Digital Mental Health Innovation: Effectiveness of Qolbu Care App in Reducing Anxiety and Improving Resilience among Adolescents in Disaster-Prone Areas

Nurul Hidayah[1*], Florensa[2], Nisma[3], Muhammad Luthfi[4], Yogasliana Fathudin[5]

[1,2,3] STIKes Yarsi Pontianak, Indonesia
[4] Department of Nursing, Faculty of Medicine, Tanjungpura University, Pontianak, Indonesia
[5] Department of Nursing, Poltekkes Kemenkes Bandung, Indonesia
* Correspondence e-mail; nurul16040@mail.unpad.ac.id

Article history	
Abstract	High levels of anxiety and low resilience remain common psychological challenges faced by individuals in coping with life stressors. Technology-based approaches, such as mental health applications, offer innovative and easily accessible solutions, yet remain under-researched in Indonesia. This study aims to analyze the Qolbu Care application's effectiveness on respondents' anxiety and resilience levels. The research employed a quasi-experimental design with a one-group pretest–posttest approach involving 90 respondents. The intervention was administered over eight weeks using the Qolbu Care application. Standardized anxiety and resilience questionnaires were used as research instruments. Data were analyzed using a paired t-test. The analysis revealed a statistically significant reduction in anxiety levels (mean = –16.45; SD = 8.12; SE = 1.05; $p = 0.0001$), as well as a statistically significant increase in resilience (mean = 11.40; SD = 6.85; SE = 0.98; $p = 0.0001$). The Qolbu Care application has proven effective in reducing anxiety and enhancing resilience among respondents. These findings affirm that digital-based interventions can be an innovative alternative for psychosocial support within nursing practice.

1. INTRODUCTION

Anxiety disorders among adolescents in disaster-prone areas are a serious problem that can impact their mental health and quality of life. Adolescents who live in areas with high disaster risk, such as coastal regions in Telok Pakedai, Kubu Raya, which are vulnerable to sea water abrasion; riverbanks in the working area of Puskesmas Tambelan Sampit, Pontianak City, which experience annual tidal flooding (rob); and landslide-prone areas such as Cijambu Village, West Bandung Regency, which are also at risk of flash floods, often face psychological pressure due to environmental uncertainty.

Trauma from disasters, loss of housing, and limited access to mental health services further worsen this condition (Hidayah, 2024). Unfortunately, mental health services available in these areas are still extremely limited, both in terms of the number of professional personnel and service accessibility. Disasters always claim lives, but not all victims die. Some survive and become survivors. Survivors of disasters, including adolescents, often experience psychological disturbances due to the realities they have endured. This psychological burden can trigger various new problems, including anxiety and depression (Contrada,2011). Survivors who remain after a disaster face prolonged stress, which, if not properly addressed, can disrupt their overall well-being. According to Kubler-Ross's grief stages theory, individuals who experience significant loss, such as due to a disaster, go through five stages of grief: (1) denial, where they struggle to accept reality; (2) anger, marked by negative emotions toward their surroundings; (3) bargaining, as an attempt to avoid the truth; (4) depression, resulting from deep sadness; and (5) acceptance, where the individual begins to accept the situation and move forward with life (Syafrizaldi, 2023).

In the context of adolescents, anxiety caused by disasters can be more complex. Adolescence is a vulnerable stage of emotional development, and exposure to disasters can worsen feelings of insecurity, uncertainty, and excessive worry about the future. The inability to manage this anxiety can lead to more serious emotional problems, such as panic attacks, sleep disturbances, and even depression. Therefore, the ability to adapt positively after experiencing a traumatic event, known as resilience, is a crucial factor in the psychological recovery of adolescent disaster survivors. Resilience is an individual's ability to readjust and recover from experienced adversity to return to optimal functioning (Syafrizaldi, 2023).

To address this issue, there is a need for innovative digital interventions that are easily accessible to adolescents in affected areas. The Qolbu Care application was developed as a psychosocial-based solution to help reduce anxiety and enhance

adolescent resilience.

Emotional Freedom Technique (SEFT), digital meditation, and online journaling have been recognized as independent intervention approaches that can reduce anxiety and strengthen resilience. Previous studies have also demonstrated the effectiveness of SEFT in disaster contexts. Hidayah et al. (2024) reported that SEFT as a complementary modality therapy effectively reduced stress among adolescent survivors of the Cianjur earthquake, while Hidayah and Jamil (2024) found that digital SEFT significantly decreased anxiety symptoms among adolescents affected by tidal flooding in the Kapuas River. Furthermore, Firth et al. (2018) emphasized that digital technologies provide innovative and accessible solutions in treating anxiety, strengthening the rationale for developing digital-based interventions.

Unlike global mental health applications such as Calm or Headspace, which focus primarily on mindfulness and meditation in a general context, Qolbu Care integrates SEFT with spiritual values that are culturally relevant to Indonesian adolescents. This spiritual integration is expected to provide a deeper sense of meaning, comfort, and connectedness, particularly for adolescents in disaster-prone regions who often face psychological distress and existential questions. Building on this evidence, the present study will be conducted in three locations with diverse disaster characteristics: Telok Pakedai, Kubu Raya (a coastal area vulnerable to sea water abrasion), Tambelan Sampit, Pontianak City (a riverbank area affected by annual tidal flooding/rob), and Cijambu Village, West Bandung Regency (a region prone to landslides and flash floods). This study is highly urgent considering the increasing prevalence of anxiety disorders among adolescents in disaster-affected areas and the limited availability of mental health services. The Qolbu Care application is expected to provide a more accessible, effective, and spiritually integrated intervention for adolescents facing uncertain and challenging environments.

Based on this background, the research questions are formulated as follows: (1) What is the level of anxiety and resilience among adolescents before receiving the *Qolbu Care* application intervention? (2) What is the level of anxiety and resilience among adolescents after receiving the Qolbu Care application intervention? (3) What is the effect and effectiveness of the Qolbu Care application on adolescent anxiety and resilience after the intervention? These questions will guide the evaluation of changes in anxiety and resilience among adolescents following the use of Qolbu Care as a psychosocial intervention.

2. METHODS

This study employed a quasi-experimental method with a one-group pretest–posttest design, without a control group. This design was selected to evaluate the effectiveness of the Qolbu Care application in reducing anxiety levels and enhancing resilience among adolescents residing in disaster-prone areas. Data were analyzed quantitatively using a paired t-test. The study was conducted in three disaster-prone areas: Telok Pakedai in Kubu Raya Regency, a coastal region vulnerable to erosion and tidal flooding; the banks of the Tambelan Sampit River in Pontianak City, which experiences annual tidal floods; and Cijambu Village in West Bandung Regency, known for its susceptibility to landslides and flash floods. The study subjects were adolescents aged 13–18 years who had been directly affected by disasters, with a minimum sample of 90 respondents or approximately 30 from each location. The sampling technique employed was purposive sampling, based on the following inclusion criteria: adolescents aged 13–18 years, residing in disaster-prone areas, directly affected by disasters, willing to participate in all stages of the study, and possessing an Android device. Exclusion criteria included adolescents with severe mental disorders requiring specialized care, those without an Android device, or those who did not obtain parental or guardian consent.

The research began with a literature review to identify the need for psychospiritual-based digital interventions. This was followed by the development of the Android-based Qolbu Care application, which was first pilot-tested on ten respondents to ensure the functionality and appropriateness of its features. The pilot test indicated that regular use of the application over eight weeks had already produced initial changes in anxiety levels. The selection of an eight-week duration is also consistent with findings from retrospective studies on digital Cognitive Behavioral Therapy (CBT) interventions, which demonstrated effectiveness after 12 weeks of app usage when accompanied by therapist support (Venkatesan et al., 2020), a systematic review reporting digital interventions delivered over a 2- to 8-week period among university students still demonstrated significant impacts on symptoms of anxiety and depression (Riboldi et al., 2023), as well as randomized controlled trials indicating that effective evaluation can be conducted as early as the sixth week (Gu et al., 2020). Thus, the eight weeks in this study are considered to fall within the commonly used range (6–12 weeks) and are simultaneously realistic for evaluating the effectiveness of the Qolbu Care application.

The intervention phase required respondents to use the application regularly, at least three to four times weekly, with each session lasting 15–20 minutes. The sessions included the Spiritual Emotional Freedom Technique (SEFT), digital meditation,

breathing relaxation exercises, and online journaling. Pretest and posttest measurements were conducted using two standardized instruments. The first instrument was the Resilience Quotient (RQ) developed by Reivich & Shatté (2002) with score categories classified as high (>35), moderate (25–35), and low (<25). The validity and reliability of the RQ instrument in the Indonesian context have been previously tested by Hayatini (2020), who reported a Content Validity Index (CVI) of 1.0 and a Cronbach's Alpha of 0.753, confirming the instrument as valid and reliable for use with Indonesian adolescents. The second instrument was the Zung Self-Rating Anxiety Scale (SAS) by Zung (1971), with score categories classified as mild (20–44), moderate (45–59), severe (60–74), and extremely severe (75–80). The SAS has been adapted into Bahasa Indonesia by Nasution et al. (2013), with validity test results showing r-values ranging from 0.663 to 0.918. Item number 16 was excluded due to incompatibility with computerized processing, resulting in an adapted version of 19 items. Internationally, the SAS demonstrates a Cronbach's Alpha reliability coefficient of 0.71 (McDowell, 2006), whereas the reliability test on the Indonesian version yielded a Cronbach's Alpha of 0.829 (Nasution et al., 2013).

This value exceeds the commonly accepted threshold of 0.5 used as the minimum criterion for reliability (Setyowati et al., 2019); thus, the SAS instrument can be considered valid and reliable for use among Indonesian adolescent populations. Data were collected through pretest measurements to assess baseline levels of anxiety and resilience, followed by the intervention using the Qolbu Care application according to established procedures, and concluded with posttest measurements to evaluate changes. Data analysis was conducted in three stages: descriptive statistics, normality testing, and a paired t-test, to determine whether significant differences existed between pre- and post-intervention scores. The Qolbu Care application is an Android-based digital platform designed to assist adolescents in managing anxiety and enhancing resilience through a psychospiritual approach. Its core features include stress management education, step-by-step SEFT guidance, digital meditation, breathing relaxation exercises, and a daily journal. The interface is designed to be simple, intuitive, and user-friendly. A limitation of this study lies in using a design without a control group, meaning external factors such as respondents' personal experiences during the intervention period may have influenced the outcomes. Therefore, this study primarily emphasizes preliminary effectiveness findings. Future research employing randomized experimental designs or including a control group is recommended to strengthen the validity and generalizability of the results.
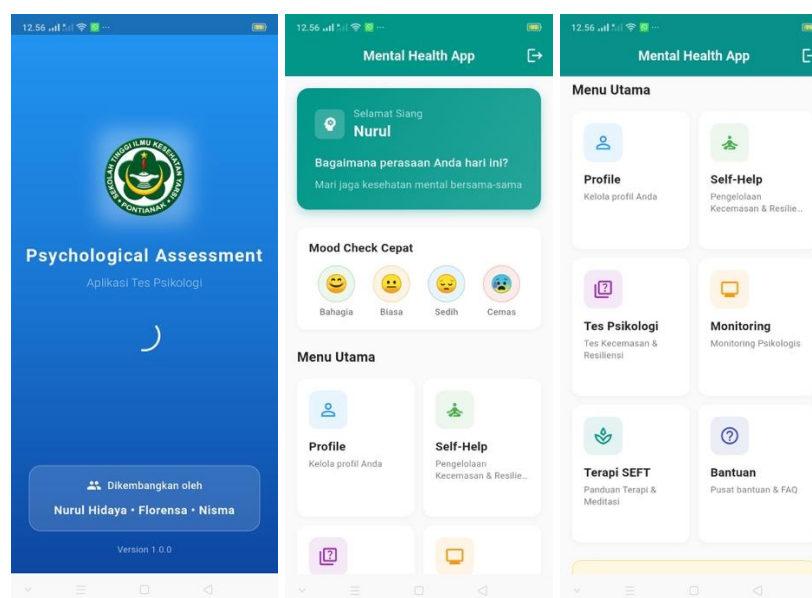
Figure 1. Qolbu Care Application Interface (Main Menu and SEFT Feature)

2.1. Ethical Considerations

This study has obtained ethical approval from the Health Research Ethics Committee (*Komite Etik Penelitian Kesehatan*/KEPK) of STIKes Buleleng with number: 942/EC-KEPK-SB/V/2025 dated May 28, 2025. This indicates that all research procedures have undergone ethical review and are in accordance with the principles of health research ethics, namely respecting human rights, maintaining confidentiality, and ensuring the welfare of research subjects. The authors must maintain the confidentiality of participants' identities, report any serious adverse events during the study, and refrain from performing any procedures on subjects without obtaining informed consent. In addition, if the research is not completed within one year from the date of issuance of the ethical clearance letter, the researcher must extend the ethical review approval. With this ethical approval, the study on "Digital Mental Health Innovation: The Qolbu Care App, a Psychosocial-Based Application to Reduce Anxiety and Enhance Resilience in Adolescents in Disaster-Prone Areas" can be conducted while upholding the principles of beneficence, non-maleficence, autonomy, and justice throughout all research stages.

3. FINDINGS AND DISCUSSION

Table 1. Distribution of Respondents' Anxiety Levels Before Using the Qolbu Care Application (Pre-test)

Variable	Category	Number	Percentage (%)

Anxiety	Mild	15	16.7
	Moderate	25	27.8
	Severe	35	38.9
	Very Severe	15	16.6
Total		90	100

Based on Table 1, it is known that before using the Qolbu Care application, most respondents experienced severe anxiety, amounting to 35 respondents (38.9%). Furthermore, 25 respondents (27.8%) were in the moderate category, 15 respondents (16.7%) in the mild category, and 15 respondents (16.6%) in the very severe category. These results indicate that most respondents experienced relatively high levels of anxiety before the intervention, with the largest proportion falling into the severe category. This condition shows that anxiety was a predominant issue among respondents before using the Qolbu Care application.

Table 2. Distribution of Respondents' Anxiety Levels After Using the Qolbu Care Application (Post-test)

Variable	Category	Number	Percentage (%)
Anxiety	Mild	50	55.6
	Moderate	28	31.1
	Severe	10	11.1
	Very Severe	2	2.2
Total		90	100

Based on Table 2, after using the Qolbu Care application, most respondents were in the mild anxiety category, amounting to 50 respondents (55.6%). Furthermore, 28 respondents (31.1%) were in the moderate anxiety category, while 10 respondents (11.1%) experienced severe anxiety. Only two respondents (2.2%) remained in the very severe anxiety category. These results indicate a shift in respondents' anxiety levels toward milder categories after receiving the intervention through the Qolbu Care application. Most respondents no longer experienced severe or very severe anxiety, suggesting that the intervention had a positive impact in reducing anxiety levels.
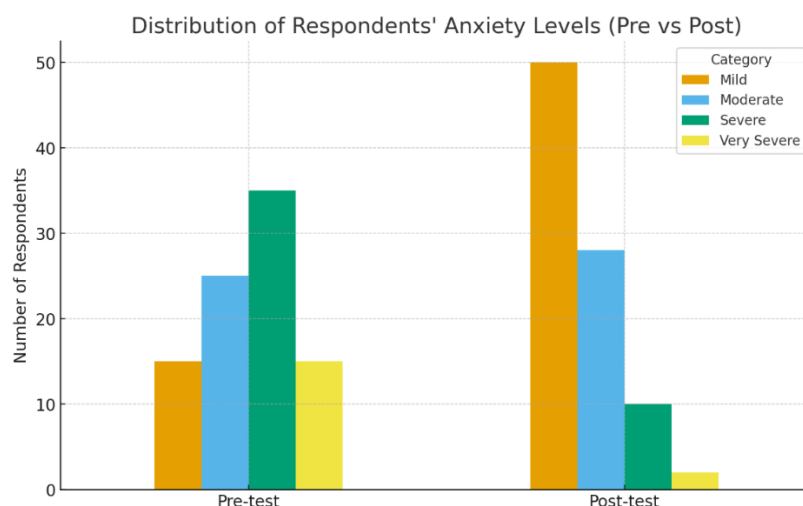
Figure 2. Distribution of Respondents

The graph illustrates a shift in the distribution of respondents' anxiety levels. At baseline (pre-test), most respondents fell into the severe category (38.9%) and very severe category (16,6%). Following the intervention (post-test), most respondents shifted to the mild category (55.6%), while the very severe category decreased drastically to only 2.2%. This further supports the finding that the Qolbu Care application is effective in reducing anxiety levels.

Table 3. Distribution of Respondents' Resilience Levels Before Using the Qolbu Care Application (Pre-test)

Variable	Category	Number	Percentage (%)
Resilience	Low	40	44.5
	Moderate	38	42.2
	High	12	13.3
Total		90	100

Based on Table 3, before using the Qolbu Care application, most respondents were in the low resilience category, amounting to 40 respondents (44.5%). Furthermore, 38 respondents (42.2%) had moderate resilience, while only 12 (13.3%) were in the high resilience category.

These results indicate that most respondents had low to moderate levels of resilience. This condition suggests that, before the intervention, respondents tended to have limited capacity in coping with stress or adapting to difficult situations.

Table 4. Distribution of Respondents' Resilience Levels After Using the Qolbu Care Application (Post-test)

Variable	Category	Number	Percentage (%)
Resilience	Low	10	11.1

	Moderate	25	27.8
	High	55	61.1
Total		90	100

Based on Table 4, after using the Qolbu Care application, most respondents had a high level of resilience, amounting to 55 respondents (61.1%). A total of 25 respondents (27.8%) were in the moderate resilience category, while only 10 (11.1%) remained in the low resilience category. These findings indicate an improvement in respondents' resilience after receiving the intervention through the Qolbu Care application. The most notable shift is seen in the low resilience group, which decreased significantly, in contrast to the high resilience group, which increased to more than half of the respondents. This indicates that the Qolbu Care application played a role in strengthening individuals' ability to adapt, cope with stress, and manage challenges more effectively.
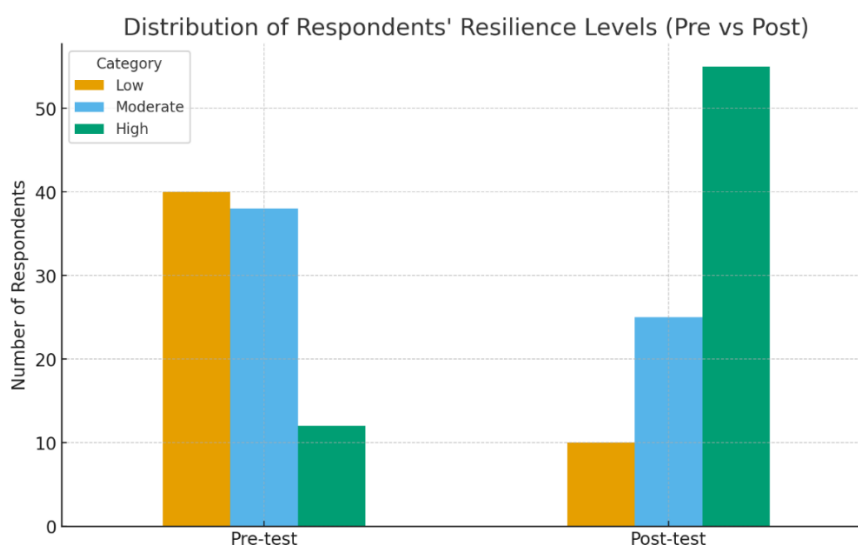

Figure 3. Distribution of Respondents' Resilience Levels

The graph shows a significant increase in the high resilience category. Whereas only 13.3% of respondents demonstrated high resilience before the intervention, this proportion rose to 61.1% following the intervention. Conversely, the low-resilience group initially accounted for 44.5% but dropped sharply to 11.1%. This finding indicates that the intervention delivered through the Qolbu Care application strengthened adolescents' capacity to adapt and cope with post-disaster stressors.

Table 5. Results of Paired t-test for Anxiety and Resilience Levels Before and After Using the Qolbu Care Application

Variable	Mean	SD	SE	P Value	N

Anxiety	-16.45	8.12	1.05	0.0001	90
Resilience	11.40	6.85	0.98	0.0001	

Based on Table 5, the paired t-test results show a significant difference in anxiety and resilience levels before and after using the Qolbu Care application. The anxiety variable's mean difference was –16.45 with a standard deviation (SD) of 8.12 and standard error (SE) of 1.05. The negative mean value indicates a significant reduction in anxiety levels after the intervention. The statistical test yielded a p-value of 0.0001 (p < 0.05), indicating that this difference is statistically significant. Meanwhile, for the resilience variable, the mean difference was +11.40 with SD = 6.85 and SE = 0.98. The positive mean value indicates a significant increase in resilience after using the Qolbu Care application. Like anxiety, the test result also shows a p-value of 0.0001 (p < 0.05), indicating that the difference is statistically significant. Overall, these results indicate that using the Qolbu Care application effectively reduced anxiety levels and improved resilience among the respondents.
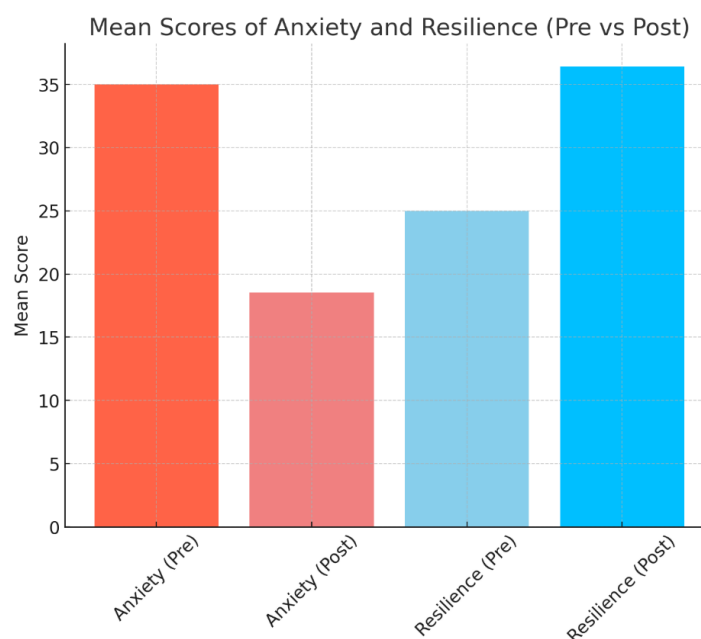

Figure 4. Mean Scores of Anxiety and Resilience

This graph presents the results of the paired t-test. It shows a statistically significant decrease in the mean anxiety score (mean difference = –16,45; p = 0,0001) and a statistically significant increase in the mean resilience score (mean difference = +11.40; p = 0,0001). This indicates that consistent use of the Qolbu Care application has a positive impact, both in reducing anxiety and in enhancing resilience.

3.2. Discussion

The study results indicate that the intervention using the Qolbu Care application significantly reduced anxiety levels (mean = –16,45; SD = 8,12; p = 0,0001; Cohen's d ≈ 2,03) and significantly enhanced adolescents' resilience (mean = 11,40; SD = 6,85; p = 0,0001; Cohen's d ≈ 1,66), indicating a very large effect size. The high Cohen's d values confirm that this intervention demonstrates a strong effect, supporting the effectiveness of Qolbu Care as a psychospiritual-based digital intervention for improving adolescent mental health in disaster-prone areas. These findings align with the Transactional Stress and Coping Theory (Lazarus & Folkman, 1984), which emphasizes that stress arises when environmental demands exceed an individual's coping resources (Gaol, 2016), and the Roy Adaptation Model (Mohammadi, 2024), which asserts that individuals can respond to stress more adaptively when equipped with appropriate coping mechanisms. Features of Qolbu Care, such as Spiritual Emotional Freedom Technique (SEFT), digital meditation, and emotional journaling, enable adolescents to employ problem- and emotion-focused adaptive coping strategies. This, in turn, reduces the perceived threat of stressors and enhances psychological adaptation capacity.

From a neuroscience perspective, anxiety reduction is associated with decreased hyperactivity in the amygdala and enhanced prefrontal cortex (PFC) regulation, which plays a critical role in emotional regulation and decision-making (Etkin et al., 2015). Mindfulness exercises, prayer, and SEFT incorporated in the application also influence neurotransmitter systems, including increased activity of GABA and serotonin, which promote calmness and reduce the fight-or-flight response (Tang, Hölzel, & Posner, 2015). The increase in resilience is linked to neuroplasticity within the PFC-amygdala-hippocampus network, which enhances the brain's capacity to adapt to stress (Southwick & Charney, 2012).

The findings of this study are also consistent with evidence from international studies regarding the effectiveness of digital interventions based on mindfulness and Cognitive Behavioral Therapy (CBT). For example, Orosa-Duarte et al. (2021) reported that using a mindfulness-based meditation app significantly reduced anxiety levels among university students, with a large effect size, indicating that structured mindfulness practice can produce tangible psychological changes within a relatively short period. Furthermore, Riboldi et al. (2023) found that digital interventions lasting between 2 and 8 weeks still produced significant reductions in symptoms of anxiety and depression among university students, reinforcing that the positive effects of digital interventions are not confined to long-term use and remain relevant even for

short-term application.

In addition, the study by Venkatesan et al. (2020) demonstrated that digital CBT-based interventions, when combined with therapist support, effectively reduced symptoms of depression and anxiety after 12 weeks of app usage. This underscores the importance of incorporating guidance or professional support to enhance the effectiveness of digital interventions. Gu et al. (2020**)** further note that evaluation of digital interventions can demonstrate effective outcomes as early as the sixth week, indicating that psychological changes may occur relatively quickly when intervention methods and content are appropriately tailored.

Moreover, Firth et al. (2018) emphasize that digital technology offers innovative, flexible, and easily accessible solutions for managing anxiety, particularly when formal psychological services are difficult to access. The availability of digital interventions enables individuals to engage in regular self-guided practice, access materials whenever needed, and adjust the intensity of the intervention according to personal needs. These findings reinforce the relevance of Qolbu Care as a psychospiritual-based digital intervention that not only reduces anxiety but also enhances resilience. It offers a practical, flexible, and widely adoptable alternative within local contexts, particularly for adolescents in disaster-prone areas with limited access to formal psychological services.

The novelty of Qolbu Care lies in its integration of psychospirituality with a digital approach, distinguishing it from international applications that predominantly focus on CBT or secular mindfulness. This makes it more culturally relevant for Indonesian adolescents. Practically, this application can serve as a non-pharmacological strategy for adolescent stress mitigation in disaster-prone areas (health policy), support emotional literacy and mental health education in schools, and assist psychosocial preparedness post-disaster by BPBD or related agencies.

Overall, these findings confirm that Qolbu Care is an effective psychospiritual-based digital intervention, demonstrating a very large effect size in reducing anxiety and enhancing adolescent resilience, while also strengthening the empirical evidence on the effectiveness of digital interventions based on mindfulness and resilience. This intervention demonstrates its potential as a practical, flexible, and culturally relevant strategy for improving adolescent mental health in Indonesia, particularly in regions with limited access to formal psychological services.

3.2.1. Study Limitations

This study has several limitations that should be considered when interpreting the findings. First, the relatively small sample size (N = 90) limits the generalizability

of the results to a broader population of adolescents, particularly those outside disaster-prone areas or with different socio-cultural backgrounds. Second, the short intervention duration does not allow for assessing the long-term sustainability of the Qolbu Care application's effects on anxiety and resilience. Third, the measurement method relied solely on quantitative pre- and post-test instruments, which may not fully capture the depth and complexity of participants' psychological experiences; qualitative data could have provided richer insights into coping mechanisms and user experiences.

In addition, the frequency and consistency of app usage among respondents were not fully controlled, which may have contributed to variability in the observed outcomes and potentially influenced the magnitude of changes in anxiety and resilience. Fourth, external factors such as family support, school environment, or exposure to actual disaster events were not accounted for, which could have affected participants' responses to the intervention. Finally, the research context, focused specifically on adolescents in disaster-prone areas, limits the applicability of the findings to other populations, such as adolescents in urban or low-risk environments or different age groups. Addressing these limitations in future research could enhance the robustness of evidence through larger sample sizes, longer follow-up periods, mixed-method approaches, and stricter monitoring of app engagement.

4. CONCLUSION

This study aims to evaluate adolescents' levels of anxiety and resilience before and after the intervention using the Qolbu Care application and assess its effect and effectiveness. The study results demonstrate that using this application effectively reduces anxiety and enhances adolescent resilience, providing evidence that psychospiritual-based digital interventions can serve as an effective non-pharmacological strategy to support adolescent mental health in disaster-prone areas.

REFERENCES

Contrada, R. J., & Baum, A. (Eds.). (2011). *The handbook of stress science: Biology, psychology, and health*. Springer Publishing Company. https://books.google.co.id/books/about/The_Handbook_of_Stress_Science.html?id=EXVlk8pnEKIC

Etkin, A., Büchel, C., & Gross, J. J. (2015). The neural bases of emotion regulation. *Nature Reviews Neuroscience, 16*(11), 693–700. https://doi.org/10.1038/nrn4044

Firth, J., Torous, J., Carney, R., Newby, J., Cosco, T. D., Christensen, H., & Sarris, J. (2018). Digital technologies in the treatment of anxiety: Recent innovations and future directions. *Current Psychiatry Reports, 20*(6), 44. https://doi.org/10.1007/s11920-018-0910-2

Flett, J. A. M., Hayne, H., Riordan, B. C., Thompson, L. M., & Conner, T. S. (2019). Mobile mindfulness meditation: A randomized controlled trial of the effect of two popular apps on mental health. *Mindfulness, 10*(5), 863–876. https://doi.org/10.1007/s12671-018-1050-9

Gaol, N. T. L. (2016). Teori stres: stimulus, respons, dan transaksional. *Buletin Psikologi, 24*(1), 1–11. https://doi.org/10.22146/bpsi.11224

Gu, J., Miller, C. B., Henry, A. L., Espie, C. A., Davis, M. L., Stott, R., ... & Carl, J. R. (2020). Efficacy of digital cognitive behavioural therapy for symptoms of generalised anxiety disorder: A study protocol for a randomised controlled trial. *Trials, 21*(1), 357. https://doi.org/10.1186/s13063-020-4230-6

Hayatini, D. R., & Dimyati, D. (2020). Validity and reliability of the resilience scale for Islamic boarding school students. *Humaniora, 11*(3), 227–233. https://doi.org/10.21512/humaniora.v11i3.6693

Hidayah, N., Florensa, F., Seprian, D., Nisma, N., & Fathudin, Y. (2024). Efektivitas model terapi modalitas dan komplementer SEFT terhadap penurunan tingkat stres pasca bencana pada remaja penyintas gempa bumi di Ponpes Minhajul Karomah, Kabupaten Cianjur. *Jurnal Pendidikan Tambusai, 8*(1), 5397–5404. https://jptam.org/index.php/jptam/article/view/13234

Hidayah, N., & Jamil, N. (2024). Intervensi digital terapi SEFT terhadap gangguan kecemasan pada remaja pasca bencana banjir rob di pinggiran Sungai Kapuas wilayah kerja Puskesmas Tambelan Sampit. *Sci-tech Journal, 3*(3), 245–254. https://www.mes-bogor.com/journal/index.php/stj/article/view/640

McDowell, I. (2006). *Measuring health: A guide to rating scales and questionnaires* (3rd ed.). Oxford University Press. https://dl.icdst.org/pdfs/files3/8c0318d9be7ee1707543f1daca6510fd.pdf

Mohammadi, K., Mehralian, H. A., Abolhassani, S., & Kheiri, S. (2024). Effect of a program based on Roy's adaptation model on coping skills of children of people with multiple sclerosis. *Iranian Journal of Nursing and Midwifery Research, 29*(3), 231–236. https://doi.org/10.4103/ijnmr.ijnmr_231_22

Nasution, T. H., Ropi, H., & Sitorus, R. E. (2013). Faktor-faktor yang berhubungan dengan manajemen diri pada pasien yang menjalani hemodialisis di ruang hemodialisis RSUP Dr. Hasan Sadikin Bandung. *Jurnal Ilmu Keperawatan, 1*(2),

162–168. https://repository.unpad.ac.id/server/api/core/bitstreams/25a13696-d27e-44d9-b14a-0a882583658f/content

Orosa-Duarte, Á., García-Campayo, J., Modrego-Alarcón, M., Navarro-Gil, M., & Montero-Marín, J. (2021). Mindfulness-based mobile app reduces anxiety and increases self-compassion in university students: A randomized controlled trial. *Mindfulness, 12*(6), 1362–1374. https://doi.org/10.1007/s12671-021-01602-9

Riboldi, I., Cavaleri, D., Calabrese, A., Capogrosso, C. A., Piacenti, S., Bartoli, F., ... & Carrà, G. (2023). Digital mental health interventions for anxiety and depressive symptoms in university students during the COVID-19 pandemic: A systematic review of randomized controlled trials. *Revista de Psiquiatría y Salud Mental, 16*(1), 47–58. https://doi.org/10.1016/j.rpsm.2022.06.001

Schäfer, S. K., von Boros, L., Schaubruch, L. M., Kunzler, A. M., Lindner, S., Koehler, F., ... & Tüscher, O. (2024). Digital interventions to promote psychological resilience: A systematic review and meta-analysis. *NPJ Digital Medicine, 7*(1), 30. https://doi.org/10.1038/s41746-024-01017-8

Setyowati, A., Chung, M. H., & Yusuf, A. (2019). Development of a self-report assessment tool for anxiety among adolescents: Indonesian version of the Zung Self-Rating Anxiety Scale. *Journal of Public Health in Africa, 10*(s1), 1172. https://doi.org/10.4081/jphia.2019.1172

Southwick, S. M., & Charney, D. S. (2012). The science of resilience: Implications for the prevention and treatment of depression. *Science, 338*(6103), 79–82. https://doi.org/10.1126/science.1222942

Syafrizaldi, S., Harahap, D. P., & Dalimunthe, H. A. (2023). Gambaran resiliensi pada remaja penyintas erupsi Gunung Sinabung, Kabupaten Karo. *Jurnal Penelitian Pendidikan, Psikologi dan Kesehatan (J-P3K), 4*(1), 31–37. https://jurnalp3k.com/index.php/J-P3K/article/view/202

Tang, Y. Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience, 16*(4), 213–225. https://doi.org/10.1038/nrn3916

Venkatesan, A., Rahimi, L., Kaur, M., & Mosunic, C. (2020). Digital cognitive behavior therapy intervention for depression and anxiety: Retrospective study. *JMIR Mental Health, 7*(8), e21304. https://doi.org/10.2196/21304

Digital Mental Health Innovation: Effectiveness of Qolbu Care App in Reducing Anxiety and Improving Resilience among Adolescents in Disaster-Prone Areas
Nurul Hidayah, et al.

386