JHNS
Journal of Holistic Nursing Science
E-ISSN: 2579-7751 P-ISSN: 2579-8472
Journal of Holistic Nursing Science

Article journey
Submitted
24/1/2026
Revised
6/3/2026
Accepted
1/6/2026
Online first
25/11/2026

CC BY NC

REVIEW ARTICLES

Virtual reality-based emotion regulation training and its impact on spiritual well-being among self-harming university students: A scoping review

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https://doi.org/10.31603/jhns.v13i2.16048

Abstract
Self-harm is a mental health concern among university students, closely associated with emotional dysregulation and lower levels of spiritual well-being. Virtual reality–based emotion regulation training (VR-ERT) has emerged as a promising intervention to enhance adaptive coping and emotional regulation. However, existing research focuses primarily on psychological outcomes, leaving the impact of VR-ERT on spiritual and broader well-being among self-harming university students fragmented and unmapped. This scoping review aimed to map the existing evidence on VR-ERT for university students who self-harm with a particular focus on emotional and spiritual well-being outcomes. This review was conducted in accordance with the PRISMA Extension for Scoping Reviews (PRISMA-ScR) guidelines. Comprehensive searches were performed across PubMed, Scopus, and Web of Science for peer-reviewed studies published between 2015 and 2025. Eligible studies evaluated VR-based interventions targeting emotion regulation and reported outcomes related to emotional regulation, mindfulness, self-awareness, meaning, or connectedness. Relevant data were charted and synthesized to identify intervention characteristics, outcome domains, and research trends, yielding 26 studies that met the inclusion criteria. Across these studies, VR-based emotion regulation interventions were associated with improvements in emotional awareness, cognitive reappraisal, distress tolerance, and emotional resilience. Furthermore, several studies reported outcomes linked to spiritual well-being, including enhanced mindfulness, self-reflection, inner calm, and life purpose. Substantial heterogeneity was observed across intervention designs, outcome measures, and populations, with relatively few studies explicitly addressing self-harming university students. Nevertheless, the current evidence base reflects growing research interest in using VR-ERT to support emotion regulation and holistic well-being in this population.

Keywords: Emotion regulation, nursing student, self-harm, spiritual well-being, virtual reality

Introduction

Self-harm or non-suicidal self-injury (NSSI) is a mental health concern that disproportionately affects adolescents and university students (Kingsbury et al., 2021; Villodas, 2024). This behaviour is defined as the deliberate and direct infliction of physical harm on one's own body without suicidal intent, most commonly as a maladaptive coping mechanism for managing overwhelming emotional distress (Christoforou et al., 2021; Lurigio et al., 2024). Consistent with this conceptualization, recent multi-country and national studies have revealed that NSSI is highly prevalent among university students with lifetime prevalence estimates ranging from 17.7% to 72.3% (Cipriano et al., 2017; Griffin et al., 2023; Kiekens et al., 2023). The substantial variation may reflect differences in study populations, research designs, and assessment methods; nevertheless, the findings consistently highlight a considerable and persistent mental health burden (Griffin et al., 2023; Kiekens et al., 2023; Sivertsen et al., 2025). Apart from its prevalence, evidence indicates that self-harming behaviors are associated with depression and anxiety (Christoforou et al., 2021; Kiekens et al., 2023), low self-esteem (Taylor et al., 2020), and emotional dysregulation (Christoforou et al., 2021; Putri & Hariyono, 2023). Moreover, NSSI has also been associated with impaired spiritual well-being, diminished meaning and purpose in life, and reduced connectedness, which may further aggravate emotional distress and maladaptive coping (Liljedahl et al., 2023; Putri & Hariyono, 2023). University students face various academic, social, and personal challenges, which may intensify

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E-ISSN: 2579-7751 P-ISSN: 2579-8472

psychological and spiritual vulnerabilities and increase their risk of self-harm (Shah et al., 2025). Consequently, university students are particularly vulnerable to self-harming behaviours, as developmental transitions, academic pressures, identity exploration, and psychosocial challenges may contribute to emotional dysregulation and increase self-harm (Camp et al., 2025; Hofer et al., 2024; Ruiz-Camacho & Gozalo, 2025).

The high occurrence of self-harm among university students, alongside its association with emotional dysregulation and diminished spiritual well-being, highlights the need for effective therapeutic interventions (Abbasi-Ghahramanloo et al., 2024). For instance, Cognitive Behavioral Therapy (CBT) and Dialectical Behavior Therapy (DBT), have been widely studied and implemented with varying degrees of success (Bettis et al., 2020; Cunha et al., 2024). CBT aims to identify and modify negative thought patterns that contribute to emotional distress, whereas DBT incorporates mindfulness and distress tolerance techniques to improve emotional regulation (Ghorbani et al., 2020). Although these interventions have been effective in reducing self-harming behaviors, they are often limited by accessibility barriers, high dropout rates, and the need for extensive therapist involvement (Bettis et al., 2020; Dixon & Linardon, 2020; Fernandez et al., 2015). Furthermore, conventional therapies may not adequately address the spiritual dimensions of well-being, which play a crucial role in promoting resilience and self-acceptance among individuals with emotional distress (Ghuloum et al., 2024). From a holistic nursing perspective, contemporary mental health care emphasizes the integration of biological, psychological, social, and spiritual dimensions (Cloninger, 2006). Evidence suggests that interventions addressing meaning-making, inner harmony, and emotional balance, alongside symptom reduction, are essential for promoting sustained recovery (Domènech-Sorolla et al., 2025; Sulosaari et al., 2022; Sumiko, 2023). Nurses are integral to the delivery of holistic mental health care by addressing patients' emotional, psychological, social, and spiritual needs through interventions. They are also responsible for providing supportive relationships that encourage emotional expression and strengthen coping abilities. Through continuous assessment, nurses can contribute to improve long-term recovery.

In light of these limitations and the need for accessible, engaging, and multidimensional interventions, Virtual Reality-Based Emotion Regulation Training (VR-ERT) has emerged as a promising digital approach to supporting university students who engage in self-harming behaviours (Montana et al., 2020). VR-ERT uses immersive virtual environments to help individuals safely experience emotional triggers and practice emotion-regulation strategies (Leong et al., 2025). The experiential learning approach enhances self-awareness and cognitive reappraisal along with develop healthier coping mechanisms (Boeldt et al., 2019). Compared to traditional interventions, VR-ERT offers higher engagement levels, intervention experiences, and reduced stigma associated with seeking mental health support (Colombo et al., 2021; Yang et al., 2024). Importantly, the flexibility and immersive capabilities of VR-ERT offer opportunities to deliver engaging interventions in university mental health settings. This approach can complement nurse-led psychoeducation and preventive mental health services on campus and in community (Carl et al., 2019; Horigome et al., 2020; Kim et al., 2024). VR-ERT may also contribute to improved spiritual well-being, which is recognized as an essential component of mental health. Evidence suggests that spiritual well-being is associated with greater resilience, more adaptive coping strategies, and higher life satisfaction (du Plessis & Jordaan, 2024).

VR interventions create immersive meditative experiences that promote mindfulness, gratitude, and self-reflection (Xie et al., 2025). Some VR-based applications integrate elements of guided meditation, nature exposure, and breathing exercises to enhance self-awareness and existential meaning (Jo et al., 2024; Ma et al., 2023). Within nursing science, higher levels of spiritual well-being are linked to more effective emotional regulation, reduced reliance on maladaptive coping behaviors, and enhanced recovery trajectories (Jamahneh et al., 2025; Sawab et al., 2024). Despite the growing interest in VR-ERT as a mental health intervention, research including scoping review exploring its impact on spiritual well-being is limited. Most existing studies focus on the role of VR in reducing stress, anxiety, and emotional dysregulation, with fewer investigations examining how VR can promote inner growth, purpose, and self-acceptance (Benchimol-Elkaim et al., 2024; Blackmore et al., 2024; Jingili et al., 2023; Li Pira et al., 2023; Wilczyńska et al., 2025). Moreover, although VR-ERT have shown promise in improving emotional regulation and spiritual well-being across diverse student populations, the existing literature has not been mapped for self-harming university students. Mapping the existing literature on this topic is vital for nursing care and practice because nurses serve as frontline responders in campus health clinics, emergency departments, and psychiatric settings. Without a synthesized understanding of how VR-ERT operates within this high-risk demographic, psychiatric and community health nurses lack evidence-based frameworks to safely integrate immersive digital interventions into holistic care. Establishing this evidence base helps nurses identify effective intervention parameters, anticipate potential adverse effects (such as cybersickness or sensory overstimulation during acute distress), and bridge the gap between traditional crisis management and accessible, technology-assisted preventive care that resonates with digitally native university students. A scoping review is the most

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E-ISSN: 2579-7751 P-ISSN: 2579-8472

appropriate methodology to address this gap because the intersection of virtual reality, emotion regulation training, spiritual well-being, and self-harm among university students represents an emerging, multidisciplinary field with heterogeneous study designs and outcomes. This scoping review allows researchers to explore the extent, characteristics, and outcome domains of current VR-ERT interventions. Furthermore, it enables the identification of key conceptual definitions, delivery modalities, spiritual integration strategies, and critical knowledge gaps in the field. Accordingly, this scoping review was guided by the following research questions: (1) What types of VR-based interventions have been developed or implemented to improve emotion regulation among university students who engage in self-harming behaviours? (2) How does emotion regulation relate to spiritual well-being, particularly in terms of meaning in life, hope, self-acceptance, and connectedness, among university students who engage in self-harming behaviours? (3) What evidence is available regarding the potential impact of VR-ERT on spiritual well-being, and what gaps remain in the existing literature?

Method

This scoping review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) to ensure methodological transparency and replicability in mapping emerging evidence (Page & Moher, 2017). Scoping reviews are specifically designed to examine the extent, range, and characteristics of available literature within a given research field, particularly when the evidence base is heterogeneous in terms of study design, intervention modality, and outcome domains (Mak & Thomas, 2022). Accordingly, this scoping review aimed to identify and describe how VR-ERT has been applied among university students who engage in self-harming behaviours. It also sought to map the reported outcomes related to emotion regulation and spiritual well-being rather than evaluate intervention effectiveness. The review process consisted of study identification, screening, eligibility assessment, and inclusion, following the PRISMA-ScR flow structure. A systematic search was conducted across three electronic databases: PubMed, Scopus, and Web of Science. These databases were selected to capture multidisciplinary literature spanning mental health, digital therapeutics, and nursing science. Search terms were developed using Boolean operators and included combinations of the following keywords as follows ("Virtual Reality" OR "VR-based intervention") AND ("Emotion Regulation" OR "Cognitive Reappraisal") AND ("Self-Harm" OR "Non-Suicidal Self-Injury") AND ("Spiritual Well-Being" OR "Mindfulness"). Search strings were adapted to the indexing structure of each database. To enhance completeness, backward and forward citation tracking of included articles was also performed to identify additional relevant studies.

Studies were eligible for inclusion if they were peer-reviewed empirical articles published between 2015 and 2025, evaluated virtual reality (VR)–based interventions targeting emotion regulation, and measured outcomes related to emotion regulation or spiritual well-being (e.g., mindfulness, meaning, connectedness, or self-awareness) among university students or young adults exhibiting self-harming behaviors. Conversely, studies were excluded if they applied VR outside therapeutic or mental health contexts, omitted relevant emotion regulation or spiritual well-being outcomes, targeted other populations, or consisted of non-empirical work and grey literature (such as reviews, conference abstracts, dissertations, or unpublished reports). The study selection process followed the PRISMA-ScR guidelines **(Figure 1)**. Initial database searches and citation tracking identified 540 records. After removing 312 duplicates, 228 records underwent title and abstract screening, resulting in the exclusion of 108 irrelevant studies. The remaining 120 articles were assessed in full text against the inclusion criteria, during which 94 studies were excluded for lacking empirical intervention data or relevant outcome domains. Ultimately, 26 studies were included in the final evidence synthesis, with any screening discrepancies resolved through reviewer consensus.

A structured data-charting form was developed to extract and organize relevant information from all included studies in accordance with the objectives of this review. The form was designed to capture comprehensive overview of the available evidence. The extracted data included publication characteristics, such as authors, year of publication, country of origin, and publication source, as well as methodological characteristics, including study design, research objectives, sample size, participant demographics, and recruitment procedures. Further information was collected regarding the characteristics of the VR interventions, including the type of virtual reality technology used, intervention components, theoretical or therapeutic foundations, delivery approaches, session frequency, duration, and level of participant engagement. The implementation context was also documented, particularly the settings in which the interventions were delivered, the healthcare or educational professionals involved, and any reported considerations regarding accessibility and feasibility. In addition, particular attention was given to the outcome domains associated with emotion regulation, including emotional awareness, emotional control, emotional reactivity, coping strategies, and the management of psychological distress. Data relating to spiritual well-being were also charted, where available, with

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E-ISSN: 2579-7751 P-ISSN: 2579-8472

consideration of dimensions such as meaning and purpose in life, hope, self-acceptance, inner peace, and connectedness. Information regarding self-harming behaviours, including their reported characteristics and any changes documented following the interventions, was also extracted when available. The review recorded the principal findings, identified research limitations, and recommendations for future investigations. This comprehensive charting process enabled the reviewers to identify patterns across the included studies, describe the range of VR-ERT applications, and highlight the extent to which emotion regulation and spiritual well-being have been addressed in the existing literature. The extracted findings were mapped descriptively to identify the scope and nature of the available evidence rather than to establish causal relationships or determine the effectiveness of the interventions.

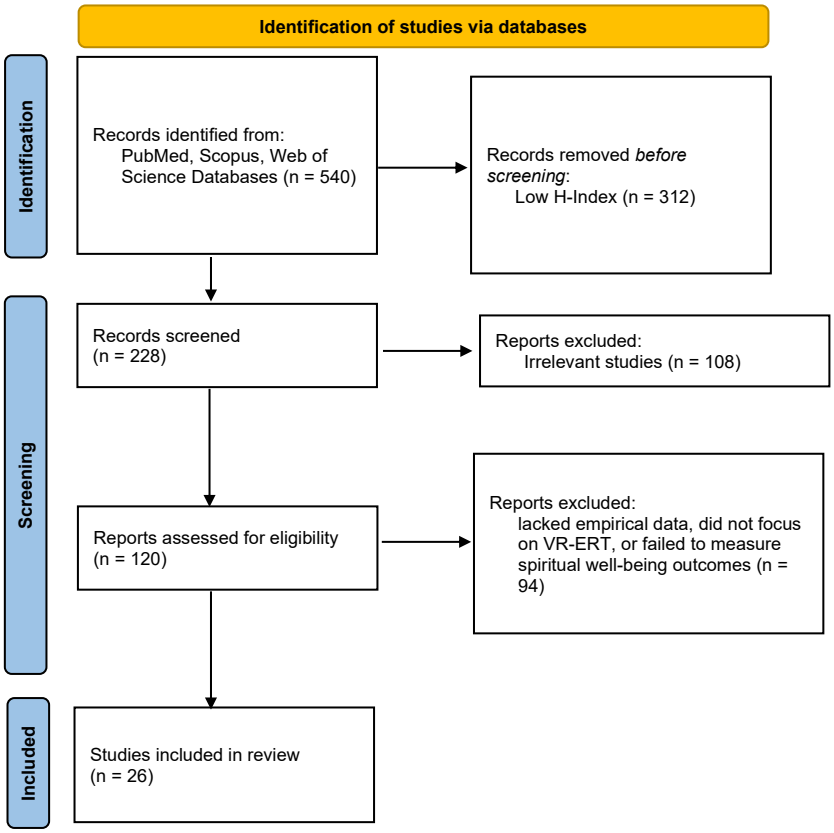

Figure 1. PRISMA-ScR Flow Diagram.

The findings were synthesized to provide an overview of the characteristics, applications, and reported outcomes. The synthesis focused on mapping the characteristics of the interventions, identifying the outcome constructs addressed in the included studies, and describing emerging research patterns and trends across different geographical and methodological contexts. The extracted findings were organized into derived categories based on the information reported in the included studies, rather than being restricted to predefined evaluative themes. This approach allowed the reviewers to identify similarities, differences, and potential relationships between intervention characteristics and the reported outcomes while maintaining the exploratory nature of the scoping review. Particular attention was given to the ways in which emotion regulation and spiritual well-being were conceptualized, measured, and reported, including whether these outcomes were examined directly or discussed as broader implications of the interventions. The synthesis also considered the distribution of study designs, participant characteristics, intervention delivery approaches, technological features, and outcome measurement instruments to provide contextual insight into the scope and methodological diversity of the available evidence. In accordance with established scoping review guidance, a formal risk-of-bias assessment was not conducted because the primary purpose of this review was to map the extent, nature, and characteristics of the existing literature rather than evaluate the methodological quality or effectiveness of individual interventions. Relevant methodological characteristics, including research design, sampling approaches, participant recruitment procedures, intervention descriptions, and outcome measurement strategies, were charted to help readers understand the strengths, limitations, and nature of the available evidence base.

The findings were interpreted descriptively, without attempting to establish causal relationships, calculate pooled intervention effects, or draw conclusions regarding the clinical effectiveness of VR-ERT. As this study involved the analysis and synthesis of previously published literature, no direct human participants or experimental animals were recruited, observed, or subjected to research procedures. Therefore, ethical approval was not required for this scoping review. However, ethical principles and academic integrity were maintained throughout the review process by ensuring transparency in study identification, selection, data extraction, and synthesis; accurately representing the findings reported in the original publications; providing appropriate citations for all included studies; and avoiding data fabrication, manipulation, selective reporting, or misinterpretation of the original evidence. Particular care was taken to preserve the intended meaning of the findings and acknowledge the limitations of the available literature without making

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E-ISSN: 2579-7751 P-ISSN: 2579-8472

unsupported claims regarding the potential benefits of VR-based interventions. The reviewers also sought to distinguish clearly between findings directly supported by empirical evidence and broader implications that may warrant further investigation.

Result

Effectiveness of VR-ERT on Emotion Regulation

The synthesis of the included studies demonstrates consistent evidence supporting the effectiveness of VR-ERT in improving emotion regulation capacities among self-harming university students. As mapped in the table **(Table 1)**, VR-ERT interventions utilize multiple regulatory mechanisms, including cognitive reappraisal, exposure-based emotional resilience training, physiological awareness through biofeedback, and adaptive coping implementation. These mechanisms are delivered through immersive and interactive virtual environments that enable participants to engage in real-time emotional processing within controlled therapeutic scenarios. Specifically, several studies employing interactive VR scenarios incorporated cognitive restructuring and reappraisal strategies, which were associated with improvements in distress tolerance and reductions in maladaptive cognitive responses. Other interventions utilized exposure-based simulations to enhance emotional resilience and self-efficacy in distress management, resulting in decreased emotional reactivity and improved behavioral coping. In addition, VR-enhanced biofeedback interventions were found to facilitate physiological awareness of emotional arousal, enabling participants to recognize distress markers and regulate stress responses more effectively.

The immersive nature of VR allows individuals to confront and regulate their emotional responses in real time, making it a valuable tool for individuals who struggle with maladaptive coping mechanisms, such as self-harm (Macey et al., 2022; Maggio et al., 2024). VR provides an opportunity for exposure-based learning, wherein individuals engage in simulated emotionally challenging scenarios and practice emotion regulation techniques in a safe, controlled setting. This exposure helps reduce emotional reactivity over time and strengthens self-efficacy in managing distressing emotions without resorting to self-harm (Alhammad, 2024; Chittaro et al., 2024; Cortez-Vázquez et al., 2024; Hanshans et al., 2024; Kerr et al., 2023; Lüddecke & Felnhofer, 2022; Mazgelytė et al., 2022; Pratviel et al., 2024; Shi et al., 2023). VR's interactive features may increase user engagement and motivation, making it more appealing than traditional CBT or DBT for some individuals (Curtiss et al., 2021; Gkintoni et al., 2024; Halkiopoulos et al., 2025; Kahlon et al., 2023; Kunzler et al., 2020). These findings indicate that VR-ERT supports emotion regulation through multimodal mechanisms targeting cognitive, physiological, and behavioral outcome domains. The distribution of these regulatory outcomes across the included studies is presented in the table **(Table 2)**, highlighting coping enhancement and cognitive reappraisal as the most frequently reported intervention targets.

VR-ERT and Spiritual Well-Being

VR-ERT interventions demonstrate potential benefits for enhancing spiritual well-being through the promotion of mindfulness, self-awareness, existential meaning, and social connectedness. As illustrated in the table **(Table 3)**, VR-based environments designed for meditation, reflective interaction, empathy simulation, and perspective-taking were associated with improvements in psychological targets related to emotional balance, personal values, and isolation reduction. Immersive mindfulness-based VR environments were linked to increased present-moment awareness, emotional acceptance, and relaxation, contributing to reductions in psychological distress and improved emotional tolerance. Reflective virtual environments were also found to promote existential meaning by encouraging self-reflection on personal values and life purpose. VR interventions incorporating empathy-based simulations and virtual social interaction were associated with increased feelings of connectedness and belonging. These outcomes are particularly relevant for self-harming individuals who experience emotional detachment and social isolation. The mapped constructs in the table indicate that mindfulness and coping-related improvements represent the most frequently reported domains associated with spiritual well-being across the reviewed interventions. These studies suggest that immersive VR environments designed with meditative landscapes, guided mindfulness exercises, and self-reflection prompts can promote inner peace and emotional resilience (Cawley & Tejeiro, 2024; Gao et al., 2024; Hanna et al., 2025; Ong et al., 2024; Puente-Torre et al., 2024; Xu et al., 2024). Some VR applications facilitate relaxation and introspection as the application include guided meditation sessions in serene virtual environments such as forests, beaches, or sacred spaces (Cawley & Tejeiro, 2024; Gao et al., 2024; Hanna et al., 2025; Ong et al., 2024; Xu et al., 2024). Studies have found that VR interventions that simulate compassionate interactions, such as guided exercises in empathy and perspective-taking (Aguirre-Calan et al., 2024; Elzie & Shaia, 2021; Estrada Villalba et al., 2021; Kouijzer et al., 2023; Lacle-Melendez et al., 2025; Soilis et al., 2024; Wagener et al., 2023). These findings suggest that VR-ERT contributes to emotional

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E-ISSN: 2579-7751 P-ISSN: 2579-8472

regulation and to broader dimensions of holistic well-being by facilitating adaptive emotional processing, meaning-making, and social connectedness.

Discussion

The synthesized evidence suggests that VR-ERT interventions are associated with improvements in emotional resilience, mindfulness, perceived meaning, and social connectedness across multiple therapeutic mechanisms. However, the integration of VR-ERT within the broader construct of spiritual well-being remains an emerging area with limited empirical exploration. For example, studies evaluated brief VR mindfulness sessions using stress and burnout outcomes rather than validated spiritual well-being instruments (Cawley & Tejeiro, 2024; Ong et al., 2024). Other studies examined reflection on personal values and personal challenges, which are only conceptually related to existential meaning (Elzie & Shaia, 2021; Wagener et al., 2023). The identified thematic domains provide a structured understanding of how immersive environments may facilitate adaptive emotional processing and meaning-making. Mental health nurses are among the key clinical gatekeepers for adopting therapeutic VR in psychiatric services (Chung et al., 2022). Within this role, they can act as facilitators who assess students' readiness and self-harm risk before immersion, help select appropriate VR content, and conduct post-session debriefing to help students translate their in-VR emotional experiences into personal meaning and coping plans. To effectively prepare future nurses for these responsibilities, VR-based simulation has been shown to strengthen nursing students' competence in mental health care. VR-ERT interventions mapped in this review commonly incorporate real-time simulations of challenging situations, often accompanied by biofeedback mechanisms that facilitate immediate awareness of physiological responses. In several studies?, immersive environments integrating mindfulness-based exercises were reported to support self-reflection, present-moment awareness, and constructs conceptually related to spiritual well-being, which may be particularly relevant for individuals experiencing emotional distress and self-harming tendencies (Bai et al., 2024; Cawley & Tejeiro, 2024; Gao et al., 2024; Hanna et al., 2025; Ong et al., 2024; Puente-Torre et al., 2024; Xu et al., 2024). CBT and DBT remain widely recognized for supporting emotion regulation through cognitive restructuring and distress tolerance strategies. Within this context, the reviewed interventions position VR-ERT as a potential adjunct modality that enables experiential rehearsal of regulatory strategies within simulated environments. Within this adjunct role, nurses can integrate VR-ERT into care plans by reinforcing the cognitive restructuring and distress tolerance skills taught in CBT or DBT, scheduling VR practice between therapy sessions, and linking each session to the student's safety plan. During and after immersion, they also monitor the student's emotional responses and manage adverse effects such as cybersickness.

The synthesized evidence further indicates that VR-based emotion regulation interventions frequently utilize interactive and scenario-based formats that allow users to engage with simulated high-stress situations in a controlled setting (Colombo et al., 2021; Hanshans et al., 2024; Macey et al., 2022). This experiential approach may provide opportunities for practicing adaptive coping strategies beyond verbal or introspective therapeutic formats. Several interventions also incorporated real-time feedback features, which were associated with increased emotional awareness and monitoring of physiological stress responses during evocative tasks (Chittaro et al., 2024; Kerr et al., 2023; Lüddecke & Felnhofer, 2022; Mazgelytė et al., 2022; Shi et al., 2023). The reviewed studies often described gamified or interactive intervention components designed to enhance user engagement and motivation within therapeutic training contexts. Participants engaging in VR-supported formats were reported to demonstrate higher levels of adherence and completion in emotion regulation training protocols compared to conventional delivery modes in some studies (Gkintoni et al., 2024; Kahlon et al., 2023; Pratviel et al., 2024). These findings suggest that immersive and interactive environments may contribute to intervention engagement, although such observations should be interpreted within the exploratory scope of the included evidence. Mental health nurses can sustain this engagement through the therapeutic relationship by providing motivational support to complete VR sessions and monitoring attendance and early signs of disengagement. They can also integrate spiritual care, such as exploring meaning, hope, and religious coping, into follow-up conversations. VR-based delivery was also discussed as a way to improve access for university students who face stigma or logistical barriers to in-person care. Some interventions explored self-guided or therapist-assisted VR applications that could offer flexible engagement with emotion regulation training in non-clinical environments (Blackmore et al., 2024; Pallavicini et al., 2022). Community and campus health nurses can extend VR-ERT beyond clinical settings by embedding VR sessions into university health centres and student counselling services. Within these accessible spaces, they can conduct routine screening for self-harm and emotional distress, refer high-risk students to specialist care, and involve peers and families in follow-up. They are well placed to adapt VR content to local cultural and religious values within community psychiatric nursing.

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Table 1. Evidence mapping of VR-ERT mechanisms for emotion regulation.

Study	Population	VR Modality	Regulation Mechanism	Outcome Domain	Reported Effect
Macey et al., 2022	University students	Interactive VR scenarios	Cognitive reappraisal	Distress tolerance	Improved adaptive coping
Maggio et al., 2024	Self-harming students	Immersive VR training	Emotional skills training	Emotion regulation	Improved regulation ability
Lüddecke & Felnhofer, 2022	Young adults	Biofeedback VR	Physiological awareness	Emotional arousal	Reduced distress response
Mazgelytė et al., 2022	Self-harming students	Exposure simulation	Emotional resilience	Emotional reactivity	Reduced reactivity
Kerr et al., 2023	Students	VR exposure therapy	Self-efficacy training	Distress management	Improved coping ability
Shi et al., 2023	Young adults	Real-time VR feedback	Adaptive coping	Stress regulation	Reduced anxiety response
Alhammad, 2024	University students	Trigger simulation VR	Emotional awareness	Emotional recognition	Increased awareness
Chittaro et al., 2024	Students	Scenario-based VR	Stress exposure training	Emotional control	Improved stress regulation
Cortez-Vázquez et al., 2024	Self-harming individuals	VR-based intervention	Coping enhancement	Behavioral response	Improved coping strategy
Hanshans et al., 2024	Young adults	Reappraisal VR training	Cognitive restructuring	Self-destructive response	Reduced maladaptive behavior
Pratviel et al., 2024	Students	Gamified VR	Motivational engagement	Therapy adherence	Increased engagement
Kunzler et al. 2020	Young adults	Guided VR training	Cognitive restructuring	Thought regulation	Improved adaptive thinking
Curtiss et al., 2021	Students	VR-supported therapy	Emotional modulation	Dysregulation	Complemented CBT/DBT
Halkiopoulos et al., 2025	University students	Virtual environment	Cognitive reframing	Negative thinking	Reduced maladaptive cognition
Kahlon et al., 2023	Students	VR therapy modules	Emotional engagement	Therapy participation	Increased engagement
Gkintoni et al., 2024	Young adults	Gamified VR therapy	Behavioral activation	Treatment motivation	Enhanced participation

Table 2. Distribution of outcome domains.

Outcome Domain	Number of Studies
Cognitive reappraisal	5
Emotional resilience	4
Physiological awareness	3
Coping enhancement	6
Mindfulness	5
Existential meaning	2
Connectedness	3

Several gaps in the current evidence base were identified. For instance, most included studies examined VR interventions using standardized formats with limited exploration of personalization based on individual differences in personality traits, cultural background, or underlying motivations for self-harming behavior. Standardized formats refer to every participant received the same pre-programmed VR content, with a fixed scenario, session length, and number of sessions, rather than content to individual needs. Variability in the functional motivations for self-harm suggests that different users may respond differently to immersive intervention components emphasizing sensory engagement,

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E-ISSN: 2579-7751 P-ISSN: 2579-8472

reflective practices, or structured coping strategies. Furthermore, the majority of reviewed interventions were developed within Western contexts, where spiritual well-being is frequently conceptualized through mindfulness and individual self-reflection. This raises questions regarding the applicability of such approaches across diverse sociocultural and spiritual frameworks. Only a few included studies were conducted in Eastern settings, and these largely adopted secular mindfulness or relaxation content (Ong et al., 2024; Gao et al., (2024). Outside the included studies, evidence from Muslim-majority settings shows that religious content can be embedded in VR: VR combined with murattal Al-Qur'an (Surah Ar-Rahman) reduced anxiety among adult emergency department patients in Indonesia (Nugroho et al., 2023). VR nature scenes with Arabic guided meditation that included Islamic elements reduced intraoperative anxiety among Palestinian patients (Mansor et al., 2025). These examples suggest that VR-ERT for self-harming students in Eastern contexts, including Indonesia, could integrate culturally and religiously meaningful practices such as prayer, dhikr, or Qur'anic recitation, although such adaptations have not yet been tested in this population (Ghuloum et al., 2024).

Table 3. Mapping of VR-based interventions and spiritual well-being constructs.

Study	VR environment type	Spiritual construct	Psychological target	Reported outcome
Cawley & Tejeiro, 2024	Meditation VR	Mindfulness	Present awareness	Increased relaxation
Gao et al., 2024	Immersive VR nature	Mindfulness	Emotional acceptance	Reduced distress
Puente-Torre et al., 2024	Guided meditation VR	Psychological flexibility	Self-reflection	Improved adaptability
Xu et al., 2024	Spiritual landscape VR	Emotional resilience	Emotional balance	Increased resilience
Hanna et al., 2025	Mindfulness VR training	Stress tolerance	Emotional awareness	Increased tolerance
Ong et al., 2024	Reflective VR space	Self-awareness	Emotional insight	Improved emotional balance
Elzie & Shaia, 2021	Reflective VR interaction	Existential meaning	Personal values	Increased purpose
Estrada Villalba et al., 2021	Empathy simulation	Connectedness	Social cognition	Improved belonging
Kouijzer et al., 2023	Virtual interaction	Social connectedness	Isolation reduction	Increased belonging
Wagener et al., 2023	Perspective-taking VR	Compassion	Emotional balance	Enhanced well-being

The integration of responsive elements remains limited within current VR-ERT designs including community-based reflection or spiritually meaningful practices. Longitudinal evaluations, that is, repeated follow-up assessments of the same participants for weeks or months after the intervention ends (e.g., at 3, 6, or 12 months) to determine whether emotional or spiritual outcomes are sustained, were scarce. Most studies relied on short-term intervention designs with immediate post-intervention assessments, limiting insights into the durability of reported outcomes (Cawley & Tejeiro, 2024; Mazgelytė et al., 2022; Ong et al., 2024). Future research may benefit from examining the conceptualization, adaptability in the term of culture, accessibility, and long-term implementation of VR-based emotion regulation interventions. Governments can optimize the use of VR-ERT by integrating digital mental health interventions, including VR, into national mental health and campus well-being policies; funding research and the provision of VR equipment in university health services, particularly in low-resource settings; establishing regulations and ethical standards for safety, data privacy, and clinical validation of VR applications; and supporting the training of nurses and other health professionals to deliver VR-based care. These actions are consistent with the recommendation that digital health interventions should complement, rather than replace, functioning health systems and should be implemented with attention to feasibility, equity, and resource use (World Health Organization, 2019).

Conclusion

This scoping review mapped the current evidence on VR-ERT and its associations with emotional regulation processes and spiritual well-being among university students who self-harm. The findings indicate that existing VR interventions frequently leverage immersive environments to promote real-time emotional awareness, cognitive reappraisal, mindfulness, and self-reflection. However, the integration of spiritual well-being constructs within VR-ERT remains conceptually inconsistent and empirically underexplored. Furthermore, this review identified critical gaps in the literature, including a lack of longitudinal evaluations, limited cultural adaptation of spiritually oriented modules, and wide variability in outcome measures assessing emotional and holistic well-being. Future research should standardize how these interventions are conceptualized, implemented, and evaluated across diverse psychosocial and cultural contexts.

Acknowledgments

The authors express deepest gratitude to all colleagues, mentors, and institutions that contributed to the successful completion of this work through guidance, insightful feedback, and technical support.

AI statements

The authors declare that generative artificial intelligence (AI) tools, specifically ChatGPT by OpenAI, were used during the preparation of this manuscript solely to assist with language editing, grammar refinement, and the improvement of clarity and coherence. The AI tool was not used to design the study, collect data, analyze data, interpret the results, or generate original scientific content. All intellectual contributions, interpretations, and conclusions presented in this manuscript are the authors' responsibility. The authors have carefully reviewed, verified, and approved the final version of the manuscript in accordance with the ethical publishing standards.

Author's declaration

All authors made substantial contributions to the conception and design of the study, as well as the data analysis, interpretation, and discussion of the results. Furthermore, all authors participated in drafting and revising the manuscript and approved the final version for publication.

Availability of data and materials

All data extracted from the included articles for analysis are presented in the table for assessment and evaluation.

Competing interests

The authors declare no conflicts of interest related to this review.

Ethical clearance

Ethical approval was not required for this study as it is a review.

Funding

This review received no grant or financial support during the preparation.

Publishers and journal's note

Mapping evidence or literature about VR-ERT training and its impact on spiritual well-being is highly important. The authors have presented excellent work on this topic, as their findings will meaningfully contribute to supporting nursing students' well-being at both national and international levels.

References

Abbasi-Ghahramanloo, A., Khodadoust, B., Adham, D., Gholami, A., Farokhi, R., Maghsodlou-Nejad, V., & Afrashteh, S. (2024). Non-suicidal self-injury and its risk factors among Iranian high school and university students. *Frontiers In Psychiatry, 15,* 1425411. https://doi.org/10.3389/fpsyt.2024.1425411

Aguirre-Calan, G. M., Mejía-Jálabe, A., Romero-Torres, J. A., & Morillo-Andrade, A. (2024). Assessment of the impact of virtual reality on empathy and learning in university students. *International Journal of Religion, 5*(11 SE-Articles), 6209 – 6225. https://doi.org/10.61707/2whvbg90

JHNS
Journal of Holistic Nursing Science
E-ISSN: 2579-7751 P-ISSN: 2579-8472

Alhammad, S. A. (2024). Advocating for action: Exploring the potential of virtual reality in breathing exercise - a review of the clinical applications. *Patient Preference and Adherence, 18,* 695–707. https://doi.org/10.2147/PPA.S451609

Bai, R., Liu, J., Gao, Y., Wang, Y., & Liu, X. (2024). Influence of stress on self-injury among Chinese left-behind adolescents is not cast in stone: Synergistic roles of family protective factors. *Child Abuse and Neglect, 154*. https://doi.org/10.1016/j.chiabu.2024.106948

Benchimol-Elkaim, B., Khoury, B., & Tsimicalis, A. (2024). Nature-based mindfulness programs using virtual reality to reduce pediatric perioperative anxiety: A narrative review. *Frontiers in Pediatrics, 12,* 1334221. https://doi.org/10.3389/fped.2024.1334221

Bettis, A. H., Liu, R. T., Walsh, B. W., & Klonsky, E. D. (2020). Treatments for self-injurious thoughts and behaviors in youth: Progress and challenges. *Evidence-Based Practice in Child and Adolescent Mental Health, 5*(3), 354–364. https://doi.org/10.1080/23794925.2020.1806759

Blackmore, R., Giles, C., Tremain, H., Kelly, R., Foley, F., Fletcher, K., Nedeljkovic, M., Wadley, G., Seabrook, E., & Thomas, N. (2024). Examining the use of virtual reality to support mindfulness skills practice in mood and anxiety disorders: Mixed methods study. *Journal of Medical Internet Research, 26,* e45640. https://doi.org/10.2196/45640

Boeldt, D., McMahon, E., McFaul, M., & Greenleaf, W. (2019). using virtual reality exposure therapy to enhance treatment of anxiety disorders: Identifying areas of clinical adoption and potential obstacles. *Frontiers in Psychiatry, 10,* 773. https://doi.org/10.3389/fpsyt.2019.00773

Camp, J., Blundell, E., Smith, P., & Rimes, K. A. (2025). Emotion regulation differences between gender and sexuality groups: A systematic review and meta-analysis. *Archives of Sexual Behavior, 54*(10), 3957–3994. https://doi.org/10.1007/s10508-025-03276-2

Carl, E., Stein, A. T., Levihn-Coon, A., Pogue, J. R., Rothbaum, B., Emmelkamp, P., Asmundson, G. J. G., Carlbring, P., & Powers, M. B. (2019). Virtual reality exposure therapy for anxiety and related disorders: A meta-analysis of randomized controlled trials. *Journal of Anxiety Disorders, 61,* 27–36. https://doi.org/10.1016/j.janxdis.2018.08.003

Cawley, A., & Tejeiro, R. (2024). Brief virtual reality mindfulness is more effective than audio mindfulness and colouring in reducing stress in university students. *Mindfulness, 15*(2), 272–281. https://doi.org/10.1007/s12671-024-02306-9

Chittaro, L., Serafini, M., & Vulcano, Y. (2024). Virtual reality experiences for breathing and relaxation training: The effects of real vs. placebo biofeedback. *International Journal of Human-Computer Studies, 188,* 103275. https://doi.org/https://doi.org/10.1016/j.ijhcs.2024.103275

Christoforou, R., Boyes, M., & Hasking, P. (2021). Emotion profiles of university students engaging in non-suicidal self-injury: Association with functions of self-injury and other mental health concerns. *Psychiatry Research, 305,* 114253. https://doi.org/10.1016/j.psychres.2021.114253

Chung, O. S., Robinson, T., Johnson, A. M., Dowling, N. L., Ng, C. H., Yücel, M., & Segrave, R. A. (2022). Implementation of therapeutic virtual reality into psychiatric care: Clinicians' and service managers' perspectives. *Frontiers in Psychiatry, 12*. https://doi.org/10.3389/fpsyt.2021.791123

Cipriano, A., Cella, S., & Cotrufo, P. (2017). Nonsuicidal self-injury: A systematic review. *Frontiers in Psychology, 8*(NOV), 1–14. https://doi.org/10.3389/fpsyg.2017.01946

Cloninger, C. R. (2006). The science of well-being: An integrated approach to mental health and its disorders. *World Psychiatry, 5*(2), 71–76.

Colombo, D., Díaz-García, A., Fernandez-Álvarez, J., & Botella, C. (2021). Virtual reality for the enhancement of emotion regulation. *Clinical Psychology & Psychotherapy, 28*(3), 519–537. https://doi.org/10.1002/cpp.2618

Cortez-Vázquez, G., Adriaanse, M., Burchell, G. L., Ostelo, R., Panayiotou, G., & Vlemincx, E. (2024). Virtual reality breathing interventions for mental health: A systematic review and meta-analysis of randomized controlled trials. *Applied Psychophysiology and Biofeedback, 49*(1), 1–21. https://doi.org/10.1007/s10484-023-09611-4

Cunha, O., Pereira, B., Sousa, M., & Rodrigues, A. C. (2024). Cognitive behavioural "third wave" therapies in the treatment of justice-involved individuals: A systematic review. *Aggression and Violent Behavior, 76,* 101923. https://doi.org/https://doi.org/10.1016/j.avb.2024.101923

Curtiss, J. E., Levine, D. S., Ander, I., & Baker, A. W. (2021). Cognitive-behavioral treatments for anxiety and stress-related disorders. *Focus, 19*(2), 184–189. https://doi.org/10.1176/appi.focus.20200045

Dixon, L. J., & Linardon, J. (2020). A systematic review and meta-analysis of dropout rates from dialectical behaviour therapy in randomized controlled trials. *Cognitive Behaviour Therapy, 49*(3), 181–196. https://doi.org/10.1080/16506073.2019.1620324

Domènech-Sorolla, J., Fernández-Pascual, M. D., Pedregosa-Fauste, S., García-Díaz, F., & Martínez-Rodríguez, L. (2025). Undergraduate nursing students' perceptions and experiences of learning spiritual competencies: A qualitative meta-synthesis. *Nurse Education Today, 147*. https://doi.org/10.1016/j.nedt.2025.106585

du Plessis, J., & Jordaan, J. (2024). The impact of virtual reality on the psychological well-being of hospitalised patients: A critical review. *Heliyon, 10*(2), e24831. https://doi.org/10.1016/j.heliyon.2024.e24831

Elzie, C. A., & Shaia, J. (2021). A pilot study of the impact of virtually embodying a patient with a terminal illness. *Medical Science Educator, 31*(2), 665–675. https://doi.org/10.1007/s40670-021-01243-9

Estrada Villalba, É., San Martín Azócar, A. L., & Jacques-García, F. A. (2021). State of the art on immersive virtual reality and its use in developing meaningful empathy. *Computers & Electrical Engineering, 93,* 107272. https://doi.org/10.1016/j.compeleceng.2021.107272

Fernandez, E., Salem, D., Swift, J. K., & Ramtahal, N. (2015). Meta-analysis of dropout from cognitive behavioral therapy: Magnitude, timing, and moderators. *Journal of Consulting and Clinical Psychology, 83*(6), 1108–1122. https://doi.org/10.1037/ccp0000044

Gao, D., Su, Y., Zhang, X., Li, H., & Luo, H. (2024). The application of virtual reality meditation and mind-body exercises among older adults. *Frontiers in Psychology, 15,* 1303880. https://doi.org/10.3389/fpsyg.2024.1303880

Ghorbani, S., Kameneh, A., Motahedy, A., & Alipour, Z. (2020). Comparative effectiveness of cognitive-behavioral therapy and dialectical behavior therapy on emotion regulation, positive and negative affection, aggressive and self-harm behaviors of 13-16-year-old female students. *International Journal of Multicultural and Multireligious Understanding, 7,* 20. https://doi.org/10.18415/ijmmu.v7i9.1883

Ghuloum, S., Al-Thani, H. A. Q. F., & Al-Amin, H. (2024). Religion and mental health: An Eastern Mediterranean region perspective. *Frontiers in Psychology, 15,* 1441560. https://doi.org/10.3389/fpsyg.2024.1441560

Gkintoni, E., Vantaraki, F., Skoulidi, C., Anastassopoulos, P., & Vantarakis, A. (2024). Gamified health promotion in schools: The integration of neuropsychological aspects and CBT-A systematic review. *Medicina, 60*(12). https://doi.org/10.3390/medicina60122085

Griffin, K., Twynstra, J., Gilliland, J. A., & Seabrook, J. A. (2023). Correlates of self-harm in university students: A cross-sectional study. *Journal of American College Health, 71*(3), 959–966. https://doi.org/10.1080/07448481.2021.1909049

Halkiopoulos, C., Gkintoni, E., Aroutzidis, A., & Antonopoulou, H. (2025). Advances in neuroimaging and deep learning for emotion detection: A systematic review of cognitive neuroscience and algorithmic innovations. *Diagnostics, 15*(4). https://doi.org/10.3390/diagnostics15040456

Hanna, J., Mehta, J., West, H., Keane, P., Wilson, N., & Bridge, P. (2025). Evaluation of a novel interactive virtual reality environment for mindfulness skills training. *BMC Digital Health, 3*(1), 6. https://doi.org/10.1186/s44247-024-00141-5

Hanshans, C., Amler, T., Zauner, J., & Bröll, L. (2024). Inducing and measuring acute stress in virtual reality: Evaluation of canonical physiological stress markers and measuring methods. *Journal of Environmental Psychology, 94,* 102107. https://doi.org/https://doi.org/10.1016/j.jenvp.2023.102107

Hofer, M. K., Robillard, C. L., Legg, N. K., & Turner, B. J. (2024). Influence of perceived peer behavior on engagement in self-damaging behaviors during the transition to university. *Journal of Research on Adolescence, 34*(3), 721–733. https://doi.org/10.1111/jora.12933

Horigome, T., Kurokawa, S., Sawada, K., Kudo, S., Shiga, K., Mimura, M., & Kishimoto, T. (2020). Virtual reality exposure therapy for social anxiety disorder: A systematic review and meta-Analysis. *Psychological Medicine, 50*(15), 2487–2497. https://doi.org/10.1017/S0033291720003785

Jamahneh, O. M., AL-Hammouri, M. M., Rababah, J., Hseinat, R., Alshurmman, N. K., Alshorman, A., Ta'an, W., & Saifan, F. (2025). Spiritual well-being and spiritual care competence: The mediating role of resilience and decision fatigue. *Journal of Holistic Nursing*. https://doi.org/10.1177/08980101251325285

Jingili, N., Oyelere, S. S., Nyström, M. B. T., & Anyshchenko, L. (2023). A systematic review on the efficacy of virtual reality and gamification interventions for managing anxiety and depression. *Frontiers in Digital Health, 5,* 1239435. https://doi.org/10.3389/fdgth.2023.1239435

Jo, M., Kim, E., & Lee, J. (2024). Virtual reality vs. imagery: Comparing approaches in guided meditation. *Frontiers in Psychology, 15,* 1472780. https://doi.org/10.3389/fpsyg.2024.1472780

Kahlon, S., Lindner, P., & Nordgreen, T. (2023). Gamified virtual reality exposure therapy for adolescents with public speaking anxiety: A four-armed randomized controlled trial. *Frontiers in Virtual Reality, 4*(August), 1–16. https://doi.org/10.3389/frvir.2023.1240778

JHNS
Journal of Holistic Nursing Science
E-ISSN: 2579-7751 P-ISSN: 2579-8472

Kerr, J. I., Weibel, R. P., Naegelin, M., Ferrario, A., Schinazi, V. R., La Marca, R., Hoelscher, C., Nater, U. M., & von Wangenheim, F. (2023). The effectiveness and user experience of a biofeedback intervention program for stress management supported by virtual reality and mobile technology: A randomized controlled study. *BMC Digital Health, 1*(1), 42. https://doi.org/10.1186/s44247-023-00042-z

Kiekens, G., Hasking, P., Bruffaerts, R., Alonso, J., Auerbach, R. P., Bantjes, J., Benjet, C., Boyes, M., Chiu, W. T., Claes, L., Cuijpers, P., Ebert, D. D., Mak, A., Mortier, P., O'Neill, S., Sampson, N. A., Stein, D. J., Vilagut, G., Nock, M. K., & Kessler, R. C. (2023). Non-suicidal self-injury among first-year college students and its association with mental disorders: Results from the World Mental Health International College Student (WMH-ICS) initiative. *Psychological Medicine, 53*(3), 875–886. https://doi.org/10.1017/S0033291721002245

Kim, G. M., Lim, J. Y., Kim, E. J., & Yeom, M. (2024). Impact of virtual reality mental health nursing simulation on nursing students' competence. *Journal of Multidisciplinary Healthcare, 17,* 191–202. https://doi.org/10.2147/JMDH.S435986

Kingsbury, M., Reme, B.-A., Skogen, J. C., Sivertsen, B., Øverland, S., Cantor, N., Hysing, M., Petrie, K., & Colman, I. (2021). Differential associations between types of social media use and university students' non-suicidal self-injury and suicidal behavior. *Computers in Human Behavior, 115,* 106614. https://doi.org/https://doi.org/10.1016/j.chb.2020.106614

Kouijzer, M. M. T. E., Kip, H., Bouman, Y. H. A., & Kelders, S. M. (2023). Implementation of virtual reality in healthcare: A scoping review on the implementation process of virtual reality in various healthcare settings. *Implementation Science Communications, 4*(1), 67. https://doi.org/10.1186/s43058-023-00442-2

Kunzler, A. M., Helmreich, I., Chmitorz, A., König, J., Binder, H., Wessa, M., & Lieb, K. (2020). Psychological interventions to foster resilience in healthcare professionals. *The Cochrane Database of Systematic Reviews, 7*(7), CD012527. https://doi.org/10.1002/14651858.CD012527.pub2

Lacle-Melendez, J., Silva-Medina, S., & Bacca-Acosta, J. (2025). Virtual and augmented reality to develop empathy: A systematic literature review. *Multimedia Tools and Applications, 84*(11), 8893–8927. https://doi.org/10.1007/s11042-024-19191-y

Leong, W. Y. (2025). Virtual reality in phobia treatment and emotional resilience. *Engineering Proceedings, 108*(1), 16. https://doi.org/10.3390/engproc2025108016

Li Pira, G., Aquilini, B., Davoli, A., Grandi, S., & Ruini, C. (2023). The use of virtual reality interventions to promote positive mental health: Systematic literature review. *JMIR Mental Health, 10*, e44998. https://doi.org/10.2196/44998

Liljedahl, S. I., Daukantaitė, D., Kleindienst, N., Wångby-Lundh, M., & Westling, S. (2023). The five self-harm behavior groupings measure: Empirical and thematic data from a novel comprehensive self-harm assessment. *Frontiers In Psychiatry, 14,* 1147206. https://doi.org/10.3389/fpsyt.2023.1147206

Lüddecke, R., & Felnhofer, A. (2022). Virtual reality biofeedback in health: A scoping review. *Applied Psychophysiology and Biofeedback, 47*(1), 1–15. https://doi.org/10.1007/s10484-021-09529-9

Lurigio, A. J., Nesi, D., & Meyers, S. M. (2024). Nonsuicidal self injury among young adults and adolescents: Historical, cultural and clinical understandings. *Social Work in Mental Health, 22*(1), 122–148. https://doi.org/10.1080/15332985.2023.2264434

Ma, J., Zhao, D., Xu, N., & Yang, J. (2023). The effectiveness of immersive virtual reality (VR) based mindfulness training on improvement mental-health in adults: A narrative systematic review. *Explore (New York, N.Y.), 19*(3), 310–318. https://doi.org/10.1016/j.explore.2022.08.001

Macey, A.-L., Macey, J., & Hamari, J. (2022). Virtual reality in emotion regulation: A scoping review. *Proceedings of the 6th International GamiFIN Conference 2022* (GamiFIN 2022), 64–74. https://researchportal.tuni.fi/en/publications/virtual-reality-in-emotion-regulation-a-scoping-review/

Maggio, M. G., Benenati, A., Impellizzeri, F., Rizzo, A., Barbera, M., Cannavò, A., Gregoli, V., Morone, G., Chirico, F., Quartarone, A., & Calabrò, R. S. (2024). Impact of cognitive VR vs. traditional training on emotional self-efficacy and cognitive function in patients with multiple sclerosis: A retrospective study focusing on gender differences. *Brain Sciences, 14*(12), 1227. https://doi.org/10.3390/brainsci14121227

Mak, S., & Thomas, A. (2022). Steps for conducting a scoping review. *Journal of Graduate Medical Education, 14*(5), 565–567. https://doi.org/10.4300/JGME-D-22-00621.1

Mansor, K., Abdellatif, S. A., & Mohamed, N. A. (2025). Virtual reality for reducing intraoperative anxiety and improving patient satisfaction under regional anesthesia among palestinian patients: A randomized controlled trial. *BMC Anesthesiology, 25*(1). https://doi.org/10.1186/s12871-025-03475-3

Mazgelytė, E., Zagorskaja, J., Dereškevičiūtė, E., Petrėnas, T., Kaminskas, A., Songailienė, J., Utkus, A., Chomentauskas, G., & Karčiauskaitė, D. (2022). Dynamics of physiological, biochemical and psychological markers during single session of virtual reality-based respiratory biofeedback relaxation. *Behavioral Sciences, 12*(12), 482. https://doi.org/10.3390/bs12120482

Montana, J. I., Matamala-Gomez, M., Maisto, M., Mavrodiev, P. A., Cavalera, C. M., Diana, B., Mantovani, F., & Realdon, O. (2020). The benefits of emotion regulation interventions in virtual reality for the improvement of wellbeing in adults and older adults: A systematic review. *Journal of Clinical Medicine, 9*(2), 500. https://doi.org/10.3390/jcm9020500

Nugroho, E., Yusuf, A., & Wahyuni, E. D. (2023). Virtual reality therapy murottal Al-Qur'an surah Ar-Rahman menurunkan tingkat kecemasan pasien dewasa non bedah [Virtual reality therapy using qur'anic recitation of surah Ar-Rahman reduces anxiety levels in adult non-surgical patients]. *NURSCOPE: Jurnal Penelitian dan Pemikiran Ilmiah Keperawatan, 9*(2), 82–93. http://dx.doi.org/10.30659/nurscope.9.2.82-93

Ong, J., Doshi, K., Chew, K. H., Tay, J. H. M., & Foo, J. J.-C. (2024). The effectiveness of immersive VR 360 mindfulness for the reduction of stress and burnout among teachers. *Mental Health and Digital Technologies, 2*(1), 20–31. https://doi.org/10.1108/MHDT-10-2024-0026

Page, M. J., & Moher, D. (2017). Evaluations of the uptake and impact of the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) Statement and extensions: A scoping review. *Systematic Reviews, 6*(1), 263. https://doi.org/10.1186/s13643-017-0663-8

Pallavicini, F., Orena, E., Achille, F., Cassa, M., Vuolato, C., Stefanini, S., Caragnano, C., Pepe, A., Veronese, G., Ranieri, P., Fascendini, S., Defanti, C. A., Clerici, M., & Mantovani, F. (2022). Psychoeducation on stress and anxiety using virtual reality: A mixed-methods study. *Applied Sciences, 12*(18), 9110. https://doi.org/10.3390/app12189110

Pratviel, Y., Bouny, P., & Deschodt-Arsac, V. (2024). Immersion in a relaxing virtual reality environment is associated with similar effects on stress and anxiety as heart rate variability biofeedback. *Frontiers in Virtual Reality, 5*(April), 1–13. https://doi.org/10.3389/frvir.2024.1358981

Puente-Torre, P., Delgado-Benito, V., Rodríguez-Cano, S., & García-Delgado, M. Á. (2024). Virtual reality as an interactive tool for the implementation of mindfulness in university settings: A systematic review. *Multimodal Technologies and Interaction, 8*(10), 89. https://doi.org/10.3390/mti8100089

Putri, A. W. R., & Hariyono, D. S. (2023). Correlation between emotion regulation and self-harm tendencies in college students. *Psikodimensia: Kajian Ilmiah Psikologi, 22*(2), 103–110. https://doi.org/10.24167/psidim.v22i2.4933

Ruiz-Camacho, C., & Gozalo, M. (2025). Predicting university students' stress responses: The role of academic stressors and sociodemographic variables. *European Journal of Investigation in Health, Psychology and Education, 15*(8). https://doi.org/10.3390/ejihpe15080163

Sawab, S., Yusuf, A., Fitryasari, R., & Arifin, H. (2024). Spirituality and recovery from severe mental disorders: A systematic review. *Journal of Psychosocial Nursing and Mental Health Services, 62*(8), 11–17. https://doi.org/10.3928/02793695-20240227-01

Shah, G. H., Khan, M. A., Muzamil, M., & Ahmed, M. (2025). From pressure to peril: Investigating the drivers of suicide planning and attempts in university students struggling with academic anxiety. *Behavioral Sciences, 15*(12), 1721. https://doi.org/10.3390/bs15121721

Shi, L., Liu, F., Liu, Y., Wang, R., Zhang, J., Zhao, Z., & Zhao, J. (2023). Biofeedback respiratory rehabilitation training system based on virtual reality technology. *Sensors, 23*(22), 9025. https://doi.org/10.3390/s23229025

Sivertsen, B., Skogen, J. C., Petrie, K. J., O'Connor, R. C., Knudsen, A. K. S., Kirkøen, B., Reneflot, A., Lønning, K.-J., & Hysing, M. (2025). Mental health and suicidal ideation from 2010 to 2023 among university students: National repeated cross-sectional analysis. *British Journal of Psychiatry*. https://doi.org/10.1192/bjp.2025.10435

Soilis, N., Bhanji, F., & Kinsella, E. A. (2024). Virtual reality simulation for facilitating critical reflection and transformative learning: Pedagogical, practical, and ethical considerations. *Advances in Simulation, 9*(1), 49. https://doi.org/10.1186/s41077-024-00319-x

Sulosaari, V., Unal, E., & Cinar, F. I. (2022). The effectiveness of mindfulness-based interventions on the psychological well-being of nurses: A systematic review. *Applied Nursing Research, 64*. https://doi.org/10.1016/j.apnr.2022.151565

Sumiko, M. (2023). Development of a culturally sensitive recovery-oriented nursing care model in community psychiatric nursing. *Journal of Psychosocial Nursing and Mental Health Services, 61*(8), 25–33. https://doi.org/10.3928/02793695-20221202-01

Taylor, P. J., Dhingra, K., Dickson, J. M., & McDermott, E. (2020). Psychological Correlates of Self-Harm within Gay, Lesbian and Bisexual UK University Students. *Archives of Suicide Research, 24*(sup1), 41–56. https://doi.org/10.1080/13811118.2018.1515136

JHNS
Journal of Holistic Nursing Science
E-ISSN: 2579-7751 P-ISSN: 2579-8472

Villodas, M. L. (2024). Suicidality and non-suicidal self-injury: A narrative review of measurement, risk, and disparities among minoritized and system-involved youth in the USA. *Children, 11*(4), 466. https://doi.org/10.3390/children11040466

Wagener, N., Reicherts, L., Zargham, N., Bartłomiejczyk, N., Scott, A. E., Wang, K., Bentvelzen, M., Stefanidi, E., Mildner, T., Rogers, Y., & Niess, J. (2023). SelVReflect: A guided vr experience fostering reflection on personal challenges. *Conference on Human Factors in Computing Systems - Proceedings, April 2023*. https://doi.org/10.1145/3544548.3580763

Wilczyńska, D., Walczak-Kozłowska, T., Alarcón, D., Arenilla, M. J., Jaenes, J. C., Hejła, M., Lipowski, M., Nestorowicz, J., & Olszewski, H. (2025). The role of immersive experience in anxiety reduction: Evidence from virtual reality sessions. *Brain Sciences, 15*(1), 14. https://doi.org/10.3390/brainsci15010014

World Health Organization. (2019, June 6). *WHO guideline: Recommendations on Digital Interventions for Health System strengthening*. www.who.int. https://www.who.int/publications/i/item/9789241550505

Xie, F., Zheng, H., & Hu, X. (2025). The effectiveness of virtual reality in enhancing mindfulness: a systematic review and meta-analysis. *Frontiers in Public Health, 13,* 1709782. https://doi.org/10.3389/fpubh.2025.1709782

Xu, J., Khanotia, A., Juni, S., Ku, J., Sami, H., Lin, V., Walterson, R., Payne, E., Jo, H., & Rahimpoor-Marnani, P. (2024). Effectiveness of virtual reality–based well-being interventions for stress reduction in young adults: Systematic review. *JMIR Mental Health, 11,* e52186. https://doi.org/10.2196/52186

Yang, B., Liao, C., Yang, Y., Shi, B., Zhang, C., & Li, C. (2024). A virtual reality-based self-guided training on identification of negative automatic thoughts in healthy adults: A mixed-methods feasibility study. *Frontiers in Psychiatry, 15,* 1479207. https://doi.org/10.3389/fpsyt.2024.1479207

Authors' insight

Key points

- VR-ERT offers an immersive and interactive environment in which university students who engage in self-harming behaviours may develop emotional awareness, emotional control, and adaptive coping strategies.
- Difficulties in regulating emotions may affect nursing students' sense of meaning, purpose, hope, and connectedness.
- Integrating VR-ERT with attention to spiritual well-being may offer new opportunities for developing more comprehensive mental health interventions.

Emerging nursing avenues

- What types of VR-based interventions have been developed or implemented to improve emotion regulation among university students who engage in self-harming behaviours?
- How does emotion regulation relate to spiritual well-being, particularly in terms of meaning in life, hope, self-acceptance, and connectedness among university students who engage in self-harming behaviours?
- What evidence is available regarding the potential impact of VR-based emotion regulation training on spiritual well-being, and what gaps remain in the existing literature?

How to cite this article (APA style)
Widagdo, P. A., Dwidiyanti, M., Anggorowati, A., Munif, B., & Dioso, R. I. P. (2026). Virtual reality-based emotion regulation training and its impact on spiritual well-being among self-harming university students: A scoping review. *Journal of Holistic Nursing Science, 13*(2), 354-367. https://doi.org/10.31603/jhns.v13i2.16048