Brief mindfulness-based interventions for hospital nurses: A Systematic Review

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Abstract

Nurses are confronted with various stressors, such as staff shortage and high workload, making them particularly vulnerable to the experience of symptoms of various mental illnesses. One approach to improve their mental health is the use of brief mindfulness-based interventions. They are thought to be effective in increasing well-being and decreasing symptoms of mental diseases in health care workers in general. In particular, brief interventions are of interest for hospital nurses because they often experience high amounts of work load and feel time pressure. Hence, a short duration is thought to increase feasibility. The aim of the present study is to examine what is known about brief mindfulness-based interventions for hospital nurses and whether they are an effective strategy to improve their mental well-being and decrease ill-being. A systematic review was conducted and the search procedure was based on the PRISMA model. Three databases were searched for peer-reviewed journal articles, *PsycInfo, scopus*, and *webofscience*, using the terms MBSR, MBI, brief mindfulness-based interventions, hospital, hospitals, nurses, nurse and nursing staff. The final number of peer-reviewed articles included in this study was 12. The results demonstrated a median length of four weeks and sessions had a median duration of 105 minutes. Content wise, most brief mindfulness-based interventions share their focus on formal and informal mindfulness practice, in particular breathing techniques with the overall aim to decrease stress levels. However, they still differ in many regards, e.g. in their delivery methods. There is evidence that brief mindfulness-based interventions are effective in increasing mental health of hospital nurses, especially in enhancing life satisfaction, relaxation and self-compassion and decreasing stress and burnout.

Keywords: brief mindfulness-based interventions, hospitals, nurses, well-being, ill-being

Nurses working in hospitals are exposed to a variety of work-related risk factors that may result in high levels of stress. For example, nursing staff may face a high workload, which can become too high and contribute to time pressure (Stuart, Jarvis, & Daniel, 2008). This might be the case when the work they need to perform is qualitatively or quantitatively too demanding, causing an inability to cope with the requirements. As a consequence, this might lead to feelings of exhaustion. Nurses who do not feel in control of their tasks are more prone to the experience of stress than the ones who feel in control (Fiabane, Giorgi, Sguazzin, & Argentero, 2013). In addition, difficulties to hire and maintain nursing staff are reported, leading to the experience of pressure and stress in nurses' work life (Otto, Bischoff, & Wollesen, 2019). In the US, nursing staff levels also seem to be inadequate and forty percent of hospital nurses indicate symptoms of emotional exhaustion and feelings of being overwhelmed, exceeding norms for health care workers in other professions (Maslach, Jackson, Leiter, Schaufeli, & Schwab, 1986).

Hence, it is important to decrease levels of psychopathology, as for example burnout, and to enhance well-being. Using interventions might help to cope with various stressors and to increase general mental health (Shapiro, Astin, Bishop, & Cordova, 2005). Mental health is defined as the presence of well-being, along with the absence of ill-being (Keyes, 2005). Well-being includes the presence of emotional well-being, as an indicator of feeling well, and the presence of psychological and social well-being, indicating to live well and to live meaningful (Diener, 1984; Diener, Suh, Lucas, & Smith, 1999). The concept of ill-being is reflected by psychopathology, symptomatology, disorders, diagnosis and treatment (Bohlmeijer, & Westerhof, in press). Behaviors are displayed which are considered to be deviant or maladaptive (Keyes, 2005). According to Keyes (2005), well-being and illness are both affecting each other.

One possibility to enhance levels of well-being and decrease illness is mindfulness. Mindfulness is defined as purposely and nonjudgmentally paying attention to the experience of the present moment (Kabat-Zinn, 2003). According to Bishop et al. (2004), mindfulness has two facets. First, it is a strategy to regulate one's attention to recognize immediate experiences. Secondly, it allows to take a curious, open-minded and accepting attitude towards these immediate experiences. Mindfulness is focused on adjusting the impact and response of an individual to his stress experience and emotional distress (Bishop et al., 2004).

Recent research provides evidence for the effectiveness of mindfulness practice in increasing different aspects of well-being and decreasing levels of psychopathology in various populations. For instance, a literature review on the use of Mindfulness-based stress

reduction, a psycho-educational program on meditation practices to reduce stress experience, suggests benefits for the mental health of health care workers and an improved ability to cope with stress (Irving, Dobkin, & Park, 2009). Mindfulness meditation is another example of mindfulness practice. An integrated literature review on the effectiveness of mindfulness meditation in nurses and nursing students found that levels of burnout, anxiety and depression were significantly reduced after mindfulness meditation interventions ended. In addition, participants reported an increase in happiness and well-being (van der Riet, Levett-Jones, & Aquino-Russell, 2018).

However, research on the use of mindfulness-based interventions in health care workers raised the issue of feasibility. High dropout rates suggest that interventions, such as the Mindfulness-based stress reduction, are too time intense for health care professionals who are already likely to experience time pressure at work (Shapiro et al., 2005). Thus, research began to investigate the effectiveness of brief mindfulness-based interventions adapted to the needs of nursing staff (Poulin, Mackenzie, Soloway, & Karayolas, 2013). Until now, there is no clear definition for "brief" interventions. Yet, research considers a duration of up to 6 weeks (Montanari, Bowe, Chesak, & Cutshall, 2018) or up to 100 minutes per week (Howarth, Smith, Perkins-Porras, & Ussher, 2019) as brief. A recent systematic review on brief mindfulness-based interventions in health care workers, including nurses, supports the effectiveness of abbreviated durations: almost half of the studies considered indicated a reduction of negative mood and anxiety (Howarth et al., 2019). But, as noted by Howarth et al. (2019), the heterogeneity of the studies' population limits the explanatory power of the outcomes. However, in particular doctors and nurses are thought to be vulnerable to the experience of low well-being and exhibit high rates of burnout (Maslach et al., 1986; Scheepers, Emke, Epstein, & Lombarts., 2019), which affects the quality of patient care, too (Wang, Wang, Liu, & Wang, 2020). Thus, a further exploration of the effectiveness of such interventions in these target groups is needed. A quasi-experimental study, which implemented an abbreviated version of the MBSR and was not included in the review of Howarth et al. (2019), reported significant improvements in life satisfaction and relaxation for health care professionals (Poulin et al., 2013). The beneficial effects of brief MBIs are further supported by an evaluation of brief MBSR interventions in mental health professionals where qualitative and quantitative results described a reduction of subjective stress levels (Dobie, Tucker, Ferrari, & Rogers, 2015). Further, a systematic review on the well-being of doctors has demonstrated a positive effect of brief mindfulness-based interventions on levels of burnout (Scheepers et al., 2019). A randomized controlled trial of a brief mindfulness-based

intervention in psychiatric nurses indicates the suitability of such interventions to enhance the experience of positive emotions and to reduce levels of anxiety, work stress and depression (Yang, Tang, & Zhou, 2018). Thus, brief mindfulness-based interventions are a promising method to increase facets of well-being and to decrease levels of ill-being, e.g. anxiety and stress, in health care workers in general, as well as in doctors and nurses specifically.

There is an extensive amount of research on the effectiveness of brief mindfulness-based interventions in health care workers because this population seems particularly prone to the experience of stress (Shapiro et al., 2005). Systematic reviews have already examined the effectiveness of brief mindfulness-based interventions in the context of doctors but there has not been a systematic review on nurses. Yet, hospital nurses contribute significantly to high quality patient care (Commonwealth Fund, 2000, as cited in Aiken, Clarke, Sloane, Sochalski, & Silber, 2002, p.1). Hence, it is important to conduct a thorough review and provide an overview of current knowledge on brief mindfulness-based interventions in the context of hospital nurses. An up-to-date review of recent research findings will encourage the implementation of brief mindfulness-based interventions in this context and illustrate possible gaps of knowledge for further research.

The aforementioned scientific findings offer evidence for the effectiveness of mindfulness-based interventions in improving mental well-being and decreasing mental ill-being of hospital nurses. In particular, briefer versions of mindfulness-based interventions seem to be a promising method since they are less time intense than regular mindfulness-based interventions and suit the time requirements of hospital nurses better. Thus, the present systematic review was conducted to explore the characteristics of brief mindfulness-based interventions and their effectiveness in improving the mental health of hospital nurses. The objective is to explore what is known about brief mindfulness-based interventions in the context of hospital nurses. Specifically, the focus is on content, delivery method, setting, duration and effectiveness in increasing well-being and decreasing ill-being.

Methods

A systematic review was conducted using the guidelines of a systematic literature review and meta-analysis (PRISMA) (Moher, Liberati, Tetzlaff, & Altman, 2010).

Search procedure

The online databases *PsycInfo*, *scopus*, and *webofscience* were used to search for brief mindfulness-based interventions aiming to improve nurse's mental health in a hospital context. The search was conducted on the 17th of April 2020. To compile the previously described research question elements of the PICO framework were used. The PICO framework aims to systematically identify and integrate different parts of an issue, i.e. Participants, Intervention, Comparison and Outcome, into a clinical research question (Miller, & Forrest, 2001). Here, participants, interventions and outcomes were included in the research question. Based on the research question, search terms were identified relating to nurses, hospitals, and brief mindfulness-based interventions. In addition, the abbreviations for Mindfulness-based stress reduction (MBSR) and Mindfulness-based Interventions (MBI) were included in the search because a first scan of literature revealed a frequent use of those interventions in the health care context. The search string therefore consisted of the following terms: *(MBSR* OR *MBI* OR *brief mindfulness-based interventions)* AND *(hospital* OR *hospitals)* AND *(nurses* OR *nurse* OR *nursing staff).*

Study Selection

Studies were included if they fulfilled the following criteria: (1) articles were published in peer-reviewed journals; (2) they were written in English language; (3) participants were working as registered nurses in a hospital setting; (4) the full text was accessible; and (5) all studies evaluated brief mindfulness-based interventions, which means their duration did not exceed 6 weeks. Excluded was literature with a focus on the treatment of patients or physical complaints of nurses.

Data Extraction Process and Study Outcomes

The author screened all articles for inclusion and exclusion criteria. They were uploaded to the reference software EndNote X9 to remove duplicates. Extracted from the articles were information including the first author, year, sample size, country, intervention, outcomes, details about the session and study design. Further, information about content, delivery method, setting and duration were collected. The effectiveness of each type of brief

mindfulness-based intervention on the mental health of nurses was examined. Outcomes either described aspects of well-being, including life satisfaction, self-compassion, happiness and relaxation, or ill-being, including anxiety, depression, stress and burnout. Eventually, 12 articles were used for the present study. All articles were published between 2006 and 2019.

Results

The literature search resulted in 565 findings. A flowchart of the study selection process is depicted in Figure 1.

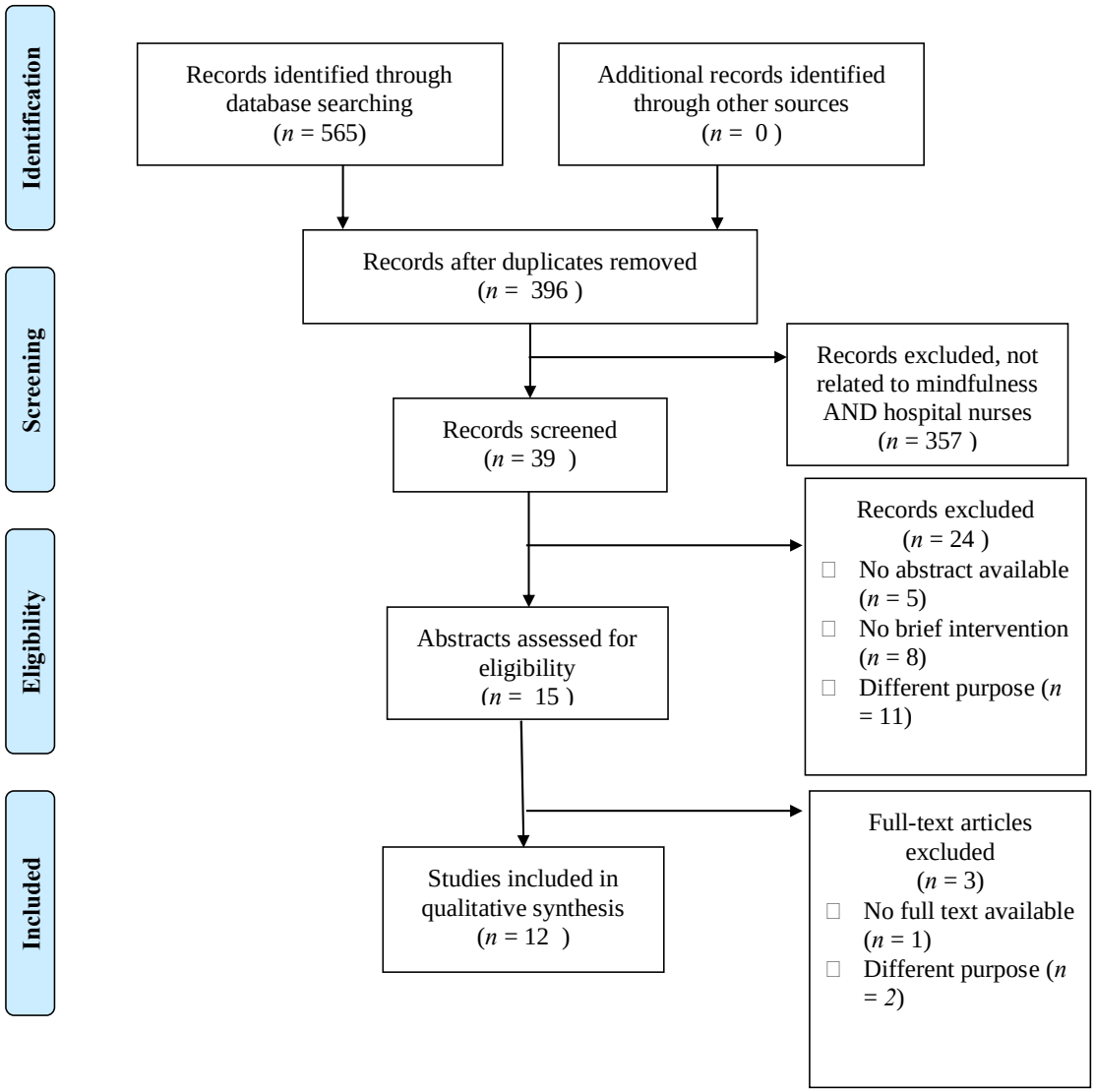

Figure 1. Flowchart of the selection process.

Characteristics of the brief Mindfulness-based Interventions

The sample sizes of the studies varied from 13 to 545. Studies were conducted in Canada (*n* = 1), Malaysia (*n* = 1), Australia (*n* = 3), Brazil (*n* = 1), the US (*n* = 2), Saudi Arabia (*n* = 1) and China (*n* = 1). Two studies did not specify in which country their studies took place. An overview of the studies' details can be found in Table 1.

Study design. The studies employed different designs, including qualitative descriptive (*n* = 1), mixed-methods (*n* = 3), quasi-experimental (*n* = 3) and pre-post follow up (*n* = 5). Studies collected data at two (*n* = 4) or three (*n* = 6) time points. The third set of data

was gathered either one month after the intervention ended (*n* = 2), 6 weeks (*n* = 1), 3 months (*n* = 1), 6 months (*n* = 1) or seven months after (*n* = 1). Two studies collected data only at the end of the intervention.

Content. All interventions incorporated mindfulness skills, meditation, informal and formal mindfulness practice. Informal mindfulness was, for example, practiced in form of mindful eating (*n* = 2). Every intervention contained breathing techniques as a form of formal mindfulness practice. In general, formal mindfulness practice is defined by the intention to specifically take time to engage in mindful meditation, e.g. practices like body scan or sitting mediation. On the contrary, informal mindfulness practice takes place when mindfulness is integrated in existing daily routines by purposely paying attention to everyday activities (Birtwell, Williams, van Marwijk, Armitage, & Sheffield, 2018). 10 of the 12 studies focused on entirely mindfulness-based interventions, whereas two focused on *aspects* of mindfulness, e.g. breathing techniques or guided imagery. Interventions were considered as entirely mindfulness-based when their main focus was on the introduction and practice of mindfulness. In contrast, interventions which included *aspects* of mindfulness had another focus than mindfulness and only included mindfulness practice as a mean to achieve their intended aim. For instance, one intervention was concerned with the mental illness burnout. During this intervention, participants learnt about burnout and practiced mindfulness only as a mean to prevent burnout and to enhance relaxation (Alenezi, McAndrew, & Fallon, 2019). However, most interventions (*n* = 8) shared the intention to reduce stress experience in participants, while other interventions (*n* = 4) aimed to enhance resiliency skills in nurses.

Another noticeable similarity was that multiple interventions (*n* = 5) provided educational workshops where nurses gained theoretical knowledge about mindfulness. The majority of these educational workshops (*n* = 4) further covered Compassion Fatigue, e.g. by providing information and Power Point material about Compassion Fatigue, its causes and what helps to prevent it (Craigie, Slatyer, Hegney et al., 2016). Three studies implemented the Mindful Self-Care and Resiliency intervention, a 4-week intervention to practice mindfulness and enhance resiliency skills to prevent compassion fatigue (e.g, Slatyer, Craigie, Rees et al., 2017). Some interventions (*n* = 2) integrated brief Mindfulness Based Stress Reduction (MBSR) interventions, which aim to teach participants mindfulness practice to reduce stress experience and enhance relaxation (Gauthier, Meyer, Grefe, & Gold., 2015). However, all other studies implemented different interventions (*n* = 10) and one used a self-designed workshop.

Delivery method and setting. Most interventions were designed as group sessions, which took place in the nurses' respective hospital (n = 10) or were embedded in the nurses' training days (n = 1). Yet, one intervention consisted of individual tasks which had to be completed at home. Only voluntary group sessions were offered in this case (Magtibay, Chesak, Coughlin, & Sood, 2017), whereas all other interventions had obligatory group sessions. Nevertheless, the interventions, which required attendance during the group sessions, differed since some (n = 3) requested additional activities. For instance, participants needed to complete homework (n = 1) or practice at home (n = 2), while others (n = 2) offered the possibility to voluntarily practice at home and provided material for this. However, most studies (n = 7) shared similarities in their delivery method and setting since they comprised group sessions and did not arrange any extra activities. All interventions were facilitated by persons with experience in mindfulness practice but differed with regards to the occupational and educational backgrounds. For instance, five interventions were realized by a person with a background in psychology or psychiatry, while others were facilitated by a Zhen Buddhist (n = 1) or a yoga teacher (n = 1) and an author on stress-free living (n = 1). For one intervention, three persons acted as facilitators, i.e. two nurses and a health coach. Noticeably, all facilitators had an occupation which is either mainly concerned with mental health or mindfulness. Some interventions (n = 4) did not give information about the facilitators.

Duration. Taken as a whole, the extent and duration of the brief interventions differed. The duration of the interventions varied from one day to six weeks, with a median duration of four weeks. The sessions differed in their total amount and in the hours spent on mindfulness practice. The median amount of sessions was five. Furthermore, the median hours spent on practice were 105 minutes. One intervention differed from the others since it included a flexible schedule (Magtibay et al., 2017), whereas all others had fixed schedules nurses needed to adhere to. Due to the flexible schedule, nurses could decide themselves how much time they want to spend practicing and when (Magtibay et al., 2017).

Effectiveness of the brief Mindfulness-based Interventions

Effects on nurse's well-being. Notably, brief mindfulness-based interventions have shown to be effective in increasing well-being, regardless of their design and duration. After participating in brief mindfulness-based interventions, nurses told that group sessions increased feelings of togetherness and reduced feelings of isolation (Edmonds et al., 2011; Pan et al., 2019). Further, qualitative data indicated enhanced happiness scores (n = 2). Particularly, outcomes suggest effectiveness in enhancing self-compassion, life satisfaction

and feelings of relaxation. All studies which measured self-compassion reported a significant increase of this characteristic, while some even indicated that results were still evident one month and six months after the intervention (Craigie et al., 2016; Slatyer, Craigie, Heritage, Davis, & Rees, 2017). Significantly increased scores were also found for quality of life, in particular for participants of the Mindful Self-Care and Resiliency intervention and Stress Reduction Program. However, differences between the two interventions became visible after they ended because results were maintained six months after the intervention only for the Mindful Self-Care and Resiliency intervention (Lan, Subramanian, Rahmat, & Kar, 2014; Slatyer, Craigie, Heritage et al., 2017). An explanation for this difference is missing, partly because those two studies were the only ones researching quality of life, which makes it difficult to generalize findings. In addition to the subjective quality of life, it was shown that brief mindfulness-based interventions increased levels of life satisfaction (Mackenzie, Poulin, & Seidman-Carlson, 2006). Further, few entirely mindfulness-based studies (n = 4) reported qualitative data, according to which participants indicated enhanced feelings of relaxation after the intervention (e.g. Farina, Minerva, Glunt, & Bernardo, 2018; Slatyer, Craigie, Rees et al., 2017). It was supported by quantitative data of Mackenzie et al. (2006), who reported significantly improved scores of relaxation. It is further in line with qualitative data, according to which participants found new ways to take time for themselves and felt more comfortable doing so (Slatyer, Craigie, Rees et al., 2017).

Effects on nurse's ill-being. It has been demonstrated that all interventions are effective in decreasing ill-being. Participants showed improved scores on anxiety (e.g. dos Santos et al., 2016; Magtibay et al., 2017), which were supported by qualitative data collected during interviews (Farina et al., 2018). Levels of depression were also reduced after several interventions (n = 4). However, most of the interventions (n = 8) seem to be particularly suitable to decrease stress experience and two of the three facets of burnout, i.e. emotional exhaustion and depersonalization, suggesting that interventions are most effective with regards to these two constructs. Six studies found that burnout levels in nurses were significantly decreased after the interventions ended (e.g. Craigie et al., 2016) and it is suggested that the reduction in burnout levels is sustainable (dos Santos et al., 2016). In particular, effects were visible for two facets of burnout: emotional exhaustion and depersonalization. At the same time, there is contradicting evidence for the effectiveness of depersonalization since some studies did not find significant changes in scores. This might be due to the participant's high scores on social desirability (Edmonds, M. Lockwood, Bezjak, & Nyhof-Young, 2011). In addition, brief mindfulness-based interventions have shown to

decrease perceived stress in the long term as indicated by significantly declined scores, which were evident six weeks after the intervention ended, too (e.g. dos Santos et al., 2016). However, outcomes pointed to an inconsistency here as well because for some interventions (n = 2) the decline was not significant (Pan et al., 2019; Slatyer, Craigie, Heritage et al., 2017). According to Pan et al. (2019) an explanation for these differing results might be the small sample size.

Table 1 *Overview of the studies*

First author (country, year)	Sample size (drop-out rate)	Study design	Intervention	Sessions		Results	
				Duration (weeks)	Number (hours per session)	Well-being (increase)	Ill-being (decrease)
Mackenzie (- ,2006)	30 (-)	Wait list control trial with pre-post data collection	Brief MBSR	4	4 (0.5h) + homework	+ interaction effect on relaxation ($p < .05$) + interaction effect on life satisfaction ($p < .01$)	- interaction effect on emotional exhaustion ($p < .05$) - interaction effect on depersonalization ($p < .05$) - personal accomplishment*
Edmonds (Canada, 2011)	182 (17.5%)	Pre-post-follow-up	CPCP	1	1 (-)	+ participants reported to feel more relaxed	- emotional exhaustion (pre-test to follow up) ($p = 0.002$) -personal morbidity (pre-test to follow up) ($p < 0.001$) - depersonalization* -personal accomplishment*
Lan (Malaysia, 2014)	41 (10.0%)	Quasi-experimental, single-group, pre-post	b-MBCT	5	5 (2h) + Practice session	+level of mindfulness ($p < .001$) +subjective happiness ($p = .028$)	- stress level ($p = .002$) - perceived stress level ($p < .001$) -anxiety levels ($p < .001$) -depression levels ($p = .001$)
Gauthier (-, 2015)	45 (15.5%)	Pre-post-follow-up	Brief MBSR	4	4 (0.5h) + practice session	+ job satisfaction* + self-compassion*	- stress ($p = .006$) - personal accomplishment ($p = .03$)
Craigie (Australia, 2016)	21 (-)	Pre-post-follow-up within subjects	MSCR	4	8 (1.75h)	- increase in compassion satisfaction from pre-test to follow up ($p<.05$)	- depression (pre-to post-test) ($p<.05$) - burnout (pre-test to follow up) ($p<.01$) - stress (pre-test to follow up) ($p<.05$) - anxiety*

Table 1 (continued)

First author (country, year)	Sample size (drop-out rate)	Study design	Intervention	Sessions		Results	
				Duration (weeks)	Number (hours per session)	Well-being (increase)	ill-being (decrease)
Dos Santos (Brazil, 2016)	13 (-)	Mixed-method	SRP	6	24 (1h)	+ quality of life (physical and psychological) (p<.05) +participants reported improved relationships and work experience	- depression (p<.05) - perceived stress (p<.05) - burnout (p<.05) - anxiety (p<.05)
Magtibay (US, 2017)	50 (-)	Quasi-experimental, 1-group baseline to postintervention	SMART	Flexible	Flexible	+happiness (p < .001) +mindful attention (p < .001)	- anxiety (p < .001) - burnout (p < .001) - stress (p < .001)
Farina (US, 2018)	545 (-)	Mixed-method	Mindfulness experiential learning session	1	2 (6h)	+participants reported to feel more relaxed and calmer	- participants reported to feel less stressed
Slatyer (Australia, 2017)	91 (16.4%)	Wait list control trial design with pre-post-follow-up data collection	MSCR	4	8 (1.5h-1.75h)	+ self-compassion (pre-test to follow up) (p<.05) + subjective quality of life (pre-test and follow up) (p<.001)	- interaction effect on burnout (p<.01) - interaction effect on depression (p<.01) - stress* - anxiety*

Table 1 (continued)

First author (country, year)	Sample size (drop-out rate)	Study design	Intervention	Sessions		Results	
				Duration (weeks)	Number (hours per session)	Well-being (increase)	Ill-being (decrease)
Slatyer (Australia, 2017)	16 (-)	Qualitative descriptive	MSCR	4	8(1.75h)	+ participants described increased feelings of calmness, better ability to focus, increased interest in self-care and better abilities to change their perspective.	- participants described decreased feelings of stress and less reactivity to negative experiences.
Alenezi (Saudi Arabia, 2019)	296 (14.0%)	Quasi-experimental, non-equivalent pre-post	Burnout prevention program	1	2 (6h)		- burnout (p = .0001) - emotional exhaustion (p =.0082) - depersonalization* - personal accomplishment*
Pan (China, 2019)	20 (5.0%)	Mixed-method	MLWS	6	6 (2h)	+ participants reported to feel more relaxed and calmer	- participants reported decreased stress - perceived stress* - anxiety* - depression*

Note: *results were not significant

MBSR Mindfulness-based stress reduction; CPCP Care for the Professional Caregiver Program; MBCT Mindfulness-based Cognitive Therapy; MSCR Mindful self-care and resiliency intervention; SRP Stress Reduction Program; SMART Stress Management and Resiliency Training; MLWS Mindful Living With Stress

Discussion

The present systematic review was the first to evaluate 12 studies investigating what is known about brief mindfulness-based interventions in the context of hospital nurses. For this purpose, the review explicitly focused on the content, delivery method, setting, duration and effectiveness in increasing well-being and decreasing ill-being. After systematically reviewing the literature at hand, it can be stated that brief mindfulness-based interventions shared several similarities with regards to their content, e.g. the types of mindfulness practice used, and delivery method as all include group sessions and are facilitated by a person experienced in mindfulness practice. But, they differed in their duration and extent. Further, brief mindfulness-based interventions were able to improve various facets of well-being and ill-being, including life satisfaction, self-compassion, stress and burnout.

Main findings

Thus far, this systematic review was the first to explore what is known about brief mindfulness-based interventions in the context of hospital nurses. In general, these interventions share a similar content, including mindfulness skills, meditation, informal and formal mindfulness practices. Particularly, formal mindfulness practice in form of breathing meditation was part of each intervention and seems to be an important aspect of various mindfulness practices. This is supported by other literature reviews on the use of brief mindfulness-based interventions in health-care workers, where breathing techniques were the main practice and used for various purposes, e.g. increasing awareness and acceptance (Gilmartin et al., 2017). Further, it became evident that all brief mindfulness-based interventions aim to reduce stress experience, which is in accordance with findings of previous literature reviews on such brief interventions in different contexts (Ghawadra, Abdullah, Choo, & Phang, 2019; Gilmartin et al., 2017; McClintock, McCarrick, Garland, Zeidan, & Zgierska, 2019)

With regards to instructors or facilitators, there is no consensus on who delivers the interventions since it might be anyone with experience in mindfulness or meditation. This accounts especially for the interventions which combine e.g. educational sessions and mediation. Gilmartin et al. (2017) further reported interventions in which the idea of an in-person facilitator was expanded. Some interventions included guided mediation and were implemented via a smartphone application or prerecorded audio meditation sessions (Gilmartin et al., 2017). Further, information is missing on how facilitators influence outcomes of the interventions. Despite these differences, it seems as the majority of brief

mindfulness-based interventions has similarities with regards to the setting in which the interventions take place. They are usually delivered in group sessions (Ghawadra, et al., 2019; Lan et al., 2014) at the workplace of nurses, i.e. hospitals (e.g. Gilmartin et al., 2017; Mackenzie et al., 2006), which might also enhance the feasibility for hospital nurses as they can participate before or after their work (Gauthier et al., 2015). Nevertheless, the present review shows evidence that the median duration of brief mindfulness-based interventions is four weeks. This is in line with previous reviews about brief mindfulness-based interventions on health-care workers, where the median length was four weeks, as well (Gilmartin et al., 2017). Research of Mackenzie et al. (2006) figured that a length of four weeks is most suitable to nurses' schedules.

The effectiveness of the included studies mostly focused on life satisfaction, self-compassion, burnout and stress, while other aspects of mental well-being and mental ill-being have not been a point of focus in research yet. Regarding aspects of mental well-being, brief mindfulness-based interventions have shown to possibly increase quality of life and life satisfaction (e.g. Lan et al., 2014), although some studies did not find significant results on this facet. However, a meta-analysis on mindfulness-based interventions in primary care supports significant outcomes of this systematic review and contradicts non-significant findings (Demarzo et al., 2015). In their review, Demarzo et al. (2015) report a significant improvement of quality of life in primary care patients after following both, brief mindfulness-based and regular mindfulness-based interventions. A meta-analysis by Wasson, Barratt and O'Brien (2020) on the effectiveness of mindfulness-based interventions in health-care professionals adds to the findings of this study as they found a significant increase in self-compassion after participants followed mindfulness-based interventions. Increased scores on self-compassion are thought to reduce stress experiences in hospital nurses (Shapiro et al., 2005), which seems important when considering the negative influences of stress on mental health, e.g. on depression (O'Sullivan, 2010).

Further, outcomes of this systematic review suggest that brief mindfulness-based interventions might be suitable to decrease stress experience and perceived stress directly (e.g. dos Santos et al., 2016). Although some of the included studies reported non-significant results, significant effects are supported by Burton, Burgess, Dean, Koutsopoulou, and Hugh-Jones (2016), who found that stress can be significantly improved by mindfulness-based interventions. It is consistent with results of other systematic reviews on mindfulness-based interventions and their clinical benefits since stress scores were significantly reduced after mindfulness practice (Chiesa, Anselmi, & Serretti, 2014). There is also some evidence that

brief mindfulness-based interventions are suitable to decrease burnout in hospital nurses (e.g. Alenezi et al., 2019), which adds to previous findings of systematic reviews on the use of mindfulness-based stress reduction among nurses (Ghawadra et al., 2019), where more than half of the studies reported reduced burnout levels. However, in the present study the effects on the facets of burnout seem to be ambiguous, especially with regards to depersonalization since outcomes indicated both, significant and non-significant changes. This is in line with outcomes of Gilmartin et al. (2017), who found varying effects on burnout levels in their systematic review. Until now, no explanation for this variation was found, although it might be that such brief intervention periods are too short to improve illnesses, such as burnout (Gilmartin et al., 2017).

Strengths and limitations

A strength of this study is the homogeneity of the sample populations included in the studies reviewed since all targeted nurses working in hospitals. It enhances the generalizability of findings compared to heterogeneous populations. As Gilmartin et al. (2017) noticed, heterogeneous populations may impact the outcomes of a review because they might have different needs and demands that influence whether they benefit from interventions (Irving, et al., 2009).

With regards to the limitations of this study, it needs to be stated that the quality of studies used for this review has not been assessed. This means, neither the validity nor the reliability have been examined using a standardized assessment tool like the Downs and Black tool, which can be used to score the methodological quality of quantitative studies (Downs & Black, 1998). However, all studies were peer-reviewed articles published in respective professional journals. This ensures a certain quality standard by itself.

In addition, search terms could be improved by including more variations of the used terms. First, not all brief mindfulness-based interventions are identified as such, some are called “short mindfulness-based interventions” or “abbreviated mindfulness-based interventions” and were thus not part of the review. Secondly, Mindfulness-based Cognitive Therapy (*MBCT*) is another frequently used intervention, which is why it might be advisable to include this term to gain a broader overview of existing research on brief mindfulness-based interventions.

Recommendations and Implications

The amount of literature solely focusing on the use of brief mindfulness-based interventions in hospital nurses is still limited compared to other literature reviews (e.g. Gilmartin et al., 2017), which makes it difficult to generalize findings. Thus, for future research it is recommended to further examine brief mindfulness-based interventions in the population of hospital nurses to confirm findings of previous research, e.g. with regards to what is known about content, duration and delivery methods. It is advisable to investigate the influence of facilitators on the effects of the interventions, too. This will help to determine which type of intervention is most effective, for instance with regards to the duration and content. Research still has differing views on what makes an intervention particularly feasible for this target group, the duration of the intervention or the time at which interventions take place (Luberto et al., 2017). Future studies should look further into possibilities to increase the feasibility for the target group of hospital nurses. In addition, it is important to consider resources which might be needed, e.g. staff to cover absence, and could limit the implementation on side of hospital managers. For instance, a brief mindfulness-based intervention could be developed in cooperation with hospital nurses and managers to adjust time schedules and content to their needs and resources.

The study provides some implications for practice too. Mindfulness interventions are brief with a median length of four weeks and 105 minutes per week. They can be facilitated by anyone with experience in mindfulness or even by smartphone apps, which might be cost-effective to implement. Therefore, hospital managers should consider integrating such short interventions or workshops in their routine to enhance the well-being of their employees. It is likely to be beneficial for hospitals because fostering self-care behavior by means of mindfulness-based interventions improves the quality of patient care (Watanabe et al., 2015). In addition, research suggests that in particular health care professionals, including nurses, are an important population for mindfulness practice because once they improve their abilities and inherit learnings from the programs, it is likely that they share what they learned with their colleagues and maybe also patients they work with (Poulin et al., 2013). As a result, mental health benefits of brief mindfulness-based interventions can be spread among different populations and eventually they may profit from this.

Conclusion

Hospital nurses are particularly vulnerable to the experience of mental illnesses due to the experience of several work-related factors, which possibly lead to a high experience of

distress and low levels of well-being. Low mental health in nurses increases problems of staff shortage and has a direct effect on the quality of care for patients, making it particularly important to increase nurse's mental health. This systematic review explored what is known about brief mindfulness-based interventions in the context of hospital nurses. It further indicated the effectiveness of brief mindfulness-based interventions in increasing life satisfaction and self-compassion, as well as in decreasing the experience of stress and levels of burnout. It is expected that outcomes of this study will contribute to the incentive to implement brief mindfulness-based interventions in hospitals as an effective way to increase the quality of patient care and to increase the mental health of nurses working in such a context.

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