



Transformative Islamic Education in Pesantren: An Ecotheological Approach to Adolescent Reproductive Health Governance

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abstract

Background: Adolescent reproductive health remains a persistent public-health and educational challenge where cultural and religious norms constrain open dialogue. In Muslim-majority settings, Islamic boarding schools (pesantren) are primary moral communities that shape youth values, knowledge, and behavior.

Aims: This study explores transformative Islamic education in pesantren through an ecotheological lens, focusing on adolescent reproductive health governance. It integrates Islamic theological principles with educational practices to address the reproductive health challenges faced by santri.

Methods: A convergent parallel mixed-methods design was applied in three pesantren in Central Java representing traditional, modern, and semi-modern orientations. Qualitative data were collected through semi-structured interviews with kyai, ustadzah, and health facilitators, while quantitative data were obtained from 150 santri using a Theory of Planned Behavior (TPB)-based survey.

Results: Reproductive health is rarely formalized in pesantren curricula, yet informal knowledge transmission through religious teachers and peer networks plays a crucial role. Subjective norms were the strongest predictor of intention ($\beta = .46$), followed by attitudes ($\beta = .29$) and perceived behavioral control ($\beta = .18$). Integrating ecotheological values such as *khalifah* (stewardship), *amanah* (trust), and *maslahah* (public benefit) with TPB constructs shows that religious legitimacy can strengthen adolescents' health intentions and behaviors.

Conclusions: The study proposes the Islamic Eco-Behavioral Model for Reproductive Health (IEBMRH), which emphasizes curriculum integration, educator capacity building, and faith-sensitive digital platforms. The model positions pesantren as transformative educational institutions that align theological values with contemporary health needs, advancing culturally congruent and ethically grounded reproductive health governance.

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1. Introduction

Adolescent reproductive health remains a persistent global public-health and educational challenge, particularly in contexts where cultural and religious norms constrain open dialogue about sexuality and reproduction. In Muslim-majority settings, Islamic boarding schools (pesantren) perform a dual role as places of formal and informal education and as primary moral communities that shape youth values, knowledge, and behavior. Understanding how pesantren can responsibly and effectively engage with adolescent reproductive health thus requires approaches that bridge theological legitimacy and behavior-change science.

Despite these advances, three gaps remain that motivate the present study. First, most TPB and reproductive-health intervention studies are situated in secular or clinical contexts; far fewer studies investigate TPB-informed interventions embedded explicitly within Islamic educational institutions such as pesantren, where institutional authority and curriculum design shape both access and acceptability (Paul et al., 2023). Second, while theological reframing (e.g., *maqāṣid*-based arguments) has been proposed in bioethics and environmental health literature, empirical research that operationalizes ecotheological concepts within pesantren curricula or governance practices for adolescent reproductive health is scarce. The literature documents normative rationale but not robust pedagogical models co-designed with pesantren stakeholders (Mohidem & Hashim, 2023). Third, there is an implementation gap concerning digital and pedagogical modalities: how faith-sensitive digital platforms, educator capacity building, and curriculum integration can be combined to produce sustainable behavior change among *santri* (students) while respecting institutional norms. Recent reviews show the promise of digital interventions for adolescent sexual health but emphasize that contextually trusted messengers and culturally congruent content are essential for impact (Aguilar-Quesada et al., 2025).

In response to these gaps, this study aims to reconceptualize pesantren as transformative Islamic educational settings for adolescent reproductive health by integrating ecotheological values with behavioral science (TPB) and by examining practical governance mechanisms (curriculum, educator capacity, and digital platforms) that enable culturally congruent interventions. Specifically, the research question is: *How can an ecotheological approach, operationalized within pesantren educational governance, strengthen determinants of reproductive-health intentions and behaviors among adolescent santri?* The study's objectives are (1) to document current institutional norms, curricular practices, and informal reproductive-health communication in pesantren; (2) to analyze relationships between TPB constructs (Armitage & Conner, 2001) and reproductive-health intentions among santri; and (3) to propose a context-sensitive Islamic Eco-Behavioral model for pesantren-based reproductive health education and governance (Andriani & Wijarnako, 2025).

1.1 Theory of Planned Behavior and adolescent reproductive health

Recent empirical and review literature indicates two relevant trends. First, interventions grounded in behavioral theories, notably the Theory of Planned Behavior (TPB) (Ajzen, 1991; Bosnjak et al., 2020), consistently show capacity to predict and change adolescent sexual and reproductive health intentions and behaviors; systematic reviews and meta-analyses in the last decade report that TPB-based education improves proximal determinants (attitudes, subjective

norms, perceived control) and often reduces risky sexual behaviors (Khechine & Lakhal, 2018; Paul et al., 2023).

The research context comprises three pesantren in Central Java representing traditional, modern, and semi-modern typologies; the unit of analysis includes (a) institutional actors (kyai, ustadz/ustadzah, administrators), (b) educators and health facilitators, and (c) adolescent santri (aged 15–19). Methodologically, the study uses a convergent parallel mixed-methods design (Creswell & Clark, 2018) combining semi-structured interviews with key stakeholders and a TPB-based survey of santri, an approach intended to triangulate theological framing, institutional practice, and measurable behavioral determinants.

1.2 Religion, religious leaders, and adolescent health

Second, there is growing evidence that faith and religion are influential determinants of adolescent health outcomes: religious leaders, institutional norms, and faith-based framing can either facilitate or impede health education depending on how messages are designed and delivered. Systematic reviews highlight the strategic role religious leaders and faith institutions may play in shaping adolescent reproductive health and in legitimizing interventions when theological concerns are properly addressed (Ashriady et al., 2024).

1.3 Ecotheology and maqāṣid ethics in health

Parallel to these two literatures, scholars have started to articulate integrative frameworks that connect environmental/ethical theology with health: an “ecothological” perspective that reframes bodily care and public health as aspects of Islamic stewardship (*khalīfah*) and *maqāṣid* ethics (e.g., preservation of life and dignity). Reviews integrating environmental and health perspectives from Islamic normative sources suggest promising conceptual links between theological values (*amanah*, *maslahah*, *tazkiyah*) and public-health objectives, though empirical operationalization in educational contexts remains limited (Mohidem & Hashim, 2023).

2. Methods

2.1 Research design

This study applied a convergent parallel mixed-methods design, following the framework of Creswell & Clark (2018), which combines quantitative and qualitative approaches to provide a comprehensive understanding of a single phenomenon (Meissner et al., 2011). The research aimed to explore how Islamic ecotheological values interact with behavioral determinants in pesantren-based reproductive health governance. The quantitative component examined the relationship among constructs of the Theory of Planned Behavior (TPB)—attitude, subjective norms, perceived behavioral control, and behavioral intention—while the qualitative component investigated theological, institutional, and gendered factors influencing health education.

2.2 Research procedures

The study was conducted from January to June 2024 in three pesantren located in Central Java, Indonesia, representing traditional (*salaf*), semi-modern, and modern typologies. These

sites were selected to capture diverse institutional practices and governance patterns in reproductive health education. Quantitative and qualitative data were gathered concurrently in the three sites, and the findings from both strands were subsequently integrated (see Section 2.5).

2.3 Participants and informants

Quantitative data were collected from 150 adolescent santri aged 15–19 years, selected through purposive proportional sampling to represent each pesantren. Twelve key informants were selected through purposive and snowball sampling, consisting of kyai, ustadzah, pesantren administrators, and health facilitators who were directly involved in student development and religious instruction.

2.4 Data collection

A structured questionnaire adapted from standardized TPB instruments was used to measure attitudes, subjective norms, perceived behavioral control, and behavioral intention toward reproductive health practices. Each construct consisted of multiple items on a five-point Likert scale ranging from “strongly disagree” to “strongly agree.” Reliability and validity of the instruments were tested using Cronbach’s alpha and factor analysis prior to field administration.

Qualitative data were gathered concurrently through semi-structured interviews, participant observation, and document review. Interviews explored perceptions of reproductive health education, the use of Islamic concepts such as *khalīfah*, *amanah*, *maslahah*, and *maqāsid al-sharī‘ah* in guiding health behavior, and institutional challenges in integrating reproductive health into pesantren governance. Observations were conducted in classrooms, dormitories, and informal student gatherings to capture natural interactions, while documentation included curriculum guides, sermons, and health policy manuals.

2.5 Data analysis

The quantitative data were analyzed using descriptive statistics (mean, standard deviation) and multiple regression analysis to determine the predictive power of each TPB construct toward behavioral intention. Quantitative data processing was conducted with SPSS version 25, and results were interpreted at a significance level of $p < 0.05$. Qualitative data were transcribed and analyzed using thematic analysis, following Braun and Clarke’s six-step framework, with coding and theme development supported by NVivo 12 software (Naeem et al., 2023; Nowell et al., 2017; O’Connor et al., 2021). Integration of qualitative and quantitative findings was performed through joint display and triangulation, enabling comparison of numerical trends with contextual insights. This process culminated in the formulation of the Islamic Eco-Behavioral Model for Reproductive Health (IEBMRH), which synthesizes TPB constructs with pesantren-based ecotheological values.

3. Result and Discussion

3.1 Results

3.1.1 Quantitative findings

The survey of 150 santri across three pesantren produced reliable measures of Theory of Planned Behavior (TPB) constructs (Table 1). Descriptive results indicated that students reported moderately positive attitudes toward reproductive health ($M = 3.67$, $SD = 0.52$ on a 5-point scale), relatively strong subjective norms ($M = 3.85$, $SD = 0.61$), and moderate levels of perceived behavioral control ($M = 3.42$, $SD = 0.58$). Behavioral intention to engage in positive reproductive health practices (e.g., seeking information from trusted sources, delaying risky behaviors) was also moderately high ($M = 3.71$, $SD = 0.54$).

Table 1. Descriptive Statistics of TPB Constructs (N = 150)

Construct	Mean (M)	Std. Dev (SD)	Cronbach's α
Attitudes toward reproductive health	3.67	0.52	0.81
Subjective norms	3.85	0.61	0.84
Perceived behavioral control	3.42	0.58	0.79
Behavioral intention	3.71	0.54	0.83

Source: Field survey, 2024.

Regression analysis showed that subjective norms were the strongest predictor of intention ($\beta = .46$, $p < 0.001$), followed by attitudes ($\beta = .29$, $p < 0.01$), while perceived behavioral control had a smaller but significant effect ($\beta = .18$, $p < 0.05$). These findings align with prior adolescent health studies where peer and authority influence consistently shaped reproductive health intentions. The results suggest that peer and religious authority norms exert greater influence than personal attitudes alone. This indicates that pesantren-based interventions must prioritize community endorsement and religious legitimacy to shape adolescent behavior, confirming earlier findings in faith-based adolescent health education (NisaMairo, Nadhiroh, Salim, & Isfandiari, 2024).

3.1.2 Qualitative findings

Analysis of 12 semi-structured interviews with kyai, ustadzah, administrators, and health facilitators revealed three main themes: institutional reluctance and informal transmission, theological justifications for health promotion, and digital access and gendered dynamics.

Institutional reluctance and informal transmission. Formal reproductive health education was rarely integrated into pesantren curricula due to fears of moral decline. However, informal channels such as personal counseling by ustadzah, religious sermons, and peer networks served as *de facto* reproductive health education. This mirrors findings from similar pesantren-based studies where informal mechanisms substituted for formal curricula.

Theological justifications for health promotion. Interviewees frequently invoked Islamic values such as *khalifah* (stewardship), *amanah* (trust), and *maslahah* (public benefit) as moral grounds for health protection. Leaders emphasized that maintaining bodily integrity is part of

maqāṣid al-sharī'ah (preservation of life and dignity). Similar arguments have been shown to increase the legitimacy of sensitive health interventions in conservative Muslim contexts.

Digital access and gendered dynamics. Students reported relying on peer-shared digital content, often unverified and sometimes misleading. Female teachers (*ustadzah*) were identified as more approachable for reproductive health concerns than male teachers. This highlights both the digital literacy gap and the gendered pathways through which information is accessed, reinforcing the need for female-led interventions and digital health literacy training.

3.1.3 Integrated interpretation

When combined, quantitative and qualitative findings suggest that reproductive health governance in pesantren is shaped by a complex interplay between institutional authority, peer influence, and theological framing. While formal curricula remain resistant, religious legitimacy significantly enhances the acceptability of reproductive health education. The statistical finding that subjective norms are the strongest predictor of intention reinforces the qualitative insight that *kyai* and peer groups are pivotal actors in shaping santri behavior. Overall, the results confirm the utility of combining ecotheological values with behavioral science (TPB) to design culturally grounded and educationally sustainable interventions in pesantren contexts.

3.2 Discussion

This study sought to address the research question of how an ecotheological approach, operationalized within pesantren educational governance, can strengthen adolescent reproductive health intentions and behaviors. By combining a TPB-based survey with qualitative interviews in three pesantren, the findings provide a multidimensional picture of how theological legitimacy, institutional norms, and peer influence interact to shape santri behavior.

Quantitative results demonstrated that subjective norms were the strongest predictor of reproductive health intentions, followed by attitudes and perceived behavioral control. This finding echoes global evidence where peer and authority figures significantly influence adolescents' sexual and reproductive health (Riyanti et al., 2024). In pesantren, these norms are uniquely reinforced by religious authority, suggesting that educational interventions will be most effective when endorsed by *kyai* and integrated into pesantren culture (NisaMairo et al., 2024). This finding also aligns with national studies highlighting the authority of pesantren leaders in shaping value-based education.

Qualitative data added nuance by showing that, despite institutional reluctance to formalize reproductive health curricula, informal mechanisms (peer discussion, *ustadzah* counseling, and sermons) serve as alternative pathways of health education. This dual reality indicates a structural gap: while formal curriculum excludes sensitive content, informal practices fill the void, albeit inconsistently. Similar dynamics have been observed in other Islamic contexts where health content framed as "moral responsibility" is more readily accepted (NisaMairo et al., 2024).

The integration of ecotheological values (*khalifah, amanah, maslahah*) with behavioral science (TPB constructs) reveals how theological framing can legitimize and reinforce adolescent health behaviors (Barbera et al., 2020). The emphasis on *maqāṣid al-sharī'ah*

(preservation of life and dignity) aligns with global calls for culturally grounded approaches in adolescent health governance. These findings suggest that reproductive health should not be construed as an external biomedical agenda but as a theologically mandated responsibility, thereby reducing institutional resistance.

This study also contributes to theoretical development by proposing the Islamic Eco-Behavioral Model for Reproductive Health (IEBMRH). Unlike conventional TPB applications, IEBMRH embeds theological legitimacy into each determinant of intention. Attitudes are shaped by religious framing of health as *ibadah* (worship); subjective norms are reinforced by kyai authority and peer alignment; and perceived behavioral control is enhanced through institutionally sanctioned digital platforms and trusted educators. This modification expands TPB into a faith-sensitive behavioral model, echoing calls for contextualized behavioral frameworks in non-Western settings.

From a practical standpoint, the findings highlight three strategic directions for pesantren. First, reproductive health should be integrated into the curriculum of Islamic studies, justified by scriptural references and *maqāṣid* principles. Second, capacity building for ustadzah and peer mentors is needed so that they can act as trusted facilitators, addressing both gendered dynamics and informal trust networks. Third, faith-sensitive digital platforms should provide adolescents with accurate, private, and religiously aligned content, reducing reliance on unverified online sources. By situating pesantren as agents of transformative Islamic education, this study demonstrates that ecotheology and TPB together can bridge the persistent gap between cultural-religious values and contemporary adolescent health needs.

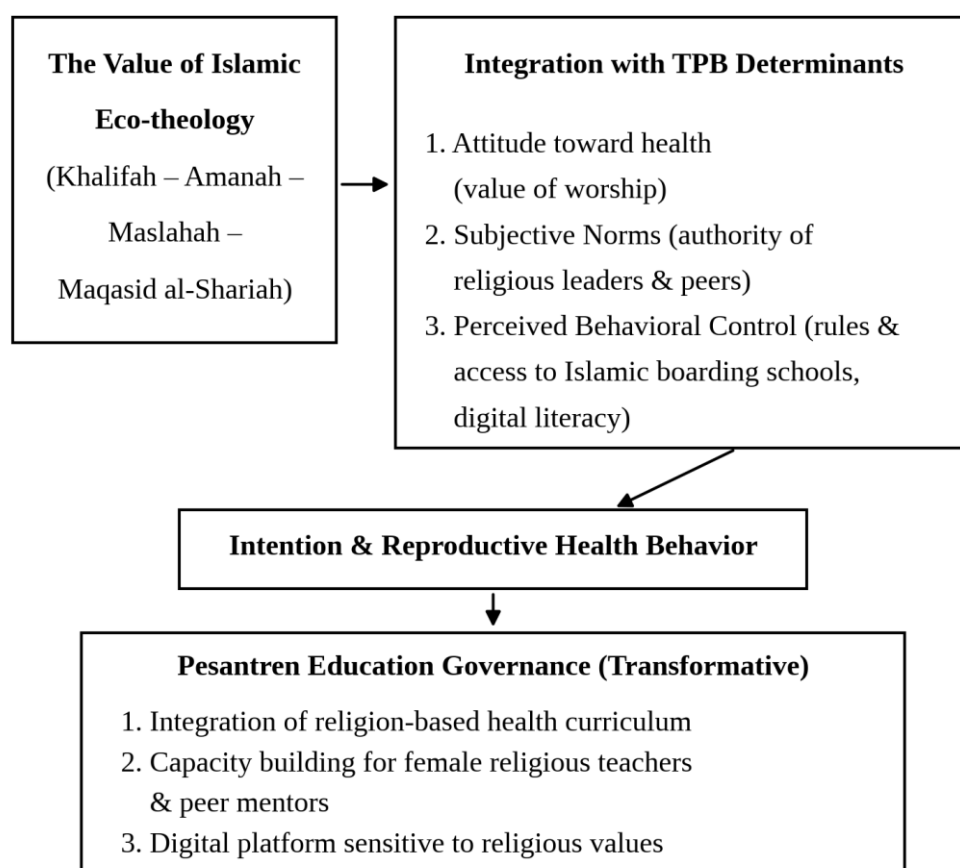


Figure 1. Conceptual Framework of the Islamic Eco-Behavioral Model for Reproductive Health (IEBMRH)

As shown in Figure 1, this conceptual framework proposes an integrative model connecting Islamic ecotheological values and the Theory of Planned Behavior (TPB) to explain the formation of reproductive health intentions and behaviors among *santri* (students in Islamic boarding schools). It also demonstrates how such integration contributes to transformative pesantren governance in health education.

Islamic ecotheological values (khalifah–amanah–maslahah–maqasid al-shariah). The foundation of this framework is built upon four core Islamic ecotheological values—*khalifah* (stewardship), *amanah* (trust), *maslahah* (public benefit), and *maqasid al-shariah* (objectives of Islamic law)—that provide a moral-spiritual basis for behavioral transformation and institutional ethics in pesantren. In Islamic theology, humans are entrusted as *khalifah* (vicegerents or stewards) responsible for maintaining harmony (*mīzān*) within creation. This stewardship implies moral accountability over one’s body, environment, and social relationships, including sexual conduct. It frames human health and ecological balance as intertwined forms of divine trust (Nasr, 1997; Zaimudin et al., 2024).

The concept of *amanah* extends stewardship into personal responsibility: the human body and life are divine trusts (*amānah ilāhiyyah*) that must be safeguarded. Maintaining sexual and reproductive health becomes not only a social obligation but also a moral covenant with God (Rahman, 1989). Derived from Islamic jurisprudence (*usul al-fiqh*), *maslahah* refers to promoting communal welfare and preventing harm (*mafsadah*). The principle authorizes

actions, including health promotion, if they preserve human dignity and benefit the broader community (Kamali, 2003). The *maqasid* provide the teleological framework of Islamic ethics: protecting life (*hifz al-nafs*), intellect (*hifz al-'aql*), and lineage (*hifz al-nasl*) are among the five primary objectives that legitimize health education and reproductive well-being as religious imperatives (Auda, 2008).

These four values together establish a faith-based ethical ecology, where human health and moral responsibility are inseparable from religious stewardship. In the pesantren context, they become guiding principles for constructing health literacy, sexual ethics, and self-control in alignment with divine purpose.

Integration with determinants of the Theory of Planned Behavior (TPB). The second level of the framework integrates these ecotheological values with the determinants of the TPB (attitude, subjective norms, and perceived behavioral control) as formulated by (Ajzen & Schmidt, 2020). The integration contextualizes behavioral determinants within the religious and institutional environment of pesantren. For attitude, the model interprets positive health behavior as a form of worship (*'ibādah*), where self-care and sexual responsibility are acts of piety. By reframing preventive behavior as spiritually meritorious, pesantren students are more likely to develop favorable attitudes toward reproductive health. For subjective norms, behavioral expectations in pesantren are shaped by influential figures such as kyai (religious leaders) and peers; the endorsement of reproductive health education by these authorities enhances its social legitimacy and reinforces normative compliance among students (Geertz, 1971). For perceived behavioral control, santri's perceived control over health practices depends on their access to accurate information, institutional rules, and digital learning resources. When pesantren provide regulated, value-sensitive access to health knowledge, students' self-efficacy and confidence in behavior management increase.

Empirical studies have validated TPB across diverse health behaviors, including reproductive health, digital literacy, and religiosity-driven compliance, confirming that attitudes, norms, and perceived control jointly predict behavioral intentions (Bagir, 2021). Thus, integrating TPB with Islamic values transforms a secular psychological model into a faith-anchored behavioral framework, harmonizing moral theology with behavioral science.

Intention and reproductive health behavior. In TPB, intention serves as the most immediate antecedent of behavior. Within this framework, intention is a function of internalized ecotheological values, socially supported norms, and perceived behavioral control. When santri view reproductive health as a moral trust (*amanah*), guided by religious norms (subjective norms), and supported by institutional systems (perceived control), their intention to adopt responsible behaviors strengthens. Consequently, behavioral manifestations such as seeking health information, practicing self-control, and supporting peers are viewed not merely as outcomes of education but as expressions of theological commitment (Auda, 2008).

Transformative pesantren health governance. At the institutional level, the framework culminates in transformative pesantren governance, in which individual behavioral transformation feeds into systemic reforms that sustain health promotion. Three strategic pillars underpin this governance transformation. The first is the integration of a faith-based health curriculum: embedding reproductive health into Islamic studies ensures continuity between religious and scientific knowledge, promoting holistic learning that aligns with *maqasid al-*

shariah (Shihab, 1999). The second is capacity building for ustadzah and peer mentors: empowering female educators and trained peer mentors to serve as facilitators enhances trust, confidentiality, and sustainability of the program (Syamsuddin, 2021). The third is the development of a digital platform sensitive to religious values: a platform designed around Islamic ethics allows students to access reliable information safely while maintaining modesty and moral integrity (Djamas, 2022).

These strategies collectively reposition pesantren from traditional centers of religious instruction to models of faith-driven public health governance, ensuring that spiritual and physical well-being are pursued in tandem. In summary, this framework illustrates a faith-integrated behavioral model linking *Islamic ecotheological values* → *TPB determinants* → *reproductive health intention and behavior* → *transformative pesantren governance*. By embedding spiritual ethics within behavioral determinants, it proposes an innovative pathway for developing culturally sustainable reproductive health programs in Islamic educational settings.

4. Conclusion

This study set out to reconceptualize pesantren as transformative Islamic educational institutions capable of addressing adolescent reproductive health through an ecotheological and behavioral lens. By integrating theological values (*khalīfah*, *amanah*, and *maṣlahah*) with the Theory of Planned Behavior (TPB), the study shows how religious legitimacy and behavioral determinants jointly shape adolescent health intentions and practices. Subjective norms, particularly those derived from religious leaders and peer groups, were the strongest predictors of reproductive health intentions among santri, highlighting the pivotal role of pesantren authority and the social environment in adolescent decision-making. In the absence of formal curricula, informal mechanisms such as peer discussion, ustadzah counseling, and sermons function as alternative channels of reproductive health education, indicating the resilience of pesantren in mediating sensitive topics through culturally acceptable pathways. By combining TPB with ecotheological framing, the study proposes the Islamic Eco-Behavioral Model for Reproductive Health (IEBMRH), which demonstrates that embedding reproductive health education within theological discourse enhances its acceptability and strengthens both attitudes and behavioral intentions. The study contributes theoretically by extending TPB into a faith-sensitive behavioral model and practically by offering strategies for curriculum integration, educator capacity building, and faith-sensitive digital platforms. Further research is needed to test the adaptability of IEBMRH across different pesantren typologies and socio-cultural contexts, and policy-level engagement is critical to institutionalize the model within national adolescent health and Islamic education frameworks, so that pesantren may evolve not only as centers of religious learning but also as active innovators in safeguarding the health and dignity of Muslim youth.

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