A review on mindfulness and nursing stress among nurses

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Abstract
Previous research has been done on mindfulness and nursing stress but no review has been
done to highlight the most up-to-date findings, to justify the recommendation of
mindfulness training for the nursing field. The present paper aims to review the relevant
studies, derive conclusions, and discuss future direction of research in this field. A total of 19
research papers were reviewed. The majority was intervention studies on the effects of
mindfulness training programs on nursing stress. Higher mindfulness is correlated with
lower nursing stress. Mindfulness-based training programs were found to have significant
positive effects on nursing stress and psychological well-being. The studies were found to
have non-standardized intervention methods, inadequate research designs, small sample
size, and lack of systematic follow-up on the sustainability of treatment effects, limiting the
generalizability of the results. There is also a lack of research investigation into the
underlying mechanism of action of mindfulness on nursing stress. Future research that
addresses these limitations is indicated.

Keywords: mindfulness, nurse, nursing stress

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Introduction
The nature of the nurses’ job is widely recognized as stressful. They have heavy workload juggling
between clinical contacts and administrative tasks, time constraint, insufficient number of colleagues to
share the work burden, strained relationship with other healthcare providers, role conflicts, and challenges
in dealing with the patients and the families’ expectations and sufferings (American Holistic Nurses
Association 2012). Nurses in Malaysia also face the similar stressors (Intan Nazni & Asri 2003). However,
research focusing on the nurses’ stress levels in Malaysia had contradictory outcomes on whether the
prevalence of stress was high (Emilia & Noor Hassim 2007) or moderate (Lua & Imilia 2011; Sharifah
Zainiyah et al. 2011). In fact, the participants in each study reported various levels of stress. This suggests
that given similar external stressors, individual nurses’ differential experiences of stress can be explained by
their personal appraisals and coping strategies. The use of self-blame and emotional ventilation among the
nurses predicted a higher level of stress (Emilia & Noor Hassim 2007; Wan Salwina, Raynuha, Ainsyah et
al. 2009).

The issue of nursing stress concerns the society because the nurses play an important role within the
healthcare settings. Ongoing experience of high stress levels contributes to a higher likelihood of burnout,
psychological distress, and physical health but diminished job satisfaction among the nurses (Michie &
Williams 2003; Wan Salwina et al. 2009)
This contributed to a high turnover rate among the nurses (O’Henley et al. 1997) that would worsen the problem with lack of manpower within the field. It also impeded healthcare outcomes and patients’ satisfaction (Brady, O’Connor, Burgermeister et al. 2011; Larrabee, Ostrow, Withrow et al. 2004). Without the use of adaptive coping, combined with the alarming negative impacts of nursing stress, necessitate the implementation of stress-management program as part of the nurses’ training so that they can learn to cope with stress more effectively.

In recent years, there is an escalating amount of research attention focusing on the effectiveness of mindfulness training programs which include mindfulness-based stress reduction (MBSR; Kabat-Zinn1990) and mindfulness-based cognitive therapy (MBCT; Segal, Williams & Teasdale, 2002) developed from MBSR in stress reduction and well-being enhancement (Baer 2003; Grossman, Niemann, Schmidt et al. 2004) across different populations including people with cancer, depression, heart disease and healthcare providers (Beddoe & Murphy 2004; Bruce & Davies 2005; Gazella 2005; Smith, Richardson, Hoffman, & Pilkinson 2005; Tacon et al. 2003 as cited in Prassman 2008). Mindfulness is the receptive awareness and attention to the present events and experiences which encompass observing, describing, acting with awareness, non-judging, and non-reactivity to private experiences (Baer, Smith, Hopkins et al. 2006; Brown & Ryan 2003). Mindfulness can be a psychological trait, a state with high awareness of the present or as a result of meditational practices that cultivate mindfulness (Germer, Siegel & Fullton 2005). The origin of mindfulness can be traced back to the ancient Buddhist tradition of contemplation. However, it is now widely applied within the secular context without the need of spirituality support because it depends on universal humans’ ability to be attentive to the present (Coffey & Hartman 2008).

As there is a rise in the number of research investigations on the relationships between mindfulness and nursing stress, it is important to conduct a literature review to highlight the most up-to-date research findings and justify the need to introduce mindfulness training to the profession. To date, only one review has been done by Smith (2014) on the studies that investigated the specific effects of MBSR on healthcare providers’ ability to cope with work-related stress. However, no systematic literature review has been done on the relationship between mindfulness and nursing stress. The present paper serves to fill in the gap by reviewing the relevant studies to date to draw conclusions and identify future research directions.

Method

Studies mindfulness and nursing stress were identified after a comprehensive search using three electronic databases: EBSCO (1997-present), Pro-Quest Health and Medical Complete (1994-present), PubMed (1999-present), and SCOPUS (2001-present). Google Scholar was used to search for unpublished dissertations. The inclusion criteria are research studies that investigate the effects of training programs that incorporate mindfulness on nursing stress. The exclusion criteria are research studies that investigate the effects of other stress management programs on other population’s stress. Keywords used to search for the articles include “mindfulness,” “nurse,” and “nursing.” The generic keywords were used to identify as many studies as possible. Filters such as “English language” and “peer-reviewed” were used to refine search. 14 full articles, three unpublished dissertations, noted with an asterisk (*), one abstract of a review paper, and one abstract of a research whereby the manuscript was under corrected proof from the abovementioned databases were identified and included in this review (Figure 1).
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Results and Discussion

A total of 19 research papers from the year 1994 till present fulfilled the inclusion criteria to be reviewed in the present paper (see Table 1 and Table 2). 17 of the research papers are intervention studies on the effects of mindfulness training programs on nursing stress and other well-being measure, one is survey study, and another one is a review paper. 18.75% of the intervention studies were randomized controlled pre-post studies, 37.5% were nonrandomized controlled, another 37.5% were quasi-experiments, and the remaining one study was qualitative. There were ten studies that involved only nurses, three that included other healthcare professionals besides nurses, and four that recruited nursing students as participants. The study by Horner, Piercy, Eure & Woodard (2013) is under corrected proof thus only the abstract with limited details is made available. Excluding Horner et al.’s (2013) study, there were a total number of 1460 nurses and 197 nursing students that were being studied. Most of the studies were conducted in U.S. (64.7%), two in South Korea, and the others were each carried out in Australia, Canada, China, Japan, and Malaysia.

Of all the intervention studies, eight studies (47%) investigated on the effects of MBSR in alleviating stress experienced by the nurses. MBSR was developed by Jon Kabat-Zinn from the University of Massachusetts Medical Center based on the concept of being entirely present to one’s personal experience without resisting or attaching any judgment termed mindfulness. The program was detailed in Kabat-Zinn’s (1990) textbook entitled “Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness.” The original MBSR spans across eight weeks, with at least 2.5 hours of weekly group sessions for formal didactic instruction on topics such as communication skills, stress reactivity, and self-compassion and experiential exercises and a 6-hour daylong retreat during the 6th or 7th week. The participants would also be instructed to actively practice mindfulness meditation for 6 days per week facilitated by the audiotaped instructions. They would also be expected to integrate the mindfulness skills and concepts into daily routine. Beddoe and Murphy (2004), Beth Elsa et al. (2007), and
Cohen-Katz, Wiley, Capuano, Baker, and Shappiro’s (2005) studies were based on the traditional Kabat-Zinn’s (1990) version of MBSR.

Other researchers modified the traditional format and/or content but found similar improvement. Bazarko, Cate, Azocar, and Kreitzer (2013) named the modified MBSR as telephonic MBSR (tMBSR) by replacing the group meeting sessions with 6 scheduled weekly 1.5-hour group teleconference calls, an additional in-person retreat day at the beginning of the program, email discussion with the instructor in between sessions, and access to personalized instructions and supports. Brady, O’Connor, Burgermeister and Hanson (2011) and Mackenzi, Poulin and Sigmund-Carlson’s (2006) adapted the duration to 4 weeks to cater to the nurses’ heavy job demands. There were weekly 1-hour group sessions focusing on formal meditation and attention to breath, mindfulness in daily activities, total body relaxation, and mindfulness at workplace and the requirement to practice meditation and mindfulness in daily activities at least 30 minutes daily. On the other hand, Foureur, Besley, Burton, Yu and Crisp (2013) modified the content into only a 1-day workshop to psychoeducate the nurses’ on the relationships among body, mind, emotion, and behavior and strategies for moment-to-moment mindfulness and the assignment to meditate daily for 8 weeks. Hee, Subramaniam, Rahmat and Phang (2014) devised a 5-week program constituting 2-hour weekly sessions and daily mindfulness practice, named brief-MBCT by integrating MBSR and MBCT approaches. b-MBCT seeks to train the participants in cultivating meta-mindfulness so that by being more aware of their private experiences, they assume a detached perspective to defuse from the negative internal events (Phang & Ooi 2012; Segal et al. 2002). b-MBCT also consists of the elements of compassion and gratitude in addition to mindfulness. In O’Brien et al.’s (2013) study where exposure to humor was incorporated to 7-minute daily meditation for 4 weeks, there was also significant improvement in terms of the nursing students’ anxiety and well-being.

There were four intervention studies that concluded the positive effects of merely daily mindfulness meditation practice across a variety of duration on nursing stress and well-being. The participants in Kang, Choi and Ryu’s (2009) 8-week mindfulness meditation program learned and practiced walking mindfully and body scan and breathing meditation as daily routine. On the other hand, in Pipe, Bortz, Dueck et al.’s (2009) study, the participants underwent a 4-week daily meditation program. Ando, Natsume, Kukihara, Shibata and Ito (2011) investigated on 2-week daily 30-to-60 minute cyclic meditation whereby the participants moved their hands or legs while meditating to focus their attention on mind and body. The program with the shortest duration is Chen, Yang, Wang and Zhang’s (2013) that involved nursing students to meditate for 30 minutes daily for only a week.

There were two other intervention studies that had also shown positive effects of spirituality program that incorporated important elements of mindfulness on nurses’ stress and well-being. Borrmann, Becker, Gershwin et al. (2006) and Yong, Kim, Park, Sweo and Swinton’s (2013) 5-week, 90-minute weekly sessions of spirituality program was based on The Mantram Handbook (Easwaran 1998), that includes practicing Mantram as a form of meditation, cultivating one-pointed attention, slowing down, and repeating mantra during daily activities.

There is only one qualitative study (Beth Elisa et al. 2007) and two quantitative studies that had included some qualitative findings (Cohen-Katz et al. 2005; Foureur et al. 2013). The participants reported that they found the program helpful in managing stress and instilling calmness but having difficulty in following routine meditation and doubted the feasibility of such program to be conducted in the hectic settings.

Twelve intervention studies (70.5%) measured both nursing stress-related and well-being outcomes. Three (17.6%) measured only stress-related findings whereas two (11.7%) measured only psychological well-being at post intervention. To measure stress-related outcomes including perceived stress, burnout symptoms, emotional distress, and job satisfaction, different instruments were used across studies. Three studies used Perceived Stress Scale (PSS) (Bazarko et al. 2013; Borrmann et al. 2006; Hee et al. 2014), one study used Derogatis Stress Profile (DSP) (Beddoe & Murphy 2004) and Mental Health Professionals Stress Scale (MHPSS) (Bradly et al. 2011). Five studies used Maslach Burnout Inventory (MBI) (Brady et al. 2011; Cohen-Katz et al. 2005; Mackenzi et al. 2006; Penque et al. 2009; Yong et al. 2011) and one used Copenhagen Burnout Inventory (CBI) (Bazarko et al. 2013) to measure their burnout symptoms. Certain studies also measured depression, anxiety, stress, and anger using respective questionnaires such as Depression Anxiety Stress Scale (DASS) (Fourer at al. 2013), State/Trait Anxiety Anger Inventory...
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(StAA) (Borrman et al. 2006), Beck Depression Inventory (BDI) (Kang et al. 2009). Chen et al. (2013) adopted Self-rated Anxiety and Depression Scale and physiological measures. Other instruments used were Brief Symptom Inventory (BSI) and Emotional Exhaustion Subscale (EES) (Cohen-Katz et al. 2005). The studies that include work satisfaction measures used Index of Work Satisfaction (Penque et al. 2009) and Job Satisfaction Scale (Yong et al. 2011).

In line with the review done by Smith (2014) which concluded that the healthcare providers including the nurses' ability to cope with job stress was improved after the MBSR, all the nurses or nursing students who had undergone the mindfulness training program regardless format and content differences, experienced significant reduction in terms of stress-related symptoms including perceived stress, burnout symptoms, anxiety, and anger. The only exception is that Brady et al. (2013) did not find significant improvement in the participants' burnout symptoms despite the significant improvement in stress levels with MBSR. Also, mindfulness training programs were found to have no impact on depressive symptoms (Chen et al. 2013; Foureur et al. 2013; Kang et al. 2009). In terms of job satisfaction, the findings by two studies were contradictory whereby the nurses in Penque et al. (2009) but not Yong et al.'s (2011) reported higher job satisfaction at post-intervention. This might be due to other individual and environmental differences in addition to stress that also affect to what extent that they could derive contentment from their job.

Besides stress-related outcomes, most intervention studies also assess the effects of mindfulness training programs on different well-being related outcomes, including mindfulness, sense of coherence, sense of self, quality of life, spiritual well-being, empathy, self-compassion, happiness, and satisfaction with life. 66.7% studies included a combination of different measures in attempt to capture the totality of psychological well-being. This is in line with the general consensus that the definition of well-being is multifaceted (Ryff & Keyes 1995). The most widely used instrument is Mindfulness Attention Awareness Scale (MAAS) (Beth Elisa at a., 2007; Cohen-Katz et al. 2005, Hee et al. 2014; O'Brien et al. 2013), followed by General Health Questionnaire (GHQ-12) (Ando et al. 2011; Foureur et al. 2013), Sense of Coherence Scale (SOC) (Ando et al. 2011; Foureur et al. 2013), and Interpersonal Reactivity Index (Beddoe & Murphy 2004; Penque et al. 2009). Others are listed in Table 1.

In the studies that also measured the treatment outcomes at 1, 2, 3, and 4 months respectively after post-intervention, the positive effects of mindfulness training programs on nursing stress and psychological well-being sustained overtime (Bazarko et al. 2013; Beth Elisa et al. 2007; Cohen-Katz et al. 2005; Mackenzi et al. 2006; Penque et al. 2009).

The survey study done by Heard (2010) showed that the nurses who reported higher level of dispositional mindfulness also had lower propensity to burn out. This implied that without mindfulness training program, individuals' trait mindfulness is also likely to buffer against stress. Based on Taylor, White and Muncer's (1999) findings, facing with the challenge of consistently inadequate number of colleagues to share the workload, the working nurses perceived a lack of resources and support that negatively affected their self-efficacy in managing the job demands. Therefore, trait mindfulness or mindfulness cultivated via training programs assist the nurses to focus while fulfilling their roles, without attaching negative judgment on personal capability and the inevitable stressful job demands. While the training programs also engaged them to develop the habit of being mindful in daily activities, it also improved their general well-being.
## Table 1: Studies of mindfulness training programs on nursing stress

| Study                | Participants | Location                          | Design                        | Program                                                                 | Measures of stress-related outcome | Measures of well-being related outcome | Significant improvement                      |
|----------------------|--------------|-----------------------------------|-------------------------------|------------------------------------------------------------------------|-----------------------------------|----------------------------------------|---------------------------------------------|
| Ando et al. (2011)   | N=28 nurses  | Elderly ward, Japan               | Nonrandomized controlled pre-post intervention study | 2-week of daily cyclic meditation for 30-to-60 minutes                  | N/A                               | General Health Questionnaire (GHQ-12), Sense of Coherence (SOC), Functional Assessment of Chronic Illness Therapy-Spiritual Well-being Scale (FACTT-Sp) | GHQ-12, SOC                                |
| Bazarkoet al. (2013) | N=36         | Midwest & Southwest Healthcare Company, U.S. | Quasi-experimental, single group, pre-post intervention study | 8-week tMBSR with additional 1 retreat day at the beginning, 2 and 4-month follow-up | Perceived Stress Scale (PSS), Copenhagen Burnout Inventory (CBI) | All                                      | All                                         |
| Beddoe & Murphy (2004)| 23 nursing students | U.S.                             | Quasi-experimental, single group, pre-post intervention study | 8-week MBSR | Derogatis Stress Profile (DSP) | Interpersonal Reactivity Index (IRI) | All                                        |
| Beth Elisa et al. (2007)| 4 nurses    | Wisconsin, U.S.                   | Qualitative                   | 8-week MBSR, 3-month follow-up | N/A         | Self-development, Mindfulness Attention Awareness Scale (MAAS) | MAAS                                      |
| Brady et al. (2011)  | N=16         | Inpatient behavioral health unit in Midwest Hospital, | Quasi-experimental, single group, pre-post intervention | 4-week brief MBSR, 1-hour weekly sessions, without retreat day          | Mental Health Professionals Stress Scale (MHPSS), Sense of Self Scale, the Toronto Mindfulness Scale | All except burnout                        |
| Study | Participants | Location | Design | Program | Measures of stress-related outcome | Measures of well-being related outcome | Significant improvement |
|-------|--------------|----------|--------|---------|------------------------------------|---------------------------------------|------------------------|
| Borrman et al. (2006) | N=62 | Veterans Affairs San Diego Health Care System, U.S. | Quasi-experimental, 5-week Mantram repetition | PSS, Engel's Quality of Life Enjoyment and Satisfaction Short Form, Spiritual Well-being Scale | All |
| Chen et al. (2013) | N=60 | Medical University in Guangzhou, China | Randomized controlled study | Self-rated Anxiety Scale, Self-rated Depression Scale, heart rate, blood pressure | N/A | anxiety, systolic blood pressure |
| Cohen -Katz et al. (2005) | N=25 | Lehigh Valley Hospital & Health Network, U.S. | Randomized controlled study | MBI, Brief Symptom Inventory (BSI), Emotional Exhaustion Subscale | MAAS | All |
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| Study | Sample Size | Setting | Intervention | Measure | Outcome |
|-------|-------------|---------|--------------|---------|---------|
| Fourure et al. (2013) | N=40 | 2 teaching hospitals in New South Wales, Australia | Modified 8-week MBSR: 1-day workshop, without retreat day | GHQ-12, Anxiety and Stress Scale (DASS) | All |
| Hee et al. (2014) | N=37 | Hospital Serdang, Malaysia | 5-week brief MBCT, 2 hours/week | DASS, PSS | All |
| Horner et al. (2013) | In press, corrected proof | U.S. | 10-week mindfulness training program | - | All: stress, burnout, mindfulness, compassion |
| Kang et al. (2009) | N=41 | South Korea | 8-week mindfulness meditation stress coping program | N/A | Stress, anxiety |
### Table 1: Continued

| Study | Participant Locations | Location | Design | Program | Measures of stress-related outcome | Measures of well-being related outcome | Significant improvement |
|-------|-----------------------|----------|--------|---------|-----------------------------------|----------------------------------------|-------------------------|
| Mackenzie et al. (2006) | N=30 nurses and nurse-aides | Canada | Nonrandomized controlled pre-post intervention study | 4-week MBSR, 1 month follow-up | MBI | Satisfaction With Life Scale (SWLS) | burnout symptoms, relaxation, and life satisfaction |
| O’Brien et al. (2013)* | N=73 Junior and Senior nursing students | Capella University, U.S. | Nonrandomized controlled pre-post intervention study | 4-week daily 7-minute guided mindfulness meditation + humor | STAI | MAAS | STAI, MAAS |
| Penque et al. (2009)* | N=61 nurses | Abbott Northwestern Hospital in Minnesota, U.S. | Quasi-experimental, single group, pre-post intervention study | 8-week MBSR, 3 months follow-up | MBI, Index of Work Satisfaction | Brief Freiburg Mindfulness Inventory (BFMI), Self-Compassion Scale, BSS, IRI | MAAS, self-compassion, serenity, work satisfaction, job burnout |
| Pipe et al. (2009) | N=33 nurse leaders | U.S. | Randomized controlled pre-post intervention study | 4-week brief mindfulness meditation course | Symptom Checklist 90-Revised | N/A | Stress |
| Yong et al. (2013) | N=51 manager nurses | Hospital in Seoul, South Korea | Nonrandomized controlled pre-post intervention study | 5-week spirituality program | MBI, Job Satisfaction Scale | Spiritual Well-being, Spiritual Integrity | Burnout, spiritual well-being, integrity, leadership practice |

### Table 2: Other non-intervention studies paper
It is indicated from this review that research on mindfulness and nursing stress is limited in the aspects of research design, research participants, generalizability of results, measures of treatment outcomes, intervention content and dosage, comparisons with other stress-buffering factors, and the underlying explanation of the positive effects of mindfulness on nursing stress.

In terms of research design, there are only a limited number of randomized controlled trials (RCTs) for the intervention studies, though RCT is widely recognized as the gold standard in evaluating the efficacy and effectiveness of a treatment (Akobeng 2005). For the single-group pre-post intervention studies where there is no controlled or comparison group, it is difficult to determine the validity of the significance of improvement. Out of 17 intervention studies, 12 did not assess the long term effects of mindfulness training program, thus weakening the justification to incorporate mindfulness training in the nursing field.

Moreover, there is no standardized treatment component except daily meditation that is required in all programs. Across studies, the participants self-monitored and self-reported on their assignments to carry out daily meditation; thus, without an objective monitoring method, it is uncertain whether they actually perform the assignments. The duration of different adaptations of the programs ranges from 1-to-10 week. The method of delivery such as classroom or telecommunication-based and content such as didactic presentations, group sharing sessions, retreat day, and self-directed meditative practices also vary by studies. There is no specific research to determine which treatment components have the largest positive effects (Penque et al. 2009). There is also no investigation to determine the format and dosage that is the most cost and time effective.

Although there are many other stress-reduction programs such as relaxation therapy, assertiveness training, and peer support groups (Lee & Ellis 1990) that were found to be effective, to date, there is no study that compares mindfulness training programs against other stress-management programs for nurses to determine the best intervention option.

There is a wide range of measures of treatment outcome which makes comparisons among studies difficult. In fact, nursing stress was not assessed directly and specifically using work-stress instruments. Although it is shown that mindfulness training programs effectively reduce stress, it is necessary to pinpoint whether the reduced stress is pertaining to the job demands in order to further justify the need to incorporate mindfulness training in the field.

The generalizability of the findings is limited because of the intervention studies that involved small sample size (Cohen-Katz et al. 2005; Mackenzie et al. 2006; Yong et al. 2011) making it difficult to obtain conclusive findings. Brady et al. (2013) explained that small sample size might have resulted in insignificant improvement in the participants’ burnout symptoms. There is also a lack of investigation on

| Study       | Participants | Design      | Program | Measures of stress-related outcome | Measures of well-being related outcome |
|-------------|--------------|-------------|---------|-----------------------------------|---------------------------------------|
| Heard       | N=1186       | Survey      | N/A     | MBI, Index of Work Satisfaction, Nurse Comfort Questionnaire | MAAS, Langer Mindfulness scale, Mindfulness-Based Self Efficacy Scale, |
| (2010)      | registered nurses from 4 hospitals in South Mississippi, U.S. |             |         |                                   |                                       |
| Smith       | Review paper | MBSR        |         |                                   |                                       |
| (2014)      |              |             |         |                                   |                                       |
the impact of gender. Among the participating nurses across studies, there was only three male nurses were involved in the Penque et al.’s (2009) study. However, this is inevitable as it is in line with the fact that male is always the underrepresented group within the nursing field (Penn State School of Nursing, 2007).

Mindfulness has been proven effective as a mean by which nurses can empower themselves to combat various stressors and comfort themselves through mindfulness meditation. However, there is no research in the underlying mechanism of the positive effects.

These limitations of current studies done on mindfulness training programs and nursing stress inform the direction of future research. Future studies are needed to compare mindfulness training programs against controlled and comparisons group using other stress management programs using RCT. The sustainability of positive effects needs to be accessed via long term follow-ups. It is also important to devise the program so that the participants’ daily meditation can be measured objectively. The investigations should also aim to produce a manualized protocol that details standardized format, content, and dosage that is deemed most cost and time effective, in order to cater to the nurses’ busy schedule. This can be done by researching on specific efficacy and effectiveness of the therapeutic components. The measure of stress can be specified to be job-related. To improve the generalizability of the findings, the sample size needs to be larger and the sample should be representative of nurses across departments, genders, and other cultural groups. Further research is indicated to explore the mechanism of action underlying the positive effects mindfulness has on the nursing stress by using mediator or path analysis studies.

Conclusions

Mindfulness has been proven to be effective in reducing nursing stress and improving psychological well-being. However, future research is necessary to include larger sample size that is randomized and representative of the nursing population, compare mindfulness to other training programs, examine the long-term benefits, and explore the underlying mechanism of action to allow more conclusive findings and produce manualized protocol that is most cost and time effective that justify adoption of mindfulness-based training program in the nursing field.

References

Akobeng, A.K. (2005). Understanding randomised controlled trials. *Archive of Disease in Childhood, 90*, 840-844.

American Holistic Nurses Association. (2012). Who we are. Retrieved from: http://www.ahna.org/AboutUs/tabid/1158/Default.aspx

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10*, 125–143.

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self report assessment methods to explore facets of mindfulness. *Assessment, 13*, 27–45.

Bazarko, D., Cate, R.A., Azocar, F., Kreitzer, M.J. (2013). The Impact of an Innovative Mindfulness-Based Stress Reduction Program on the Health and Well-Being of Nurses Employed in a Corporate Setting. *Journal of Workplace Behavioral Health, 28*, 107–133.

Beddoe, A.E., Murphy, S.O. (2004). Does mindfulness decrease stress and foster empathy among nursing students? *Journal of Nursing Education, 43*(7), 305-312.

Beth Elisa, R. (2007). Registered nurses practicing mindfulness: The lived experience. Wisconsin, Marian College of Fond Du Lac.

Bormann, J.E., Becker, S., Gershwin, M., Kelly, A., Pada, L., Smith, T. L. & Gifford, A. L. (2006). Relationship of frequent mantram repetition to emotional and spiritual well-being in healthcare workers. *The Journal of Continuing Education in Nursing, 37*(5), 218-224.

Brady, S., O’Connor, N., Burgermeister, D., & Hanson, P. (2012). The impact of mindfulness meditation in promoting a culture of safety on an acute psychiatric unit. *Perspectives In Psychiatric Care, 48* (3), 129–137.

Brown, K.W. & Ryan, R.M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology,84*(4), 822-48.
Chen, Y., Yang, X., Wang, L. & Zhang, X. (2013). A randomized controlled trial of the effects of brief mindfulness meditation on anxiety symptoms and systolic blood pressure in Chinese nursing students. *Nurse Education Today, 32*(10), 1166-1172.

Coffey, K.A., Hartman, M. (2008). Mechanisms of action in the inverse relationship between mindfulness and psychological distress. *Complementary Health Practice Review, 13*, 79–91.

Cohen-Katz, J., Wiley, S.D., Capuano, T., Baker, D.M., Shapiro, S. (2005). The Effects of Mindfulness-Based Stress Reduction on Nurse Stress and Burnout, Part II: A Quantitative and Qualitative Study. *Holistic Nurse Practice, 18*(6), 302-308.

Davies, W. (2008). Mindful meditation: healing burnout in critical care nursing. *Holistic Nursing Practice, 22*(1), 32-36.

Easwaran, E. (1998). *The Mantram Handbook* (4th, revised ed.). Tomales, CA: Nilgiri Press.

Emilia, Z.A. & Noor Hassim, I. (2007). Work-related stress and coping: A survey on medical and surgical nurses in a Malaysian teaching hospital. *Jabatan Kesihatan Masyarakat 13*(1), 56-76.

Foureur, M., Besley, K., Burton, G., Yu, N. &Krisp, J. (2013). Enhancing the resilience of nurses and midwives: Pilot of a mindfulness based program for increased health, sense of coherence and decreased depression, anxiety and stress. *Contemporary Nurse, 45*(1), 114–125.

Germer, C. K., Siegel, R. D., & Fulton, P. R. (2005). *Mindfulness and psychotherapy*. New York: Guilford Press.

Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Psychosomatic Research, 57*, 35–43.

Hee, K.L., Subramaniam, P., Rahmat, N. &Phang, C.K. (2014). The effects of mindfulness training program on reducing stress and promoting well-being among nurses in critical care units. *Australian Journal of Advanced Nursing, 31*(3), 22-31.

Horner, J.K., Piercy, B.S., Eure, L. & Woodard, E.K. (2014). A pilot study to evaluate mindfulness as a strategy to improve inpatient nurse and patient experiences. *Applied Nursing Research*.

Intan, N. &Mohd. A. (2003). *Faktor-Faktor Tekanan Kerja di Kalangan Jururawat: Kajian di Hospital Lipis, Pahang*. [Unpublished thesis]. Universiti Utara Malaysia.

Kabat-Zinn, J. (1990). *Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness*. New York: Delta.

Kang, Y.S., Choi, S.Y., Ryu, E. (2009). The effectiveness of a stress coping program based on mindfulness meditation on the stress, anxiety, and depression experienced by nursing students in Korea. *Nurse Education Today, 29*(5), 538-543.

Larrabee, J.H., Ostrow, C.L., Withrow, M.L., Janney, M.A., Hobbs, G.R. &Burant, C. (2004). Predictors of patient satisfaction with inpatient hospital nursing care. *Research in Nursing & Health, 27*(4), 254–268.

Lee, S. & Ellis, N. (1990). The design of a stress-management programme for nursing personnel. *Journal of Advanced Nursing, 13*(8), 946-961.

Lua, P.L. &Imilia, I. (2011). Work-Related Stress Among Healthcare Providers of Various Sectors in Peninsular Malaysia. *Malaysian Journal of Psychiatry Early, 9*(11), 1-15.

Mackenzie, C., Poulin, P., & Seidman-Carlson, R. (2006). A brief mindfulness-based stress reduction intervention for nurses and nurse aides. *Applied Nursing Research, 19*(2), 105-109.

Michie, S. & Williams, S. (2003). Reducing work-related psychological ill health and sickness absence: A systematic literature review. *Occupational and Environmental Medicine, 60*, 3–9.

O’Brien, D.A. (2013). Using mindfulness meditation intermixed with humor to reduce anxiety among nursing students during clinical practice. [Published doctoral thesis]. Capella University. Minnesota. *ProQuest Dissertations and Theses, 142*.

O’Henley, O., Curzio, J. & Hunt, J. (1997). Stress and sickness absence: What is and isn’t known. *Managing Clinical Nursing,1*, 87–96.

Penn State School of Nursing. (2007). Perception vs. reality. *Supporting underrepresented and vulnerable populations, 8*-11.

Penque, S. (2009). Mindfulness Based Stress Reduction Effect on Registered Nurses. [Unpublished doctoral thesis]. University of Minnesota, Minnesota.

Phang, C. K., &Oei, T. P. S. (2012). From mindfulness to meta-mindfulness: Further integration of meta-mindfulness concept and strategies into cognitive-behavioral therapy. *Mindfulness, 3*, 104–116.
Praissman, S. (2008). Mindfulness-based stress reduction: A literature review and clinician’s guide. *Journal of the American Academy of Nurse Practitioners, 20*, 212–216.

Pipe, T.B., Bortz, J.J., Dueck, A., Pendergast, D., Buchda, V. & Summers, J. (2009). Nurse leader mindfulness meditation program for stress management: A randomized controlled trial. *Journal of Nursing Administration, 39*, (3), 130-137.

Ryff, C., & Keyes, C. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology, 69*, 719–727.

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). Mindfulness based cognitive therapy for depression: A new approach to preventing relapse. New York: Guilford Press.

Sharifah Zainiyah, S.Y., Afiq, I.M., Chow, C.Y. & Siti Sara, D. (2011). Stress and its associated factors amongst ward nurses in a public hospital Kuala Lumpur. *Malaysian Journal of Public Health Medicine, 11*(1), 78-85.

Smith, S.A. (2014). Mindfulness-Based Stress Reduction: An Intervention to Enhance the Effectiveness of Nurses’ Coping With Work-Related Stress [Abstract]. *International Journal of Nursing Knowledge*.

Wan Salwina, W.I., Raynuha, M., Ainsah, O., Idayu, B.I. &Aniza, I. (2009). Stress and Coping Styles: The Experience of Nursing Staff Working At Two Public Hospitals in Klang Valley, Malaysia. *Medicine & Health, 4*(2), 101-107.

Yong, J., Kim, J., Park, J., Seo, I., & Swinton, J. (2011). Effects of a spirituality training program on the spiritual and psychosocial well-being of hospital middle manager nurses in Korea. *The Journal of Continuing Education in Nursing, 42* (6), 280-288.