Integrating Islamic Values into Maternal Nutrition Education: A Framework for Strengthening Family Health in Muslim Societies

Lintang Purwara Dewanti, Laras Sitoayu, Noni Agustina

Abstract

Maternal and child nutrition plays a crucial role in strengthening the health and resilience of Muslim families. However, existing maternal nutrition education programs often lack cultural and religious contextualization aligned with Islamic teachings. This study aims to develop a conceptual framework for integrating Islamic values into maternal nutrition education as a means to enhance family health in Muslim societies. Using a narrative review approach, the paper synthesizes evidence from Islamic education principles, public health nutrition, and behavioral change models such as the Health Belief Model and Social Cognitive Theory. The proposed framework is built upon three interrelated pillars: (1) Faith-based Nutrition Literacy, promoting the application of Qur'anic and Prophetic guidance in daily food choices; (2) Family-Centered Health Promotion, emphasizing shared responsibility and the mother's role as a health educator within the family; and (3) Community Support and Digital Empowerment, utilizing Islamic institutions and technology for sustained learning. This integration of Islamic principles and modern nutrition science provides a culturally grounded approach to enhance health literacy and family well-being, aligning with the broader goal of Islamic human capacity development.

Keywords: Islamic Education, Maternal Nutrition, Family Health, Health Literacy, Muslim Societies

Lintang Purwara Dewanti¹

¹Nutrition Study Program, Faculty of Health Sciences, Universitas Esa Unggul, Jakarta Indonesia email: lintangpurwara@esaunggul.ac.id¹

Laras Sitoayu², Noni Agustina³

^{2,3}Faculty of Health Sciences, Universitas Esa Unggul, Jakarta Indonesia

e-mail: laras@esaunggul.ac.id¹, noni@esaunggul.ac.id²

2nd International Conference on Islamic Community Studies (ICICS)

Theme: History of Malay Civilisation and Islamic Human Capacity and Halal Hub in the Globalization Era https://proceeding.pancabudi.ac.id/index.php/ICIE/index

Introduction

Maternal nutrition is a crucial determinant of health and human development in Muslim societies. Adequate maternal and child nutrition not only ensures physical well-being but also influences cognitive and emotional growth, thereby shaping the quality of future generations. In Islam, preserving life (hifz an-nafs) is one of the objectives of the Sharia (Maqasid al-Sharia) and nutrition plays a pivotal role in fulfilling this mandate. For example, the concept of halalan thayyiban—permissible and wholesome food—is explicitly emphasised in the Qur'an and is linked with overall health and ethical consumption [1], [2].

Despite the religious and moral importance of nutrition in Muslim-majority contexts, many existing maternal nutrition education programmes continue to rely on generic public-health models that do not fully integrate Islamic teachings and cultural frameworks. As a result, these programmes may struggle to achieve meaningful behaviour change or maintain long-term impact among Muslim mothers. For example, research in the UK found that religiosity among British Muslims influenced food choice through themes such as verification of halal authenticity and following the Prophet's example—yet public programmes rarely address these faith dimensions explicitly [3], [4].

Similarly, while interventions rooted in behavioural models (such as the Health Belief Model) have demonstrated improvements in knowledge and dietary intake among pregnant women, only a limited number have incorporated faith-based content tailored to Islamic values [4], [5].

Recent qualitative and process-evaluation studies suggest that embedding Islamic values into health programmes (for example via mosque-based sessions or faith-leader involvement) enhances cultural relevance, trust, engagement, and thus may improve outcomes [6], [7]. In short, the gap between standard nutrition education models and faith-informed, culturally grounded strategies highlights the need for frameworks that integrate Islamically informed value systems into maternal nutrition education.

This article aims to develop a conceptual framework for integrating Islamic values into maternal nutrition education to strengthen family health in Muslim societies. By aligning modern nutrition education with Islamic moral and spiritual principles, the proposed framework contributes to the broader agenda of Islamic human capacity development—emphasising education, family empowerment, and spiritual well-being as key components of sustainable health promotion.

Literature Review

2.1 Islamic Values, Nutrition and Health

The doctrine of *Halalan Thayyiban* relates not only to permissibility (halal) but also to wholesomeness (thayyib) — encompassing adequacy of nutrition, cleanliness, safety, and ethical procurement. For example, a study defining halal and thayyib foods states that "halal" is a legal category in Islamic jurisprudence, whereas "thayyib" refers to goods that are wholesome, healthy, pure, balanced, safe and beneficial [8], [9]. Another investigation into raw-food consumption shows that the concept of halalan-toyyiban extends into health domains by linking consumption of food that is lawful and wholesome to human physical and spiritual well-being [10]. Moreover, the concept of halalan thayyiban aligns closely with the objectives of the Sharia (Maqasid al-Sharia) — particularly the protection of life (*hifz al-nafs*), intellect (*hifz al-aql*), lineage (*hifz al-nasl*), and wealth (*hifz al-mal*) — in that food which is lawful, safe, nutritious and ethically produced contributes to those ends. For instance, the Maqasid-based study of halal food states that the concept underscores not only permissibility but also the protection of religion, life, intellect, offspring and property [11], [12].

Studies focusing explicitly on healthy eating practices from an Islamic viewpoint further show that Qur'anic guidance (e.g., "eat of what is lawful and good" [Q 2:168]) and prophetic traditions around moderation, cleanliness and mindful consumption provide foundational

principles for nutrition education that remain relevant to today's health-promotion efforts. For example, one article documents how the Qur'an frames *halalan thayyiban* as part of human welfare and health [13]. Thus, in Muslim societies, maternal nutrition education that ignores these faith-embedded elements potentially misses out on important moral, spiritual and cultural drivers of food behaviour. Embedding halalan-thayyiban into nutrition education, therefore, offers a culturally grounded pathway to align nutritional adequacy, safety and ethical consumption with Islamic value systems.

2.2 Behavioural Theories in Nutrition Education

Education interventions grounded in behaviour change models such as the Health Belief Model (HBM) have shown **efficacy in improving nutrition knowledge and practices**. For instance, a cluster-randomised controlled trial conducted in Dessie Town, Northeast Ethiopia, found that pregnant women who received nutrition education based on the HBM experienced a significant increase in mean nutritional knowledge from 6.9 to 13.4 and a rise in the proportion of "good" dietary practice from 56.5% to 84.1% in the intervention group (P < 0.001) [14]. In a more recent study in Southeast Ethiopia, a combined HBM + Theory of Planned Behavior (TPB) intervention increased adequate dietary diversity among pregnant women by 14.15 % (45.09% vs. 30.94%) and showed that having received the intervention conferred an AOR of 1.89 (95% CI: 1.27–2.79) for improved dietary diversity [15].

In Indonesia, while there are fewer large-scale randomized trials specifically on HBM for maternal feeding practices, cross-sectional studies suggest that maternal perceptions aligned with HBM constructs (perceived susceptibility, perceived benefits, self-efficacy) are significantly associated with feeding behaviours in mothers of toddlers. For example, a study of 178 mothers of overweight toddlers found that perceived susceptibility (p = 0.020), perceived benefits (p = 0.024), and self-efficacy (p = 0.018) were significantly associated with feeding practices; the strongest effect in multivariate testing was attributed to perceived susceptibility (OR = 4.067) [16].

Together, these findings underscore that nutrition education programmes which **explicitly incorporate behavioural-change theory constructs**—especially those fostering self-efficacy, perceived benefit, and perceived susceptibility—can achieve better outcomes in knowledge and behaviour. In contexts such as Muslim-majority societies, integrating such theory-based approaches with culturally and religiously relevant content may further strengthen uptake and sustainability of maternal nutrition interventions.

2.3 Family, Community and Education in Muslim Contexts

The tradition of Islamic education emphasises a holistic developmental paradigm – one that simultaneously nurtures the intellect ('aql), the spirit (ruh), and the body (jasad) — rather than treating education as mere cognitive transmission. For example, Mariani (2023) observes that Islamic holistic-education frameworks integrate intellectual intelligence (IQ), emotional intelligence (EO), and spiritual intelligence (SO) as inseparable dimensions of humandevelopment [17]. Embedding such a holistic approach into maternal-nutrition programmes means designing curricula and interventions that go beyond imparting facts about micronutrients or feeding practices, and instead foster internalised behavioural change by aligning nutrition knowledge with spiritual values, embodied wellbeing, and family responsibilities. Although direct empirical research specifically on maternal-nutrition education with Islamic-value integration remains limited, broader literature on Islamic educational models supports the relevance of such alignment: Hasan et al. (2024) highlight that Islamic education models which separate science ('ilm) and spirituality tend to produce less balanced outcomes, emphasising the need for integrated models that engage cognition, affections, and embodied practice [18], [19]. Moreover, studies of family-nutrition literacy and community-based strategies in Indonesia suggest that educational media and community engagement can improve household nutrition literacy — thereby indicating promising entry points for holistic, valuegrounded maternal-nutrition education. Finally, the implication is that nutrition interventions grounded in a holistic Islamic pedagogy can better resonate with mothers' identities as believers, caretakers, and members of a faith community, thereby enhancing motivation, sustained practice, and inter-generational impact.

2.4 Gap and Need for a Conceptual Framework

Existing research has contributed valuable insights into halal nutrition, healthy eating from an Islamic perspective, and the use of behavioural change models such as the Health Belief Model (HBM) to improve dietary practices. Studies have also shown the potential of community-based family nutrition programmes in strengthening nutrition literacy and promoting healthier eating habits among mothers and families. However, these areas of research often operate separately — Islamic principles are usually discussed in the context of food law or ethics, while behavioural theories are applied in secular health-education settings, and family- or community-based approaches are treated as independent strategies.

This fragmented approach highlights a critical gap: the lack of a comprehensive, unified framework that systematically connects these three dimensions. To effectively promote maternal and family nutrition within Muslim societies, education models must align Islamic values (e.g., *halalan thayyiban*, *maqasid al-sharia*), behavioural-change theory (e.g., HBM constructs such as perceived benefit and self-efficacy), and family-community engagement into a single, culturally resonant system. Addressing this gap is essential to ensure that nutrition education not only improves knowledge but also transforms attitudes and sustained practices through moral, spiritual, and social reinforcement.

Therefore, this article proposes an integrated conceptual framework built upon three interrelated pillars:

- 1. Faith-Based Nutrition Literacy, which embeds Qur'anic and prophetic guidance into nutrition understanding;
- 2. Family-Centered Health Promotion, which empowers families—especially mothers—as agents of behavioural change; and
- 3. Community Support and Digital Empowerment, which leverages Islamic community networks and digital platforms to sustain learning and practice.

This integrated approach aims to bridge the divide between spiritual values and scientific nutrition education, offering a holistic model for strengthening family health in Muslim societies.

Research Methodology

This study employs a narrative review and conceptual synthesis approach to develop a framework that integrates Islamic values into maternal nutrition education. The method was designed to systematically connect scriptural guidance with behavioural theory and practical nutrition education strategies relevant to Muslim-majority contexts such as Indonesia. The methodology is structured into three distinct stages, each designed to ensure a rigorous connection between faith, behavioural theory and practice in the maternal-nutrition context.

3.1 Identification of Islamic value constructs.

We began by identifying core Islamic principles directly relevant to nutrition and health — including *halālan ṭayyibān* (lawful and wholesome), *amanah* (trust/responsibility), *ihsān* (excellence in conduct), *wasatiyyah* (moderation) and the *maqāṣid al-sharīʿa* (objectives of Islamic law). These constructs were explored through Qurʾan and Hadith exegesis and supplemented by peer-reviewed studies on Islamic dietary and health ethics (for example, Dewi & Agustina, 2021, on the concept of halalan thayyiban in consumer food behaviour [20]).

3.2 Review of behaviour-change models.

The second stage reviewed empirical literature on behavioural models applied in nutrition education, particularly the Health Belief Model (HBM) and the Social Cognitive Theory (SCT). For example, a cluster-randomised controlled trial in Ethiopia found that nutrition

education integrating HBM and the Theory of Planned Behavior (TPB) significantly improved dietary diversity among pregnant women [15]. This review enabled the extraction of key behavioural constructs such as perceived susceptibility, perceived benefits, cues to action and self-efficacy, which can be mapped into nutrition education in a Muslim context.

3.3 Synthesis and framework development.

In the final stage, Islamic value constructs and behavioural theory domains (knowledge, attitudes, practice) were mapped and synthesized to develop an integrated conceptual framework. This synthesis used the Best Fit Framework Synthesis (BFFS) method as defined by Carroll et al. [21]. The resulting framework bridges scriptural guidance, behavioural mechanisms and contextual practice in maternal nutrition, tailored for Muslimmajority settings such as Indonesia.

By following this three-phase method, the study creates a culturally congruent and theoretically sound model that links **Islamic ethical principles**, **behavioural change alchemy**, and **family-community nutrition practice**.

Results

The proposed framework—Integrating Islamic Values into Maternal Nutrition Education—comprises three interrelated pillars that align spiritual principles with behavioural change mechanisms. Figure 1 illustrates the dynamic interaction among the three pillars of the proposed framework—Faith-Based Nutrition Literacy as the foundation, Family-Centred Health Promotion as the core, and Community Support and Digital Empowerment as the enabling environment for sustained behaviour change.

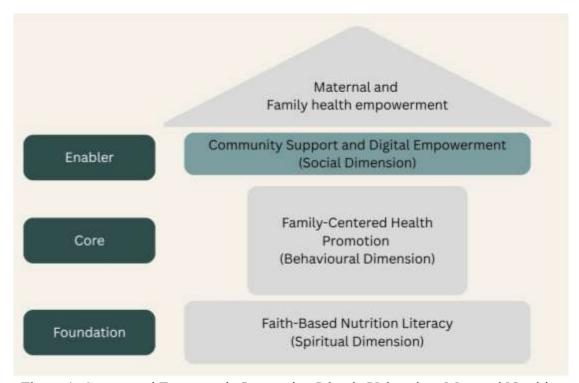


Figure 1. Conceptual Framework: Integrating Islamic Values into Maternal Nutrition Education

The model demonstrates how the integration of Islamic values, behavioural theory, and community engagement can produce a holistic, culturally grounded system that supports maternal and family nutrition. Each pillar reinforces the others through continuous feedback and mutual learning processes.

4.1 Faith-Based Nutrition Literacy (Spiritual Dimension)

This pillar forms the **foundation** of the framework. It emphasises the internalisation of Qur'anic and prophetic teachings—such as *halālan ṭayyiban*, moderation (*wasatiyyah*), gratitude (*shukr*), and responsibility (*amānah*)—as guiding principles in everyday food practices. Faith-based nutrition literacy provides the **mo**ral motivation and spiritual meaning behind healthy eating, transforming nutrition from a biological necessity into an act of worship and stewardship.

Grounded in *halālan ṭayyiban* and *maqāṣid al-sharīʿah*, this dimension promotes understanding food as both physical sustenance and a spiritual obligation. Qurʾanic verses such as "*Eat of what is lawful and good on the earth*" (Al-Baqarah 2:168) form the basis for promoting awareness of food quality, ethical consumption, and gratitude toward Allah. Recent studies affirm that the concept of *halālan ṭayyiban* extends beyond legality to encompass safety, purity, and nutritional adequacy—reflecting a balance between spiritual and physical well-being [22]. Integrating these values into nutrition education sessions strengthens intrinsic motivation and aligns dietary behaviour with moral responsibility. The key outcome for this dimension is strengthened motivation and value alignment for healthy behaviours.

4.2 Family-Centered Health Promotion (Behavioural Dimension)

At the **core** of the framework lies the family unit, where nutrition decisions are formed, negotiated, and reinforced. Within Islamic pedagogy, the family (*usrah*) is viewed as the primary locus of moral and behavioural learning. Mothers function as *murabbi* (educators and role models), while fathers and extended family members share responsibility through *musyawarah keluarga* (family consultation).

This dimension applies constructs from the **Health Belief Model (HBM)**—such as perceived susceptibility, perceived benefits, and self-efficacy—to translate faith-based motivation into tangible health behaviours. Empirical evidence supports this linkage: a cluster-randomised trial integrating the HBM and Theory of Planned Behaviour (TPB) in Ethiopia significantly improved dietary diversity and knowledge among pregnant women [15]. Similarly, family-based participatory interventions have been shown to enhance sustainability and nutrition literacy across generations [12]. The key outcome for this dimension is enhanced family participation and sustained behaviour adoption.

4.3 Community Support and Digital Empowerment (Social Dimension)

The **outer layer** of the framework represents the social and technological enablers of health behaviour. Islamic community institutions—such as mosques, *majlis taklim*, and Islamic schools—serve as key platforms for health education and reinforcement. Integrating these structures with **digital health technologies** expands reach, continuity, and peer support. Emerging research indicates that mobile-based health education and digital counselling platforms can significantly improve maternal health knowledge and breastfeeding practices when designed to reflect cultural and religious contexts [23]. Initiatives such as telelactation services and faith-sensitive nutrition campaigns demonstrate how technology can sustain engagement among working mothers while upholding Islamic ethical values. Community-driven online groups and *majlis taklim digital* reinforce collective learning and accountability, supporting long-term behavioural change through social and spiritual cohesion [24]. The key outcome for this dimension is broader community reinforcement and sustained digital engagement.

At the top of the model lies maternal and family health empowerment, symbolising the synergistic outcome of these three dimensions. Standing together as the arrows up showing interactions: faith nurtures motivation, family practice reinforces belief, and community networks amplify both through support and technology. Collectively, this framework provides a culturally resonant, evidence-informed model that bridges Islamic ethics, behavioural science, and public-health practice to strengthen maternal nutrition education in Muslim societies.

Conclusion

This paper presents a conceptual framework that integrates Islamic values into maternal nutrition education as a pathway to strengthen family health in Muslim societies. By aligning Qur'anic principles with behavioural change theory and digital empowerment, the framework advances the discourse on *Islamic human capacity development* through health education.

Theoretical implications: It bridges the gap between Islamic ethics and health education by offering an evidence-based yet faith-anchored approach adaptable to various cultural contexts.

Practical implications: Policymakers and educators can adopt this model to design culturally resonant maternal nutrition curricula and digital health campaigns in Muslim communities. **Future research:** Empirical validation of the framework through pilot interventions—such as mosque-based or mobile-assisted maternal nutrition programmes—is recommended to assess its impact on literacy, behaviour, and family health outcomes.

References

- [1] S. Maheran, A. Saiin, M. April, and M. Rizki, "Pendekatan Maqashid Syariah Terhadap Konsep Makanan Halalan Thoyyiban Dalam Islam," *TERAJU*, vol. 4, no. 01, pp. 49–59, Mar. 2022, doi: 10.35961/teraju.v4i01.435.
- [2] M. Arsudin, S. Saad, W. Kurni, and M. Masykur, "Konsep Halalan Thayyiban dalam Al-Qur'an dan Relevansinya dengan Kesehatan Jiwa," *Adh Dhiya* | *J. Quran Tafseer Stud.*, vol. 1, no. 2, pp. 73–89, May 2024, doi: 10.53038/adhy.v1i2.124.
- [3] U. Owais, R. Patel, and S. Abbott, "The influence of religiosity on food choice among British Muslims: A qualitative study," *Nutr. Health*, vol. 31, no. 2, pp. 749–756, Apr. 2025, doi: 10.1177/02601060241244883.
- [4] A. I. Padela and D. Zaidi, "The Islamic tradition and health inequities: A preliminary conceptual model based on a systematic literature review of Muslim health-care disparities.," *Avicenna J. Med.*, vol. 8, no. 1, pp. 1–13, 2018, doi: 10.4103/ajm.AJM_134_17.
- [5] S. Riazi, V. Ghavami, S. R. Sobhani, N. J. Shoorab, and K. Mirzakhani, "The effect of nutrition education based on the Health Belief Model (HBM) on food intake in pregnant Afghan immigrant women: a semi-experimental study," *BMC Pregnancy Childbirth*, vol. 24, no. 1, p. 700, Oct. 2024, doi: 10.1186/s12884-024-06728-0.
- [6] A. Safi, M. Hossain, and T. Myers, "Faith, health and well-being: a qualitative study exploring Islamic perspectives on physical activity and the role of Imams (scholars)," *Discov. Soc. Sci. Heal.*, vol. 5, no. 1, p. 95, Jul. 2025, doi: 10.1007/s44155-025-00236-y.
- [7] J. Hall, R. Rashid, A. Rafiq, K. Fatima, S. E. Barber, and S. A. Dogra, "Reflections on co-producing an obesity-prevention toolkit for Islamic Religious Settings: a qualitative process evaluation," *Int. J. Behav. Nutr. Phys. Act.*, vol. 21, no. 1, p. 63, Jun. 2024, doi: 10.1186/s12966-024-01610-w.
- [8] A. F. Tsani, H. Susilo, S. Suyamto, U. Setiawan, and S. Sudanto, "HALAL AND THAYYIB FOOD IN ISLAMIC SHARIA PERSPECTIVE," *Int. J. Mathla'ul Anwar Halal Issues*, vol. 1, no. 1, pp. 97–109, Mar. 2021, doi: 10.30653/ijma.202111.34.
- [9] S. D. Rahmatika and Y. A. Bashori, "Legal Awareness and Practical Approaches to Halalan Thayyiban Compliance," *Invest J. Sharia Econ. Law*, vol. 4, no. 2, pp. 262–279, Dec. 2024, doi: 10.21154/invest.v4i2.8978.
- [10] M. A. Mas'ad and M. Z. F. Zainul Hisham, "Raw Food Consumption And Its Effects On Human Health: An Analysis Of Halalan Toyyiban Concept," *Umr. Int. J. Islam. Civilizational Stud.*, vol. 5, no. 2–1, Oct. 2018, doi: 10.11113/umran2018.5n2-1.312.
- [11] S. I. Hilme and R. M. Raffi, "Magasid Approach and Shariah Rules Towards Halal

- Industry," *J. Halal Sci. Ind. Bus.*, vol. 2, no. 2, pp. 1–14, Nov. 2024, doi: 10.31098/jhasib.v2i2.2691.
- [12] R. B. Alim, A. Rohman, and D. Dzikrulloh, "Identifikasi Makanan Halal dalam Perspektif Hifz al-Nasl pada UMKM Tahu Agung Jaya Bangkalan Madura," *J. Ris. Agama*, vol. 3, no. 3, pp. 388–400, Dec. 2023, doi: 10.15575/jra.v3i3.30767.
- [13] N. Nuraini, "Halalan Thayyiban Alternatif Qurani Untuk Hidup Sehat," *J. Ilm. Al-Mu'ashirah*, vol. 15, no. 1, p. 82, Jan. 2018, doi: 10.22373/jim.v15i1.5460.
- [14] T. Z. Diddana, G. N. Kelkay, A. N. Dola, and A. A. Sadore, "Effect of Nutrition Education Based on Health Belief Model on Nutritional Knowledge and Dietary Practice of Pregnant Women in Dessie Town, Northeast Ethiopia: A Cluster Randomized Control Trial," *J. Nutr. Metab.*, vol. 2018, pp. 1–10, Jun. 2018, doi: 10.1155/2018/6731815.
- [15] G. Beressa, S. J. Whiting, and T. Belachew, "Effect of nutrition education integrating the health belief model and theory of planned behavior on dietary diversity of pregnant women in Southeast Ethiopia: a cluster randomized controlled trial," *Nutr. J.*, vol. 23, no. 1, p. 3, Jan. 2024, doi: 10.1186/s12937-023-00907-z.
- [16] N. Ferdian, Z. Shaluhiyah, and A. Kartini, "Faktor-Faktor yang Berhubungan dengan Praktik Ibu dalam Pemberian Makan Pada Balita Berdasarkan Teori Health Belief Model," *MAHESA Malahayati Heal. Student J.*, vol. 4, no. 12, pp. 5426–5440, Dec. 2024, doi: 10.33024/mahesa.v4i12.16211.
- [17] Mariani, "PENDIDIKAN HOLISTIK DALAM ISLAM: STUDI TERHADAP IQ, EQ, DAN SQ," *Tarb. Islam. J. Ilm. Pendidik. Agama Islam*, vol. 11, no. 1, pp. 1–6, 2021, doi: 10.18592/jtipai.v11i1.4780.
- [18] Z. Hasan, M. A. A. Nasution, A. Asfahani, M. Muhammadong, and S. Syafruddin, "Menggagas Pendidikan Islam Holistik melalui Integrasi Ilmu Pengetahuan dan Spiritualitas," *Glob. Educ. J.*, vol. 2, no. 1, pp. 81–89, Mar. 2024, doi: 10.59525/gej.v2i1.321.
- [19] S. Fatimah and S. Sumarni, "A Holistic Approach To Islamic Basic Education: Synthesizing the Development of Students' Potential From Intellectual, Spiritual and Emotional Aspects," *Pionir J. Pendidik.*, vol. 13, no. 2, p. 106, 2024, doi: 10.22373/pjp.v13i2.24259.
- [20] N. Y. S. Dewi and A. Agustina, "Halalan Toyyiban: Theory and Implementation of Food Products Consumers," *Indones. Interdiscip. J. Sharia Econ.*, vol. 4, no. 1, pp. 179–189, Sep. 2021, doi: 10.31538/iijse.v4i1.1425.
- [21] C. Carroll, A. Booth, J. Leaviss, and J. Rick, "Best fit' framework synthesis: refining the method," *BMC Med. Res. Methodol.*, vol. 13, no. 1, p. 37, Dec. 2013, doi: 10.1186/1471-2288-13-37.
- [22] A. P. Black, K. D'Onise, R. McDermott, H. Vally, and K. O'Dea, "How effective are family-based and institutional nutrition interventions in improving children's diet and health? A systematic review," *BMC Public Health*, vol. 17, no. 1, p. 818, Dec. 2017, doi: 10.1186/s12889-017-4795-5.
- [23] A. Mildon and D. Sellen, "Use of mobile phones for behavior change communication to improve maternal, newborn and child health: a scoping review," *J. Glob. Health*, vol. 9, no. 2, Dec. 2019, doi: 10.7189/jogh.09.020425.
- [24] S. Nurhayati, A. Setra, and T. Taufikin, "ISLAMIC VALUE-BASED COMMUNITY ENVIRONMENTAL LITERACY AND EDUCATION AS A FRAMEWORK FOR CIRCULAR ECONOMY AND SUSTAINABLE WASTE MANAGEMENT," *Humanit. J. Univ. Zakho*, vol. 13, no. 3, pp. 490–503, Sep. 2025, doi: 10.26436/hjuoz.2025.13.3.1620.