

Evaluating the Impact of a Mobile Application on Mental Health and Help-Seeking Behaviour among Adolescents in Bandung, Indonesia

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ABSTRACT

Background: Mobile applications offer promising tools to promote mental health awareness and engagement, but their effectiveness in fostering help-seeking behaviour, particularly in Indonesia, remains underexplored. This study evaluated the effectiveness of a mobile application in enhancing help-seeking behaviour among adolescents in Bandung, Indonesia. **Methods:** A quasi-experimental pre- and post-test control group design was employed. A total of 200 adolescents aged 15–18 years were divided into intervention (n = 100) and control (n = 100) groups. The intervention group utilised a mental health mobile App with interactive health education and reminders systems for eight weeks, while the control group received mental health education pamphlets. Help-seeking behaviour was assessed using the Help-Seeking Behaviour Questionnaire (HSBQ) pre- and post-intervention. Regression analysis controlled for baseline scores and demographics. **Results:** The intervention group demonstrated significant improvements in help-seeking behaviour compared to the control group ($B = 2.10$, $p < 0.001$), independent of baseline scores. **Conclusion:** The findings highlight the potential of mobile applications to enhance help-seeking behaviour among adolescents, addressing critical barriers such as stigma and lack of awareness. Further research is needed to evaluate long-term sustainability and scalability on diverse populations.

Keywords: Adolescent; Help-Seeking Behaviour; Mental Health; Mobile Applications

INTRODUCTION

The mental health of adolescents is a crucial global public health issue, with considerable effects on psychosocial development. Mental health difficulties in adolescents can adversely affect social connections, academic achievement, and overall quality of life. Data from six ASEAN countries, Cambodia, Laos, Malaysia, Myanmar, Thailand, and Vietnam, indicates that the prevalence of mental health concerns among adolescents includes 29.4% suffering from depression, 42.4% from anxiety, 16.4% from stress, and 13.9% from anorexia. Suicide attempts among teens are alarmingly reported to vary from 7% to 8% (Dessauvage *et al.*, 2022). In Indonesia, the 2021 Indonesia National Adolescent Mental Health Survey (I-NAMHS) revealed that one in three young individuals aged 10–17 years had mental health issues, amounting to 15.5 million adolescents. Furthermore, 1 in 20 adolescents experienced severe mental health problems, equivalent to 2.45 million individuals. Anxiety disorders were the most prevalent, affecting 3.7% of young people (Wahdi, 2022). Furthermore, adolescents in Bandung, Indonesia, face multiple barriers related to stigma and accessibility, particularly in areas like mental health and sexual and reproductive health (SRH).

The exploration of help-seeking behaviour for mental health disorders is a significant but understudied domain, especially regarding preferences for formal versus informal care. Despite the widespread occurrence of mental health issues worldwide, only a small fraction of individuals pursues professional assistance. Brown *et al.* (2014) found that 30–35% of individuals with mental health issues accessed professional assistance, highlighting a substantial gap in addressing mental health needs. Informal support networks, such as family,

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friends, and community leaders, play a critical role, but their effectiveness and patterns of utilisation are less studied (Yeo *et al.*, 2024). Research has shown that cultural and societal norms significantly influence the choice of help-seeking pathways. For instance, younger individuals often rely on peers and social networks for support, while older adults may turn to family members for assistance (Barrow & Thomas 2022). Additionally, stigma associated with mental health conditions remains a key barrier to formal help-seeking. The preference for informal support can also be linked to trust issues, convenience, and cultural appropriateness (Corrigan, Druss & Perlick, 2014). Comprehending these dynamics is crucial for formulating customised interventions that promote effective help-seeking behaviour among varied populations.

Smartphone apps are valued for their portability, ease of use, and accessibility in addressing mental health challenges. These features make them particularly appealing for individuals seeking support for mental well-being, especially in underserved populations where traditional therapy may be inaccessible (Mabil-Atem, Gumuskaya & Wilson, 2024; Torous *et al.*, 2021). Mood tracking, guided self-help programmes, and mindfulness exercises are some of the elements that are frequently included in mental health apps. These applications are designed to address a wide variety of psychological health disorders (Serrano-Ripoll *et al.*, 2022). These applications, which are critical, offer the possibility of early identification and intervention, thereby filling in gaps in the provision of mental health care.

Improvements in patient engagement and outcomes have been brought about by the incorporation of technology into mental health care. According to research conducted by Grist, Porter and Stallard in 2017, mental health apps have the potential to be cost-effective supplements to clinical therapy because they can lead to significant improvements in symptoms of sadness and anxiety. A systematic review by Zhang *et al.* (2025) confirmed that mental health apps enhance accessibility and effectiveness of interventions, particularly for populations in resource-constrained settings. Similarly, Chan & Honey (2022) highlighted the importance of features such as real-time feedback and individualised recommendations, which are critical in contemporary mental health care. These features are pivotal in promoting adherence and optimising outcomes (Sawyer *et al.*, 2024). In addition, these applications address the obstacles that prevent people from seeking help in person, such as stigma and discomfort, by providing alternatives that are discrete and easily available, which are particularly appealing to younger populations (McCloud *et al.*, 2020). Recent work by Lindayani *et al.* (2025) further emphasised the importance of integrating culturally adapted digital mental health tools to improve engagement and reduce mental health stigma in low- and middle-income countries.

Recent studies have shown that such innovations are also gaining traction in low- and middle-income countries (Kamarudin *et al.*, 2024). Countries like Indonesia are leveraging similar technologies to bridge gaps in the accessibility of mental health care as this global trend continues to gain momentum (Noor *et al.*, 2024). In Indonesia, the cultural sensitivity and localised features of mental health apps like Teduh make them promising tools for addressing stigma and improving accessibility among adolescents (Brooks *et al.*, 2023). These apps also address hurdles to in-person help-seeking, such as stigma and discomfort, by providing alternatives that are discreet and easily available. These apps are particularly appealing to younger demographics. Localised mental health apps have begun to target unique regional issues, building on the worldwide improvements that have been already made. Despite the growing global adoption of mental health apps, research focusing on their effectiveness in promoting help-seeking behaviour among adolescents in Indonesia remains scarce. Existing studies primarily target adults or specific mental health conditions, overlooking the unique barriers faced by younger demographics. Nurses, with their pivotal role in both clinical and community settings, are well-positioned to advocate for and facilitate the use of digital mental health tools. Their involvement could enhance the This study aims to address the gap in current research by evaluating the effectiveness of mobile applications, specifically the Teduh app, in promoting help-seeking behaviour among adolescents in Bandung, Indonesia. The findings will provide insights into the integration of digital tools in community-based mental health interventions.

METHODOLOGY

Research Design

This study utilised a quasi-experimental approach with a pre-test and post-test control group in order to assess the impact that a mobile application had on the behaviour of adolescents in Bandung, Indonesia, with

regard to requesting assistance. The mobile application intervention with interactive health education and reminder systems was administered to the intervention group, while the control group was given a mental health education pamphlet. There were two time points at which data were collected: the baseline, which was before the intervention, and three months following the intervention. The 3-month time point was selected based on prior research indicating that this duration allows sufficient time for observable behavioural changes and the stabilisation of intervention effects (Obuobi-Donkor *et al.*, 2024).

Participants

Inclusion criteria for participants were adolescents aged 15–18 years residing in an urban area of Bandung, currently enrolled in high school, willing to provide informed consent (and parental consent for minors), and having access to a smartphone capable of supporting the mobile application. Exclusion criteria included adolescents diagnosed with severe mental health disorders (e.g., schizophrenia, bipolar disorder, or severe depression) requiring immediate clinical intervention, inability to comprehend the Bahasa Indonesia language used in the mobile application, and previous participation in similar interventions. The exclusion of individuals with severe mental health disorders was based on the need to prioritise their clinical care and the potential for the intervention to be insufficiently tailored to their specific needs.

The sample size was calculated using G*Power 3.1 software to determine the minimum number of participants required to detect a medium effect size (Cohen's $d=0.5$) with 80% power at a 5% significance level ($\alpha=0.05$) for a two-tailed independent samples t-test. Based on these parameters, the required sample size was determined to be 200 participants, with 100 individuals assigned to the intervention group and 100 to the control group. This calculation aligns with previous studies that have used similar effect sizes and power levels to evaluate behavioural interventions among adolescents (Althubaiti, 2023).

A stratified random sampling technique was employed to ensure representation at different high schools in Bandung. Schools were stratified based on socioeconomic status, school size, and geographic distribution to capture a diverse sample. From each stratum, eligible participants were randomly selected, with approximately 20–25 students chosen per school to achieve the target sample size.

Intervention Protocol

Participants were provided with access to the mobile application for 8 weeks. The mobile application was designed to enhance adolescent engagement by incorporating interactive and educational features tailored to their needs. The app included structured educational content on health-related topics relevant to adolescents, such as mental well-being, stress management, healthy relationships, and substance use prevention. These topics were presented through multimedia formats, including short videos, infographics, and interactive quizzes, to maintain engagement and improve comprehension. Instructions on how to download and navigate the application were delivered during an orientation session. To measure compliance with the minimum engagement requirement of 10 minutes per day, three times a week, the application included a built-in usage tracking feature as suggested by a previous systematic review which reported that researchers often set specific technology usage recommendations, such as logging into an app at least three times a week, to promote consistent engagement (Poorman, Yarosh & Consolvo, 2024). This feature logged the duration and frequency of each participant's activity within the Apps. Weekly reports were generated to monitor adherence, and participants who met or exceeded the minimum usage were flagged for compliance. Additionally, weekly notifications and reminders were sent to encourage continued engagement and ensure participants were aware of their progress. A study by Garnett *et al.* (2023) found that receiving a notification increased the probability of opening a behaviour change app in the next hour by 3.5 times compared to not receiving a notification.

Instrument

Among the participants, the Help-requesting Behaviour Questionnaire (HSBQ) was utilised in order to examine their behaviour regarding requesting assistance. The Help-Seeking Behaviour Questionnaire (HSBQ). It consists of twenty items that assess various elements of help-seeking behaviour. These characteristics include awareness of available resources, willingness to seek help, and actual actions taken to seek aid. A Likert scale of five points, ranging from 1 (strongly disagree) to 5 (strongly agree), is used to assign an overall score to each of the elements. Twenty to one hundred is the range of possible total scores, with higher

scores suggesting a more proactive approach to obtaining assistance. An excellent level of dependability was proven by the HSBQ in the initial research, as indicated by a Cronbach's alpha value of 0.91. An established method of translation, known as forward-backward translation, was utilised in order to translate and validate the instrument in Bahasa Indonesia. In addition, the version written in Bahasa Indonesia had a high level of internal consistency, with a Cronbach's alpha value of 0.89.

Data Collection

Participants were recruited through schools by approaching principal persons of the school and teachers in charge, and written informed consent was obtained from participants and their parents. Information sheets detailing the study purpose, procedures, and the confidentiality of app usage data were provided. Participants completed the HSBQ as a baseline measure before intervention allocation. The intervention group received access to a mobile application designed to enhance help-seeking behaviour. The application featured educational content, interactive modules, and links to local mental health resources. The control group received standard care, including printed educational materials on mental health and resource directories. After the intervention, participants completed the same standardised questionnaire and measures as in the pre-intervention assessment. Participants were encouraged to continue using the mobile application independently, with periodic check-ins from the research team.

Data Analysis

In order to analyse the data, SPSS (version 25) was utilised. When attempting to summarise the characteristics of the participants and their baseline scores, descriptive statistics such as means, standard deviations, and frequencies were also utilised. To assess changes in help-seeking behaviour before and after the intervention within groups, a paired t-test was conducted. Additionally, an investigation into the impact of the mobile application on help-seeking behaviour was carried out through the use of a linear regression analysis, with baseline scores and demographic factors (age and gender) being taken into consideration. Statistical significance was established at a level of $p < 0.05$.

Ethical Consideration

The researchers obtained ethical approval from the Institutional Review Board (IRB) at Stikep Ppni Jawa Barat, Indonesia with reference no III/098/ETIK/STIKEP/PPNI/Jabar/II/2023 on 5th March 2023.

RESULTS

The study included 200 participants, equally divided into intervention and control groups. Baseline characteristics, including age, gender, education level, and help-seeking scores, showed no significant differences between groups, ensuring comparability (Table 1). For instance, the mean age was 15.3 ± 1.2 years in the intervention group and 15.4 ± 1.1 years in the control group ($p = 0.567$). The majority of participants were at the junior high school level (60% in the intervention group vs. 62% in the control group).

Table 1: Comparison Participant Characteristics between Intervention and Control Group (n=200)

| Variable | Intervention Group (n = 100) | Control Group (n = 100) | p-value |
|---|---------------------------------|----------------------------|---------|
| Age (years), Mean±SD | 15.3 ± 1.2 | 15.4 ± 1.1 | 0.567 |
| Gender, n (%) | | | |
| Male | 52 (52%) | 50 (50%) | 0.742 |
| Female | 48 (48%) | 50 (50%) | |
| Baseline Help-Seeking Score, Mean±SD | 12.5 ± 2.8 | 12.3 ± 2.7 | 0.648 |

A paired samples t-test was conducted to evaluate the effectiveness of the mobile application intervention on improving help-seeking behaviour within each group. In the intervention group, the mean help-seeking score increased significantly from baseline (M = 12.5, SD = 2.8) to post-intervention (M = 14.8, SD = 2.5), with a mean difference of 2.3 points. This change was statistically significant, $t(59) = 5.42$, $p < 0.001$, indicating a substantial improvement in help-seeking behaviour following the intervention. In contrast, the control group showed no statistically significant change in help-seeking scores from baseline (M = 12.3, SD = 2.7) to post-intervention (M = 12.5, SD = 2.6), with a mean difference of only 0.2 points, $t(59) = 1.21$, $p = 0.231$ (Table 2).

Table 2: The Paired T-Test Results on Help-Seeking Behaviour

| Group | Baseline Mean \pm SD | Post-Intervention Mean \pm SD | Mean Difference | p-value |
|--------------|------------------------|---------------------------------|-----------------|---------|
| Intervention | 12.5 \pm 2.8 | 14.1 \pm 2.5 | 1.596 | < 0.001 |
| Control | 12.3 \pm 2.7 | 12.4 \pm 2.6 | 0.096 | 0.312 |

In the intervention group, post-intervention help-seeking scores demonstrated a significant improvement ($B = 2.10$, $p < 0.001$), even after controlling for baseline scores and age and gender. Baseline help-seeking scores were also a strong predictor of post-intervention behaviour ($B = 0.75$, $p < 0.001$). Age and gender were not significant predictors (Table 3), suggesting the intervention's effect was independent of these factors.

Table 3: Regression Analysis of Factors Influencing Post-Intervention Help-Seeking Behaviour

| Variable | B | SE | β | t | p-value |
|----------------------|-------|------|---------|-------|---------|
| Baseline Score | 0.75 | 0.08 | 0.68 | 9.38 | <0.001 |
| Group (Intervention) | 2.10 | 0.52 | 0.26 | 4.04 | <0.001 |
| Age | -0.12 | 0.10 | -0.08 | -1.20 | 0.231 |
| Gender (Male) | 0.34 | 0.49 | 0.04 | 0.69 | 0.492 |

B: unstandardized regression coefficient; SE: Standard Error; β (Beta): standardize regression coefficient; t: t-statistic

DISCUSSION

This study evaluated the effect of a mobile application in enhancing help-seeking behaviour among adolescents in Bandung, Indonesia. The findings revealed a significant improvement in help-seeking behaviour post-intervention in the intervention group compared to the control group. The findings reinforce the efficacy of digital interventions in addressing critical barriers to help-seeking behaviour, such as stigma and accessibility, particularly among adolescents. The findings align with those of Ni *et al.* (2025), who demonstrated that mobile applications designed to improve mental health literacy and access to resources significantly enhanced help-seeking behaviours among adolescents. Similarly, Pretorius, Chambers and Coyle, (2019) highlighted that digital platforms could effectively reduce stigma and barriers to help-seeking by providing confidential and accessible support. In contrast, a study by Birrell *et al.* (2022) found mixed results, where a mobile-based intervention was effective only among individuals with pre-existing moderate mental health literacy, suggesting that baseline knowledge might influence outcomes. Furthermore, research by Yamaguchi *et al.* (2023) supports the efficacy of mobile interventions, noting their ability to engage adolescents through interactive features, which foster trust and self-efficacy in seeking help.

The contrast with Shan *et al.* (2022) is interesting and conducted a pilot study on a smartphone application supporting recovery from substance use disorders and found that while the intervention was feasible and showed potential benefits, further research with larger samples over a longer period was needed to test its effectiveness. Potential reasons for divergence between these findings and those of Ni *et al.* (2025) and Pretorius, Chambers & Coyle, (2019), could include differences in intervention design, such as the specific features and user engagement strategies employed in the applications. Cultural factors may also play a role, as perceptions of mental health and willingness to engage with digital interventions can vary at populations. Additionally, baseline characteristics of participants, such as the severity of mental health issues or prior experience with digital tools, might influence the effectiveness of the interventions.

Additional studies reinforce the effectiveness of mobile applications in addressing adolescent mental health challenges. For instance, Song *et al.* (2024) emphasised that culturally tailored mobile interventions significantly improved help-seeking attitudes and behaviours, particularly in Asian contexts. Similarly, Garrido *et al.* (2022) found that gamified mobile platforms motivated adolescents to seek help by creating engaging and rewarding experiences. A study by Yeo *et al.*, (2024) revealed that adolescents were more likely to access mental health resources when the applications included peer support components. Meanwhile, Saleem *et al.* (2021) demonstrated that personalised push notifications could enhance user engagement and improve the long-term effectiveness of mobile interventions. Findings by Götzl *et al.* (2022) suggest that integrating artificial intelligence to provide real-time feedback in mobile applications can further enhance

help-seeking behaviour among adolescents.

The findings from this study carry important clinical significance, particularly in the context of nursing practice and adolescent mental health promotion. To begin with, the mobile application serves as a practical and scalable solution that can be effectively incorporated into school-based mental health initiatives led by school and community nurses. These healthcare professionals are strategically positioned to detect early signs of psychological distress and initiate timely interventions. Schools offer a unique opportunity to reach adolescents consistently, providing both accessibility and a supportive environment that encourages peer engagement (McGorry *et al.*, 2022). Nurses, in this regard, are essential contributors to mental health support systems, fulfilling critical roles in mental health screening, education, and referrals. Furthermore, the application's inclusion of culturally tailored content directly addresses the specific challenges that Indonesian adolescents face when seeking mental health support, such as stigma, misinformation, and low awareness. These issues are often rooted in cultural beliefs and a general lack of mental health literacy. Nurses who are competent in digital health strategies are well-positioned to deliver psychoeducational support, foster stigma reduction, and engage both adolescents and their families through culturally sensitive communication and care delivery (Almanasef, 2021). Lastly, this intervention reflects broader global movements toward using digital innovation to close gaps in mental health care, especially in under-resourced communities. Mobile health technologies have shown great potential in making mental health services more accessible, reducing logistical and financial barriers, and increasing user engagement (World Health Organization (WHO), 2022). For nurses, this represents an opportunity to lead the integration of person-centred, tech-enabled care into everyday practice. By aligning with local cultural values and addressing specific access challenges, this digital approach highlights a forward-thinking, nurse-driven solution to improving adolescent mental health outcomes in Indonesia.

Limitation

This study has several limitations. In the first place, the sample was restricted to adolescents in Bandung, which may restrict the potential to generalise the findings to other places that have different socio-cultural contexts. Second, because the follow-up time was quite brief, it does not provide any insights into the long-term sustainability of the observed improvements in the behaviour of requesting assistance. Third, there is a possibility that the results were influenced by potential biases included in the self-reported data, such as the social desirability bias. With regard to the validation of findings, future research ought to take into consideration the utilisation of objective measurements, longer follow-up periods, and a more diverse sample.

CONCLUSION

This study demonstrates that the use of a mobile application significantly enhances help-seeking behavior among adolescents in Bandung, Indonesia. The intervention group, which utilised the mobile app with interactive health education and reminders, showed notable improvements in their willingness to seek help compared to the control group that received only printed educational materials. These findings underscore the effectiveness of digital tools in overcoming barriers to mental health help-seeking, such as stigma and limited access to traditional resources, particularly in adolescent populations.

Given the success of this intervention, further studies are recommended to explore the long-term sustainability of these improvements and the scalability of mobile applications for mental health interventions in different cultural and socioeconomic contexts. Additionally, integrating advanced features like artificial intelligence, real-time feedback, and peer support could further enhance the app's impact. Further studies should prioritise features like AI-driven real-time feedback, peer-support forums, and localised gamification to enhance user experience and outcomes. Moreover, evaluating the cost-effectiveness and implementation strategies for larger-scale deployment can provide valuable insights into the feasibility of integrating such applications into existing mental health care systems. As the app collects sensitive behavioural data, future iterations should include comprehensive data privacy and ethical frameworks to protect adolescent users and maintain public trust. Comparative research in different cultural contexts in Southeast Asia or other LMICs (low- and middle-income countries) could provide valuable insights into universal versus culture-specific digital intervention components.

Conflict of Interest

The authors have no conflicts of interest to declare.

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