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Improving Worship Discipline and Focus Through Prayer Reminder Apps

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Abstract

This study investigates the impact of prayer reminder applications on worship discipline and spiritual focus (khusyuk) among Muslim university students in Bandung, Indonesia. The research aims to assess the effectiveness of such apps in enhancing prayer punctuality and spiritual engagement. Using a quantitative explanatory method, data were gathered from 33 users of apps like Muslim Pro and Al-Quran Indonesia. Results show significant improvement in prayer timeliness (mean: 4.1/5) though the improvement in khusyu' was more modest (mean: 3.0/5). Key obstacles include poor internet (35%), app errors (30%), and inconsistent alerts (25%). The findings suggest that while digital nudges improve external discipline, they are less effective in fostering inner devotion. This study's novelty lies in its integration of behavioral nudging with Islamic educational values. It recommends features like offline access and reflective prompts to support both compliance and spiritual depth. These insights offer implications for Islamic app developers and educators aiming to enhance faith-tech experiences.

Penelitian ini mengkaji pengaruh penggunaan aplikasi pengingat waktu shalat terhadap kedisiplinan ibadah dan fokus spiritual (khusyuk) pada mahasiswa Muslim di Bandung, Indonesia. Tujuan penelitian ini adalah untuk mengevaluasi efektivitas aplikasi tersebut dalam meningkatkan ketepatan waktu shalat dan kedalaman keterlibatan spiritual. Metode yang digunakan adalah kuantitatif eksplanatori dengan pengumpulan data dari 33 pengguna aktif aplikasi seperti Muslim Pro dan Al-Quran Indonesia. Hasil menunjukkan peningkatan signifikan dalam ketepatan waktu shalat (rata-rata: 4,1/5), namun hanya peningkatan sedang dalam khusyuk (rata-rata: 3,0/5). kendala utama yang dihadapi mencakup koneksi internet yang buruk (35%), kesalahan aplikasi (30%), dan notifikasi yang tidak konsisten (25%). Temuan ini menunjukkan bahwa meskipun dorongan digital dapat meningkatkan disiplin eksternal, dorongan tersebut kurang efektif dalam menumbuhkan kedalaman spiritual internal. Kebaruan dari penelitian ini terletak pada integrasi antara teori nudging dan nilai-nilai pendidikan Islam. Studi ini merekomendasikan fitur seperti akses offline dan konten reflektif untuk mendukung kepatuhan ritual sekaligus memperdalam keterhubungan spiritual. Temuan ini memiliki implikasi bagi pengembang aplikasi keislaman dan pendidik yang ingin memperkaya pengalaman ibadah digital.

A. INTRODUCTION

The rapid evolution of digital technology has reshaped various aspects of Muslim daily life, including religious practices (Akim et al., 2023; Slama & Barendregt, 2018). Among these developments, prayer reminder applications such as Muslim Pro, Salaam, and Al-Quran Indonesia have gained popularity for supporting the timely observance of the five daily prayers through features like adhan notifications, GPS-based scheduling, and digital prayer guides (Kabir et al., 2024; Wahid, 2024; Yunanto et al., 2024). These tools are widely used by Muslim youth for their convenience and ease of use. While their influence on punctuality is clear, their impact on spiritual focus (khusyu')—a mindful, undistracted state during prayer—remains underexplored due to the challenge of quantifying such an internal experience (Rahmanto et al., 2023).

Existing studies confirm that prayer reminder apps enhance user discipline and punctuality through interactive cues and habitual reinforcement (Malik et al., 2022; Umar & Tilli, 2025). However, khusyu' involves internal elements such as mental presence, emotional readiness, and concentration—qualities that surpass routine behavioral compliance. Classical scholars like Al-Ghazali and Ibn Qayyim al-Jawziyya emphasize that khusyu' requires presence of heart (hudur al-qalb) and understanding prayer meanings. These concepts are also explained in contemporary fatwas such as those by (Al-Munajjid, Muhammad Saalih, n.d.), who highlights khusyu' as the foundation of sincere worship. Supporting this, recent academic perspectives such as (Syamila & Mansoer, 2023) explore khusyu' through psychological indicators like mindfulness and mind-wandering, showing that religious salience and spiritual preparedness predict higher focus during prayer.

To provide deeper theoretical grounding, Rassool (2023) offers a comprehensive model of Islamic psychology rooted in the unity of body, mind, and spirit. He links khusyu' with Qur'anic concepts of fitrah, nafs, and qalb, suggesting that achieving a mindful state in prayer requires alignment between cognitive focus and spiritual awareness. This broader theological and psychological framing aligns khusyu' with the Islamic understanding of muraqabah (God-conscious vigilance) and tawakkul (trust in God).

This study adopts behavioral nudging theory by Thaler and Sunstein (2008), which posits that subtle cues—like smartphone alerts—can encourage positive behavioral shifts. This framework is increasingly used in Islamic psychology to explore how technology can both aid and hinder religious practice (Erwahyudin, 2024). Ethical

discussions around nudging highlight concerns about autonomy and agency (Schmidt & Engelen, 2020), yet scholars like Saeed and Gamal (2021) argue that nudging is inherently compatible with Islamic teachings, where divine commands serve as spiritual prompts. Tafer et al. (2016) reinforce this by showing how Islamic ethics underpin rational behavior, positioning Islamic nudging as both morally sound and practically viable.

Such perspectives open pathways for applying ethical nudging in religious contexts. Aaminou and Aboulachif (2017), for instance, document how Islamic banks use behavioral strategies like default options and reminders to encourage ethical saving habits. Their work suggests a viable precedent for applying similar techniques to prayer habits via digital tools. In parallel, Sanusi (2024) identifies how digital Islamic education can promote religious values among youth while acknowledging that quality, oversight, and teacher-student interaction remain pressing concerns.

However, habit formation literature suggests that sustained behavioral change—especially in spiritually reflective domains—requires more than repetition. While Lally et al. (2010) estimate forming a habit takes 18 to 254 days, scholars such as Gravert and Collentine (2020) point out that digital nudging often falls short when deeper reflection is required. Erwahyudin (2024) cautions that over-reliance on technology may reduce spirituality to mechanical behavior, a concern echoed by Rubini (2025), who emphasizes ethical boundaries and intentionality in tech use.

University students face particular challenges in maintaining consistent worship practices due to academic demands, limited prayer spaces, and digital distractions (Grant et al., 2023). Umar and Tilli (2025) show that mobile apps improve students' access to Qur'anic and Hadith content and support learning outcomes, although digital literacy gaps and content quality remain issues. Fabula (2024) finds that regular prayer correlates with academic performance, indicating the broader relevance of disciplined spiritual routines. Abubakari and Zakaria (2023) note that both external factors and internal motivations affect how students engage with spiritual apps. Similarly, Mashudi and Hilman (2024) and Faqihuddin and Muflih (2024) highlight how Indonesian educators are beginning to integrate digital religious tools, yet often face infrastructural and pedagogical challenges.

This study contributes by evaluating both practical outcomes (e.g., punctuality) and deeper reflective impacts (e.g., khusyu') of prayer reminder apps among university

students. While prior research has tended to focus on one dimension, this study offers a more holistic perspective using a behavioral nudging framework.

Compared to previous works, this research fills several notable gaps. Malik et al. (2022) demonstrated that prayer apps improved punctuality, but did not explore their role in supporting khusyu' or spiritual depth. Ahmed and Yousaf (2025) focused on the psychological dimensions of khusyu' as a mindfulness state but did not link this to digital or behavioral interventions. Mashudi and Hilman (2024) evaluated Islamic digital tools for engagement but did not examine nudging theory or the challenges users face in sustaining focus during prayer. In contrast, this study integrates behavioral nudging with Islamic educational theory (TAMISE) to assess both punctuality and khusyu', and highlights technical barriers that affect these outcomes. The novelty lies in its dual evaluation of behavioral and spiritual dimensions in the context of a localized Muslim student population in Bandung, offering practical insights for more spiritually responsive app design.

Accordingly, the study aims to: Measure the influence of prayer reminder applications on Muslim students' prayer punctuality; Evaluate their impact on students' spiritual focus (khusyu'); Identify key technical limitations encountered by users.

This study is limited to Muslim university students in Bandung, Indonesia, who are users of prayer reminder applications, in order to focus on a demographically relevant and behaviorally aligned population. These objectives are addressed through a quantitative explanatory approach and aim to provide both theoretical insight and practical recommendations for Islamic digital platforms and education providers.

B. RESEARCH METHODOLOGY

This study employed a quantitative explanatory method to examine the causal relationship between the use of prayer reminder applications and two primary outcomes: prayer punctuality and spiritual mindfulness (khusyuk). This approach is appropriate for analyzing cause-effect relationships using data collected from a defined sample and analyzed through statistical procedures (Bryman, 2012; Creswell, 2009; Sugiyono, 2016).

1. Related Studies

Recent empirical research supports the growing role of mobile applications in facilitating Islamic practices and digital spirituality. Umar and Tilli (2025)

demonstrated how Islamic learning apps enhance memorization and comprehension of religious material. Kabir et al. (2024) evaluated 11 lifestyle applications, revealing design shortcomings but affirming their motivational potential. Laird et al. (2024a) explored Pray.com, linking usage with improved spiritual and mental health. Rojak et al. (2021) investigated prayer app accuracy, emphasizing the importance of technical reliability in user trust. Lastly, Erwahyudin (2024) emphasized the psychological benefits of digital dhikr tools in modern Islamic therapy. These studies inform the present research's focus on prayer punctuality and khusyuk through app-based behavioral change.

2. Research Design

An explanatory survey design was used. A structured questionnaire was distributed via Google Forms to participants who met specific inclusion criteria—a platform recognized for its accessibility and reliability in educational and behavioral research. Google Forms has been widely used in cross-national religious behavior studies, especially during digital shifts post-COVID-19 (Fatima et al., 2022).

3. Research Approach

The study was guided by the Technology Acceptance Model (TAM) (Davis, 1989) and its Islamic adaptation, the Technology Acceptance Model in Islamic Education (TAMISE), validated by Abubakari and Zakaria (2023). TAMISE incorporates constructs such as Islamic compatibility and digital self-efficacy relevant to religious technology use. Additionally, behavioral nudging theory (Thaler & Sunstein, 2008) informed the framework, suggesting that subtle digital cues, such as prayer notifications, can shape habitual behavior.

4. Research Method

To guide this study, a conceptual framework was developed (Figure 1) to visualize the hypothesized relationships between prayer reminder app features and user outcomes. App elements such as adhan notifications, GPS-based prayer times, Qur'anic reflections, and custom alerts are operationalized as digital nudging mechanisms (Thaler & Sunstein, 2008; Wood & Neal, 2007) These nudges are expected to influence both behavioral outcomes (prayer punctuality) and reflective outcomes (spiritual focus or khusyuk). However, these effects may be moderated by technical challenges, such as app instability, notification errors, or advertisements, which could disrupt either habit formation or spiritual engagement. This model reflects a dual-

pathway structure: one targeting external compliance, and the other aiming for internal devotional quality.

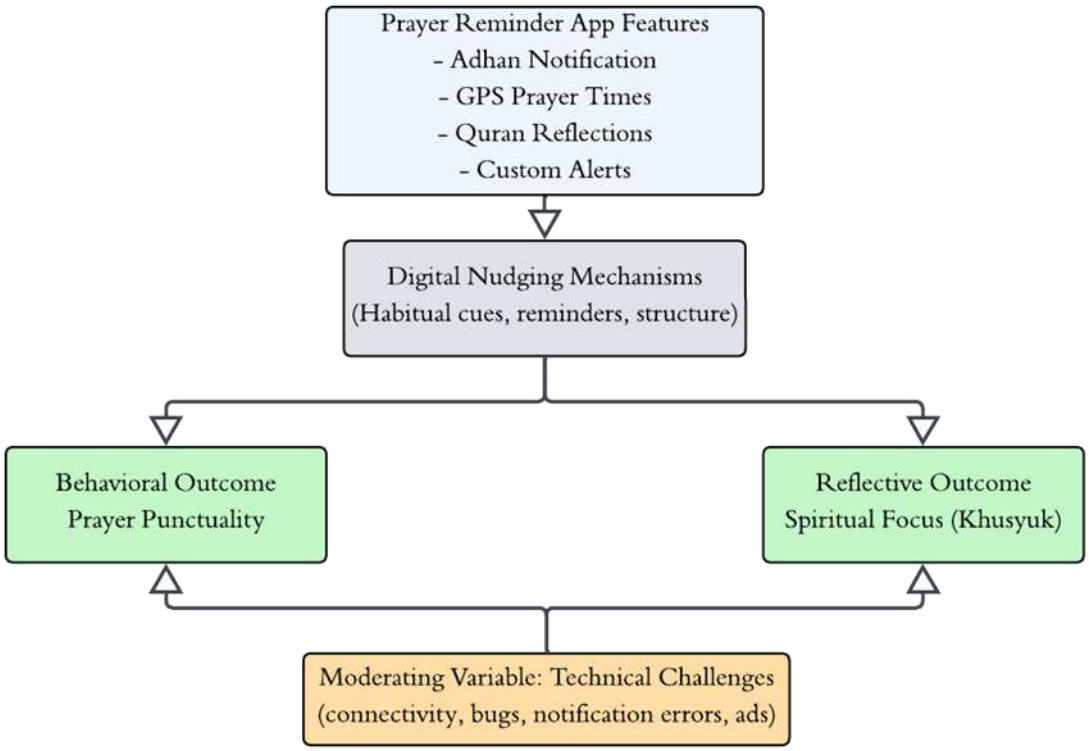

Figure 1. Conceptual framework illustrating how prayer-reminder app features can influence prayer punctuality and spiritual focus (khusyuk) through digital nudging mechanisms, with potential moderation by technical challenges.

5. Research Instruments

Data were collected using a self-administered questionnaire featuring Likert-scale items organized into five thematic areas:

a. Demographic background
b. App usage patterns and preferred features
c. Perceived impact on prayer punctuality
d. Perceived impact on spiritual focus (khusyuk)
e. Technical challenges encountered during app use

The questionnaire design was informed by the TAMISE model (Abubakari & Zakaria, 2023), Islamic digital psychology (Erwahyudin, 2024), and app-based behavioral studies (Kabir et al., 2024; Rojak, 2021), as well as the usability-efficacy link demonstrated by Umar & Tilli (2025). Likert scale structure and response design followed best practices in behavioral survey research. Rokeman & Roselidyawaty

(2024) offered validation for the importance of alignment between research objectives and Likert item selection, while Kusmaryono et al. (2022) confirmed that five- or seven-point odd-numbered Likert formats are optimal for reliability and range.

Two academic experts in Islamic education and psychology reviewed the instrument to ensure both content validity and cultural appropriateness, consistent with validation protocols in educational research (Creswell, 2009).

6. Data Collection Techniques

The survey was distributed over a two-week period in December 2024 via Google Forms. Participants were invited through academic and student community networks, and responses were monitored to ensure completeness and prevent duplication. This approach aligns with best practices for online behavioral data collection, offering both accessibility and response reliability (Evans & Mathur, 2005).

7. Data Analysis Techniques

The collected data were analyzed using IBM SPSS Statistics version 26. Descriptive statistics were applied to summarize demographic profiles, app usage patterns, and perceived effects. Inferential analysis, including mean comparisons and correlation analysis, was conducted to examine the relationships between app usage, prayer punctuality, and khusyuk (Alrawhani et al., 2025; Field, 2013).

8. Data Credibility Test / Validity Test

Additionally, data credibility was enhanced through response monitoring and researcher triangulation during interpretation to minimize bias and ensure trustworthy results. Cronbach's Alpha yielded a coefficient of 0.87, indicating a high level of internal consistency for social research instruments (Tavakol & Dennick, 2011).

9. Ethical Considerations

This study was conducted in accordance with ethical research standards involving human participants. Participation was entirely voluntary, with informed consent obtained through the Google Forms platform before participants accessed the questionnaire. Respondents were assured of full anonymity, and no personally identifying information was collected. Given the minimal-risk nature of the study and its educational context, formal ethical approval was not required by the host institution. These ethical safeguards align with established social research standards (Babbie, 2008; Neuman, 2014).

C. RESULTS AND DISCUSSION

Results

This section presents the findings from the survey of 34 Muslim university students who actively use prayer reminder applications. The results are structured according to the study's three research objectives: (1) the influence of these apps on prayer punctuality; (2) their impact on spiritual focus (khusyuk); and (3) the technical challenges faced by users.

1. Prayer Punctuality and Spiritual Focus

Most respondents (74.3%) reported regular use of prayer reminder apps, and over half (54.3%) used them on a daily basis. Muslim Pro (used by 51.4% of respondents) and Al-Quran Indonesia (34.3%) emerged as the most popular applications. These findings align with Malik et al. (2022), who noted that Muslim Pro was among the most downloaded and trusted apps due to its accurate Azan reminders and location-based features that improve user punctuality. Participants in our study similarly noted that these apps greatly improved their prayer punctuality but had only a moderate effect on spiritual focus: only 31.4% of respondents reported any enhancement in their sense of khusyuk (spiritual devotion).

Across the three key indicators—usage frequency, perceived outcomes, and technical reliability—a consistent pattern emerges: users rely heavily on these apps for behavioral reminders (especially timing), but technical flaws and a lack of emotional depth limit their impact on spiritual experience. While nearly half of the respondents scored high on discipline (46.5%), only a small fraction reported high khusyuk (9.1%). Simultaneously, 30.3% faced notification or connectivity failures, which potentially disrupt both punctuality and mindfulness. These results suggest that while prayer apps are effective for establishing ritual structure, they fall short in fostering immersive, contemplative prayer experiences.

This pattern also echoes the findings of Behdar and Sheikh (2023), whose meta-review of over 50 clinical studies confirmed that regular salat is linked to reduced anxiety, improved emotional well-being, and higher life satisfaction. However, such outcomes are often mediated by internal mindfulness and reflection—traits that may not be adequately cultivated by external reminders alone. Similarly, Mashudi and Hilman (2024) emphasized that digital Islamic education tools, while enhancing

engagement and access, frequently struggle to replicate the spiritual resonance and internal transformation associated with traditional mentorship and reflection

Table 1. Distribution and Frequency of Prayer Reminder App Usage (n = 34)

No	Application	User Percentage	Daily Usage Percentage
1.	Muslim Pro	51.4%	54.3%
2.	Al-Quran Indonesia	34.3%	31.4%
3.	Salaam	8.6%	14.3%

Quantitatively, the mean self-reported score for improved prayer timeliness was high (approximately 4.0 out of 5), whereas the mean improvement in spiritual focus was notably lower (around 3.1 out of 5). This discrepancy underscores that while the apps effectively reinforce timely prayer habits, their influence on achieving deeper spiritual engagement is comparatively limited. Table 2 provides a detailed comparison of these discipline versus spirituality outcomes.

Table 2. Comparative Scores of Prayer Discipline versus Spiritual Focus (n = 34)

No	Discipline (%)	Spiritual Focus (%)
1.	3	18.2
2.	12.1	21.2
3.	21.3	39.4
4.	46.5	12.1
5.	15.2	9.1

2. Technical Challenges

Respondents also identified several technical issues that hindered their user experience with the prayer apps. The most common problems reported were notification failures (30.3% of users), application malfunctions (27.3%), and unstable internet connectivity (27.3%). Such technical challenges can significantly undermine the apps' effectiveness. Table 3 summarizes the frequency of these reported issues.

Table 3. Technical Challenges Experienced by Users (n = 34)

No	Technical Issue	Percentage (%)
1.	Notification Failures	30.3
2.	Application Malfunctions	27.3

3.	Internet Connectivity Problems	27.3
4.	In-App Advertisements	6
5.	Notification Preferences	3
6.	Low Response to Notifications	3
7.	No Technical Issues	15.2

Discussion

1. Behavioral Outcomes: Punctuality versus Khusyuk

The findings indicate that prayer reminder apps significantly enhance observable prayer behaviors—especially prayer punctuality—consistent with behavioral nudging theory (Thaler & Sunstein, 2008). This is reinforced by the high mean score for punctuality, suggesting that digital cues are effective in reinforcing external discipline. However, the influence of these apps on intrinsic spiritual engagement (khusyuk) appears limited, as reflected in the lower mean score.

This limitation aligns with Kahneman's dual-system theory, where automatic, routine behaviors (System 1) are more easily influenced by external reminders than reflective, intentional states (System 2) that govern deeper forms of worship (Kahneman, 2011). Apps that rely primarily on System 1 activation may succeed in shaping outward behavior but fail to support internal transformation.

Recent research by Valta & Maier (2025) underscores the importance of designing digital nudges that consider not only form and timing, but also context and user impact. Their digital nudging taxonomy can help guide prayer app developers toward more thoughtful, spiritually resonant UX models. While behavioral prompts may build consistency, achieving khusyuk likely requires tools that engage cognitive-emotional faculties through reflection and surrender.

Rahmanto et al. (2023) support this view by showing that khusyuk is not merely a behavioral output but the result of an inner psychological struggle mediated by the soul's condition (nafs). Their Islamic psychology framework describes how achieving khusyuk is tied to transitions between states of nafs al-ammarah (ego-driven), nafs al-lawwamah (self-reproaching), and nafs al-mutmainnah (tranquil soul). These transitions involve the heart ('aql) overcoming inner distractions and desires—a transformation that cannot be prompted solely by reminders or alerts. Instead, it

requires cultivating awareness, submission, and emotional depth through consistent inner work and spiritual reflection.

Thus, while digital reminders can serve as tools for behavioral conditioning, truly transformative prayer experiences require features that support deeper psychological and spiritual engagement. This opens a space for app developers to design beyond routine functionality and consider tools like guided contemplation, Qur'anic reflection prompts, or dhikr-based transitions that help users align outward actions with inward devotion.

2. Technology Fatigue and UX Barriers

A contributing factor to the limited spiritual effect of prayer apps may be alert fatigue—a phenomenon where users become desensitized to frequent notifications and begin to ignore or disable them. This pattern is widely observed across digital health systems and behavioral apps, where overuse of prompts undermines user engagement. Gani et al. (2025), in a qualitative systematic review of clinical reminders in primary care, found that frequent alerts often lead to cognitive overload, reduced responsiveness, and user frustration—outcomes similarly relevant to prayer app environments. Excessive digital cues, even when well-intentioned, can diminish their behavioral impact over time.

The design of these apps also plays a crucial role in mitigating fatigue. Valta and Maier (2025) provide a robust taxonomy of digital nudging, classifying nudges by intrusiveness and user impact. Their review suggests that spiritual apps must strike a balance between timely guidance and preserving emotional readiness. Overly intrusive nudges, especially those not attuned to context or mood, risk undermining spiritual engagement rather than supporting it. In line with this, Rahmanto et al. (2023) highlight the importance of cultivating tuma'ninah (inner calm) in spiritual focus, which is easily disrupted by poorly timed or excessive digital interaction.

Furthermore, Yunanto et al. (2024) emphasize the application of the KISS (Keep It Simple, Stupid) principle in prayer app development. Their findings show that reducing interaction costs and streamlining interfaces can significantly improve user satisfaction and minimize fatigue. When users encounter frequent disruptions, inefficient navigation, or unnecessary complexity, their mental bandwidth is consumed by managing the app rather than entering a meditative spiritual state.

In high-stakes digital contexts such as medical technology, similar concerns are addressed through human-centered UX design. Familoni and Babatunde (2024) argue

that intuitive, empathetic interfaces are essential for maintaining focus, trust, and emotional resilience. While their context is clinical, the same principles apply to spiritual technologies, which must foster not only usability but also tranquility and trust.

These findings collectively underscore a critical insight: spiritual disengagement is not necessarily a failure of the user, but a byproduct of systems that overload attention, fragment presence, and misalign their prompts with the user's inner rhythm. For technology to support sincere worship, it must move beyond merely functional reminders toward mindful, context-sensitive design that encourages stillness and inward awareness.

3. Faith-Tech Integration and Internal Motivation

While prayer apps can enhance outward discipline, the cultivation of inner sincerity remains a deeper challenge. Imam Al-Ghazali, in his Ihya 'Ulum al-Din (Al-Ghazali & Muhammad, 2011), emphasizes that sincere worship arises from awareness of Allah's presence (ihsan), which is rooted in introspection and continuous remembrance. This aligns closely with Rahmanto et al. (2023), who describe khushoo as a condition of the soul, developed through stages of nafs transformation and requiring both emotional quietude and cognitive surrender.

Recent research underscores that this inward journey can be partially supported—but not fully replaced—by digital design. Erwahyudin (2024) highlights how digital dhikr applications and spiritual educational content can facilitate psychological and spiritual bonding, especially when traditional mentorship or in-person reflection is inaccessible. Such tools, when designed with spiritual insight, offer modern Muslims new channels for spiritual engagement that complement—not substitute—the depth of embodied worship.

However, most Islamic lifestyle apps fall short in nurturing internal states. Kabir et al. (2024), using self-determination theory, find that many lack features fostering autonomy, competence, or spiritual relatedness. Their study of 11 leading Islamic apps revealed an overemphasis on surface-level utilities (e.g., timers, verse libraries) without meaningful support for affective or reflective depth. This aligns with user dissatisfaction observed in our study, where even daily app users reported weak gains in khushoo despite punctuality improvements.

To support deeper engagement, apps must move beyond basic functionality and scaffold spiritual presence. Al Jafar et al. (2025) demonstrate how gamified Islamic

app interfaces increase motivation, engagement, and emotional resonance. While caution is needed to avoid trivializing sacred practices, structured interactivity—such as guided reflection, tafakkur sessions, or emotion-sensitive prompts—can enhance user readiness for sincere worship.

Additionally, Laird et al. (2024a) and Laird et al. (2024b) show that even in non-Muslim contexts, spiritual mobile apps contribute to psychological well-being and spiritual growth when usage is consistent and internally motivated. Their Pray.com studies suggest that digital rituals, when paired with contemplative content and community scaffolding, support lasting impact.

These findings reinforce that Islamic digital tools must align with maqasid al-shariah—particularly tazkiyat al-nafs (soul purification) and muraqabah (spiritual vigilance). When reminders are accompanied by spiritually informed design, personalized guidance, and space for emotional processing, technology can become not just a behavioral cue—but a quiet companion on the path to presence.

4. Cross-Cultural and Interfaith Reflections on Spiritual App Use

The study's findings resonate with a growing body of global research highlighting the spiritual and psychological benefits of digital religious engagement. Behdar and Sheikh (2023), in a synthesis of over 50 clinical studies, confirmed that Salat (Islamic prayer) is strongly correlated with improved emotional well-being, reduced anxiety, and increased life satisfaction. These results align with the present study's observation that prayer apps often succeed in reinforcing punctuality and structure, though they remain less effective in fostering inward states such as khushoo.

Comparative work outside the Islamic context reveals similar patterns. Laird et al. (2024a), in a randomized controlled study of the Pray.com Christian app, found that regular app users reported enhanced spiritual reflection and improved emotional stability over time. Their complementary perception survey (Laird, Van Tongeren, et al., 2024b) confirmed that sustained engagement is often tied to internal motivation and content personalization—features echoed by our own respondents who sought deeper spiritual meaning beyond routine notifications.

Yet, there are important contrasts. Sayeed and Prakash (2021) argue that while both Salah and yoga involve structured bodily postures and breath, their underlying spiritual frameworks differ significantly. Yoga emphasizes internal awareness and calm as ends in themselves, whereas Salah integrates legal obligation, theological

submission, and community rhythm. The widespread use of "mindfulness" as a cross-religious term often glosses over these doctrinal distinctions.

Al-Razi and Azhar (2024) make this point empirically: their bibliometric review shows that the term khushoo is severely underrepresented in international literature. Global databases more commonly use proxies like "spiritual focus" or "mindful prayer," which, while overlapping conceptually, lack the theological and jurisprudential specificity of khushoo in Islam. This absence risks reducing uniquely Islamic spiritual aims to generic wellness metrics, stripped of their theological richness.

Furthermore, intra-Islamic UX patterns reflect distinct cultural expectations. Rosli and Rahim (2017), studying Malaysian youth via the TAM framework, found that Muslim Pro was popular not for its immersive features, but for its ease of use and reliable timing. This supports our observation that usability and performance often take precedence over spiritual resonance. Kabir et al. (2024) similarly argue that most Islamic lifestyle apps neglect autonomy and affective personalization—an oversight that may disproportionately impact diasporic or younger users seeking deeper emotional connection.

These insights collectively suggest that while cross-faith app research validates the emotional and cognitive impact of spiritual tech, Islamic app developers must attend to more than universal UX principles or generic motivational models. They must foreground theological nuance, local culture, and the distinctive inner grammar of worship. Without this, the tools risk mirroring global wellness trends without fulfilling the devotional depth Islam demands.

5. Design Implications for Islamic App Developers

The findings of this study point to several design strategies that can help Islamic prayer apps bridge the gap between behavioral support and spiritual depth. While digital tools have successfully reinforced punctuality and ritual structure, their effect on cultivating khushoo, inner calm, and sustained reflection remains limited. To address this gap, developers must root their designs in both behavioral science and Islamic theology, ensuring that apps serve not only outward discipline but also inward devotion.

a. Prioritize Stillness Over Stimulation

Islamic worship is grounded in a state of presence and tranquility. As Rahmanto et al. (2023) argue, khushoo is cultivated through transitions in the soul (nafs)—from ego-driven action to tranquility (nafs al-muthmainnah). Designing interfaces that

promote silence, pause, or subtle ambient cues can reduce mental noise and encourage emotional receptivity. Al-Ghazali (2011) likewise reminds that ihsan (spiritual excellence) begins not with action, but with inward watchfulness—apps must help users slow down, not just act fast.

b. Balance Nudging with Autonomy

Valta et al. (2025) warn that digital nudges must be thoughtfully timed and appropriately subtle; otherwise, they risk triggering fatigue or pushback. Kabir et al. (2024) highlight that most Islamic lifestyle apps fail to support users' psychological autonomy. Developers should therefore avoid rigid, overly persistent alerts. Instead, they can offer adaptive reminders that respond to user preferences, prayer habits, or emotional readiness, preserving the sanctity of intention.

c. Integrate Reflective Interactivity

Prayer is not only ritual, but reflection. Al Jafar et al. (2025) show that gamified Quran apps significantly enhance engagement and perceived meaning. While gamification must be used with care, interactive features such as daily tafakkur prompts, emotion-based journaling, or mood-aware dhikr guidance can deepen users' spiritual attention without diluting sacredness.

d. Root Design in Spiritual Intent

Underlying all features must be a commitment to help users draw closer to Allah—not just become more efficient. This aligns with the higher objective of maqasid al-shariah in nurturing tazkiyat al-nafs (Al-Ghazali & Muhammad, 2011; Rahmanto et al., 2023). Developers should consciously move from usability-first thinking to ihsan-oriented design: intuitive, peaceful, and spiritually transparent.

6. Limitations and Future Directions

While this study contributes to understanding the impact of prayer reminder applications on spiritual and behavioral outcomes, it is subject to several limitations that should guide future inquiry. First, the sample size was relatively small (n = 34) and limited to university students within a specific cultural context. This may restrict the generalizability of the findings to broader or more diverse Muslim populations, particularly older users, different socio-economic backgrounds, or non-Indonesian contexts. Similar concerns have been noted by Rosli and Rahim (2017) in their study of Muslim youth engagement with religious apps in Malaysia, where user preference was shaped by context-specific usability patterns.

Second, the study relied on self-reported data, which may be influenced by social desirability bias or personal interpretation of abstract constructs such as khushoo. Future research would benefit from integrating structured measurement instruments. For instance, Al Jafar et al. (2025) employed validated tools like the Intrinsic Motivation Inventory (IMI) and User Engagement Scale (UES) in their gamified Quran app study, providing a replicable model for capturing spiritual and emotional engagement.

Third, the cross-sectional nature of the survey design limits insight into long-term effects or changes in user engagement over time. Laird et al. (2024b), in their longitudinal study of Pray.com users, demonstrated the importance of capturing evolving user perceptions and behaviors over sustained periods—an approach that could yield valuable insights for Islamic app development.

Lastly, further work is needed to develop standardized tools for assessing khusyuk in digital settings. Emerging frameworks from Islamic psychology and user engagement theory offer a promising foundation.

By addressing these limitations, future research can better align Islamic digital tools with both theological authenticity and experiential depth—advancing technologies that not only guide behavior but also nurture the heart.

D. CONCLUSION

This study examined how prayer reminder applications influence both external discipline and internal spiritual focus among Muslim university students. Grounded in behavioral theory and Islamic pedagogy, the findings confirm that these applications enhance prayer punctuality through digital nudging mechanisms. However, their impact on khusyuk (spiritual presence) remains modest, as reflective worship requires deeper emotional and cognitive engagement than routine behavioral cues can provide.

Technical constraints such as inconsistent notifications, internet dependency, and limited customization emerged as common barriers to user satisfaction and sustained use. These issues not only disrupted prayer timeliness but also diminished the quality of spiritual presence by introducing mechanical rigidity into worship routines.

This study offers two key implications. First, for Islamic app developers, it underscores the importance of integrating spiritually intelligent features—such as guided reflection, mood-sensitive dhikr, and Qur'anic contemplation prompts—that

support inward sincerity alongside outward compliance. Second, it encourages religious educators to supplement traditional instruction with digital tools that prioritize emotional resonance and spiritual intentionality over automation.

Future research should explore culturally tailored UX strategies, longitudinal patterns of behavior change, and neuroscience-informed measures of khusyuk. These directions can help advance the design of faith-based technologies that are both theologically grounded and experientially meaningful—bridging ritual regularity with inner devotion in a digital age.

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