Review

The Potential of Mindfulness in Oncology Nursing: A Systematic Review

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ABSTRACT: Oncology nurses face multiple challenges that affect both themselves and their patients. Mindfulness, as a personality trait, can be cultivated through well-designed practices and may serve as an effective strategy for maintaining nurses' well-being. This systematic review aimed to evaluate the value and usefulness of mindfulness practice for oncology nurses. A systematic search was conducted in PubMed, Scopus, and Elsevier databases in September 2024 using the keywords: oncology nurses, haematology nurses, mindfulness, professional quality of life, compassion satisfaction, compassion fatigue, burnout, stress, resilience, and wellbeing. English-language studies published between 2010 and 2024 concerning the trait of mindfulness were included. Twelve studies met the inclusion criteria; eight were interventional and implemented mindfulness-based programs. Various assessment tools were used across studies. Interventions were delivered either in person, via audio materials, or through mobile applications. Most were based on Mindfulness-Based Stress Reduction (MBSR) principles or other mindfulness approaches such as the Zentangle method. The intervention studies were generally well-accepted by oncology nurses and demonstrated positive outcomes. Most findings supported the benefits of developing and applying mindfulness in daily clinical practice. Reported improvements included professional quality of life, resilience, stress management, sleep quality, and overall physical and psychological well-being. Despite the limited number and heterogeneity of studies, the overall evidence highlights mindfulness as a promising and effective approach to enhance the well-being and professional satisfaction of oncology nurses.

KEYWORDS: *Oncology nurses, hematology nurses, mindfulness, professional quality of life, stress, wellbeing.*

Introduction

Oncology nurses play a central role in the cancer care continuum addressing the physical, emotional and spiritual needs of their patients.

They provide comprehensive person-centered care while fostering effective communication, essential but often undervalued elements of oncology nursing care [1].

While oncology nursing is often seen as a "calling," some nurses enter the field inadequately prepared for the emotional toll of close bonds formed with patients and families during cancer care [2].

Oncology nursing involves unique challenges that often lead to higher stress levels than other specialties [3].

Thus, oncology nurses, who daily care for cancer patients, need emotional strength and resilience to handle difficult situations that evoke hopelessness.

This spans the treatment journey, from diagnosis to survival or end-of-life, requiring nurses to show compassion [4].

Compassion in oncology isn't always a positive force; fatigue can strain personal relationships and drive nurses to consider leaving the field [5-7].

There are numerous factors in oncology nursing that affect nurses' physical, emotional, and spiritual well-being, and thus their professional quality of life.

Oncology nurses develop the closest contact with patients and families facing a cancer diagnosis [8].

They also very often face ethical dilemmas that have to do with the obligation to apply treatments that they may consider futile at the end of life or even to be witnesses of physical pain, suffering and death [8,9].

Various clinical situations cause intense emotional distress in oncology nurses, such as patient death, triggering profound sadness.

Long-term, repeated hospitalizations foster deep interpersonal bonds, even friendships, with patients.

Daily challenges, especially in advanced or end-stage disease, heighten compassion fatigue risk.

Moreover, providing empathetic care to dying patients can be influenced by nurses' personal views on death, confronting their own

10.12865/CHSJ.51.04.03

mortality and further impacting professional quality of life [10].

It is therefore important for oncology nurses to maintain appropriate balance in both their professional and personal lives and to enhance their physical, mental and spiritual well-being, in order to continue to provide quality and compassionate care and for patients to express their satisfaction with it.

Mindfulness is an effective method and practice with multiple benefits for the individual that could be utilized by oncology nurses.

Mindfulness involves intentionally focusing on the present moment without judging the development of experience from one moment to the next [11].

This mindful approach to the present moment helps mitigate burnout and stress, allowing professionals to cultivate deeper resilience and empathy without judgment [12-14].

Mindfulness also strengthens the patient-provider bond by helping staff listen more deeply, recognize their own biases, and communicate more effectively [15].

So, mindfulness helps professionals build deeper compassion and stronger relationships, which ultimately leads to better patient outcomes [13].

Objective

This review aimed to highlight the value and usefulness of mindfulness practice for oncology nurses, encouraging not only them to utilize its potential, but also the administrations of nursing institutions who seek to ensure both satisfied employees and content recipients of healthcare services.

Methods

The review methodology for assessing primary research studies examining the trait of mindfulness in oncology nurses was based on the PRISMA guidelines [16].

A systematic literature review was conducted in the Pubmed, Scopus and ScienceDirect databases in September 2024.

The search strategy combined keywords using Boolean operators (AND/OR) and truncations where appropriate.

For example, terms related to the population included ‘oncology nurse’ OR ‘haematology nurse’ OR ‘cancer nurse’, while terms related to the intervention included ‘mindfulness’ OR ‘mindful*’ OR ‘MBSR’ (Mindfulness-Based Stress Reduction).

Outcomes were captured with terms such as ‘professional quality of life’ OR ‘compassion satisfaction’ OR ‘compassion fatigue’ OR ‘burnout’ OR ‘resilience’ OR ‘well-being’.

These sets were combined using AND to refine results (e.g., “oncology nurse AND mindfulness AND burnout”).

This detailed strategy ensures reproducibility and aligns with PRISMA reporting standards.

The inclusion criteria were English-language research studies published between 2010 and 2024 that specifically examined the trait of mindfulness in oncology nurses.

Eligible studies were limited to those in which the study population consisted solely of oncology nurses working in any setting with patients diagnosed with malignant diseases, including both solid tumors and hematological malignancies.

Exclusion criteria were studies that involved mixed populations of nurses or oncology healthcare professionals more broadly, as well as bibliographic or systematic reviews.

The inclusion criteria were intentionally broad (English-language studies from 2010-2024, focusing on oncology nurses and mindfulness) to capture a wide range of evidence in a field where research is still limited.

Nonetheless, this breadth may have introduced heterogeneity across study designs, populations, and interventions, which complicates synthesis.

The screening process was conducted in two stages.

First, titles and abstracts of all retrieved records were screened for relevance, followed by full-text review of potentially eligible articles.

Two reviewers independently performed both stages of screening.

Any disagreements regarding inclusion were resolved through discussion, and if consensus could not be reached, a third reviewer was consulted.

This approach ensured consistency and minimized selection bias during study identification and eligibility assessment.

Two thousand twenty-seven potentially relevant references were identified from the databases.

After title and abstract screening of these potentially relevant references for each of the databases, twenty three were further evaluated.

After removing duplicates and excluding one interventional study with insufficient mindfulness results, 12 articles met the inclusion criteria (Figure 1).

10.12865/CHSJ.51.04.03

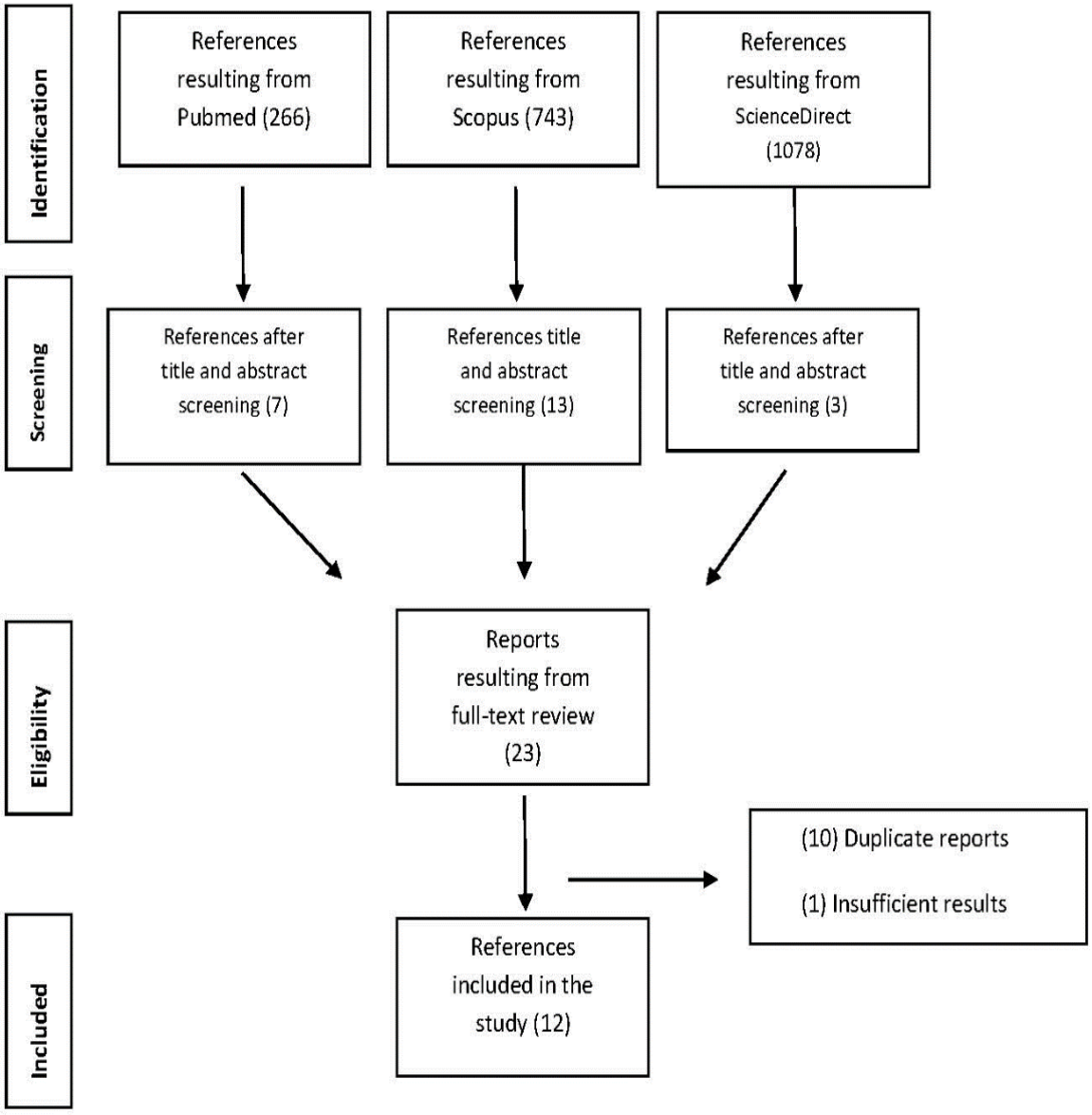

Figure 1. PRISMA Flowchart of studies' selection method.

Results

The literature search identified twelve studies that met all inclusion criteria (Table 1).

Of these studies, four were cross-sectional [17,18,23,24], two non-randomized controlled studies [26,27], and six non-randomized interventional studies [19-22,25,28].

Of these twelve studies, two were conducted in China [17,24], two in Portugal [26,27] one in Italy [18], one in Iran [23], and the remaining six in USA [19-22,25,28].

In all of the studies, the population was exclusively oncology nurses, as this was one of the inclusion criteria in this review.

However, it is worth mentioning that one study involved nurses working in hematopoietic cell transplantation units [22], one involved nurses in an oncology intensive care unit (ICU) [20], one involved nurses working in an hematology/oncology clinic [25], and another involved oncology nurses working with outpatients [21].

Table 1. Studies included in the review (most recent to oldest).

Author Team/ Country	Study Design	Research Question	Sample	Tools	Intervention	Results	Limitations
Shi et al., (2024) China [17]	Cross sectional descriptive study	To identify heterogeneity groups of oncology nurses on mindful self-care ability based on latent profile analysis (LPA) and examine the sociodemographic correlation of these profiles	839 oncology nurses	Brief Mindful Self-care Scale (B-MSCS)	An online anonymous cross sectional study of 911 oncology nurses in two university – affiliated cancer hospital was conducted from January to May 2023	The total score of the B-MSCS was76,40 +/-13,19. The support structure dimension had the highest score (mean value=3,60) and physical care had the lowest score (mean value= 2,57). The findings of the LPA showed that respondents were divided into 3 classes, moderate mindful self-care (51,2%), low-low mindful relaxation (14,8%) and high-high mindfulness self-awareness (34,0%). Across scale scores and dimensions, 3 groups demonstrated statistically significant differences ($p<0,05$). Univariate analysis revealed significant differences between the 3 profiles in terms of professional title, position, concern about self-care, interest in mindfulness and experience with meditation ($p<0,05$). Profile membership was predicted by 3 factors, self-care status, interest in mindfulness and experience with meditation.	Using convenient sample Self-reported and web-based questionnaire Not using other scales to determine potential influencing factors of mindful self-care
Vitale et al. (2024) Italy [18]	Cross sectional study	Investigation of the variations in the five facets of holistic mindfulness among Italian oncology nurses based on gender, work experience in oncology, and shift work	306 oncology nurses	Five Facet Mindfulness Questionnaire (FFMQ)	A Google Moduli questionnaire was performed and disseminated via the "Nurse all face" social media page by inviting nurses employed in the oncology field to complete the questionnaire. All visitors could access the presentation letter of the study, but only those who gave their consent to participate and declared themselves to be an oncology nurse could proceed further with the questionnaire	There were no significant differences in all five facets ((observe, describe, acting with awareness, non-judging, non-reacting) of holistic mindfulness ($p \geq 0.05$) according to gender, work experience in the oncology field, and shift work.	Study's design Online questionnaires' distribution Convenience sample Using of self-reported data
Klee et al. (2024) USA [19]	Non randomized with pre- and post-intervention study	Exploration whether Zentangle which used as a meditative activity in an acute time frame decreased stress, fatigue, and burnout and increased professional quality of life and well-being in oncology nurses	24 oncology nurses	Perceived Stress Scale (PSS) Warwick–Edinburgh Mental Wellbeing Scale (WEMWBS) Patient-Reported Outcomes Measurement Information System–29 (PROMIS-29) Professional Quality of Life (ProQOL)	Study procedures included an initial in-person class where participants learned the Zentangle method and then completed their own work during the four following weeks. Participants were asked to complete baseline surveys after electronic written consent was obtained and prior to the in-person guided Zentangle session. Participants answered the WEMWBS, PROMIS-29, and proQOL surveys after the in-person group session, week 3 post-class, and week 5 post-class. An Investigator-developed Zentangle engagement survey was also distributed at weeks 3 and 5. Participants answered the PSS survey at the completion of the study (week 5). Participants received all surveys via email.	Stress, well-being, anxiety, fatigue, ability to participate in social activities, pain, and secondary traumatic stress among participants showed significant improvement from pre-class to five weeks post–guided Zentangle class. The mean score for anxiety at the pre-class survey was 9.25, which decreased to 7.79 at week 5 ($f = 5.59$). Stress also decreased, with a mean PSS score of 22.7 pre-class and 20.52 at week 5 post-class ($t = 2.369$). Participants reported less fatigue at week 5 compared to pre-class ($f = 4.89$). WEMWBS scores increased significantly ($p < 0.001$) from the pre-class survey (- X = 45.78) to the post-class survey (- X = 47.26), and participants remained at a moderate level of well-being throughout the study. Participants also reported increased participation in social roles and activities at week 5 compared with pre-class ($f = 7.25$). Most participants preferred instructor-guided sessions compared to self-guided sessions at week 3 ($n = 13$) and week 5 ($n = 14$). The majority of participants engaged in one to two Zentangle sessions per week at week 3 ($n = 17$) and week 5 ($n = 16$). Most participants spent at least 11–20 minutes working on their Zentangle pieces at weeks 3 ($n = 14$) and 5 ($n = 13$). At weeks 3 ($n = 19$) and 5 ($n = 20$), most participants planned to continue using Zentangle after completion of the study	Study design Small non diverse sample Study's timeline Nurses' full-time equivalent was not considered during the study Participation to in-person sessions may have been perceived barriers
Urso et al., (2022) USA[20]	Non randomized, pre-post intervention study	Evaluation the feasibility of implementing an Mindfulness Based Intervention (MBI) and determination its effects on burnout, stress, anxiety, and depression among oncology Intensive Care	45 participants (38 nurses and 7 PCT) 24 interventio n group	Depression, Anxiety and Stress Scale (DASS-21) Maslach Burnout Inventory-Human Services Survey for Medical Personnel [MBI-HSS (MP)]	It was created an 8-week personalized yoga therapy MBI for nurses and patient care technicians (PCT) in an oncological ICU. Validated self-report scale tools were used to measure burnout, stress, anxiety, and depression in the intervention and control groups	Both groups at baseline had low prevalence of stress, anxiety, and depression (13% vs 36.8%,p=0.11; 21.7% vs 52.6%;p=0.17; 17.4% vs 26.3%;p=0.48; respectively). Low rates of high emotional exhaustion, depersonalization, and low professional efficacy were observed for both groups (41.7% vs 35.0%, p=0.65; 20.8% vs 15%,p=0.71; 58.3% vs 50.0%, p=0.58;respectively). Post-MBI, prevalence of depression, anxiety, stress, emotional exhaustion, and depersonalization remained low and similar between both groups. The implementation of MBI was	Limited completion of MBI Compliance to MBI was low Study's design Small sample size

10.12865/CHSJ.51.04.03

		Unit (ICU) nurses and patient care technicians (PCT)	21 control group			not found to be feasible and did not have statistically significant effects on already low scores of depression, stress, anxiety and overall burnout. Notwithstanding, professional efficacy scores significantly improved in a between group comparison (0.063 vs −0.25;p=0.0336)	
Qualls, et al., (2022) USA[21]	Prospective pre-/posttest pilot study	Determination whether a preshift Mindfulness Based Stress Reduction (MBSR) intervention, could reduce self-reported stress and lead to long-term improvement after 8 sessions on a measure of compassion fatigue, burnout, and compassion satisfaction and whether this intervention could effectively reduce physiological indices of stress including specifically heart rate, blood pressure, and respiratory rate.	12 oncology nurses in an outpatient clinic	Self-reported stress on a 10-point Likert scale Professional Quality of Life Scale Version 5 (ProQOL-V) A 3-item MOON Experience Post-Survey The physiological outcomes measured were heart rate, blood pressure, and respiratory rate before and after the intervention	Nurses were asked to complete the initial ProQOL-V and demographic surveys prior to their first session of the intervention. They were then asked to review their work schedule for the upcoming 4 weeks and select 2 days each week on which they would be willing and able to arrive to work approximately 15 minutes prior to the start of their scheduled shift. At each session, nurses met author in a conference room close to their units where she obtained each nurse's pre-intervention blood pressure, heart rate, and respiratory rate. Nurses were also asked to rate, using a scale of 0 to 10, with 0 being no stress and 10 being extreme stress, how stressed they felt at that moment. At this point, depending on which group they were assigned to, participants were provided with headphones and an MP3 player preloaded with their assigned intervention. Both meditations were 9 minutes 31 seconds long in length. Upon completion of the MBSR exercise, nurses were asked again to rate their current level of stress and author repeated each nurse's post-intervention blood pressure, heart rate, and respiratory rate. After 8 meditations, during the final session, each nurse completed a second survey packet containing the ProQOL-V and the 4-item experience survey.	From pre-intervention to post-intervention, nurses experienced a statistically significant decrease in self-reported stress scores at all 8 sessions. The most significant reductions (P < .001) in self-reported stress were observed at sessions 2 and 8. ProQOL-V scores were calculated prior to the study and again 4 weeks later, at the conclusion of the study. There was a statistically significant decrease in the subscales of compassion fatigue (P = .005) and burnout (P = .004). The increase in the compassion satisfaction subscale was marginally significant (P =.058). Before the intervention, nurses reported moderate levels of compassion satisfaction and burnout and a low level of compassion fatigue. After the intervention, nurses still reported a moderate level of compassion satisfaction and a low level of compassion fatigue, but their average score on the burnout subscale decreased enough to place them in the range of low level of burnout. Although their average respiratory rate was within normal limits before and after the interventions at all 8 sessions, in 2 of the sessions nurses experienced a statistically significant decrease in breaths per minute. Likewise, although their average heart rate was within normal limits before and after the interventions at all 8 sessions, in 6 of the sessions nurses experienced a statistically significant decrease in heart rate. From pre-intervention to post-intervention, nurses experienced a statistically significant decrease in systolic blood pressure in 5 of the 8 sessions and a statistically significant decrease in diastolic blood pressure in 3 of the 8 sessions	Study's design Small sample size Results may not be generalizable to other settings or specialties Participants tended to follow their own schedule regarding intervention It is unclear when some of the initial survey packets were completed
Knill et al., (2021) USA[22]	Evidence-based practice quality improvement longitudinal intervention project	Evaluation whether the use of the smartphone mindfulness app increased well-being and decreased burnout symptoms among inpatient Bone Marrow Transplantation (BMT) nurses	86 BMT nurses	Well-Being Index (WBI) A single-item valid measure was used to assess burnout	Three in-person educational sessions were offered to nurses 4 weeks prior to the start of the initiative, related to the purpose of the initiative, definitions of burnout and well-being, and use of the "Headspace" app. Anonymous paper surveys were distributed on the units at baseline, 30 days, 60 days, and 90 days and collected over 7 days at each time point.	There were significant improvements in burnout and well-being in staff nurses and nurse practinionaires from baseline to each time point. Sleep hygiene meditations were the most widely used programs within the "Headspace" app for both nursing groups.	It is unknown whether the same individuals who participated at baseline continued to participate throughout the course of the initiative (anonymous surveys) The initiative took place during the holiday season which often adds stress and decreases participation in initiative BMT units were undergoing construction, which deprived some staff of close communication with their coworkers and the primary team Not using of "Headspace" as instructed

							Many participants missed survey opportunities and other information regarding mindful activities
Heshmati & Caltabiano (2020) Iran[23]	Cross sectional study	Investigation of the indirect effect of dispositional mindfulness on fatigue via emotional suppression in oncology female nurses	137 female oncology nurses	Weinberger Adjustment Inventory (WAI) Five Facet Mindfulness Questionnaire (FFMQ) Multidimensional Fatigue Inventory (MFI)	Data were collected from December 2018 to March 2019. There were applied eligible and exclusion criteria. The questionnaires were distributed among the volunteers to complete.	Pearson correlation analyses revealed that nurses with higher levels of dispositional mindfulness had lower levels of fatigue. Emotional suppression was positively correlated with fatigue. As emotional suppression decreased, fatigue decreased. Dispositional mindfulness was negatively associated with emotional suppression ($\beta = -0.69$, $p = 0.000$ while no significant correlations were found in fatigue dimensions, and dispositional mindfulness.). Emotional suppression was positively associated with fatigue ($\beta = 0.32$, $p = 0.014$). The mediation path was significant with emotional suppression fully mediating the relationship between dispositional mindfulness and fatigue (b = -0.20 [CI: − 0.01, − 0.25]	Study's design Using of convenience sample The gender of sample (female – Azeri) so the results might not be entirely generalizable to more heterogeneous samples of nurses Using of self-reported data
Fang et al., (2019) China [24]	Cross sectional study	Assessing of sleep disturbance and its association with mindfulness and also examining the interactive effect of personality and mindfulness	172 female oncology nurses	Pittsburgh Sleep Quality Index (PSQI) Mindful Attention Awareness Scale (MAAS) Big Five Inventory (BFI-44)	The study was conducted from March to August 2016 in three cancer hospitals in Shandong Province, China. The participants completed the questionnaires.	Mindfulness was correlated with the global PSQI score ($r = -0.281$, $p < 0.01$). Trait extraversion and neuroticism moderated the mindfulness-sleep relationship. The simple slope analysis indicated that the negative relationship between mindfulness and the global PSQI score was only significant at higher levels of extraversion ($\beta = -0.419$, $p < 0.001$) and lower levels of neuroticism ($\beta = -0.344$, $p = 0.001$). Within a specific region (extraversion values above 21.93 and/ or neuroticism values below 23.78), mindfulness was significantly associated with the global PSQI score; beyond the value regions, the significant association was lost. Mindfulness might play a protective role against sleep disturbance only among certain oncology nurses.	Small sample size Study's design (cross-sectional)
Vaclavik, Staffileno & Carlson (2018) USA [25]	Non randomized, pre-post intervention study	Implementation a process for staff to cope with moral distress	56 nurses in oncology /hematology unit	21-item Moral Distress Scale– Revised (MDS-R)	The tool was administered pre- and post intervention to a sample of 56 oncology nurses to assess moral distress and whether it was alleviated with the use of mindfulness interventions.	Of the 21 items listed on the MDS-R, witnessing healthcare providers giving false hope was not only the most distressing situation experienced by nurses, but also the most frequently reported morally distressing situation prior to the intervention. This finding was statistically significant and was consistent with comments made during the support sessions (part of the bundle of mindfulness interventions) when nurses stated that, at times, they were providing treatment to patients who were in the active stages of dying. The frequency with which staff nurses felt distress from observing healthcare providers give a false sense of hope to patients decreased from 81% pre-intervention to 44% post-intervention.	Study's design Small sample size Using convenient sample
Duarte & Pinto-Gouveia (2017) Portugal [26]	Non randomized controlled study	Exploring the potential role of trait mindfulness, self-compassion and psychological inflexibility as mediators of the effects of a MBI on burnout, compassion fatigue, psychological symptoms and satisfaction with life.	94 oncology nurses	Professional Quality of Life Scale, version 5 (ProQOL-5) Depression, Anxiety, Stress Scale (DASS-21) Acceptance and Action Questionnaire – II (AAQ-II) Five Facets of Mindfulness Questionnaire (FFMQ) Self-Compassion Scale (SCS) Satisfaction with Life	As above.	Changes in mindfulness mediated changes in burnout, anxiety and stress, and satisfaction with life; changes in self-compassion mediated the impact of the intervention on burnout, depression, anxiety, stress and satisfaction with life; and psychological inflexibility mediated reductions in burnout, compassion fatigue, depression, and stress	Study's design High attrition rate Using of self-reported data Using of multiple testing which can increase errors in inference, particularly Type 1 error

10.12865/CHSJ.51.04.03

				Scale (SWL)			
Duarte & Pinto-Gouveia (2016) Portugal [27]	Non randomized controlled study	Exploring the effectiveness of an on-site, mindfulness-based intervention on oncology nurses' psychological outcomes.	94 oncology nurses	Professional Quality of Life Scale, version 5 (ProQOL-5) Depression, Anxiety, Stress Scale (DASS-21) Acceptance and Action Questionnaire – II (AAQ-II) Ruminative Responses Scale-Short (RRS) Five Facets of Mindfulness Questionnaire (FFMQ) Self-Compassion Scale (SCS) Satisfaction with Life Scale (SWL)	Participants were allocated to the experimental and wait-list comparison conditions. The intervention took place on site, during nurses' working schedule. All participants in the comparison group were offered the opportunity to access the course subsequently. The baseline package of questionnaires was delivered one week before the intervention and completed before session one. All participants were asked to complete their post-intervention questionnaires and return them in a sealed package to the training office.	Nurses in the intervention group reported significant decreases in compassion fatigue, burnout, stress, experiential avoidance, and increases in satisfaction with life, mindfulness and self-compassion, with medium to large effect sizes. Nurses in the comparison group didn't present significant changes in these variables. Results also pointed to a high degree of acceptability of the intervention	Relatively small sample size and most participants were women Non randomization Lack of a follow-up assessment Using of self-reported data
Hevezi (2016) USA [28]	Non randomized, pre-post intervention study	Effectiveness' evaluation of short (less than 10 minutes) structured meditations in decreasing compassion fatigue and improve compassion satisfaction in oncology nurses.	15 female oncology nurses	Professional Quality of Life Scale, version 5 (ProQOL-5) Four subjective, supplemental questions and an opportunity for free text response at postinervention stage	Participants used specific meditations designed to establish a sense of calm, relaxation, and self-compassion 5 days a week for 4 weeks. Meditations were provided on an audio-CD after brief individual instruction. The tool was administered pre and post intervention along with supplementary questions.	Paired t test of the ProQOL constructs revealed that the intervention demonstrated a statistically significant increase in compassion satisfaction scores (mean difference = −2.66, 95% confidence interval [CI] = [−4.98, −0.36], t[14] = −2.48, p = .027, d = 0.63) and decreases in burnout (mean difference = 4.13, 95% CI = [1.66, 6.60], t[14] = 3.581, p = .003, d = 0.92) and secondary trauma (mean difference = 3.00, 95% CI = [0.40, 5.96], t[14] = 2.174, p = .047, d = 0.56) scores. The effect size, which measures the magnitude of the treatment effect, was large (d > 0.5), despite the small sample. On the supplementary questions, all participants reported increased feelings of relaxation; developing sense of self-compassion; positive changes in physical, emotional, and mental reactions to stress; and a high likelihood of incorporating meditation into their self-care plans Nine participants responded to the free text on the supplementary questions. Four described the benefits of the breathing exercises with two nurses reporting incorporating them into bedside care. Two participants described feeling less stress at work. Two described emotional difficulty when starting the Loving Kindness Meditation, in realizing the extent to which they thought of others but not themselves.	Small sample size Lack of a control group Subsequent timed postintervention questionnaires were not part of the study design. Therefore, the long-term effects of the interventions are not known.

In general, there was great heterogeneity between the studies.

Thus, out of the total of twelve studies, eight concerned intervention studies with the implementation of mindfulness programs and with a different endpoint.

Similarly for the other four cross-sectional studies that investigated different endpoints regarding mindfulness.

Consequently, there is also a variety in the assessment tools used (Table 2).

Table 2. Assessment tools per study.

Tool	Studies
B-MSCS	Shi et al., 2024 [17]
PSQI	Fang et al., 2019 [24]
MAAS	Fang et al., 2019[24]
BFI-44	Fang et al., 2019[24]
ProQOL-5	Duarte & Pinto-Gouveia, 2016,2017; Hevezi, 2016; Qualls et al., 2022; Klee et al., 2024 [19,21,26-28]
DASS-21	Duarte & Pinto-Gouveia, 2016, 2017; Urso et al., 2022 [20,26,27]
AAQ-II	Duarte & Pinto-Gouveia, 2016,2017 [26,27]
RRS	Duarte & Pinto-Gouveia, 2016,2017[26,27]
FFMQ	Duarte & Pinto-Gouveia, 2016,2017; Vitale et al., 2024; Heshmati & Caltabiano, 2020 [18,23,26,27]
SCS	Duarte & Pinto-Gouveia, 2016,2017[26,27]
SWL	Duarte & Pinto-Gouveia, 2016,2017 [26,27]
WAI	Heshmati & Caltabiano, 2020 [23]
MFI	Heshmati & Caltabiano, 2020 [23]
WBI	Knill, Warren, Melnyk,& Thrane, 2021 [22]
MBI-HSS (MP)	Urso et al., 2022 [20]
MDS-R	Vaclavik, Staffileno & Carlson, 2018 [25]
PSS	Klee et al., 2024 [19]
WEMWBS	Klee et al., 2024 [19]
PROMIS-29	Klee et al., 2024 [19]

B-MSCS :Brief Mindful Self-care Scale, PSQI: Pittsburgh Sleep Quality Index, MAAS: Mindful Attention Awareness Scale, BFI-44 : Big Five Inventory, ProQOL-5: Professional Quality of Life Scale version 5, DASS-21: Depression, Anxiety, Stress Scale, AAQ-II: Acceptance and Action Questionnaire–II, RRS: Ruminative Responses Scale-Short, FFMQ: Five Facets of Mindfulness Questionnaire, SCS: Self-Compassion Scale, SWL: Satisfaction with Life Scale, WAI: Weinberger Adjustment Inventory, MFI: Multidimensional Fatigue Inventory, WBI: Well-Being Index, MBI-HSS (MP): Maslach Burnout Inventory-Human Services Survey for Medical Personnel, MDS-R: Moral Distress Scale–Revised, Perceived, PSS: Stress Scale, WEMWBS: Warwick–Edinburgh Mental Wellbeing Scale, PROMIS-29: Patient-Reported Outcomes Measurement Information System–29

Although valid and reliable tools were used in all the studies, most notably were the Professional Quality of Life (ProQOL) scale, the Five Facets of Mindfulness Questionnaire (FFMQ), or the Depression, Anxiety, Stress Scale (DASS) and some studies also used auxiliary tools.

Thus, additional questions were given with the possibility of open-ended answers [28] or a valid one-item tool for the assessment of professional burnout [22].

Also, one study, assessed self-reported stress with a 10-point Likert scale, while upon completion of the intervention, participants were asked to evaluate their experience on three items, using a 4-point Likert scale.

The same study also evaluated the effect of the intervention on physiological parameters and vital signs such as heart rate, blood pressure and respiration [21].

Furthermore, interventional studies were mostly been conducted using in-person mindfulness programs.

However, four of them used either audio aids (audio-CDs, headphones, MP3 players) [21,26-28], or a smartphone application [22].

For some of the interventional studies, the mindfulness program implemented was generally based on the principles and exercises of Mindfulness-Based Stress Reduction (MBSR) programs [25-27].

In particular, Vaclavik, Staffileno & Carlson (2018) implemented a set of mindfulness interventions to address the stressor most frequently identified by oncology nurses, which concerns moral distress, such as critical debriefings, yoga classes or mindfulness sessions [25].

Also, Klee et al. (2024) implemented the Zentangle method in order to promote mindfulness and creative expression of the participants and consequently the dimensions of well-being, socialization, anxiety, fatigue and secondary traumatic stress, of oncology nurses[19].

Noteworthy, the duration of the mindfulness interventions applied varied between the studies.

So, for the studies of Duarte & Pinto-Gouveia (2016), Duarte & Pinto-Gouveia (2017) and Vaclavik, Staffileno & Carlson (2018) a six week program were carried out [25-17].

Interventions lasting four weeks were implemented by Hevezi (2016) [28], Qualls et al. (2022) [21], as well as Klee et al. (2024) [19], while Urso et al. (2022) implemented an eight-week intervention [20].

For the study by Knill et al. (2021), participants were given free access to the "Headspace" application for three months with access to mindfulness exercises and meditations [22].

Overall, the studies involving mindfulness interventions were generally accepted and implemented by oncology nurses and demonstrated positive results.

However, one study concluded that the implementation of a mindfulness-based intervention (MBI) was not considered feasible and did not have a statistically significant impact on the already low scores of depression, stress, anxiety and overall burnout for both groups (intervention and control).

10.12865/CHSJ.51.04.03

However, scores related to professional effectiveness improved significantly for the intervention group [20].

Discussion

The included studies were highly heterogeneous in design (e.g., cross-sectional surveys, non-randomized interventions, small pilots), populations, mindfulness approaches, and outcomes, preventing meta-analysis and strong generalizable conclusions-findings were thus reported descriptively.

While most suggested mindfulness benefits for oncology nurses, variability in rigor, sample sizes, and intervention fidelity obscures effect magnitude and consistency.

Small, non-randomized studies raise bias and overestimation concerns.

Future research needs rigorous RCTs with standardized protocols and validated measures to bolster evidence and synthesis.

A recent study [17] identified three distinct profiles of mindfulness among oncology nurses: moderate self-care (51.2%), low relaxation (14.8%), and high self-awareness (34%).

The research suggests that a nurse's personal interest in self-care and their previous experience with meditation are the primary factors determining which group they fall into.

By applying these findings, healthcare leadership can introduce mindfulness-based measures that protect nurse well-being and improve overall professional standards.

Moreover, a study emphasized that interventions to promote mindful self-care and self-compassion can support the resilience and well-being of palliative care professionals [29].

Further research explored the link between sleep disturbances and mindfulness among oncology staff, specifically examining how personality factors play a role [24].

Researchers found high sleep disturbance rates among oncology nurses, with mindfulness positively linked to sleep quality.

Extraversion and neuroticism moderated this: the positive link weakened with lower extraversion/higher neuroticism but strengthened with higher extraversion/lower neuroticism.

Thus, mindfulness protects against sleep issues mainly for some nurses.

These insights help identify vulnerable individuals for targeted interventions. It is also not a coincidence that in the study by Knill et al. (2021), meditations related to sleep were the most widely used programs in the “Headspace” application used [22].

Vitale et al. (2024) found that factors like gender, years of experience, and shift patterns had no significant impact on mindfulness aspects (observe, describe, acting with awareness, non-judging, non-reacting) [18].

Researchers suggest mindfulness may be an inherent trait.

However, it also serves as a valuable approach for enhancing functional emotional regulation amid oncology nurses' challenging environments-including patient cancer care demands and working conditions.

Of particular interest is the study by Heshmati & Caltabiano (2020) who examined the relationships between mindfulness, emotional suppression, and fatigue in oncology nurses [23].

They found mindfulness disposition negatively correlated with emotional suppression, which positively correlated with fatigue and fully mediated the mindfulness-fatigue link.

Thus, mindfulness training targeting emotion regulation via reduced suppression can effectively mitigate fatigue in oncology nurses.

Interventions must include psychoeducation on emotion suppression's harms, helping nurses notice negative emotions, recognize suppression, practice nonjudgmental awareness, and use alternative coping strategies.

Evidently, mindfulness practice helps oncology nurses regulate negative emotions by nonjudgmentally observing thoughts and feelings through a compassionate lens, without reactive judgment.

Thus, it fosters functional emotional responses to daily clinical challenges, enhancing nurses' well-being and optimal patient care.

The findings regarding mindfulness in the Heshmati & Caltabiano (2020) [23] study, clearly reinforce and are consistent with the positive results for the majority of intervention studies in this review [19,22,25-28].

Mindfulness-based interventions may be effective in reducing burnout, compassion fatigue, and stress in oncology nurses, while improving their overall well-being [27].

Although the intervention involved a relatively large sample of ninety-four oncology nurses, the intervention implemented by Hevezi (2016) in a comparatively smaller sample (fifteen oncology nurses) was also effective, achieving a statistically significant increase in compassion satisfaction and a reduction in burnout and secondary traumatic stress scores,

as well as all participants reporting increased feelings of relaxation and well-being [28].

Significant improvements in burnout and well-being were also noted by the intervention using the "Headspace" application [22].

Implementing brief mindfulness training (MBSR) reduces burnout and compassion fatigue.

These self-reported improvements are confirmed by physiological data, including improved heart and respiratory rates [21].

While the Zentangle method as a form of mindfulness succeeded in significantly improving well-being, socialization, anxiety, fatigue, levels of secondary traumatic stress and stress levels of oncology nurses.

As a result, Zentangle was considered as a tool for promoting the well-being of nurses by encouraging self-care [19].

Moreover, and especially for nurses, it was shown quite early on that mindfulness constitutes an effective strategy for reducing burnout, since its application has been observed to result in significant reductions in emotional exhaustion and depersonalization, and a tendency towards a significant improvement in the sense of personal fulfillment [30] or for the treatment and prevention of stress-related problems and thus promoting adaptability and health, even if this is offered in a short form [31].

Most interventional studies in this review evaluated mindfulness practices' impact on oncology nurses' professional quality of life (compassion satisfaction, fatigue, burnout, secondary trauma), anxiety, resilience, and overall well-being, yielding mostly positive results.

Hegel et al. (2021) examined if mindfulness's present-moment awareness links to burnout and compassion fatigue in oncology professionals.

They found more weekly patient contact positively associated with secondary traumatic stress, while mindfulness and present-centered attention correlated with lower disengagement, emotional exhaustion, posttraumatic stress, and compassion burnout, plus higher compassion satisfaction [32].

Tamura et al. (2020) also examined the effectiveness of a mindfulness program, finding that it may have the potential to cultivate awareness and compassion in healthcare professionals working in oncology and palliative care settings, which in turn may contribute to alleviating psychological distress and burnout [33].

Then, Orellana-Rios et al. (2017) piloted compassion-focused mindfulness meditation for multidisciplinary palliative care teams, finding significant improvements in two burnout components (emotional exhaustion, personal fulfillment), anxiety, stress, two emotional regulation skills, and work joy.

Qualitatively, participants reported better self-care, mental pauses in routines, fewer unpleasant patient-contact sensations, enhanced interpersonal connections, and group communication.

The study affirms such programs' usefulness and benefits [34].

Finally, a pilot study tested an eight-week mindful self-compassion intervention on nurses, finding significant decreases in secondary trauma and burnout-negatively correlated with self-compassion and mindfulness-plus increases in resilience and compassion satisfaction [35].

However, there are also those studies, which on the one hand concluded that the implementation of a mindfulness-based intervention (MBI) was not considered feasible and on the other hand did not manage to cause statistically significant effects on the scores of depression, stress, anxiety and overall professional burnout for both groups (intervention and control). In addition, it should be noted that this study showed low scores for the aforementioned characteristics before the start of the intervention.

Nonetheless, it was observed that the scores related to professional effectiveness improved significantly for the intervention group.

Therefore, even a small positive outcome from the implementation of mindfulness programs is important and is considered appropriate even if it is implemented with any difficulties on the part of the participants [20].

This study could be compared to that of Moody et al. (2013), who examined a mindfulness-based program to reduce burnout in a pediatric oncology multidisciplinary team.

Nearly 100% showed baseline burnout, with no significant post-intervention improvements in burnout, stress, or depression scores.

However, qualitative diary analysis revealed reduced anxiety, greater inner peace, compassion and joy, improved concentration and self-awareness, and fewer physical symptoms [36].

As mentioned, mindfulness interventions have been implemented in a variety of ways, like through the use of mobile applications [22].

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However, research into app-based meditation found it to be a practical tool for palliative care teams.

Participants noted significant gains in mental clarity and empathy, fostering a stronger sense of community. However, despite the app's accessibility, work demands and burnout remained significant barriers to consistent practice [37].

Also, Duarte and Pinto-Gouveia (2017) explored how mindfulness interventions actually work, finding that mindfulness, self-compassion, and psychological flexibility are the core drivers of change.

These three factors don't work in isolation; instead, they reinforce one another to lower burnout and anxiety while boosting life satisfaction [26].

A little later, Di Giuseppe et al. (2019), focused on the effect of unconscious defense mechanisms and conscious mindfulness attitudes in terms of protecting oncology nurses from depression and anxiety [38].

Defense mechanisms and mindfulness have several points in common and should be considered complementary in improving psychosomatic well-being [39].

Daily clinical practice in oncology frequently involves ethical dilemmas and moral distress, where nurses find themselves unable to act on what they know is morally right [40].

Managing the ethical challenges of terminal cancer care frequently triggers moral distress, driving many nurses toward professional disillusionment [3].

Thus, Vaclavik, Staffileno & Carlson (2018) found that, in addition to the identification of moral distress-in the form of a false sense of hope from health professionals being reported more frequently-and the fact that the frequency with which nurses felt anxiety and concern from observing health professionals giving patients a false sense of hope, was significantly reduced [25].

Hence, it is understood that in order for oncology nurses to be able to provide holistic care without compromising their ethics, it is necessary to use strategies such as the practice of mindfulness that will allow them to recognize their thoughts and feelings and to accept and reconcile with any circumstances and conditions.

Promising results are tempered by significant gaps in the research. Publication bias likely skews the data toward positive outcomes, while the vast differences in program length and format make it difficult to identify a sustainable model for real-world oncology care.

While small study sizes limit general certainty, the low cost and popularity of mindfulness make it a scalable option for burnout.

Leaders must remember, however, that mindfulness works best as a supplement to-not a replacement for-addressing workload and organizational health.

This review is a first for the field, but its transparency is limited by a lack of prior registration and formal bias assessments.

By using broad criteria and only three databases, the study may have missed relevant psychological research.

Future reviews should prioritize standardized appraisal tools and expanded database coverage (e.g., CINAHL and Web of Science) to provide a more definitive evaluation of the evidence.

These aspects should be addressed in future systematic reviews to improve methodological rigor.

Conclusions

Although this review shows promising benefits of mindfulness for oncology nurses, the evidence base is limited and methodologically heterogeneous. Studies varied in design, sample size, and outcomes, mostly small, non-randomized, or exploratory.

While mindfulness positively affects well-being, resilience, stress, and professional quality of life, results warrant caution. Stronger evidence requires adequately powered RCTs with standardized interventions and validated measures.

Future research should examine long-term effects, implementation, and organizational support to solidify mindfulness as a practical oncology nursing approach.

Moreover, nowadays it is understood that mindfulness practices are an essential component of safe and compassionate patient care [41].

Considering that the number of people diagnosed and living with cancer is increasing worldwide [42], the rapid progress in cancer treatments and the subsequent extension of survival, the need for competent and reliable oncology nursing care is constant [43].

Oncology nurses face significant challenges that threaten their professional quality of life and well-being.

Thus, nursing institutions and administrations must invest in staff, enhance working

conditions, and implement protective interventions to shield them from adversities while sustaining their well-being and prosperity.

Ultimately, such support will elevate the quality of their professional lives [44].

Mindfulness practice is a relatively inexpensive and easy-to-implement intervention that can improve not only the professional quality of life of oncology nurses but also outcomes for patients.

Acknowledgements

None to declare.

Author Contributions

Conceptualization, E.P., I.T., and O.G.; Methodology, E.P., I.T., S.P., and O.G.; Investigation, E.P., I.T., and O.G.; Data analysis, E.P., and I.T.; Software, S.P., and T.I.K.; Visualization, E.P., I.T. and T.I.K.; Manuscript writing and initial draft preparation, E.P., I.T., S.P., D.K.P., T.I.K., and O.G.; Manuscript review and editing, E.P., I.T., S.P., D.K.P., T.I.K., and O.G.; Supervision, O.G.

All authors read and approved the final manuscript.

Funding

This research received no specific funding.

Conflicts of interest

The authors declare no competing interests.

Institutional Review Board

Not applicable.

Consent Statement

Not applicable.

Data availability

All data presented in the manuscript are available from the authors upon request.

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