**Research Article**

**Stress and Mindfulness in Nursing Students**

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**How to cite this article:** Embrey K, et al. (2024) Stress and Mindfulness in Nursing Students. *Int J Nurs & Healt Car Scie* 04(02): 2024-308.

**Submission Date:** 17 January, 2024; **Accepted Date:** 07 February, 2024; **Published Online:** 10 February, 2024

**Abstract**

**Objectives:** 1) Identify stress levels in two traditional baccalaureate student nurses (BSN) cohorts (2) Identify demographic factors that impact stress, (3) Identify student perceptions of the benefits and uses of mindfulness (4 Explore nursing student perception of the effect mindfulness meditation can have on nursing practice and patient care.

**Methods:** Cross-sectional survey data using the Perceived Stress Scale (PSS) [1] and an open-ended questionnaire. First and third semester students of a traditional four-semester baccalaureate nursing program participated in eight ten-minute mindfulness meditation sessions and completed the PSS and qualitative reflection survey questions.

**Results:** SAS statistical software program assessed the effect variables of age, gender, nursing course, ethnicity, and marital status had on students’ stress levels. Multiple linear regression analysis showed total stress level not associated with age, gender, course, ethnicity, or marital status. Student comments on mindfulness practice fit into three categories: (1) usefulness now,(2) usefulness later, and (3) usefulness in practice.

**Conclusions:** Findings of study revealed nursing students are stressed. Students perceived that mindfulness sessions were helpful and something students would incorporate into a self-care regime both in personal time as well as during work days when dealing with difficult patients and families.

**Keywords:** Baccalaureate Nursing Education ;Mindfulness; Stress

**Introduction**

The World Health Organization defined stress as the “Epidemic of the 21st Century [2]. College students report high levels of stress related to academic performance, family issues, financial concerns, and relationship problems. The percentage of reported stress issues has increased by 30% from 2009-2010 to 2014-2015 [3]. In addition to the aforementioned college student stressors, nursing students have additional stress related to clinical expectations and experiences. Furthermore, nursing students experience more anxiety, especially test anxiety, than students from other healthcare disciplines [4]. Clinical experiences at the undergraduate level add a unique set of stressors for nursing students [5]. According to Turner & McCarthy [4], student nurses experience significant course related stress which leads to burnout syndrome [6] and could contribute to high attrition rates.

**Background/Literature**

High stress levels can impact health, memory, problem-solving, the ability to cope and thus poor academic performance [7]. Burnout syndrome among undergraduate nursing students has been attributed to stress [6]. Poor academic performance can lead to course and program failure. Decreased academic performance can cause higher levels of stress leading to an unhealthy cycle [8].

Stress management programs can significantly reduce the stress experienced by student nurses [9]. Such programs can be lengthy, time consuming and offer a variety of stress reduction techniques. However, the types of interventions that are most successful commonly incorporate skills to enable relaxation. According to Ratanasiripong P, et al. [10], one stress reduction intervention is the practice of mindfulness or mindfulness meditation (MM). Variants of mindfulness meditation have been incorporated into Western psychology and have shown evidence of improving mental health [11]. Howland and Bauer-Wu [12] write mindfulness is the ability to intentionally bring awareness to the present moment and one can develop the ability to be more mindful through mindfulness meditation and other practices. Mindfulness meditation is a means of sensory detachment and reducing bias in one’s perception of the world. Although learning to be more mindful is a lifelong process, one can potentially experience the effects of mindfulness in as little as 10 minutes a day [12].

The stressful and demanding nature of nursing in contemporary healthcare settings [13,14] and attrition resulting from burnout [15] warranted an exploration of the potential benefits of mindfulness meditation for nurses and nursing students by van de Riet, et al. [16]. Findings from the van de Riet, et al. [16] study reported enhanced well-being of the participants after completing a seven-week stress management program. The authors recommended mindfulness meditation programs be introduced early in the curricula for nursing students in the first year of a Bachelor of Nursing program. To these authors’ knowledge there are currently no studies that have compared findings of brief mindfulness meditation sessions among nursing students at different levels of study in a traditional BSN program.

**Aims**

This study aimed to examine the stress levels of Baccalaureate Nursing Students and the impact of mindfulness on stress.

**Methods**

**Research Questions**

What are the stress levels of first and third semester nursing students in a four-semester program?

What factors are associated with stress among nursing students?

What is the impact of mindfulness on stress?

What is student perception on the use of mindfulness for self-care and patient care.

**Study Design, Setting, and Sample**

This study was a cross- sectional survey of first (Junior 1) and third semester (Senior 1) students in a four-semester baccalaureate nursing program in the southeastern United States. A total of 79 students were consented at the beginning of the semester; 60 students from the Junior 1 level enrolled in the Professional Nursing class and 19 students from the Senior 1 level enrolled in Adult Health II nursing course. Recruitment was via course announcements that were verbalized in class and posted on the learning platform class announcement page. Students were invited to participate in eight, 10-minute mindfulness meditation activities during class. Participation was voluntary and participation or nonparticipation had no impact on the course grade. Students who expressed an interest in the program were consented.

**Instrument**

Students were surveyed using The Perceived Stress Scale-10 (PSS) [1]. The PSS uses a Likert scale and consists of 10 items of perception of stress in the last month. The PSS is a validated tool that has been used in many research studies [17,18] with Cronbach’s alpha and test retest reliability both >.70 with moderate or strongly correlated hypothesis testing [18]. Individual scores on the PSS can range from 0 to 40 with higher scores indicating higher perceived stress. Scores ranging from 0-13 would be considered low stress. Scores ranging from 14-26 would be considered moderate stress. Scores ranging from 27-40 would be considered high perceived stress. The Perceived Stress Scale is interesting and important because it takes into account one’s perception of what is currently happening in one’s life, meaning two individuals could have the exact same events and experiences in their lives for the past month but depending on their perception, total score could put one of those individuals in the low stress category and the total score could put the second person in the high stress category [1]. PSS was administered at the beginning and end of a 15-week semester. At the end of the semester, students were also asked to submit a reflective survey and answer the following questions:

How many sessions did you attend?

Did you have prior knowledge of the us of mindfulness for stress reduction?

Will you continue to use mindfulness as part of your personal self-care?

How might you use mindfulness in nursing practice?

**Intervention**

At the beginning of the 10-minute mindfulness sessions, students who wanted to participate were guided through the following sequence: 1. Turn off phones and computers, clear desk. 2. Sit upright in chair with feet flat on the flow (no crossed legs or ankles) and arms in a comfortable position on the abdomen or resting on the thighs or desktop. 3. Close your eyes and focus on your breathing. Feel the breath enter through the nose and fill the chest and abdomen, then feel the breath exit through the nose as you exhale. 4. Let your mind be free and empty. If thoughts of the impending test, family stressors, etc. enter, just let them sit, then go away. Do not judge. Do a body scan with a gradual sweeping of attention through the entire body from bottom to top, feet to head, focusing on the sensations of each part of your body. Focus on the point of reference without judgement or criticism of extraneous thoughts. At the end of 10 minutes, participants were directed to return to the present.

**Ethical Considerations**

This study was reviewed and approved by the University Institutional Review Board and has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. Participants were assured that this study was confidential and anonymous, and their participation was voluntary. All data collection forms were given a code number. Coded information was used for data management.

**Data Analysis**

PSS survey included 10 items of perception of stress measured at the Likert scale. Each item asks participants to select one of the five responses. Responses were coded as follows: 0 - Never, 1 - Almost never, 2 - Sometimes , 3- Fairly often and 4 – Very often. Items 6, 7, 8 and 9 were negative items in PSS, therefore, these items we rescored as 4 - Almost never, 3 - Sometimes, 2- Fairly often and 1 – Very often. Furthermore, the scores of all the 10 items were summed to get a numerical value of stress. Descriptive statistics, including means, standard deviations and frequencies were used to explore the participants’ characteristics by using statistical software SAS 9.4. As we had some missing data for the students at the end of the semester, we used multiple imputation method to make valid inferences. It is well accepted that this method is superior than many other approaches for handling missing data in many health-related fields [20]. Multiple linear regression was used to assess the effect of variables age, gender, nursing course, ethnicity, and marital status on change in student’s stress level from the beginning of the semester to the end of the semester.

**Results**

**Demographic Characteristics**

Table 1 represents the participant characteristics for this study. There were a total of 79 students were enrolled at the beginning of the semester while 25 completed the posttest survey at the end of the semester. Majority of students enrolled in the study were between the age of 18-24 years old. Majority of the students were white females.

**Stress Level**

The mean total stress level before and after the intervention is reported in Table 1. Table 1 demonstrates that the stress level was higher for the students at the end of the semester compared to the beginning of the semester. Multiple linear regression analysis (statistical significance p<.05) showed change in total stress level was not associated with age, gender, course, ethnicity or marital status (Table 2).

|  |  |  |  |
| --- | --- | --- | --- |
| Variables |  | Beginning of Semester (N=76) | End of Semester (N=25) |
| Age | 18-24 years | 63.29% | 52.00% |
|  | 25-34 years | 22.78% | 16.00% |
|  | 35-44 years | 10.13% | 24.00% |
|  | 45-64 years | 2.53% | 8.00% |
| Gender | Men | 8.86% | 4.00% |
|  | Women | 91.14% | 96.00% |
| Ethnicity | White | 66.67% | 60.00% |
|  | Black | 17.95% | 20.00% |
|  | Other | 15.38% | 20.00% |
| Marital Status | Married | 29.11% | 41.67% |
|  | Single | 67.09% | 50.00% |
|  | Divorced or Separated | 3.80% | 8.33% |
| Stress | Total Stress (mean ± sd) | 20.89±4.44 | 22.24±3.68 |

**Table 1:** Participant characteristics.

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Estimate | SE | P-value |
| Intercept | -0.78 | 7.02 | 0.9121 |
| Age 18-24 25-34 35-44 45-64 | 10.06 6.57 1.96 Ref | 7.90 5.73 4.45 Ref | 0.2121 0.2585 0.6626 Ref |
| Gender Female Male | 3.25 Ref | 5.89 Ref | 0.5858 Ref |
| Nursing Course Class 1 Class 2 | -1.94 Ref | 1.98 Ref | 0.5552 Ref |
| Ethnicity White Blacks Others | 0.11 -3.16 Ref | 3.71 3.48 Ref | 0.9758 0.3698 Ref |
| Marital Status Married Single Divorced or Separated | -5.01 -12.16 Ref | 4.58 6.46 Ref | 0.2775 0.0662 Ref |

**Table 2:** Multiple Linear Regression for change in stress with covariates.

**Reflection Responses**

At the end of the semester, students were asked to reflect on the usefulness of mindfulness practice while in nursing school and in future nursing practice by answering seven questions which included: if the student attended the mindfulness sessions and if so, how many; prior knowledge of the use of mindfulness for stress reduction; whether the student would continue to use mindfulness as part of personal self-care; and how would the student use mindfulness in nursing practice. Twenty-five answered the open-ended survey questions. Results of the open-ended questionnaire student reflective comments fit into three categories: (1) usefulness now in personal self-care, (2) usefulness later in personal self-care, and (3) usefulness in nursing practice.

Some examples of reflective comments on usefulness now: “The sessions gave me the ability to focus better”, “…calmed my nerves and lowered my stress level”, “gave me a time to pause and reorganize”, “used them at night to fall asleep when stressed”, “calmed me down before the tests”, “created a general feeling of calm despite stressors”, “I felt very relaxed every time and felt confident and ready for whatever the day had coming for me”, “helped ease my mind”, “centered me and allowed me to disconnect in a healthy way”, “made me feel happier”, “they made me feel relaxed, sort of felt like I left my body and went somewhere else”, “they help me to stop worrying”.

Following are some quotes demonstrating usefulness later: “When getting overwhelmed take a minute to myself and breathe”. When I feel overwhelmed and my brain starts to hurt, I will use mindfulness session to calm my brain.” “I will always need it in nursing” “Remember to institute it was a preventable measure for handling stress, “useful at home processing negative incidences...it was better than eating”, “I believe I will definitely try and use this in my future because it was helpful”, “maybe, it’s helpful and seems beneficial to health but I might not think to do it in times of stress” Students also commented on the usefulness of MM in nursing practice “Also to cope with stress and share with patients who may benefit from it.” “Take deep breaths in stressful situations, or after a long frustrating shift, it can help relieve stress prior to going to bed” “take a breather with a difficult patient or after a difficult shift.”, “if a patient passes away it will help me cope.” “I feel that I will continue to use mindfulness throughout the nursing program as well as my career.” “Keeping this stress reducer technique will help me be a better student and eventually a better nurse.” “Personally I will use it as a CAM [complementary and alternative modality] to aid patients, especially those with chronic illness”, “I think it would be helpful, nursing is stressful and we should all take a few minutes”, “it’s important to stop and take a moment to breathe and calm yourself in the midst of an overwhelming work day”, “to decrease the stress of my patients”, “before and after shifts to separate work and home life”, “I could use mindfulness on myself to calm down and clear my mind before work so that I can start the day off positively. I could also offer them to my patients as a destructive or calming method for them”, “whenever a patient has anxiety about something, recommend this activity”, “if a patient is causing a lot of stress I can use the techniques of deep breathing to not allow the situation to escalate. Also, if a patient passes away, I can use this as a coping mechanism to help with the unfortunate outcome”. “A less stressed nurse will equal better patient satisfaction. It can also help reduce errors”. “Mindfulness can promote a clear head, so the nurse will feel less stressed and be able to provide quality care to the patient.'' “A more positive mindset could really improve patient care”.

**Discussion**

Findings from this study identified similar levels of stress in in two traditional BSN cohorts regardless of whether students were juniors or seniors. Stress levels increased from the beginning to the end of the semester. This finding suggests students are stressed throughout the curriculum, regardless of the schedule of classes and the end of the semester is more stressful than the beginning. The overall mean scores for perceived level of stress were reported within the moderate stress level (14-26) according to the PSS and went up from the beginning of the semester compared to the end of the semester yet still remained in the moderate level. Despite this, most participants in the study expressed mindfulness sessions were helpful and something they would incorporate into a self-care regime that could be used not only in personal time but during stressful days at work when dealing with difficult patients and families. These findings can be used in nursing academia as data to increase awareness among faculty of the perception of nursing students stress levels and support early intervention for incorporating modalities such as MM techniques into the curriculum. These modalities should be introduced beginning with the first semester students and incorporated throughout all levels of the curriculum. As stress levels increase throughout the semester more MM sessions could be offered before each exam, and more frequently during the last few weeks of the semester when more academic demands are placed on students (i.e. final class assignments, final exams, clinical notebooks, etc…). Results also suggest it could be beneficial for faculty to encourage students to reach out for support when feeling overwhelmed and increase student awareness of university resources available for stress reduction (counseling center, recreation facilities, tutoring, student success center, etc…).

Open ended responses lend support to previous research that showed MM and cognitive behavioral interventions increase student wellbeing and decrease anxiety [21,22]. Reported perceived stress scores remained in the moderate range throughout the semester. This finding is similar to other studies regarding stress in college students and specifically nursing students [4,7,9]. The results of the PSS showing increased levels of stress in students lend support to Koren’s [23] research on the importance of increasing awareness of the amount of stress and the need for mindfulness training as part of nursing student’s self-care regime to decrease stress levels and augment daily awareness. The role of stress in producing physiological and psychosocial problems is well known [24]. College students experience levels of stress that could lead to potentially adverse health conditions [25]. These problems include everything from hypertension and gastric ulcers to mental health problems and can be reduced with mindfulness practice [26,27]. Participating in mindfulness meditation could help college students alleviate stress and facilitate other positive outcomes [25].

Mindfulness sessions were introduced into the curriculum both at the junior and senior levels. Data revealed stress levels between cohorts were very similar and statistically insignificant. This further lends support to incorporating MM into all levels of the nursing curriculum as both the junior and senior year of nursing school are perceived by students as equally stressful.

Students in this study perceived mindfulness to be a beneficial part of self-care regime in the present and future and identified many benefits of mindfulness. The findings of this study support previous research that supports the use of mindfulness in nursing students to foster academic success [28], improve judgement [5], and improve the health and functioning. Students who use mindfulness may improve their own health and functioning and use this intervention to foster better patient outcomes [26]. Strengthening attention-regulation efficiency of nursing graduates is important to the quality and safety of nursing practice and neuroscientific evidence suggests regular practice of focused meditation can enhance attentional skills [29].

Findings from this study build upon previous research and explored the potential impact mindfulness practice could have on one’s capacity to provide person-centered care. Students who continue to use mindfulness when they enter the healthcare workforce may experience more job satisfaction [30], greater patient safety [30] and acquire self-regulatory skills necessary for safe nursing practice [29]. Emerging evidence supports the use of mindfulness at work as a means to improve attention and thus the workplace outcomes, including performance, relationships, and well-being [31].

**Limitations of the study**

This study was limited to students in two semesters for one four-semester BSN program. Participation in the mindfulness sessions was voluntary, thus the range of participation was from none to all ten sessions. Additionally, The PSS did not address the sources of stress.

**Conclusion**

Nursing students are stressed. Students in this study had increased stress from the beginning to the end of the study. The findings of this mixed methods descriptive study revealed the brief mindfulness sessions were helpful and something they would possibly incorporate into a self-care regime that could be used not only in personal time but during stressful days at work when dealing with difficult patients and families.

Mindfulness meditation may contribute to student well-being and help students become more effective healthcare providers. Additional studies using MM could include the effect of this practice on attrition and absence as these have not yet been reliably demonstrated.

**Funding Statements**

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

**Conflict of Interest**

The authors declare that they have no conflict of interest.

**Ethical Approval**

This study was reviewed and approved by the University Institutional Review Board and has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

**Acknowledgement**

We are grateful for all of the students who participated in this study and the School of Nursing for support with the study.

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