenolic content and greater radical scavenging activity compared with other honey sources. *Nutr Res* 31, 322-325.
59. Kuniyasu, H., Kitadai, Y., Mieno, H., Yasui, W., 2003. *Helicobacter pylori* infection is closely associated with telomere reduction in gastric mucosa. *Oncology* 65, 275-282.

60. Kuper, H., Adami, H.-O., Trichopoulos, D., 2001. Infections as a major preventable cause of human cancer. *Journal of Internal Medicine* 249,, 61-74.
61. Le Marchand, L., Hankin, J.H., Wilkens, L.R., Pierce, L.M., Franke, A., Kolonel, L.N., Seifried, A., Custer, L.J., Chang, W., Lum-Jones, A., Donlon, T., 2001. Combined effects of well-done red meat, smoking, and rapid N-acetyltransferase 2 and CYP1A2 phenotypes in increasing colorectal cancer risk. *Cancer Epidemiol Biomarkers Prev* 10, 1259-1266.
63. McCourt, C.K., Mutch, D.G., Gibb, R.K., Rader, J.S., Goodfellow, P.J., Trinkaus, K., Powell, M.A., 2007. Body mass index: relationship to clinical, pathologic and features of microsatellite instability in endometrial cancer. *Gynecol Oncol* 104, 535-539.
64. McLaughlin-Drubin, M.E., Munger, K., 2008. Viruses associated with human cancer. *BiochimBiophys Acta* 1782, 127-150.
65. Miorin, P.L., Levy Junior, N.C., Custodio, A.R., Bretz, W.A., Marcucci, M.C., 200. Antibacterial activity of honey and propolis from *Apis mellifera* and *Tetragoniscaangustula* against *Staphylococcus aureus*. *Journal of applied microbiology* 95, 913-920.
66. Moghaddam, A.A., Woodward, M., Huxley, R., 2007. Obesity and risk of colorectal cancer: a meta-analysis of 31 studies with 70,000 events. *Cancer Epidemiol Biomarkers Prev* 16, 2533-2547.
67. Molan, P.C., 2001a. Potential of honey in the treatment of wounds and burns. *American journal of clinical dermatology* 2, 13-19.
68. Molan, P.C., 2001b. The potential of honey to promote oral wellness. *General dentistry* 49, 584-589.
69. Moutsatsou, P., 2007. The spectrum of phytoestrogens in nature: our knowledge is expanding. *Hormones (Athens)* 6, 173-193.
70. Oddo, L.P., Heard, T.A., Rodriguez-Malaver, A., Perez, R.A., Fernandez-Muino, M., Sancho, M.T., Sesta, G., Lusco, L., Vit, P., 2008. Composition and antioxidant activity of *Trigona carbonaria* honey from Australia. *Journal of medicinal food* 11, 789-794.
71. Othman, N.H., Zin, A.A., 2008. Association of colorectal carcinoma with metabolic diseases; experience with 138 cases from Kelantan, Malaysia. *Asian Pac J Cancer Prev* 9, 747-751.
72. Parkin, D.M., Almonte, M., Bruni, L., Clifford, G., Curado, M.P., Pineros, M., 2008. Burden and trends of type-specific human papillomavirus infections and related diseases in the latinamerica and Caribbean region. *Vaccine* 26 Suppl 11, L1-15.
73. Perez, R.A., Iglesias, M.T., Pueyo, E., Gonzalez, M., de Lorenzo, C., 2007. Amino acid composition and antioxidant capacity of Spanish honeys. *Journal of agricultural and food chemistry* 55, 360-365.
74. Pichichero, E., Cicconi, R., Mattei, M., Muzi, M.G., Canini, A., 2010. Acacia honey and chrysin reduce proliferation of melanoma cells through alterations in cell cycle progression. *Int J Oncol* 37, 973-981.
75. Pischon, T., Nothlings, U., Boeing, H., 2008. Obesity and cancer. *The Proceedings of the Nutrition Society* 67, 128-145.
76. Pyrzynska, K., Biesaga, M., 2009. Analysis of phenolic acids and flavonoids in honey. *TrAC Trends in Analytical Chemistry* 28, 893-902.
77. Rapp, K., Klenk, J., Ulmer, H., Concin, H., Diem, G., Oberaigner, W., Schroeder, J., 2008. Weight change and cancer risk in a cohort of more than 65,000 adults in Austria. *Ann Oncol* 19, 641-648.
78. Reeves, G.K., Pirie, K., Beral, V., Green, J., Spencer, E., Bull, D., 2007. Cancer incidence and mortality in relation to body mass index in the Million Women Study: cohort study. *Bmj* 335, 1134.
79. Seow, A., Yuan, J.M., Koh, W.P., Lee, H.P., Yu, M.C., 2006. Diabetes mellitus and risk of

- colorectal cancer in the Singapore Chinese Health Study. *J Natl Cancer Inst* 98, 135-138.
- Sharma, V., Chauhan, V.S., Nath, G., Kumar, A., Shukla, V.K., 2007. Role of bile bacteria in gallbladder carcinoma. *Hepatogastroenterology* 54, 1622-1625.
80. Sharp, A., 2009. Beneficial effects of honey dressings in wound management. *Nurs Stand* 24, 66-68, 70, 72 passim.
81. Siddique, K., Bhandari, S., Harinath, G., 2010. Epstein-Barr virus (EBV) positive anal B cell lymphoma: a case report and review of literature. *Ann R Coll Surg Engl* 92, W7-9.
82. Swellam, T., Miyanaga, N., Onozawa, M., Hattori, K., Kawai, K., Shimazui, T., Akaza, H., 2003. Antineoplastic activity of honey in an experimental bladder cancer implantation model: in vivo and in vitro studies. *Int J Urol* 10, 213-219.
83. Tonks, A.J., Cooper, R.A., Jones, K.P., Blair, S., Parton, J., Tonks, A., 200. Honey stimulates inflammatory cytokine production from monocytes. *Cytokine* 21, 242-247.
84. Tonks, A.J., Dudley, E., Porter, N.G., Parton, J., Brazier, J., Smith, E.L., Tonks, A., 2007. A 5.8-kDa component of manuka honey stimulates immune cells via TLR4. *Journal of leukocyte biology*, 82, 1147-1155.
85. Valko, M., Leibfritz, D., Moncol, J., Cronin, M.T.D., Mazur, M., Telser, J., 2007. Free radicals and antioxidants in normal physiological functions and human disease. *The International Journal of Biochemistry & Cell Biology* 39, 44-84.
86. Von Low, E.C., Perabo, F.G., Siener, R., Muller, S.C., 2007. Review. Facts and fiction of phytotherapy for prostate cancer: a critical assessment of preclinical and clinical data. *In Vivo* 21, 189-204.
87. Woo, K.J., Jeong, Y.J., Park, J.W., Kwon, T.K., 2004. Chrysin-induced apoptosis is mediated through caspase activation and Akt inactivation in U937 leukemia cells. *Biochem Biophys Res Commun* 325, 1215-1222.
88. Yaghoobi, N., Al-Waili, N., Ghayour-Mobarhan, M., Parizadeh, S.M.,
89. Abasalti, Z., Yaghoobi, Z., Yaghoobi, F., Esmaeili, H., Kazemi-Bajestani, S.M., Aghasizadeh, R., Saloom, K.Y., Ferns, G.A., 2008. Natural honey and cardiovascular risk factors; effects on blood glucose, cholesterol, triacylglycerole, CRP, and body weight compared with sucrose. *ScientificWorldJournal* 8, 463-469.
90. Yang, Y.X., Hennessy, S., Lewis, J.D., 2005. Type 2 diabetes mellitus and the risk of colorectal cancer. *Clin Gastroenterol Hepatol* , 587-594.
91. Yao, L., Datta, N., Tomás-Barberán, F.A., Ferreres, F., Martos, I., Singanusong, R., 2003. Flavonoids, phenolic acids and abscisic acid in Australian and New Zealand *Leptospermum* honeys. *Food Chemistry* 81, 159-168.
92. Yuen, M.F., Hou, J.L., Chutaputti, A., 2009. Hepatocellular carcinoma in the Asia pacific region. *J Gastroenterol Hepatol* 24, 346-353.
93. Zaid, S.S., Sulaiman, S.A., Sirajudeen, K.N., Othman, N.H., 2010. The effects of Tualang honey on female reproductive organs, tibia bone and hormonal profile in ovariectomised rats-- animal model for menopause. *BMC Complement Altern Med* 10, 82.

Congregational prayers in the mosques and the risk of spread of COVID-19

Abstract of poster which was presented at the BIMA National Conference, 6th December 2020

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Background:

Congregational prayers, particularly the Friday prayer (*Jumu'ah*), is a key Islamic obligation and Islamic symbol (1). In accordance with the *Shari'a* rules, when Muslims gather in the mosques for congregational prayers, five times a day, they set the rows in order, stand shoulder to shoulder, and close the gaps in between two individuals (2).

Aim:

The aim of this analytic study is to assess the importance of preventative measures to reduce the transmission of COVID-19 infection during congregational prayers.

Method:

The risk factors of the transmission of COVID-19 were examined in the mosque setting. The recent comprehensive deliberations by the representatives of Wifaqul Ulama (3), Muslim Council of Britain (4) and verdicts from other Islamic jurists (5) on this issue were analysed. Risk assessment of spread of the disease was carried out.

Result:

With physical distancing, the transmission of the COVID-19 reduces to about 3% when people keep a distance of at least one metre from others, compared with 13% when people keep a distance of less than one metre. With face masks, the chance of transmission was 3% with a mask compared with 17% without a mask (6).

During the COVID-19 pandemic, to minimise the risk of transmission of viral infection during congregational prayers, the recommended formation of closeness has been modified and a zig zag formation has been adopted. Using such a formation, the vertical distance between two persons are more than one metre and horizontal distance is just about one metre. Whilst praying, attendees do not face each other. All the attendees perform ablution before they enter the mosques, wear a face mask and use personal prayer mats. Therefore, when they are prostrating in their prayers, they potentially contaminate their own mats which they take with them after finishing prayers. The attendees follow a well guided one-way entrance and exit pathways, maintain proper distancing and spend minimum time in the mosque.

To conduct the practice of religious obligation of congregational prayers the Islamic legal maxims allows modifications to follow the lesser of two evils (7), and to take measures to protect oneself and prevent greater harm and overlook the lesser harm (8).

Conclusion:

Adherence to the guidelines for congregational prayers in the mosques is important for safety of health and to reduce the risk of transmission of COVID-19 infection.

References

1. Al Qur'an, Surah Al-Jumu'ah (62:9).
2. Abu Dawood, Hadith No 666.
3. Wifaqul Ulama and Islamic Council of Europe. Coronavirus briefing for Mosques (v0.9 - 09/09/2020). 2020.
4. Muslim Council of Britain. 9 Steps to Re-Opening Mosques Safely. 2020.
5. Maulana Naieem Mohammad. Pandemic Advice – Adopting Social Distancing Regulations in the Masjid (Fatwa ID: 03946). 2020.
6. Chu DK, Akl EA, Duda S, Solo K, Yaacoub S, Schünemann HJ, et al. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. *Lancet*. 2020 Jun 27;395(10242):1973–87.
7. Qawaa'id Ul Fiqhiyya pg.32 #19.
8. Qawaa'id Ul Fiqhiyya pg.32 #20.

Tackling voluntourism: shaping a sustainable healthcare partnership overseas to improve maternal health as an integrated medical team.

Abstract of poster which was presented at the BIMA National Conference, 6th December 2020

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Aims

Maternal Aid Association (MAA) is a student-founded charity aimed at revolutionising maternal healthcare in resource poor settings. 99% of maternal deaths occur in developing countries, with Bangladesh continuing to have one of the highest maternal mortality rates (MMR) in the world.¹ Even as a lower middle income country, these deaths are not inevitable, given that the majority are preventable with simple, cost-effective care^{2,3}. Furthermore, acknowledging the 89% Muslim population, cultural sensitivity is paramount to avoid negative effects of voluntourism by engaging in an appropriate manner to improve health seeking behaviours⁴⁻⁶.

Voluntourism has highlighted issues of a fragmented approach in projects overseas, hence MAA established a Bangladesh team, consisting of Bangladeshi doctors and medical students to provide sustainable medical aid in a setup similar to an International Volunteer Cooperation Organisation (IVCO).⁷ In this way, the emphasis is on the UK team facilitating change by empowering the stakeholders in Bangladesh.

Methods

A two-day mobile maternal health screening camp in rural villages Bhalaganj and Ramsiri provided free antenatal care (ANC) checks. Each participant then attended a maternal health education (MHE) seminar; developed following research suggesting maternal education improves the MMR and the health seeking

behaviours of women⁸. The sessions address topics around pregnancy, delivery and red flag symptoms to seek medical help for.

At the end of the seminar, participants answered a questionnaire which explored individual pregnancy experiences, engagement with healthcare facilities, and the overall impact of MAA's MHE seminar. A total of 55 women were included in the analysis. All services were provided by our student volunteers from both the UK and Bangladesh.

Results

The MAA MHE seminar evaluations depict a positive impact of the sessions in improving health seeking behaviours of participants during pregnancy and post-partum.

Post MHE seminar, 58% more women were able to identify red flag symptoms. Additionally, results show an 11% increase in participants' willingness to increase their food intake and 25% increase in women more willing to exercise during their pregnancy. This indicates the possibility to address known cultural beliefs and help women engage in improving their general health whilst respecting their lifestyle using an accept and adapt approach^{5,9}.

Conclusions

The use of MAA's MHE seminars illustrates a positive impact on improving health seeking behaviours in pregnant women and provides a promising preventative

medicine approach. By working as an integrated team to maintain a relationship with communities, MAA hopes to improve maternal healthcare in Bangladesh.

References

1. Girum T, Wasie A. Correlates of maternal mortality in developing countries: an ecological study in 82 countries. *Matern Heal Neonatol Perinatol*. 2017;3(1):1–6.
2. Ministry of Health and Family Welfare Bangladesh. Success factors for women’s and children’s health: Bangladesh. World Health Organisation. 2015
3. World Health Organisation. Maternal Mortality [Online]. 2019 [Accessed 15 November 2020]. Available from: <https://www.who.int/news-room/fact-sheets/detail/maternal-mortality> .
4. United States of Department State. Bangladesh 2019 International Religious Freedom Report. 2019. Available from: <https://www.state.gov/reports/2019-report-on-international-religious-freedom/bangladesh/>
5. Kirillova K, Lehto X, Cai L. Volunteer Tourism and Intercultural Sensitivity: The Role of Interaction with Host Communities. *J Travel Tour Mark*. 2015;32(4):382–400.
6. Guttentag D. The Possible Negative Impacts of Volunteer Tourism. *Int J Tour Res*. 2009;551(March):537–51.
7. Lough BJ, Oppenheim W. Revisiting reciprocity in international volunteering. *Prog Dev Stud*. 2017;17(3):197–213.
8. Bicego GT, Boerma JT. Maternal education and child survival: a comparative study of survey data from 17 countries. *Soc SciMedicine*. 1993;36(9):1207–27.
9. Choudhury N, Ahmed SM. Maternal care practices among the ultra poor households in rural Bangladesh: A qualitative exploratory study. *BMC Pregnancy Childbirth*. 2011;11:1.

1001 Cures – Contributions in Medicines & Healthcare from Muslim Civilisation

(Edited by Peter Pormann, and published by FSTC 2018)

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1001 Cures is a read that any physician or science enthusiast would enjoy. Although the book title pays tribute to the famous 1001 Nights or Arabian Nights, the material it covers has a rivalling impact on our modern civilisation equal or exceeding any literary masterpiece.

1001 Cures covers the era of Muslim civilisation, however it doesn't shy away from giving credit to all scholars who contributed to this civilisation's succession, regardless of their origin or religion.

The elegantly structured book contains nineteen rich chapters. The first half is dedicated to various distinctive medical specialities while the second half covers ethics and philosophy with two independent chapters honouring Al-Razi and Avicenna (Ibn-Sina) influential scholarly work. All chapters are packed with carefully researched accounts and provide an extensive reading list for avid readers. Casual readers interested in individual chapters are advised to read the book introduction as it offers informative summaries for all chapters and it will help navigate the book contents.

In the first chapter, readers are set on a time travel back to the 8th century AD, when the Muslim rulers embarked on a simple task to translate Greek texts to Arabic. The Greco-Arabic translation movement turned to be a life-changing endeavour that shaped the course of history and elevated Arabic to be the medieval world lingua franca. The translations covered all fields of knowledge and literature available – which questionably may be the biggest influx of scientific writing in centuries that will set the scene to ages of scientific and medical flourish in years to come.

Muslim civilisation scholars expanded on the Greek theories and refined them. For instance, marginal modifications were introduced to Galen's work on humoral pathology but his anatomy work was challenged

based on logical and empirical grounds by Ibn al-Nafis physiology commentaries. These topics were covered in detail in chapters two and three.

The Muslim civilisation scholars preferred preservation of health, whether that is physical or mental to its restoration. As a result, Arabo-Muslim physicians believed in soul and body reciprocity, an important principle of Greek medicine. This was demonstrated by the unprecedented dedication to the topic in their encyclopaedias (e.g. 'Book of all beneficial things for body and soul' by al-Balkhi) compared to the Greek works. To elucidate on this connection, they studied mental health, ethics and natural philosophy. This holistic treatment approach led to ample medical literature on hygiene to improve both physical and mental state. The fourth and fifth chapters discuss these topics and relevant works by Al-Razi, Al-Kindi, Maimonides and many more.

At the occurrence of ailment two courses of treatment are expected to take place; medication and surgery. Three chapters cover these topics. Chapter six on pharmacology demonstrated how the Arabs excelled in the field, building on knowledge from Greece, India, south east Asia and China. Their pharmacopoeias provided instrumental work on experimenting with compounding, portioning and categorising medicines. A more contemporary pharmaceutical content is presented a few chapters away in chapter twelve, studying the ramifications of the inverse – translation flux of the newly developed iatrochemical knowledge from Latin Europe to the Ottoman empire in the 17th century.

The seventh chapter delves into surgical practice of the era with the majority of the text dedicated to the pioneering work of al-Zahrawi (Albucasis) who is universally celebrated as the greatest medieval surgeon.

The eighth is titled gynaecology, but it doesn't only cover the medical practice itself. The chapter offers in-depth insight into the middle ages' development of the field in patriarchal societies.

While female practitioners played a great role in providing primary health care in the middle ages, there are only few mentions to female physicians and small number of medical works on women's health.

Some encyclopaedias, as AL-Razi's the Book of Experiences, mentioned breast disorders and extensive contraception methods classification, though it primarily targeted females few mentioned ones were to be administered by males. The next chapter naturally covers childcare and all the aspects of their well-being. The scholarly work provided advice on breastfeeding, weaning, even the milk quality and its connection to food consumed by the mother/nurse. In few pages, the author highlights that these physicians paid similar attention to children's health and hygiene as to adults.

The ophthalmology chapter provides a concise account on the field that kept using practices developed during that era up until recent modern times. It covers major textbooks, practices development and use of medicines but fails to mention Ibn al-Haytham, the hailed father of optics who was the first to explain how vision works.

The interconnected issues of epidemiology, theology, colonialism effects and quarantine are explained in the wholesome content of chapter eleven titled Plague and contagion.

The twelfth chapter explains how medical ethics evolved from the Greek traditions under the Muslim civilisation

doctrine. Similarities were drawn on topics of physician's oath and rise of official regulating manuals to ensure competence and avoid malpractice. The author includes witty doctor jokes and some information on the quackery of those ages, which will brighten the reader's mood after a serious read.

Chapter fourteen investigates the concept of medieval Islamic hospital 'Bimaristan', how it evolved over different periods and its role in society. The Bimaristan was mainly a charitable organisation, catering for the physical/metal needs of the poor, travellers and students while offering a perfect training ground for future practitioners.

As previously mentioned, chapters fifteen and sixteen are devoted for the lives and practices of al-Razi and Ibn Sina, who were arguably most significant physicians of their time.

The last three chapters, compile conclusions the readers must have reached by now if they read the book chapters in their chronological order, medicine during that era was deeply connected to language, philosophy and religion.

The majority of the personnel mentioned in the book were litterateurs and philosophers. This can be explained by their holistic soul-body approach, which was supported by the religious bodies who not only encouraged seeking and dissemination of knowledge but advocated healthcare. All of which have resulted in the production of easy to comprehend and entertaining texts written by these accomplished scholars.

This review aimed to provide an insight to the '1001 cures', a content rich book perfect for novices and academic scholars alike.

A Jurisprudential Opinion on Using a Vaccine Containing Pork Gelatine

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Question:

Kindly clarify for us the Shariah ruling on using a child nasal spray flu vaccine that contains gelatine originating from swine (porcine): Is it permissible to use such medication? Is it a problem that it contains a minute amount of gelatine? What if the gelatine was from other animals, like cows for example?

Response:

All praise and gratitude be to The Almighty. Peace and blessings be upon Prophet Muhammad.

Having considered the matter from all its facets and having consulted with a number of pharmacologists and specialist doctors, my conclusion is that this vaccine is both **permissible and pure**. That it contains a minute amount of gelatine, originating from swine, has no bearing on this ruling at all. This is for three reasons:

First:

If we were to suppose that the added percentage were taken directly from the swine itself, and not from a swine-based gelatine, it would have had no bearing on its permissibility for two reasons:

1. The percentage is negligible compared to the pure substance; since it is minuscule in comparison with the overall composition of the vaccine and is only added as a preservative. It follows the jurisprudential rule that states: That which is submerged by another and whose trace or effect cannot be identified or recognised is as if it had never existed - as a ruling. To this effect we find Prophetic traditions informing us that if there existed a tiny amount of impurity, yet it is overcome by purity, then the former is forgiven. It is also similar to the pouring of the bucket of water on the urine of the Bedouin inside the Prophet's mosque, as occurs in the authentic narrations.

2. It is not edible food, but rather a medicine. That which is forbidden is the eating of pork and its derivatives as per the holy verse: [Say (O Muhammad): I do not find in what has been revealed to me anything forbidden to eat except carrion, running blood or swine as it is impure or a sinful offering in the name of any other than Allah] (al-An'am: 145).

Second:

This ingredient, although being of tiny percentage, is of gelatine origin and not of pure pork. Gelatine is a pure material regardless of its origins since it undergoes a process in which it is chemically altered to the point of transformation into a new material of different attributes than those of its basic ingredients. Jurists call this metamorphosis "*Istihalah*", i.e. that a material transforms into another that is different from the first in Shariah ruling and reality, like the transformation of wine into vinegar that changes its ruling from prohibition to permission – as opposed to the transformation of water into urine.

Most jurists and schools of Islamic law have adopted the *Istihalah* principle, among them: the Hanafis, Malikis, one reported opinion from Ahmad bin Hanbal and the Thahiris, Ibn Taymiyyah, among others.

Due to the importance of the matter at hand, I will quote here a useful synopsis provided by Imam Ibn Hazm: "If the characteristics of an impure or forbidden material transform via *Istihalah*, then its term changes from one falling under prohibition to another falling under permission. It is no longer impure or prohibited as it has metamorphosed into another material of a different ruling. Similarly, if a pure and permissible material transforms via *Istihalah* into another which is impure and prohibited, its status changes from one falling under permission to another falling under prohibition with a different ruling than the first. It is like fruit juice transforming into wine, wine transforming into vinegar or pork consumed by a

chicken and the meat of the latter overwhelming the former rendering the chicken's flesh lawful, etc."

The concluding recommendation of The Islamic Organisation's Eighth Symposium of Medical Sciences in Kuwait (1995), stated: "Gelatin is a permissible material regardless of its basic origin as it has transformed into a new material." Participants in the symposium included chemists, pharmacists, doctors and jurists, as well as representatives of al-Azhar, the Islamic Jurisprudence Convention in Jeddah, the Regional Office of the World Health Organisation in Alexandria and the Kuwaiti Ministry of Health.

The Islamic Jurisprudence Convention in India (2004) also passed the same ruling of permissibility. This opinion of a transformation (*Istihalah*) occurring with regard to gelatin is the one to follow. There are those who may choose to pursue the ruling that such *Istihalah* does not change the ruling of the materials' basic ingredients if they were originally prohibited, as per the Shafi'i School. Yet the Shafi'is maintain that such ruling must be revisited if the process occurs in certain materials like alcohol, if it ferments naturally through God's will and is not manmade. In any case, this opinion of the Shafi'is is refuted by modern chemistry which proves that the transformation of the original material's elements into new chemical compounds that are different from the those of the first actually occurs, like wine transforming into vinegar or other things.

Third:

If we were to concur that the gelatin retains its swine origin, as per the Shafi'i school, there still exists no prohibition to use this vaccine – for a reason different from the above – as any prohibited material, other than fermented alcohol, may be used as medicine if no other alternative exists even if it is made up solely of prohibited ingredients and without any permitted ones contained therein. If, as in this case, it is merely added to a permitted ingredient, then it is more sense to be permitted.

This is supported by two proofs:

1. When considering the major objectives of Islamic law we realise that the purpose for which one refrains from impurities and foul matters is of the desirable or complementary ranking of importance; while seeking treatment to preserve one's life is of the necessary - and therefore higher - category of importance in the

Shari'ah scale. The necessary upends and supersedes what is desirable or complementary.

1. The ruling of prohibition or impurity of a specific material is due to its harm and foulness, but if transformed to become a reason for wellness and benefit, its ruling changes to permissibility. An example on this is that one may consume carrion, running blood or swine flesh if necessary for survival when no other lawful means exists.

As for the saying, "Seek treatment, but not with that which is prohibited", it is considered a weak hadith. But even if it were true, then its meaning would be: Do not voluntarily choose to medicate yourselves with that which is prohibited. Therefore, the hadith does not refer to need or necessity when no permissible substitute to the medicine exists.

Conclusion:

As per the Shariah proofs provided above, the use of such treatment is permitted, the ruling correlates with the jurisprudential opinion of most jurists and there are no grounds to prohibit it. Many flu and flu-like diseases have plagued our world and have rendered the use of such vaccines a must; particularly nowadays as we have been plagued with Covid-19 – a calamity that mandates we do our utmost in seeking the means for its prevention and cure. It could also be reason to avoid visiting health centres under such circumstances in fear of contracting the virus. The permissibility of using such a treatment is further emphasised when it is endorsed by health bodies.

Regarding the question about what if the gelatin was derived of other animals, like from cows for example?

The information provided above on gelatin derived of swine origin better clarifies the Shariah ruling on that which originates from other animals. We know that much gelatin originates from cows whether slaughtered Islamically or not. It is definitely permitted in the case of the former; for the latter, it follows the same ruling as the one mentioned above on that of swine origin. If the gelatin is of fish or non-animal origin, it is definitely permissible and requires no questioning.

We pray that God Grants us wellness and safety, and that He Saves us all from all ailments by the Grace of His Mercy for He is The Most Merciful.

November 20th, 2020.

Rabi 'II 5th, 1442 AH

السؤال:

نرجو أن تبينوا لنا الحكم الشرعي في أخذ لقاح للأطفال يحتوي على جيلاتين من أصل خنزيري، ويُعطى للطفل بواسطة بخاخ: هل يجوز استعمال هذا اللقاح؟ وهل يؤثر اشماله على نسبة ضئيلة جدًا من الجيلاتين؟ وما الحكم لو كان الجيلاتين من مواد حيوانية أخرى كالبقر مثلاً؟

الجواب:

الحمد لله، والصلاة والسلام على رسول الله.

أما بعد،

فإنه بعد تصور المسألة والتحري فيها بمراجعة أهل الاختصاص من الصيادلة والأطباء، فقد تبين أن هذا اللقاح المسؤول عنه دواء مباح طاهر، وما استشكل من إضافة نسبة من جيلاتين مستفاد من الخنزير لا أثر له في هذا الحكم؛ لوجوه ثلاثة:

الوجه الأول: أنه لو تُصوّرَ أن تلك النسبة المضافة كانت مستفادة مباشرة من الخنزير (وليست من جيلاتين أصله خنزيري)، فلا يؤثر ذلك على الإباحة، لسببين:

السبب الأول: أنها نسبة منغمرة في الطاهر، وذلك لكونها ضئيلة جدًا بالنظر إلى مجموع مادة اللقاح تضاف كمادة حافظة، وهي بالاعتبار المذكور مما تنطبق عليه القاعدة الفقهية: (العين المنغمرة في غيرها إذا لم يظهر أثرها، فهي كالمعدومة حكمًا)، ومن هذا ما دلت عليه نصوص نبوية في العفو عن يسير النجاسة إذا انغمرت بغلبة الطاهر، كما في صب دلو الماء على بول الأعرابي في مسجد النبي صلى الله عليه وسلم.

والسبب الثاني: أنها ليس طعامًا يؤكل، وإنما هي دواء، والمحرم إنما هو أكل لحم الخنزير وما يلحق به من شحم ونحوه، كما قال: {قُلْ لَا أَجِدُ فِي مَا أُوحِيَ إِلَيَّ مُحَرَّمًا عَلَى طَاعِمٍ يَطْعَمُهُ إِلَّا أَنْ يَكُونَ مَيْتَةً أَوْ دَمًا مَسْفُوحًا أَوْ لَحْمَ خَنْزِيرٍ فَإِنَّهُ رِجْسٌ أَوْ فِسْقًا أُهْلًا لغير الله به} [الأنعام: 145].

الوجه الثاني: أن تلك المادة على ضالتها إنما هي من الجيلاتين لا من عين الخنزير، والجيلاتين مادة طاهرة من أي شيء تَحَلَّقَتْ، وذلك أنها تتحول عن المادة الأصلية إلى مادة جديدة مختلفة الأوصاف، وهذا التحول يسمى عند الفقهاء بـ "الاستحالة"، وذلك كاستحالة الخمر إلى خلّ، فهذا ينقل حكمها من التحريم إلى الإباحة، ويقابله تحوّل المادة الطاهرة إلى نجسة كتحويل الماء إلى بول.

وإلى هذا في "الاستحالة" ذهب معظم الفقهاء، منهم الحنفية، والمالكية، ورواية عن أحمد بن حنبل، وقول الظاهرية، وابن تيمية، وغيرهم.

ولأهمية هذه المسألة، أسوق هنا خلاصتها من كلام الإمام ابن حزم، قال: "إذا استحالت صفات عين النجس أو الحرام، فبطل عنه الاسم الذي به ورد ذلك الحكم فيه، وانتقل إلى اسم آخر وارد على حلال طاهر، فليس هو ذلك النجس ولا الحرام، بل قد صار شيئاً آخر ذا حكم آخر. وكذلك إذا استحالت صفات عين الحلال الطاهر، فبطل عنه الاسم الذي به ورد ذلك الحكم فيه، وانتقل إلى اسم آخر وارد على حرام أو نجس، فليس هو ذلك الحلال الطاهر، بل قد صار شيئاً آخر ذا حكم آخر كالعصير يصير خمراً، أو الخمر يصير خلاً، أو لحم الخنزير تأكله دجاجة يستحيل فيها لحم دجاج حلالاً، ... ومثل هذا كثير".

وقد انتهت توصيات "الندوة الثامنة للمنظمة الإسلامية للعلوم الطبية بالكويت" (1995) إلى ما حاصله: أن الجيلتين مادة مباحة بغض النظر عن أصل ما كانت عليه، لأنها قد تحولت عن ذلك الأصل إلى مادة جديدة، وقد كان شارك في تلك الندوة علماء من الكيميائيين والصيدلة والأطباء والفقهاء، بمشاركة الأزهر ومجمع الفقه الإسلامي بجدة والمكتب الإقليمي لمنظمة الصحة العالمية بالإسكندرية ووزارة الصحة بدولة الكويت. كما أفتى بالحل بناء على وقوع الاستحالة: مجمع الفقه الإسلامي بالهند (2004).

وهذا الرأي بصحة وقوع الاستحالة في الجلاتين هو القول الصواب، خلافاً لمن استشكل ذلك، أو قلّد رأي من لا يرى تغير الحكم الأصلي بالاستحالة من الفقهاء، كالشافعية، مع أنهم يرون تصحيح القول بالاستحالة في بعض الأشياء وأبرزها الخمر إذا تخللت بفعل الله تعالى لا بفعل الإنسان، ورأيهم هذا يرده اليوم الكشف العلمي الذي يبين أن عناصر المادة الأصلية تتحول إلى مادة جديدة مختلفة في صفاتها الكيميائية، سواء في الخمر تتحول خلاً أو في غيرها.

والوجه الثالث: لو سلّمنا رأي من يرى أن الجيلتين لاحق بأصله الذي تحوّل عنه، أي باق هنا على أصله الخنزيري، كما هو مذهب الشافعية، فهذا أيضاً لا يمنع استعمال هذا اللقاح؛ وذلك لسبب آخر غير ما تقدم، وهو أن المادة المحرمة إذا كانت غير الخمر يجوز استعمالها للدواء إذا لم يتيسّر دواء مباح، وهذا إذا كانت خالصة الحرمة غير مخلوطة بمباح، فإذا كانت مضافة إلى مادة مباحة فذلك أولى بالجواز. يؤيد هذا دليان:

الأول: من جهة المقاصد، وهو أن مقصد اجتناب النجاسات والمستخبثات تحسيني، ومقصد التداوي حاجي لحفظ ضرورة النفس، والحاجي مقدم على التحسيني.

والثاني: أن الحكم بالتحريم أو النجاسة لمادة معينة إنما هو لخبثها وضررها، فإذا انقلبت لتكون سبباً للعافية والمنفعة، تحول حكمها إلى الإباحة، وهو وجه إباحة تناول الميتة والدم ولحم الخنزير عند الضرورة؛ لأنها انقلبت عند ذلك من رجحان ضررها إلى رجحان منفعتها، فزال خبثها في ذلك الظرف أو ضعّف.

ولا يُعترض على هذا بما يُروى: "تداووا، ولا تداووا بحرام"، فهذا حديث ضعيف، ولو صح فالمعنى فيه: لا تداووا بحرام اختيارًا، فلا يتناول الحديث حالة الحاجة أو الضرورة حيث لا يوجد بديل مباح يحقق ما يحققه ذلك الدواء.

الخلاصة:

مما تقدم يتبين أن استعمال اللقاح المذكور جائز بمقتضى الأدلة الشرعية، وهو المتفق مع مذاهب معظم الفقهاء، ولا يوجد ما يمنع منه، بل انتفاء أمراض الإنفلونزا باستعماله ضروري، بخاصة اليوم وقد ابتلي الناس بداء (كورونا)، الأمر الذي يتطلب الاجتهاد بأخذ أسباب العافية درءًا لهذا المرض أو تخفيفًا لآثاره عند الابتلاء له، كما قد يكون سببًا لاتقاء مراجعة الجهات الصحية في مثل هذه الظروف. ويتأكد جواز استعمال هذا اللقاح عندما تنصح به الجهات الصحية.

ماذا لو كان الجيلاتين متحولًا من حيوان آخر كالبقر مثلاً؟

ما تقدم بيانه في مادة الجيلاتين المتحولة من أصل خنزيري، يجعل الحكم الشرعي أبيض فيما يتم تحوُّله من أصل حيواني آخر، ومعلوم استفادة الجيلاتين من البقر، والبقر لا يخلو أن يكون مذكي أو ميتًا، فإن كان مذكي فحكمه الإباحة على أي حال، وإن كان ميتًا فحكمه كالذي يتحول عن أصل خنزيري، وإن كان من أصل سمكي أو غير حيواني فحكمه في الإباحة لا يحتاج إلى سؤال. نسأل الله العافية والسلامة، وأن يرفع عن الناس كل داء برحمته وهو أرحم الراحمين.

وكتب

د. عبد الله بن يوسف الجديع

الرئيس السابق للمجلس الأوروبي للإفتاء والبحوث

المستشار الشرعي لمسجد ليدز الكبير - مدينة ليدز المملكة المتحدة

5 ربيع الثاني 1442 هـ

20 نوفمبر 2020 م

BIMA Lifesavers: Embrace the virtual world

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As the pandemic started there were predominantly two reactions from individuals, organisations and others. The first was that their activities simply could not work in a virtual environment and therefore they should be curtailed or stopped altogether. Many of them relied on seemingly foolproof arguments like stating that their physical events were just not possible to carry out in the virtual world or that there were too many moving parts involved.

The other reaction was a can-do attitude that involved adjusting activities and pivoting to the new online reality. This was surprisingly taken up by individuals and families with even the previously technologically challenged older generations and institutions like mosques making the switch. To do this involved a degree of flexibility and agility that is necessary to turn a crisis into an opportunity.

Examples of restaurants that switched to takeaway services, gyms that promoted online courses and mosques that streamed sermons every Friday come to mind. However, as usual, the reaction from the medical community tended to be less adventurous with many

medical schools still struggling to come up with a reasonable online programme and many CPD activities being abandoned till many months later.

The British Islamic Medical Association (BIMA) Lifesavers faced the same challenge as everyone else. How do you teach a hands-on skill like CPR online? The options were clear. We could cancel the entire event and try again next year, hoping that the pandemic would have settled by then. The other option was to do an informational video but without the ability to practise or have your technique reviewed.

However, none of these were optimal and to the credit of the team - they decided to attempt to do an online event with the element of small group practising. Attendees were encouraged to use family members, pillows, teddy bears or anything they had to hand. Even with nothing to hand, we advised attendees to practise on thin air and indicate the hand movements.

The event was successful and the feedback was quite positive.

The Covid Pandemic - A Front Line Respiratory Physician's Perspective

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Almost one year ago, the Covid pandemic originated in China and we had the first case reported in the UK in late February this year. Coronavirus has had a profound and devastating effect globally and almost every human being has been affected. Having heard of the pandemics of the past, most of us would never have envisaged we would be facing the coronavirus pandemic and no nation was really prepared for this eventuality. Facing a global pandemic can never be easy, however the Covid pandemic has been exceptionally difficult to cope with even in this modern era due to the highly unpredictable nature and behaviour of this virus, and the unexpected clinical outcomes.

With most infectious organisms, outcomes can be predicted with some degree of certainty which is contrary to what we have seen with Covid. Rather bizarrely, approximately a quarter of Covid patients remain asymptomatic despite having active infection, on the other hand 15 to 20 percent display severe symptoms with respiratory involvement needing hospitalisation. Although there are risk factors in patents that can predict outcomes once severe disease prevails, it is ironic that some patients with significant comorbidities despite getting coronavirus display only mild symptoms, whereas others who are young and fit and well, experience severe respiratory failure and have succumbed to the illness. This behaviour of the virus has perplexed the medical community and has become a source of great anxiety and fear globally.

As a respiratory physician, I have been deeply involved with Covid management from the outset. As Covid is predominantly a respiratory illness, it was felt chest physicians would be best placed to deal with this condition. Back in March when we first started seeing patients with coronavirus, we had no previous experience of managing these cases and we had heard of the harrowing experience of Italian hospitals. In the NHS robust planning and preparations began early on and in

Bradford we had excellent arrangements to deal with the first wave of Covid. We worked closely with our colleagues on the Covid wards and our non-respiratory clinician colleagues were managing the Covid stepdown wards. Bradford Teaching Hospitals has been an active participant in the UK based RECOVERY trial and we quickly learnt Dexamethasone therapy reduced Covid mortality which is now standard of care for hypoxic patients. We also realised the importance of robust VTE prophylaxis and management of pulmonary embolic disease. The difficulties with invasive ventilation and ventilator dependency soon became apparent prompting the use of early non-invasive ventilation (CPAP therapy) and proning, which has proven to have better outcomes.

The BAME community and elderly population, and those with co morbidities in particular obesity, diabetes mellitus, chronic lung, heart and kidney diseases were noted to be at increased risk of mortality. Bradford despite having a large south asian population has not had worse outcomes compared to neighbouring hospitals in the region. In Bradford we continued to have Covid patients once the first wave eased, whereas some hospitals in the UK had virtually no cases. Having a small number of Covid patients in hospital necessitated the need to maintain Covid services which has equipped us for the second wave and our efforts continue.

Although Covid is far from being a desirable event, there is a lot to learn from this pandemic. We have learnt that maintaining a healthy lifestyle has a protective effect. Obesity has become a prevalent issue globally which has largely gone unnoticed and the Covid pandemic has been a wakeup call. Obesity being a root cause for so many other illnesses (associated with poor outcomes in Covid), has made us realise this needs to be tackled as a priority public health initiative, and more people have been adhering to healthier lifestyles. We have learnt the most effective measures to curb the spread of disease is maintain social distancing, hand washing, use of face

coverings and adhering to government advice. Covid has changed our working lives; we have learnt remote working from home does work for different professions. This has eliminated travelling time and environmental congestion, and will almost certainly be adopted once the pandemic is over.

The Covid pandemic is not over and even global experts are not sure if the coronavirus will ever be eliminated completely. As health care professionals, we all have a responsibility to continue the fight against this pandemic. It is crucial we reiterate the message to our patients and the public to adhere to all measures to control the spread of the disease. From the platform of Bradford Teaching Hospitals, our representatives have been able to get these messages across on several occasions via national and local media sources.

The RECOVERY trial has proven that there is an effective treatment which reduces mortality in severe

Covid, and as physicians we have a responsibility to encourage every hospitalised patient to participate in clinical trials to explore other beneficial treatments. Nationally and globally endless efforts are ongoing to find an effective Covid vaccine and in Bradford we have been fortunate to be a part of this effort. We have been working closely with various community groups and representatives, having successfully recruited more than 500 subjects for the phase 3 Novavax trial. The Bradford respiratory team is ambitious and planning to be a part of further Covid trials in the near future hoping there will be a breakthrough soon.

Finally, as the medical community, we must remain determined in the efforts against Covid, provide prompt medical care to our patients in well-equipped hospitals and find new scientific approaches to neutralise the devastating virus.