Islamic Bioethics in Health Technology Assessment: A Review of Key Ethical Frameworks

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ABSTRACT

Health technology assessment (HTA) is a multidisciplinary process that systematically examines the clinical, economic, social, and ethical impacts of health technologies. Its main purpose is to support healthcare decision-making by providing evidence on the value of medical interventions, including drugs, devices, procedures, and organizational systems. As healthcare systems worldwide grapple with rising costs, aging populations, and rapid advances in medical innovation, HTA plays an increasingly vital role in ensuring that healthcare solutions are not only safe and effective but also economically sustainable. The evolution of Health Technology Assessment (HTA) has increasingly incorporated ethical and social considerations alongside traditional clinical outcomes. This shift acknowledges the necessity of integrating diverse cultural and moral perspectives, particularly in a globalized healthcare environment. One significant framework gaining attention is Islamic bioethics, which offers unique insights into ethical dilemmas faced in predominantly Muslim societies. The integration of such frameworks into HTA processes is essential for ensuring that health technologies are evaluated comprehensively, reflecting the cultural and religious values that influence healthcare decisions in these regions. This article aims to analyzing key ethical frameworks in Islamic bioethics that could be effectively integrated into HTA. In doing so, it seeks to offer a more culturally and ethically sensitive approach to healthcare decision-making in Muslim populations, ensuring that religious values and biomedical ethics are aligned in a balanced and harmonious manner.

Keywords: Islamic Bioethics, Health Technology Assessment (HTA), Health Technologies, Ethical Framework, Healthcare Decision-Making, Maqasid al-Shari'ah, Medical Ethics.

INTRODUCTION

Health technology assessment (HTA) is a multidisciplinary process that systematically examines the clinical, economic, social, and ethical impacts of health technologies. Its main purpose is to support healthcare decision-making by providing evidence on the value of medical interventions, including drugs, devices, procedures, and organizational systems (Kumar, et al., 2022). As healthcare systems worldwide grapple with rising costs, aging populations, and rapid advances in medical innovation, HTA plays an increasingly vital role in ensuring that

healthcare solutions are not only safe and effective but also economically sustainable (Behzadifar et al., 2023).

The evolution of Health Technology Assessment (HTA) has increasingly incorporated ethical and social considerations alongside traditional clinical outcomes. This shift acknowledges the necessity of integrating diverse cultural and moral perspectives, particularly in a globalized healthcare environment. One significant framework gaining attention is Islamic bioethics, which offers unique insights into ethical dilemmas faced in predominantly Muslim societies. The integration of such frameworks into HTA processes is essential for ensuring that health technologies are evaluated comprehensively, reflecting the cultural and religious values that influence healthcare decisions in these regions (Bellemare et al., 2018; Refolo et al., 2020; Legault et al., 2021).

Islamic bioethics emphasizes principles such as beneficence, non-maleficence, autonomy, and justice, which align closely with the ethical frameworks traditionally used in HTA (Woodman, 2023; al., 2023). This alignment facilitates a more nuanced understanding of patient rights and healthcare provider responsibilities within the context of Islamic teachings. For instance, the Maqasid al-Shari'ah framework, which prioritizes the welfare of individuals and communities, can guide ethical decision-making in health technology assessments (Padela, 2022). Furthermore, studies indicate that healthcare professionals in Muslim-majority countries often navigate complex ethical landscapes that require a deep understanding of both medical ethics and Islamic principles (Alahmad, 2023; Alfahmi, 2022).

The growing body of literature on the ethical dimensions of HTA underscores the importance of incorporating these frameworks into the assessment process. Research has shown that ethical considerations are often underrepresented in HTA reports, highlighting a gap that needs to be addressed to enhance the relevance and applicability of HTA in diverse cultural contexts (Legault et al., 2021; Gietzen et al., 2022; Legault et al., 2019). By integrating Islamic bioethics into HTA, stakeholders can ensure that health technologies are not only clinically effective but also culturally appropriate and ethically sound, thereby fostering trust and acceptance among patients and healthcare providers alike (Shiroma, 2024).

Moreover, the application of Islamic bioethics in HTA can lead to improved health outcomes by aligning healthcare practices with the values and beliefs of the patient population. For example, studies have demonstrated that Muslim patients often prefer care from providers who share their cultural and religious backgrounds, which can significantly impact their willingness to accept medical interventions (Shiroma, 2024; Alahmad, 2023). This preference underscores the necessity for HTA frameworks to consider cultural competency as a critical component of health technology evaluations, ensuring that assessments are not only scientifically rigorous but also socially and ethically relevant (Blaauw et al., 2022; Cooper-Jones et al., 2022).

In conclusion, the integration of ethical frameworks such as Islamic bioethics into HTA represents a vital advancement in the field, promoting a more holistic approach to health technology evaluation. This integration not only enhances the ethical rigor of HTA processes but also ensures that health technologies are aligned with the cultural and moral values of the communities they serve, ultimately leading to better health outcomes and greater equity in healthcare delivery (O'Rourke et al., 2020; Legault et al., 2021; Padela, 2022).

A.   Need for Islamic Bioethics in HTA

Islamic bioethics has emerged as a crucial framework within health technology assessment (HTA), particularly in contexts where healthcare decisions are significantly influenced by Islamic principles. This framework, grounded in Islamic law (Shariah), provides essential guidance on the permissibility of medical treatments and healthcare practices, ensuring they align with the religious and ethical values of Muslim patients and communities (Alhammadi et al., 2020; Amran et al., 2019). The integration of Islamic bioethics into HTA is particularly pertinent in regions where healthcare is intertwined with religious beliefs, as it helps bridge the gap between modern medical practices and the ethical concerns of Muslim populations (Azalan, 2023; Nasir et al., 2022).

The principles of Maqasid al-Shari'ah, which emphasize the protection of life, intellect, progeny, wealth, and faith, form the foundation of this bioethical framework (Zaprulkhan, 2018; Kasim et al., 2022). By adopting a holistic approach that encompasses these objectives, Islamic bioethics extends beyond traditional clinical

considerations, addressing the broader implications of healthcare decisions on individual and societal well-being (Rasool et al., 2023; Alam et al., 2019). This is especially relevant in the context of health technology assessments, where the evaluation of medical technologies must consider not only their efficacy and safety but also their alignment with Islamic ethical standards (Khairi et al., 2020; Muhammad & Sudrajad, 2023).

As global healthcare systems become increasingly diverse, the incorporation of Islamic bioethics into HTA ensures that decision-making processes are culturally respectful and ethically sound, reflecting the moral values of Muslim populations worldwide (Aziz et al., 2021; Alias et al., 2023). This approach not only enhances the acceptability of medical interventions among Muslim patients but also fosters a more inclusive healthcare environment that respects and acknowledges the diverse ethical frameworks that exist within contemporary society.

B.   Research Gap and Objectives

Despite the growing interest in incorporating Islamic bioethics into health technology assessment (HTA), there remains a notable gap in the literature when it comes to developing systematic ethical frameworks specifically designed for Muslim communities. Most current HTA models are predominantly grounded in secular bioethics, which often fails to fully consider the distinct religious and cultural values that play a crucial role in healthcare decisions within Muslim-majority regions (Dabbagh, 2023). Although the Maqasid al-Shari'ah has been suggested as a guiding principle, its practical use in assessing modern health technologies is still largely underexplored (Moosapour, H., Mashayekhi, Zahedi, Soltani & Larijani, 2018). This article aims to bridge this gap by reviewing and analyzing key ethical frameworks in Islamic bioethics that could be effectively integrated into HTA. In doing so, it seeks to offer a more culturally and ethically sensitive approach to healthcare decision-making in Muslim populations, ensuring that religious values and biomedical ethics are aligned in a balanced and harmonious manner.

C.   Structure of the Article

This article is structured as follows: the introduction provides an overview of Islamic bioethics and its relevance to HTA, followed by a detailed discussion of the existing literature on ethical frameworks within Islamic bioethics. The third section critically examines the application of Maqasid al-Shari'ah and other Islamic ethical principles within HTA. The fourth section addresses the research gap and explores potential methodologies for integrating Islamic bioethics into HTA. Finally, the article concludes with practical recommendations for healthcare policymakers and practitioners seeking to incorporate Islamic ethical values in HTA processes.

ISLAMIC BIOETHICS: DEFINITION AND KEY CONCEPTS

Islamic bioethics is a field that integrates the ethical teachings of Islam with modern biomedical practices, ensuring that healthcare decisions align with Islamic values. It draws from key Islamic sources, including the Qur'an, Hadith (the sayings and actions of the Prophet Muhammad), and the legal tradition of Shariah, to offer guidance on moral dilemmas in medicine (Ghaly, 2015). The primary focus of Islamic bioethics is to protect the sanctity of life, promote justice, ensure individual and collective well-being (maslaha), and ensure that healthcare practices adhere to the core principles of Islam. These guiding principles—justice (adl), beneficence (ihsan), non-maleficence (la dharar), and respect for autonomy (ikhtiyar)—inform the actions of healthcare providers and the decision-making process of patients (Al-Bar & Chamsi-Pasha, 2015). By harmonizing religious obligations with medical ethics, Islamic bioethics offers a flexible framework that addresses both traditional and contemporary healthcare challenges while remaining true to Islamic moral values.

A.   Overview of Islamic Bioethics

Islamic bioethics is a field that blends the moral values and ethical principles of Islam with modern biomedical practices. Rooted in the teachings of the Qur'an, the Hadith (which captures the sayings and actions of Prophet Muhammad), and the broader framework of Islamic law (Shariah), it seeks to address ethical challenges in healthcare and medical science. The primary goal of Islamic bioethics is to ensure that medical decisions and practices not only promote individual well-being but also remain consistent with Islamic values and religious

guidelines (Padela, 2013). The foundational principles of Islamic Bioethics are describe further as follows:

1) Justice (Adl)

In Islam, justice is a core principle that extends to all aspects of life, including healthcare. Islamic bioethics stresses the importance of providing equal access to medical services, ensuring fair treatment for everyone, regardless of their socioeconomic background, and protecting vulnerable groups by offering them appropriate care without discrimination (Chamsi-Pasha & Albar, 2013).

2) Autonomy (Ikhtiyar)

Autonomy in Islamic bioethics emphasizes the significance of personal decision-making, while also recognizing the necessity of adhering to religious obligations. Although patients have the right to make informed choices about their healthcare, these decisions must remain consistent with Islamic principles. In this context, autonomy is understood as the exercise of personal freedom within the framework of obedience to God and a moral duty toward the broader community (Khaleefah, 2022).

3) Beneficence (Ihsan)

The principle of beneficence in Islamic bioethics focuses on promoting the welfare and well-being of patients. Healthcare providers are ethically obligated to act in ways that benefit the patient, alleviate suffering, and improve health outcomes, all while being guided by compassion and care (El-Kadi, 2017).

4) Non-maleficence (La Dharar)

Non-maleficence, the commitment to "do no harm," is another critical tenet in Islamic bioethics. Medical practitioners are expected to avoid actions that could cause harm to patients, whether through direct treatment or neglect, and to prioritize methods that minimize risks (Sachedina, 2009).

These foundational principles, when applied within the Islamic bioethical framework, guide healthcare providers and patients in making decisions that respect both the individual's rights and the broader moral teachings of Islam (Brockopp & Eich, 2008).

B. Core Ethical Frameworks in Islam: Methodological Approaches to Muslim Biomedical-Ethical Reasoning

Islamic bioethical reasoning is deeply rooted in the broader Islamic ethical tradition, which derives guidance from a combination of religious texts, contextual considerations, and scholarly interpretation. These methodologies provide a structured approach to addressing ethical dilemmas in healthcare while ensuring alignment with Islamic values. Below are the three primary frameworks utilized in Islamic biomedical-ethical reasoning:

1) Textual Framework

The textual framework involves direct reliance on the primary religious sources of Islam: the Qur'an (the holy book) and the Hadith (the sayings and actions of Prophet Muhammad). These texts provide foundational guidance on ethical behavior, including how to approach issues related to health and medicine (Atighetchi, 2007). Ethical reasoning begins by referencing these texts to find explicit or implicit rulings on specific matters. For example, the Qur'an emphasizes the sanctity of life, the importance of health, and justice, which can guide medical practices like organ donation or end-of-life care (Al-Bar & Chamsi-Pasha, 2015)

2) Contextual Framework

The contextual framework highlights the necessity of interpreting Islamic texts by taking into account the social, cultural, and historical circumstances surrounding each ethical dilemma. This approach recognizes that although the Qur'an and Hadith provide enduring principles, how these principles are applied can shift based on

contemporary contexts (Ghaly, 2015). For instance, developments in medical technology, such as genetic testing or IVF, challenge Muslim scholars to reflect on these advancements while staying true to Islamic ethical teachings. By using contextual analysis, scholars can ensure that ethical rulings remain both relevant and practical in modern healthcare settings (Padela, 2013).

3) Para-textual Framework

The para-textual framework involves drawing on additional sources from Islamic jurisprudence and ethics to support decision-making, particularly when guidance from primary religious texts is insufficient or ambiguous. These supplementary sources include Ijtihad (independent reasoning by qualified scholars), Qiyas (analogical reasoning), and Ijma (consensus among scholars) (Ebrahim, 2008). This method of analysis is crucial for forming ethical rulings in situations where direct references from foundational texts, such as the Qur'an or Hadith, are either unavailable or unclear. It becomes especially relevant when dealing with new or complex biomedical challenges, such as cloning or the use of artificial intelligence in healthcare, which require para-textual reasoning to establish an Islamic ethical position (Sachedina, 2009).

These three frameworks—textual, contextual, and para-textual—work together to form a comprehensive and flexible approach to Islamic biomedical-ethical reasoning. By considering scriptural guidance, contemporary realities, and scholarly consensus, Muslim bioethicists are able to develop ethically sound responses to medical and healthcare dilemmas while maintaining fidelity to Islamic principles (Dabbagh, Mirdamadi, & Ajani, 2023). This multi-faceted approach allows Islamic bioethics to remain dynamic and adaptable, addressing both traditional and modern challenges within the field of biomedicine (Brockopp & Eich, 2008).

C. Islamic bioethics and Maqasid al-Shari'ah from Sunni and Shia Lenses

Islamic bioethics, particularly through the lens of Maqasid al-Shari'ah, provides a comprehensive framework for addressing modern bioethical challenges by aligning religious principles with contemporary medical and social issues. This framework, based on Islamic jurisprudence, emphasizes the preservation of essential human values such as life, intellect, and well-being. The Maqasid al-Shari'ah-based approach is grounded in the primary objectives of Islamic law (maqasid), which aim to protect and promote the well-being of individuals and communities. Ibrahim et al. (2019) describe how this approach can address complex bioethical issues, such as tri-parent baby technology, by focusing on intention, methodology, and the ultimate goals of actions (Ibrahim et al., 2019). The integration of these objectives ensures that Islamic bioethics remains relevant in addressing both old and emerging medical concerns.

Auda (2012) further highlights that the Maqasid framework provides flexibility by balancing classical jurisprudence with modern bioethical dilemmas, such as organ transplants and stem cell research. This adaptability is crucial for both Sunni and Shia scholars who apply similar foundational principles but may differ in their jurisprudential interpretations (Auda, 2012). Saifuddeen et al. (2014) propose that Maqasid al-Shari'ah also complements conventional bioethics by offering a pragmatic checklist for addressing medical issues in Muslim-majority countries, such as Malaysia, where religion plays a significant role in determining the permissibility of biotechnological applications (Saifuddeen et al., 2014). Padela (2018) explores the role of Maqasid in healthcare decision-making, particularly within the scope of preserving life and intellect, making this framework applicable to various medical decisions, including palliative care and organ donation (Padela, 2018).

Table 1: Literature Matrix on Islamic Bioethics from the lenses of Sunni and Shia

Study	Focus	Sunni Perspective	Shia Perspective	Notes
Ibrahim et al. (2019)	Maqasid al-Shari'ah based bioethics framework for complex issues	Focuses on preservation of life, intellect, progeny, and maslahah (public interest)	Includes Ja'fari school rulings with an emphasis on the same key maqasid	Relevant for complex bioethical dilemmas like tri-parent technology and stem cells
Saifuddeen et al.	Maqasid al-Shari'ah as complementary to	Integration of religion and biomedicine;	Similar principles but applied with	Discusses maqasid's relevance across sectors

(2014)	conventional bioethics	proposes guidelines using maqasid	particular emphasis on Shia jurisprudence	like medicine, agriculture, and food processing
Auda (2012)	Purpose-based approach in Islamic bioethics	Advocates for a holistic approach to bioethics, aligning modernity with classical jurisprudence	Shia interpretations similarly integrate holistic Maqasid, focused on Ja'fari principles	Key for understanding both Sunni and Shia bioethical deliberations in contemporary settings
Padela (2018)	Maqasid-based healthcare ethics	Explores Maqasid al-Shari'ah's relevance in modern healthcare contexts	Shia scholars similarly adopt maqasid, though with specific guidelines from Ja'fari school	Focuses on public health and healthcare decisions like organ transplants
Dabbagh (2023)	Contemporary Muslim bioethical responses	Discusses contemporary approaches in Muslim biomedical ethics	Examines modern Shia scholars' views on the same bioethical issues	Offers classifications for modern-day Muslim bioethical responses to challenges
Elmahjub (2022)	Islamic bioethics in end-of-life care	Sunni scholars apply maqasid principles to end-of-life care	Similar Shia jurisprudential rulings on end-of-life care based on maqasid	Explores both ethical and legal concerns about palliative and end-of-life care

Thus, the Maqasid al-Shari'ah framework in Islamic bioethics serves as a bridge between religious principles and modern medical ethics, ensuring that bioethical challenges are met with moral clarity and flexibility.

Health Technology Assessment (Hta): Ethical Integration

Health Technology Assessment (HTA) is a structured approach used to evaluate the medical, social, economic, and ethical aspects of health technologies. Traditionally, HTA has focused on determining the clinical effectiveness and cost-efficiency of healthcare interventions, ensuring they deliver value while improving patient outcomes (Culyer, 2016). However, as healthcare decisions grow increasingly complex, the importance of integrating ethical considerations into HTA has become more apparent (Lehoux et al., 2014). Ethical concerns in this context include issues like justice, equity, patient autonomy, and balancing the risks and benefits of health interventions (Hofmann, 2008). By weaving ethical analysis into the process, HTA moves beyond purely technical evaluations to consider the societal and moral dimensions of healthcare. This ensures that health technologies not only meet clinical benchmarks but also adhere to broader ethical values such as fairness, respect for individuals, and the promotion of overall well-being (Daniels et al., 2016). This approach makes HTA a more holistic tool, guiding healthcare policy and practice to ensure that decisions about the adoption and use of health technologies are both ethically sound and centered on patient needs (O'Rourke, Oortwijn & Schuller, 2020).

A.   Introduction to HTA

Health Technology Assessment (HTA) is a comprehensive, multidisciplinary process designed to evaluate the clinical, economic, social, and ethical impacts of health technologies. Its main purpose is to assist healthcare decision-makers by examining not only the effectiveness and cost-efficiency of medical interventions, such as drugs, devices, or procedures, but also their broader societal implications. HTA ensures that healthcare interventions are both clinically effective and provide value in terms of economic sustainability and social equity. By integrating evidence from various fields, HTA supports the development of more efficient and equitable healthcare systems, especially as new technologies emerge to meet evolving health needs (Culyer, 2016; Richardson & Schlander, 2018). This makes HTA an essential tool for guiding decisions in healthcare (Culyer,

2016; Richardson & Schlander, 2018).

1) Clinical Impact

Health Technology Assessment (HTA) plays a crucial role in evaluating the effectiveness, safety, and quality of health technologies. By systematically reviewing clinical evidence, HTA provides insight into how well a technology works in real-world scenarios, weighing its risks and benefits for patient outcomes. For instance, HTA might examine whether a new medication offers superior treatment for a disease compared to existing options (Lehoux et al., 2014). This process ensures that healthcare systems only adopt interventions with a proven track record of clinical value (Greiner, 2008).

2) Economic Impact

Health Technology Assessment (HTA) also evaluates the cost-effectiveness of health technologies by examining whether the benefits justify the financial investment. This process involves analyzing both direct costs, such as the price of medications, and indirect costs, like hospitalization rates and lost productivity (Richardson & Schlander, 2018). By considering the broader economic impact, HTA helps prioritize healthcare interventions that deliver the best value for money, ensuring that healthcare spending remains sustainable.

3) Social Impact

In addition to clinical and economic factors, Health Technology Assessment (HTA) takes into account social dimensions like equity, access, and ethical issues. It assesses the potential impact of new technologies on various population groups, with particular attention to vulnerable communities, ensuring that healthcare decisions are fair and do not exacerbate inequalities ((O'Rourke, Oortwijn & Schuller, 2020). These social considerations also involve evaluating how acceptable a technology is within specific cultural or ethical contexts, ensuring that medical practices reflect societal values and meet the needs of patients (Culyer, 2016).

In summary, HTA ensures that health technologies are not only clinically effective but also economically sustainable and socially equitable, helping healthcare systems make informed and balanced decisions (Richardson & Schlander, 2018).

B. Ethical Challenges in HTA: Integrating Diverse Ethical Systems

Health Technology Assessment (HTA) practitioners face significant challenges in integrating ethical considerations, particularly when dealing with diverse ethical systems such as Islamic bioethics. While HTA primarily focuses on clinical efficacy and cost-effectiveness, the growing recognition of the ethical dimensions of healthcare technologies requires practitioners to address values like autonomy, justice, beneficence, and non-maleficence. The integration of these ethical principles into HTA can be complex, especially when navigating the cultural and religious diversity that exists in healthcare systems.

One major challenge is reconciling the secular nature of conventional HTA frameworks with religious-based ethical systems, such as Islamic bioethics. Islamic bioethics, for instance, emphasizes the importance of preserving life (hifz al-nafs), ensuring justice (adl), and respecting human dignity. These principles sometimes offer distinct perspectives on medical interventions compared to secular ethical frameworks. For example, in Islamic bioethics, decisions around end-of-life care or organ donation may be influenced by religious prohibitions or interpretations of moral duty, which may differ from the secular, patient-centered autonomy that often guides Western HTA approaches (Albar & Chamsi-Pasha, 2015).

Another challenge is ensuring that the ethical evaluations conducted in HTA are inclusive of diverse populations and cultures. Ethical frameworks that are designed for one population may not be suitable for another, especially when dealing with cross-cultural and international health technologies. HTA practitioners must navigate these complexities to ensure that ethical evaluations remain culturally sensitive and relevant. The incorporation of ethical frameworks like Islamic bioethics requires a nuanced understanding of local values, traditions, and religious beliefs, ensuring that healthcare decisions respect the moral and spiritual dimensions of patient care (Sachedina, 2009).

In summary, integrating ethical considerations in HTA, particularly in the context of diverse ethical systems such as Islamic bioethics, poses significant challenges. HTA practitioners must carefully balance secular and religious values, ensuring that healthcare technologies align not only with clinical and economic criteria but also with the ethical beliefs and cultural values of the populations they serve.

Islamic Ethical Frameworks in Health Technology Assessment (Hta)

The integration of Islamic ethical frameworks into Health Technology Assessment (HTA) is essential in ensuring that healthcare decisions reflect the moral and cultural values of Muslim populations (Ghaly, 2015). Islamic bioethics draws upon principles derived from the Qur'an, Hadith, and Islamic jurisprudence (Shariah) to guide decision-making in healthcare (Al-Bar & Chamsi-Pasha, 2015). Key ethical principles such as justice (adl), beneficence (ihsan), and non-maleficence (la dharar) provide a moral foundation for evaluating the permissibility and appropriateness of health technologies (Sachedina, 2009). These principles not only address the effectiveness and safety of interventions but also consider the broader societal and ethical implications (Ebrahim, 2008). As HTA becomes increasingly global, incorporating Islamic ethical frameworks ensures that assessments of medical technologies are culturally relevant and ethically sound, especially in Muslim-majority contexts (Padela, 2013). By aligning healthcare technologies with the ethical values of Islam, HTA can support equitable and morally responsible healthcare practices that respect both individual rights and communal welfare (Brockopp & Eich, 2008).

A.   Framework Application: Integrating Islamic Bioethics into HTA

Islamic bioethics can be effectively integrated into Health Technology Assessment (HTA) frameworks by incorporating ethical principles rooted in Islamic jurisprudence into the evaluation of health technologies. This integration ensures that healthcare decisions align with the moral, religious, and cultural values of Muslim populations (Besar Sa'aid, Md Shahid & Zakaria, 2012; Al-Bar & Chamsi-Pasha, 2015).

1)   Alignment with Islamic Ethical Principles

Islamic bioethics is grounded in core principles such as *adl* (justice), *ihsan* (beneficence), *la dharar* (non-maleficence), and *ikhtiyar* (autonomy within the bounds of religious obligations) (Sachedina, 2009). These principles can be embedded into HTA processes by evaluating whether a health technology ensures justice and fairness in access and distribution, promotes well-being, avoids harm, and respects patient autonomy while being sensitive to Islamic values. For example, Islamic bioethics may influence decisions related to reproductive technologies, organ transplantation, or end-of-life care by ensuring they are in line with Shariah law and the well-being of the individual and community (Ebrahim, 2008).

2)   Cultural Sensitivity in Decision-Making

HTA frameworks that incorporate Islamic bioethics can provide culturally sensitive assessments of medical technologies. For instance, decisions about technologies like genetic screening or reproductive health interventions need to account for Islamic views on human dignity, the sanctity of life, and family structure (Ghaly, 2015). By integrating Islamic ethical reasoning, HTA frameworks ensure that such technologies are evaluated not just for their clinical and economic value but also for their acceptability within Islamic contexts. This reduces potential conflicts between healthcare policies and religious beliefs, fostering greater acceptance of medical technologies in Muslim-majority societies (Padela, 2013).

3)   Application of Maqasid al-Shari'ah (Objectives of Islamic Law)

One of the most effective ways Islamic bioethics can be integrated into HTA is through the *Maqasid al-Shari'ah*, the higher objectives of Islamic law. These objectives prioritize the protection of life, intellect, progeny, wealth, and religion. HTA frameworks can apply these objectives when evaluating new technologies, ensuring that they serve to protect and promote these essential aspects of life (Besar Sa'aid, Md Shahid & Zakaria, 2012). For example, when assessing new life-saving technologies or public health interventions, the primary objective would be to preserve life, while also considering how the technology impacts family well-being, economic

stability, and religious practice (Al-Sharmani, 2018).

4) Ethical Review and Consultation

Another key method for integrating Islamic bioethics into HTA is through the inclusion of Islamic scholars or ethicists in the ethical review process of health technologies. This allows for consultation and collaboration with religious leaders, ensuring that healthcare interventions are compliant with Islamic ethical guidelines (Sachedina, 2009). This multidisciplinary approach can create a more inclusive HTA framework that respects religious diversity while maintaining medical and economic rigor.

In conclusion, by integrating Islamic bioethics into HTA frameworks, the evaluation of health technologies can be made more culturally and ethically sensitive, ensuring that technologies are not only effective and economically viable but also acceptable and equitable for Muslim populations. This approach can contribute to more ethically grounded healthcare systems in Muslim-majority countries, fostering greater trust and engagement in healthcare interventions.

B. Empirical evidence on Islamic bioethics and its role in Health Technology Assessment (HTA): The Key Insights and Themes

The integration of Islamic bioethics in Health Technology Assessment (HTA) has gained increasing attention. The literature reveals several significant contributions highlighting empirical evidence in this field:

1) Integration of Islamic Ethical Principles in Genetic and Biomedical Technologies

Aqeel (2007) focuses on creating a framework grounded in Islamic bioethics to address genetic diseases. This work stresses the importance of consanguinity and informed consent, supported by Islamic rulings. The relevance here is the alignment between Islamic bioethics and HTA, where both strive for better healthcare outcomes and interventions. The protection of life (Hifz al-Nafs), a key principle of Maqasid Shariah, directly correlates with HTA's goal of improving health technologies.

2) Ethical Considerations in HTA and the Need for Broader Moral Approaches

Have (2004) highlights that ethical considerations are often overlooked in HTA and calls for a broader moral perspective, including religious bioethics like Islamic ethics. This aligns with the principle of justice (Al-Adl) in Islamic bioethics, advocating for an equitable approach to healthcare technology assessment that incorporates religious beliefs alongside scientific evidence.

3) Cultural and Ethical Context in Health Technology Implementation

May et al. (2003) explore how social, cultural, and ethical factors shape the implementation of HTA in telehealthcare. They suggest that contextual factors such as Islamic bioethics should play a role in decision-making processes. This resonates with the concept of Hifz al-Deen (Protection of Faith), ensuring that technologies align with religious and cultural norms, which is particularly significant for Muslim communities when adopting health technologies.

4) Consequentialism in Islamic Bioethics and Its Role in Assessing Technologies

Hossain (2012) provides a consequentialist perspective in Islamic bioethics, highlighting the balance between technological advancements and Islamic ethical limitations. This framework is useful in HTA, where decisions must consider the broader societal and ethical implications of technologies. Islamic bioethics serves as a moral compass guiding HTA to balance innovation with ethical constraints based on Shariah law.

5) Challenges in Balancing Empirical Findings with Ethical Norms

Pacyna and Sharp (2020) discuss the conflict between empirical data and long-standing moral intuitions in bioethics. This is relevant to Islamic bioethics, where the dynamic nature of Shariah allows for interpretations

that address modern challenges in healthcare technology. The principle of benefit (Maslahah) can be applied to resolve these conflicts by prioritizing the greater good in the context of HTA.

6) Empirical and Normative Inquiry in HTA

Wilt et al. (2022) propose combining empirical analysis with normative inquiry, emphasizing that Islamic ethical principles can be integrated into HTA processes. This approach strengthens the methodological rigor of HTA by incorporating ethical guidelines grounded in religion, ensuring that both scientific data and moral principles are considered in evaluating health technologies.

7) Islamic Bioethical Implications for Reproductive Technologies

Padela et al. (2020) examine how Islamic bioethics influences the use of reproductive technologies like IVF and surrogacy. This highlights the role of Islamic bioethics in decision-making for family and societal well-being (Hifz al-Nasl), which is essential in HTA, especially when evaluating new reproductive technologies.

Table 2: Literature Matrix on Empirical evidence on Islamic bioethics and its role in Health Technology Assessment (HTA)

Authors	Paper Title	Key Focus	Empirical Evidence	Relevance to Islamic Bioethics in HTA
Aqeel, A. (2007)	Islamic Ethical Framework for Research into and Prevention of Genetic Diseases	Framework for genetic counseling and prevention rooted in Islamic bioethics	Highlights Islamic principles in medical genetics, focusing on ethical concerns such as consanguinity, informed by historical Islamic rulings	Emphasizes the role of Islamic ethics in genetic disease prevention, aligning with HTA goals of improving healthcare interventions
Have, H. (2004)	Ethical Perspectives on Health Technology Assessment	Minor role of ethics in HTA	Empirical study on why ethical considerations are often overlooked in HTA, arguing for a broader moral approach	Calls for integrating bioethics, including religious ethical perspectives, into HTA processes
May, C., Mort, M., Williams, T., Mair, F., & Gask, L. (2003)	Health Technology Assessment in its Local Contexts: Studies of Telehealthcare	Ethnographic studies of HTA in telehealthcare	Shows how HTA implementation in telehealthcare practices is shaped by social, cultural, and ethical factors	Suggests the importance of contextual factors such as Islamic bioethics when conducting HTA
Hossain, A. (2012)	Consequential Approach of Islamic Bioethics	Consequentialist ethical perspective in Islamic bioethics	Discusses the balance of technological advancements and ethical limitations based on Islamic principles	Islamic bioethics plays a key role in assessing new biomedical technologies from a consequentialist perspective in HTA
Pacyna, J., &	When Moral	The intersection	Demonstrates the	Highlights the

Sharp, R. (2020)	Intuitions and Empirical Findings Collide: A Case for Revisiting Protectionist Tendencies in Bioethics	of moral intuitions and empirical research in bioethics	conflict between empirical findings and long-held moral positions in bioethics	importance of integrating empirical data with ethical principles, potentially including Islamic bioethics, to inform HTA
Wilt, G., Bloemen, B., Grin, J., Gutiérrez-Ibarluzea, I., Sampietro-Colom, L., Refolo, P., Sacchini, D., Hofmann, B., Sandman, L., & Oortwijn, W. (2022)	Integrating Empirical Analysis and Normative Inquiry in Health Technology Assessment: The Values in Doing Assessments of Health Technologies Approach	Combining empirical and normative aspects in HTA	Suggests a method for combining empirical data with normative ethical inquiry to assess the value of health technologies	Provides a structured approach that could integrate Islamic bioethical principles into HTA processes
Padela, A., Klima, K., & Duivenbode, R. (2020)	Producing Parenthood: Islamic Bioethical Perspectives & Normative Implications	Islamic bioethics on reproductive technologies	Examines the ethical implications of technologies such as IVF and surrogacy within the framework of Islamic bioethics	Highlights how Islamic bioethics influences decision-making in HTA for reproductive technologies

The literature matrix provides a comprehensive view of how Islamic bioethics interacts with HTA, emphasizing the need to incorporate ethical principles based on Maqasid al-Shari'ah into decision-making processes. The authors collectively argue for a more integrated approach, where empirical data and normative ethics work together to guide the assessment and implementation of healthcare technologies, ensuring they are in line with Islamic ethical norms.

C.   Case Studies: Examples where Islamic bioethical principles influenced decision-making in Health Technology Assessment (HTA)

Islamic bioethical principles have significantly shaped healthcare decision-making in Muslim-majority contexts, particularly in areas where health technology assessments (HTAs) intersect with ethical and religious considerations. Below are a few case studies that illustrate how Islamic bioethics has been applied in various health contexts, influencing both policy and clinical decisions.

1)   Reproductive Technologies in Assisted Reproduction

One of the prominent areas where Islamic bioethics has shaped HTA is in the realm of assisted reproductive technologies (ART). In many Muslim-majority countries, the use of ART, including in vitro fertilization (IVF) and surrogacy, must align with Islamic principles of marriage and procreation. Islamic bioethics emphasizes the sanctity of marriage, limiting the use of reproductive technologies to married heterosexual couples, and prohibits third-party involvement in surrogacy or gamete donation (Albar & Chamsi-Pasha, 2015). For example, artificial womb technology offers an alternative for premature births and infertility treatment, but it raises ethical concerns about the status of the fetus and sanctity of life (Hifz al-Nafs). Islamic scholars express caution, advocating that HTA should incorporate Islamic values that protect life and the integrity of family structures. The debate extends to whether such technologies could disrupt natural reproduction and how Islamic law can provide safeguards to

ensure ethical use of the technology (AlJahsh, 2024). Thus, in countries like Saudi Arabia and Iran, HTA frameworks evaluating ART must consider these religious rulings, ensuring that policies and technologies align with Islamic principles of procreation and family integrity.

2) Organ Transplantation

Organ transplantation is another area where Islamic bioethics plays a critical role in decision-making within HTA. Islamic scholars have debated the permissibility of organ donation, particularly cadaveric donations, due to concerns over the sanctity of the human body. However, many scholars have ruled that organ donation is permissible under the principle of *maslaha* (public benefit) if it saves lives (Ghaly, 2015). For instance, in Malaysia, HTA frameworks that evaluate organ transplantation technologies incorporate these ethical considerations, ensuring that organ donation is seen as an act of charity while maintaining the dignity of the donor. This case demonstrates how Islamic bioethics influences the HTA process by ensuring that medical technologies serve both individual and public health needs without violating religious principles.

3) End-of-Life Care

End-of-life care poses significant ethical dilemmas, particularly around the use of life-sustaining technologies such as mechanical ventilation and feeding tubes. Islamic bioethics, which emphasizes the sanctity of life, also recognizes the importance of avoiding undue suffering (la dharar). This is especially relevant when medical interventions may prolong life without improving the quality of life. In the context of end-of-life care, HTA decisions are significantly influenced by Islamic bioethics, which stresses the importance of not artificially prolonging life. The principle of avoiding unnecessary harm and allowing natural death is central. Islamic bioethics urges the careful application of life-sustaining technologies to ensure that interventions do not violate the natural process of death, promoting dignity in the dying process (Elmahjub, 2022). In countries like Egypt and the UAE, HTA frameworks assess the use of life-sustaining technologies in light of Islamic teachings, which allow the withdrawal of futile treatments if the patient is deemed to be in a terminal condition, where recovery is not expected (Sachedina, 2009). This integration of Islamic bioethics into HTA helps inform decision-making that respects both religious principles and medical ethics in end-of-life scenarios.

4) Genetic Screening and Therapy

Genetic screening and therapies, such as gene editing, have raised ethical questions within Islamic bioethics, particularly around issues of human dignity and the permissibility of altering God's creation. However, many Islamic scholars have ruled that genetic interventions aimed at preventing or treating hereditary diseases are permissible if they promote the welfare of the patient and do not involve prohibited practices, such as selecting embryos for non-medical reasons (Gatrad & Sheikh, 2001). For example, the He Jiankui case, where CRISPR-Cas9 was used for germline editing without oversight, created an ethical crisis. From an Islamic bioethical viewpoint, the case emphasizes principles such as the protection of lineage (Hifz al-Nasl) and human dignity. Islamic ethics, which prioritizes prevention of harm (Darar), calls for strict regulation and oversight of technologies that could potentially alter the human genetic code permanently. This case underscores how Islamic bioethics can guide HTA by ensuring technologies are aligned with moral and ethical frameworks before being accepted into healthcare systems (Alsomali, 2021). Thus, in countries like Qatar, HTA frameworks evaluating genetic technologies are guided by these rulings, ensuring that they are used ethically and responsibly, in line with Islamic principles of beneficence and justice.

These case studies highlight the significant influence of Islamic bioethical principles on HTA decision-making, particularly in areas like reproductive technologies, organ transplantation, end-of-life care, and genetic screening. By integrating these ethical principles, HTA frameworks in Muslim-majority countries ensure that health technologies are evaluated not only for their clinical and economic benefits but also for their alignment with the moral and religious values of the population.

Comparative Analysis: Islamic Vs. Secular Ethical Frameworks

In the evaluation of health technologies, ethical frameworks play a pivotal role in guiding decision-making.

Islamic bioethical principles and secular ethical frameworks, often employed in Health Technology Assessment (HTA), provide contrasting but complementary approaches to addressing ethical dilemmas. Islamic bioethics, deeply rooted in the Shariah, emphasizes principles such as the sanctity of life, justice, beneficence, and the collective welfare of the community. In contrast, secular ethical frameworks, such as those based on Western biomedical ethics, focus on autonomy, individual rights, and the utilitarian balance of risks and benefits (Gatrad & Sheikh, 2001). While both frameworks prioritize patient welfare, their approaches to autonomy, end-of-life decisions, and resource allocation may differ significantly. For instance, in Islamic bioethics, the community's well-being and religious obligations often take precedence over individual autonomy, a core tenet of secular frameworks (Sachedina, 2009).

Incorporating Islamic ethical principles into HTA presents both benefits and challenges. On one hand, integrating Islamic ethics allows for healthcare decisions that are culturally sensitive and reflective of the values of Muslim-majority populations. It ensures that health interventions align with religious and moral obligations, promoting equity and justice within these communities. On the other hand, challenges arise when balancing the collectivist orientation of Islamic ethics with the more individualist approach of secular frameworks, particularly in areas such as patient autonomy and consent (Albar & Chamsi-Pasha, 2015). The inclusion of Islamic bioethics in HTA requires a nuanced understanding of cultural contexts to avoid conflicts between ethical systems and ensure that healthcare practices remain respectful and inclusive.

A. Islamic vs. Secular Ethical Frameworks

In health technology assessment (HTA), ethical frameworks are essential for guiding decision-making on the use of medical technologies. Islamic bioethics and secular ethical frameworks, though both rooted in ensuring ethical healthcare practices, differ in their principles and applications. Islamic bioethics is grounded in the teachings of the Qur'an, Hadith, and the Shariah, and emphasizes the preservation of life (*hifz al-nafs*), justice (*adl*), and collective welfare (*maslaha*) (Chamsi-Pasha & Albar, 2016). Conversely, secular bioethics, as exemplified by the Western biomedical framework, is primarily based on four key principles: autonomy, beneficence, non-maleficence, and justice (Beauchamp & Childress, 2019).

The principle of autonomy, which holds a central place in secular frameworks, gives patients the right to make decisions about their own healthcare. In contrast, Islamic bioethics incorporates autonomy but places greater emphasis on community welfare and moral responsibility, often subordinating individual autonomy to the greater good (Chamsi-Pasha, Albar & Chamsi-Pasha, 2022). For example, decisions regarding end-of-life care in Islamic ethics may prioritize the sanctity of life over patient autonomy, differing from the secular focus on the patient's right to refuse treatment (Elmahjub, 2022). In terms of justice, both frameworks seek fairness in healthcare. However, Islamic bioethics frames justice within the broader context of societal obligations and religious duties, which can influence decisions related to resource allocation and access to care (Sachedina, 2009). Meanwhile, secular ethics typically approaches justice from an egalitarian perspective, prioritizing equal access and rights for all individuals.

These differences highlight the challenge of integrating diverse ethical systems into HTA, particularly in multicultural or Muslim-majority societies. While secular frameworks emphasize individual rights and autonomy, Islamic bioethics promotes a balance between individual, communal, and religious responsibilities, which may lead to different healthcare priorities in HTA.

B. Benefits and Limitations of Incorporating Islamic Ethics into HTA

Incorporating Islamic ethics into Health Technology Assessment (HTA) offers both significant advantages and challenges. Islamic bioethics, which is rooted in the teachings of the Qur'an, Hadith, and Shariah, emphasizes core principles like the preservation of life (*hifz al-nafs*), justice (*adl*), and collective welfare (*maslaha*). These principles provide a holistic approach to healthcare, prioritizing not just individual well-being but also communal welfare. However, integrating Islamic ethics into HTA frameworks, which are often built on secular principles such as individual autonomy, poses certain challenges. This analysis explores the benefits and limitations of this integration in the context of healthcare decision-making.

1) Benefits of Incorporating Islamic Ethics into HTA

i. Holistic Approach to Healthcare

Islamic ethics emphasizes the preservation of life (*hifz al-nafs*), justice (*adl*), and collective welfare (*maslaha*), offering a holistic view of healthcare that extends beyond the individual to include societal and communal well-being (Chamsi-Pasha & Albar, 2016). This approach ensures that health interventions consider not only the patient's autonomy but also the broader societal impacts, making it particularly valuable in public health decisions.

ii. Moral and Religious Guidance

Islamic bioethics, grounded in the teachings of the Qur'an and Hadith, provides clear moral guidance that aligns with the religious values of Muslim-majority societies (Chamsi-Pasha & Albar, 2016). This alignment can enhance the acceptance and legitimacy of healthcare policies, as individuals are more likely to trust and follow medical recommendations that are consistent with their religious beliefs.

iii. Emphasis on Social Justice

Islamic ethics places a strong emphasis on justice and equity, ensuring that healthcare resources are distributed fairly and that vulnerable populations are protected (Sachedina, 2009). This can help address health disparities by prioritizing communal welfare and the rights of disadvantaged groups in health technology assessments.

2) Limitations of Incorporating Islamic Ethics into HTA

i. Potential Conflict with Secular Principles

The principle of autonomy, which is central to secular ethical frameworks, often conflicts with the collective welfare focus in Islamic ethics. Islamic bioethics may prioritize societal needs over individual autonomy, which could pose challenges in multicultural settings where individual rights are highly valued (Elmahjub, 2022). For example, end-of-life decisions in Islamic ethics may emphasize the sanctity of life, while secular ethics may prioritize patient autonomy and the right to refuse treatment.

ii. Challenges in Resource Allocation

While Islamic ethics emphasizes justice, its interpretation can vary, particularly regarding the allocation of limited healthcare resources. Decisions influenced by religious duties may differ from secular egalitarian perspectives, potentially complicating the integration of both systems in diverse societies (Sachedina, 2009). For instance, Islamic bioethics may favour resource allocation that supports religious or community obligations, which might not align with secular views that prioritize equal access for all.

iii. Application in Multicultural Settings

Islamic bioethics is deeply rooted in religious traditions, which may present challenges in multicultural or secular societies where diverse ethical systems coexist (Elmahjub, 2022). Incorporating Islamic ethics into HTA in these settings may lead to conflicts with non-Islamic ethical frameworks, making consensus-building difficult when developing health policies that cater to all citizens.

Incorporating Islamic ethics into HTA offers valuable benefits, particularly in Muslim-majority contexts, by promoting holistic care, moral guidance, and social justice. However, challenges arise when integrating these principles with secular ethics, especially in areas concerning autonomy, resource allocation, and multicultural considerations. A balanced approach is needed to reconcile these differences in order to create inclusive and effective health technology assessments.

CONCLUSION: SUMMARY OF KEY INSIGHTS AND FUTURE DIRECTIONS

A. Summary of Key Insights on the Integration of Islamic Bioethics into HTA

In summary, the integration of Islamic bioethics into Health Technology Assessment (HTA) provides valuable insights for culturally sensitive healthcare decision-making. Key benefits include the holistic approach to healthcare that Islamic ethics promotes, focusing on both individual and community welfare, and the strong emphasis on justice and equity in resource allocation (Chamsi-Pasha & Albar, 2016). These aspects make Islamic bioethics especially relevant in Muslim-majority societies, where religious values guide ethical decision-making in healthcare.

However, challenges arise in balancing Islamic bioethics with secular principles, particularly concerning individual autonomy. Islamic ethics often prioritizes communal welfare over personal choice, which can lead to conflicts in multicultural or secular settings (Elmahjub, 2022). Additionally, the variation in ethical priorities can complicate policy decisions in diverse societies, making the integration of Islamic ethics into HTA a complex process.

Ultimately, a nuanced approach is needed to effectively integrate Islamic bioethics into HTA. This requires careful consideration of both religious and secular ethical frameworks to ensure that healthcare policies are equitable and culturally appropriate for all populations (Sachedina, 2009).

B. Future Directions: Recommendations for Enhancing the Integration of Islamic Ethical Frameworks in HTA

The future integration of Islamic ethical frameworks into Health Technology Assessment (HTA) presents promising avenues for research and policy-making. To strengthen this integration, several key recommendations can be proposed:

1) Context-Specific Ethical Guidelines

Future research should focus on developing context-specific ethical guidelines that align Islamic bioethics with HTA processes in Muslim-majority societies. These guidelines should offer clear frameworks for balancing religious principles with healthcare priorities, ensuring that Islamic values such as justice, communal welfare, and the preservation of life are fully considered in decision-making (Chamsi-Pasha & Albar, 2016). Policymakers can use these tailored guidelines to create more culturally relevant and ethically grounded health interventions.

2) Cross-Cultural Comparative Studies

Comparative studies that examine the integration of Islamic bioethics with secular HTA frameworks in multicultural or secular societies are essential for navigating ethical conflicts. Research should explore how Islamic principles, particularly the emphasis on community welfare, can be harmonized with secular principles like autonomy and egalitarian justice (Elmahjub, 2022). These studies could identify best practices for policy-making in diverse settings, helping to balance individual and communal ethical considerations.

3) Training and Education Programs

Enhancing the integration of Islamic bioethics into HTA requires investment in education and training programs for healthcare professionals. Training curricula that integrate Islamic ethical principles into medical practice can empower Muslim healthcare providers to apply these values in patient care and decision-making processes (Mahmood, 2023). This focus on education will foster a deeper understanding of Islamic ethics in HTA and improve the skills of healthcare professionals in implementing ethical decisions.

4) Interdisciplinary Collaboration

Future research should also emphasize interdisciplinary collaboration between Islamic scholars, bioethicists,

healthcare professionals, and policymakers. By fostering dialogue across these fields, researchers can ensure that HTA frameworks are inclusive of both religious and scientific perspectives. This collaboration is crucial for creating well-rounded policies that respect religious ethics while promoting the best outcomes for patients (Moattar, Asghari, & Majdzadeh, 2016).

5) Public Engagement and Awareness

Policymakers should also focus on public engagement, promoting awareness of the role Islamic bioethics plays in healthcare decision-making. By encouraging public discourse on the integration of religious ethics into HTA, researchers and policymakers can better align healthcare interventions with the values of Muslim communities. This will enhance the acceptance and legitimacy of HTA processes, leading to more equitable health outcomes (Sachedina, 2009).

Future research and policy-making efforts must prioritize context-specific guidelines, comparative studies, training programs, interdisciplinary collaboration, and public engagement to enhance the integration of Islamic ethical frameworks in HTA. These steps will help create more inclusive, culturally sensitive, and ethically grounded health technology assessments that address the needs of diverse populations.

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REFERENCES

1. Alahmad, G. (2023). Attitudes toward medical ethics among obstetricians and gynecologists in Saudi Arabia: an exploratory survey. Healthcare, 11(10), 1394. https://doi.org/10.3390/healthcare11101394
2. Alam, M., Said, J., & Hassan, S. (2019). Performance of Islamic microcredit in perspective of Maqasid al-Shari'ah: a case study on Amanah Ikhtiar Malaysia. https://doi.org/10.31235/osf.io/ay6bf
3. Albar, M. A. and Chamsi-Pasha, H. (2015). Assisted reproductive technology: Islamic perspective. Contemporary Bioethics, 173-186. https://doi.org/10.1007/978-3-319-18428-9_11
4. Al-Bar, M. A., & Chamsi-Pasha, H. (2015). Contemporary bioethics: Islamic perspectives. Springer. https://doi.org/10.1007/978-3-319-18428-9
5. Alfahmi, M. (2022). Justification for requiring disclosure of diagnoses and prognoses to dying patients in Saudi medical settings: a Maqasid al-Shari'ah-based Islamic bioethics approach. BMC Medical Ethics, 23(1). https://doi.org/10.1186/s12910-022-00808-6
6. Alhammadi, S., Alotaibi, K., & Hakam, D. (2020). Analysing Islamic banking ethical performance from maqāṣid al-sharī'ah perspective: evidence from Indonesia. Journal of Sustainable Finance & Investment, 12(4), 1171-1193. https://doi.org/10.1080/20430795.2020.1848179
7. Alias, A., Sulaiman, M., Ariffin, N., & Bakar, I. (2023). Malaysian takaful reporting from a maqasid shariah perspective. Journal of Islamic Philanthropy and Social Finance, 5(1), 1-9. https://doi.org/10.24191/jipsf/v5n12023_1-9
8. AlJahsh, M. A. I. (2024). Science and Islamic ethics: Navigating artificial womb technologies. https://www.cell.com/heliyon/fulltext/S2405-8440(24)12824-1
9. Al-Sharmani, M. (2018). Marriage in Islamic interpretive tradition: Revisiting the legal and the ethical. Journal of Islamic Ethics, 2(1-2), 76-96. https://doi.org/10.1163/24685542-12340017
10. Alsomali, N. (2021). CRISPR-Cas9 and He Jiankui's Case: An Islamic Bioethics Approach. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8298734/
11. Amran, S., Rasool, M., & Ali, S. (2019). Addressing household wellbeing through maqasid shariah: a micro perspective. Journal of Islamic Philanthropy and Social Finance, 1(1), 55-66. https://doi.org/10.24191/jipsf/v1n12019_55-66
12. Atighetchi, D. (2007). Islamic bioethics: problems and perspectives. International Library of Ethics, Law, and the New Medicine. https://doi.org/10.1007/978-1-4020-4962-0
13. Auda, J. (2012). An outline of the Islamic Maqasidi/purpose-based approach. Bioethics Proceedings, 2012, 1. https://doi.org/10.5339/QPROC.2012.BIOETHICS.5.1.

14. Azalan, M. (2023). Natural product as chemoprevention from maqasid shariah perspective: a narrative review. RAS, 13(2). https://doi.org/10.31436/revival.v13i2.369

15. Aziz, M., Rasid, S., & Aziz, N. (2021). Credit evaluation by the small-medium sized enterprises: maqasid shariah approach. International Journal of Academic Research in Business and Social Sciences, 11(10). https://doi.org/10.6007/ijarbss/v11-i10/10919

16. Beauchamp, T., & Childress, J. (2019). Principles of biomedical ethics: Marking Its fortieth anniversary. The American Journal of Bioethics, 19(11), 9–12. https://doi.org/10.1080/15265161.2019.1665402

17. Behzadifar, M., Behzadifar, M., Saran, M., Shahabi, S., Bakhtiari, A., Azari, S., … & Bragazzi, N. L. (2023). The role of Iran's context for the development of health technology assessment: challenges and solutions. Health Economics Review, 13(1). https://doi.org/10.1186/s13561-023-00438-7

18. Bellemare, C., Dagenais, P., K-Bédard, S., Béland, J., Bernier, L., Daniel, C., … & Patenaude, J. (2018). Ethics in health technology assessment: a systematic review. International Journal of Technology Assessment in Health Care, 34(5), 447-457. https://doi.org/10.1017/s0266462318000508

19. Besar Sa'aid, H.; Md Shahid, S.A. & Zakaria, A.B. (2012). Islamic bioethics as an extended new element in a health technology assessment (HTA) framework. Paper presented at the WCIT 2012 - World Conference on Islamic Thought and Civilisation, Kolej Universiti Sultan Azlan Shah (KUISAS), 11-12 September. Kuala Kangsar, Perak, Malaysia. https://tinyurl.com/2bzubpbd

20. Blaauw, D., Chambers, C., Chirwa, T., Duba, N., Gwyther, L., London, L., … & Tugendhaft, A. (2022). Introducing an ethics framework for health priority-setting in South Africa on the path to universal health coverage. South African Medical Journal, 112(3), 240-244. https://doi.org/10.7196/samj.2022.v112i3.16278

21. Brockopp, J. E., & Eich, T. (Eds.). (2008). Muslim Medical Ethics: From Theory to Practice. University of South Carolina Press. https://doi.org/10.2307/j.ctv1ffpd0n

22. Chamsi-Pasha, H. and Albar, M. A. (2016). Doctor-patient relationship. Saudi Medical Journal, 37(2), 121-126. https://doi.org/10.15537/smj.2016.2.13602

23. Chamsi-Pasha, H., & Albar, M. A. (2013). Western and Islamic bioethics: How close is the gap?. Avicenna journal of medicine, 3(1), 8–14. https://doi.org/10.4103/2231-0770.112788

24. Chamsi-Pasha, H., Albar, M. A., & Chamsi-Pasha, M. (2022). Comparative study between Islamic and western bioethics: the principle of autonomy, Journal of the British Islamic Association, 11(4), 1-11. https://www.jbima.com/wp-content/uploads/2022/09/2-Ethics-_1_-ChamsiPasha__.pdf

25. Cooper-Jones, B., Mason, J., Kamel, C., Mittmann, N., & Dunfield, L. (2022). Virtual care and health technology assessment considerations. Healthcare Management Forum, 35(3), 127-129. https://doi.org/10.1177/08404704211061954

26. Culyer, A. J. (2016). HTA – algorithm or process? comment on "expanded HTA: enhancing fairness and legitimacy". International Journal of Health Policy and Management, 5(8), 501-505. https://doi.org/10.15171/ijhpm.2016.59

27. Dabbagh, H., Mirdamadi, S. Y., & Ajani, R. R. (2023). Approaches to Muslim Biomedical Ethics: A Classification and Critique. Journal of bioethical inquiry, 20(2), 327–339. https://doi.org/10.1007/s11673-023-10239-6

28. Daniels, N. and Wilt, G. J. v. d. (2016). Health technology assessment, deliberative process, and ethically contested issues. International Journal of Technology Assessment in Health Care, 32(1-2), 10-15. https://doi.org/10.1017/s0266462316000155

29. Ebrahim, A. F. M. (2008). An Introduction to Islamic Medical Jurisprudence. Islamic Medial Association of South Africa.

30. Elmahjub, E. (2022). Normative account of Islamic bioethics in end-of-life care. https://www.tandfonline.com/doi/full/10.1080/11287462.2022.2118977

31. Elmahjub, E. (2022). The role of Islamic ethics in healthcare decision-making. Journal of Medical Ethics, 48(3), 189-194. https://doi.org/10.1136/medethics-2021-107456

32. Gatrad, A. R., & Sheikh, A. (2001). Medical ethics and Islam: Principles and practice. Archives of Disease in Childhood, 84(1), 72–75. https://doi.org/10.1136/adc.84.1.72

33. Ghaly, M. (2015). Islamic perspectives on the principles of biomedical ethics. Intercultural Dialogue in Bioethics. https://doi.org/10.1142/q0014

34. Gietzen, L., Ogilvie, S., Steerling, E., Houston, R., Nygren, J., & Ruiter, H. (2022). Ethics and new health

technologies: an innovative descriptive analysis of the state of the literature. Creative Nursing, 28(4), 221-227. https://doi.org/10.1891/cn-2022-0044

35. Greiner, W. (2008). Health technology assessment (HTA). Gesundheitsökonomische Evaluationen, 447-469. https://doi.org/10.1007/978-3-540-49559-8_19

36. Hofmann, B. (2008). Why ethics should be part of health technology assessment. International Journal of Technology Assessment in Health Care, 24(04), 423-429. https://doi.org/10.1017/s0266462308080550

37. Ibrahim, A. H., Rahman, N. N. A., Saifuddeen, S. M., & Baharuddin, M. (2019). Maqasid al-Shari'ah based Islamic bioethics: A comprehensive approach. Journal of Bioethical Inquiry, 1-13. https://doi.org/10.1007/s11673-019-09902-8.

38. Kasim, E., Daud, D., Alam, M., Omar, N., & Kusrini, E. (2022). Application of Maqasid al-Shari'ah into supply chain management practices for sustainable development.. https://doi.org/10.31219/osf.io/789vz

39. Khairi, K., Samat, M., Laili, N., Sabri, H., Basah, M., Haris, A., … & Mirza, A. (2020). Takaful protection for mental health illness from the perspective of maqasid shariah. International Journal of Financial Research, 11(3), 168. https://doi.org/10.5430/ijfr.v11n3p168

40. Khaleefah, S. (2022). Justice and Autonomy in Islamic Bioethics. Acta Cogitata: An Undergraduate Journal in Philosophy. 10(3). https://commons.emich.edu/ac/vol10/iss1/3

41. Kumar, R., Suharlim, C., Amaris, A. M., Gilmartin, C., Mehra, M., & Castro, H. (2022). Assessing progression of health technology assessment implementation in Asia: A balanced scorecard for cross comparison of selected countries in Asia. International Journal of Technology Assessment in Health Care, 38(1). https://doi.org/10.1017/s0266462322000423

42. Legault, G., Béland, J., Parent, M., Bédard, S., Bellemare, C., Bernier, L., … & Patenaude, J. (2019). Ethical evaluation in health technology assessment: A challenge for applied philosophy. Open Journal of Philosophy, 09(03), 331-351. https://doi.org/10.4236/ojpp.2019.93022

43. Legault, G., Gagnon, H., Parent, M., Bellemare, C., Béland, J., Kocsis-Bédard, S., … & Patenaude, J. (2021). Integration of ethical considerations into hta reports: an analysis of integration levels using a systematic review. International Journal of Technology Assessment in Health Care, 37(1). https://doi.org/10.1017/s0266462321000325

44. Lehoux, P., Blume, S., & Hivon, M. (2014). Integrating ethics in health technology assessment: The quest for appropriateness. Health Care Analysis, 12(1), 315-326. https://doi.org/10.1007/s10728-012-0211-6

45. Mahmood, M., Yusof, N. M., Saidi, S., & Ahmad, A. A. (2023). The integration of Islamic values in daily clinical practice among healthcare professionals: a scoping review. IIUM Medical Journal Malaysia, 22(3). https://doi.org/10.31436/imjm.v22i3.2273

46. Moattar, A. S., Asghari, F., & Majdzadeh, R. (2016). Do ethical considerations influence any in HTA reports? A review of reports. Medical journal of the Islamic Republic of Iran, 30, 362.

47. Moosapour, H., Mashayekhi, J., Zahedi, F., Soltani, A., & Larijani, B. (2018). General approaches to ethical reasoning in Islamic biomedical ethics discourse. Journal of medical ethics and history of medicine, 11, 11. https://jmehm.tums.ac.ir/index.php/jmehm/article/view/309

48. Muhammad, M. and Sudrajad, O. (2023). Analysing banking compliance from Maqasid Shariah perspective: evidence from Islamic and conventional bank in Indonesia. International Journal of Current Science Research and Review, 06(02). https://doi.org/10.47191/ijcsrr/v6-i2-69

49. Nasir, N., Nair, M., & Ahmed, P. (2022). Environmental sustainability and contemporary Islamic society: a shariah perspective. Asian Academy of Management Journal, 27(2). https://doi.org/10.21315/aamj2022.27.2.10

50. O'Rourke, B., Oortwijn, W., & Schuller, T. (2020). Announcing the new definition of health technology assessment. Value in Health, 23(6), 824-825. https://doi.org/10.1016/j.jval.2020.05.001

51. O'Rourke, B., Oortwijn, W., & Schuller, T. (2020). The new definition of health technology assessment: a milestone in international collaboration. International Journal of Technology Assessment in Health Care, 36(3), 187-190. https://doi.org/10.1017/s0266462320000215

52. Pacyna, J., & Sharp, R. (2020). When Moral Intuitions and Empirical Findings Collide: A Case for Revisiting Protectionist Tendencies in Bioethics. AJOB Empirical Bioethics, 11, 24 - 26. https://doi.org/10.1080/23294515.2020.1713245.

53. Padela, A. (2018). The essential dimensions of health according to the Maqasid al-Shari'ah frameworks

of Abu Ishaq al-Shatibi and Jamal-al-Din-ʿAtiyah. IIUM Medical Journal Malaysia. https://doi.org/10.31436/imjm.v17i1.1035.

54. Padela, A. (2022). Maqāṣidī models for an "Islamic" medical ethics. American Journal of Islam and Society, 39(1-2), 72-114. https://doi.org/10.35632/ajis.v39i1-2.3069

55. Padela, A. I. (2013). Islamic bioethics: between sacred law, lived experiences, and state authority. Theoretical Medicine and Bioethics, 34(2), 65-80. https://doi.org/10.1007/s11017-013-9249-1

56. Padela, A., Klima, K., & Duivenbode, R. (2020). Producing Parenthood: Islamic Bioethical Perspectives & Normative Implications. The New Bioethics, 26, 17 - 37. https://doi.org/10.1080/20502877.2020.1729575.

57. Rasool, S., Hussain, M., Saleem, H. H., Sultan, S., Akhter, S., & Aslam, E. (2023). Islam and four principles of biomedical ethics: from theory to practice. Russian Law Journal, 11(11s). https://doi.org/10.52783/rlj.v11i11s.2033

58. Refolo, P., Bond, K., Bloemen, B., Autti-Rämö, I., Hofmann, B., Mischke, C., … & Sacchini, D. (2020). Core competencies for ethics experts in health technology assessment. International Journal of Technology Assessment in Health Care, 36(6), 534-539. https://doi.org/10.1017/s0266462320001968

59. Richardson, J., & Schlander, M. (2018). Health technology assessment (HTA) and economic evaluation: efficiency or fairness first. Journal of market access & health policy, 7(1), 1557981. https://doi.org/10.1080/20016689.2018.1557981

60. Sachedina, A. (2009). Islamic biomedical ethics principles and application. New York, 2009; online ed, Oxford Academic. https://doi.org/10.1093/acprof:oso/9780195378504.001.0001

61. Saifuddeen, S. M., Rahman, N. N. A., Isa, N. M., & Baharuddin, A. (2014). Maqasid al-Shari'ah as a complementary framework to conventional bioethics. Science and Engineering Ethics, 20(2), 317-327. https://doi.org/10.1007/s11948-013-9457-0

62. Shiroma, N. (2024). Exploring the gender and age demographics of patients treated by emergency medical teams during disasters. International Journal of Environmental Research and Public Health, 21(6), 696. https://doi.org/10.3390/ijerph21060696

63. Wilt, G., Bloemen, B., Grin, J., Gutiérrez-Ibarluzea, I., Sampietro-Colom, L., Refolo, P., Sacchini, D., Hofmann, B., Sandman, L., & Oortwijn, W. (2022). Integrating Empirical Analysis and Normative Inquiry in Health Technology Assessment: The Values in Doing Assessments of Health Technologies Approach. International Journal of Technology Assessment in Health Care, 38. https://doi.org/10.1017/S0266462321001768

64. Woodman, A. (2023). Challenges associated with end-of-life care in Saudi Arabia.. https://doi.org/10.5772/intechopen.110283

65. Zaprulkhan, Z. (2018). Maqāṣid al-shariah in the contemporary Islamic legal discourse: perspective of jasser auda. Walisongo Jurnal Penelitian Sosial Keagamaan, 26(2), 445. https://doi.org/10.21580/ws.26.2.3231