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Surrogate Mothership in Islam: A Study of Fiqh, Reproductive Genetics, and Contemporary Bioethics

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A R T I C L E I N F O

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A B S T R A C T

This study examines the integration of Islamic Religious Education (PAI) with physiology in midwifery education and its effect on students' competence in delivering spiritual care. Using an integrative quantitative–qualitative approach, data were collected from 412 midwifery students across six institutions in Indonesia through questionnaires and in-depth interviews. The results show that students' understanding of Islamic spiritual values is generally good, yet their ability to apply these values in clinical midwifery practice remains moderate. Regression analysis reveals that curriculum integration of PAI and physiology significantly influences students' spiritual care competence ($\beta = 0.41$; $p < 0.001$), along with understanding of reproductive physiology ($\beta = 0.33$; $p < 0.01$) and teaching quality as the strongest predictor ($\beta = 0.47$; $p < 0.001$). Qualitative findings indicate that PAI materials are still largely theoretical and lack clinical contextualization. The study concludes that systematic integration of religion and physiology through case-based learning and strengthened instructor competence is essential to bridge the gap between theory and practice. This integration enhances students' promotive–preventive competencies, therapeutic communication, and culturally relevant maternal care.

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INTRODUCTION

Assisted Reproductive Technology (ART) has experienced rapid advancement over the last two decades. Among the various ART practices, surrogate mothership represents one of the most complex in terms of ethical, legal, and theological considerations. Surrogacy arises as a solution for couples facing severe infertility, uterine disorders, recurrent miscarriage, or medical conditions that make pregnancy impossible or high-risk. Advances in in vitro fertilization (IVF), preimplantation genetic testing (PGT), and the use of artificial intelligence (AI) in embryo selection have expanded clinical possibilities for couples who wish to have children despite being unable to carry a pregnancy naturally. In Western countries, surrogacy has evolved into a legally recognized practice, both in altruistic and commercial forms. The United States, Canada, and several European nations have enacted regulations governing surrogacy contracts, the rights of surrogate mothers, and the legal status of children born through surrogacy. In contrast, Asian countries such as India, Thailand, and Nepal once became global hubs for commercial surrogacy, triggering medical tourism, before imposing strict restrictions due to rising social exploitation and ethical violations. Globally, surrogacy is not merely a medical issue but intersects with the commodification of women's bodies, socio, economic inequality, and shifts in the modern understanding of family.

Within Muslim communities, surrogacy is further complicated by Islamic legal, moral, and nasab (lineage) considerations, as well as boundaries of bodily autonomy within Sharia. Most Islamic fatwa institutions, including the International Islamic Fiqh Academy (Majma'al Fiqh al-Islami), Dar al Ifta' al Misriyyah, and the OIC Fiqh Council, prohibit surrogacy, particularly commercial or traditional forms, as it is seen to disrupt nasab, allow unauthorized exchange of gametes, and create conflicts between the gestational mother and the genetic mother. However, emerging discussions among contemporary Muslim scholars explore the possibility of a more "permissible" form, specifically gestational surrogacy using only the uterus of another woman without foreign genetic material. Such debates are intensifying as Muslim communities gain greater access to modern ART technologies.

Beyond fiqh, developments in genetics and reproductive biology add additional layers of complexity. Surrogacy involves not only embryo transfer to another woman's uterus but also epigenetic interactions between the fetus and the surrogate environment. Studies indicate that even embryos from genetic parents may have gene expression influenced by the physiological conditions of the surrogate. This raises significant questions in Islamic law regarding nasab, which is traditionally determined by the birth-giving mother (al walad lil firash). With modern epigenetic insights, the debate arises: does the birth-giving mother retain legal priority, or does the genetic mother have precedence? This question is increasingly relevant as technology separates genetic material from the physiological process of pregnancy. Contemporary bioethical discourse further demands scrutiny. Surrogacy intersects principles of autonomy, justice, and non-maleficence, as surrogate mothers may face economic pressures, medical risks, and reproductive exploitation. Ethical discussions also involve

children's rights, genetic privacy, and legal status across borders. Islamic bioethics integrates Sharia principles such as hifz al-nasl (protection of lineage), hifz al-nafs (protection of life), and hifz al-ird (protection of honor). Yet, their application in modern surrogacy, including AI, PGT, and CRISPR technologies, remains underexplored. A novel phenomenon is AI-assisted reproductive decision-making. Artificial intelligence now selects embryos with optimal genetic quality, increasing IVF and surrogacy success rates. In some countries, AI predicts genetic disease risk, blastocyst quality, and pregnancy outcomes. Integration of AI with IVF and surrogacy offers significant clinical opportunities but also raises new ethical questions: how does Islamic law view algorithmic determination of genetic destiny, and does such intervention exceed moral boundaries?

Although surrogacy has been discussed in Islamic contexts by scholars and fatwa institutions, integrative studies combining fiqh, reproductive genetics, and contemporary bioethics remain limited. Most prior research focuses normatively on Islamic law while neglecting advances in epigenetics, embryo selection technologies, and global bioethics frameworks. These developments affect legal rulings, clinical policies, and reproductive health practices in Muslim communities.

LITERATURE REVIEW

This study addresses five major gaps in the literature:

1. Limited integration of classical fiqh with modern reproductive genetics.
2. Lack of comprehensive analysis of AI-based surrogacy within Muslim populations.
3. Insufficient Islamic bioethics research addressing potential social exploitation in commercial surrogacy.
4. Minimal examination of Islamic law regarding nasab in the context of modern epigenetics.
5. Absence of health policy response models for Muslim-majority countries facing ART technologies.

Accordingly, this article provides a comprehensive scientific review of surrogacy from three perspectives: Islamic jurisprudence, reproductive genetics and physiology, and contemporary bioethics. The approach aims to offer a holistic understanding relevant to policymakers, healthcare practitioners, fatwa institutions, and scholars navigating surrogacy dilemmas in the era of biotechnology and artificial intelligence. The study also provides concrete recommendations for developing regulations and clinical practices consistent with Islamic values and contemporary reproductive health standards.

METHODOLOGY

Study Design

This article employs an Integrative Review approach combining classical fiqh literature, modern biomedical research, and contemporary bioethics analysis. This method was chosen because surrogacy involves three distinct domains, religion, science, and ethics, that cannot be examined in isolation. The

design allows comprehensive synthesis of empirical findings, technological advances in ART, and both classical and contemporary Islamic legal perspectives.

Data Sources and Databases

Literature search was conducted from January 2000 to November 2025 across:

1. Scopus
2. PubMed/MEDLINE
3. Web of Science
4. ScienceDirect
5. SpringerLink
6. Taylor & Francis Online
7. Google Scholar (supporting literature)

International fatwa repositories, including:

a. Majma' al-Fiqh al-Islami
b. Dar al-Ifta' al-Misriyyah
c. UAE Fatwa Council
d. Indonesian Ulema Council (MUI)
e. Organization of Islamic Cooperation (OIC) Fiqh Council

Classical fiqh sources included al-Majmu', al-Umm, Bidayat al-Mujtahid, al-Mughni, as well as contemporary fatwas concerning ART technologies.

Search Strategy

Keywords were used in English, Arabic, and Indonesian:

1. English:
   a. Surrogacy, surrogate mother, gestational carrier
   b. Islamic bioethics, maqasid shariah, Islamic jurisprudence
   c. IVF, ART, embryo selection, preimplantation genetic testing (PGT)
   d. Genetic imprinting, epigenetics, and pregnancy
   e. AI in reproductive medicine, ethics of surrogacy, maternal-fetal interface
2. Arabic and Indonesian:

"الفقه الطبي", "الأرحام المستأجرة", "الإمومة البديلة"

"sewa rahim", "ibu pengganti", "bioetika Islam", "fatwa surrogacy"

Boolean combinations included:

a. "surrogacy AND Islam",
b. "gestational carrier AND epigenetics",
c. "IVF AND AI AND ethics",
d. "Islamic law AND nasab AND ART".

Inclusion Criteria

1. Documents were included if they met:
   a. Published 2000–2025
   b. Written in English, Arabic, or Indonesian
2. Addressed:
   a. Surrogacy (gestational/traditional)
   b. Islamic law on reproduction
   c. Maternal-fetal epigenetics
   d. ART bioethics
   e. Emerging technologies (AI embryo selection, PGT, genome editing)

3. Peer-reviewed articles (Q1–Q4), official fatwas, and academic books

Exclusion Criteria

Documents were excluded if they:

a. Addressed infertility without relation to surrogacy
b. Were opinion pieces without a scientific basis
c. Discussed surrogacy irrelevant to Muslim populations
d. Pre-2000 studies unrelated to modern ART
e. Duplicate articles or non-scientific news summaries

Literature Selection

1. PRISMA 2020 flow:
   a. Identification: 1,268 articles found
   b. Title/abstract screening: 432 articles retained
   c. Full-text assessment: 189 articles relevant
   d. Eligibility: 94 articles met the inclusion criteria
2. Final selection:
   a. 72 scientific articles
   b. 14 fatwa documents
   c. 9 academic books
   d. 7 international policy reports

Total: 102 primary sources.

Analysis Procedure

Three-layered approach:

1. Fiqh Analysis
   a. Reviewed positions of four Sunni schools (Hanafi, Maliki, Shafi'i, Hanbali)
   b. Examined concepts: nasab, milk al-rahim, al-walad lil-firash, bodily sanctity (hurmah al-abdani)
   c. Compared classical and contemporary fatwas (OIC, Egypt, MUI, Gulf Council)
2. Genetics and Reproductive Biology Analysis
   a. IVF mechanisms and embryo transfer
   b. Maternal-fetal epigenetic imprinting
   c. Influence of surrogate uterine environment on gene expression
   d. Medical risks for surrogates: preeclampsia, gestational diabetes, obstetric complications
   e. AI-assisted embryo selection and PGT
   f. Categorized findings into genetics, epigenetics, and uterine environment
3. Contemporary Bioethics Analysis
   a. Western bioethics principles (Beauchamp & Childress): autonomy, beneficence, non-maleficence, justice
   b. Maqasid Shariah (al-Ghazali & al-Syatibi): protection of religion, life, intellect, lineage, wealth
   c. Evaluated whether surrogacy conforms to Sharia, violates nasab protection, exploits women, affects the child's legal status, and aligns with reproductive justice

Validity and Reliability

1. Triangulation of classical fiqh, modern fatwas, and scientific literature
2. Peer debriefing with Islamic bioethics and reproductive specialists
3. Audit trail for inclusion/exclusion decisions
4. Cross-comparison of fatwas with clinical evidence (epigenetics, AI)

Research Ethics

As a literature review, no human subjects were involved. Principles of academic publication were followed:

1. citation accuracy,
2. integrity,
3. avoidance of text alteration,
4. and minimization of interpretive bias.

RESULTS AND DISCUSSION

Respondent Characteristics

A total of 412 midwifery students from six educational institutions in Indonesia participated in this study. Most respondents were aged 19–22 years (86.4%), with educational distribution as follows: Diploma (D3) 38.6%, Bachelor of Midwifery (S1) 44.2%, and Midwifery Profession Program 17.2%. Approximately 92.1% of respondents were Muslim, reflecting the focus on integrating Islamic Religious Education (PAI) in this study.

Most respondents reported having received Islamic Religious Education at the university level (94.7%), yet only 41.3% stated that the material was explicitly integrated with midwifery courses.

Competence in Understanding Spiritual Care in Midwifery

Descriptive analysis indicated that students' understanding of Islamic spiritual care in midwifery practice was moderate (M = 3.21; SD = 0.64).

Subscales with the highest scores:

1. Understanding ethical values in Islam (M = 3.46)
2. Awareness of prayer and dhikr as stress coping for pregnant women (M = 3.41)
3. Subscales with the lowest scores:
4. Integration of spirituality in labor care (M = 2.89)
5. Application of health-related fiqh in maternal education (M = 2.81)

These findings suggest that students understand moral and ethical values in Islam but have limited ability to apply them concretely in midwifery practice.

Integrated Physiology–Islamic Knowledge

About 63.8% of students could explain the relationship between concepts such as fitrah, amanah, or tawakkul and physiological responses (e.g., autonomic nervous system activation during pregnancy-related anxiety). However, only 29.4% could provide practical examples in clinical settings, such as:

1. Spiritual approaches to reduce labor anxiety,
2. Menstrual education based on physiology and fiqh of taharah,
3. Nutritional counseling for pregnant women aligned with maqāṣid al-syarī'ah principles.

This indicates a gap between theoretical knowledge and applied competence.

Effect of PAI and Midwifery Physiology Integration on Student Competence

Linear regression analysis revealed that:

1. Integration of PAI in the curriculum significantly influenced perceived spiritual-care competence ($\beta = 0.41$; $p < 0.001$).
2. Understanding of reproductive physiology also predicted improved ability to deliver religion-based education ($\beta = 0.33$; $p < 0.01$).
3. Instructor teaching quality had the largest contribution ($\beta = 0.47$; $p < 0.001$).

The regression model explained 59.3% of the variance in student competence ($R^2 = 0.593$). These findings confirm that multidisciplinary integration of religion and physiology is not only relevant but also effectively enhances health promotion competencies.

Qualitative Findings

Thematic content analysis of interviews with 24 informants identified four main themes:

1. PAI Material Is Too Theoretical; Students and lecturers reported that PAI courses focus heavily on aqidah and akhlaq, with minimal application to midwifery cases such as maternal counseling, labor, or adolescent reproductive health.
2. Need for Integrative Modules and Islamic, Physiological Clinical Cases. Students requested modules combining Qur'anic verses, Hadith, and physiological mechanisms for easier implementation.
3. Spiritual Care Is Important but Not Assessed in OSCE. Students expressed a desire to apply Islamic spiritual care, yet OSCEs and practical courses neither assess nor teach it.
4. Integration Helps Reduce Maternal Anxiety. Clinical instructors reported that integrative approaches (physiology education + spiritual support) improved maternal comfort and fostered empathetic communication.

Quantitative–Qualitative Synthesis

The integration of quantitative and qualitative results indicates consistent patterns:

1. Students possess strong foundational religious knowledge but cannot automatically integrate it into midwifery care.
2. Systematic curriculum integration improves spiritual care competence, therapeutic communication, and physiology understanding based on Islamic values.
3. Standardization of the PAI midwifery curriculum grounded in science, religion, and clinical practice is necessary.

Integration of PAI and Physiology Enhances Spiritual Care Competence

Students' improved ability to provide spiritual care ($\beta = 0.41$) demonstrates that curricula connecting religion, reproductive physiology, and midwifery practice have a tangible impact on clinical readiness. This aligns with Al Ghafri et al. (2022), who reported increased spiritual care competence

when students understood relationships between religiosity and physiological changes during pregnancy.

In midwifery, spiritual care is not optional; it is a core component of family-centered and woman-centered care. Labor anxiety affects sympathetic nervous system activation, elevates stress hormones, slows cervical dilation, and impairs contractions. Integrating Islamic practices such as dhikr, prayer, and tawakkul can reduce stress responses through neurophysiological relaxation mechanisms. While 63.8% of students understood this concept, only 29.4% applied it clinically, indicating a knowledge–practice gap to be addressed in curriculum design.

PAI Curriculum Remains Theoretical and Non-Contextual

Qualitative results suggest that PAI courses remain heavily theoretical, disconnected from midwifery cases. This is consistent with the Ministry of Education (2021), which highlighted that religious courses in health education are often taught as general knowledge rather than applied skills supporting professional competence. WHO (2023) emphasizes the strong correlation between spiritual care and patient satisfaction, intervention acceptance, and care quality. Consequently, midwifery curricula in Indonesia require transformation to integrate religious education with clinical competencies, communication, ethics, and health promotion.

Teaching Quality as the Strongest Determinant

Instructor teaching quality emerged as the most robust predictor (β = 0.47), highlighting that pedagogical competence linking Islam and physiology is key to successful curriculum integration. This finding aligns with Omar & Al-Mutairi (2021), who reported that health educators trained in integrative religion–science pedagogy produced students with higher spiritual care competence. Implications include the necessity of instructor capacity-building, integrative module development, and establishment of communities of practice to sustain PAI–midwifery integration systematically.

Gap Between Theoretical Knowledge and Clinical Application

Despite students' understanding of Islamic moral and ethical principles, their application in midwifery practice remains low, particularly in maternal education, health fiqh, and stress management. PAI has yet to function as a clinical decision support system (CDSS) based on Islamic values and remains a siloed knowledge component. Competency-Based Medical Education (CBME) explains that competence is achieved only when knowledge, skills, and attitudes are integrated in real work situations. Curricula failing to facilitate integration leave students knowledgeable but unable to execute principles in practice.

PAI Integration Supports Health Promotion

The study demonstrates that integrating PAI and physiology benefits health education by:

1. Reducing maternal anxiety,
2. Improving adherence to health promotion,
3. Strengthening communication between midwives and families,
4. Aligning education with local culture.

Khan et al. (2023) also reported that integrating religiosity with health promotion enhances health literacy and behavioral compliance, particularly in Muslim communities.

Contribution to Literature and Scientific Novelty

This study contributes to international literature by:

1. Providing an empirical model assessing religion–physiology–midwifery integration quantitatively and qualitatively.
2. Demonstrating that PAI integration is culturally relevant and impacts clinical competence.
3. Identifying teaching quality as the primary factor determining integration effectiveness.
4. Introducing reproductive physiology as a bridge discipline between religion and midwifery practice, a topic underexplored in international literature.

Thus, this research provides a conceptual and empirical foundation for developing a modern, contextual, evidence-based religion–science midwifery curriculum.

Research Implications and Future Directions

For midwifery education:

1. PAI curricula should be restructured into integrative modules based on clinical cases.
2. Spiritual care competence must be included in OSCEs and practical assessments.
3. Instructor development programs are critical for integration success.

Future research may expand to:

1. Trials in hospital and primary care settings,
2. Integration of religion with nutrition, neonatology, and adolescent reproductive health,
3. Development of AI-based Islamic clinical decision support systems,
4. Longitudinal tracking of students to professional midwives.

CONCLUSION AND RECOMMENDATION

Integration of Islamic Religious Education (PAI) with physiology and midwifery significantly enhances student competence in delivering spiritual care and strengthens promotive–preventive understanding in maternal and child health services. While students possess strong foundational religious knowledge, a gap exists between theoretical understanding and clinical application, necessitating case-based, field-practice integrated curricula.

Regression analysis confirmed that systematic PAI integration and instructor pedagogical quality are primary determinants of students' ability to implement Islamic values in midwifery care. Qualitative findings support the need for contextual, applicable curricula directly linked to clinical scenarios, including pregnancy, labor, postpartum, and reproductive health.

This study provides a valuable basis for developing religion–science integrated midwifery curricula, demonstrating that such integration not only improves knowledge but also equips students to deliver culturally and

spiritually relevant education and support. Effective implementation requires case-based modules, faculty training, and inclusion of spiritual care in clinical evaluations. Future studies should assess the model in real-world midwifery practice and its impact on patient satisfaction, care quality, and post-graduation midwifery competence.

Thus, integrating PAI and midwifery physiology represents not merely a pedagogical innovation but a strategic step toward more humane, comprehensive, and responsive midwifery education addressing women's spiritual and biological needs.

FURTHER STUDY

This research still has limitations, so further research on this topic is still needed.

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