

Review article

A Systematic Review of Spiritual and Cultural-Based Digital Interventions for Suicide Risk Prevention among Students

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Abstract

Suicide represents a significant global public health issue and ranks as the third leading cause of death for individuals aged 15 to 29. College students are especially vulnerable, and although there are spiritual and cultural digital interventions available, they are typically applied independently. This systematic review explores the effectiveness of combined spiritual and cultural digital strategies in mitigating suicide risk among college students. In accordance with PRISMA guidelines, English-language literature published from 2020 to 2025 was gathered from ScienceDirect, Springer, EBSCO, and Sage through the use of specific keywords. The studies selected focused on digital interventions that incorporated spiritual and/or cultural elements aimed at preventing suicide risk or improving mental health outcomes among college students. Out of an initial pool of 9,272 records, 20 studies were found to meet the criteria for inclusion. The results indicate that digital interventions that blend spiritual and cultural aspects significantly alleviate symptoms of stress, depression, anxiety, and suicidal thoughts, while promoting overall psychological well-being. Spirituality acts as a protective factor by enhancing emotional resilience, fostering hope, and providing a sense of meaning in life. The cultural relevance of elements such as community values, social solidarity, and family dynamics is crucial for designing effective interventions. Impressively, 75% of the studies examined reported significant improvements ($p < .05$). Furthermore, these integrated digital interventions not only enhance access to mental health resources but also bolster emotional resilience and a sense of purpose, making them a promising approach for suicide prevention among college students.

Keywords: spiritual; cultural; digital; suicide risk; student; systematic review

1. Introduction

Suicide continues to be a significant global public health issue. According to the World Health Organization (WHO, 2025), over 720,000 individuals die by suicide each year across the globe. Furthermore, the Pan American Health Organization (PAHO, 2024) points out that suicide is affected by a range of intricate psychological, biological, social, cultural, and environmental factors, which underscores the need for early detection and mental health support. Data from a comprehensive systematic review and meta-analysis reveal a notable worldwide prevalence of suicidal thoughts and attempts among adolescents and young adults, highlighting the urgency of addressing suicide as a pressing public health concern for those aged 10 to 29 years (Van Meter et al., 2023). Data shows that the risk of suicide among teenage girls in the U.S. rose by 51% in 2021 compared to 2019 (Van Meter et al., 2023). In South Korea, there was a notable increase in suicide rates among young women between the ages of 20 and 30 in 2021 (Jang et al., 2023).

Suicide-related issues among university students continue to be a major global concern, especially for those dealing with academic and psychological stress. Elevated stress levels in this population correlate with a rise in suicidal thoughts. Additionally, academic pressures and challenges in adjusting to university life can worsen psychological distress. Studies have shown that as students' stress levels increase, so does the risk of experiencing suicidal ideation (Lalenoh et al., 2021).

In Indonesia, there has been a noticeable rise in suicide cases in recent years, especially among adolescents and young adults (Komnas Perempuan, 2024). Additionally, research indicates that a significant number of university students in Indonesia have experienced suicidal thoughts, with empirical studies revealing a prevalence rate of 32% (Panjaitan et al., 2023).

Atoofi et al. (2024) explains that weak spiritual engagement and religiosity can raise the risk of suicide by diminishing individuals' sense of life's meaning, hope, and resilience. Studies show that supportive family ties, community backing, and cultural mastery act as protective factors against suicidal thoughts in Indigenous and culturally diverse youth groups. This indicates that active social and cultural involvement may help mitigate suicide risk (Brockie et al., 2025).

Various strategies have been used to reduce suicide risk, both in person and online. Direct methods include in-person therapy, such as psychoeducation, risk assessments, gatekeeper training, the development of mental health curricula, and peer support initiatives. Indirect approaches involve online tools, such as websites and apps, that provide support for student mental health (Daulay et



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al., 2023; Fitri, 2023; Hendrawati et al., 2023; Septiansyah et al., 2025). Challenges in direct interventions include social stigma, limited professional resources, and restricted access to therapy (Abdillah et al., 2022; Febriawan, 2020; Karisma et al., 2024; Wong et al., 2021).

Digital interventions are increasingly recognized for offering easier access to services and around-the-clock emotional support (Kahl et al., 2020; Looijmans et al., 2024; Yip et al., 2020). Globally, mobile apps, online training, and telehealth services have been developed for suicide prevention (Bernert et al., 2020; Lee et al., 2023; Na et al., 2020). Research shows that spiritual approaches can strengthen life meaning, emotional resilience, and hope among students experiencing psychological distress (Guo et al., 2025). Spiritual-psychological interventions, such as gratitude-based methods, have been linked to enhanced self-esteem and psychological well-being among adolescents and young adults (Suryaningrum et al., 2025). Furthermore, culturally rooted strengths such as collectivism, social support, community solidarity, interpersonal connections, and belonging can decrease vulnerability to suicidal behaviors and aid culturally responsive suicide prevention efforts (Brockie et al., 2025). However, most existing digital interventions mainly focus on general psychological treatments and often lack comprehensive integration of spiritual and cultural factors. Incorporating these elements could improve the effectiveness of suicide prevention, especially in culturally and spiritually diverse settings. Nonetheless, research on this topic among college students remains limited, highlighting a gap in current studies gap (Atoofi et al., 2024).

This systematic review seeks to assess the effectiveness of digital interventions that incorporate spiritual and cultural elements in reducing suicide risk and enhancing mental health among college students. It specifically investigates how these components are integrated into digital tools and identifies forms of integration that could provide accessible, holistic mental health support for young adults in higher education.

2. Research Methods

This systematic review adhered to the PRISMA guidelines for reporting. Searches were conducted in four electronic databases: ScienceDirect, Springer, EBSCO, and SAGE Journals. The keywords used were (“digital intervention” OR “online intervention”) AND (spiritual OR cultural) AND (“suicide prevention” OR “suicide risk”) AND (“college students” OR “university students”) AND (“quantitative method”). Relevant research articles and conference papers that met the inclusion criteria were included. The inclusion and exclusion criteria were formulated using the PICOS framework (Population, Intervention, Comparison, Outcomes, and Study Design), ensuring a structured literature selection process. These criteria are detailed in Table 1.

Table 1. Inclusion and Exclusion Criteria Based on the PICOS Framework

| PICOS Component | Inclusion Criteria | Exclusion Criteria |
|---------------------------|---|---|
| Population Intervention | College/university students Spiritual and culturally based digital interventions for suicide risk prevention | Non-college student populations Interventions unrelated to spiritual and culturally based approaches |
| Comparison Outcomes | Not specifically required Suicide prevention or reduction of suicide risk | - Outcomes unrelated to suicide prevention or suicide risk |
| Study Design | Original research articles and conference papers using quantitative methods | Systematic reviews and other non-original studies |
| Publication Year Language | 2020–2025 English | Before 2020 Languages other than English |

Data extraction was performed manually by reviewing full-text articles that satisfied the inclusion criteria. The extracted data comprised author(s), publication year, study design, participant details, type of digital intervention, cultural or spiritual elements, and key findings on suicide risk prevention among college students. These studies were then assessed for their relevance to the research objectives and inclusion standards.

Initially, 9,272 articles were identified through the screening process, sourced from ScienceDirect (6,935 articles), Springer (237), EBSCO (416), and Sage Journals (1,684). During the initial screening of titles and abstracts, 8,574 articles were excluded as irrelevant to the study, leaving 698 articles for further evaluation. Among these, 77 duplicates were detected and removed, leaving 621 unique articles. A full-text review then excluded 601 articles that did not meet the eligibility criteria, resulting in 20 articles included in this systematic review. The screening process is depicted in Figure 1.

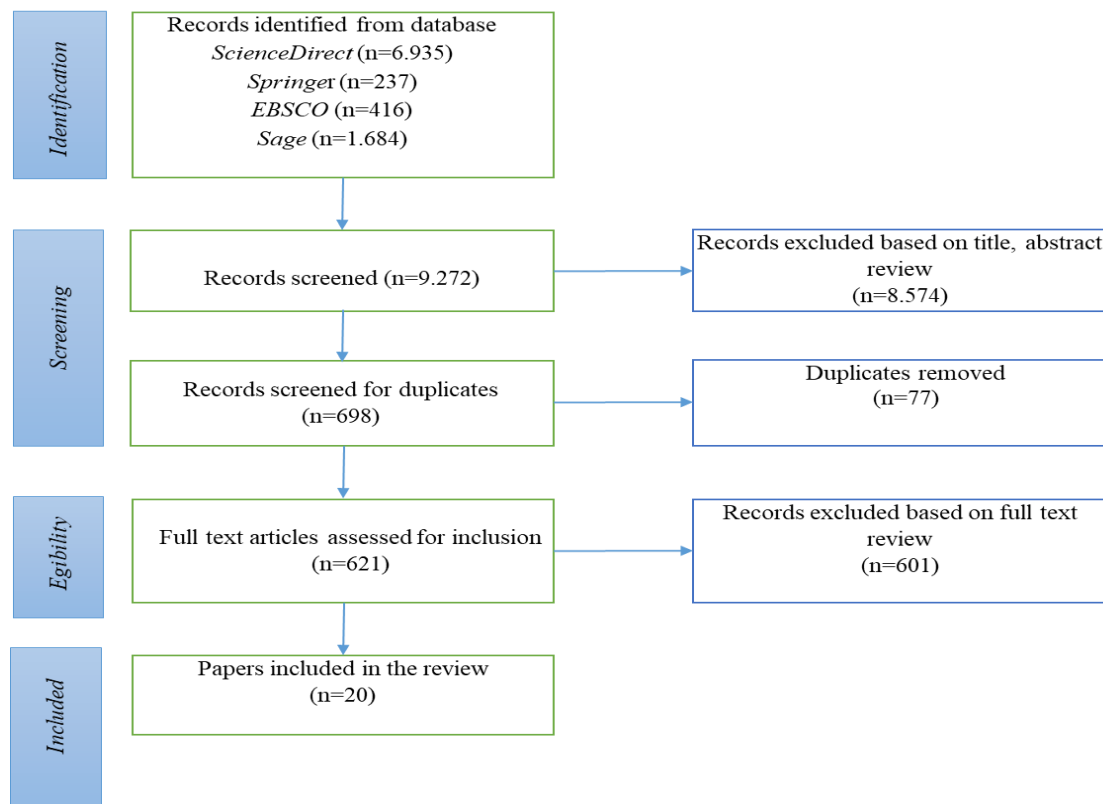


Figure 1. PRISMA Flowchart Diagram for Identifying Literature

3. Results and Discussion

3.1. Results

This systematic review included 20 studies conducted in countries such as Indonesia, China, India, Portugal, Canada, Australia, Sweden, the UK, and the US, highlighting diverse cultural and educational backgrounds among university students in digital mental health interventions. Most used randomized controlled trial (RCT) methods, with others employing quasi-experimental, mixed-method, experimental, descriptive quantitative, and pre-post test designs. Sample sizes ranged from 35 to 2,209 participants, with most studies involving more than 50 respondents. The interventions also showed wide variation, including mobile apps, web platforms, online mindfulness courses, video interventions, chatbot systems, and digital self-help tools. Table 2 summarizes the key characteristics and main findings of these studies.

The included studies showed a wide variety of intervention methods, digital formats, and targeted mental health outcomes. These interventions varied from CBT-based mobile apps and online self-help options to culturally tailored mindfulness practices and spiritually focused techniques. To better analyze these interventions, the studies were summarized by type, digital format, and primary mental health outcomes.

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The interventions reviewed mostly included programs based on CBT, mindfulness, psycho-spiritual methods, and culturally tailored digital mental health solutions. They were primarily delivered via mobile apps, web platforms, video modules, and chatbots. Cultural adaptation was achieved by incorporating local languages, values, and relevant mindfulness content, especially among Indonesian university students. Spiritual aspects were often included through meditation, emotional regulation, self-awareness, spiritual connection, and meaning-making activities. While some interventions integrated both cultural and spiritual elements, none of them offered a fully integrated spiritual-cultural digital intervention framework.

Table 2. Characteristics and Main Findings of Included Studies

| Author (Year) | Country | Study Design | Sample | Digital Intervention | Main Findings |
|-------------------------------|----------------|-----------------------------------|---|---|---|
| Liu et al., (2023) | China | Quasi-experimental | 74 students (37 intervention; 37 control) | Video-based loving-kindness meditation | Improved self-compassion, positive psychological capital, and reduced suicidal ideation |
| Listiyandini et al., (2023) | Indonesia | Mixed-method | Study 1: 248 students; Study 2: 19 students | PSIDAMAI culturally adapted online mindfulness program | High cultural relevance and positive acceptance among students |
| Singh & Bandyopadhyay, (2021) | India | Quasi-experimental | 462 students | Psycho-Spiritual Well-being Intervention (PSI) | Improved psychological and spiritual well-being |
| Listiyandini et al., (2024) | Indonesia | Open pilot trial | 40 students | Guided culturally adapted online mindfulness intervention | Improved psychological well-being and mindfulness outcomes |
| Ponzo et al., (2020) | United Kingdom | Randomized controlled trial (RCT) | 262 students | BioBase mobile CBT application | Reduced anxiety and improved mental well-being |
| Wiljer et al., (2020a) | Canada | Randomized controlled trial (RCT) | 481 students | Thought Spot mental health support application | No significant improvement in help-seeking intention |
| Durán et al., (2022) | Portugal | Randomized controlled trial (RCT) | 98 students | DEEP digital depression literacy intervention | Increased knowledge of depression symptoms and treatment |
| Åsberg et al., (2024) | Sweden | Randomized controlled trial (RCT) | 2,209 students | Focus web-based procrastination intervention | No significant effect on procrastination outcomes |
| Macrynika et al., (2025) | United States | Randomized controlled trial (RCT) | 245 participants | mindLAMP digital mental health application | Improved engagement and reduced anxiety and depression symptoms |
| Suffoletto et al., (2021) | United States | Pilot randomized controlled trial | 52 students | MoST-MH digital mental health support intervention | Reduced depressive symptoms and improved self-efficacy |
| Horwitz et al., (2022) | United States | Descriptive quantitative | 1,673 students | Personalized digital emotional feedback intervention | Increased engagement among students at elevated suicide risk |
| Rackoff et al., (2022) | United States | Randomized controlled trial (RCT) | 585 students | Internet-based CBT self-help program | Reduced stress and depressive symptoms |
| Crosby et al., (2024) | United States | Randomized controlled trial (RCT) | 61 students | Sleep Scholar internet-based insomnia intervention | Improved insomnia and depressive symptoms over time |
| Lu, (2024) | China | Experimental study | 60 students | Self-regulated music psychotherapy | Reduced psychological distress and stress symptoms |
| Wu & Adamsk, (2021) | China | Quasi-experimental | 114 students | CBT intervention for suicidal ideation | Reduced stress, depression, anxiety, and suicidal ideation |
| Sreeraj et al., (2017) | India | Pre-post test design | 35 participants | Suicide prevention gatekeeper training | Improved suicide prevention knowledge and skills |
| Gao et al., (2025) | China | Quasi-experimental | 456 students | AI-powered gamification fitness application | Increased physical activity engagement |
| Jiang et al., (2020) | China | Randomized controlled trial (RCT) | 142 students | Light therapy intervention | Reduced depressive symptoms |
| Vereschagin et al., (2024) | Canada | Randomized controlled trial (RCT) | 1,489 students | Minder mobile mental health intervention | Reduced anxiety and depression symptoms |
| Farrer et al., (2024) | Australia | Randomized controlled trial (RCT) | 487 students | Uni Virtual Clinic-Lite video-based intervention | No significant differences in mental health outcomes |

Table 3. Synthesis of Digital Interventions, Digital Forms, and Mental Health Outcomes

| Intervention Category | Description | Digital Form | Main Outcomes |
|---|--|---|---|
| Spiritually Based Interventions | Interventions that emphasize self-awareness, meditation, emotional regulation, spiritual connection, and meaning-making—such as Psycho-Spiritual Well-being Intervention (PSI) and self-regulated music psychotherapy. | Video-based meditation apps, music therapy tracking tools, and digital CBT platforms. | Enhanced psychological and spiritual health, with decreases in stress, depression, anxiety, and suicidal thoughts. |
| Culture-Based Interventions | Interventions tailored to participants’ social and cultural backgrounds, such as culturally adapted mindfulness programs and intervention materials relevant to the local context. | Web-based mindfulness programs that incorporate text, illustrations, and audio, and are culturally adapted. | Enhanced self-acceptance and emotional well-being, decreased psychological distress, and a greater sense of connection to the intervention program. |
| Interventions Reflecting Both Cultural and Spiritual Elements | Interventions that include both culturally sensitive and spiritually focused elements in digital mental health programs. | Short video-based meditation apps, digital self-help platforms, and culturally tailored digital mindfulness programs. | Enhanced self-compassion and psychological well-being; decreased suicidal thoughts and stress symptoms. |

Effects of Digital Interventions

The reviewed studies revealed different positive mental health outcomes among university students after digital interventions. Most interventions had beneficial impacts on anxiety, depression, stress, psychological well-being, self-compassion, and suicidal thoughts. Nevertheless, some studies reported non-significant results, especially concerning interventions aimed at procrastination and formal help-seeking behaviors (Åsberg et al., 2024; Wiljer et al., 2020a).

Effect on Anxiety, Stress, and Depression

The evaluated interventions proved effective in lowering anxiety, stress, and depression among university students. CBT-based mobile apps, online self-help programs, and mindfulness techniques generally enhanced emotional health and psychological functioning. Apps like BioBase and Minder contributed to reductions in anxiety and depression symptoms (Ponzo et al., 2020; Vereschagin et al., 2024), while internet-delivered CBT programs helped decrease stress and boost resilience (Rackoff et al., 2022). Additionally, interventions such as Sleep Scholar and light therapy showed positive impacts on depressive symptoms and emotional distress (Crosby et al., 2025; Jiang et al., 2020).

Effect on Suicidal Ideation and Psychological Well-Being

Interventions based on spirituality and mindfulness have shown beneficial effects on reducing suicidal thoughts and enhancing psychological well-being. Loving-kindness meditation, for instance, increased self-compassion and positive psychological resources, while also decreasing suicidal ideation (Liu et al., 2023). Psycho-spiritual approaches focusing on self-awareness, emotional regulation, meditation, and meaning-making helped improve both psychological and spiritual health (Singh & Bandyopadhyay, 2021). Additionally, CBT strategies specifically designed to address suicidal thoughts were effective in lowering psychological stress, anxiety, depression, and symptoms related to suicide (Wu & Adamsk, 2021).

Participant Engagement and Cultural Relevance

Previous research emphasized the significance of participant engagement and cultural relevance in digital mental health interventions. Culturally tailored programs, especially for Indonesian university students, showed high acceptability, emotional connection, and positive user experiences (Listiyandini et al., 2023, 2024). Elements such as digital alliances, personalized

feedback, and culturally appropriate materials were linked to increased engagement and better intervention results (Horwitz et al., 2022; Macrynikola et al., 2025).

Non-Significant Findings

Although most results were positive, some interventions failed to show statistically significant improvements in their targeted outcomes. For example, web-based procrastination programs, digital help-seeking apps, and certain video interventions proved to be only modestly effective (Åsberg et al., 2024; Farrer et al., 2024; Wiljer et al., 2020a). These outcomes imply that factors such as how the intervention is designed, participant engagement levels, accessibility, and the duration of the intervention can all impact the success of digital mental health initiatives.

This systematic review indicates that digital mental health interventions typically help improve psychological well-being and lower levels of anxiety, depression, stress, and suicidal thoughts in university students. Programs that include culturally adapted or spiritually focused elements showed better engagement and emotional benefits. Nevertheless, the success of these interventions can depend on factors such as the program's design, participant involvement, cultural appropriateness, and how accessible the digital platforms are.

3.2. Discussion

This systematic review evaluated the effectiveness of digitally delivered mental health interventions that emphasize spiritual and cultural aspects for university students. Overall, the findings indicate that these digital approaches enhance psychological well-being and help lower symptoms of anxiety, depression, stress, and suicidal ideation (Liu et al., 2023; Ponzo et al., 2020; Rackoff et al., 2022; Wu & Adamsk, 2021). Interventions that incorporate mindfulness, emotional regulation, culturally relevant content, and spiritual elements tend to engage students positively and produce beneficial emotional outcomes (Listiyandini et al., 2024; Singh & Bandyopadhyay, 2021). These results imply that digital mental health support can be adaptable, easily accessible, and may reduce stigma, providing essential psychological assistance to students facing mental health challenges.

The findings emphasize the growing importance of digital mental health tools in higher education. Mobile apps, web-based platforms, online mindfulness courses, and video interventions offer practical ways to support students' mental well-being, increasing accessibility and adaptability (Macrynika et al., 2025; Vereschagin et al., 2024). The effectiveness of these digital approaches relies on participants' ability to independently engage with the content and implement coping techniques in their everyday lives. These results reaffirm previous research that stresses the necessity for readily available, technology-based mental health support for young adults and university students (Ferrari et al., 2022; Madrid-Cagigal et al., 2025).

A key discovery of this review is the growing integration of cultural adaptation and spiritually oriented elements in digital interventions. Cultural adaptation included incorporating local values, language, and culturally relevant mindfulness content, especially in programs designed for Indonesian university students (Listiyandini et al., 2023, 2024). Approaches with spiritual emphasis commonly focused on meditation, self-awareness, emotional regulation, spiritual connection, and meaning-making (Liu et al., 2023; Singh & Bandyopadhyay, 2021). These elements seem to enhance emotional comfort, acceptance of interventions, and participant engagement. The results indicate that tailoring interventions to students' cultural and spiritual backgrounds may bolster psychological resilience and make mental health programs more meaningful and effective.

While some interventions incorporated both cultural and spiritual elements, none explicitly offered a fully integrated spiritual-cultural digital approach (Listiyandini et al., 2024; Liu et al., 2023). The majority of studies mainly focused on psychological methods, especially Cognitive Behavioral Therapy (CBT), with cultural and spiritual elements typically serving as supportive or adaptive features rather than being part of a fully integrated intervention framework (Rackoff et al., 2022; Wu & Adamski, 2021). This suggests a gap in the existing literature and highlights opportunities for future research and intervention development that more holistically combine psychological, cultural, and spiritual aspects.

This review's findings align with earlier systematic reviews indicating that digital mental health interventions can enhance psychological well-being and lessen anxiety and depression symptoms in university students. Past studies also highlight the interventions which are culturally sensitive and contextually appropriate tend to be more acceptable and engage participants better (Madrid-Cagigal et al., 2025; Riboldi et al., 2023). Moreover, spiritually focused interventions are linked to improved emotional resilience, self-awareness, and coping skills. Research on religiosity and spiritual support suggests that spiritual resources may help alleviate psychological distress and promote emotional adjustment through adaptive coping mechanisms (Pratama et al., 2024). This review further emphasizes the importance of culturally and spiritually oriented digital interventions in promoting mental health and preventing suicide among university students.

Although most findings were positive, some studies in this review showed non-significant results. Interventions targeting procrastination, help-seeking intentions, and certain web-based programs had limited success (Åsberg et al., 2024; Farrer et al., 2024; Wiljer et al., 2020b). These differences might arise from factors like intervention length, participant engagement, accessibility of digital platforms, variations in intervention design, and how well the content matches participants'

needs. Additionally, barriers such as academic workload, technological access issues, and inconsistent participation can also influence intervention outcomes.

This systematic review has several limitations. First, there was significant heterogeneity among the included studies regarding intervention types, outcome measures, and digital formats, which hindered direct comparisons. Second, the review was limited to English-language publications from 2020 to 2025, possibly excluding relevant studies from other times or languages. Third, no formal risk of bias assessment was conducted, which is a notable limitation. Lastly, some studies involved small or specific participant groups, restricting how broadly the findings can be applied to general university populations.

Future research should focus on creating more comprehensive digital interventions that integrate both cultural adaptation and spiritual approaches within one framework. Long-term studies with a broader range of university populations are necessary to assess lasting effects, engagement levels, and real-world applicability. Additionally, future work should examine ethical concerns, accessibility challenges, and how social support systems can enhance the effectiveness of digital mental health interventions for university students.

4. Conclusion

This review shows that digital mental health interventions have strong potential to aid in suicide prevention and enhance psychological well-being among university students. The studies reviewed indicate that these digital solutions can decrease anxiety, depression, stress, and suicidal thoughts, while also boosting emotional regulation, self-compassion, and resilience. Additionally, digital platforms offer flexible, scalable, and less stigma-associated mental health support, making them more accessible for students.

The review emphasizes the significance of including cultural adaptation and spirituality-focused elements in digital mental health programs. Interventions that feature mindfulness, emotional regulation, self-awareness, meaning-making, and culturally appropriate materials showed improved participant engagement, emotional reassurance, and acceptance of the intervention. These results indicate that mental health support tailored to students' cultural and spiritual backgrounds can offer more comprehensive and relevant assistance.

The review revealed that most current interventions mainly focus on psychological methods, with cultural and spiritual factors often serving as supplementary rather than core components. Future digital mental health programs should aim to develop more integrated models that combine psychological, cultural, and spiritual elements into a unified intervention. This approach would offer university students more effective, accessible, and holistic support, considering the variety of educational and sociocultural backgrounds.

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Author Contributions

All authors contributed to the conception and design of the study. All authors participated in data collection, analysis, and manuscript preparation. All authors reviewed, revised, and approved the final version of the manuscript.

Conflict of interest

The authors declare that they have no conflict of interest.

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