Solo International Collaboration and Publication of Social Sciences and Humanities
E-ISSN: 2988-3512
Vol.4, No.1, 2026, pp. 29-44
DOI: https://doi.org/10.61455/sicopus.v4i01.254

The Integration of Islamic Philosophy of Science and Ethics in the Development of Modern Pharmacy: A Philosophical and Practical Review

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Received January 14, 2025; Revised February 14, 2025; Accepted July 09, 2025

Abstract

Objective: This research is to explore the integration of Islamic philosophy of science and ethics in the development of modern pharmaceutical science that is sustainable, innovative, and by sharia principles. **Theoretical framework:** this research is based on the philosophy of Islamic science that balances revelation and reason as the basis for the development of knowledge, as well as Islamic ethics that emphasizes the principles of justice (al-adl), benefit (maslahah), and avoidance of harm (mafsadah) as a moral foundation in ensuring halal and thayyib pharmaceutical products. **Literature review:** this study includes an analysis of 15 articles obtained from the Scopus, PubMed, and Google Scholar databases that discuss the integration of philosophy of science in modern science, the application of Islamic ethics in pharmaceutical practice, and the challenges and opportunities in the development of halal pharmaceuticals at the global level. **Methods:** This study uses a qualitative literature study approach with thematic analysis to identify the relevance and potential application of Islamic philosophy of science and ethics in modern pharmacy. **Results:** research shows that the integration of Islamic philosophy is able to provide a holistic framework of thinking that balances physical, mental, and spiritual aspects of pharmaceutical innovation. In addition, Islamic ethics play an important role in ensuring the halalness and quality of pharmaceutical products by the principles of thayyib. The research also identified challenges in the form of a lack of supporting regulations and health workers' understanding of Islamic principles, as well as a great opportunity that can be exploited, namely the increasing global demand for halal pharmaceutical products. **Implications:** This study emphasizes the importance of developing Sharia-based pharmaceutical policies and the need to integrate Islamic values into the pharmacy education curriculum to support the sustainability and excellence of the modern pharmaceutical system. **Novelty:** This research proposes the comprehensive integration of Islamic philosophy and Islamic ethics as a new approach to building a modern pharmaceutical system that is not only scientific but also moral, sustainable, and relevant to the needs of the global Muslim community.

Keywords: philosophy of science, islamic ethics, modern pharmacy, science and ethics, integration.

INTRODUCTION

The word "pharmacy" comes from the Greek word "pharmakon," which has a variety of meanings, including magic spells, medicines, or poisons. Pharmacy is one of the professions in the health field that integrates medical science, including general health, and chemical sciences. This profession has the primary responsibility for ensuring the safe and effective use of medications. Pharmacy is also defined as the art and science of preparing medicinal ingredients, both from natural and synthetic sources, to be distributed and utilized in the treatment and prevention of various diseases [1].

The history of pharmaceutical science has a close relationship with the development of medicine that has taken place thousands of years ago. In the early days, treatment was carried out from generation to generation based on inherited traditions. The practice of medicine at that time involved the use of plant-based herbs, such as leaves, roots, or sap [2]. Illness is often thought to be the result of the entry of evil spirits or punishment from the gods, so the evolving methods of treatment involve attempting to ward off evil spirits through spells, sounds, or the administration of special potions [3].

Modern pharmacy science developed not only as a branch of exact science but also as a discipline that relies heavily on the consideration of moral and ethical values. In practice, pharmaceutical science not only aims to create effective medicines but also to ensure that they are accessible equitably to the entire society [4]. In global challenges such as inequality of access to healthcare, the environmental impact of pharmaceutical production, and sustainability issues, an integrative approach that combines the Islamic philosophy of science and ethics is becoming increasingly relevant. The philosophy of science provides a foundation for exploring the essence of knowledge in pharmacy, while Islamic ethics offers moral guidance rooted in universal values such as justice (al-adl), benefit (maslahah), and harm avoidance (mafsadah) [5].

One of the main challenges in the development of Islamic-based pharmaceutical science is the lack of a deep understanding among health professionals regarding halal principles. This leads to a mismatch between pharmaceutical practices and the needs of Muslim patients, especially regarding the medicines and active ingredients used. Research shows that special education and training on Islamic ethics and pharmacy can increase professional awareness and competence in this field [6]. In addition, the integration of Islamic ethics in the development of modern pharmacy also provides a great opportunity to create a more inclusive and culturally sensitive health system. An example is the application of the principles of maqasid sharia, which places the protection of life (hifz al-nafs) as a top priority in the development of medicines and pharmaceutical services. This principle encourages innovation that not only prioritizes economic benefits but also the welfare of society as a whole [7].

A holistic approach that combines the Islamic philosophy of science and ethics also allows for the creation of pharmaceutical services that are more responsive to local needs. For example, the use of local natural resources for the development of herbal traditional medicines that not only support environmental sustainability but also in accordance with Islamic values. This effort is in line with the spirit of local wisdom which is an integral part of the community's culture. This research aims to explore the relationship between the philosophy of science, Islamic ethics, and the development of modern pharmaceutical science. This study is expected to provide new insights into how Islamic values can be integrated into modern pharmaceutical practices, as well as provide recommendations for policy development and education in this area. Thus, this contribution can encourage the creation of a pharmaceutical system that is not only innovative but also ethical and sustainable [8].

Implications and Novelty. The integration of Islamic philosophy of science and ethics into modern pharmaceutical development presents several important implications for both academic discourse and practical healthcare systems. First, it calls for a paradigm shift in

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how pharmaceutical research and development are conceptualized—not merely as technical or commercial endeavors, but as moral and spiritual responsibilities. This approach urges pharmaceutical professionals and institutions to consider not only the efficacy of medicines but also their halal status, ethical production, and equitable distribution, particularly within Muslim communities.

One major implication is the need for policy reform and regulatory alignment. Governments and health authorities in Muslim-majority countries are encouraged to create and enforce regulatory frameworks that accommodate Islamic ethical standards. This includes setting guidelines for halal certification, ensuring transparency in drug composition, and promoting ethical technology use such as telepharmacy. In addition, integrating Islamic ethics into pharmacy education curricula will prepare future professionals to address the ethical challenges of emerging medical technologies while remaining faithful to Islamic moral values. Moreover, this integrative approach supports the achievement of Sustainable Development Goals (SDGs), particularly in areas of health equity, cultural inclusion, and responsible innovation. It strengthens public trust in pharmaceutical services and increases the relevance of medical treatments for diverse populations [8].

Novelty. The novelty of this study lies in its comprehensive proposal to integrate Islamic philosophy of science and Islamic ethics as a dual epistemological and moral foundation for pharmaceutical development. While previous research has separately explored aspects of ethics or halal medicine, this study offers a holistic framework that connects metaphysical principles, ethical values, and practical applications. It emphasizes not only compliance with Islamic law but also the importance of spiritual well-being and social justice in healthcare. This perspective advances the discourse on Islamic science by demonstrating its practical relevance to modern issues, and it introduces a sustainable, value-based model for pharmaceutical development that addresses both global innovation and local religious identity.

LITERATURE REVIEW

Philosophy of Science in an Islamic Perspective

The philosophy of science in Islam is rooted in the teachings of the Qur'an and Hadith which encourage mankind to study natural phenomena as a form of gratitude to Allah. Islam views science as a means to get closer to the Creator while providing benefits to humans and the environment [9]. This philosophy of science emphasizes the importance of integration between divine revelation and human reason, which allows for a holistic understanding of natural and social phenomena. This principle is an important foundation in the development of various fields of science, including pharmacy, to ensure that scientific practice is not only scientific but also ethical and in accordance with religious values [10].

The Islamic approach to the philosophy of science also emphasizes the importance of a balance between material and spiritual aspects. In the context of pharmaceuticals, this philosophy helps drive innovation that is not only oriented toward economic gain but also considers its impact on society [11]. For example, modern pharmacy can leverage this concept to develop scientifically effective drugs while meeting halal and Islamic ethical standards. With this holistic approach, the philosophy of Islamic science makes a significant contribution to realizing a more equitable and beneficial pharmaceutical system for the wider community [12].

Islamic Ethics in Modern Pharmacy Practice

Islamic ethics have an important role to play in modern pharmaceutical practices, especially in ensuring that healthcare services and pharmaceutical products are in accordance with religious values. Islam regulates the consumption of halal and thayyib (good) products which include raw materials, production processes, and the distribution of pharmaceutical

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products. This ethics requires pharmacists to not only act by professional standards but also to adhere to moral values rooted in Islamic law [13].

In pharmaceutical practice, Islamic ethics also encourage transparency and fairness in service to patients. For example, pharmacists are expected to provide clear and correct information about the composition and side effects of the drug being given [14]. In addition, this ethics also demands the use of safe and appropriate technology, such as in the implementation of telepharma systems that meet halal regulations and patient data protection. Thus, Islamic ethics contribute to improving the quality of modern pharmaceutical services, while addressing the specific needs of Muslims [15].

Challenges and Opportunities for the Integration of Islamic Philosophy of Science and Ethics

Integrating Islamic philosophies of science and ethics in the development of modern pharmacy presents challenges, including a lack of understanding among healthcare professionals about these concepts. Another challenge is the lack of clear regulations regarding the application of Islamic principles in pharmaceuticals, especially in the context of globalization and rapid technological innovation. This obstacle can hinder efforts to create pharmaceutical products that are in accordance with sharia principles [16].

However, the opportunities offered are quite large. With the increasing demand for halal products in the global market, modern pharmaceuticals have the opportunity to develop innovations that are in accordance with Islamic law. In addition, this integration can strengthen the connection between science and religious values, ultimately driving the creation of a more inclusive, ethical, and sustainable pharmaceutical system. This requires collaboration between academia, government, and the pharmaceutical industry to ensure the successful implementation of these principles across all aspects of modern pharmacy [17].

METHODOLOGY

This research is a literature study with a qualitative approach that uses data tracing methods from various related scientific journals [18]. The data used is in the form of secondary data from journal articles relevant to the theme "Integration of Islamic Philosophy of Science and Ethics in the Development of Modern Pharmaceutical Science." Data sources are obtained through trusted databases such as Scopus, PubMed, Google Scholar, and Garuda, with predetermined criteria. The collected data is analyzed descriptively to understand the role of Islamic philosophy of science and ethical values in shaping a holistic and sustainable approach to the development of modern pharmaceutical science [19].

Data Search Process

A reference search was conducted in January 2025 using the following keywords:

Indonesian: "Philosophy of science", "telepharma", "digital pharmacy", and "Islamic ethics in drug development".

English: "Pharmacy development", "digital pharmacy", "telepharmacy", and "Islamic ethics in drug development". Data sources come from journals indexed by Sinta, PubMed, and Google Scholar, as well as national platforms such as Garuda.

Study Criteria

These criteria are used to ensure that only quality and relevant journals are included in the study:

Inclusion Criteria

1. Articles published in the time range 2018–2025.

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2. Articles are written in Indonesian and English.
3. Articles available in full text.
4. Articles that focus on the themes of philosophy of science, Islamic ethics, and the development of modern pharmaceutical science.

Exclusion Criteria

1. Articles that are not available in full text.
2. Articles with abstracts that are not relevant to the research theme.
3. Articles that discuss the theme of pharmacy but do not integrate aspects of Islamic ethics or philosophy of science.

Quality Assessment and Data Extraction Process

Journals selected through initial selection will go through a quality assessment process and data extraction. This process includes:

1. Initial Selection: Articles are checked through abstracts, keywords, and body to ensure they meet inclusion criteria.
2. Data Extraction: The data taken include the author's name, year of publication, type of research, research results, and relevance to the theme of Islamic philosophy of science and ethics in pharmacy. This data is systematically recorded using Microsoft Excel to support in-depth analysis.

Data Analysis

The data collected will be analyzed to identify key themes in the literature, including:

1. The relationship between the philosophy of science and the development of modern pharmaceutical science.
2. The role of Islamic ethics in creating a sustainable pharmaceutical approach.
3. Challenges and opportunities for the application of sharia maqasid in pharmaceutical research.
4. Implications of the integration of Islamic philosophy of science and ethics in the development of pharmaceutical technology.

Data Results and Representation

The results of the analysis will be displayed in the form of a table that summarizes the relevant information from each article. The data representation will include the main theme, the relevance of the article to the research objectives, and its contribution to the understanding of Islamic philosophy of science and ethics in modern pharmacy. All of these findings will be documented in a structured written report to support the preparation of comprehensive conclusions [20].

RESULTS AND DISCUSSION

Through searching data using databases such as PubMed, Sinta, Google Scholar, and Garuda, as many as 50 articles were found that were relevant to the research topic. After the initial screening process, as many as 15 articles were removed because they were duplicates or did not meet the basic criteria. Of the remaining 35 articles, 30 were selected for further review, while 5 were inaccessible. Furthermore, a feasibility evaluation was carried out on 15 articles, but 10 articles were excluded because they were only reviews, and the other 5 did

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not have adequate data. Finally, a total of 15 articles that met the inclusion criteria were selected for further analysis.

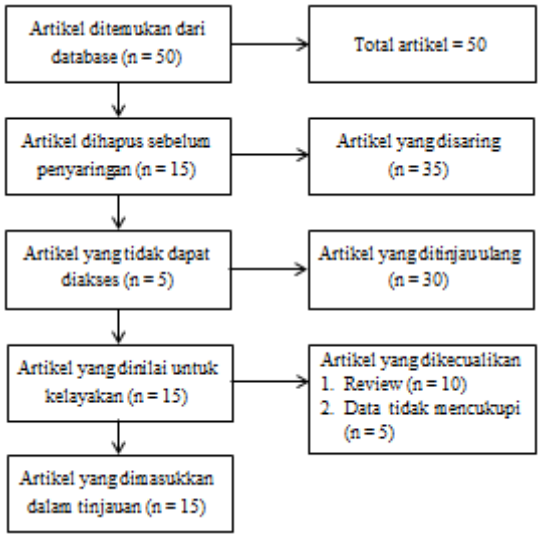

Figure 1. Research Prism Chart

Table 1. Summary of the Study on the Integration of Islamic Philosophy of Science and Ethics in the Development of Modern Pharmaceutical Science

Author and Year	Research Title	Research Objectives	Research Focus	Research Results
Muhammad Fadhil Faqih Assauqi et al [21]	The Use of Hadith and the Qur'an on Medicine as the Basis for the Development of Modern Herbal Medicine	Analyzing the use of the Qur'an and Hadith as a foundation in the development of modern herbal medicine.	Research on the benefits of herbs mentioned in Islam, such as honey, olives, and black peppers.	This study shows that Islamic-based medicine, such as the use of herbs mentioned in the Qur'an, has a strong scientific basis that supports its use in modern pharmacy. The integration of the philosophy of science is seen in how Islamic traditions have become the basis of modern pharmaceutical epistemology, while Islamic ethics are applied to ensure that these treatments are halal, tayyib, and safe for patients.

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Raden Ayu Erika Septiana & Raden Ayu Ritawati [22]	The Phenomenon of Herbal Therapy in the Qur'an, A Hermeneutic Approach	Uncovering the benefits of herbal therapy in the Qur'an through a hermeneutic interpretation approach.	A study of Qur'anic interpretation on nutritious herbal plants, such as ginger and pomegranate.	This article reinforces the argument that the philosophy of science in Islam can serve as a guide to understanding the benefits of herbal plants. The hermeneutic approach opens up space for dialogue between the study of religion and modern science, while Islamic ethics ensures that the development of pharmacy still considers the value of benefits and adherence to sharia.
Dani Suryaningrat et al [23]	The Qur'an's View on the Use of Drugs in the Treatment of Diseases	Reveal the study of the interpretation of the Qur'an regarding the use of drugs for treatment.	Integration between physical and spiritual medicine based on Islamic teachings.	This article integrates the spiritual values of the Qur'an with modern medicine, including ethical aspects in the selection of halal and thayyib medicinal ingredients. This reflects the philosophy of Islamic science which views health as a blessing of Allah that must be maintained through rational efforts that remain within the limits of sharia ethics. Modern pharmacy gets a strong moral foundation from this approach.

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Aiswah Zahra Amalia & Nur Hilmi [24]	Ethics of Treatment/Genetic Engineering in Islam as Implications for Gene Therapy and DNA Technology	Explores the implications of Islamic ethics on gene therapy and modern genetic engineering technologies.	Harmony between genetic technology innovation and sharia principles.	The study highlights ethical challenges in the application of modern pharmaceutical technologies, such as gene therapy and DNA editing that must still be subject to sharia values. The philosophy of Islamic science is an important foundation in ensuring that this innovation is not only technically safe but also by Islamic ethics and morals. This article recommends a balance between scientific innovation and spiritual ethics in modern pharmacy.
Rizky Gustinanda & Oman Fathurohman SW [25]	Islamic Perspective on the Characteristics of Muslim Pharmacists	Examines how Islamic values affect the professional characteristics of Muslim pharmacists.	Integration of Islamic values in pharmaceutical practice, such as honesty, ethics, and social responsibility.	This study emphasizes the importance of integrating Islamic ethical values in the pharmaceutical profession, where pharmacists are not only required to be professionals in pharmaceutical science but also committed to Islamic morality. This article shows how the characteristics of an ideal Muslim pharmacist based on Islamic ethics can contribute to the

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				development of modern pharmacy while maintaining a balance between science, technology, and spiritual values.
Siti Rahma [26]	The Utilization of Lizards (Eutropis multifasciata) as an Itchy Allergy Medicine in an Islamic Perspective	Knowing the pharmaceutical potential of lizards as an itch allergy medicine and Islamic views on its use.	Analysis of antimicrobial content in lizards and Islamic law related to their consumption.	Lizards have an effective antimicrobial content for itching. Consumption is allowed if the type of lizard is a dhab (herbivore), indicating the integration of modern pharmacy with an Islamic perspective.
Rizka Batara Siregar & Muhammad Iqbal Fasa [27]	Buying and Selling Drugs Containing Addictive Substances and Narcotics in the Perspective of Sharia Economic Law	Discussing the use of narcotics in medicine from the perspective of Islamic and positive law.	Narcotics and Islamic rukhsah regulations are in an emergency.	Islam allows the use of narcotics for treatment in emergencies, subject to certain conditions. This article highlights how Sharia ethics and maqashid can be a guide in modern pharmacy, particularly in dealing with addictive drugs.
Ricky Aditya Syam et al [28]	The Relationship of Islamic Law and Ethics in Pharmacist Practice	Examining the relationship between Islamic law and pharmaceutical practices, especially related to the halalness of pharmaceutical products.	Analysis of the knowledge gap in halal pharmacy among pharmacists.	The research emphasizes the need for training and education on Islamic law to increase Muslim patients' trust in pharmaceutical services, integrating Islamic ethics into modern pharmaceutical standards.

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Asrofik et al [29]	Islamic Health Culture: A Historical Review and Its Relevance in Contemporary Public Health	Tracing the history of Islamic health culture and its contribution to contemporary medicine.	The role of Islamic values in physical, mental, and spiritual health.	Islamic health culture brings together religious teachings, traditional medicine, and modern science for the welfare of society. This study is relevant to the integration of Islamic philosophy and ethics in modern pharmaceutical practice.
Faraz Mansoor [30]	Healthcare Decisions in Islam: Key Ethical Considerations	Discuss Islamic ethical principles in health care decisions.	Medical cases such as abortion, organ donation, and the use of animal-based drugs.	Emphasizing the importance of understanding the principles of Islamic law in medical decisions to create culturally and ethically sensitive treatments, which contribute to modern pharmacy based on Islamic values.
Faradilla Diwanta et al [31]	Ethical Principles in Public Health Research: Contextual Understanding with Islamic Legal Principles	Exploring ethical principles in health research based on Islamic values.	Analysis of the principles of monotheism, justice, and equality in health research.	This research recommends the use of Islamic legal principles to ensure ethical and Sharia-compliant health research, emphasizing the importance of integrating Islamic values into contemporary health practice.
Rasool Esmalipour	The Ethical Challenges in Pharmacy Practice	Identify ethical challenges in community	Challenges related to professionalism,	The study highlights the need to improve professionalism in

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et al [32]	in Community Pharmacies	pharmacy practice.	communication, and regulation in community pharmacies.	pharmacy and align regulations with Islamic ethical principles, which are relevant to the development of modern pharmacy based on Islamic values.
Rizky Gustinanda & Oman Fathurohman SW [33]	Islamic Perspective on the Characteristics of Muslim Pharmacists	Examining the influence of Islamic values on the professional character of pharmacists.	Integration of Islamic values in pharmaceutical practice, such as honesty and social responsibility.	Emphasizing the importance of the character of Muslim pharmacists based on Islamic ethics for optimal service. This article is relevant to the development of modern pharmacy based on the Islamic philosophy of science and ethics.
M. Arsyad Alkadafi et al [34]	Islam and Its Contribution to the Development of Science: A Study	Discussing the contribution of Islam to the development of science, including pharmaceuticals.	The history of the progress of Islamic science during the golden age.	Islam has contributed greatly to the development of medical and pharmaceutical sciences, making the integration of Islamic ethics with science an important pillar in modern pharmaceutical practice.
Rubén Viegas et al [35]	Telepharmacy and Pharmaceutical Care: A Narrative Review by International Pharmaceutical Federation	Review the impact of digital transformation in pharmaceutical services through Telepharmacy.	The role of Telepharmacy in improving accessibility, efficiency of pharmaceutical services, and	Telepharmacy is becoming an important part of telemedicine, providing faster and cost-effective access to pharmaceuticals. This article shows the

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			patient satisfaction.	potential of technology in designing more inclusive, efficient, and human value-based pharmaceutical services. However, there are ethical constraints related to patient data privacy and security that must be overcome. This is relevant to the integration of Islamic philosophy of science and ethics to ensure practices based on moral values.

This research examines the integration of Islamic philosophy of science and ethics in the development of modern pharmacy, basing its approach on the harmony between revelation and reason. The philosophy of Islamic science provides a holistic epistemological framework, encompassing physical, mental, and spiritual aspects of pharmaceutical development [36]. For example, research by Assauqi et al. shows that the use of the Qur'an and Hadith in the development of herbal medicines such as honey and black seed has a strong scientific basis. This approach shows how Islamic traditions can be the basis for safe, halal, and beneficial pharmaceutical innovations [37].

Islamic ethics play an important role in ensuring that pharmaceutical development remains within the moral and sharia corridors. Research by Aiswah & Hilmi discusses ethical challenges in the application of technologies such as genetic engineering and gene therapy, emphasizing the importance of the principles of justice (al-adl) and the avoidance of harm (mafsadah) [38]. In addition, Islamic regulations on the use of narcotics in emergency medicine, as studied by Rizka Batara Siregar & Muhammad Iqbal Fasa, show how sharia maqasid can be an ethical guideline to maintain a balance between medical innovation and the moral protection of society [39].

In terms of professionalism, research by Rizky Gustinanda & Oman Fathurohman SW highlights the importance of Islamic values such as honesty and social responsibility in shaping the character of Muslim pharmacists. This shows that modern pharmaceutical practices require not only technical competence but also a strong moral foundation to provide fair and quality health care [40]. In addition, a study on Telepharmacy by Rubén Viegas et al. shows how technology can improve the efficiency and accessibility of pharmaceutical services. However, the protection of privacy and fairness in access to services is an ethical challenge that must be considered [41]. Overall, this literature shows that the Islamic philosophy of science and ethics provides a moral and scientific foundation for the development of modern pharmaceuticals. This integration not only encourages innovation based on spiritual values but also creates a pharmaceutical ecosystem that is more ethical, sustainable, and relevant to the needs of the Muslim community. However, there are still challenges such as a lack of supportive regulations and limited understanding of Islamic

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principles, so cross-sector collaboration is needed to ensure the successful implementation of this approach.

Analysis

The integration of Islamic philosophy of science and Islamic ethics into modern pharmaceutical development offers both a transformative framework and a value-driven innovation path. The reviewed literature indicates that Islamic philosophy views science as a balanced pursuit of knowledge rooted in revelation (wahyu) and reason (aql), emphasizing harmony between spiritual and empirical insights. This perspective allows for a holistic development of pharmaceuticals that not only fulfill scientific standards but also align with religious, ethical, and community values. Pharmaceutical innovations guided by this philosophy are more likely to address societal needs ethically. For example, the use of natural ingredients like honey and black seed, as supported by Qur'anic and Hadith traditions, reflects both historical and scientific relevance. Studies emphasize how Islamic ethics—through the principles of al-adl (justice), maslahah (benefit), and mafsadah (harm prevention)—serve as ethical boundaries for innovation, regulating issues such as drug composition, safety, pricing, and equitable access.

Technological developments, such as telepharmacy, show great potential to expand pharmaceutical access, especially in remote areas. Yet, these advancements also raise ethical concerns about data protection, transparency, and fairness. The analysis suggests that integrating Islamic ethical frameworks can guide the responsible use of such technologies.

However, the review highlights significant challenges: the lack of regulatory structures that reflect Islamic values, and limited professional competence in Islamic bioethics among health workers. To overcome these barriers, cross-sector collaboration involving scholars, policymakers, and the pharmaceutical industry is essential. Furthermore, Islamic ethical training and education should be included in pharmaceutical curricula to equip professionals with both technical and moral competencies. Overall, this integration creates an opportunity for developing a pharmaceutical ecosystem that is spiritually grounded, socially responsive, and ethically sustainable. Such a system not only supports global health goals, particularly for Muslim populations, but also contributes to a more inclusive and value-conscious model of healthcare innovation.

CONCLUSION

This literature review concludes that integrating the Islamic philosophy of science and Islamic ethics offers a comprehensive epistemological and moral foundation for the advancement of modern pharmacy. By positioning revelation ('wahyu') and reason ('aql) as two interrelated sources of knowledge, Islamic scientific philosophy supports innovation that is not only rational and evidence-based but also enriched with spiritual and ethical considerations. This integration ensures that pharmaceutical advancements are not detached from humanistic and religious values, which is crucial in today's rapidly evolving healthcare landscape. Islamic ethics plays a significant role in guiding pharmaceutical practices through its key moral principles, such as justice (al-'adl), public benefit (maslahah), and the prevention of harm (mafsadah). These principles serve as a framework to evaluate whether pharmaceutical research, production, distribution, and services are ethically sound and compliant with Islamic sharia. For example, decisions about drug content, halal certification, equitable access, and fair pricing can all be informed by these values. Such ethical benchmarks ensure that the pharmaceutical industry is not merely profit-driven but also directed toward the well-being of individuals and society as a whole. Furthermore, the integration of Islamic ethics encourages the adoption of innovative and ethical practices such as telepharmacy, which can help provide healthcare access to remote or underserved Muslim communities. It also supports the development of halal pharmaceuticals that cater to religious sensitivities, promoting inclusivity and trust in medical treatments. This aligns with the principles of the Sustainable Development Goals (SDGs), particularly in achieving good

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health and well-being while respecting cultural and religious diversity.However, several challenges hinder the full implementation of this integration. These include a lack of comprehensive regulatory frameworks that accommodate Islamic ethical standards and the limited understanding of Islamic bioethics among pharmaceutical professionals. Addressing these challenges requires collaborative efforts between scholars of Islamic thought, pharmaceutical experts, policymakers, and regulatory bodies. By fostering interdisciplinary dialogue and policy innovation, a more ethical, inclusive, and sustainable pharmaceutical system can be achieved—one that respects both scientific progress and Islamic moral values. In conclusion, the integration of Islamic philosophy of science and ethics into pharmaceutical development offers a holistic approach that balances scientific advancement with ethical responsibility, ultimately serving the health needs of Muslim communities and contributing to global health equity.

Acknowledgments

The author expresses his appreciation and gratitude to Dr. Muthoifin, S.H.I., M.Ag, as a lecturer in the Philosophy of Islamic Science and Ethics course at the Master of Pharmacy Program of the University of Muhammadiyah Surakarta, for the support and guidance provided during the process of preparing this literature review article.

Author Contribution

All authors are proportionately involved in the preparation of this article. Each author has read, reviewed, and approved the final manuscript of the article, and ensured that there were no conflicts of interest related to this research.

Conflicts of Interest

All authors declare no conflict of interest.

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