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Assalamo Alaikom

I recall sitting down to write the previous JBIMA Editorial and thinking that the only appropriate topic to cover was the suffering of our brothers and sisters in Gaza as the world looks on. It pains me that another 4 months later, Israeli bombardment continues and a ceasefire is yet to be implemented.

As healthcare professionals, we aim to save lives, to improve their quality and to heal the pain of our fellow human beings. The scenes in Gaza are particularly difficult for us to comprehend; they go against our very profession and stand in opposition to our values. We agree to the terms of the Hippocratic Oath when we start as students to not harm any patient under our care, so what is stopping doctors in Israel from speaking out? As of the time of writing, since October, more than 35,000 Palestinians have been killed, which roughly equates to 180 a day, 1 is killed every 8 minutes. When we consider it from this perspective, the sheer horror becomes clear. No family in Gaza has escaped unscathed as a parent, sibling, spouse, or child from almost every household has been killed or seriously injured.

Sometimes numbers fail us. As human beings, we can quickly become overwhelmed by abstract numbers and those who have been killed end up becoming faceless statistics. It is in this vein that we must remember Dr Ahmad Al-Maqadmeh and his mother Dr Yusra Al-Maqadmeh who were executed by Israeli forces after their withdrawal from Al-Shifa hospital. This was a young Plastic Surgeon and GP who were murdered for carrying out their jobs. Even the Royal College of Surgeons paid tribute to him, though the statement was sadly quite weak. The attacks on healthcare professionals and hospitals equates to war crimes that Israel must be held accountable for.

Speaking of Al-Shifa hospital, the building is destroyed. It is barely recognisable to the busy, bustling hospital it was only a few months ago. Al-Shifa hospital is now no longer fit to even be a graveyard; it is a ghost town and

the few patients there face almost certain death. The scenes in the hospital are akin to an apocalypse film where the end of the world has arrived. In Gaza, the healthcare system has for all intents and purposes, collapsed. Its people are even more desperate for medical aid, but even that is proving difficult to allow in.

The most needed solution to the medical crisis in Gaza is the implementation of an immediate ceasefire. Israel has to stop its attacks on the strip. And thinking in the medium and long term, there needs to be a serious effort to rebuild the shattered healthcare system.

It is worth mentioning that BIMA has recently surveyed Muslim doctors across the UK about their thoughts on how their workplaces have supported them during the Gaza crisis. The responses, published in the BMJ, are deeply upsetting though unsurprising. Almost all the respondents (97%) said that the situation over the past few months has negatively impacted their wellbeing and has made their work even more challenging. Colleagues surveyed also reported a culture of silence at the workplace which has led to perceptions of double standards as hospitals say nothing on Gaza whilst statements of support were made to Ukraine. And even those who turn to social media for support are left looking over their shoulders, constantly worried about how their support for the people of Gaza will be misconstrued into something more sinister.

The BMJ covering this is a step in the right direction, but it's too late; Muslim doctors have been struggling internally with this for months and have received very little support at their workplace. We at BIMA stand alongside our brothers and sisters who offer their support to the people of Gaza.

Wassalam.

Prof. Sharif Kaf Al-Ghazal
JBIMA, Editor in Chief

Smallpox Inoculation in the Ottoman sultanate: A gendered study of women's involvement in early modern public health

Fatima Sharif

MA, SOAS, University of London

Correspondence: fatima@fstc.org.uk

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Abstract

Since the COVID-19 pandemic, vaccination has been a popular point of discussion in modern medicine. This paper takes a historic and gendered approach in tracing the origins of the modern vaccine to the Ottoman sultanate, crucially exploring how old women were central to administering the prophylactic. Two eighteenth-century letters penned by English travellers to the provinces of the Ottoman sultanate are examined in this paper, revealing that the procedure of inoculation was practiced widely by old women as a response to the smallpox epidemic. Inoculation was a precursor to the smallpox vaccine developed by Edward Jenner in the late eighteenth-century.

1. Introduction

When Šā'id ibn al-Ḥasan (d. 1072), a medieval Christian doctor, lamented the faith that patients had in “senile old women” who, despite their “lack of intelligence”, were regarded as “more knowledgeable and of sounder opinion than the [male] physician” by patients, [1] he suggested that ‘learned medicine’ was the esoteric knowledge of male physicians. More significantly, however, he shed light on the contested position of female healers in medieval Muslim civilisation. Despite Ibn al-Ḥasan’s derisive characterisation of ‘old women’, Pormann has suggested that in “medieval Islamic and early modern European societies”, women were among the main practitioners of medical care in the form of “nurses and midwives” and “carers and curers”. [2] That “learned medical discourse” was saturated with male physicians certainly did not mean that female healers were excluded from practicing medicine—on the contrary, they “constituted potentially powerful competition for their male counterparts”. [3] The same can be said of early modern Ottoman public health in the 18th century.

2. Smallpox Inoculation in the Ottoman Sultanate: A Woman's Business

Two letters penned by eighteenth-century English travellers to the provinces of the Ottoman sultanate provide significant accounts of the widespread, largely female-led, practice of smallpox inoculation, indicating women’s public duty towards healthcare in Constantinople and various Arab regions of the Ottoman caliphate. Both letters—Lady Mary Montague’s addressed to Sarah Chiswell (1717) and Patrick Russell’s to his brother Alexander (1767)—elucidate how the procedure was performed. Lady Mary (d. 1762), wife of the English Ambassador to Constantinople, is credited with introducing the prophylactic to England. Russell (d. 1805), as an English physician in Aleppo, carried out a “comprehensive investigation” of the “spread of inoculation” amongst the Arabs of the sultanate. [4] Due to the dearth of sources from female healers who performed the operation, contemporary epistles shed light on the procedure as observed by outsiders of the Ottoman lands.

3. Lady Mary Montague's Turkish Embassy Letters

Smallpox has been regarded as “one of the greatest scourges of mankind”, [5] as it was a deadly disease in the 18th century which also caused bodily scarring. [6] As the earliest prophylactic for the epidemic, inoculation involved the “transference of pustule fluid from a person with smallpox to ... a healthy person”. [7] Old female healers who lived in the sultanate—also known as *kocakari*—were known to “ritually administer” the procedure for smallpox. [8] In a letter that the English Ambassador's wife addressed to Sarah Chiswell on the 1st April 1717, she describes the procedure:

There is a set of old Women who make it their business to perform the Operation. Every Autumn in the month of September, when the great Heat is abated, people send to one another to know if any of their family has a mind to have the smallpox. They make parties for this purpose, and when they are met (commonly 15 or 16 together) the old Woman comes with a nutshell full of the matter of the best sort of small-pox and asks what veins you please to have open'd. She immediately rips open that you offer to her with a large needle [...] and puts into the vein as much venom as can lye upon the head of her needle [...] and in this manner opens 4 or 5 veins. [9]

The following year, Lady Mary arranged for an “old woman” to administer the prophylactic on her child. [10] After requesting that the Embassy surgeon Charles Maitland (d. 1748) inoculate her young boy, on the 23rd March, Lady Mary's letter to her husband records that their son Edward was “engrafted last Tuesday, and is at this time singing and playing and very impatient for his supper”. [11] Later in 1722, Maitland would depict the inoculator as an “old Greek Woman”. [12] Accordingly, what emerges from Lady Mary's account is that inoculation was a “female concern”. [13]

Although Lady Mary's *Turkish Embassy Letters* were printed posthumously in 1763 as *Letters of Lady Mary Wortley Montague: Written during her Travels in Europe, Asia, and Africa*, [14] the present study uses selected letters from Robert Halsband's edition, *The Complete Letters*, published in three volumes between 1965-1967, as it contains the entirety of Lady Mary's letters that have been found. [15] Her letters, however, were circulated during her lifetime with amendments from the original, [16] and consequently cannot be regarded as entirely reliable. Of the issues that emerge

from historians studying the dilettante's correspondence, there remains the fact that her letters were not “purely” epistolary—they are only a “re-imaging” of the initial letters which she revised copies upon coming back to England. [17] Halsband has commented that they are “a compilation of pseudo-letters”, contemplating whether they can be seen as a “travel-memoir”. [18] Nonetheless, the *Turkish Embassy Letters* remain a detailed and authoritative account of Lady Mary's sojourn, [19] and there is no doubt that they were crafted for publication. [20] Following her demise in 1763, her epistolary correspondence would come into print “from an imperfect ... manuscript” while her family were unaware—this would become the “basis of all editions”, only being rectified in 1861 “when the albums ... were first used”. [21] For this reason, the Halsband edition is more useful than the first edition which was incomplete and based on unpolished originals, and is therefore used in this chapter.

However, there still remains an issue with Lady Mary's letter to Sarah Chiswell, which was initially intended for Lady Mary's father. [22] During the editing of her epistolary collection, she “reassigned” the original “to someone else”. [23] Consequently, Lady Mary's letters alone cannot be taken as the sole source for old women's inoculation. Notwithstanding the limitations that emerge from the reliability of the source, her observations myopically focus on Constantinople where her son was ‘engrafted’.

4. Patrick Russell's Account of Inoculation

Patrick Russell, per contra, paints a broader portrait by “interview[ing] women in the harems, their Bedouin servants” and merchants, observing “that inoculation was used almost everywhere outside the bigger cities such as Constantinople and Aleppo”. [24] Describing when he had visited a Turkish harem, Russell explains that an old Bedouin women corrected him on the method of ‘the operation’:

An old Bedouin, who having heard me with great attention, assured the ladies, that my account was upon the whole a just one, only that I did not seem to well to understand the way of performing the operation, which she asserted should be done not with a lancet, but with a needle; she herself had received the disease in that manner, when a child [...] adding moreover, that the practice was well known to the Arabs [25]

Moreover, the procedure was termed “buying the small pox” [26] as the child undergoing the procedure would

exchange foodstuffs such as “raisins, dates, [and] sugar plumbs” with the child bearing smallpox—asking “how many pocks he will give in exchange.” [27] Bedouins who were “employed in the service of the Harems” were less inclined to the procedure as “their children” were raised surrounded by Turks among whom inoculation was proscribed. [28] Although he did not travel outside of Aleppo, he confirmed from several Turkish merchants of Baghdad and Mosul that the prophylactic was common amongst Eastern Arabs too, and even practiced in the holy city of Mecca. [29] Similar to Lady Mary’s description in her 1717 letter, Russell illustrates that it was a customary practice to “give notice by a public crier” so that people could “have their children inoculated.” [30]

Russell’s letter was addressed to his half-brother Alexander, who became Physician to the Levant Company’s Factory in Aleppo in 1740. [31] When Alexander left his post in 1753, Russell would take his position for another eighteen years, and the brothers often wrote to each other. [32] This explains why Russell’s epistolary correspondence to his brother resembles a naturalist’s findings, for he was a “skilled naturalist” writing to a fellow physician who had spent thirteen years in Aleppo. [33] His observations are corroborated by first-hand information, not chance observation. Moreover, Russell rectifies Alexander’s claim in the preceding letter, dated April 18th 1768, who had stated that prior to his departure from Aleppo, he “hear[d] that it was practised amongst some of the Bedouins there”. [34] Reading from Russell’s letter, Alexander would later on give an address before the Royal Society, indicating that it held significance for the medical establishment. [35] Taken as a whole, both sources demonstrate women’s central role to the widespread administration of the smallpox prophylactic, suggesting that the procedure “was women’s business”. [36]

5. Female Healers and the Origins of the Vaccine

Engaging with historiography, the following section argues that these accounts evidence that female healers contributed to the formation of public health in Constantinople and various Ottoman cities. [37] Old women’s ‘engrafting’ in the eighteenth-century points towards the beginnings of Ottoman public health which preceded modern vaccination; however, a problem arises for historians in locating the untold narratives of female healers who operated outside of institutionalised hospitals and therefore, outside of the discourse of

‘learned medicine’. Lady Mary informs Chiswell that “every year thousands undergo this Operation”, [38] while the old Bedouin woman that Russell interviews “had in her time inoculated many”, [39] indicating that an early form of public health was forming which women were organically involved in. Unlike hospital salary lists, there are no recorded documents of wages for these female healers, and consequently, little information can be gauged from sources on their demographic.

The “surgical procedure”[40] was a practice of folk medicine, a craft that may have been passed on from one to another through observation and practice; however, it was “not documented in medical texts and treatises”, nor was it a practice of “institutional medicine” in 18th century hospitals or centuries prior. [41] Moore, a historian writing in 1815, suggests that according to various sources, engrafting was of unknown origins, but an established procedure in Persia, Armenia, Georgia, and Greece. [42] A more common theory, particularly “of a Patriarch of Constantinople”, was that it originated in the Arabian deserts “where neither physicians nor priests officiated”, and would come to be “monopolised by old women.” [43] It has also been speculated that Circassian traders were responsible for bringing inoculation to the seventeenth-century Ottoman provinces; [44] more specifically, Circassian women who were engrafted during childhood are thought to have introduced the prophylactic procedure “to the court of the Sublime Porte”. [45] Inoculation was not only practiced by Muslim women, a fact attested to by an English physician residing in Aleppo. Edward Tarry recorded that in 1706 a sweeping smallpox epidemic hit the cities of Constantinople, Galata, and Pera, [46] where a “Greek woman, native of the Morea” engrafted 4000 people. [47] These were Constantinople’s suburbs where “European ... personnel lived”—and indeed, Pera is where Lady Mary would live between 1717-18, overseeing her son’s inoculation by an old Greek woman. [48]

Despite the contested narratives on the origins of the practice in medical historiography, most of the scholarship on Ottoman healthcare is concerned with “professional medicine” and the origins of “institutional medicine”. [49] It has been posited that this is due to two reasons; firstly, the “accessibility of the sources”; [50] and secondly, the dismissal of folkloric medicine “as a valid domain for investigation.” [51] Although folk and traditional medicine addressed the medical needs of a large population which early modern hospitals did not have the capacity for, they were regarded pejoratively as “primitive”. [52] As hospital staff only administered healthcare for a small percentage, [53] most of the

population of the vast Ottoman sultanate had no means of accessing physicians. [54] It is therefore problematic to attribute the emergence of Ottoman public health to the 19th century, as it disregards the precursor to Jenner's (d. 1823) cowpox vaccine as a 'primitive' prophylactic—which, in 1796, he reformed. [55] Historians of Western medicine, on the other hand, assign to Lady Mary a pioneering role. [56] This historiographical dichotomy leaves a gap in the discourse of the emergence of Ottoman public health.

6. Challenging Thomas Kuhn's Structure of Scientific Revolutions

According to Thomas Kuhn's conceptualisation of paradigms, inoculation would not become a "scientific revolution" until the late nineteenth-century, the moment that the paradigm shifted. [57] Thus, inoculation was first dismissed by the prevailing paradigm of humoral medicine from the second century and would have to wait for the late nineteenth-century to become a revolution in modern medical advancements. [58] Bozok suggests that historians may encounter multiple beginnings when uncovering the history of events; thus, the smallpox vaccine may have emerged at almost the same time in different geographies, several centuries apart. [59] However, the birth of public health in the dynasty was only marked when Ottoman modern medicine embraced medical education. [60] While the history of modern medicine attributes the cowpox/smallpox vaccine to Jenner, female healers who did not conform to the paradigm are given minimal recognition. Within Kuhn's paradigm there is no place for female inoculators or pioneering women who operated before the 19th century 'scientific revolution'.

Overall, this study has evidenced that old women played a pivotal role in the emergence of health care as demonstrated by their response to smallpox epidemics in the eighteenth-century Ottoman sultanate.

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The good, The bad, and The ugly of Artificial Intelligence

Majed Chamsi-Pasha¹, Hassan Chamsi-Pasha²

¹MBBS, SBIM. Consultant Physician. European Medical Center, Jeddah, Saudi Arabia

²MD, FRCP (Lond), FRCP (Glasg), FRCP (Ire), FACC. Consultant Cardiologist, GNP Hospital, Jeddah, Saudi Arabia

Correspondence: drhcpasha@hotmail.com

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Abstract

Integrating Artificial Intelligence (AI) and robotics in healthcare is a transformative development with enormous promise for revolutionizing patient care, diagnostics, and treatment modalities. These technologies enhance the precision and efficiency of medical practices, improve patient outcomes, and alleviate the burden on healthcare professionals. While AI offers tremendous potential in healthcare processes, it presents multifaceted ethical challenges that demand meticulous consideration. The primary concerns include bias, privacy, trust, responsibility, transparency, cybersecurity, and data quality.

The appearance of ChatGPT, an artificial intelligence (AI) chatbot with amazing abilities, caused a great sensation in academia. ChatGPT has demonstrated significant potential in various healthcare-related applications, ranging from medical education to clinical decision-making and patient care. Ethical issues brought up using ChatGPT include privacy, authorship, transparency, abuse, and security. One major concern is the potential for bias in ChatGPT's responses, stemming from biases in the original data given to the chatbot. As AI systems continue to evolve, it is crucial to balance AI advancements and human intervention. While AI has the potential to enhance human intelligence, it is unlikely to completely take over, as human creativity, adaptability, and critical thinking remain indispensable in various aspects of life and scientific research. Establishing clear guidelines and usage policies is essential to ensure the responsible integration of AI in academic and professional settings. Using proactive initiatives and rigorous evaluations can harness AI's capabilities while upholding stringent ethical standards.

Introduction

The twenty-first century is often recognized as the era of Artificial Intelligence (AI), which raises many questions regarding its impact on human beings. AI is a type of computer system that simulates human intelligence and is used to achieve various tasks by mimicking human cognition, learning, and decision-making processes. It incorporates various technologies and algorithms, including machine learning, deep learning, natural language processing, computer vision, and more.¹

Generative AI refers to a subset of AI that generates content, including text and images, by utilizing natural language processing.² The scope of generative AI reach is both vast and overwhelming, especially when considering the abilities of AI-generated large language models (LLM) such as Chat Generative Pre-trained Transformer (ChatGPT) developed by OpenAI, Google Bard, Microsoft Bing, Claude, and Perplexity.

AI technologies are transforming medicine and healthcare. Scholars and practitioners have debated the ethical, legal, and regulatory implications of medical AI.³ The use of AI has enhanced clinical diagnosis, predictive medicine, patients' data and diagnostics, and clinical decision-making.⁴

With the launch of ChatGPT, OpenAI has taken the academic community by storm, forcing researchers, editors, and publishers of scientific journals to rethink and adjust their publication policies and strategies. While there are promising results for potential applications of ChatGPT in various fields, there are also significant ethical considerations to be addressed before widespread implementation can prevail.⁵

Artificial intelligence technologies can also be used in criminal and deceptive activities such as cyber intrusions, electronic fraud, media misinformation, and other illegal and unethical activities. The huge amount of data handled by AI systems could be exposed to hacking or illegal exploitation, which constitutes a serious threat to privacy and security.¹

Artificial Intelligence in Healthcare

The emergence of LLM artificial intelligence like ChatGPT, represents one of the most profound developments in healthcare in decades, with the potential to create seismic and revolutionary changes in the practice of medicine.⁴

The integration of AI and robotics in the healthcare sector has steered into a new era of efficiency and innovation. These technologies offer a multitude of benefits that have the potential to significantly enhance patient care, improve healthcare outcomes, and streamline various healthcare processes.⁶ It enhances diagnosis and treatment capabilities and increases efficiency and productivity in healthcare processes. AI systems provide healthcare professionals with real-time clinical decision support. Robotic-assisted surgeries provide unequalled skill, precision, and stability, reducing the risk of complications and accelerating patient recovery times. AI accelerates drug discovery by analyzing vast datasets to identify potential drug candidates and predict their efficacy.⁶

The cost savings that AI can bring to the healthcare system is an important driver for incorporating AI technologies. AI applications are estimated to cut annual US healthcare costs by USD 150 billion in 2026. A significant part of these cost reductions stems from

changing the healthcare process from a reactive to a proactive approach, focusing on health management rather than disease treatment.⁷

ChatGPT has demonstrated significant potential in various healthcare-related applications, such as medical education, radiologic decision-making, clinical genetics, patient care, and facilitating communication between patients and healthcare professionals.

Artificial Intelligence in research and medical education

ChatGPT has potential applications in research improving scientific writing, enhancing research versatility, streamlining workflow, saving time, and improving health literacy.⁸ Their utilization comes with potential risks and challenges, including ethical, legal, copyright, transparency, and concerns related to the generation of content difficult to distinguish from human-generated content.^{9,10} The German artist Boris Eldagsen won a photography award but turned it down with the explanation that his image submission was AI-generated and was designed to fool the judges and provoke debate.¹¹ This is a small offence when compared to the way that AI has been used to generate fraudulent images in research publications.¹² The utilization of ChatGPT poses several other challenges, including bias, plagiarism, lack of originality, inaccurate content, incorrect citations, dehumanization, false forecasting, and the dangers of blind trust.⁶ The reliance on LLMs like ChatGPT for scientific thinking may hinder social and scientific progress, as these models are trained on past data and may not be able to think differently from the past.

A recent systematic review found that ChatGPT improved writing and was useful in healthcare research and education. However, over 95% of responders expressed concerns vis-à-vis ethical and legal issues, copyright, bias and plagiarism, lack of originality, inaccurate content, and security issues.¹⁰

ChatGPT is prone to generating fake references and citations, a phenomenon referred to as "hallucination" or "stochastic parroting".¹³ This poses a significant challenge for journal editors. The potential misuse of ChatGPT for plagiarism also raises concerns that could disrupt traditional methods of assigning essays and lead to a decline in academic integrity.¹⁴

Almost 2% of scientists admitted to data fabrication,

falsification, or modification at least once, and over a third admitted to other questionable research practices. Given human nature and fondness for untruth, these are probably conservative estimates.¹⁵ There is potentially already a large amount of AI-generated text in medical literature, with more to come unless we are very careful. Indeed, “at a time when trust in science is eroding, it’s important for scientists to recommit to careful and meticulous attention to details.”¹⁶

Some have put an outright call for complete rejection of any output produced with AI assistance and others have allowed AI (ChatGPT) to be on the author list.¹⁷

Since an AI chatbot is not a human being, in the current legal system, the text automatically generated by an AI chatbot cannot be a copyrighted work; thus, an AI chatbot cannot be an author of an academic paper, not only from the perspective of copyright law but also from the perspective of research ethics. Although researchers can use AI chatbots as research tools, they must be aware that AI chatbots can be competent but dangerous research assistants.¹⁸

Ethical Challenges in Artificial Intelligence

Despite its remarkable capabilities, AI has several limitations and ethical implications that need to be considered, particularly in sensitive fields like healthcare and education.^{13,19,20}

Several key issues need to be discussed, including the potential for AI-generated content to be used unethically, the need for transparency and honesty, the risk of manipulating public opinion or decision-making, and the necessity of policies and guidelines.¹⁹ The literature was primarily focused on the ethics of AI in health care, particularly on diagnostics, and precision medicine, but was largely silent on the ethics of AI in public and population health. The literature highlighted several common ethical concerns related to privacy, bias, trust, accountability, and responsibility. Obviously missing, was the ethics of AI in global health, particularly in the context of low- and middle-income countries.²¹

The widespread application of AI in the medical field also brings about autonomy and responsibility issues. AI systems may make autonomous decisions in diagnosis and treatment and automatically recommend the best treatment plan without the intervention of a doctor. Such autonomous decision-making may result in the neglect of patients’ interests.¹ Privacy emerges as a critical concern and ensuring the privacy and security of this data is

paramount. Transparency and trust are crucial for successful AI adoption. Cybersecurity concerns are of utmost importance to safeguard patients’ safety and data integrity. Responsibility attribution in AI remains complex and evolving, requiring a balance between human agency and AI capabilities. Shifting from data ownership to data stewardship may ensure responsible data management and privacy protection. The phenomenon of hallucinations in large language models necessitates rigorous validation and fact-checking to ensure the accuracy and reliability of AI-generated outputs.²²

Privacy

AI-based applications have a direct impact on patients’ privacy and confidentiality. The loss of control over data access may have a serious psychological impact on patients if their private health information is exposed. The availability of databases involving genetic sequences and medical history could hinder the collection of data and the advancements in medical tests.²²

Bias and inequality

AI systems (especially health data systems) may contain biases in the way they represent and treat individuals and groups, leading to unfair treatment. There is currently a disparity for black workers. A study in 2019 found that only 2.5% of Google’s employees were black, while Microsoft and Facebook had only 4% representation.²³ An example of discrimination and racism caused by AI is the “Tay bot” which was launched by Microsoft via Twitter on March 23, 2016; It caused harsh criticism of Microsoft after the bot started posting racist tweets. The developers did not consider the moral risks to the community when the Tay chatbot spread hate and unleashed its tweets, leading Microsoft to shut it down within 24 hours.²⁴

Studies have also revealed poorer implementation rates for specific diseases in rural areas, racial and ethnic minority groups, those without insurance, as well as individuals with lower education and income.^{22,25}

Transparency and trust

The transparency of the algorithm enables healthcare professionals to understand how ChatGPT formulates its recommendations. Despite existing guidance for transparent reporting, poorly reported medical AI models are still common. Failure to prioritize explainability in clinical decision support systems can jeopardize core

ethical values in medicine and may have adverse effects on both individual and public health.^{26,27}

Responsibility and accountability

AI responsibility attribution poses significant questions regarding who should be held liable for the outcomes of AI actions. The use of AI systems might result in a loss of accountability. Who is responsible for the decisions taken by the AI system, especially when errors are made and harm is done? Are there decisions that AI systems should never make? Should we require algorithmic accountability and transparency? Should we require that the actions of AI systems are always explainable? If an expert medical diagnosis system exists, and kills a patient with an incorrect diagnosis, who is at fault?

Some papers explore human responsibility concerning AI systems. Others advocate for examining the causal chain of human agency, including interactions with technical components like sensors and software, to determine accountability. Shifting from data ownership to data stewardship is crucial to ensure responsible data management, safeguard patients' privacy, and adhere to regulatory standards. Data stewardship involves governance and protection of data, including determining access and sharing permissions, ensuring regulatory compliance, and facilitating collaborations and data exchange for research and technological advancements.²²

Cybersecurity

Cybersecurity is the practice of preventing unauthorized access, theft, damage, or other harmful attacks on computer systems, networks, and digital information. Security breaches can be concealed by AI systems' incapacity to be explained and interpreted.

Impact on healthcare professionals

The incorporation of AI and robotics into healthcare system not only transforms patient care but also reshapes the roles and responsibilities of healthcare professionals. Automating specific tasks may raise concerns about job displacement among healthcare professionals. Ethical considerations involve ensuring a smooth transition for affected individuals and providing retraining opportunities.⁶

Conclusion

The use of AI in healthcare introduced unique ethical considerations that demand careful examination and

thoughtful resolution. It raises questions about authenticity, accountability, privacy, and security. ChatGPT has shown significant potential in revolutionizing various fields, including science, healthcare, and education, by accelerating processes, enhancing personalization, and providing valuable support to professionals and learners alike.

Despite promising applications, ChatGPT confronts limitations, including critical thinking tasks and generating false references, necessitating stringent cross-verification. For effective and ethical AI deployment, collaboration amongst AI developers, researchers, educators, and policymakers is vital. These tools should augment, not supplant, human expertise. The fusion of technology and healthcare holds vast promise, but only if we navigate its intricacies with conscientiousness and diligence.²⁸ By developing regulatory frameworks and comprehensive guidelines, AI can transform the healthcare process and improve patient outcomes while respecting ethical principles.

AI is likely to be the best or worst thing to ever happen to humanity, so "there is a lot of value in getting it right." This was the appeal made by Stephen Hawking (1942-2018) who tried to summarize his call to "humanize artificial intelligence."²⁸ The international community must "humanize" it, that is, make it serve humans through binding international agreements, otherwise its consequences will be disastrous for humanity.

Unless we are careful and before long, we won't trust anything for sure and we'll believe in nothing. What a time to be alive".^{29,30,31} With great power and inventions comes great wisdom and responsibility. We bear a significant burden, and our judgment must be spot-on, otherwise, we doom ourselves to disaster.

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Artificial Intelligence (AI) In Healthcare : Navigating Technological Advancement and Ethical Challenges

Shamim Ahmed, *PhD (c), M Eng, MIET*
Aston University, Birmingham, UK

Correspondence: shamim.ahmed@mftec.org

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INTRODUCTION

Artificial Intelligence (AI) is revolutionising the healthcare landscape where Machine Learning (ML), particularly the subfield of Deep Learning (DL), is driving advancements in vital sectors such as medical imaging, drug discovery, and even personalised medicine. Nevertheless, the deployment of such cutting-edge technologies necessitates a principled approach, ensuring ethical considerations are at the forefront of AI development.

AI'S POTENTIAL IN HEALTHCARE

Focusing intently, regulators standardise technologies whilst orchestrating medical adherence. Navigating anomalies precociously, practitioners recognise, observe, assess, comprehend, handle, evaluate, diagnose. As these regulatory frameworks evolve to ensure safety and efficacy, the practical applications of artificial intelligence in healthcare are rapidly expanding. Computer vision technologies, enabled by Convolutional Neural Networks (CNNs), are capable of analysing medical scans with superhuman accuracy enabling early disease detection, potentially saving lives and making radiologist's Mondays a breeze. The field of Reinforcement Learning (RL) is being explored in robotic surgery to attain heightened precision and reduce instances of human error by employing learn-through-imitation methods in a simulated setting. Moreover, advancements in the field of Natural Language Processing (NLP) are enabling chatbots to answer patient questions, manage appointments, and even offer preliminary symptom analysis.

CHALLENGES AND CONSIDERATIONS

Sought advantages of AI in healthcare are highly promising, with the potential to revolutionise patient care. Guardian of impartiality, the imperative is to ensure that training data does not embed algorithmic biases. To guarantee equitable outcomes, selecting diverse datasets becomes essential. Protect against biases, the application of debiasing algorithms are necessary in forming a critical barrier to safeguard the integrity and fairness of AI-driven outcomes. Reputation of AI technologies depends on these measures, ensuring benefits are realised equitably across all demographics.

Despite its immense potential, AI in healthcare presents challenges. The complex nature of deep learning models can make their decision-making process opaque, raising concerns about transparency and accountability. To address this, Explainable AI (XAI) techniques are crucial to help healthcare professionals understand the rationale underpinnings of AI recommendations [1].

EMERGING FRONTIERS

Recent developments in Federated Learning enable AI model training on distributed datasets without compromising privacy, facilitating a collaborative approach that keeps patient data secure on local devices with only model updates being shared across networks, effectively alleviating concerns relating to data security [2]. Generative Adversarial Networks (GANs) present another exciting frontier where researchers are exploring their potential to synthesise artificial medical imagery for training purposes. This could address data scarcity issues in specific medical fields, leading to more robust and generalisable AI models that can be effectively applied across a wider range of patients [3].

THE LATEST IN MEDICAL CHATBOTS

Large Language Models (LLMs) that leverage sophisticated Transformer technologies, such as ChatGPT and Gemini, are pioneering advancements in digital interaction across various sectors. Specialised medical AI assistants, such as Qwen and Florence, are tailoring this technological transformation to healthcare. Standing at the forefront of this domain, Google's Med-PaLM-2 demonstrates the ability to accurately address complex medical queries, as evidenced by its impressive 86.5% score on the 'MultiMedQA' benchmark - a test set that encompasses medical exams, research, and patient cases. The ongoing evaluation of Med-PaLM-2 underlines its potential to transform patient informatics and clinical dialogue [4].

SHARED RESPONSIBILITY: A MULTI-STAKEHOLDER APPROACH

Ethical implementation necessitates collaboration where healthcare professionals need to carefully assess AI tools to ensure they augment, not supplant, human expertise. Developers have a moral obligation to prioritise transparency and minimise bias through rigorous testing methodologies. Policymakers are advised to establish robust regulations for AI in healthcare, balancing innovation with patient safety and privacy where patients are informed about AI limitations hence are empowered to make informed decisions about their care.

Conclusion

Open dialogue and collaboration among stakeholders are crucial in navigating ethical considerations and ensuring

AI serves as a force for good in healthcare. While concerns about job displacement and misuse remain, focusing on human-AI collaboration is central. AI's potential to transform medicine gives healthcare professionals the bandwidth to focus on more complex cases and deepen patient trust and engagement. By prioritising patient safety, data privacy and fairness, AI can become a powerful tool for enhancing healthcare delivery. The future holds immense potential for advancements in diagnostics, personalised treatments, and ultimately, contributing to a healthier populace.

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Reviewed by Dr Miguel Hernandez Silveira - IEEE, PhD, BEng, MIET miguelhernandez.silveira@mftec.org

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Rights of People with Disabilities from Islamic Perspectives

Prof. Dr. Faisal A. Alnaser, *MBBS, FPC, MICGP, FRCGP, FFPH, FAM(USA), PhD*

President-Elect WONCA Emr (World Congress for Family Physicians).

President, Bahrain Family Physician Association.

Vice President; Gulf Family Physicians' Society.

Honorary Faculty; Dept of Primary Care & Public Health, Imperial College, London.

Vice President, International Society for the History of Islamic Medicine (ISHIM).

WHO EMRO Temp Adviser.

Bahrain Representative in Anti-Smoking International Alliances

Correspondence: faisal.alnaser@gmail.com

Key Words: *Rights, Disabilities, Islam, Biomedical ethics*

Abstract

People with disabilities are individuals who experience long-term physical, mental, intellectual, or sensory impairments that may limit their full and effective participation in society. People with disabilities often show their resilience and determination to overcome their challenges in order to emphasize their role as active members of society contributing to its sustainable development.

The mention of health rights underscores the significance of addressing the healthcare needs of individuals with disabilities as a fundamental right. It is notable that not every country around the globe has comprehensive regulations and laws protecting the rights of people with disabilities. However, the Islamic Sharia's long-standing emphasis on proper dealing with this group with utmost care, noting that the spiritual attributes are valued more than the physical appearance in Islam.

Islamic scholars and Muslim Caliphs have historically taken measures to benefit people with disabilities, a topic that this article aims to explore in more detail. This literature review article sets the stage for discussing how Islamic teachings and historical practices have addressed the rights and well-being of individuals with disabilities.

Introduction

The disabled are those who suffer from long-term physical, mental, intellectual, or sensory disabilities that may hinder their full and effective participation in society on an equal basis with others. They usually have a strong will and determination to achieve their goals and always strive to overcome their difficulties and obstacles. These people are members of society who are expected to play

an active role in its sustainable development. The health rights of people with disabilities are considered one of the fundamental rights that communities, governments, and health institutions must pay special attention to. We must empower them in society, improve their living conditions, provide care and rehabilitation, create jobs,

and offer support that reduces their disability factors. Such will encourage them to continue their hard work in society without being hindered by their disabilities, ultimately contributing to the country's advancement. They should also have the same basic rights as everyone else, including the right to receive medical care and make decisions about their health. However, these individuals may continuously face unique challenges when it comes to accessing medical care and advocating for their own health needs.

Many types of disabilities may affect a person but the most prevalent are:

- Poor vision
- Deafness or hard of hearing
- Impaired mental abilities
- Intellectual disabilities
- Disabilities due to brain and nervous system injuries
- Autism spectrum disorder
- Physical disabilities

The prevalence of people with any type of disability is estimated at 1.3 billion people worldwide, representing 16% of the world's population (or 1 in every six people)(1). Eighty percent of people with disabilities live in developing countries and the World Bank estimates that 20% of the world's poorest people suffer from some kind of disability. The rates are significantly higher among groups with low educational achievement than with a higher level of education. According to UNESCO, 90% of children with disabilities in developing countries do not attend school and according to UNICEF, 30% of street youth suffer from some kind of disability. The prevalence is higher in women than in men and a good number of them die before reaching 20 years of life expectancy compared to non-disabled people. Mortality of children with disabilities is very high reaching 80% in countries where the under-five mortality rate has fallen below 20%. In the USA the Centers for Disease Control and Prevention estimates that 61 million adults, or more than 1 in 4, have any sort of disability (2).

People with disabilities encounter various health problems and are more susceptible to living and social challenges, ranging from minor to severe. They are twice as likely as others to suffer from depression, poor oral health, asthma, diabetes, obesity, and stroke. They also face 15 times more difficulty in accessing affordable transportation than others. Moreover, they are more prone to being victims of violence and rape (3), discrimination and inequality in health services. Many of

them also experience stigma, poverty, exclusion from education, and employment (1).

Despite these facts, studies on disability legislation reveal that only 45 countries have anti-discrimination and other disability laws. The United Nations General Assembly for Human Rights, in its general meeting on the 9th of May 1975, adopted the Declaration of the Rights of Persons with Disabilities, stating, "Persons with disabilities have the right to medical, psychological, and occupational treatment, including access to prosthetic and orthopedic devices, medical and social rehabilitation, education, vocational training, assistance, counseling, placement services, and other services that enable them to develop their abilities and skills to the maximum." It recommends speeding up the necessary procedures for their integration into society or reintegration (4). In another meeting on the 13th of December 2006, the United Nations General Assembly for Human Rights issued a resolution stating, "The need to have access to the material, social, economic, cultural, health, educational, and informational status that enables persons with disabilities to fully enjoy all human rights while providing them with fundamental freedoms" (5).

The purpose of this convention is to promote, protect, and ensure the full and equal enjoyment by all persons with disabilities of all human rights and fundamental freedoms. It also aims to promote respect for their inherent dignity, based on respect, dignity, and individual autonomy, including the freedom to make one's own choices, personal independence, non-discrimination, full and effective participation, integration into society, respect for difference, and acceptance of persons with disabilities as part of human diversity and humanity. It also provides an environment of equal opportunities and accessibility to the requirements of daily life, equality between men and women, respect for the developed abilities of children with disabilities, and respect for the right of children with disabilities to preserve their identity.

The United States of America issued many federal civil rights laws such as the Americans with Disabilities Act (ADA), Rehabilitation Act, and Affordable Care Act all to protect the human rights of the disabled. It was made clear that these people have the right to all health facilities and services provided by medical providers. These rights also extend to health insurance companies and public and private entities while making sure that it strictly prohibits discrimination against people with disabilities (6).

Concerning Health Rights, people with disabilities should enjoy many of the following:

- **Right to Consent to Medical Clearance:** they have the right to be fully informed about their medical condition and treatment options. They can make decisions about their healthcare, including the right to refuse treatment or request alternative options.
- **Right to Adequate and Integrated Care:** they have the right to receive comprehensive and integrated care that addresses their specific needs.
- **Right to Facilities for Health Services:** healthcare providers should offer facilities ensuring equal access, such as providing sign language interpreters.
- **Right to Participate in Health Decision-Making:** they have the right to actively participate in decisions regarding their health.
- **Right to Health Information and Education:** they have the right to access health information and education tailored to their needs.
- **Right to Confidentiality and Privacy:** People with disabilities have the same right to privacy as others regarding their health and private information.
- **Right to Non-Discrimination:** Healthcare providers cannot discriminate based on disability, ensuring the same quality of care for people with disabilities as for non-disabled individuals.
- **Right to Protection from Abuse and Exploitation:** They have the right to be protected from abuse and exploitation in healthcare settings.
- **Right to Access All Health Care Facilities:** Healthcare facilities must be accessible, and accommodate people with disabilities, including those using wheelchairs or other mobility aids.
- **Right to Defend Their Rights:** They have the right to advocate for their healthcare needs, including making necessary claims and filing complaints for rights violations.
- **Right to Support and Assistance:** they should receive necessary support and assistance, whether at the health, social, or psychological level, to improve their quality of life (7-8).

To ensure the safety and health of people with disabilities the United States stipulated many Regulations and Laws such as:

- **Accessibility of Medical Facilities:** Facilities must be designed for accessibility, including ramps, elevators, accessible bathrooms, and signage for those with visual impairments.

- **Access to Examination Rooms:** Special paths and medical furniture should be provided to meet the needs of individuals with disabilities.
- **Communication with Individuals with Impaired Sensory or Manual Skills:** Entities must offer appropriate assistance and auxiliary services, including sign language interpreters.
- **Communication with Deaf Individuals:** Effective communication tools and services must be provided to patients, family members, and visitors who are deaf or hard of hearing.
- **Communication for Blind or Visually Impaired Individuals:** Entities are required to provide information through appropriate means for individuals who are blind or visually impaired.
- **Standards require the design of medical facilities to consider accessibility for people with disabilities.** This includes making paths enabling access, providing ramps and elevators, easily accessible doors, light switches, bathrooms, private parking, and guide signs for the blind or visually impaired.
- **Special paths are provided to access various medical services, along with medical furniture meeting the needs of individuals with disabilities.**
- **According to laws, covered entities must provide appropriate assistance and auxiliary services to individuals with disabilities related to sensory, manual, or speaking skills.** This includes providing sign language interpreters.
- **Relevant entities must provide effective communication using assistive tools and services for patients, family members, and visitors who are deaf or hard of hearing.**
- **Assistance and auxiliary services should be provided for effective communication with patients, family members, and visitors who are blind or visually impaired.**
- **Health entities should make their programs and activities available through information technology and electronic communication means for people with disabilities.** This includes accessing online appointment systems, electronic invoices, account statements, doctor search tools, and other information.
- **There are many decisions and bylaws against discrimination for people with all kinds of disabilities (9).**

In the Kingdom of Bahrain, special legislation has been enacted for people with disabilities, and coordination is underway with relevant authorities in the public and private sectors to facilitate access for people with

disabilities to various services. These include social allowances, transportation services, public transport, public utilities, health care, education, rehabilitation, career development programs, as well as sports and other services (10).

Historic and Islamic perspectives on the rights of people with disabilities:

The treatment of people with special needs in the West, particularly in ancient European societies such as Rome and Sparta showed the gross neglect and oppression that this category of people faced in these societies. Disabled individuals, including children, were often neglected, and there were instances of executing disabled children.

The historical perspective underscores negative attitudes mistreatment and discriminatory practices towards people with disabilities in ancient Europe. It was rooted and influenced by false beliefs, superstitions, and negative philosophies. The societies of that time believed in myths associating mental disabilities with demonic possession and evil spirits. These erroneous beliefs were adopted by Western philosophers and scientists, further contributed to the mistreatment of individuals with disabilities.

For example, the laws in societies like Sparta and Athens allowed for the disposal of individuals with disabilities, especially those deemed unfit for work or military service. Philosopher Plato went as far as declaring people with special needs a malicious category and a burden on society, suggesting they were detrimental to the idea of the Republic (11).

Herbert Spencer, a prominent figure in Western philosophy, advocated for the prohibition of various forms of assistance to people with special needs. Darwin's observations on the natural order of plants and animals reinforced Spencer's belief that the social order was governed by the "survival of the fittest". This belief helped to justify forced sterilizations, marriage restrictions, and the warehousing of individuals with disabilities in institutions. He argued that assisting this category would burden society without yielding any benefits (12).

It is a fact that the historical mistreatment of people with special needs in ignorant European societies was dominant, where they were subjected to ridicule, entertainment, and humor. This led to a sense of exclusion and oppression for individuals with disabilities. The historical context of disabled people in various

civilizations is explored. In ancient Roman society, there was an inclination to get rid of disabled individuals, while Pharaohs in ancient Egypt also disposed of disabled children.

However, it was noted that over time, societies evolved, and during the Islamic period, Islam paid great attention to all categories of society with a more compassionate and inclusive approach advocated by Islamic teachings towards individuals with special needs. Muslims were urged to provide full care for the weak and those with special needs. Islamic law prohibited the ridicule of people in general particularly those who suffer from disabilities.

Islam places a strong emphasis on empowering individuals with special needs, aiming to guide them towards a dignified life and transform them into productive members of the Muslim community. The Sharia's guidance while acknowledging the inability of individuals with disabilities to compete on an equal footing without additional support, prioritizes them for development of the society by recognizing their unique challenges and seeks to create opportunities for them. The Islamic religion, particularly through the revelations of the Holy Quran (13), plays a crucial role in raising awareness about the dignity of individuals with disabilities and their human rights. It goes beyond mere acknowledgment of physical disabilities, extending to a deeper understanding of challenges that affect their soul and morality. The key theme in the Quran embraces individuals with disabilities, emphasizing that the essence of a person lies in their soul rather than their physical body. The sanctity of the spirit is highlighted, and the recognition that the image of God is present in the highest aspects of the human spirit is emphasized. The Quranic verse number 18 in Surat Al-Baqara (صُمُّ بَنٌمٌ عَمًى لَا يَرْجُونَ) suggests that some individuals may be spiritually deaf, resistant to faith, and unwilling to open their hearts to understanding. The text implies that such spiritual deafness is more severe than physical disability (13).

In highlighting human dignity and rights, the Quran does not create a barrier between those with physical disabilities and those who are healthy. Instead, it draws attention to afflictions that go beyond physical impairments, addressing deficiencies in the soul or morality.

This perspective encourages a holistic understanding of disability, recognizing the importance of addressing not

only physical challenges but also moral and spiritual aspects to foster a more inclusive and compassionate society.

Under the Islamic system, individuals with special needs are not neglected, and the verses from the Quran emphasize the importance of supporting the weak and helping them.

Ayat 11 in Surat Alhojrat of the Quran, reinforces the message of not ridiculing or discriminating against any people, emphasizing that such actions go against the principles of faith and are considered immoral. The literature of the Quran considers physical disabilities as defects that do not justify insulting the dignity of the disabled or ridiculing their rights (13).

(يَا أَيُّهَا الَّذِينَ آمَنُوا لَا يَسْخَرُ قَوْمٌ مِّن قَوْمٍ عَسَىٰ أَن يَكُونُوا خَيْرًا مِّنْهُمْ وَلَا نِسَاءٌ مِّن نِّسَاءٍ عَسَىٰ أَن يَكُنَّ خَيْرًا مِّنْهُنَّ وَلَا تَلْمِزُوا أَنْفُسَكُمْ وَلَا تَنَابَزُوا بِالْأَلْقَابِ بِئْسَ الْأَسْمُ الْفُسُوقُ بَعْدَ الْإِيمَانِ وَمَن لَّمْ يَتُبْ فَأُولَٰئِكَ هُمُ الظَّالِمُونَ
(الحجرات 11))

It reinforces the prohibition of mocking others and highlights the importance of avoiding discriminatory behavior. The prohibition is extended to the use of derogatory nicknames, with a reminder that pity and compassion should prevail over judgment. This prohibition aligns with the teachings of the Prophet Muhammad (peace and blessings be upon him), who emphasized the equality of rights for individuals with disabilities. An illustrative example from the Battle of Uhud [Shawwal 3 Ah – April 624 AD], is provided, where a blind hypocrite cursed the Prophet and threw dirt at him (14). Despite the tense situation and the army being on its way to battle, the Prophet chose not to harm the individual and instead instructed his companions to let him go. This incident emphasizes the Prophet's refusal to take advantage of the weakness of the disabled individual and his commitment to principles of compassion and non-violence, even in challenging circumstances. The mercy of the Prophet for people with special needs is exemplified when he said to all those with disabilities: "Any Muslim injured by even a thorn and above will get a degree of ajar and a sin will be erased from him" (15).

In such prophetic texts and holy hadiths, there is consolation and good news for every person with a disability: if he is patient with his misfortune, satisfied with his condition, and believes that God takes account of his disability, then there is no reward for him with God except Paradise. Al-Qahtani (16) highlights that Prophet Mohammed (PBUH) directed followers to provide

educational and psychological care for people with special needs. This guidance emphasizes the importance of not neglecting individuals with special needs and working towards their rehabilitation to integrate into social life. The Prophet, exemplified this care by considering the disabilities they face, alleviating some of their financial burdens, instilling self-confidence, and helping them overcome life challenges. Acceptance of their disabilities is encouraged, with the understanding that the reward for such efforts is with Allah.

During the Islamic civilization, almost all the Caliphs used to take care of people with disabilities. Foreexample; the Umayyad Caliph Umar Bin Abdul Aziz initiated an institution that conducted a census of the disabled in the Islamic State assigning leaders to the blind and servants to those unable to stand alone. These values extended to the Alwaqaf system (Endowment System), leading to the establishment of endowments across Arab capitals to support individuals facing adversity and misfortune. Legislation by Imam Abu Hanifa was made, stating that the House of Muslim Money is responsible for alimony for the disabled. During those periods monasteries and hospitals were established that were dedicated to those with special needs, such as the Ezekiel monastery between Wasit and Baghdad (دير حزقيال بين واسط وبغداد), showcasing a longstanding tradition of care and support. Numerous manuscripts and works related to the rights and conditions of disabled individuals written by many Muslim scholars are available in different libraries. These manuscripts reflect the historical commitment of Muslims to the welfare of disabled individuals. The narrative also extends to Arab churches and mosques, noting that physical disabilities did not hinder the contributions of individuals to faith. Both faith communities, Arab Muslims and Christians, have seen great figures with disabilities, including the blind, hunchbacked, lame, and deaf, who have played significant roles in advancing their respective religious teachings. There are inclusive and compassionate stances of Islamic law towards individuals with special needs. History shows that there were great efforts made by various Islamic leaders and scholars to provide care for disabled individuals. Caliph al-Walid bin Abdul Malik established the first hospital for leprosy in 88 Hijri, while other Umayyad rulers and other Muslim scholars like Al-Razi and Avicenna contributed to the understanding and care of people with disabilities. The Umayyads in general established hospitals for the insane and imbeciles, and the caliph Al-Ma'mun established shelters for the blind and helpless women in Baghdad and large cities. Sultan Qalawun built a Bimaristan to care for the disabled, and many Muslim scholars even wrote about the disabled,

indicating their interest in them, such as Al-Razi who classified degrees of hearing loss and Avicenna who explained the causes of deafness (17).

Islamic law advocates equal opportunities for both ordinary people and those with special needs. In the eyes of Islamic law, despite potential differences in the distribution of human benefits, all members of society are considered equal in human value(15). Also, Islam regards individuals with special needs as those afflicted by the Almighty God, and their condition is to be accepted as part of divine justice (18). In addition, Islam positions individuals with special needs under its protective umbrella, advocating for their care and support. It prohibits the mockery of individuals with special needs and underscores the need to address their psychological well-being, eradicating feelings of inferiority and fostering satisfaction, self-confidence, and happiness (19).

The underlying principle in Islamic Sharia, as highlighted by Hajjar (20), is to deal with people with special needs with care, alleviating their legitimate costs, and aiding them in becoming independent. Moreover, Islamic Sharia is rooted in ease and aims to remove barriers for individuals with special needs in performing various acts of worship, allowing them to fulfill their religious duties according to their abilities (21). Islamic law has historically prioritized the welfare of individuals with special needs, surpassing other civilizations in this regard. The care provided by Islam extends to individuals with motor, visual, auditory, and mental disabilities promoting societal acceptance and understanding, discouraging mockery, and encouraging positive interactions with individuals with special needs (22).

Literature has documented many Islamic scholars who suffered from some sort of disability and played a vital role in society. Here are a few examples:

- Muhammad bin Sirin who was deaf, was a hadith scholar, jurist, and imam with abundant knowledge. He was an expert in dream interpretation, knowledgeable about arithmetic, obligations, and judgment, and worked in trade, keen to do what was lawful. He also had stances of courage and honesty.
- Bashar bin Burd who was blind from birth and then contracted smallpox, was an Abbasid poet; He was very intelligent, learned poetry and literature, and excelled at them. He was also one of the most

powerful poets in Arabic literature and imam of poets in his time. He had a private poetry school.

- Amr ibn Al-Jumuh, عمرو بن الجموح who was lame, the Prophet in honoring him used to say about him: "Your white-wrinkled Amr ibn al-jumuh is your master". The Prophet once said to him: "it's as if I am looking at you walking with your perfect feet in Paradise" (18).
- Ibin Um Maktoom (ابن أم مكتوم) who was blind. He was assigned twice by the Prophet in the city of Almadina to lead the people during prayer, as reported by Anas ibn Malik (19).
- Abu Al-Ala Al-Maarri: He is an Abbasid poet who went blind when he was four years old. He was a philosopher, thinker, and poet. He wrote several books, including *Al-Luzumiyat fi alfalsapha*, *Resalat Alghufrani* and *Saqat Alzand* رسالة الغفران... and had a great influence on the poetic and literary movement (23).
- The greatest conqueror, Musa Ibn Nusayr, was a lame man and was famous for his conquests in North Africa and Andalusia during the Umayyad Caliphate.
- Mustafa Sadiq Al-Rafi'i, born in 1880, is an Egyptian writer of Syrian origin, who suffered from a loss of hearing, so he could not complete his education and stopped at the primary stage. He has been able to compose a large number of poems and was called the miracle of Arabic literature.
- Ibn Umm Maktum, a blind man, holds a significant place in Islamic history. His story is mentioned in Surah Abasa (Chapter 80 of the Quran), (13) where the Prophet Muhammad (PBUH) was engaged in a conversation with a notable person while Ibn Umm Maktum approached him seeking guidance. The Prophet was reminded by Allah to give attention to everyone, including those with disabilities.
- Abu Ubaidah IbnulJarrah was a close companion of the Prophet Muhammad (PBUH) and played a crucial role in various battles. Despite having a disabled leg, he demonstrated courage and dedication in serving Islam.
- Abdullah Ibn Masoud was known for his deep knowledge of the Quran and Islamic teachings. Despite having a weak physique, he excelled in explaining the meanings of the Holy Quran (24).

And throughout history, many many other great and famous people have challenged their physical disability to prove to all of us that disability is nothing but a disability of thought and spirit.

Conclusion

In conclusion, the overall message is that Islamic teachings promote compassion, support, and care for individuals with special needs, challenging the historical mistreatment they faced in certain societies. The protection of the aforementioned health rights of people with disabilities is crucial, requiring the implementation of various laws and legislations to ensure their well-being. The objective is to offer comprehensive healthcare, improve their health status, and enforce these legislations across all branches of the state. These rights should be upheld without any form of discrimination, exclusion, or obstacles. The provision of basic health rights demands collaborative efforts from governments, health institutions, international organizations, and communities to play pivotal roles in securing these fundamental health rights. Only through such concerted actions can we guarantee that individuals with disabilities receive full and adequate healthcare. This collective commitment fosters health solidarity and ensures that health justice prevails, contributing to a more inclusive and equitable society. The Islamic law illustrates the comprehensive and considerate approach towards individuals with special needs, emphasizing equality, support, and the removal of obstacles to enable their active participation in society.

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Ethical issues and associated medical risks in uterine transplantation

Najma Ali ¹, Prof. Saad Amer ²

1- Medical student. 4th year , Queens University , Belfast, UK

2- FRCOG, MD - Professor, Obstetrics and Gynaecology Department, University of Nottingham,

Correspondence: Nalio4@qub.ac.uk

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Introduction:

In reproductive medicine, a significant portion of female infertility that is incurable is categorised as absolute uterine factor infertility (AUI) (Johannesson et al., 2014). In the world, this disorder affects roughly 1 in every 500 women who are of reproductive age (O'Donovan, Williams and Wilkinson, 2019). It is thought to be due to the absence of an anatomical or functional uterus (Johannesson and Järholm, 2016) and can be a result of congenital malformations for example the Mayer–Rokitansky–Küster–Hauser (MRKH) syndrome, or acquired such as in women who have had a previous hysterectomy (Williams, 2016). These women can also possess a uterus but due to physiological or anatomical defects, it is rendered non-functional (Johannesson et al., 2014). Figure 1 below illustrates the major causes of AUI.

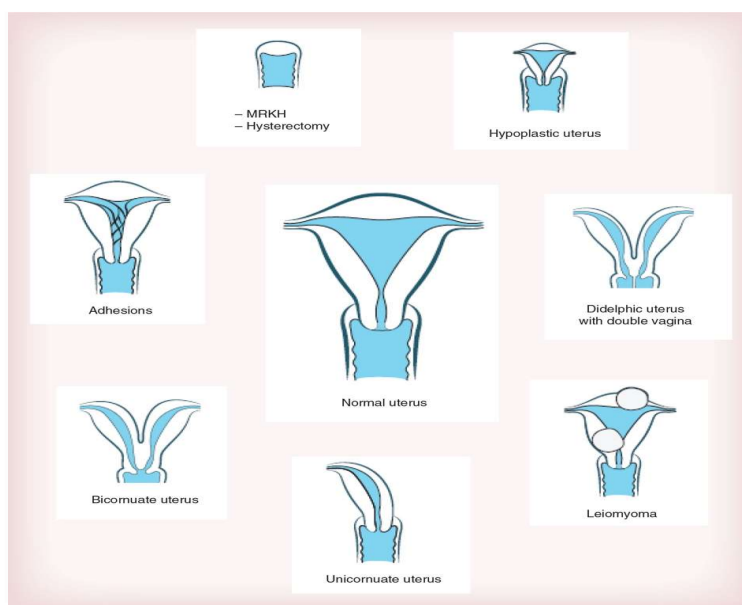


Figure 1. Multiple contributing factors of absolute uterine factor infertility (adapted from (Johannesson et al., 2014).

Adoption or surrogacy are now the only alternatives available to women with AUI who want to become parents (O'Donovan, Williams and Wilkinson, 2019). However, there are ethical, legal, financial and cultural concerns surrounding these procedures with gestational surrogacy currently being illegal in several countries (Saxena, Mishra and Malik, 2012). On the other hand, uterine transplantation (UTx) can offer these women the opportunity to become mothers in a gestational, social and genetic sense (Williams, 2016). Consequently, uterine transplantation models have first been established in smaller and larger animal models before progressing to the experimental clinical stages (Wranning *et al.*, 2006, 2008). Several human uterine transplantation attempts have been carried out and in 2014, a report was published on the first livebirth following uterine transplantation which can be viewed as evidence of UTx as a form of treatment for absolute uterine factor infertility (Brännström *et al.*, 2015).

However, UTx raises several ethical concerns especially as this form of treatment is viewed to be at the forefront of research, falling somewhere between advancements in assisted reproductive technology (ART) and novel transplantation (O'Donovan, Williams and Wilkinson, 2019). The ethical frameworks that currently govern UTx are mostly derived from those that govern solid organ transplantation (Horvat and Iltis, 2019) despite UTx being different from conventional organ transplantation in numerous ways. For example, UTx has the unique feature of being an "ephemeral" transplant with hysterectomy being recommended after a period of time (O'Donovan, Williams and Wilkinson, 2019) which offers the advantage of stopping immunosuppressive medications when the recipient's family is complete (Jones *et al.*, 2021). However, this procedure is not considered to be lifesaving and offer the recipient with no immediate health benefits (Testa and Johannesson, 2017). Therefore, ethical concerns surrounding access to UTx including eligibility, living versus deceased donation, and risks versus benefits, have arisen and pose a great challenge. Additionally, UTx addresses every significant facet of human ethics, such as autonomy, beneficence, justice, dignity, and non-maleficence. In this paper, we will briefly review these key ethical concerns associated with UTx.

Access to UTx

Several concerns arise when considering who should have access to UTx procedures. Questions are raised by UTx regarding the allocation criteria used to create a just system of organ distribution and the selection criteria that

apply to potential patients (O'Donovan, Williams and Wilkinson, 2019). Implementing patient selection criteria seems reasonable, similar to other ART programmes, to guarantee only patients with a reasonable chance of success begin treatment. Within the setting of UTx, these have involved an inclusion criteria of, for example a genetic female which raises a controversial point as to whether women who are genetically XY should be offered UTx (Sampson *et al.*, 2019). It is suggested in transgender women, UTx has the potential to reduce dysphoria that may stem from not being able to become parents (Jones *et al.*, 2021) and because reproductive rights can be viewed as human rights, in accordance with UK legislation, it can be against the law to deny transgender women a uterus transplant based on their gender identity (Jones, Alghrani and Smith, 2019).

Another general inclusion criterion is the woman should have the capacity to raise children although this can prove to be highly divisive. In the UK, a "welfare of the child" evaluation which is mandated by the Human Fertilisation and Embryology Act 1990 is carried out before treatment and is described as a better threshold selection requirement (O'Donovan, Williams and Wilkinson, 2019). Additionally, global differences exist in the inclusion and exclusion criteria. The criteria in Sweden, for instance, require the recipient to be part of a stable relationship; UK standards do not. Furthermore, Swedish standards seem to focus solely on biological parenthood, in contrast to the UK, which bars applicants who have already had children (Hammond-Browning, 2019). Such inconsistencies highlight the ethically challenging task of creating inclusion and exclusion criteria in UTx clinical trials, coupled with the challenge of determining who would be given priority for a transplant should UTx become the norm in clinical practice (Koplin and Kendal, 2020).

With regards to justice, the current guidelines for organ transplantation are designed to foster equality and justice; for example organs are assigned based on medical urgency rather than financial means (Koplin and Kendal, 2020). However, these well-established guidelines do not neatly apply to UTx. The concept of "sickest first" allocation is not adhered to in UTx; prognosis and standards of living benefits from UTx transplants, are more difficult to measure than from donations that directly address medical needs; and infertility cases that are more or less "urgent" do not exist. (Koplin and Kendal, 2020).

This may create allocation bias which can have an impact on who has access to UTx as a form of treatment.

Concerns about justice are also pertinent to the debate over whether UTx should get government funding. Thus, the question of whether to fund UTx will eventually have to be decided upon by publicly funded healthcare systems like the National Health Service (NHS) in the UK. This raises controversy as funding for current ART such as IVF already generates hostility in the public with some people arguing allocating funding to ART entails sacrificing advances in other areas of health (Devlin and Parkin, 2003). One main argument to consider is whether infertility should be perceived as a disease. In response to this, a comprehensive survey on general population views regarding infertility and its treatment, was carried out by Adashiet *al.* across Australia, several European countries, and the USA, with just 38% of respondents, agreeing with the statement that "infertility is a disease" (Adashiet *al.*, 2000). The question's implications are apparent: if AUFI is regarded as a sickness, state funding for its management is justifiable; the only thing left to decide is how important it is to prioritise it in comparison to other necessary treatments. If not, public funding of UTx may be deemed unjustifiable (Wilkinson and Williams, 2016) although this argument is implausible on the basis that AUFI has distinct biological causes and thus effects and these can then be exacerbated by social factors such as pronatalist beliefs (Wilkinson and Williams, 2016).

Living vs deceased donation

The preference for either living or deceased donors is a matter on which scientists involved in UTx strongly differ. Approximately 75% of the documented cases of UTx procedures have used living donors, the majority being close family members of the recipient with only 25% using uteri from brain-dead (deceased) donors (O'Donovan, Williams and Wilkinson, 2019). Thus, there has been much discussion on the relative importance of each model and, consequently, which model should be chosen, presuming that both are eventually shown to be adequately safe and effective.

A major factor that influences the type of model donor to use is the clinical benefits and risks associated with each (O'Donovan, Williams and Wilkinson, 2019). The possible benefits of using a deceased donor model for UTx include a lower risk of complications such as thrombosis seen in live donor models due to the surgeons being able to recover longer lengths of vasculature which are obtained from the deceased donor more efficiently (Del Priore and Gudipudi, 2014).

Additionally, in response to the claims that living donors are more suitable with regard to long-term graft survival, it can be argued the benefits are minimal as UTx is intended to be ephemeral (Williams, 2016). The transplantation procedure in a deceased donor model is also considered to be more simplified with shorter durations and therefore poses a lower anaesthesiologic risk in patients (Johannesson and Järholm, 2016).

Nevertheless, despite these benefits, most doctors conducting UTx trials believe that the living donor model is likely to offer more advantages such as; the uterus being of a higher quality due to considerably reduced cold and warm ischaemia times, a closer tissue match when related donors are used, and the ability to set a convenient date and time to allow sufficient time for the donor and organ to be thoroughly evaluated prior to transplantation (Johannesson and Järholm, 2016). It is also easy to argue that allowing living donor model takes into account the autonomy of those who decide to donate by giving them the opportunity to do so (O'Donovan, Williams and Wilkinson, 2019). However, this position is thought to be more complicated in reality. A small number of clinicians argue that living donation is unsuitable due to the risks and harms involved, in addition to the doctor's responsibility of non-maleficence and UTx being viewed as a quality-of-life transplant rather than a lifesaving one (O'Donovan, Williams and Wilkinson, 2019). However, others argue this risk has to be weighed against the advantages UTx offers (Williams, 2016).

Additionally, in the case of living and deceased models, there is a chance the uterus may have been donated without adequate high-quality consent (Koplin and Kendal, 2020). External factors, including pressure from relatives to inquire about UTx or peer pressure to donate their own uterus, carry some risk in both the case of living donors and receivers, thus affecting the quality of the consent obtained (O'Donovan, Williams and Wilkinson, 2019). Similarly, one could also question whether wider societal factors such as a pro-natalist ideology could jeopardise autonomous consent with pronatalism being linked to a greater social pressure to have children who are genetically related, which may have a large impact on a woman's choice to get UTx or to give her daughter, a loved one or even a stranger her own uterus (Koplin and Kendal, 2020). The degree to which informed consent for UTx is threatened by these social influences remains a crucial ethical concern that necessitates further evaluation.

Risks versus benefits

The balancing act of risks and benefits is viewed to be more complex in UTx compared to other forms of organ transplantation. For instance, since neural innervation is currently impossible in UTx and numerous sensations related to pregnancy would be absent, there is a higher chance that as a result, recipients will feel a sense of disappointment even in the chance of a live birth as the full experience of pregnancy is just as important to some individuals (Catsanos, Rogers and Lotz, 2013). It is important to note an analysis of the risks and benefits associated with UTx includes four parties; the recipient, the recipient's partner, the donor and the prospective child (Johannesson *et al.*, 2014). In UTx, given the recipient undergoes the risk of pregnancy, immunosuppression, and surgery, she is the one who is most at risk (*ibid*). However, in contrast to other organ transplantations, UTx poses a risk to other parties in particular the prospective child who would undergo immunosuppressive treatment while still in utero (Arora and Blake, 2014) which can lead to a greater risk of premature birth, intrauterine death and a low birthweight (Benedet, 2019).

The benefits of UTx are also distinct from those of other types of organ transplantation. In contrast to for example a heart transplant, UTx is viewed as a life enhancing rather than a lifesaving procedure (Koplin and Kendal, 2020). However, it can be viewed as a way for women with AUI to become parents with objectives that involve assisting them in becoming emotionally, visually, and socially recognised as pregnant (Arora and Blake, 2014). These objectives set UTx apart from other organ transplantation procedures as well as from other AUI-related ways to become a parent, such as adoption or surrogacy (Koplin and Kendal, 2020). However, this raises the question of to what extent can these risks be accepted to achieve these goals.

In terms of the procedure itself, the duration of surgery is a major concern, with research now focussing on robotic assisted procedures in order to reduce operative times (Fornalik and Fornalik, 2018) and make it less invasive (Benedet, 2019). Post-operative complications such as infection, thrombosis, fistula, and uretic damage also pose further risks to the health of the recipient (Kisuet *et al.*, 2018). Women who undergo organ transplants also undergo immunosuppressive therapy with potential complications for the recipient including an increased risk of malignancy, nephrotoxicity and bone marrow toxicity (Benedet, 2019) thus the adverse risks of this form of therapy should be followed up in the long term.

In addition, there are more widespread concerns such as the psychological issues following transplant surgery for all four parties with emphasis placed on an assessment carried out pre-and postoperatively by a certified psychologist (Johannesson and Järholm, 2016). Taking everything into account, more information is needed to truly comprehend the potential risks associated with UTx with a focus on safety and efficacy before it is widely adopted in routine clinical practice. Determining whether the benefits of UTx outweigh the risks involves the ethics of beneficence and non-maleficence and these will still be relevant when UTx becomes the norm in clinical practice (Koplin and Kendal, 2020).

Conclusion

Uterine transplantation was revolutionary in the world of reproductive medicine and has had remarkably positive results thus far. However, it does raise significant social, legal, and ethical concerns. As more data emerges regarding the benefits and risks associated with this procedure, solutions to these concerns will become apparent and policy adjusted accordingly. This pertains specifically to concerns about using living or deceased donors, meeting financial requirements, and recipient allocation criteria. When comparing UTx to other alternatives for AUI, a major distinctive feature of UTx that warrants special consideration is the opportunity for the recipient to become socially and genetically related to the child. How much value we can attribute to this unique feature is dependent on all four facets of human ethics—beneficence, non-maleficence, autonomy, and justice.

Therefore, a solid ethical foundation is required in this rapidly evolving area to govern guidelines and laws before UTx becomes the norm in clinical practice. The prospective future of uterine transplantation will possibly involve establishing and implementing robust consent processes, laparoscopic methods to minimise risks and duration of surgery, organ engineering technology with the aim of eliminating the use of immunosuppressive therapy which will all hopefully lead to UTx being introduced in a wider general setting.

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Muslim Women Have a Gender Preference for Female Physicians

Ponn P. Mahayosnand¹, Saylin Gomez², Samiha Ahmed³, ZM Sabra⁴

¹MPH, Research Scholar, Ronin Institute, 127 Haddon Place, Montclair, NJ, USA

²BA Graduate, Providence College, Providence, Rhode Island

³MPH Graduate, University of Maryland, College Park, Maryland

⁴Medical Student, Islamic University of Gaza, Faculty of Medicine, Gaza, Palestine

Correspondence: ponn.mahayosnand@ronininstitute.org,

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Abstract

This review article serves to bring attention to the need for diverse cultural and religious understanding within the medical workforce for Muslim women patients specifically. Women patients generally prefer women physicians. (1) The authors assess four surveys from women patient populations, the final of which also interviewed medical professionals. The female patients in these surveys were found to convey both a lack of access to female physicians and a preference for women physicians. These surveys have also conveyed that, in instances where same sex physicians are not present, necessary care may be delayed or left unobtained. (2) This is even more of concern in emergency medicine situations where physician attention is required immediately and, statistically speaking, a female physician may not be available. Muslim women are brought into focus due to the religious nature of this preference. With patient comfort and healthcare accessibility in mind, the authors assess the findings of these four surveys to advocate for the respect of patient preferences through the acclimation of more female physicians and cultural/religious sensitivity training in the medical workforce.

Women in medical school

Unfortunately, there is still a problem with the kind of attitude and treatment given to female doctors compared to male doctors. (3) The field of medicine has been historically male-dominated and considered an easier profession for men. Shelby Ross, a medical graduate from Canada, stated that when women began showing interest in the discipline, hospital administrators and male medical students argued that they would not be ideal candidates. Concerns were voiced that women would simply drop their medical careers when they got married and had children, which meant men would be more ideal candidates for the job. They felt giving women training

for a career they would end up leaving was a waste of time and resources that would be better spent on men. (3) While women may have familial responsibilities by nature or desire, it is not appropriate for society as a whole, especially medical institutions, to make this assumption and penalize female doctors, such as by paying them less. In this fashion, women are discriminated against solely because of their gender. (1)

Muslim Women Patients

There has been an increase in the request for same sex doctors by Muslim women over the last few years. (2) Muslim women were surveyed in Chicago regarding their

view on same sex doctors and how they are treated once they ask for this request. The survey noted a delay in seeking medical care when there is not a female doctor available upon request. Additionally, 93% of women who self-reported they had high levels of modesty on the study scale, also reported always facing some sort of delay. When Muslim women find that the system does not cater to their religious needs, they may presume “perceived religious discrimination” within the system, compounding on delays in care. To achieve true health equity, supporting individual patient needs, even religion-based, is a necessity.

The push for same sex doctors stems from Islam having certain rules and regulations that revolve around daily interactions and any kind of health-related encounter. (4) Religious decrees in Islam dictate a level of modesty that must be maintained between the two sexes. The two sexes are expected to maintain physical distance unless absolutely necessary, as well as cover the body in front of one another. While the degree to which an individual adheres to this religious doctrine varies based on a variety of variables, seeking medical care when only physicians of the opposite sex are available proves difficult for those who are stricter with their adherence.

An emergency department surveyed both Muslim men and women from Saudi Arabia concerning any delays in services. (4) The survey concluded that about 65.1% of the population, which was 87.5% female, preferred being seen by a female provider compared to a male provider. Having this large percentage of the entire population challenge the medical field’s view on women and what kind of role they actually play is noteworthy. Within the Emergency Department, there are numerous issues that impact the delay in services to Muslim women. For example, this emergency department usually involves very sick patients that need services extremely fast. This may cause a problem because there are not always female physicians readily available for less urgent cases like physical examinations. Since physical examinations involve touching one’s body, female physicians are preferred. A solution may be informing women not to come to the Emergency Department for more routine, primary care appointments in which they can seek their own female physician to care for them.

Muslim women’s preference of same sex doctors in OB/GYN

In specialities such as obstetrics and gynecology, Muslim women prefer being seen by a same sex doctor compared to male physicians. (5) In a public hospital in Al Ain,

UAE, these female Emirati nationals were interviewed by medical students revolving around services such as gynaecology and/or any other medical consultation. They were given a number of different hypothetical scenarios in which some questions were about personal physician preferences while one scenario asked about physician preferences for an 8-year-old child. They were also asked about past experiences being treated by either a female and/or a male physician. Female physicians were preferred for gynaecological services and/or physical touching. (4, 5) More than 50% of the population being interviewed would refuse being seen and/or treated by a male physician as they felt much more comfortable with a female physician. By contrast, patients were fine with an 8-year-old being seen by a physician of either gender. McLean et al. concluded that the medical field has to respect and accept different religious and cultural values. (5) This should be taught and explained during medical training in order to allow these Muslim women to feel just as comfortable as anyone else. Another survey conducted by Hasnain et al., asked for personal stories from patients about both positive and negative experiences with physicians. There are numerous instances where Muslim women reported not feeling comfortable with their healthcare provider. Certain notable comments mentioned that doctors were overtly familiar, complimenting the patient’s figure, or that the physician “expressed an arrogant level of superiority.” (6) Both women and physicians found the lack of mutual cultural understanding to negatively impact physician-patient interactions. These studies support the need for provider education about basic religions and different cultural beliefs.

Conclusion

Overall, the desire for a more culturally and religiously sensitive workforce for same sex physician preferences has been made evident. Furthermore, without the presence of more female physicians in the workforce, many women may delay or avoid care which can lead to adverse health consequences for patients, as well as a difficult workplace for physicians. As a result, there should be a greater emphasis on recruiting and training women into the medical workforce and incorporating cultural sensitivity training for all physicians. Limitations for many of the cited sources include a small sample size. Future studies should focus on expanding this data pool, and set out to assess physician-patient interactions in settings where cultural/religious sensitivity training programs may have already been implemented. A strong association between training and positive healthcare experiences will further cement the need for it.

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The Hajj: Season of Rahma or Zahma? Allowing ambulances to access patients

Usman Maravia

National Director BIMA Ethics team; Member of the Patient and Public Panel for the Northwest Ambulance Service; ESRC Centre for Corpus Approaches to Social Science (CASS), Lancaster University

Correspondence: u.maravia@lancaster.ac.uk

Keywords: *ambulances, crowd safety, Hajj, pilgrims, traffic control*

Abstract

This chapter focuses on the need for ambulances during Hajj, the allocation of resources by the Saudi Red Crescent Authority, and the technology used to monitor and control the crowd. Recommendations for smoother crowd control include a recalculation of the intake numbers and improved communication between the police force and the Saudi Red Crescent Association (SRCA) in relation to traffic control points. Additionally, crowd health and safety awareness courses could be included in the Hajj visa process and reiterated by Hajj operators worldwide.

Introduction

Hajj is the most important pilgrimage Muslims make at least once in a lifetime. Arabia has always welcomed Muslim pilgrims as the '*Dhuyoufar*' *Rahman*', meaning 'Guests of the Most Merciful One'. The Hajj ritual is restricted to time and space; whereby it is performed between the 8th to the 13th of the Islamic lunar month of Dhul Hijjah in the Hajj zone, which includes Mecca, Mina, Muzdalifa, and Arafat. With over two million pilgrims arriving from all nations of the world, the Saudi government have invested enormously in grand constructions, expansions, and health facilities including mega-ambulances. However, the most difficult challenge the government continue to face every year is controlling the large dense crowds. Within this crowd are patients who might be on the verge of or might already have suffered from a heat stroke or a cardiac arrest. However, the emergency medical service struggles to reach these patients in time when the crowds block the routes for ambulances. While Muslims are ambitious of gaining

spiritual rewards and are observant of the jurisprudential rulings of performing the Hajj, there remains ignorance about mass crowd health and safety.

Photographers have captured some of the most breathtaking views of the Hajj with over two million pilgrims from all around the world gathered in one place to glorify their Creator. On the other hand, some of the most shocking photographs of the Hajj have also been taken (see Figure 1 below) where hundreds of pilgrims are seen engulfing an entire fleet of ambulances (Photos Fig.1 (1,2) and pilgrims are seen walking in front of flashing ambulances (Photos Fig 1(3,4) .

Such alarming Hajj moments raise a series of questions: such as: why is there a stationary ambulance blocking the path of the pilgrims? Or the reverse, why are hundreds of pilgrims crowding and blocking an ambulance route? What protocol set by the Saudi Ministry of Hajj and Umrah was supposed to be followed by the emergency response service (EMS) and other Hajj volunteers as well



Figure 1: Photos of pilgrims blocking ambulances.

as the crowd? Are these ambulances trying to reach a patient? or are they trying to transport a patient to medical facilities and emergency care? How serious is the condition of patients that they critically require an ambulance during peak Hajj days? The fundamental question, however, is – why do such scenarios occur and what measures can be put in place to avoid them?

To address these questions, first, the valley of Mina will be described, followed by the need for ambulances in the Hajj zone. The contribution of the Saudi Red Crescent Association (henceforth SRCA) will also be explained. Measures taken to manage the Hajj crowd will also be explored including the challenges created by a) traffic control points and b) pilgrims sleeping on routes. Lastly, factors are discussed for the consideration of the MOH as well as Hajj operators worldwide.

Mina

Mina is an area, mostly a valley, where the pilgrims participate in rituals in remembrance of Abraham and his family (Peace be upon them). One of the rituals involves casting stones on the 10th to the 13th of the Islamic lunar month Dhul Hijjah at a place within Mina known as the Jamarat. Because this ritual is essential in Hajj and because Mina is a central location in relation to Mecca and Arafah, where other Hajj rituals are observed, from the 8th to the 13th of Dhul Hijjah, pilgrims reside in Mina. The area of Mina is 20 km²[5]. Since the time of the Prophet Muhammad (peace be upon him), pilgrims brought and pitched their own tents. In the 90s, the Saudi government installed permanent cotton tents. However, permitting pilgrims to cook and warm food on open fires near these cotton tents posed a major health and safety

risk [5]. Consequently, the great fire of Mina in 1997 injured over 1,500 pilgrims and claimed the lives of over 340 pilgrims [6]

Subsequently, open source flames were prohibited by the Saudi government [7]. Moreover, the government invested in 100,000 permanent fireproof tents made of fibreglass with an outer coating of Teflon [8]. Large tents can accommodate between 100 to 150 pilgrims [9]. Furthermore, the tents are air-conditioned. The tents have been grouped and divided by nationalities and are situated with a complex network of walking streets and roads used by conventional and shuttle buses [10]. Cooking sites are now regulated and monitored for fire threats [11][12]. Additionally, in recent times, several towers have also been built in Mina as an alternative accommodation. As such, Mina today accommodates up to three million people and is renowned as the ‘City of tents’. Moreover, the city is provided water by the National Water Company, which consists of nearly 2,300 employees who help to maintain water systems and to clean and maintain toilets at the Hajj sites including Mina [13].

The Hajj is a unique event as it attracts over two million pilgrims from more than 180 countries [14]. Such a mass gathering is larger in scale than sports events, festivals, and concerts [15][16]. Furthermore, unlike these static events, the Hajj ambulance system requires unique perspectives because it involves pilgrims moving to and from locations [15].

Need for ambulances in Hajj

Pilgrims who are most likely to require an ambulance include patients who suffer from diabetes mellitus, hypertension, asthma, and anemia, but especially patients with cardiovascular diseases. To illustrate, cardiac arrests account for 43% of deaths in Hajj, making it the most common cause of death in Hajj [17]. Blocking ambulances from reaching patients in peri-arrest is likely to result in the death of the patient [18]. Moreover, in the summer and early autumn, ambient temperatures in the region reach up to 45°C. Such extreme heat causes body temperature to rise resulting in dizziness, disorientation, hallucinations, and loss of consciousness. In extreme cases, especially when one is dehydrated, clots can appear in the blood vessels of the brain, resulting in a heat stroke. In Hajj 2018, the number of heat stroke cases reached 124 [19] and over the years, has become a major cause of morbidity and mortality [18]. Even if patients survive, there is a high risk of patients suffering from permanent paralysis [20]. Another hazard that requires

ambulances in Hajj involves pedestrian traffic accidents when people are walking in close proximity to dense traffic, resulting in traumatic injury [21]. One study revealed that of patients that were admitted to different surgical departments, 60% were involved in road traffic accidents [22].

When stampedes have occurred, pilgrims have been killed as a result of asphyxiation or head trauma [21]. Unfortunately, ambulances and paramedics are been unable to reach patients in large dense crowds. In the Hajj 2006 stampede, for instance, 363 pilgrims were killed and over a thousand pilgrims were injured [23]. Crowd crushes in Mina have always been a fear given the 1995 fire and the stampedes in 1990, 1994, 2004, 2006, and 2015 [24]. Due to major incidents, between 1994 and 2006, an estimated 1,300 pilgrims were injured and over a thousand pilgrims were killed. With over two million pilgrims gathered in close proximity under extreme heat, casualties and incidents are imminent, especially for patients with existing health conditions. As such, awareness of ambulance routes is imperative for pilgrims to allow paramedics access to reach patients in time and try to save their lives.

SRCA medical response provisions

The primary emergency medical services operator for the Hajj is the Saudi Red Crescent Authority (SRCA). Over the years, reports have mentioned the MOH's high allocation of emergency medical staff. Estimates show that to provide all emergency and medical services to pilgrims inside and outside Makkah and other holy places, over 100 field teams consisting of over 1,800 people are allocated [25]. In Hajj 2012, the SRCA deployed 1,750 EMS providers and 600 volunteers to respond from 26 ambulance stations [26]. The MOH has been known to deploy a medical workforce for Hajj consisting of over 17,500 specialised personnel with more than 15,000 doctors and nurses [27]. Moreover, for a fortnight at Hajj time, around 30,000 medical staff, paramedics, and volunteers are reported to operate 24 hours [28]. For critical situations, authorities provide flying paramedics [29]. As of Hajj 2021, Saudi women have also joined the military to serve as guards during the Hajj season [30]. With pilgrims attending from over 120 countries, Leggio et al. describe that for non-Arab speakers, the SRCA use 'custom-designed picture books with facial expressions, anatomical graphics and medical and traumatic depictions ... to assist pilgrims in communicating the location and severity of their medical condition, illness or injury' [31].

A high number of ambulances are reported to have been deployed by the SRCA. For instance, in Hajj 2015, they deployed a fleet of 452 ambulances, nine mini ambulances, 21 SUV paramedics, 24 motorcycle units, and nine helicopters to operate as mobile intensive care units to handle field ambulatory emergencies [32]. Hajj 2016 included 57 large ambulances and 120 mini ambulances [33]. Special landing pads have also been constructed to lift ambulances to landing pads to transport patients by helicopter [7]. Another impressive provision by the SRCA is the highly-equipped mega-ambulances that are capable of handling several cases at the same time [32].

For Hajj 2023, preparations were made to provide seven such mega ambulances [34]; each one with a specific design, purpose, and even a name:

1. *Dhamak*: This ambulance was designed to deliver special equipment, wear, and shields, to tactical teams and paramedics.
2. *Haddadg* and *Sanad*: These two ambulances were designed to contain and deliver medical supplies to serve 90 injured people at a time (See Figure 2 below [35]). With main roads either shut down or blocked by crowds [36], these ambulances could help with medical supplies with less movement.
3. *Khuzam*: A four-wheel drive designed to reach difficult terrain and also contains medical equipment for the safety of paramedics and patients.
4. *Salma*: Designed to respond to cases involving dangerous chemical spills.
5. *Thurayya*: The design of this ambulance includes high-quality thermal cameras to monitor accident sites and provide an urgent response. Additionally, this ambulance contains a mobile operating room for communications.
6. *Tuwaiq*: This mega-ambulance is designed for multiple incidents within a crowd and can accommodate the transportation of ten patients at once. Tuwaiq also contains medical equipment, integrated first aid kits, and electric shock devices (see Figure 3 below [37]).

Ambulance routes lead to facilities prepared by the Saudi Ministry of Health (MOH) to help pilgrim patients.



Figure 2: The Haddadg ambulance in Hajj 2022



Figure 3: Photos of The Tuwaiq ambulance at the Hajj Expo 2023

During the Hajj season, the pilgrims can be treated at 25 hospitals; with 5,000 beds including 500 critical beds [27]. Historically, since Mina has seen the most incidents near the Jamarat Bridge and in the surrounding areas, Mina contains 28 healthcare centres and four hospitals [38]. These hospitals include: 1) Mena General Hospital (350 beds), 2) Mena Aljisir (207 beds), 3) Mena Alwadi (145 beds), and 4) Mena Almahbat (91 beds) [7].

Along the Jamarat Bridge are 17 emergency care centres to provide immediate healthcare access [39]. Furthermore, medical tents and mobile clinics, staffed with medical personnel and equipped with medical supplies, are strategically located in Mina and along the Hajj routes to Arafat and Muzdalifah. The total number of temporary and permanent rescue centres allocated by the SRCA exceeds over 150 centres [40]. Moreover, health care is provided free to all pilgrims.

D'Alessandro et al. [41] report that:

“During the 1433H/2012G Hajj, the SRCA answered 57,420 calls for assistance, with 20,210 responses that provided care to 18,230 patients. Of these patients, 34% were transported medical patients; 39% were non-transported medical patients; 11% were transported trauma patients and 16% were non-transported trauma patients.”

Moreover, In relation to Hajj 2017 (1439 AH), The General Authority for Statistics (GASTAT) reported that the Hajj medical team performed ‘142 cardiac catheterization procedures, 9 open-heart surgeries in addition to other 568 surgeries during the same period’ [42]. In Hajj 2018, the number of open heart surgeries reached 35 [43]. One report from 2018 mentions that the MOH carried out 1,280 blood transfusions [44].

To transport patients to these strategic locations, ambulance services are distributed within ‘hot zones’. The System A Medical Evacuation Plan [45] describes 302 ambulance fleets being stationed in these potential areas to allow for quick response in mass emergency cases. Additionally, the SRCA and the MOH have detailed documents that provide guidelines for the Hajj staff. Key documents prepared by the SRCA include operation plans for ambulance missions for Hajj [46], as well as general [47] and detailed plans for Hajj [48].

Likewise, key documents prepared by the MOH include the unified framework for emergency planning [49], medical evacuation plans [50], and the emergency plans

evacuation form [51]. According to these plans, several key roles are played by the EMS:

1. Pre-locating the ambulance teams within the hot zones
2. Following the pilgrims as they move from site to site
3. Being prepared to respond quickly to any incident
4. Leading the triage area
5. Treating patients on location including providing first aid to the injured
6. Transporting patients from the scene to a primary healthcare centre or a hospital
7. Executing the medical evacuation plan

Hajj crowd management

The greatest difficulty, however, that ambulances face during Hajj is finding access to patients in large dense crowds [52]. Nevertheless, for Hajj 2016, the MOH introduced electronic GPS wrist bracelets [53]. Pilgrims were expected to wear these to provide authorities with demographic information to help track, manage, and control the crowd movement. Advanced versions of these bracelets have included information relevant to the identity of pilgrims; such as their names, ages, and nationalities; their location and accommodation; and importantly, information related to their health such as blood oxygen, pulse, blood type, allergies, and comorbidity. Additionally, the bracelets would allow pilgrim patients to request emergency medical assistance. Such facilities and gadgets have made the Hajj inclusive and welcoming to patients who would otherwise be incapable of performing the Hajj. The Hajj is also monitored by The Radio and Television Authority [13], which has over 1,200 employees. This authority, as described by GASTAT, broadcasts the Hajj through five satellite channels and six radio stations. Moreover, the Hajj rites are also broadcasted by the Audio-Visual Production Organization through nearly 250 satellite channels.

The reality in the Hajj zone

Despite the generous allocation of resources and health and safety measures, ambulances are still stuck in Hajj.

According to Al Ruwaithi [52], among the main reasons for this phenomenon include problematic traffic control points (TCPs) and pilgrims sleeping on the streets and waysides.

Traffic control points

A major problem EMS face is passing traffic control points during Hajj times. Ambulances are allowed to pass only on very rare occasions and according to strict limits. Despite radio communication and seeking permission for road access, their requests are reported to have been denied by traffic control officers – even sometimes when transferring critical patients. Although golf cart size mini ambulance vehicles would easily be able to pass through a large crowd, those too are restricted from passing TCPs.

Al Ruwaithi quotes a member of the Hajj workforce in his interview study that the situation was “normal” and that security forces permitted EMS to enter and pass freely until Hajj 2015 but it was from Hajj 2017 that “the strict control began”. Strict traffic control has also been reported to increase the average response time. The Operational Plan for the implementation of Ambulance Missions for the Hajj Season 2018 highlights that ambulances are required to adhere to the orders of the traffic police. Part of the guidance in the plan is to allow EMS coordinators to pass through. However, reports from ambulance crew members reveal that the police are known to block and barricade roads forcing even ambulances to take a U-turn or take other roads. EMS members have also reported that manoeuvring ambulances through TCPs causes unnecessary delays in reaching emergency cases, transferring patients to health centres, and returning to EMS stations. Another ambulance crew member reported that on one occasion he left the EMS centre at noon to deal with an urgent case 3 km away but reaching the patient took 40 minutes. Returning to the EMS centre, however, took two and a half hours. All interviewees from EMS systems in Al Ruwaithi’s study agree[d] that 1) TCPs significantly affect the ambulance dispatching process whether they see it a reasonable approach or not, and 2) there is a need for improving the coordination of those TCPs’.

Sleepers on routes

Another problem that seriously hinders ambulance movement in the Hajj zone as highlighted by Al Ruwaithi is pilgrims deciding to sit or sleep on the sidewalks and even on the routes. Despite police intervention and government regulations to mitigate sleeping on routes,

the problem persists. Such pilgrims are not without accommodation, however, they choose to sleep on the routes rather than return to their accommodations to allow them to reach their destination quicker the next day. A large crowd of pilgrims, therefore, sleep on the Eastern borders of Mina on the night of the 9th to be able to proceed to Arafat the next morning or spend the last few nights sleeping on the Western borders of Mina or by the Jamarat Bridge for the remaining of the Hajj to be able to proceed to Mecca or to avoid travelling to and fro for the stoning ritual at the Jamarat.

Another problem that is created as a result of pilgrims sleeping on routes is that other pilgrims are blocked from reaching their destinations. Another challenge that authorities and pilgrims face in the Hajj zone is the beggars, peddlers, and squatters blocking the paths. Some pilgrims believe that spending the last few nights in Mina is a ritual obligation. Such doctrines further complicate the movement of pilgrims in the Hajj zone [54]. Resultantly, pilgrims are forced to find a different way and risk getting lost and confused. For patients with underlying health conditions, such detours in the heat, often involving a much longer route with slow-moving crowds would be perilous. In the case of non-Arabic pilgrims, finding their way back is even more difficult due to language barriers and remains a significant problem [55].

Discussion

Hajj authorities must revisit their plans and consider the concerns raised by EMS and the SRCA concerning the right of passage at traffic control points. Ambulance delays have resulted in the deaths of pilgrims and so the facilitation of ambulance movement must be revisited to ensure that traffic bottlenecks are avoided and the response time is quicker.

To improve the Hajj experience for all parties involved, a recalculation of the Hajj zone along with an evaluation of ingress and egress models is crucial. Ambulance routes to emergency health care centres must be excluded from calculations and the intake of pilgrims needs to be based on the accommodation zones and other walkways. Ambulance routes could be paved in red and enclosed by high gates and guarded by the military to prevent pilgrims from trespassing. These pathways could also lead to medical centres in the Hajj zone; with the entire city consisting of white tents, medical tents could be red.

To ease the medical burden, countries Turkey, Malaysia, and Iran bring medical experts to Hajj to provide walk-in

care for pilgrims in their groups [56]. Also, organisations like the British Hajj Delegation [57], the Council of European Jamaats [58], and US-based Imamia Medics International Hajj Medical Mission [59] have been involved in health care for pilgrims.

Every group that attends the Hajj from abroad require a Hajj visa and, therefore, the number of pilgrims is limited. The Hajj visa process requires pilgrims to abide by health regulations. The process includes ensuring pilgrims are vaccinated against infectious diseases like yellow fever, meningococcal meningitis, polio, Covid-19, and seasonal influenza[60].

Another factor that could be added to the Hajj visa process is a psychological evaluation of individuals, especially those with underlying mental health conditions, to examine whether they are mentally prepared and that they would be able to respond rationally in large dense and slow-moving crowds in high temperatures. Patients with severe mental illnesses and those who suffer from high blood pressure due to stress would also be at risk of strokes and cardiac arrests [61]. In Hajj 2005, 92 patients were presented to psychiatric services for anxiety disorders (34%), mood disorders (22%), and psychotic disorders (20%) [62]. Likewise, anxiety can lead to the development of heart disease [63]. Hajj can also affect sleep patterns, which consequently can affect brain function. As such, disturbed sleep patterns in patients with underlying mental health illnesses could lead them to have panic attacks [64] and breathing difficulties [65]. In large dense crowds and temperatures, a pilgrim with underlying mental health issues can be a danger to others and themselves. Hajj is a journey that is meant to provide an opportunity for spiritual reflection. The purpose of Hajj must not be conflated as a form of therapy for mental health issues. Assuming that mental health is a result of djin influence that can be cured by performing Hajj can potentially be tragic.

Whilst the Saudi government are responsible for the crowd intake and its management in the Hajj, another key group includes private organizers and Hajj campaign leaders. Every pilgrim from abroad is required to join a Hajj group from their respective countries. Hajj operators worldwide commonly take the role of applying for visas on behalf of their group members. In collaboration with large mosques, people who intend to go for Hajj are invited to practice sessions where they are taught the rites of Hajj from a jurisprudential viewpoint. Hearing the grand virtues of kissing the black stone and performing prayers by the Maqam Ibrahim is common, however,

pilgrims in such training sessions are likely to underestimate the challenges of mass multi-lingual crowds and high temperatures. Findings from a study of 136,000 Indian pilgrims revealed that more resources and awareness are needed as 83% of pilgrims reported not being adequately informed about the actual difficulties involved during the Hajj [66].

To support the Hajj authorities, the Saudi Ministry of Hajj could collaborate with the Federation of Islamic Medical Associations (FIMA) to create Hajj crowd safety courses that could be mandatory to complete as part of the visa process. Key Hajj plans and maps could also be shared with FIMA to help promote the plan worldwide and so that pilgrims would be conscious to avoid negatively affecting EMS. In relation to maps, all personnel involved in the Hajj including the ambulance crew also require advanced navigation training in the Hajj zone. The training needs to prepare the ambulance crew to manoeuvre in difficult situations and learn to navigate the Hajj zones using key landmarks.

From the month of Ramadan onward, social media could be used to promote Hajj plans and warn pilgrims against trespassing on ambulance routes with a focus on health risks and mortality rates. Crowd safety videos could also be displayed by airlines as well as provide leaflets to pilgrims to read during their flights. Pilots could emphasise crowd safety to pilgrims upon landing. At the Hajj terminal, pilgrims wait for transport to be taken to their destinations; this wait can take many hours. The Hajj staff could deliver crowd safety sessions to pilgrims in person in various languages. Hotels that accommodate pilgrims could also show crowd safety videos intermittently.

A factor that could be contributing to the acceptance of Hajj deaths is the notion that death during the pilgrimage is considered praiseworthy. Such a belief might be rooted in an incident recorded during the Hajj of Rasulullah when a camel bucked and the pilgrim riding it fell to his death [67][68]. Rasulullah comforted those grieving that the deceased will be resurrected and when he does, he will continue to recite the talbiyah, meaning glorification of God. This report requires a few considerations; 1) Rasulullah is attesting to the case of one specific pilgrim; which further attests that the pilgrim was sincere in his Hajj and that the fall was accidental. 2) A similar case is found in a battle context when a person was found to end his own life and Rasulullah did not guarantee the same outcome. 3) The reward of Hajj is described as the pilgrim would be forgiven their sins committed against God, however, one's dealings with humanity such as

debts, oppression, and injustice remain a matter that must be settled through seeking forgiveness from those wronged. A pilgrim who avoids foul behaviour was described by Rasulullah to return to a state whereby they are as sinless as the day they were born [67][68]. As such, the purpose of Hajj was never to die therein, but to return alive and to continue living a spiritual life. Given this context, those responsible for the health and safety of the pilgrims must exert every effort to ensure lives are not lost in Hajj.

Conclusion

The Hajj is one of the most aspired rituals by Muslims. The only country wherein the Hajj takes place is Saudi Arabia. As such, the burden of responsibility falls on the Saudi government to ensure the health and safety of over two million pilgrims. Accordingly, the Saudi government has certainly improved the Hajj zone by investing in grand constructions and expansions. The government has also showcased advanced surveillance technology for Hajj purposes along with impressively designed mega-ambulances. Thousands of personnel are deployed with supporting patients. The Hajj plan is also scripted in key documents. Despite such strenuous efforts, the challenge remains on the ground. Traffic control points and pilgrims sleeping on ambulance routes seem to trample these plans and render the authorities helpless.

Therefore, evaluating a range of ingress and egress models is crucial. Calculations for determining the intake of pilgrims must take into account the space required for ambulances and EMS. Ambulance routes could be paved in red and enclosed by high gates and guarded by the military. Medical tents could also be red. In relation to crowd management, the main obstacles that ambulances face need to be explored further; Is the interaction with walking pilgrims the main concern or that no specific routes are allocated for them? Hot spots in Mina, Arafat, and Muzdalifa where pilgrims crowd and block ambulance routes also need to be precisely located and investigated.

Moreover, whilst the Saudi government continue to revise and improve the Hajj plans, Hajj operators worldwide also need to take responsibility. All individuals intending to perform the Hajj must be psychologically prepared for the Hajj for instance, by passing a crowd safety course that could be required as part of the Hajj visa process. The Qur'an (5:32) states that to save one life is to save humanity whereas the killing of one individual is equal to killing humanity. Applying this verse to Hajj, the severity must be realised

that the ‘killing’ of even one pilgrim as a result of unnecessary and avoidable blocking of ambulances would be equal to the massacre of all pilgrims. Hajj operators must also emphasise that injustice toward patients in need of emergency medical attention is a matter related to the rights of people, a crime for which completing the rites of Hajj might not suffice to be forgiven. Rasulullah highlighted that ‘there is no intelligence like planning ahead’. Ultimately, a safe Hajj requires rigorous advanced planning that is collaborative between Saudi authorities and between Saudi Arabia and Muslim medical associations worldwide.

Lastly, concerning the future, Saudi Vision 2030 involves a trillion-dollar plan to create an awesome line. By contrast, the key question that lingers for now, is what investments are still required in the Hajj zone for pilgrims fighting for their lives to have a secure ambulance lane?

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Dignity of female pilgrims during tawaf: Revisiting proxemics in the Mataf to prevent any harassment

Usman Maravia

National Director BIMA Ethics team; Member of the Patient and Public Panel for the Northwest Ambulance Service; ESRC Centre for Corpus Approaches to Social Science (CASS), Lancaster University

Correspondence: u.maravia@lancaster.ac.uk

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Abstract

Sexual harassment has a long-term mental and physical impact on its victims, who are overrepresented as females. Increasing reports via social media have highlighted the occurrence of sexual harassment in the Mataf. A major factor that contributes to this problem and allows opportunities for perpetrators is high crowd density. This chapter provides an analysis of traditional approaches to performing tawaf, and jurisprudential matters related to the termination and resuming of tawaf. In light of the comparison between approaches to tawaf, classical and contemporary, limiting the crowd to 3 persons per m² would be safer for pilgrims. Allowing a crowd density of and over 5 persons/ m² is dangerous and makes female pilgrims vulnerable to sexual harassment. More importantly, the Mataf area with its history tracing back to Hajar, has always been a sacred space not only for males but equally for females.

Introduction

Sexual harassment, irrespective of age, race, and income, is a reality that women and girls face on daily basis in cities all around the world [1]. Women are also overrepresented among victims of sexual harassment whether they are alone in transit or among crowds [2]. As such, sexual harassment can be expected not only when women are by themselves but even in public spaces [3] where victims and perpetrators converge [4]. Given this common phenomenon, non-verbal, verbal, and physical sexual harassment [5] can be expected to occur in socially disorganised contexts that are characterised by poor social control [6]. Such unwanted sexual behaviours can severely impact women's ability to participate in public life [7]. Muslim women, on the other hand, could experience harassment on three levels: gender, race, and faith. A haven for Muslim women could be to break

away from the troubles of life and find time to undertake a spiritual journey to Mecca, especially for the Hajj.

Despite the millions of pilgrims who reminisce about their Hajj experience positively, not all women are as fortunate to have enjoyed a fulfilling spiritual experience. A rise in complaints by female pilgrims via social media [8] has revealed female experiences of sexual harassment during Hajj and Umrah. Such complaints could easily be dismissed socially as fake news and media propaganda, and might even be considered by some Muslims to be impossible. Irrespective of whether the incidents can be verified or the perpetrators can be brought to justice, the rise in concerns does warrant attention regarding the Hajj zone having safety procedures. Historically, female pilgrims have been known to be vulnerable; one historical account from the British colonial period reports

female pilgrims from India being onboarded an overcrowded ship only then to be physically examined for ‘medical and sanitation’ purposes by male staff [9]. The Prophet Muhammad (peace be upon him forthrightly) warned the Muslims against various forms of assaults against women. In his Farewell Hajj sermon, he insisted that people treat women with dignity [10]. Echoing this message, Dar al-Ifta Al-Azhar states that ‘sexual harassment is an unjustifiable crime’ [11].

Hidden effects of sexual harassment

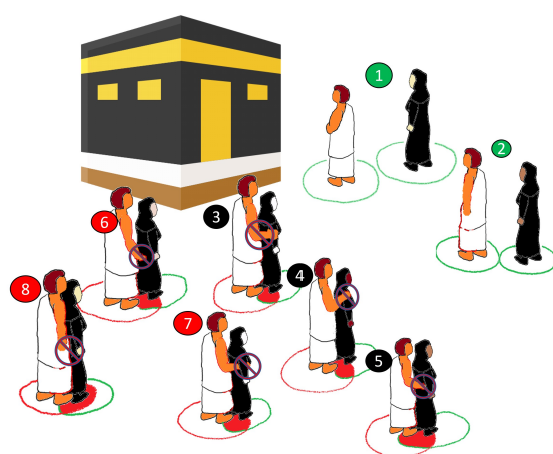
Victims of sexual harassment are likely to experience emotional and physical symptoms long-term possibly extending beyond a decade. The overwhelming experience, or the denial of it, can manifest as physical symptoms such as muscle aches, headaches, and chronic physical health problems with high blood pressure and blood sugar levels. The most common diagnoses for victims of sexual harassment are depression, anxiety, acute stress, and PTSD. For victims who experience sexual abuse earlier in life, symptoms are likely of long-term depression. Previous conditions that might have been controlled or resolved could be exacerbated with yet another experience of sexual abuse. The feelings of shame or guilt that a person might feel when sexually harassed during tawaf^a could devastate their self-esteem and spirituality. Moreover, the victim’s poor mental health can impact their family, friends, and colleagues.

Sexual harassment in a dense Mataf

Zina is a term used in Sharia law to describe a broad spectrum of sexual acts and behaviours that are unacceptable.

The intent behind sexual harassment could either be lustful or to express domination and power. The Prophet foretold that the greatest test for men will be the way they treat women [12]; this test could be interpreted as curbing sexual urges as well as practising restraint from urges of domination and power over females in unlawful ways. The occurrence of sexual harassment is not limited to occurring only in colleges, bars, or the military but can occur anywhere, including in sacred areas like the *Mataf*^b. The Prophet highlighted that Satan is very easily able to influence men’s attitudes and behaviours toward women [13]. On that note, the Quran lists women as the most lusted creation by men [14]. The majority of people committing acts of sexual violence are reported to be men and the majority of people experiencing it are reported to be women [15].

On a spectrum of sexual offences, a perpetrator in the Mataf might find opportunities to carry out a range of acts (see Figure 1 above) that would constitute sexual harassment. The *zina* of the eyes includes leering at female pilgrims; of the heart includes fantasising or blocking their movement; of the tongue includes cat-calling and making unwanted conversation to elicit personal details; of the legs includes stalking; of the hands includes stretching out an arm to prevent passage, non-consensual taking and sharing of photos. More serious forms of sexual offences include the perpetrator grabbing a female pilgrim’s scarf or dress, or her wrist [16] or arm, resting hands on her shoulders, or even touching her hip and waist area [17]. More serious offences could involve touching the thighs, pinching the buttocks [16], groping breasts [16][18] and even pressing one’s genitalia against a female [19] [20] [21]. Moving



Safe tawaf

1. Males and females horizontally distant
2. Males are ahead of females by a safe distance

Inappropriate behaviour

3. Holding a female’s arm
4. Resting hand on a female’s shoulder
5. Touching a female on the hip or waist area

Sexual assault

6. Touching a female’s buttocks
7. Groping a female’s breast
8. Pressing male genitalia against a female

Figure1. Forms of sexual harassment in the Mataf

away from such graphic descriptions of what constitutes sexual harassment, senior Saudi Arabia Interior Ministry official and spokesman, Maj. Gen. Mansour Al-Turki stated, “The law is clear ... Everyone understands what sexual harassment is. We are all Muslims and have been raised with Islamic values” [22].

Whilst the perpetrator desires such sexual pleasures, to treat an individual in this way, especially without their consent [23] and even more so despite their disapproval, is sexual objectification and antithetical to human dignity. Unwanted sexual experiences involving physical and non-physical contact are all forms of sexual harassment [24]. Such sexual victimisation, ranging from *zina khafi* (minor offences) to *zina haqeeqi* (which includes sexual assault and rape), is prohibited by Shariah law. Moreover, perpetrating these forms of sexual harassment is a direct violation of not only the dignity of females but also a violation against Almighty Allah for misconduct during a sacred time at a sacred place wherein the expectation is that His guests are to be treated with *aman*, meaning safety.

The Qur’an prohibits leering at women [25] whereas the Prophet sternly warned against touching women without their consent. In one Hadith, the Prophet explains that touching a woman without her consent is more severe than one’s head being pierced with an iron nail [26]. The words of the Prophet are stern yet they reiterate the hyperbolic message of Christ (upon whom be peace, forthrightly) who said that better it is for an individual to deliberately lose an eye than to sin with it and resultantly, the entire body is liable for punishment [27]. Christ on another occasion explained that to look at a woman lustfully is adultery of the heart [28]. In the Torah, such lustful coveting constitutes one of the ten commandments [29][30]. As such, unsolicited sexual contact with a female is strictly prohibited in Shariah law, and in the Abrahamic faiths. Moreover, the Quran categorically states that sexual misconduct is intolerable during Hajj [31]; whereby when sexual activity with one’s spouse is prohibited in the state of *ihram*, sexual victimisation of other pilgrims is much more severe. The merit of ‘returning from Hajj free of sins like the day one was born’ was promised by the Prophet on the condition that pilgrims refrain from sexual misconduct [32].

Radical increase in pilgrim numbers

Mecca is also known as Becca, the etymology of the latter geographical name is given a list of origins: a) They are simply dialects, as the Arabs would phonetically interchange *b* and *m* sounds; b) Bacca is the

area of the Ka’aba whilst Mecca is the city, and c) Becca is from the verb *bacca* to mean people bumping into one another in a crowd [33]. The last explanation might lead to the acceptance of overcrowding and close contact between genders. Additionally, the Qur’an promised and assured Abraham that Allah would inspire multitudes of people from distant places of the world to arrive for the sacred pilgrimage [34]. Naive females who perform tawaf might accept or be led to believe that close contact and ‘accidental’ touching is ‘normal’.

The journey to Mecca and the stay therein, however, is also described as being ‘safe’ [35]. However, safety is perhaps best understood from two dimensions: a) Those on their way to Hajj and who are in the Hajj zone are safe in the sense that they are under the merciful watch of Allah and their sins would be erased; but also b) in terms of practical safety measures, authorities need to take responsibility to safeguard pilgrims.

A comparison of the Prophetic tawaf model compared to tawaf approaches in the 21st century, however, reveals concerning differences to the detriment of female pilgrims.

The reported number of pilgrims in the Prophet’s Farewell Hajj is estimated between 90,000 to 114,000 [36]. According to Al-Mosleh, the pilgrim count for the 1315 AH Hajj (circa 1894) was estimated at 200,000 [37]; suggesting an increase of 75% over 13 centuries.

This calculation also implies that the number of pilgrims increases only slightly with 60-70 pilgrims more than the year before. After 1315 AH, in just 75 years, the pilgrim count exceeded exponentially with a 400% increase with over a million pilgrims by Hajj 1970 CE [37]. The reason for allowing such an incredible influx of pilgrims is mainly due to the overall increase in the human population, and accordingly, the Muslim population; as well as 21st-century breakthroughs in aviation. With the Hajj being an obligation for Muslims once in a lifetime, the desire of millions of Muslims to arrive at Mecca places incredible pressure on the Saudi Ministry of Hajj (henceforth MOH). Muslims’ desire for the Hajj is heightened with many believers viewing the ritual as a convenient means of forgiveness for a lifetime of sins.

Additional pressure from Muslim nations to demand access to Hajj adds pressure on the MOH; with refusal to allow entry possibly viewed as neglecting the rights of Muslims [38]. Consequently, Saudi Vision 2030 aims to accommodate five million people. A Hajj on that scale

would be 43 times greater than the scale of the Prophet's Hajj.

Ensuring the peace and safety of Muslims

With regards to denying entry for the Hajj, a central theme in the life of the Prophet is his being compelled to leave Mecca and settle in Medina. The Prophet yearned to return to Mecca and even when the Muslims were so close to finally performing the Umrah in 6 AH, the Meccans denied them entry and the Prophet amicably returned to Medina. Resultantly, the Prophet eventually performed his Hajj in 10 AH. Since the conquest of Mecca in 8 AH, Muslims have always valued the freedom to access the Haram as the right of Muslims.

However, the Hajj has been interrupted on many occasions and pilgrims, sometimes even those in Mecca were restricted access to Hajj for different reasons ranging from a) outbreak of epidemics diseases (968 CE, 1831 CE, cholera outbreaks between 1837-1858 CE, and the 2020 coronavirus pandemic); b) economic turmoil (1028 CE), c) conflicts (865 CE and 1256 CE); d) and instability of security (629 CE, 930 CE, 1099 CE, and 1799 CE). A question that arises is - should the MOH prioritise the safety of all pilgrims or allow as many Muslims to fulfil their obligation of Hajj? The Prophet's example demonstrates that he chose the welfare of the pilgrims; rather, he stipulated it as a condition. This being the case, if one does not have safe passage to the Hajj zone or fears their safety in the Hajj zone then such individuals have no obligation to perform the Hajj in that year. In the event of Hudebiya in 6 AH, the Prophet sensibly cancels his plans for Umrah due to favouring a peace treaty and calls for the Muslims to safely return to Medina. Consequently, some Muslims who died shortly after never found the opportunity to perform Hajj or Umrah. Nevertheless, peace and safety were the Prophet's choice rather than compelling Muslims to perform pilgrimage in danger. Such decisions are also in agreeance with Quranic guidelines of performing pilgrimage only when doing so would be safe [35].

Spatial considerations

The Prophet eventually performed the Hajj in 10 AH. Despite there not being a crowd limit, Muslims who were physically or mentally unwell to attend the Hajj themselves were excused. These individuals were given the option to either make Hajj arrangements for another time or delegate the Hajj to be performed by someone else on their behalf [39].

Furthermore, the Prophet allowed pilgrims flexibility to perform the rituals of Hajj in different order especially to avoid crowding. For a compendium of rulings and dispensations in Hajj due to crowding, see Al-Mosleh's work 'Al-Zahaam wa atharuhu fi'n nusuk' (Crowding and its impact on the provisions of Hajj and Umrah) [37].

A key location in Hajj and one which has the smallest surface area is the Mataf. Traditionally, the Mataf was considered to be the area between the walls of the Kabah (inclusive of the Hatim) up to the Maqam Ibrahim. The area beyond the Maqam was reserved for those engaged in salah. As such, upon completion of the tawaf, pilgrims would exit the Mataf and perform prayers beyond the Maqam. In the Farewell Hajj, between the 10th and the 13th of Dhul Hijjah, an estimated 114,000 pilgrims completed their tawaf; on average, an estimated 29,000 pilgrims would have been able to do the tawaf per day; with tawafs performed every 20-30 mins, the Mataf would have accommodated, at one moment, an estimated 600 pilgrims. The crowd density in the mataf could be estimated at two persons/ m2 (see also Figure 3, image 2); this density would also have allowed pilgrims to perform *raml* (quick-paced walking) safely. To separate those performing the tawaf from other visitors, the Mataf was fenced. Pilgrims intending to perform the tawaf were allowed access through the Bani Shayba gate. Accordingly, the amount of people that performed the Hajj with the Prophet appears to be in proportion to the Mataf capacity.

In Shia hadith literature, Imam Ja'far al-Sadiq is reported to have said that performing the tawaf beyond the Maqam is unacceptable [40]. In another narration, the Imam qualifies this statement for those who do so without a valid reason [41]. As such, both Sunni and Shia Muslims agree that performing the tawaf beyond the Maqam is permitted due to necessity. However, today the Mataf area itself has been expanded beyond the Maqam by approximately 50 metres. Consequently, what was once tolerated as a necessity has today become the norm. Because of such expansions - and by comparison to the small scale of pilgrims in the Prophet's Hajj - more questions arise today:

1. Should the aim of those authorised with supervising the Hajj aim to limit the number of pilgrims according to the original Mataf capacity?

2. Should the Mataf be expanded according to the increasing demand of a greater number of pilgrims?

Evidently, for 13 centuries, this question did not demand such attention as much as in the 21st century.

The argument in favour of expansion is rooted in the Quranic verse 'Allah wishes ease for you and does not wish hardship' [42][43][44][45]. On the one hand, Muslim scholars argue that God wishing ease implies that the Mataf area can be extended to allow for more pilgrims. However, the former Dean of the Shariah College at Najran University Abid Sufyani observed that many pilgrims who save money their whole lives to perform the Hajj are unable to perform the tawaf [46]. Sufyani criticises this phenomenon as an 'injustice' toward pilgrims. If on the other hand, the Mataf area is geographically restricted, then based on the fact that not all pilgrims would physically be able to perform the obligatory Hajj tawaf within a reasonable time, many Muslims would be excused from attending and performing the Hajj. Where individuals face difficulties to adhere to Sharia law, *rukhsa* (exclusive dispensation) is offered whereas where large populations are affected such as when the Hajj ceased in the past due to various crises then they are granted general *taysir*, meaning general exemption [37]. Whereas the former interpretation implies a greater degree of obligation to perform the Hajj, the latter emphasises a Hajj that is safe and dignified.

Another related matter that arises is how many people should be permitted in the Mataf. Is the aim of expanding the Mataf to allow more pilgrims to perform tawaf or to allow them to perform tawaf with ease? Continuous expansion of the Mataf with increasing crowd density means more and more pilgrims are performing tawaf with increasing difficulty; which is contrary to the idea of 'ease' and instead creates 'hardship'. An inevitable hardship that arises in large dense crowds is losing personal safe space. Crowded in arms reach of one another from all sides allows for much inappropriate physical contact. Despite the short Mataf space in the Prophet's time and a relatively much smaller number of pilgrims, the Prophet was very much aware and observant of unwelcome behaviour. Two types of unwelcome behaviours that are condemned in hadith literature include a) aggressive behaviours (such as pushing by hand or with the shoulder, nudging, and pushing between pilgrims to get ahead) and b) non-consensual sexual contact.

The Prophet is reported to have cautioned Umar ibn al-Khattab to not push against the crowd, especially near the black stone [47]; thereby physically and mentally affecting weaker pilgrims. The Prophet advised that the black stone should be kissed only if it is safe for the individual without harming anyone in the process. The alternative to kissing, and the option which the Prophet

himself preferred in his Hajj was *istilam*, meaning to simply gesture a kiss [48]. The reason for the Prophet avoiding kissing the stone is believed to be that he did not want to encourage the masses to compete against one another [35]. With regard to aggressive behaviour, to overlook, monitor and control the behaviour of pilgrims at the stoning ritual, the Prophet did so by mounting a camel. On one occasion, when he noticed pilgrims carrying larger stones, he immediately called out, 'People! Beware of murder, use tiny stones!' [49]

With regards to women in crowds, the Prophet's wife Sauda was weary of proceeding from Muzdalifa to Mecca due to the large crowd. Likewise, his wife Umm Salama also raised concerns about the Mataf being crowded by men. The former was advised to leave Muzdalifa ahead of the male pilgrims whereas the latter was instructed to perform the tawaf on a camel away from the male pilgrims. Furthermore, although men and women did perform tawaf at the same time in the Mataf, each gender had its own designated space [50].

Men are described as being closer to the Kabah performing shorter tawafs whilst the women performed longer tawafs closer to the Maqam.

Whilst such organisation might initially appear unfair, a few reasons need to be considered:

1. During congregational prayers also, the women had their designated prayer area behind the males to allow them convenient exit after prayer before the males [51].
2. With females closer to the Bani Shayba gate, they could easily exit the Mataf area.
3. If the women are closer to the Kabah and then move toward the outer circle, they would have to rely on the men to allow them passage [52].
4. With more female pilgrims, they would require greater surface area allocated to them, hence the further away from the Kabah, the greater the space [50].
5. Weaker pilgrims relied on being carried by people or by mounting camels; such provisions require more space and so these services were accommodated on the outer circles closer to the Maqam [52].
6. The segregation of males and females in the Mataf would also have prevented crowding and pushing into one another [53].

The Umayyad ruler Ibn Hisham (d. 743) declared that men and women were no longer permitted to perform tawaf at the same time; this policy led to a discussion as to the way tawaf was managed during the time of the Prophet. In a discussion between Ata bin Abi Rabah and Aisha, the latter clarifies that even in the Prophet's time the men and women did not perform tawaf in mixed

crowds; the segregation was not in terms of time but space i.e. during the Prophet's time, males and females did perform tawaf at the same time but spatially away from each other [54]. During the reign of Umar ibn al-Khattab, he ensured that during tawaf, men did not invade the female crowd [55].

Even in pre-Islamic Arabia, the men did tawaf in daylight and the women did so under the cover of darkness [56]. Al-Mosleh writes that the manner in which men and women push against each other in the crowd nowadays cannot be endorsed in Shariah law [37]. Lebanese Imam, Sheikh Hasan Al-Shall also stated that men must refrain from crowding around women because it is a severe violation; the sanctity of the Haram and the laws of Almighty Allah must be upheld if one hopes for an accepted Hajj [57]. The sanctity of the Haram demands that if an individual enters it to remain safe from wild beasts then they must be permitted entry and kept safe [58]. By contrast, a female pilgrim seeking closeness to Allah through tawaf deserves the utmost respect and dignity.

The discussion around whether or not tawaf is permitted beyond the Maqam becomes obsolete given the fact that the present design of the Mataf constitutes the entirety of the Haram courtyard. Some groups of pilgrims, mostly women and wheelchair users, perform their tawaf on a circular ramp elevated from the ground and yet more pilgrims perform the tawaf beyond even the courtyard on three levels. The design of al-Masjid al-Haram in the 21st century leaves readers with a sense of surrealism when compared to the way the masjid appeared in the past 13 centuries. Nevertheless, the manner in which the earlier tawaf was conducted must be considered for the lessons it can provide concerning the protection of female pilgrims. Importantly, the Mataf, as previously discussed, consisted of a shorter space that was supervised by the Prophet whilst mounting a camel. This approach allowed the Prophet to effectively manage the crowd as well as to observe and prevent any misconduct. Equally, the pilgrims would also have felt safer under the Prophet's supervision.

Another difference to note in the modern design of the Haram is that males are seen occupying not only the original Mataf area but up to a radius of approximately 30 metres. In contrast to earlier times, female pilgrims today find themselves performing the tawaf at much greater distances from the original Mataf and that too by walking.

The major schools of Islamic jurisprudence agree that wudhu in tawaf is needed for a minimum of the first three

and a half rounds. The Maliki and Hanbali schools assert that the termination of wudhu results in the tawaf being nullified. The Jafari, Hanafi, and Shafi schools, however, agree that the tawaf remains pending. If one's wudhu is terminated after the first three and a half rounds then according to the Maliki and Hanbali schools, fresh wudhu is necessary. The Jafari and Hanafi schools, however, agree that having done half of the tawaf, if one's wudhu is terminated, there is no such requirement. When Sheikh Ibn Uthaymeen was asked about the need to perform wudhu in these circumstances, his response was "How long would it take people to exit the courtyard? How long would they then need to wait because the toilets are occupied? How long after that to find water? How long after that to return to the courtyard?" Given the extreme difficulty, Ibn Uthaymeen concludes that 'therefore, when a person's wudhu is terminated in tawaf, especially in these 'dire times', continuing the tawaf would be acceptable' [60].

As for resuming the tawaf, the Jafari, Hanafi, and Shafi schools agree that when resuming tawaf, one may continue from the same last location. Another similar scenario arises when a pilgrim requires a rest break or feels the need to exit an increasingly dense crowd. In such cases, based on above mentioned principles, according to the Jafari and Hanafi schools, one may simply pause their tawaf and resume from the same location once they are ready to continue with the tawaf [37].

Approaches to tawaf in a mixed crowd

Because female pilgrims are likely to want to avoid undertaking such long lapses, they are likely to get closer to the Kabah by infiltrating the male crowd. Seeing a less dense crowd in the Mataf, the motivation for getting closer could also include additional factors such as a) saving time, b) the belief that the closer the tawaf to the Kabah, the greater the reward, or c) wanting to perform the tawaf with family and fellow pilgrims. Compared to previous centuries, such scenarios have led to a change in the way tawaf is performed in modern times. Classical sources discuss males and females performing tawaf separately. In modern times, female pilgrims are seen to infiltrate male crowds in various ways:

1. by being shielded by their husbands or family members
2. by creating a large cell with a male wall with females inside the cell (Photo A)
3. by creating a large cell with a female wall with females inside the cell
4. by joining in as small groups of females or even individually.

Location	Distance from the Kabah centre (radius in metres)	Distance of one lapse (circumference in m)	Tawaf distance (in metres)	Tawaf distance (in miles)	Tawaf distance (in km)
Close to the Kabah	11-18	70-113	791	0.5	0.8
Closer to the Maqam	18-25	113-157	1099	0.7	1.1
Beyond the Maqam	25-32	157-201	1407	0.9	1.4
Two-thirds closer to the Kabah	32-39	201-245	1715	1.1	1.7
Two-thirds away from the Kabah	39-46	245-289	2023	1.3	2.0
Outer circles of the courtyard	46-53	289-333	2331	1.4	2.3
Closer to the edge of the courtyard	53-60	333-376	2632	1.6	2.6
Beyond the courtyard	60-67	376-420	2940	1.8	2.9

Table 1. Estimated tawaf distances in relation to the Kabah



Figure2. Cell with male wall and females within [61]

Although taking approaches III and IV appear safe in less dense crowds, crowd management in Hajj times does not have the most admirable reputation. What might appear to be a moving crowd with a density of 2 people/m² (Figure 3, Image 2) can appear appealing to female pilgrims to get closer to the Kabah to kiss the Black Stone, supplicate at the Multazam, or touch the kiswa [59][62].

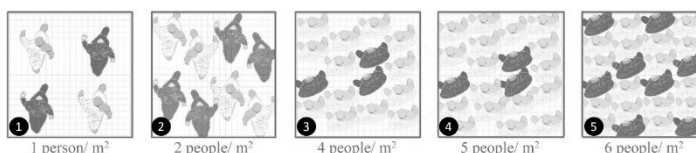


Figure3. Crowd density per square metre (Adaptation of Still, 2011) [63]

However, during the course of performing tawaf, there is a risk that crowd density will increase. Concerns arise then with approach IV, especially in a highly dense crowd. For instance, 4 people/m² (Figure 3, image 3) is considered close together yet this is safe when the crowd is static. This level of density is similar to people queuing in the UK or in the US [64]. The Haram, however, is reported to have a large influx of 28,000 pilgrims leading to a crowd density of 4 people/m². At 5 people/m², physical contact between people is unavoidable and

instead of walking, the crowd would be shuffling; rather aerial images of the crowd would show it as static. Such density is not advised for a moving crowd because it would lead to unsafe pushing and shoving. During peak times in Ramadan and Hajj, a moving crowd of 40,000 pilgrims in the Haram courtyard can lead to a crowd density of 6 people/m². This high level of density is considered dangerous, especially because not only would female pilgrims be unable to maintain personal distance from men, but the latter would also enter the females' intimate space [65] (see Figure 4 below). Male and female pilgrims are most likely to make physical contact. Moreover, being unable to keep a wider stance, pilgrims can easily trip. In worst cases, pilgrims can lose autonomous movement and instead be pushed involuntarily by the crowd.

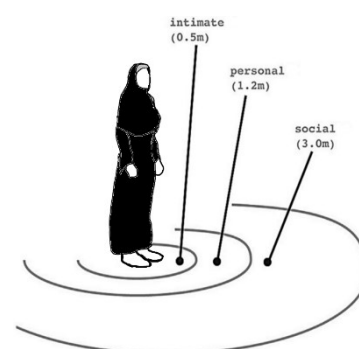


Figure4. Distances (Adapted from Alghamdi et al.) [66]

Such scenarios can create many difficulties, especially for female pilgrims. If they are about to fall, they might find a male pilgrim grabbing them with the intent to save them from tripping; or even holding onto them with the intent to 'prevent' females from falling. Some males might hold on to females to support themselves. In extremely dense crowd situations, where intimate space is lost, the chances of sexual misconduct also increase.

Some male pilgrims might seek an opportunity to target specific female pilgrims through stalking. As the crowd density increases, difficulty arises to view the visibility of hand movements. With pilgrims unable to see who is behind them or turn around to see, female pilgrims in such positions are at increased risk of sexual victimisation.



Figure5: female-centric tawaf from Hajj 2020 [67]- [68]

One seemingly unprecedented approach was implemented in Hajj 2020 during the coronavirus pandemic period (see Figure 5 above). This approach involves pilgrims maintaining a distance of approximately 2m apart. This distance also means that the crowd density is reduced to one person/ m² and is very safe. Moreover, females are seen performing the shortest tawafs closest to the Kabah whilst the males performed the longest tawafs on the outer circles. Whilst this approach was possible due to the restrictions during the pandemic, alternative solutions for regular peak times

involve seven inward and outward spiralling designs to a) direct traffic with a one-way system, b) overcome the problem of pilgrims losing count of tawaf rounds, but importantly, c) maintain better ingress and egress control [69][70].

Challenging sexist attitudes and beliefs

Various pyramids have been developed to illustrate foundational attitudes and beliefs that can contribute to sexual violence and allow it to continue. The pyramid of sexual harassment against female pilgrims (Figure 6 below) is adapted from existing pyramids of sexual violence developed by anti-sexual violence educators [71][72].

The pyramid illustrates possible underlying factors that lead to sexual harassment against female pilgrims in the Mataf. The initial reaction to hearing such incidents taking place in the haram can create reactions of disbelief and anger. Individual acts of prejudice could involve considering the victim to be the cause of the problem; by making comments such as ‘it’s her fault for doing tawaf among men’ or ‘maybe she wanted the attention’. Cultural micro-aggressions could involve Muslims defending the perpetrator by saying ‘boys will be boys’ or ‘women should do tawaf far away from the men’. The greater problem, however, is that such sexual harassment is rooted in power and entitlement.

By advancing inappropriate non-consensual sexual contact, the perpetrator is acting in their own interest and disregarding the needs and boundaries of females and their autonomy. The Quran warns ‘Do not even go near zina’. From an Islamic viewpoint, therefore, the perpetrator is guilty of disregarding the boundaries set even by Almighty Allah. The perpetrator’s audacity to cross these boundaries reveals certain attitudes and beliefs whereby they feel a sense of privilege to dehumanise or devalue females. The poor crowd control in Hajj times, despite viral complaints on social media, could arguably be a symptom of a much deeper-rooted ideology which involves racism, sexism, and sectarianism. Therefore, to treat the symptoms at the top of the pyramid, the foundation needs to be challenged and problems uprooted.



Figure6. Pyramid of sexual harassment against female pilgrims

Recommendations

Sexual harassment needs to be tackled first and foremost by addressing the root of the problem - sexist attitudes, beliefs and institutionalised patriarchy. Action needs to be taken not only by the MOH but by Muslims and faith leaders collectively worldwide. Hajj operators also need to prioritise areas of training required for pilgrim safety.

Faith leaders

Sexual harassment needs to be challenged by faith leaders explicitly and more frequently. Faith leaders are known to regularly remind males to lower their gazes, avoid unnecessary intermingling, and engage in pre-marital and extra-marital affairs. Such preaching helps to prevent sexual harassment, however, actual cases of sexual harassment also need to be condemned. Calling out sexual harassment must not be conflated with a poor representation of the faith. Rather, faith demands that sexual harassment is acknowledged and dealt with i.e. strong faith demands one to take care of one another by condemning instances of sexual harassment. To raise awareness of this issue, faith leaders could also verbally include victims of sexual harassment in their

congregational supplications. Moreover, faith leaders need to also be mindful of their choice of words and phrases in their lectures for the way they represent women. Islam teaches that males and females have equal status before God and each individual excels only by piety. The purpose of women in society, therefore, should not be limited in discussions to only marriage purposes, but to their greater role and contributions to the world – like when mention is made of luminaries (upon whom be peace) such as Maryam, Khadija, and Fatima al-Zahra.

Sexist jokes or over-focussing on narratives about women's inabilities, and shortcomings, and undermining their contributions to society only contributes to the problem of sexual harassment. As such, congregations need to challenge such sexist linguistic representations. In the changing landscape of the 21st century, Imams continue to lecture from pulpits, however, the voice of a female victim via social media is likely to have greater national, if not worldwide, influence.

Ministry of Hajj and security personnel

Addressing sexist attitudes must also be reiterated by the MOH. Before Hajj commences, the largest crowds of

pilgrims before are in the Haramain. The Imams of both mosques can emphasise the importance of treating female pilgrims with respect and dignity. Sermons during the Hajj season, including the Arafah sermon, can also be addressed directly to authorities responsible for crowd control and emphasise the fact that poor control could result not only in physical casualties but could also allow opportunities for sexual harassment.

Furthermore, easy-to-comprehend and follow policies for pilgrims need to be made transparent. The reporting process needs to allow victims to be able to voice their concerns in common languages to female staff. The process must also include policies on ways to report incidents of sexual harassment if perpetrated by male security officers. The MOH must also consider the possibility that black women are likely to be more hesitant to report their experiences out of fear that they will be ignored or treated unfairly. A clear process is crucial so that victims can avoid resorting to gossip or social media, which is likely to compromise formal investigations. Victims of sexual health should seek the professional help of a therapist as a first step. Posting personal experiences of sexual harassment online could result in negative reactions from other users, which would only add to the victim's trauma [73]. Additionally, female pilgrims travel to the Hajj zone from various parts of the world and expect to be treated with respect for their gender not only at airport customs but with even greater dignity in the Haram.

Strict crowd control and surveillance must be upheld by authorities. Trained male and female security personnel must be present and strategically located around the Mataf ideally on higher platforms. Occasions, when sexual harassment is highly likely, are when the crowd is dense. Enforced legislation is known to limit the range of sexual crimes [5]. Accordingly, the Mataf crowd control needs to be a matter of legislation endorsed by the criminal justice system, which in the case of negligence, would hold the crowd management team legally responsible. Perhaps, the legal limit for a moving crowd ought to be no more than 3 people/ m² for mixed crowds so that safe space is maintained between pilgrims and hand movements can be detected by surveillance cameras and security officers. Should the crowd density increase to 5 people/ m², inquiries need to be made to investigate reasons why the crowd management team was unable to maintain control. Additionally, better ingress and egress models that consider physiological, psychological and sociological aspects of human actions are required to produce simulations of crowd scenarios that are more realistic [59].

To limit opposing currents during the Mataf, the Zuhr and Asr prayers could be combined and likewise, the Maghrib and Esha prayers. This approach would allow pilgrims to continue tawaf in a one-directional current without additional visitors entering the Mataf waiting for congregational prayers. Moreover, the majority of the pilgrims are travellers, hence, greater the validity for combining prayers. Pilgrims who are unable to maintain their wudhu after 3. 5 rounds would also be able to complete their tawaf without the pressure of performing wudhu for congregational prayers.

Hajj operators

A key role that Hajj operators can play is to educate their groups by providing training on safety for female pilgrims. The training could involve the importance of treating female pilgrims with respect and dignity; addressing sexist attitudes; explaining appropriate conduct in a crowded setting, and providing steps to report sexual harassment. Before and after performing tawaf and after similar crowded occasions, Hajj operators must also pay careful attention to changes in the behaviour of female pilgrims. Some victims struggle to report their experiences after experiencing complex emotions after a traumatic event. Hajj operators must prioritise the maqasid al-Shariah (objectives of the law) which includes respecting human dignity.

Early Islamic sources highlight that following the massacre at Karbala, one pilgrim asked Ibn Umar about a judicial ruling related to mosquito blood. Ibn Umar retorted, 'The man asks me about mosquito blood after they took the life of the Prophet's grandson!' [74] The lesson for Hajj operators to learn from this encounter is that one might be tempted to over-focus on minor rulings and lose sight of the great importance that Islam places on the dignity and sanctity of human life. The same Ibn Umar narrated that he once saw the Prophet performing the tawaf saying to the Kabah:

مَا أَطْيَبَكَ وَأَطْيَبَ رِيحَكَ مَا أَعْظَمَكَ وَأَعْظَمَ حُرْمَتَكَ وَالَّذِي نَفْسُ مُحَمَّدٍ بِيَدِهِ
لِحُرْمَةِ الْمُؤْمِنِ أَعْظَمُ عِنْدَ اللَّهِ حُرْمَةً مِنْكَ

"How pure you are and how sweet is your fragrance! How sacred you are and how great is your sanctity. But I swear by He who has authority over my soul, for Allah, greater than your sanctity is the sanctity of a believer [75].

Female pilgrims

Pilgrims, male and female, intending to perform the tawaf are strongly advised to not go alone. Upon

reaching the Mataf, pilgrims should have awareness of the locations of security officers. The outermost circle of pilgrims performing the tawaf is the safest route because of its lesser density and better flow of movement.

Upon completing the tawaf, the outermost circle also allows for a convenient exit. Although a less dense crowd can be tempting to move closer to the Kabah, pilgrims need to be observant of any increase in crowd density by having spatial awareness.

As more people join the Mataf during one's tawaf, crowd density is likely to increase. Upon noticing an increase in crowd density, pilgrims are advised to start moving further toward the outer circle. If a pilgrim experiences sexual harassment, they should call out the action as well as report their experience according to policy. Sexual victimisation can also be a stigmatised experience [76][77], however, keeping such traumatising experiences a secret would be toxic to physical and mental health as well as social and spiritual health.

Conclusion

Whilst the sacred time and place of Hajj serve as reminders of being more God-conscious, hajj authorities need to ensure that pilgrims are not left vulnerable. Female pilgrims performing tawaf, especially for the first time, are not only likely to be in awe of the majestic atmosphere of the Haram but are also likely to be overwhelmed by the dense crowd. Resultantly, seeing a less dense crowd might encourage female pilgrims to gain closeness to the Kabah as well as wanting to complete their rituals following their understanding of Islamic jurisprudence.

Perhaps, the unexpected scenario for female pilgrims is when authorities allow a large influx of people to enter the Mataf in exponential numbers resulting in a dense crowd that is dangerously shuffling. Trapped among men, female pilgrims are left vulnerable to sexual harassment. Along with provisions for males and females, Mataf designs also need to consider intersex pilgrims.

The harms of sexual harassment must not be underestimated as it can have detrimental long-term effects on the victim's mental and physical health. A clear action plan needs to be created and enforced by the MOH to provide safety to all pilgrims, especially to the female pilgrims in the Mataf. Reports and symptoms must not be dismissed as victims 'over-reacting' or being 'dramatic'. Pilgrims must bear in mind, that other

pilgrims might already have underlying health conditions that they are aiming to spiritually overcome. Sexual harassment can exacerbate those conditions. Should a female pilgrim report sexual harassment, a fair and just policy needs to be in place so that the crime can be reported. A moving crowd density of 5 people/ m2 needs to be met with legal inquiries.

Revisiting early models of the Mataf and approaches to tawaf could help to refute sexist attitudes. Although historical accounts depict the ritual whereby male pilgrims performed tawaf closer to the Ka'bah and females did so around the men, the same argument in the context of today's Mataf practices would be a misapplication. The maximum number of pilgrims needs to be limited to an amount that the MOH can effectively handle. Sexist attitudes and institutionalised patriarchy need to be addressed by Muslims worldwide through the lens of respect and human dignity toward female pilgrims.

Notes

- 1 *Tawaf is one of the essential acts of Hajj, which consists of walking seven lapses around the Kaba.*
- 2 *The Mataf is the area wherein pilgrims perform the tawaf.*

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Genetically Manipulated Pigs in Xenotransplantation: *haram* or *halāl*

Dr. Kee Lam Wong ¹, Prof, Waleed Fekry Faris ²

1- MBBS (HK) MTH (Queensland) MD (HK) FRCP (Edin) FRACP FHKCP FHKAM (Medicine) - Rheumatologist in Private Practice (Hong Kong) and International Institute of Islamic Thoughts and Civilization, International Islamic University Malaysia, Kuala Lumpur, Malaysia.

2- PhD, Virginia Tech University, USA; MSc and BSc (Mechanical Engineering), Zigzag University, Egypt. - Professor Dr, International Institute of Islamic Thoughts and Civilization and Department of Mechanical Engineering, International Islamic University Malaysia, Kuala Lumpur, Malaysia.

Correspondence: Dr Kee Lam Wong wongkl7352507@gmail.com

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Abstract

Allotransplantation (AT) is the accepted mode of treatment for patients with organ failures. Perpetual (human) Organ Shortages in developed and developing countries limit the number of patients that can benefit from this treatment. In addition, organ shortages create enormous ethical controversies, illegal activities and possibly injustices. Xenotransplantation (XT), especially porcine xenotransplantation (PXT), may provide the solution to Organ Shortages and solve their consequent ethical problems.

Recent advances in genetic manipulation (GM) of the porcine donor genome and blastocyst complementation (BC) have the potential to ameliorate or abrogate the obstacles to human PXT. Once PXT is successful in clinical transplantation, Organ Transplantation(OT) will enter a new era.

From the Islamic perspectives, opinions are divided on use of therapeutic products or organs derived from the pigs. *istihalah* (transformation), *ḍarūrah* (dire necessity) and *maṣlahāh* (public interests) have been applied in deliberations and decisions to permit such utilization. This paper reviews the prohibition and permissibility of GM in porcine biomedical products and organs with special emphasis on porcine knockout, porcine transgenesis, human-porcine chimera and animal welfare in PXT.

Introduction

Shari'ah governs the life of Muslims to ensure that the purposes of human creations are fulfilled in this world and hereafter. This entails the coverage of public interests

and all humanities [1]. *Shari'ah* laws have entrenched flexibility to avoid hardships or injuries such that Muslims do not have to suffer physically or mentally to be compliant with these obligations, rules and regulations. [2].

halāl is what is/are permissible and lawful whereas *haram* is what is/are prohibited and punishable. The Qur'an prohibits the consumption of pork (Al-Baqarah 2:173; Al-Ma'idah 5:3; Al-An'am 6: 119; Al-An'am 6:145; An-Nahl 16:115) and arguably, all products related to pigs. Conditional permissibility is allowed when *is it halah* (transformation), *darūrah* (dire necessity) or *maṣlahāh* (public interest) is accepted.

Human Organ Shortages in AT cause enormous medical and bioethical controversies and illegal activities. Pigs are the preferred donor animals in human-XT because of anatomical and physiological compatibility with potentially rapid and unlimited supply [3]. GMs provide the much-needed technology to overcome the obstacles to PXT [4]. Successful PXT will revolutionize the whole field of OT. What have been judged as *haram* may become *halāl* if successful PXT is attained.

istihalah, *darūrah*, *maṣlahāh* and permissibility of *haram* treatment

The objectives of the *Shari'ah* are aiming for the welfare and benefits of the person, ummah and community at large. It is not penalizing and scaled. Derived from *Shari'ah* is *maqāṣid shari'ah* that was initially established for the purpose of protection of the five hierarchical necessity higher objectives: *al-dīn* (faith), *al-naḥs* (life), *al-'ird* (dignity or progeny), *al-'aql* (intellect or mind) and *al-māl* (property or wealth). In addition to the necessity (*darūri*) *maqāṣid*, Padela introduced two complementary *maqāṣid*: needful (*hājī*) *maqāṣid* and the enhancing (*taḥsīnī*) *maqāṣid* [5].

Two common mechanisms are used in bioethical deliberations to reverse treatments from *haram* (prohibitory) to *halāl* (permissible):

a) *istihalah*: the *haram* products or ingredients have undergone a transformation process that changes their (phenotypic) appearances; physical, chemical, biochemical or genetic properties; identifiable characteristics or mode of applications [6] [7]. Sufficient dilution, minute quantities or unavoidable contamination may also make such products or treatment permissible [8] [9] [10].

b) *darūrah*: the basis of *darūrah* is the protection or preservation of the necessity *maqāṣid shari'ah*. If the pre-conditions for *darūrah* are satisfied (Table 1), a prohibited treatment becomes permissible (*halāl*).

The often-under-emphasized issue in *darūrah* is the effects of the medical condition(s) beyond the person. In Islam, *maṣlahāh* refers to something good that could bring benefit to the doer in this world and the hereafter [11]. These include the interests (benefits and harms) of the person, the ummah and community at large. However, *maṣlahāh* does not give a blanket approval for permissibility. The application of *maṣlahāh* must be extremely careful, may be restricted and must not be used to create a separate unprincipled legal system on their own. Any deviation from or suspension of *Shari'ah* laws because of public interest (*maṣlahāh*) must not contradict the higher moral values of *Shari'ah* [12].

Organ shortages have resulted in numerous bioethical issues. Some of these can amount to injustice. These include:

- Long waiting lists that prolong unnecessary sufferings, disease burdens on the person, caregivers, family, community and nation.
- Patients dying while on the waiting list. About 40% of patients on kidney transplant waiting lists may die in 5 years [3] and 43% of patients waiting for heart transplant died or become too sick for a heart transplant [13].
- Strict inclusion criteria for AT that exclude patients with milder but medically significant organ failures.
- Exclusions for AT that are based on age, co-morbidities, HLA sensitization etc.
- Illegal activities e.g. organ trading, trafficking, duress, exploitation, transplantation commercialism, transplantation tourism, forced organ harvesting etc. [14] [15] [16] [17]. The sales of organs from Muslim and non-Muslim citizens of poor states, refugees and migrant workers etc. are well known with numerous anecdotes. These types of transplanted related crimes are often under-reported and are estimated to occur in 5 – 10% of global organ transplants [15]. In 2018, about 40 million of people were victims of 'the trafficking of human beings for the purpose of organ removal' [16].
- Controversies in definition and acceptance of brain death or donation after circulatory determination of death (DCDD) that facilitate human organ procurements [18].

If PXT is successful, porcine organs become tradable commodities and available to all the patients with organ failures. The potentially unlimited supply of organs could satisfy the demands for OT and solve these bioethical

issues. For Muslims, PXT can stop the procuring of human organs from living or deceased donors; eliminate the black markets for human organs and the exploitation of the under-privileged Muslims; avoid the controversies of brain death [19] or DCDD and provide much needed justice to all the patients.

Porcine derived treatment: overview and established permissibility

Pork is *haram*. However, a wide range of porcine derived products and appliances are permitted to be used medically for a long time. In the contemporary period and during the life time of the Prophet, PBUH, pigs were grown and bred as source of food (pork) and hide. It is not envisaged that pigs can be used for other purposes, as known today. The often-quoted harmful effects from pork or pigs, including various porcine transmissible diseases [20] could be controllable or eliminated through meticulous porcine husbandry (*vide infra*) [21]. The metabolic effects from ingestion of pork or porcine organs, like hyperlipidaemia and gout, will not appear in recipients of Organ PXT. It is arguable whether these reasons could still be used to reject PXT.

The jurists' opinions are divided whether porcine derived biomedical products or treatments are *haram* or *halāl* [20]:

- haram*: pork and all porcine products are prohibited.
- halāl* after *istihalah* or *ḍarūrah* invoked [8].
- halāl* for *maṣlahāh* where benefits exceed the harms.

The extent of application of these general principles varies. A minority jurist school (Zhiri) opined that only pork is *haram*. Other porcine products are permissible. *shāfi* and *hanbalī* schools limit the application of *istihalah* to a few circumstances only e.g. wine to vinegar and tanned animal skins [8]. However, most scholars permit the use of non-*halāl* ingredients in medications or treatments through *istihalah*. Where *istihalah* is disallowed, *ḍarūrah* *maṣlahāh* applied to permit *haram* treatments in specific situations. In using *maṣlahāh*, the negative impacts of the harmful porcine xenozoonoses need to be excluded as well.

Porcine therapeutic products or appliances, that have been permitted, include porcine heart valves that are used for respective valvular replacements [20] [22], Clexane in post-partum women [23], gelatin in vaccines and capsules, and trypsin in vaccines [6] [7], porcine surgical products [24].

Cells and Organs PXT: Compatibility and Obstacles

As in all OTs, successful PXTs must overcome the various obstacles listed in Table 2.

From the Islamic Perspectives, PXTs also have to satisfy the requirements involving the recipients, donor pigs, the PXT process and the community at large (Table 3). In Islamic bioethics, avoidance of harm presides over benefits. Specifically, the first priority in PXT is the minimization or prevention of porcine xenozoonoses that may affect the recipients or spread to the community [5] [25] [26]. Researches will not be permissible if there were harms or violation to the rights of the patients, the community at large or the donor animals [11][27].

For both Cells and Organ PXT, GMs in pigs can enhance the survival and functioning of the Porcine Xenograft (PXG). More and more GMs have been investigated and are available for experimental and clinical studies [4] [28].

The often-neglected issue in PXT is the requirement of good animal husbandry [29]. The veterinary staff and facilities are responsible for taking care of the pigs from isolation and breeding to ova, zygote and blastocyst extractions, post-procedure care, operative delivery, early colostrum weaning etc. [21] Appropriate considerations to the welfare of animals must be given [30]. The animals after GM must be able to live well, have close to normal physiologies, survive and reproduce [31].

However, the more the GMs, the more the porcine genome will deviate from the wild type. This may affect the livelihood and welfare of the donor animals *per se*. Deleting some genes, e.g. SLA class I genes, may increase the risks of infection or cancer in the host animals [32]. Respective human genes are increasingly added to the pig genome to produce the more desirable human proteins. These pigs become more humanized and may have increased risks of trans-species microbe mutations and contracting human pathogens. Thus, over-zealous GMs may not be beneficial and should be avoided.

Genetic manipulations in Pigs: *haram* or *halāl*

From the Islamic perspectives, all scientific researches, advances and developments must conform with Islamic ethics as prescribed in the Qur'an, hadiths and sunnah;

and be compliant with *Shari'ah* [27] [33]. Researchers should have bravery, honesty, consideration, experience, fairness and justice, and be knowledgeable. In simple terms, GMs in pigs have to follow 'the process of evidence, justification and truth' [30]. The process of deliberations for GMs will involve determination of permissibility from the source, the process and outcome of GMs to their clinical benefits and harms.

The techniques for GM have evolved rapidly over the last 30 years. Clustered regularly interspaced short palindromic repeats associated with protein 9 (CRISPR/Cas9) revolutionizes the whole field of GM and is the most promising and efficient technology that can be applied to PXT [28] [34]. Two predominant GM groups are available: knockout (KO)/deletion and transgenesis (TG)/addition [4] [28]. The success of PXT will be built upon these multiple and efficient genetic editing in the porcine genome in both the Conventional Approach and Human-Porcine Chimera (BC).

1. PXT: Conventional Approach

The Conventional Approach uses GMs to modify the porcine genome to improve PXG engraftment and survival [35] [36] [37], enhance physiological compatibility and ameliorate post-PXT syndromes [35] [38], eliminate or minimize risk of PERV infection [39] [40] [41].

However, GMs alone are not sufficient. Adjunctive immune-suppression or immune-modulation are required. The two thymo-kidneys, 'immunomodulated PXG', from Genetically Manipulated Pig (GMP) in a recent report were functional with no evidence of rejection 54 hours after PXT in the decedents (per protocol) [42]. KO will affect viability of the donor pig. TGs, that humanizes the donor's genome, may create ethical problems. Optimizing the GM combination, immunosuppression and/or immunomodulation protocols has to be determined in future clinical trials.

2. PXT: Human-Porcine Chimera (BC)

Post-PXT immunosuppression in PXG recipient is an important adjunct to successful PXT. Because of the Xenobarrier, the immunosuppression is expected to be very intensive even after GMs. The side effects of these immunosuppressive agents could be serious affecting the survival and quality of life of the recipients. Even in AT, 40% of death in kidney AT recipients died with a functional kidney allograft with most deaths attributed to immunosuppression [43]. Personalized or custom-made

chimera that does not require such immunosuppression will be a better alternative especially for patients who cannot tolerate intensive immunosuppression.

The BCtechnology involves getting donor cells sourced from GMP with the critical gene for formation of the desired or target organ being knocked out (the agenesis phenotype). These are used to form the embryo. The host blastocyst is extracted and pluripotent stem cells (PSC) or induced PSC (iPSC) from the anticipated recipient is injected into the blastocyst. The PSC/iPSC will supply the missing (emptied developmental niche) organ genes in the host embryo and form the target organ. The resulting human-porcine chimeric organ is predominantly human with varying proportion of porcine cells. Being a chimeric organ, it is recognized as self by the recipient's immune system, is not rejected by the recipient and functions like an autograft. Post-PXT immunosuppression is not necessary. However, this method is still experimental and no human organs have been grown successfully yet [13] [44].

3 GMs in PXT: haram or halāl

A simple statement to decide whether GMs in PXT is haram or halāl is probably not desirable or possible. A careful dissection of the entire process of GMs and PXT would be needed to determine their permissibility. The foremost and critical issue is how successful is the Organ PXT. From the Islamic perspectives, PXT is permissible only after invoking *istihalah*, *darūrah* or *maṣlahāh*. Benefits from PXT in recipients with the respective organ failure must be established to decide on the permissibility of GMs, i.e, the post-GM PXG needs to be successfully engrafted and functional, relieving the suffering of the recipient.

3.1 General Considerations

There are no published deliberations or decisions with regards to permissibility of GM in PXT. GMs are linked to experimental and clinical PXT for permissibility. Four linked groups need to be assessed: i) the pig (donor or source animal); ii) the GM process; iii) the post-GM PXG; iv) PXT recipients and the community at large.

To be permissible, animal welfare before and after GMs needs to be well taken care of in biosecured facilities. Rules, regulations and guidelines must be established and

complied with such that the rights of the donor pigs are protected [37] [42].

The GM process starts from the donor (porcine) cells to the mature GMP. The CRISPR/Cas9 system does not involve any (Islamic) unlawful materials. Even if unlawful materials or procedures are used, *ḍarūrah* can be invoked. This follows the general principles established in the use of unlawful or prohibited (porcine) ingredients for medical use e.g. alcohol in liquid medicine, gelatin in vaccines etc. [6] [8] The GM is needed for the PXG that is used either for research or clinical studies. If the unlawful material or procedure is absolutely necessary to complete the GM process and no lawful alternative is available, they will be permitted through *ḍarūrah* for 'future' public interest.

The third and fourth groups comprise the full process of PXT from PXG to the recipient and community at large. Similar to organ transplantation [45] and porcine products [8], three views are expected on permissibility of GMs in PXT:

- a) Categorically impermissible (all *ḥaram*).
- b) Impermissible in principle (*ḥaram*) but can be conditionally permissible (*halāl*).
- c) Generally permissible (*halāl*) under certain conditions.

3.2 GMs: Impermissibility

The impermissibility view establishes its view on the general prohibition of pork and all porcine related products, including porcine organs, irrespective of how these are produced or used [8]. Similar to any other OTs, this harm would outweigh all benefits obtained in this life and hereafter [45]. Thus, all porcine organs, wild type or after GMs, are impure and not transplantable into Muslim patients for whatever reason.

3.3 GMs: Conditional Permissibility

GMs is likely to be mandatory for PXT to succeed. Humanizing the porcine genome e.g. human insulin or erythropoietin, to produce humanized protein may infringe on human creation as well. The conditional permissibility view relies on the relieves given by the Qur'an and *ijtihād* that abrogates porcine prohibition and any contradiction to human dignity. These relieves may be *istihalah* or *ḍarūrah*. *istihalah* cannot be invoked since GMPs are still predominantly porcine. If *ḍarūrah*

can be invoked for PXT in patients with organ failure, it can be similarly invoked in GMs and *vice versa*.

To invoke *ḍarūrah*in PXT, the preconditions for the medical condition (harm) and availability of the prohibited treatment are clearly satisfied (Tables 1 and 3). However, the benefits are not established. As of now, the most successful PXT is Islet PXT for type 1 Diabetes Mellitus (T1DM). Other organ PXTs are still experimental though they appear promising for kidney and heart PXT. Nevertheless, out of beneficence and altruism, the recipients may receive the GM-PXG in experimental PXT after knowing the harms, possible benefits to himself or future benefits of other patients with organ failure (*maṣlahāh*). Since GM plays the pivotal role in the current experimental and clinical PXT, it would be permissible accordingly through *maṣlahāh*.

3.4 GMs: General Permissibility

The general permissibility view uses *maṣlahāh* (human interests) to support that PXT is needed for Muslim patients with organ failure and the community at large. The enormous benefits of GM-PXT to the public for solving the injustices, unethical and illegal activities in Muslims and non-Muslims arising from Organ Shortages could over-ride any prohibitions. The minority opinion from Zahiri School that only pork is *ḥaram* and all other parts of pigs are *halāl* would also support General Permissibility [8].

3.5 GMs: Special Considerations in BC

BC after GM is experimental and not ready for clinical application. Permissibility will need to be decided in the future. The first requirement for permissibility of BC is to create a totally human target organ. From Islamic perspectives, inserting any piece of human genetic information into the pig's genome contradicts the purpose and dignity of human creation. In addition, the personalized chimeric human organ will not be completely human. The purity status of the chimeric organ is debatable, especially on lawful procurement or slaughtering of 'a humanized' animal, and permissible extent of porcine component in the chimeric organ. Minute quantity of porcine cells or fluid can be considered as dilution within the meaning of *istihalah* [8] [9] [10]. *Ex vivo* perfusion of the target organ by 'preparatory' fluids can minimize the porcine elements further by removing the impermissible porcine blood and

fluid within the target organ. Nevertheless, these ‘contaminated’ or ‘residual’ porcine components may still be considered *haram* and will require *darūrah* to make the chimeric organ permissible [46].

Furthermore, all unwanted differentiations and migrations from PSC to the brain, gonads or elsewhere have to be eliminated by appropriate GM technology (suicide genes) [47]. To minimize the risk of harm of PERV to the recipient and the community at large, low PERVs and/or PERV-C free GMPs should still be chosen [48].

Conclusion

The public interests on Organ Shortages and associated ethical issues are immense especially in Muslims and non-Muslim countries. If PXT is successful and permitted, transplantable organs become easily available. Most bioethical controversies, including illegal and unethical organ procurements, can be eliminated.

The foundation of any successful PXT is GM. Post-GM Organ PXTs still require adjunctive immunosuppression, immunomodulation or tolerance induction (chimerism) [32]. BC is a promising approach for PXT where GMs are also required. Besides its intrinsic advantages over the conventional approach, it could provide a potential alternative to liver PXT which medical problems are extremely difficult to overcome by conventional GMs.

As of now, *darūrah* cannot be invoked to allow permissibility of GM because benefits from PXT have not been established. At this stage, GMs in pigs can be permitted on *maṣlahāh* for both experimental and clinical PXT until PXT benefits are certain or established. By then, *darūrah* can also be invoked permitting GMs and PXT.

Table 1 Preconditions for *darūrah* [2]

1 The medical condition

- a) affects his/her life at this moment (immediate) or near future with high certainty or probability.
- b) causes his/her life in danger or shorten his life expectancy.
- c) inflicts physical, social or psychological suffering, pain or agony.
- d) has negative impact on his/her quality of life (well-being) if the harm is allowed to continue.
- e) improves or will be benefited from a prohibited medical treatment.

2 The prohibited treatment

- a) is effective or likely to be effective to preserve or save life; relieve suffering, pain or agony; improve his/her quality of life.
- b) is the best option after a thorough harm-benefit, what-if and proportionality analysis.
- c) is the only option with no other lawful treatment being available.
- d) is accessible, affordable and executable.
- e) is provided by a trusted experienced and Allah-fearing medical practitioner.

3 The execution of the prohibited treatment

- a) will not inflict harm on other people or conflict with other hierarchical necessities in *maqāṣid shari'ah*.
- b) must be target based with the minimal effective amount for the shortest possible period.
- c) must minimize the cause of prohibition as much as possible.
- d) will be stopped once the harm or the anticipated harm has resolved or a lawful treatment is available.

Table 2 Obstacles following PXT

Survival Phases after PXT	Obstacles
Immediate	Structural and technical compatibility Complications from Transplant Operation Hyper-rejection
Short-term	Rejection Acute infection from immunosuppression Physiological incompatibility
Medium-term	Rejection Dysfunction PXG Post-PXT syndromes Opportunistic infection Cross-species infection
Long-term	Chronic rejection Dysfunction PXG Post-PXG syndromes Opportunistic infections Cross-species infections

Table 3 Anticipated Requirements for PXT: Islamic Perspectives

1 The Recipient:

- a) he/she must have suffered significantly from one or more organ failures.
- b) he/she has consented to PXT.
- c) the acceptance or tolerance of risks is personal and subjective.

2 The Pig:

- a) Respective organs are available.
- b) Rights and welfare are safe-guarded.
- c) The procurement process should only cause minimal suffering to the pig.
- d) The aftercare following procurement should dignify the pig with strict infection control.

3 The GM and PXT process

- a) PXT is the only method available to the recipient.
- b) PXT has a reasonable chance of success and provides benefits to the recipient through a functional organ relieving his suffering and saving his life.
- c) The harms and benefits of the PXT must be compared to the natural state and history of progression of the organ failure, supportive therapy and AT in the recipient.

4 The Public

- a) The Public will not be harmed by porcine related zoonosis.
- b) The Public can benefit from PXT with less disease burdens and less public health expenses used for treatment of patients with organ failures.

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Management of Chronic Diseases During the Hajj period

Najma Ali ¹, Dr Zain Ul Abideen ²

¹ BSc, MPhil, Medical Student at Queens University, Belfast, UK

² MRCP(UK), MRCP Nephrology, Consultant Nephrologist, University Hospital, Birmingham, UK

Correspondence: Nalio4@qub.ac.uk

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Introduction

Every year, more than 2 million people worldwide perform a pilgrimage known as Hajj to the Kaaba, the “House of Allah”, in the sacred city of Mecca, Saudi Arabia. Hajj is one of the five pillars of Islam and is mandatory to perform at least once in a lifetime for all adult Muslims who can afford to make the pilgrimage and are in good health (1). In the Holy Quran, God commands Prophet Ibrahim to call people to perform the Hajj, “*And proclaim the Hajj to all the people: they will come to you on foot and on lean camels, coming from distant places*” (Surat Al-Hajj :27). The reward of Hajj is stated in one hadith, where Abu Hurairah reported that Prophet Mohammed (peace and blessings be upon him) said, “*The reward for a Hajj mabroor is nothing but Paradise*” (Al-Bukhari and Muslim).

Hajj takes place in the last month of the Islamic lunar calendar for a period of 5 days (2) and is considered to be one of the largest annual mass gatherings in the world. Despite the many benefits and rewards gained from Hajj, it can pose a public health concern.

The rise in population and proximity between pilgrims in addition to the intense Saudi Arabian heat can create perfect conditions for the spread of infectious diseases (3). Furthermore, pilgrims may encounter several challenges including access to adequate food, water, and sanitary facilities. However, the Saudi Ministry of Health (MOH) has taken certain measures to address such challenges. For instance, before each Hajj, a proactive public health strategy is launched with an emphasis on preventing and monitoring health risks and providing

medical care with the provision of safe water, food supplies and sanitation (1).

Nonetheless, Hajj can be very arduous with the population consisting of a significant elderly population many of whom have underlying medical issues (4). The environmental and physical strains in addition to changes in eating and sleeping patterns experienced during Hajj can lead to the exacerbations of non-communicable diseases (NCDs) such as cardiovascular disease (CVD), diabetes, and hypertension. This is important particularly if pilgrims forget to take their usual medication, reduced self-monitoring of blood pressure, blood glucose, and preventive health measures (5). Therefore, these NCDs and their associated complications pose a significant health risk during Hajj and are a leading cause of hospitalisation and mortality among pilgrims with extensively published data (3,5–8). However, data regarding nephrological or renal conditions amongst pilgrims is very limited.

Chronic Kidney disease is common and has the potential to worsen if the general health of patients deteriorates. In addition, many patients with CKD have renal replacement therapy (haemodialysis, peritoneal dialysis and renal transplantation), and have specific needs/precautions that they should follow when commencing hajj

Currently, literature is scarce regarding individuals with renal conditions who inquire about Islamic rituals such as Hajj. Therefore, this paper will aim to review the existing research and highlight what patients with renal conditions can do to safeguard their health when performing Hajj.

Hajj and Chronic kidney disease

Chronic kidney disease (CKD) affects approximately 8-16% of the population worldwide (9). It is defined by structural or functional abnormalities of the kidneys that have been present for ≥ 3 months and have an impact on health. It is described as albuminuria of ≥ 30 mg/24 hours, a glomerular filtration rate (GFR) of < 60 mL/min/1.73 m² or the presence of markers of kidney damage such as haematuria (10). The estimated GFR is classified from stages 1-5 (eGFR ≥ 90 mL/min, eGFR 60-90 mL/min, eGFR 30-60 mL/min, eGFR 15-30 mL/min, and eGFR < 15 mL/min respectively) (11). Albuminuria is also assigned into 3 categories: A1 < 3 mg/mmol, A2 3-30 mg/mmol and A3 > 30 mg/mmol. A higher stage signifies more severe renal disease for both eGFR and ACR.

Management of CKD involves identifying and treating the underlying cause, measures to delay decline in renal function, treating complications of CKD to maintain health and preparing for renal replacement therapy if renal function continues to decline despite appropriate measures.

Complications of CKD include hypertension, anaemia, acid-base abnormalities, cardiovascular disease, mineral bone disorder and volume overload (12). Patients with CKD should undergo assessment for these complications as they are thought to contribute to poor quality of life, high morbidity and mortality therefore should receive optimum treatment to reduce such risks.

Good hydration and avoiding extreme heat

During Hajj, temperatures can rise to 45°C which can lead to heatstroke and heat exhaustion (13). The strenuous physical rituals and limited enclosed spaces particularly in the desert during the day of Arafat, where pilgrims stand for long hours during the day may place individuals in danger of extreme heat exposure. With a higher daily temperature, the incidence of renal colic, renal failure and urinary tract infection increases (14). Dehydration and can lead to acute kidney injury (AKI) (15). The concurrent dehydration stress on these individuals could exacerbate their renal function further and lead to higher hospital admissions.

To help avoid this, water mist sprayers are often used especially in the desert, and it is recommended and permitted during Hajj to use umbrellas, perform some of the rituals at night, and have adequate fluid intake.

Hospitals also have specialised cooling systems for the treatment of heatstroke.

Infections and CKD – a special concern

A special concern during Hajj is the emergence of infectious diseases. The conditions of Hajj such as crowded accommodations, extreme temperatures, inadequately stored food, a global population and proximity between pilgrims during prayer and congregational encourage the transmission of infectious diseases particularly airborne pathogens (1). This is important as patients with CKD are at an increased risk of infection (16). Infections can lead to sepsis, which is associated with AKI, hospital admissions and increased mortality (17). It is also important to note, that although AKI is reversible, on a background of existing stable CKD, it can lead to progressive deterioration in renal function.

To minimise the health risks to pilgrims and to prevent the spread of communicable diseases in Hajj, the MOH outlines its regulations which pilgrims are required to meet including vaccinations. Sanitation, vector control, and the provision of safe water and food supplies are also the main public health initiatives at Hajj with continuous surveillance of the spread of several bacterial and viral pathogens done routinely.

Medication compliance and CKD – the importance of compliance, sick day rules and patient awareness

It is expected of pilgrims with chronic renal conditions to bring their usual medication with them during Hajj. However, the proper handling and storage of drugs during Hajj are difficult due to several factors, especially for pilgrims with chronic diseases who must take their medications regularly or for those who use medications that are temperature-sensitive and must be kept at cool or low temperatures. In CKD, medication compliance is a crucial element in effective disease management and this multi-pharmacological treatment may infer a substantial quantity of pill consumption. This makes managing multiple medications a challenging task, particularly since the Hajj pilgrimage entails long flights, a variety of outdoor physical tasks sometimes in extremely hot weather and travelling between holy sites which are often done by foot. It is also believed lack of education can lead to medication misuse (18). For instance, dehydration can pose a significant risk to individuals taking certain medications. Medications such as ACE inhibitors and

NSAIDs can worsen renal function and result in kidney failure if taken when dehydrated therefore should be temporarily stopped during a dehydrating illness (Sick day rules)(19).

Healthcare professionals should therefore pay attention to how religious services such as Hajj influences an individual's physical health. They are an important source of information in managing and controlling chronic diseases and their advice should be sought prior to undertaking Hajj. A suggestion may be for healthcare professions to train individuals suffering from chronic conditions in being compliant with their medication and visit healthcare facilities upon their return for a check-up. Additionally, there are also several public health measures set in place during Hajj including free healthcare to pilgrims and widespread healthcare education resources such as health education materials, travel agents, and media communication during Hajj, written in several languages.

Hajj and renal transplant patients

Renal transplantation is the best form of renal replacement therapy. The cornerstone of renal transplantation is systemic immune-suppression aimed at dampening down the host's immune response to reject the donor kidney. Immuno-suppressed individuals are at significant risk for contracting infections due to the risks associated with Hajj including fatigue, excessive physical exertion, and massive crowding. However, the impact of the Hajj on renal transplant patients has not been the subject of published research. General advice for such individuals is to get the meningococcal vaccine prior to travel (20) and to adhere to advice about pneumonia and influenza vaccinations (21). The MOH also issues guidelines for kidney patients including ensuring they carry the required prescribed medications and keep them in a location that is suitable and simple to reach(22). This is important as post-renal transplant patients are required to take immunosuppressive drugs to prevent organ rejection ; adherence is vital to ensure the transplanted kidney's longevity(23). Travellers who are immunocompromised should also consult with their primary care doctor and transplant specialists both pre-and post-departure and they must be prepared to offer guidance to this distinct group of travellers to assess and mitigate the risks associated with Hajj.

Hajj and dialysis patients

For patients undergoing dialysis who want to perform Hajj, the MOH has provided several free facilities for

haemodialysis. However, prior to leaving for Hajj, it is recommended to inform the renal physician at least a few months before travelling for them to provide advice regarding fitness for travel. It is also useful to inform the dialysis facility prior to travelling to give them sufficient time to compile all medical reports. Apart from these medical reports, it is also useful to bring viral serology reports, dialysis prescriptions, and a report from the GP stating all the prescribed medications. The MOH has fully equipped healthcare centres for haemodialysis and is working on coordinating several centres in different hospitals in Mecca and the holy sites based on the movements and ritual performance of pilgrims. Once the pilgrim has recorded their data in one of these kidney units, the MOH will try to schedule dialysis sessions for them and once this is done, available staff will guide pilgrims every time to the nearest kidney unit based on their movements(24). It is important to note the MOH has started a mobile dialysis service that can be used in accordance with requirements and standards during emergency transportation, inside pilgrim camps (if required) and in hospitals that don't have a central dialysis unit. Additionally, most dialysis patients must restrict their dietary intake of sodium, potassium, and phosphorus. For example, a common food during Hajj is dates, which are reported to contain a high amount of potassium and thus are recommended to be consumed less on a renal diet. It is important to discuss nutritional needs with a nephrologist before travel as these may vary amongst individuals.

Some patients are on Peritoneal dialysis which is another form of renal replacement therapy. This therapy gives a patient more independence (as they don't have to visit a dialysis facility 3 times a week as for haemodialysis). It however, does involve apparatus at home like a PD machine and dialysate bags. It is important for such patients, to discuss their situation with their nephrologist and make arrangements well in advance before Hajj including sorting arrangements for peritoneal dialysis.

Hajj and Hypertension

Every year, approximately 25-37% of pilgrims suffer from hypertension and diabetes(26). Hypertension is a risk factor for stroke, kidney disease and CVD and thus is considered a major health issue globally. However, less than 20% of individuals have it under control with reports of a significant number of hospitalised Hajj pilgrims having hypertension with 3% of ICU admissions mostly due to hypertension (5). It is advised that prospective pilgrims undergo an adequate health assessment, paying close attention to how effectively

they can control their chronic diseases. It is also recommended to bring enough supplies of regular medications and monitoring equipment as adherence to antihypertensive medications and monitoring blood pressure regularly is crucial for blood pressure to remain controlled during Hajj. Emphasis should be on increasing the pilgrims' understanding of their diseases, compliance with their medication, self-monitoring, and the adoption of strategies to prevent unfavourable health outcomes.

Hajj and Diabetes

The Hajj pilgrimage can also have a great impact on patients with diabetes with an increased risk of hypoglycaemia and hyperglycaemia. This may be attributed to changes in diet, delays in mealtimes, dehydration secondary to hot temperatures and strenuous activity during Hajj. Poor adherence to antidiabetic medication is also common as pilgrims are preoccupied with rituals of Hajj and may lack information about diabetes self-management during Hajj.

This makes complications such as diabetic ketoacidosis, fatigue, and unconsciousness greater and can be observed in diabetic pilgrims(27). These individuals are also at a high risk of infections and foot complications as Hajj entails prolonged periods of walking, often without any kind of protective footwear. Therefore, several precautions are necessary to prevent and treat such complications.

Pre-Hajj counselling should be provided to all prospective pilgrims including the importance of having a summary of their current treatment regimen and adherence to their medications. Sick day rules for diabetes should also be included in this guidance which involves measuring blood sugar regularly, staying hydrated and if taking anSGLT2i tablet, to stop taking them when unwell. For the prevention of foot problems, it is recommended to use well-fitted shoes, padded socks, and to avoid walking barefoot. To avoid a hypoglycaemic episode, it is suggested to avoid skipping meals, carry emergency snacks, stay hydrated and get some rest in between the Hajj rituals(28). The crowded conditions of Hajj may be an ideal environment for the spread of infectious diseases which can result in an increased risk of hospital admission among diabetic pilgrims therefore it is recommended to complete all vaccinations including pneumococcal and influenza.

Prior to Hajj, an in-depth clinical assessment with a doctor is necessary, attending an education session on diabetes control, preparing enough medication and

monitoring equipment including a cool pack to store insulin and bringing appropriate footwear are all necessary steps a prospective diabetic pilgrim should take. During Hajj, consulting a medical team is also very crucial if feeling unwell. After Hajj, scheduling a check-up with a physician for a follow-up and necessary investigations performed, and readjustments made if needed.

Conclusion

One of Islam's five pillars is the Hajj pilgrimage. Every Muslim who is financially able to do so and is in good health is obligated to perform Hajj at least once in their lifetime. Although it is a life-changing spiritual experience, Hajj can foster a stressful environment and present unique challenges to people suffering from chronic diseases. A pre-travel consultation with a healthcare professional is recommended to assess fitness for travel, with an emphasis on guidance, education, and risk stratification for all prospective pilgrims with a chronic condition. It is very important healthcare providers and patients are aware of the risks that could happen during Hajj and the importance of well-being to ensure pilgrims perform Hajj safely.

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Black seed (*Nigella sativa*), a COVID-19 Medicinal Intervention

Ponn P. Mahayosnand¹, Samiha Ahmed², ZM Sabra³

¹MPH, Research Scholar, Ronin Institute, Montclair, NJ, USA

²MPH, Graduate, University of Maryland, College Park, Maryland.

³Medical Student, Islamic University of Gaza, Faculty of Medicine, Gaza, Palestine.

Correspondence: ponn.mahayosnand@ronininstitute.org

Keywords: Black seed, *Nigella sativa*, COVID-19, COVID-19 prophylaxis, COVID-19 treatment

Abstract

This review article presents the medicinal use of black seed (*Nigella sativa*) for coronavirus 2019 (COVID-19). The authors analyze current COVID-19-specific black seed studies in the Middle East, South Asia, and the Far East. While black seed has benefits far beyond its antiviral and immunity-enhancing effects, the authors focus on these properties as they relate specifically to COVID-19. Since some of the countries discussed have fewer financial and human resources, the successful ingestion or inhalation of black seed or black seed oil deserves worthy attention. This report is split into two sections: [1] the Islamic, historical, botanical, and scientific significance of black seed; and [2] the chemical composition, nutritional values, and current use of black seed as a prophylactic and COVID-19 treatment.

Introduction

The authors intend to introduce black seed, a common ancient natural medicine that can be used to improve overall health and well-being, to key stakeholders: health researchers, policymakers, public health and preventive medicine clinicians and practitioners, and other persons concerned about a more equitable, economical, and accessible alternative, all-natural option for preventing and treating COVID-19. Black seed also serves as an introduction to Prophetic Medicine, a complementary practice used throughout the Muslim world alongside allopathic medicine. Implemented into one's daily life, black seed has proven health implications surpassing the current COVID-19 pandemic.

The history and religious significance of black seed

Black seed is known as a natural medicine in the Christian faith, as noted in the Old Testament. (1, 2) In

Islam, it is reported that the Prophet Muhammad (peace be upon him) said black seed is a cure for everything, when used regularly, except death. (1-4) Following the medicinal advice of the Prophet (peace be upon him) or verses from the Qur'an is called *at-Tib an-Nabawi* or Prophetic Medicine. (5,6) It is hard to gauge how widespread black seed usage is among Muslims worldwide. However, Muslim-majority countries had fewer COVID-19 cases and deaths during the 3 global peak dates in 2020-2021 in a cross-country analysis of 165 countries. (7) Therefore, stakeholders should take notice of any COVID-19 interventions used in Muslim-majority countries.

It is documented that black seed was historically used by the Egyptian pharaohs, Greek physicians, and Ibn Sina, who is often referred to as the father of modern medicine. (1,2) Black seed was used by Egyptians for mummification, and it was found in Tutankhamun's tomb. They also recorded black seed as a prescription for various health conditions, such as bronchial asthma,

hypertension, and back pain. Hippocrates and Galen used to treat hepatitis, fevers, nasal congestion, headaches, influenza, and even intestinal parasites with black seed. (2,3) In Ibn Sina's famous "Canon of Medicine," black seed is noted for its ability to energize and stimulate a fatigued body and mind. Black seed is one the most widely and continuously researched medicinal plants in peer review journals, (6) with proven efficacy in non-communicable diseases and other ailments.

The botany of black seed

Black seed is also known as black cumin seed, black cumin, black caraway, and black coriander in English, "little black seed" in Greek, black grains in Italian, "seeds of blessings" in Arabic, and kalonji seeds in India. (1) Additionally, it is referred to as "the miracle cure" and "blessed herb." (4)

The botanical names are:

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Order: Ranunculales
Family: Ranunculaceae
Genus: *Nigella*
Species: *sativa*

Originally from the Mediterranean peninsula, black seed spread throughout Northern Africa, Eastern Asia, and Southern Europe, then to Eastern Europe and North America. Although it is currently cultivated throughout the world, it thrives in the climate and soil of the Middle East, the Mediterranean region, and Southern Asia. The plant is a thin white-petaled flower with five seed pods that distinctively stay closed until the seeds are ripe. Once the pods open, exposure to the air turns the seeds' color to black.

The science of black seed

Black seed is "antioxidant, antibacterial, antifungal, antiparasitic, antiviral, anti-inflammatory, anticancer, antidiabetic, hepatoprotective, [and] immunomodulatory," with many other beneficial medicinal effects. Black seed's therapeutic potential "is mostly related to the presence of a number of pharmacologically active constituents such as thymoquinone, thymohydroquinone, dithymoquinone, thymol, nigellone and many other phytochemicals." (1,6,8) Elnour and Abdelsalam reported black seed's "extremely low toxicity" on humans and animals. Black

seed has a strong ability to improve immunity when taken regularly and continuously.

Nutritional benefits

Black seed is rich in nutritional value as it contains vitamin A, calcium, iron, sodium, potassium, and more. (3) Notably, it has 8 of the 9 essential amino acids, which cannot be synthesized in the body and thus must be ingested from food. In relation to immunity, when a black seed powder capsule was ingested for 4 weeks in healthy volunteers, the ratio of helper to suppressor T-cells increased 73%, whereas the ratio decreased by 7% in the control group receiving a placebo. (2) When studied on immunocompromised AIDS patients, they increased the ratio by 55%. Ingested black seed oil relieves allergy and bronchial asthma symptoms as it serves as a bronchodilator. (4)

With over 100 chemicals making black seed unique and incomparable, its antiviral properties are also impressive. For example, black seed can significantly inhibit Hepatitis C Virus (HCV) replication. (3) A black seed concoction was found to dramatically decrease the viral load, symptoms, and signs and CD4 T-cell counts of HIV patients. Numerous studies have also proven its antimalarial properties.

In conjunction with its benefits on immunity and respiratory health, black seed's ability to relieve fevers and influenza, along with its antiviral abilities, the possibilities of black seed having a positive effect on COVID-19 is extremely positive. Black seed and its oil are readily available, highly affordable, and can be self-administered at home. Known as a "miracle cure" by the two largest religions in the world (Christianity and Islam), black seed should be considered seriously.

Black Seed and COVID-19

Black seed COVID-19 related studies have taken place in Pakistan, China, India, Korea, Malaysia, and treatment protocols are used in Saudi Arabia, Egypt, and Pakistan.

Chemical structure and Biological Properties of Black Seed

An important aspect of black seed is that the chemical structure of its biological compounds supports antiviral activity. The primary bioactive compounds of interest identified in black seed include thymoquinone and nigellimine. (8) Thymoquinone studied in isolation has shown "anti-inflammatory, anti-oxidant, anti-tumor, and

antimicrobial activities.” (6,9) A molecular docking study in India analyzed the binding between the SARS-CoV-2 receptor-binding sites and active compounds in black seed, primarily dithymoquinone, thymohydroquinone, thymol, and thymoquinone. This study showed the potential for blocking viral activity by binding to the COVID spike protein receptor. In some cases, these compounds bound SARS-CoV-2 even more strongly than chloroquine, which was considered a potential immunoregulatory treatment at the time. (5) Thymoquinone was also found to be safe for children in a study done on epileptic adolescents. (9)

Respiratory Benefits of Black Seed

Across several respiratory disease studies, both in humans and in guinea pigs, respiratory symptom relief, such as in asthma patients, was observed after treatment with black seed. (10) In one study, some cases showed less reliance on their original inhaler dosage after treatment. Additionally, cytokines that lead to increased numbers of mucus-producing cells in the lungs have been inhibited by black seed. This activity would potentially decrease the overproduction of mucus, alleviating a patient's shortness of breath. Given the severe respiratory nature of COVID-19, black seed has great potential as a viable treatment.

Symptom Reliever

Black seed may also serve as an effective COVID-19 symptom treatment of fever, chills, shortness of breath, low oxygen levels, muscle fatigue, and loss of taste or smell. (11) For patients experiencing Cytokine Storm Syndrome due to an exacerbated inflammatory response to COVID-19, the anti-inflammatory properties of black seed can provide relief. (12) Since black seed has shown to increase the production of reactive oxygen species denaturing enzymes, it can also aid in the oxidative stress observed in COVID-19 patients. (11) While COVID-19 inhibits autophagic activity, an important immune response that removes virus-infected cells from the human body, thymoquinone shows promise in enhancing this immune response. (12)

TaibUVID - a Black seed mixture as a COVID-19 treatment

The Taibah University anti-COVID-19 treatment (TaibUVID) has been studied in Saudi Arabia as a novel COVID-19 treatment. The TaibUVID mixture consists of “1 small spoonful (tea spoonful) of nigella sativa oil (or 2

gram nigella sativa seeds) mixed with 1 gram of grinded anthemis hyalina mixed with 1 large spoonful of natural honey.” (13) The mixture is recommended orally or can be inhaled as a vapor. A retrospective study of 20 COVID-19 patients and their healthy contacts in Egypt used this supplement. The study cohort consisted of volunteers who were already familiar with TaibUVID as a supplement through social media. (14) El-Sayed found that regular consumption among infected patients led to reduced COVID-19 symptoms, and, in 70% of patients, there was a faster recovery time of 1-4 days.

A group of healthy contacts of the infected patients of this study, including family members, medical personnel, and others, volunteered to use TaibUVID as a prophylaxis regularly. Of these individuals, 70% of those who had contact with COVID-19 infected patients did not result in any positive PCR tests during the 4 months of testing. This indicates TaibUVID's significant potential for prophylaxis, which is important to consider as COVID variants emerge. Not unpleasant to consume, participants generally had no complaints taking TaibUVID regularly. Composed of readily available, inexpensive ingredients, TaibUVID is a highly accessible prophylaxis. TaibUVID Forte supplements were recommended alongside COVID-19 treatment on positive cases for expedited symptom relief, and TaibUVID inhalation therapy was a recommended hospital treatment for COVID-19 inpatient cases.

Honey and black seed COVID-19 treatment

A clinical trial conducted in Pakistan showed promising results of honey and black seed mitigating severity of symptoms in COVID-19 patients. (15) Both moderate and severe COVID-19 cases were included in the study. The experimental group was given a mix of 1 g honey and 80 mg/kg of body weight of black seed daily. This mixture was divided into 2-3 doses per day. After roughly 3 months of symptom observation and regular PCR testing, it was found that symptoms were resolved in patients given the honey and black seed earlier than those receiving the placebo. The patients receiving the mixture also tested negative for COVID-19, on average, 4 days earlier than the group receiving the placebo.

Conclusion

The promising results presented in this paper represent only a fraction of the black seed COVID-19 research conducted. For example, in India, a list of all COVID-19 immunity-boosting foods studied was compiled. Black seed topped the list with the highest nutrient value, above

the commonly-known cumin, turmeric, cinnamon, and cardamom. (16) Saudi Arabia studied natural combinations of black seed, garlic, wasabi, honey, and vitamin C-rich foods. (17) A study in Malaysia found that black seed's effectiveness increased when supplemented with Zinc. (8) Bangladesh also took steps to conduct research with black seed. (18) An important fact stressed throughout this paper is that black seed must be taken regularly and continuously for the greatest prophylaxis or treatment effect.

The authors hope that this introductory piece intrigues the reader and encourages them to support, further explore, and possibly use black seed and/or Prophetic Medicine as a complement to Western medicine practices. Specific to the pandemic, the authors strongly recommend further and ongoing research trials of black seed and its therapeutic and prophylactic effects on COVID-19 be conducted.

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The Special Role of Medics in the Gaza Crisis

Dr Muhammad Akhter

General Practitioner, London,

BIMA LifeSavers Project Lead

Assistant Secretary General, Muslim Council of Britain

Tutor in Social Media and Medicine & History of Medicine at Barts Medical School - London

Correspondence: wajid.akhter@britishima.org

It is a testament to the absolute devastation being wrought by the Israeli government during the plausible genocide in Gaza that there is no sector of normal life left untouched by it.

Education, housing, mosques, water, food, security... the list is endless. When faced with a multi-faceted emergency requiring a response, there are very few fields as capable of addressing it as much as healthcare.

Medics are especially used to prioritise, managing and reassess life and death situations regularly and often coldly. In a mass trauma event, we have the discipline to triage those who we feel are more likely to survive and leave those who we don't. In a war zone, we are able to treat enemy combatants with the same care and diligence as those on our own side. It is for this reason that we must give special attention to the process of saving and then rebuilding Gaza. We know all too well what the 2nd or 3rd wave killers are, and that will stalk the population long after the bombs fall silent.

We know the hidden mental health disaster that will unfold largely out of sight but not out of mind. We know the impact of poor sewage systems and unclean roads and unburied thousands on the public health of the entire

population. With knowledge comes power. With power comes responsibility. With responsibility comes a test. The people of Gaza are passing their test with resilience and patience, which is sublime. Will we?

In order to do this, we will need to be organised and dedicated to working in a way that moves beyond a haphazard or emergency response. BIMA is starting the process of doing this through experienced members like Dr Najeeb Rahman of DWW (Doctors Worldwide), Dr Adil Riaz of Aghosh, Dr Hammad Lodhi of UKIM (UK Islamic Mission) and Dr Kiran of ChildrenNotNumbers that is helping with treatment and medical evacuation for injured children.

We are also working with our more experienced colleagues in other Islamic Medical Associations, especially IMANA (Islamic Medical Association of North America).

However, in order to move to the next level, we will need to continue to build the infrastructure within BIMA and the Muslim community in the UK so that we can play a leading role in protecting the healthcare of the people of Gaza and elsewhere following disasters.

Dr. Syed Mubin Akhtar – Obituary

Dr. Tanveer Zubairi

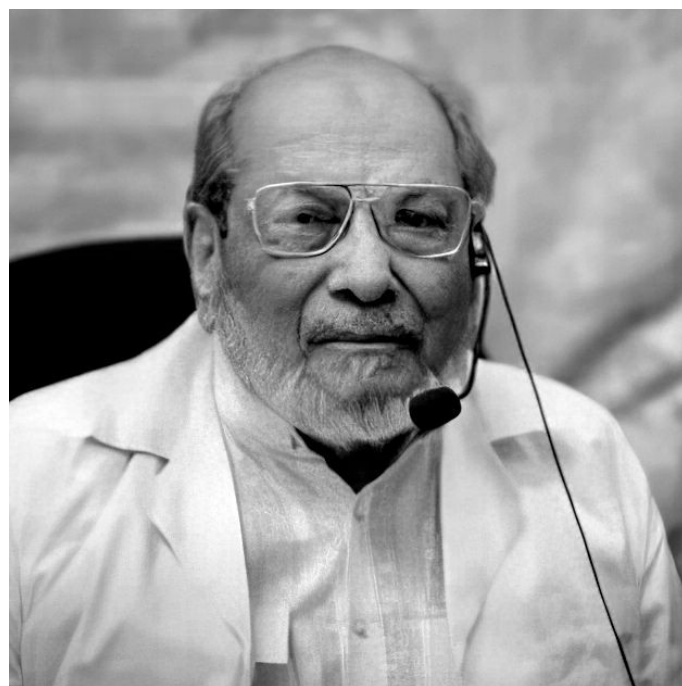
Consultant Radiologist,
Ex Chief of Radiology, Service Hospital Lahore, Pakistan
CEO Punjab Radiology,
Ex President FIMA (2013-2017)

Correspondence: tanveer.zubairi@gmail.com

We take a moment today to honor the memory of a remarkable and outstanding leader who played a pivotal role in shaping The Islamic Medical Association of North America (IMANA), Pakistan Islamic Medical Association (PIMA) and The Federation of Islamic Medical Associations (FIMA) : Dr. Syed Mubin Akhtar, our esteemed co-founder of these renowned organizations.

It is with deep sadness that we share the news of Dr. Akhtar's passing today in Pakistan (May 1st, 2024). Dr. Syed was born in the United Provinces of British India in 1933. The family later migrated to Lahore where he did his senior Cambridge certification from Saint Anthony's high school in 1949, he stood second in the province of Punjab intermediate examination (F.Sc) attending from Government College, Lahore. He was admitted to King Edward Medical College, Lahore and graduated with laurels in 1956. He practiced in Lahore for a few years and later moved to USA for his postgraduate studies. He joined MSA (Muslim Students Association) of USA and was its active worker. He was the founding member of ICNA (Islamic Circle of North America). He was the founding president of IMANA in 1968 and founding president of FIMA in 1981 in Orlando fostering international collaboration among Muslim medical professionals. He was also recognized for his lifelong commitment to medicine by receiving the first-ever IMANA Ahmed Elkadi Award in 2003, and a FIMA lifetime achievement award in 2015.

He was also a founding member of PIMA in 1979 and remained an active participant in the activities of all the three associations to whom he had a credit to be a founder and a mentor. He served as the first president of the IMANA, then known as the Islamic Medical Association (IMA) and laid the foundation for its mission



of promoting Islamic values within the medical community and wrote its first constitution. .

He was a notable psychiatrist in the USA and later returned to Pakistan in 1969, where the practice of psychiatry as a specialty was in its infancy. He took a leading role to establish and develop this important field of medicine in Pakistan and founded Karachi Psychiatric Hospital in 1970. He was trained at Ypsilanti state hospital and University hospital in St. Louis, Missouri, USA. He did his board certification in 1968. His passion to develop his field of specialization was immense and overwhelming. He wrote scores of articles, radio and television interviews and programs to highlight the myths and taboos prevalent in our societies. He published scientific and public magazines to appraise the

professionals and common people regarding the importance of research and highlighted the modern treatment options for the less understood psychiatric diseases and psychological issues.

He was also an activist in promoting his national language (Urdu) as a medium of instruction and official language in the country. He was an active member of Islamic movement and got elected as a chairman of the district board and served his community in whatever way he could.

Dr. Akhtar was a true trailblazer who exemplified the values of the medical profession by large. He wasn't just passionate about serving the Muslim community; he actively sought ways to connect Muslim medical professionals across the globe.

We have lost a visionary leader, a par excellence psychiatrist and a cherished member of the IMA family. We ask you to send your thoughts and prayers to Dr. Akhtar's loved ones and to pray for the departed during this difficult time.