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Complementary Therapies Interventions to Handle Stress in Nursing Students: A Scoping Review

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Abstract

Background: Nursing students are highly vulnerable to academic and clinical stress, which can negatively impact their mental health, academic performance, and professional development. In recent years, complementary therapies have gained attention as non-pharmacological alternatives to reduce stress and promote emotional well-being. **Objective:** To analyze the available evidence on the effectiveness of complementary therapy interventions for stress reduction in undergraduate nursing students. **Methods:** A scoping review was conducted following the PRISMA-ScR guidelines. Scientific articles were retrieved from databases such as PubMed, Scopus, Web of Science, Cochrane Library, SciELO, LILACS, and gray literature sources. The selection included randomized controlled trials, quasi-experimental, observational, and feasibility studies evaluating stress-reduction therapies in nursing students. A narrative synthesis was performed due to methodological heterogeneity. **Results:** Nine studies published between 2017 and 2024 were included. Interventions evaluated included mindfulness, yoga, acupressure, energetic modalities, cognitive behavioral group therapy, and flower essence therapy. All studies reported a significant reduction in perceived stress and/or improvement in stress-coping strategies. However, limitations such as small sample sizes, lack of long-term follow-up, and methodological variability were identified. **Conclusions:** Complementary therapies demonstrate potential as effective tools for stress management in nursing students. Future research should explore standardized protocols, combined therapy models, and long-term outcomes to enhance the integration of these interventions into nursing education programs.

Keywords

Complementary Therapies, Stress, Nursing Students, Scoping Review

1. Introduction

Nurse students are constantly exposed to a variety of stressors derived from academic overload, emotional demands of clinical environment, as well as their transition to their professional role [1]. Stress along academic training not only affects the psychological well-being of students, but also it compromises their academic performance, as well as their future professional development [2].

The World Health Organization (WHO) recognizes stress as an adaptative physiological response, necessary to face immediate requirements; however, when stress is intense or last long it is detrimental for mental and physical health [2]. It is estimated the by 2030 the economic burden associated with mental health issues will reach 6 billion USD, affecting mainly the young population [3].

To face this view, it is very important to consider accessible intervention strategies, no pharmacological and culturally accepted, such that they favor emotional regulation. Complementary therapies, such as mindfulness, acupressure, yoga, aromatherapy, and energetic techniques have been progressively integrated in educational and clinical contexts, as tools to promote mental health [4] [5].

These interventions would contribute to strengthen confrontation abilities, better emotional self-regulation, and diminish stress in forming students. Diverse studies have shown their positive effects in different populations; however, the specific evidence about college nursing students is still fragmented [6].

So, it is necessary to systematize the available knowledge to identify the most effective therapies, their practical applicability, and the relevant methodological elements for their implementation.

The aim of this coping review is to analyze the available scientific evidence about the efficacy of complementary therapies to reduce stress in nursing students.

2. Methodology

A scoping review was conducted following the PRISMA guidelines, with a specific focus on its extension for this type of review (PRISMA-ScR) [7]. The research question was developed using the PICO framework, where: P refers to undergraduate nursing students; I to interventions involving complementary therapies for stress management; C to students without intervention; and O to the reduction of stress symptoms. The central question was: What scientific evidence exists regarding the effectiveness of complementary therapies in reducing stress among nursing students? The protocol was registered on the INPLASY platform under the DOI number: 10.37766/INPLASY2023.4.0097.

2.1. Searching Strategies

An exhaustive search of scientific studies was conducted, consulting the following electronic databases: PubMed, Cochrane Library, Scopus, Web of Science, SciELO, and LILACS, up to march 23, 2025. Language filters were used to rescue papers in English, Spanish, and Portuguese only. In addition, the search was expanded to consult the repository TesiUNAM and in Google Scholar. The searching strategy was constructed with the relevant DeCS/MeSH descriptors, combined with Boolean operators [8]. The detailed search strategies applied are presented in **Table 1**.

Table 1. Search strategies for applied databases.

PubMed Cochrane Library Scopus Web of Science	(Stress Psychological) AND (Students Nursing) AND ("Complementary Therapies") ("Complementary Therapies" OR "Stress Management") AND ("stress" OR "Psychological Stress") AND (students nursing) ("Stress Management" OR "Stress Reduction" OR "Coping Strategies") AND ("Complementary Therapies") AND (students nursing) ("Psychological Stress") AND (students nursing) AND ("Complementary Therapies") ("Psychological Stress") AND (Complementary Therapies) AND (Students Nursing) NOT Anxiety ("Stress Management") AND ("Complementary Therapies") AND (Nursing Students) ("Stress") AND ("Stress Reduction") AND (Nursing Students) ("Stress") AND ("Complementary Therapies") ("Nursing Students") NOT Anxiety ("Complementary Therapies" OR "Stress Management") AND ("Stress" OR "Psychological Stress") AND ("Nursing Students") NOT "Pharmacological" ("Stress, Psychological" OR Stress) AND ("Students, Nursing" OR "Nursing Students" OR "Nursing Education") AND ("Complementary Therapies" OR "Mindfulness" OR "Meditation" OR "Aromatherapy" OR "Relaxation Therapy" OR "Alternative Therapies") NOT ("Pharmacological Interventions")
SciELO; LILACS TesiUNAM	("Complementary Therapies" OR "Stress Handling") AND ("Stress" OR "Psychological Stress") AND (Nursing Students) ("Stress" OR "Stress Handling") AND ("Nursing Students" OR "Nursing alumni" OR Nursing) AND ("Complementary Therapies" OR "Alternative Therapies" OR "Complementary Medicine" OR "Relax Techniques" OR Mindfulness OR Aromatherapy OR Meditation)

Note: Search strategy developed by the authors.

2.2. Inclusion and Exclusion Criteria

The inclusion criteria were: experimental, quasi-experimental, cross-sectional observational studies, and clinical trials; articles published in English, Spanish, or Portuguese; and participants who were nursing students over 18 years of age with signs or symptoms of stress.

The exclusion criteria included: letters to the editor, proceedings, conference abstracts; articles published in other languages; and studies involving participants diagnosed with severe mental illness with cognitive impairment, as well as interventions not aimed at stress reduction.

2.3. Articles Selection

Paper selection was independently carried out by two reviewers using a datasheet based on the defined criteria. The process included: removal of duplicates, initial screening by title and abstract, and full-text review to determine eligibility. Discrepancies were resolved by consensus.

2.4. Data Extraction

The selection was carried out independently by two reviewers using a spreadsheet based on the predefined criteria. The process included: removal of duplicates, initial screening by title and abstract, and full-text review to determine eligibility. Disagreements were resolved by consensus [9].

2.5. Analysis and Data Synthesis

Bias analysis and the graphical representation of results used Review Manager (RevMan) software, versión 5.4. Due to methodological and clinical heterogeneity of the included studies (intervention types, duration, measurement type, and population), it was not possible to conduct a meta-analysis. Then, we focused in a narrative synthesis, grouping the findings according to the type of therapeutic intervention.

3. Results

3.1. Studies Selection

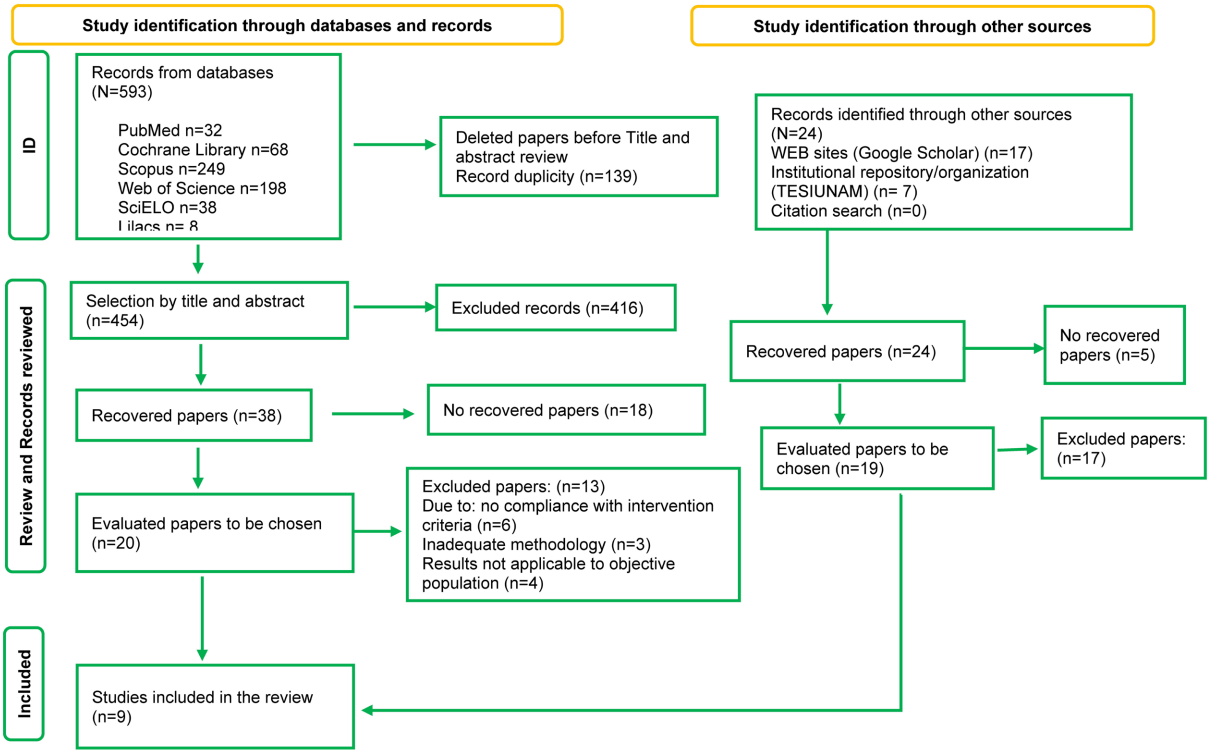

Figure 1. PRISMA flow chart.

A total of 593 papers were identified through the defined search strategy. Then, 139 papers were eliminated due to duplication, and 454 articles were retained. After reviewing the titles and abstracts, 416 papers were excluded because they did not meet the inclusion criteria. Subsequently, 38 papers were evaluated in full, and 18 were excluded due to not meeting the methodological or topical eligibility criteria. Finally, 9 papers met all criteria and were included for detailed analysis. The complete procedure is shown in the PRISMA flow chart (**Figure 1**) [10].

Figure created by the authors based on the PRISMA 2020 guidelines [10].

3.2. Characteristics of the Included Studies

Nine selected studies were published between 2017 and 2024, from countries or regions including Brazil, Türkiye, India, Indonesia, the United States, and Sweden, as well as one study conducted in the Taiwan region. Evaluated interventions were diverse, including: Mindfulness (n = 3), Yoga (n = 2), Aromatherapy from Flowers Bach and Saint Germain systems (n = 2), Energetic modalities such as Reiki, therapeutic touch, and prana healing (n = 1), Acupressure (n = 1). Regarding methodological design: five clinical randomized studies (CRS), and four cuasi-experimental studies were identified. Detailed description is shown in **Supplement 1**.

All studies included nursing students, both men and women, in diverse steps of their academic training. Sample size was between 33 and 120 participants, evaluated in high academic demand context, in school clinics, or along critical situations due the COVID-19 pandemic. Applied interventions used different strategies: Mindfulness programs with loving-kindness, Group cognitive-behavioural therapy, Energetic modalities workshops (with preventive and therapeutic approach), Acupressure applied in specific body sites along two weeks, Group blossomtherapy with systematic scents administration, traditional and laughter yoga.

All strategies were focused to get a better perception of the psychological well-being and to strengthen the stress confrontation mechanisms. Regarding the comparison, five studies included an active control group (placebo, simulated acupressure or waiting list), or control group with no intervention. The rest of studies used a design of unique group with evaluation pre and post intervention.

Evaluated variables focused in: Graded perceived stress, Stress confrontation, Psychological symptoms (anxiety and depression), Graded full attention (mindfulness).

Most used measurement instruments were: PSS-10 y PSS-14 (Perceived Stress Scale) DASS-21 (Depression, Anxiety and Stress Scale), HADS (Hospital Anxiety and Depression Scale), SCL-90 (Symptom Checklist), Coping with Stress Scale, Five Facet Mindfulness Questionnaire (FFMQ).

Regarding results, all studies reported statistical significant reductions in stress in intervention groups. It was observed: Better confrontation of stress, Increase in mindfulness response in full attention programs, Significant reduction in symptoms with laughter yoga, aromatherapy, acupressure, and floral scents interven-

tions.

Operational concepts of used therapies in the analyzed studies can be consulted in **Supplement 2**.

Taken together, the analyzed evidence suggests that complementary therapies represent an effective alternative for stress management in nursing students, promoting emotional well-being and the development of coping skills in response to academic and clinical demands.

3.3. Comparison of Effectiveness by Type of Intervention

All studies reported statistically significant reductions in perceived stress levels. The therapies with the strongest evidence of effectiveness were structured mindfulness [11] and flower therapy with defined protocols and double-blind evaluations [12] [13]. Acupressure and laughter yoga also showed consistent positive effects, especially when applied regularly and in supervised sessions [14] [15]. Energy-based therapies and loving-kindness meditation demonstrated benefits, although with lower methodological rigor and, in some cases, without control groups [16] [17].

3.4. Methodological Heterogeneity

A marked variability was observed in study designs, sample sizes (n = 12 to n = 120), duration of interventions (1 to 10 weeks), and types of instruments used (PSS, DASS-21, HADS, etc.). This heterogeneity limits the ability to directly compare results and generalize findings. Some studies used active or placebo control groups, while others employed pre-post designs without comparison groups.

3.5. Synthesis of Results

Results were grouped according to the type of intervention. Improvements were observed in stress coping, mindfulness, and the reduction of psychological symptoms such as anxiety and depression. Most studies used internationally validated scales, which enhances the reliability of the findings. Despite the limitations, the evidence suggests that complementary therapies may be useful tools for stress management in nursing students, especially when implemented with defined protocols and professional supervision.

3.6. Risk of Bias Assessment

Overall, four studies presented a high risk of bias and five showed a probable risk. The most common weaknesses were identified in the domains of random sequence generation, blinding of participants and personnel, and lack of appropriate comparison groups.

For example, Yildirim & Özcan [14] used random assignment but did not detail the allocation concealment procedure, which compromises internal validity. Albuquerque & Turrini [18] demonstrated a more robust design by conducting a double-blind, placebo-controlled trial, minimizing measurement bias. In contrast, studies such as those by Kramer [19] and Domingues [20] did not include a con-

trol group, limiting causal inference of the observed effects.

The use of tools such as the Newcastle-Ottawa Scale and the ROBINS-I tool allowed the identification of specific sources of bias. Figures 2-3 present a graphical summary of the domains assessed and the overall risk by study. The main areas of high risk were the lack of blinding and the non-random selection of participants.

Figure 2 provides a graphical representation of the proportion of studies that presented low, unclear, or high risk of bias across each evaluated domain. The domains with the highest proportion of high risk were related to participant and personnel blinding, as well as random sequence generation. In contrast, domains such as selective reporting bias and other sources of bias mostly showed low risk. This analysis helps to identify common methodological weaknesses across the reviewed studies, which is essential for accurately interpreting the quality of the synthesized evidence.

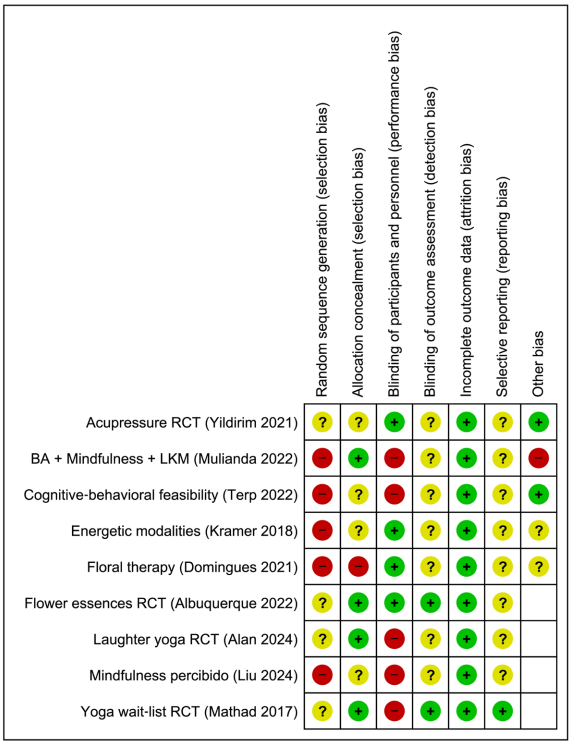

Figure 2. Analysis of bias risk and dominion methodology quality.

Figure created by the authors based on the risk of bias analysis conducted in Review Manager (RevMan), version 5.4.

Figure 3 provides a visual summary of the risk of bias for each included study, evaluating seven methodological domains. The color coding (green = low risk, yellow = unclear risk, red = high risk) allows for comparison of methodological quality across studies and highlights those with greater rigor versus those with limitations that should be taken into account when interpreting the findings.

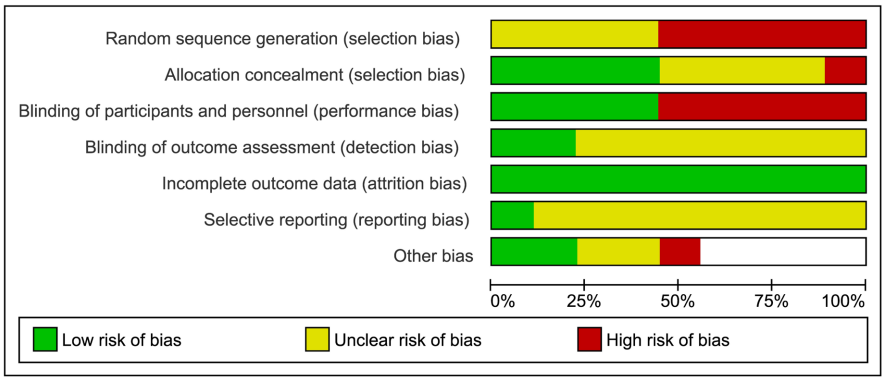

Figure 3. Summary of bias risk for each analyzed study.

Figure created by the authors based on the risk of bias analysis conducted in Review Manager (RevMan), version 5.4.

4. Discussion

The findings of this scoping review suggest that complementary therapies represent promising strategies for reducing stress in nursing students. All evaluated interventions showed positive effects, although with varying degrees of effectiveness. Interventions such as mindfulness and flower therapy demonstrated greater methodological rigor and consistent results, while others, such as energy-based therapies or yoga, showed favorable outcomes with less experimental control.

Some studies stand out for their methodological rigor and clinically relevant results. Yildirim & Özcan [14] evaluated acupressure as a strategy to reduce clinical stress, observing a significant reduction compared to a control group with sham acupressure. Albuquerque & Turrini [12] reported significant reductions in perceived stress when comparing a flower essence formula with placebo in a randomized double-blind clinical trial. Domingues [13] also documented a 67% decrease in perceived stress levels following the administration of flower therapy. Liu [11] reported sustained improvements in mindfulness and stress reduction after an eight-week structured mindfulness program, while Mathad *et al.* [21] showed positive effects of traditional yoga on psychological and emotional indicators.

Likewise, Mulianda [17] and Terp [22] demonstrated reductions in stress, anxiety, and depression through combined interventions involving mindfulness, loving-kindness meditation, and group cognitive-behavioral therapy. Kramer [16] suggested that even a single session of energy-based modalities could have positive effects on general stress, and Alan [15] found that laughter yoga significantly improved coping strategies.

Regarding the possibility of replicating these interventions in the national context, cultural, logistical, and educational factors must be considered. Student acceptance, the availability of trained personnel, institutional integration, and the standardization of protocols are key elements. Some strategies, such as mindfulness or acupressure, could be implemented relatively easily, while others require

further validation and regulation to ensure their safe and effective application.

However, the methodological heterogeneity among the included studies represents a significant limitation. Differences in study design (randomized trials, quasi-experimental, and observational studies), intervention duration (ranging from a single session to 10 weeks), participant characteristics (academic level, clinical or academic setting, pandemic context), and the instruments used to measure stress (PSS-10, PSS-14, HADS, DASS-21, among others) hinder direct comparison of the results.

5. Conclusions

This coping review focused in the analysis of the available scientific evidence on the efficacy on complementary interventions therapies to reduce stress in nursing students. Starting with the systematization of nine published studies between 2017-2024, distinct no pharmacological strategies were identified, that reported statistical significant reductions in perceived stress, psychological symptoms, and confrontation abilities.

Evidence suggests that short- or medium-term interventions could be implemented in educational settings to strengthen emotional skills in nursing students. However, it is essential that these strategies be rigorously validated to support their efficacy and long-term sustainability.

A relevant finding was the absence of studies that evaluate integrated interventions combining multiple complementary strategies, which points to an innovative area for future research. Exploring a multimodal approach will allow researchers to examine synergistic effects and the adaptation of programs to the actual needs of students.

Finally, integrating complementary therapies and emotional support strategies into the curriculum may contribute to a better preparation of future nursing professionals, promoting resilience, empathy, and self-care in the face of demanding and stressful clinical settings.

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Conflicts of Interest

The authors declare no conflict of interest.

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Addenda

Supplement 1. Analyzed papers.

Author (year)	Country or region	Design	Sample	Intervention	Comparison	Variable and instrument	Results
Yildirim D, Özcan E. (2021) [14]	Türkiye	RCT	EE, n = 68 divided in experimental group and control group	Acupressure in points HT7 and Yintang during 30 minutes (pressure every 5 minutes)	CG control without intervention	Clínical stress: Analogic Visual Scale (AVS) and Inventory of Anxiety Status (STAI)	Significant reduction of clinical stress in experimental group after third application (AVS: de 6.95 ± 1.57 - 2.82 ± 1.94, $p < 0.05$); clinical stress mean diminished from 46.54 ± 3.81 a 25.15 ± 5.26 ($p < 0.005$)
Mulianda (2022) [17]	Indonesia	Cuasi-experimental with one group (pretest-postest)	EE, n = 83 nursing students	Combined intervention of active cognitive-behavioural, mindfulness and meditation of lovely goodness during 4 weeks	Without CG	Perceived stress: Perceived Stress Scale (PSS)	Significant reduction of perceived stress with mean diminution of 16.66 a 14.76 ($p < 0.05$)
Terp (2022) [22]	Sweden	Feasibility study with repeated measurements	EE, n = 82	Intervention of stress handling based in cognitive-behavioural therapy (CBT), with weekly group sessions during 10 weeks	Without CG	Skills in stress handling: Stress Management Competency Inventory Autoefficacy: General Self-Efficacy Scale (GSE) Autoestima: Rosenberg Self-Esteem Scale	Intervention was feasible and accepted by nursing students. Preliminary improvement in skills to handle stress, self efficacy and self esteem were observed
Kramer (2018) [16]	USA	Cuasi-experimental (pretest–postest without control group)	EE, n = 30	Energetic integral therapy (modalities of energetic healing, like Reiki and guided meditation) during 4 weeks	Without CG	Stress: Perceived Stress Scale (PSS) general wellbeing: structured survey developed by authors	Significant reduction in perceived stress post-intervention ($p < 0.01$); participants reported an increase in the sense of general well-being
Domingues (2022) [13]	Brazil	Cuasi-experimental	EE, n = 12	Administration of a blossom therapy formula during 60 days, with a dose of 4 drops, twice a day	Without CG	Perceived stress: Perceived Stress Scale (PSS)	Significant reduction of perceived stress in students after intervention, diminution of 67% in reported stress values
Albuquerque & Turrini. (2022) [12]	Brazil	RCT	EE, n = 101 nursing students with moderate to high stress (51 in experimental group and 50 in control group)	Blossom formula with Cerato, Cherry Plum, Elm, Impatiens, Larch, Olive and White Chestnut, administered during 60 days, 4 drops, 4 times per day	Control group with placebo	Perceived stress: Perceived Stress Scale (PSS) Signs and symptoms of stress: Test of Baccaro	No significant difference between groups in stress ($p > 0.05$). Both groups showed significant reduction in scales ranges ($p < 0.001$), with a great effect
Alan (2024) [15]	Türkiye	RCT	EE, n = 66	Laughter yoga (6 sessions)	Control group without intervention	Stress confrontation: Coping with Stress Scale	Significant improvement in confrontation ($p < 0.01$)

Continued

Liu (2024) [11]	Taiwan region	Cuasi-experimental	EE, n = 82	Course of full consciousness during 8 weeks, weekly sessions of 50 minutes of training and practice of meditation and mindfulness techniques	Control group that watched 50 minutes films per week during 8 weeks	Mindfulness: Mindful Attention Awareness Scale (MAAS) Perceived Stress: Perceived Stress Scale (PSS)	Significant increase in mindfulness at 2 months post-intervention and significant reduction of perceived stress at 6 months post-intervention in experimental group compared to control group ($p<0.05$)
Mathad *et al.* (2017) [21]	India	RCT	EE, n = 100 nursing students (50 in yoga group, 50 in control groupo)	Traditional yoga intervention during 8 weeks, including physical postures, breathing and meditation exercises	Group of waiting list	Mindfulness: Freiburg Mindfulness Inventory (FMI) self-compassion: Self-Compassion Scale-Short Form (SCS-SF) Resilience: Connor-Davidson Resilience Scale (CD-RISC) Satisfaction with life: Satisfaction with Life Scale (SWLS) Empathy: Jefferson Scale of Empathy HPS-Version (JSE-HPS) Perceived Stress: Perceived Stress Scale (PSS)	Significant improvement in self-compassion and mindfulness in yoga group in comparison with control group ($p < 0.05$); improvement in resilience, satisfaction with life and perceived stress, were observed, these were not statistically significant

Table developed by the authors based on the studies included in the review.
• RCT: Randomized clínical trial; • NS: Nursing Students; • CG: Control group; • PSS: Perceived Stress Scale; • DASS-21: Depression Anxiety Stress Scales-21; • HADS: Hospital Anxiety and Depression Scale; • FFMQ: Five Facet Mindfulness Questionnaire; • SCL-90: Symptom Checklist-90*. The group of waiting list means that participants did not receive intervention during the experimental phase, but later on they had acces to the yoga program once the study ended.

Supplement 2. Definition of complementary therapies used in the studies.

Acupressure: A traditional medicine technique from China that involves applying finger pressure to specific body points to relieve stress and muscular stiffness..	Mindfulness: Full attention practice focused in the present moment, with acceptance and without judgement.
- Meditation of lovely goodness: Meditation technique to cultivate love, goodness and compassion feelings for self and others.	- Group cognitive-behavioural therapy: Psychological intervention working in group to identify and modify automatic negative thoughts and maladapted behaviours.
- Energetic modalities (Reiki, therapeutic touch, pranic healing): Techniques that aim to harmonize the body's vital energy through the laying on of hands, energy channeling, or manipulation of the bioenergetic field.	- Blossom therapy: Use flower-derived essence to equilibrate emotions and stress reduction.
- Laughter yoga: Group practice that combines laughter and deep breathing exercises to diminish stress.	- Traditional yoga: Physical and mental discipline that integers body postures (asanas), breathing techniques (pranayama) and meditation.

Table developed by the authors based on the description of the interventions found in the studies included in the review.