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**The Association Between Holistic Modalities and Stress Reduction in Nursing Students
Attending School during the COVID-19 Pandemic**

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Abstract

Nursing students tend to experience high levels of stress due to the pressures and demands of nursing school, including exams, clinical, and interactions with professors and preceptors (Labrague et al., 2017). Recently, the COVID-19 Pandemic has created additional stressors. Both mind and body modalities (yoga, meditation, deep breathing etc.) and exercise modalities (running, walking, etc.) are some of many health promoting, stress reducing activities that were proven to be effective in reducing stress in nursing students prior to the pandemic. This study aims to determine if these modalities are still effective now, and how nursing faculty supports stress reduction in their students. A systematic literature review was conducted. A one-time, online, anonymous survey was distributed to junior and senior nursing students at Western Michigan University and Ferris State University. Questions from the Perceived Stress Scale (Cohen, 1983), combined with further questions developed with mentoring from faculty including demographics, nursing school specific stressors, stress reduction techniques, and COVID-19 stressors were distributed to students. Results indicate that there is not an association between use of holistic modalities and stress reduction, but students feel that more stress reduction teaching in curriculum could be beneficial. Further directions of research should examine the holistic modalities in more detail and other stress reduction techniques used by nursing students, as well as how nursing faculty can better help their students maintain lower stress levels.

Introduction

The professional nurse has many roles outside of their main responsibility to provide care for their patients. Nurses must be researchers, advocates, educators, and much more. Presently, there is a growing emphasis on health promotion as a major responsibility of the nurse. Nurses have the ability to encourage a health-related behavioral change in their patient that can result in an increased quality of life, positive health outcomes, and a greater understanding of adherence and self-management in the patients that they care for (Kemppainen et al., 2012). Nurses need to ‘practice what they preach’ before they can provide quality care, meaning they need to focus on their own health and well-being before handling the health of others.

While nurses use health promotion techniques frequently for their patients, nurses often forget to apply their knowledge and care to themselves. In a profession as demanding and stressful as nursing, and during a time as uncertain as a global pandemic, it is important that nurses find time to take care of themselves and ensure that they are healthy. Nurses have extensive knowledge about promoting health, but there is a discrepancy between knowing what is healthy and actually carrying it out in their own lives outside of the hospital (Dunham, 1995). This inconsistency is not limited to nurses but is also present in nursing students.

Students going through nursing school and clinical practice experience their own set of stressors that can negatively impact the students. The importance of health promotion is emphasized throughout most baccalaureate nursing courses, yet like nurses, nursing students often neglect to use what they are taught about promoting optimal levels of health and well-being in their own lives. In order to reach the highest level of well-being, nursing students need to implement health promoting strategies that they would suggest to their patients into their own lives in an attempt to reduce stress levels.

The use of holistic modalities, both mind-body and exercise based, are growing in popularity as a method of stress reduction due to the magnitude of evidence of effectiveness. These practices have a multitude of benefits on many aspects of health, leading to an overall healthier state of well-being, which is the ultimate goal of health promotion in the nursing community. A study performed by Stetson (1997) found that nursing students can utilize a variety of holistic modalities to reduce stress and relieve subsequent discomfort. However, the pandemic has significantly changed the nursing school experience for students in the classroom and clinical setting, both physically and emotionally (Fitzgerald & Conrad, 2021). The techniques that were once successful in reducing the stress levels of nursing students and the health promotion and stress reduction strategy education provided by nursing school professors and clinical instructors may not be sufficient due to the changes and stressors the pandemic has created. Presently, there is a much information about the impact of the COVID-19 Pandemic on nursing students, but a lack of information regarding how to manage new stressors and experiences.

This study aims to determine if holistic modalities, both mind/body and exercise modalities, remain adequate stress reduction techniques for nursing students attending school during the pandemic through a one-time, anonymous, electronic survey. The study also aims to provide nursing students with ideas of activities that can be used as positive stress reduction tools. As well, the study will also examine the nursing student's perspective regarding the inclusion of health promotion and stress reduction education in nursing school curricula.

Theoretical Framework

Nola Pender's Health Promotion Model (1982) views health as more than the absence of illness and disease. The goal of this model is for the person to achieve a health promoting

behavior that will ultimately improve their overall well-being. Pender's framework outlines the factors that can impact an individual's ability to engage health-related behavioral change. These factors include existing personal factors (biological, psychological, sociocultural), the perceived benefits and barriers of the behavior, environmental and relationship influences, and the commitment to the plan that will result in change, as seen in the framework below (see Appendix B). Since this model is effective in changing potentially harmful behaviors, such as the stress that nursing students experience, this framework was selected to guide the current study.

The model was created for nurses to promote healthy behavioral changes in their patients. However, if nurses cannot succeed with achieving health behavior change in their lives, their patients are less likely to accomplish it in their lives. Nurses need to serve as both advocates and role models for their patients, and this should start in nursing school so it can become an instinctive part of their nursing practice (Dunham, 1995). Implementing health promoting behaviors, such as yoga and meditation, or running and walking, into nursing students' lives could increase the student's overall well-being, which is end goal of this model. It will be important to address the student's perceived benefits and barriers to implementing this behavior when interpreting the result of the study. This model does not require the individual to be motivated by fear about their current behavior but encourages and promotes taking appropriate actions to increase the individuals current state of well-being, while taking into consideration the factors that may prevent someone from achieving a behavioral change.

One study that utilized Pender's Health Promotion Framework to examine the health promoting behaviors that nursing students engage in revealed that nursing students are exposed to health promoting behaviors in school, but rarely go on to apply them in their lives (Bryer et al., 2013). The study focused on analyzing the self-perceived barriers in nursing students and

concluded that as nursing students progress through the program, there is a decrease in the amount of health promoting behaviors (such as holistic modalities) along with an increase in perceived barriers. Results also showed that some students felt that implementing various holistic modalities add more stress to their lives as it is another commitment to add to their schedule, especially when it is not a convenient time for them (Bryer et al., 2013). Educating students that they have the choice whether to and when to implement these activities to reduce stress will allow them to reach a higher level of well-being, instead of causing more stress.

The goal of utilization of the Health Promotion Theoretical Framework in this study is to bring awareness to nursing students about activities that will increase their level of well-being and ultimately lead to a permanent health related behavior change, while still allowing the student the choice to engage in the activities, as outlined in Pender's model (see Appendix B).

Literature Review

A systemic literature review was conducted to gather current research regarding stress reduction in nursing students. Four database were used in this systemic literature review: CINAHL with Full Text, Clinical Key, ProQuest, and PubMed. The same 17 search terms were submitted into each database. The search terms consisted of terms such as “nursing students and stress”, “nursing students and stressors”, “nursing students and COVID”, “nursing students and health promotion”, “importance of health promotion and nursing students”, “holistic modalities and stress reduction”, “holistic modalities and stress reduction in nursing students”, “nursing students and CAM”, “nursing students and CAM attitudes” and more to help gather adequate information regarding nursing students and the use of yoga to reduce stress. A total of 98,657 articles resulted from using these 17 search terms in all four databases (see Appendix A). 3 additional articles were found using Google Scholar (see Appendix A). Through elimination of

duplicates, screening, and analysis, 103 articles were identified as being eligible for the current systemic literature review (see Appendix A). The following review includes eighteen of these articles. 85 of the eligible articles were excluded due to the following (see Appendix A): full text unavailable (n=33), stress level were not assessed (n=15), more than just nursing students were studied (n=3), nursing faculty was studied (n=1) non-academic/clinical stressors were assessed (n=7), negative attitudes towards CAM (n=4), and appropriate holistic modalities were not an addressed intervention (n=12).

Stress in Nursing Students

No student is exempt from the variety of different stressors that being in college presents. Nursing students, however, report higher levels of stress throughout their college years when compared to the general student body due to the demands of clinical experiences on top of academics. In a study performed by Bartlett et al (2015) examining stress levels over the past 12 months in the general student body compared to nursing students, there is an obvious difference. 6.9% of the general student body indicated experiencing no stress at all. while 0% of nursing students indicated the same. 6.9% of the general student body reported tremendous stress over the past 12 months, however 17.6% nursing students reported tremendous stress over the past 12 months, Nursing students were also found to have significantly more stress related symptoms such as migraines, sleep disturbances, and illnesses than the general student body (Bartlett et al., 2015).

Stress levels in nursing students tend to be higher due to the increased demands and pressures placed on students going through nursing school. Labrague et al (2017) performed a literature review on 13 studies that examined the stressors of nursing students, and 6 of the studies found that the clinical component of a nursing program is typically what produces the

highest level of discomfort, stress, and anxiety in nursing students. More specifically the unfamiliar settings, caring for patients, fear of harming the patients, their lack of clinical knowledge and experience, and speaking to physicians/preceptors contributed to the stress regarding the clinical experience. As discovered in a study performed by Pulido-Martos et al (2011), other stressors for nursing students include examinations and assessments, the fear of failing courses, financial concerns, and being late to both class and clinical. Despite the large number of nursing students who feel stress for a variety of reasons, one study performed by Murdock et al (2010) revealed that that majority (92.6%) of the nursing students had the desire to improve their stress management and reduction skills. About half of these students went on to indicate that they feel that they have poor stress management skills.

High levels of stress in nursing students has been found to cause students to leave the program, as seen in a study done by O'Donnell (2011). Through his research he found stressors consistent with the studies mentioned above, but also found that students unrealistic expectations of what they thought nursing school would be like. Often times, the student's expectations differ from reality and lead to high levels of stress and anxiety. The author acknowledges the validity of the wide variety of stressors that may cause a student to leave nursing school but suggests that promoting appropriate ways to manage and reduce stress could prevent students from leaving the program (O'Donnell, 2011).

The year of 2020 added the stressor of the COVID-19 pandemic into everyone's lives, especially students who had to learn to quickly adjust to remote and online learning. Nursing schools requires significant amounts of hands-on learning and in-person experience, and the lack of this added significant stress into the lives of nursing students. A study conducted by Aslan & Pekince (2020) compared the stress levels of nursing students during the pandemic to their stress

levels in previous years of nursing school. Results indicated that the COVID-19 pandemic negatively affected the stress levels of nursing students when compared to previous years. 97% of the students in the study reported higher levels of stress related to worry about the pandemic, on top of academic, clinical, and personal stressors that were already present. Temiz (2020) also concluded through the comparison of a pre-COVID stress survey given to nursing students, and a survey given in July of 2020 showed that there was a significant increase in stress levels and a decreased use of coping strategies in nursing students.

An additional study performed by Fitzgerald & Konrad (2021) explored the not only the stress levels of nursing students transitioning to learning and clinical during a pandemic, but also focused on the physical and emotional symptoms that resulted from the feelings of stress. Fifty nursing students responded to the one-time electronic survey. All fifty students indicated that they experience at least one symptom from stress related to school related COVID-19 concerns. According to Fitzgerald & Konrad (2021), “common symptoms reported were difficulty concentrating, feeling overwhelmed, restlessness and irritability, fatigue, sleep disturbances, heart palpitations, abdominal distress, trembling, and panic attacks”. 80% of the respondents reported that these symptoms ‘often’ and ‘very often’ impacted their academic performance, workplace functioning, and caused feelings of isolation (Fitzgerald & Konrad, 2021).

Despite the abundance of evidence regarding nursing students stress levels and their impacts, healthy stress reductions strategies are not often implemented by these students. Nursing students tend to have a sedentary lifestyle during the week due to lectures and lengthy amounts of time spent studying, and may consume an unhealthy diet, as seen in a study conducted by Macedo et al (2020). While nursing students report using health stress coping mechanisms such as exercise, deep breathing, distraction, etc. some of the time, nursing students

also report the more frequent use of alcohol, tobacco, and other substances as ways they cope with stress. These are not health-promoting behaviors, and if nursing students participate in these coping mechanisms as a nurse, it will be difficult to promote health and wellness to their patients.

An additional study performed by Savitsky et al., (2020), aimed to determine how the COVID-19 Pandemic changed how nursing student's placement coping skills and stress reduction techniques to achieve a higher level of well-being. Researchers found an increase in the coping strategy of 'mental disengagement', which refers to the use of alcohol, sedative drugs, and excessive eating, has increased from pre-pandemic levels (Savitsky et al., 2020). Use of these methods actually resulted in higher and worsening levels of anxiety for the students. Hamadi et al., (2021) found that "nursing students' use of Avoidance and Transference as overall coping strategies increased during the COVID-19 Pandemic in comparison to before the pandemic."

Holistic Modalities & Stress Reduction

Through the review of various studies regarding stress and poor management of it in nursing students, it is clear that nursing students could benefit from engaging in holistic modalities. According to the American Holistic Nurses Association (2022), "the aim of holistic health is to support maximum well-being." Holistic health modalities consider and support the health of all parts of a person: mind, body, and spirit. This is important when it comes to stress reduction because the stress response can impact the physical body in addition to the mind, and these holistic modalities target improved well-being for both.

Mind and body practices make up one category of holistic health modalities. The NIH National Cancer Institute (2022) defines a mind-body modality as “a health practice that combines mental focus, controlled breathing, and body movements to help relax the body and mind.” A study of young adults ages 18-24 revealed that both males and females this age mainly utilize these practices for stress reduction and overall improved wellness and find it to be effective (Upchurch, 2018). Some of the many practices include meditation, yoga, deep breathing, guided imagery, hypnosis, and tai chi. A literature review conducted by Riley & Park (2015) resulted in the knowledge that mind and body modalities can reduce stress both biologically and psychologically, both equally important to overall stress reduction. These practices decrease the sympathetic nervous system's response to stressors. The physical symptoms associated with stress, such as an increased heart rate and blood pressure are less likely to manifest in someone who practices yoga regularly. The HPA axis, which is responsible for secreting the stress hormone of cortisol becomes less active with yoga practice. Psychologically, the mindfulness that develops through the practice of these activities leads to changes in how the person thinks about and approaches stressful situations. Those who practice things like yoga, meditation, and deep breathing tend to be more aware of their stressors and coping mechanisms and have a more positive attitude towards stress. (Riley & Park, 2015). Yoga, in particular, is rapidly growing in popularity due to extensive research that proves its effectiveness in reducing stress levels. The practice of yoga is beneficial because it “facilitates a unique interaction between psychological and physiological processes” (Francis & Beemer, 2019). Stress reduction in the mind also results in stress reduction in the body, decreasing some of the negative physical symptoms created by the stress response.

Exercise activities such as running, walking, weight-lifting, hiking, and dancing make up another category of holistic modalities that are proven to be effective in stress reduction. Exercise overall helps promote high levels of well-being and utilizing exercise as a stress reduction technique in addition to maintaining physical health can create immense benefits for the individual. Though everyone respond differently to stress, the impact of the general stress response results in detrimental physiological changes in the brain and the body during the period of stress. Exercise has been shown to “counteract” the effects of the stress response in the body, mainly by reducing the production of stress hormones and stimulating the production of endorphins and the “feel good” chemicals in the body (Jackson, 2013). One study investigates the relationship between going for a walk-in nature or in a gym and the cortisol level of the stressed individual. When comparing pre and post intervention cortisol levels, there was a decrease in cortisol levels in both groups of participants regardless of where they went for a walk (Olafsdottir et al., 2018). Another study focused on determining what intensity of exercise is most effective in reducing stress. Researchers found that high intensity exercise may bring about greater stress relief, but regardless, “aerobic exercise is effective in the treatment of patients with clinically raised anxiety” (Aylett et al., 2018). An additional study conducted examined the benefits that college students derive from using exercise as a stress-reduction technique. Through interviews, the researchers discovered that exercise resulted in positive emotions of happiness and comfort, mind/body satisfaction, and more effective problem-solving and skills. Most notably, participants reported that in addition to feeling relief from stress, exercise helped them to reach higher levels of well-being through improved sleep, diet, and mood, all things that are negatively impacted with stress (Kim & McKenzie, 2014).

Holistic Modalities & Nursing Students

It is clear that various holistic modalities are generally effective in reducing overall stress levels and could benefit nursing students. Previous evidence presented in this literature shows a lack of use of these modalities, so it is important to examine nursing students' attitudes and beliefs regarding the use of holistic practices for stress reduction to determine if promotion of adaption of these modalities is practical.

A qualitative research study conducted regarding nursing students' openness to utilizing holistic therapies found that "an overwhelming majority of students were open to using and/or recommending holistic and complementary therapies, although lack of knowledge and lack of time were seen as barriers to their use" (Kinchen & Loerzel, 2019). An additional study conducted by Walker et al (2017) found similar results. 321 nursing students were asked about their knowledge, beliefs, and attitudes regarding holistic and complementary modalities. The majority of the students had positive attitudes regarding the use of these modalities but lacked sufficient knowledge about actually implementing them into their lives as a consistent stress management strategy (Walker et al., 2017). Another study performed by Avino (2011), also gathered similar data from nursing students. Her research also found that both nursing students and faculty had positive attitudes regarding holistic modalities. 80% of the students in the study reported that they either had used these strategies or would be willing to use these strategies. 81% of the students reported the desire to further their knowledge and training on how to use these strategies in their lives as a technique to reduce their stress levels.

The knowledge that nursing students are open to utilizing these modalities presents a need to determine if these strategies were effective in this population prior to the pandemic. A study of eighty-nine nursing students was conducted with the aim of finding out if mindfulness activities such as meditation reduced stress and anxiety levels. The State-Trait Anxiety Inventory

was the instrument utilized for pre and post intervention survey. According to Ratanasiripong et al (2015), “the mindfulness meditation intervention program also significantly reduced anxiety levels, as well as levels of perceived stress in nursing students.” An additional study conducted examined the effectiveness of a guided yoga class through a YouTube video on reducing nursing students stress levels. When comparing pre and post Perceived Stress Scale results, yoga was found to be an effective tool for stress reduction (Gustas, 2016). As well, another study outlined the benefits of physical activity on stress reduction (weight lifting, flexibility, aerobic exercises) and the negative health effects of inactivity in the general population. The researchers found that nursing students who do engage in physical activity have lower stress levels, and also explored the barriers that impede participation. The researchers provided recommendations for how nursing students can maintain participation in physical modalities for stress reduction despite the barriers, due to their proven effectiveness (McSharry & Timmons, 2017).

It is important to note, however, that all of these studies were conducted prior to March 2020 – pre pandemic. Pre-Covid-19 research indicates that holistic modalities are effective in reducing stress levels in nursing students, but the pandemic has significantly changed the nursing school experience. There is little to no information regarding how students can manage the stress and resulting symptoms, and if pre-COVID stress reduction strategies are effective. As well, current research presents a need for a better understanding of nursing students’ perception of the inclusion of teaching and participation of holistic modalities in nursing school curriculum. Closing these knowledge gaps can reveal to both nursing students and nursing faculty what stress reduction techniques are effective in promoting the well-being of nursing students, and how nursing schools can support their students.

Methodology

After receiving approval from the Institutional Review Board (IRB), subjects from were recruited to participate in this study. A partnership with Ferris State University's nursing program was developed and finalized to broaden the group of potential participants. This partnership was formed partially because Bronson School of Nursing at Western Michigan University is one of nine holistically accredited nursing programs in the country. The School of Nursing at Ferris State University is not one of these programs, and researchers are interested in the differences of stress levels of the students in these two different programs. Recruitment efforts included e-mails, group-chat messages, online fliers, and an informational overview video sent through e-mail. Subject inclusion criteria included being junior or senior status, being enrolled in Western Michigan University's or Ferris State University's nursing program and providing informed consent. Participants were provided with the link to a one-time, online, anonymous survey through e-mail. The survey consisted of 27-questions (multiple choice, Likert Scale, select all that apply, short answer), estimated to take 9.5 minutes to complete. Survey questions and answer choices included in Appendix C. 68 participants took the survey between September 21 and November 4, 2022, 63 of which completed the survey in full. Data was analyzed using Qualtrics and SPSS to determine findings and draw conclusions.

Results

In total, sixty-eight participants consented to participate in this research study. (n=68). Sixty-three patients completed the survey in total. (n=63). The following results and analysis include only the responses received from the sixty-three fully completed surveys.

Basic demographic information was collected for the participants. When asked about gender identify, 88.9% of participants identified as female (n=56). 9.52% of participants identified as male (n=6). 1.6% of participants chose to not disclose their gender identity (n=1).

Ages of participants range from 20 years old – 47 years old. Of the participants, 87.30% of are college seniors (n=55), and 12.70% are college juniors (n=8). In regards to nursing program, 38.1% of participants are enrolled in the Bronson School of Nursing at Western Michigan University (WMU), and 61.9% are enrolled in the School of Nursing and Ferris State University (FSU).

Brief information was gathered about participants activities and commitments outside of class and clinical time. 7.94% of participants indicate that they work a full-time job during the school year (n=5). The majority of participants-74.60%- work a part time job during the school year (n=47). 17.46% of students have no job during the school year (n=11). Additionally, a table below shows the reported amount of hours per week students spend studying and working on homework (*see Table 1*).

Hours/week	# Of Participants
0 – 10 hrs.	n=8 (12.70%)
11 – 20 hrs.	n=30 (47.62%)
21 – 30 hrs.	n=20 (31.75%)
31 – 40 hrs.	n=5 (7.94%)
40+ hrs.	n=0

Table 1. Hours per week spent on homework

Participants were then asked to rate both their pre-pandemic and current stress levels on a scale from 0-10. 92.1% of participants reported being more stress currently than pre-pandemic (n=58). 7.9% of participants reported no change in stress levels (n=5). Zero participants reported a decrease in their stress levels.

The Perceived Stress Scale (PSS) (Cohen et al., 1983) was included in the survey. The PSS is a commonly used tool to determine how an individual perceives their stress levels.

Questions and subsequent scoring included (see Appendix D). Participants scores were calculated, and results show that 1.6% of participants scored in the 'Low Stress' category (n=1), 73.1% of participants scored in the 'Moderate Stress' category (n=46), and 25.4% of participants scored in the 'High Stress Category' (n=16).

A Two Sample T-Test was conducted using SPSS to compare the stress levels of students attending WMU vs. FSU. The mean PSS score of WMU students is 24.04, and the mean PSS score of FSU students is 22.44. On average, students enrolled in both nursing programs score in the 'Moderate Stress' category. The resulting p-value (<0.05) indicates that there is a statistically significant difference in stress levels between the two groups of nursing students.

Once participants reported their stress levels, data regarding the use of holistic modalities and the subsequent association between the modalities and the participants stress level were examined. Holistic modalities used include yoga, meditation, deep-breathing, mindfulness, jogging/running, walking, Pilates, dance, weightlifting. Participants were also asked to report any other methods they use for stress reduction; this includes taking naps, spending time with friends and family, engaging in hobbies, cooking, watching TV, reading for pleasure, drawing, and journaling. 74.60% of participants report more frequent use of exercise modalities such as running, walking, and weight lifting for stress relief (n=47). The remaining 25.40% of participants report more frequent use of mind and body modalities such as yoga, meditation, and deep-breathing for stress relief (n=16). Of the participants who use these modalities, 66.67% of participants feel that there is a stronger association between exercise modality use and lower stress, rather than mind and body modalities (n=42). 33.33% of participants report the opposite: that there is a stronger association between mind and body modality use and lower stress (n=21).

A further breakdown of participants holistic modality use, and the participants reported association between the modality and their stress level is displayed below (see Table 2 & 3).

Modality	Everyday	5-6 days/wk.	3-4 days/wk.	1-2 days/wk.	Never.
Exercise	n=4 (6.35%)	n=10 (15.87%)	n=25 (39.68%)	n=19 (30.16%)	n=5 (7.94%)
Mind and Body	n=0 (0%)	n=2 (3.17%)	n=11 (17.46%)	n=32 (50.79%)	n=18 (28.57%)

Table 2. Days per week participants engage in exercise or mind and body modalities

Modality	Every time	Most of the time	Sometimes	Rarely	Never
Exercise	n=2 (3.17%)	n=32 (50.79%)	n=22 (34.92%)	n=5 (7.94%)	n=2 (3.17%)
Mind and Body	n=1 (1.59%)	n=13 (20.63%)	n=33 (52.38%)	n=8 (12.7%)	n=8 (12.7%)

Table 3. How frequently participants feel exercise and mind and body modalities are associated with lower levels of stress.

To further examine the relationships between holistic modalities and participants stress levels, additional statistical analysis was performed.

A Two Sample T-test was conducted between use of mind and body holistic modalities and associated PSS scores. Participants who use these modalities more frequently have a higher mean perceived stress level (M=24.69) than those who use them less frequently (M=22.62). The p-value of 0.518 (> 0.05), indicates that there is not a statistically significant difference in perceived stress scores and the students reported used of mind/body modalities.

Exercise modality use revealed similar results through a One-Way ANOVA test. Similarly, to the mind and body modalities, participants who use these modalities never to one time/week have the lowest mean PSS score (M=22.88), when compared to the mean PSS of

moderate use of two times/week to four times/week ($M = 23.25$), and the mean PSS of high use of five times/week to everyday ($M = 23.00$). The p-value of 0.953 (> 0.05), indicates that there is not a statistically significant difference in perceived stress scores and the students reported used of exercise modalities.

Information was gathered regarding students' perceptions of their respective nursing programs inclusion of holistic modality and stress reduction teaching in nursing school curriculum (*see Table 4*). Combined between both schools, 77.78% of participants feel that increased holistic modality and stress reduction teaching integrated into nursing school curriculum could be beneficial in helping students better manage their stress ($n=49$).

Nursing Program	Never	Once a semester	2-3 times per semester	4-5 times per semester	6+ times per semester
WMU	n=1 (4.0%)	n=1 (4.0%)	n=12 (48.0%)	n=3 (16.0%)	n=7 (28.0%)
FSU	n=0 (0%)	n=5 (10.53%)	n=22 (57.89%)	n=6 (15.79%)	n=6 (15.79%)

Table 4. How many times stress reduction strategies are taught per semester at WMU vs. FSU.

Participants had the opportunity to share personal experiences with holistic modalities and stress reduction. Below are comments from participants that indicated a theme in participants overall:

“Usually, I will start to notice my anxiety when it starts to show physical symptoms, so techniques to reduce physical signs like deep breathing work best for that. They don’t really impact my actual stress levels, just help with the physical symptoms.”

“I recently have been going through a very bad bout of panic attacks directly related to school and family life, along with relationship issues. It has been so bad that I’ve recently started taking medication for it for the first time. Doing mindfulness meditations almost every day and reframing thoughts have been helpful, but it is extremely difficult.”

“Mindfulness helps me fall asleep at night.”

“I play a sport, so unfortunately body modalities aren’t for the purpose of stress reduction, however mind modalities sometimes help lower stress.”

Finally, participants could provide comments regarding their experiences with stress reduction being taught in their respective nursing program. Below are comments from individual participants that indicated a general theme in participants overall:

“I have done most of these in class and I do find that they reduce stress levels. I know that if I did them outside of class, they would help reduce stress, however, I never do them because I feel like I do not have time, or as though I should be studying or doing something else.” -WMU Student

“I think running and taking time to yourself if what I practice, not necessarily because the nursing program’s curriculum, but because it is a self-formed habit.” -FSU Student

“We had a meditation session in OB once because the professor is super supportive to students. But other than that, I can’t remember a time when we have used class time for stress relief.” -WMU Student

“The faculty does, in my opinion, a wonderful job of reminding students to focus on self-care when they can. I appreciated how self-care was able to be applied to our community volunteer hours this semester because it shows that our professor values it. I do wish other courses incorporates it into the curriculum more.” -WMU Student

Overall, results reveal that nursing students in both programs are moderately stress, and more so than prior to the beginning of the COVID-19 Pandemic. Though the participants feel that both exercise and mind and body modalities are associated with feelings of lower stress, further analysis shows no statistically significant difference in perceived stress and different amounts of holistic modality use. Participants feel that though holistic modality and stress reduction teaching is currently included in nursing curriculum, more could be beneficial.

Limitations

There are multiple limitations that exist in this research study. Firstly, the smaller sample size (n=63) limits the amount of statistical analysis that can be conducted and what conclusions

can be drawn from the data in terms of the hypothesis. A larger sample size could have allowed for more extensive and detailed analysis of the data to learn more about the participants responses and what they mean.

Additionally, information about the external factors in the participants life at the time of the completion of the study was not gathered. PSS scores could have easily been influenced depending on these external factors. This limits what interpretations can be made about participants stress levels since there was limited information regarding what was contributing to the numbers at that specific point in time.

Similarly, limited information about the use of holistic modalities was gathered and taken into consideration. More detailed information regarding a participant's history and current practices with holistic modalities could have provided more information and data to analyze and draw conclusions from. For example, a participant may have reported that they use meditation every day of the week, but just started doing this, so an association in lower stress levels may not have been noticed by the participant at the time of survey completion. There are many factors to be considered in addition to how often the modality is used, and this could create stronger research.

Time constraints may be considered another limitation of this research study. Further analysis could have been performed with a longer period of time for completion of the study. Similarly, lack of experience from the student research limited what tests, methods, and analysis could be completed.

Discussion

The results show that many nursing students feel that engaging in holistic modalities, both mind/body and exercise, is associated with feeling lower levels of stress to some extent. However, Perceived Stress Scores still indicate that nursing students are not experiencing adequate stress relief with these modalities. Research shows that these holistic modalities were effective in nursing students prior to the pandemic; however, this research shows otherwise. There is a need for further research to determine why this is the case, and if there are other stress reduction techniques that have proven to be effective post-pandemic. Other techniques that nursing students use for stress reduction should be explored, including the use of negative coping mechanisms. This current research study shows that there *may* be an association between holistic modalities and stress reduction, but there are likely other strategies that nursing students are using to manage the levels of stress experienced during nursing school and navigate the challenges the COVID-19 pandemic created.

However, before completely disregarding holistic modalities as useful in lowering nursing students stress levels during the pandemic, further research could be completed with more detailed information about the participants use of holistic modalities: this could include gathering information about how long the participant has been using the modality, the duration of time they use the modality when they do, how consistently they do this, if there are any indications in feeling of stress or symptoms that prompt the participant to use the modality, etc. It's possible that there is a specific "dose" or "frequency" of holistic modality use that is required to have an impact on stress levels, and these participants are engaging in these activities differently. In the same sense, more extensive information about what is going on in the patient's life at the time of survey completion in research studies like this should be gathered. For

example, did the participant take the survey immediately before a final exam? Was the participant experiencing major stressors in their personal life when they took the survey? Had the participant just worked 3-12 hours shifts in a row? Research of this magnitude could provide further insight into what is contributing to PSS scores of participants, and if there are holistic modalities that work better for different levels of stress and worry.

Nursing school faculty should consider the inclusion of more frequent and/or more in-depth stress reduction teaching and practice into their curriculum. A common experience among nursing students is feeling guilty, or worried about taking time away from doing homework and studying to engage in holistic modalities like these. Mean Perceived Stress Scale Scores show that on average, those who use holistic modalities less frequently have lower perceived stress levels. This could be because taking a break from assignments, studying, and school commitments actually increases the stress a student feels. While they are engaging in a modality, they may be focusing on all of the other school related things they could be doing, rather than solely focusing on self-care and stress relief. This could indicate a potential need for curriculum changes to incorporate in-class activities or self-care assignments. Doing this would essentially 'force' nursing students to engage in holistic modality activity. If a professor designates five minutes of class per day to stress relief or require students to engage in self-care activities as a 'course requirement', there would likely be less feelings of guilt, or worry about falling behind. With consistent practice like this in class, there is the hope that students could begin to adapt to this and incorporate the strategies into their life, even outside of class requirements.

The difference in mean PSS scores between WMU and FSU are cause for further research because the Bronson School of Nursing at WMU is one of the nine American Holistic Nurses holistically endorsed nursing programs; Ferris State is not. Students from a nursing

school with this accreditation have the ability to apply for a certification of this following graduation. This certification advances nursing by allowing holistic nurses to better promote health, wellness, and well-being for their patients (AHNCC, n.d.). The researchers of this hypothesized that WMU would have lower stress overall than FSU based on the idea that holistic practice and teaching is thoroughly incorporated into WMU's nursing program. However, this is not the case – the student that go to the non-holistically accredited nursing program actually had lower PSS scores at the time of survey. This creates curiosity regarding nursing program curriculum differences between schools and poses the need for further research between holistically accredited vs. non-holistically accrediting nursing programs. The numbers could also serve as a guide for nursing faculty to adjust curriculum and teaching accordingly to promote optimal stress levels in their nursing students.

Conclusion

As much as nurses have a responsibility to take care of their patients and help them to become as healthy as possible, they have the same responsibility to themselves. According to the American Nurses Association (2015), “the nurse owes the same duties to self as to others, including the responsibility to promote health and safety, preserve wholeness of character and integrity, maintain competence, and continue personal and professional growth.” This provision is highly regarded in the world of nursing, and it should be held to that same standard of importance in nursing school. Learning about how to maintain their own well-being, in addition to learning how to take care of patients, will set the students up for success as they transition into the RN role. There is no denying that nursing students are stressed, and likely always will be, but there are strategies and techniques that should be explored and implemented that will help nursing students achieve and maintain healthy levels of stress.

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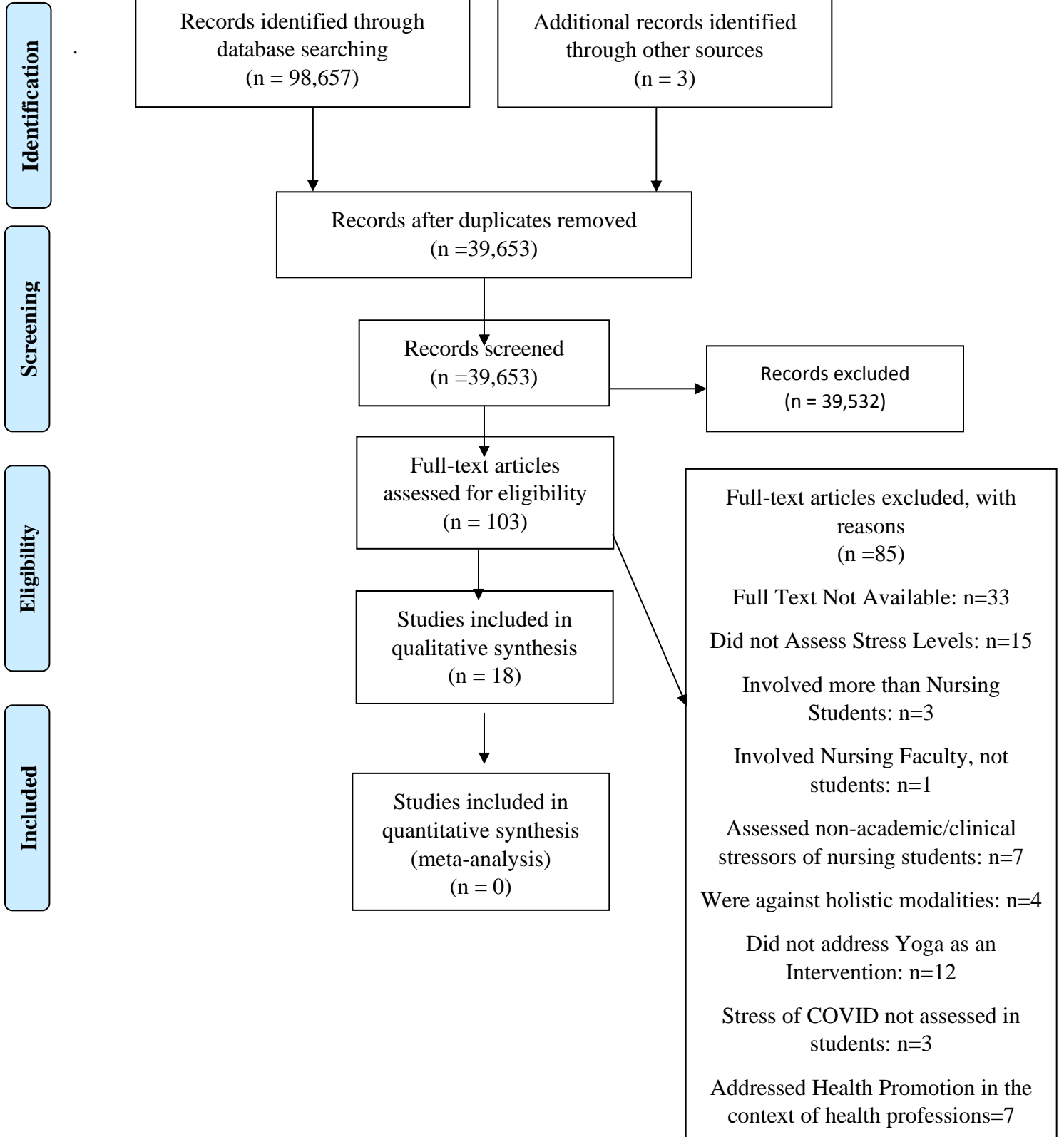
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Appendix

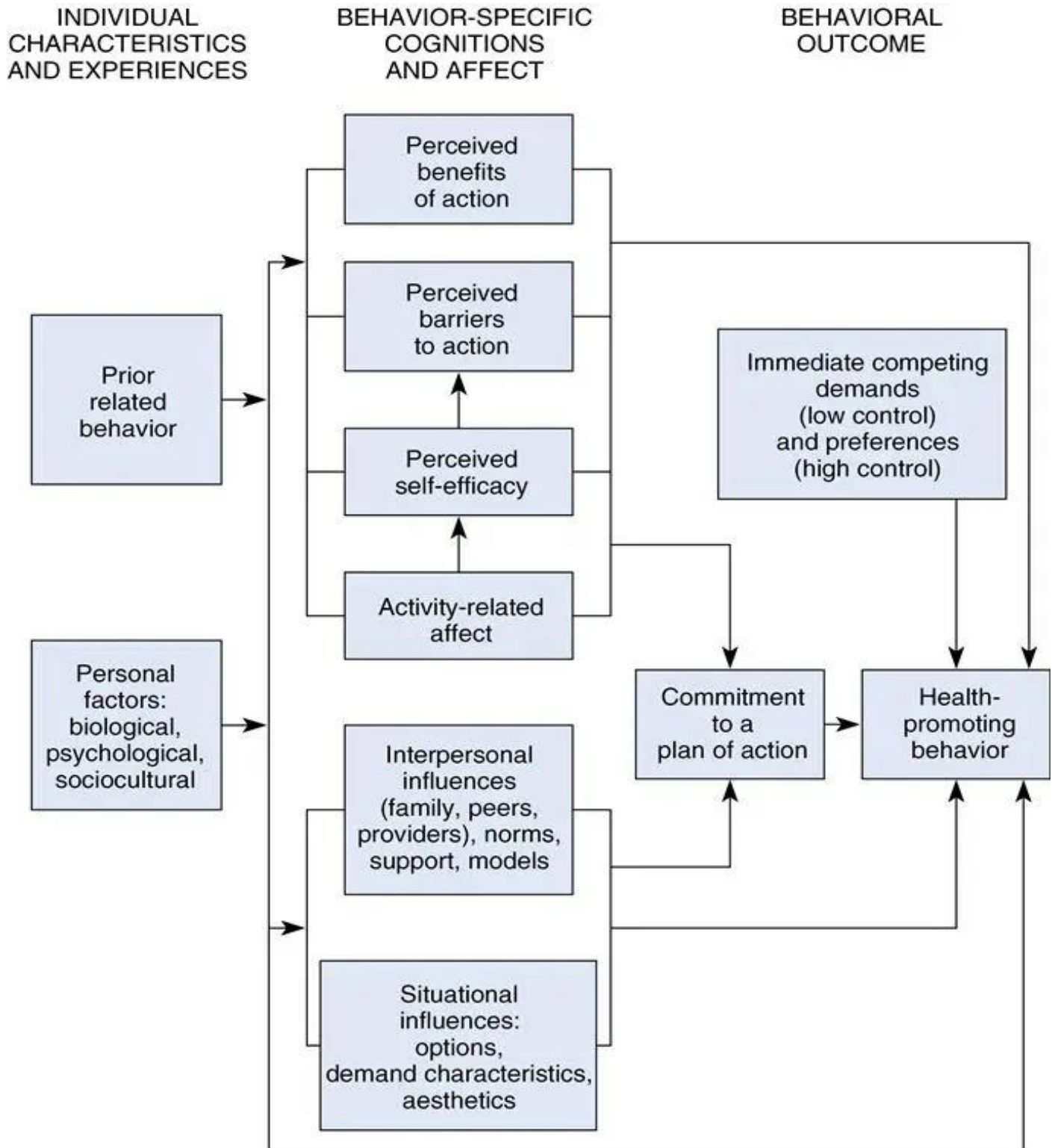
Appendix A – PRISMA Flow Diagram



PRISMA 2009 Flow Diagram



Appendix B – Nola Pender’s Health Promotion Model (1982)



The following document with consent forms and questions will be created into a survey using the Western Michigan University provided application Qualtrics.

When the participant clicks the link to access the survey, the first page will be the **Anonymous Online Survey Consent Form**, linked in this application. If the participant selects **NO**, the next screen will state “Thank you for your response” and will close. If the participants selects **YES**, the survey below will open:

Thank you for taking the time to complete this short survey. The intent of this short study is to learn about wellness and self-care behaviors in nursing students.

We want to reiterate that by completing this survey you provide implied consent for participation. Personal identifying data such as date of birth, name, and address will not be collected during this survey.

Demographic Information

1. Age:
2. Gender: Female, Male, Non-Binary, Gender Fluid, Prefer not to disclose
3. Nursing Program Name: WMU, Ferris State
4. Current semester of nursing program:

Semester 3, Semester 4, Semester 5, Semester 6

5. College status:

Junior, Senior

Survey Questions

Age, semester in nursing program, gender, job/work responsibilities, stress level on scale of 0-10, hours you spend on homework/studying per week, hours you spend using stress reduction techniques per week

0 = Never, 1 = Almost Never, 2 = Sometimes, 3 = Fairly Often, 4 = Very Often

Perceived Stress Scale Questions (Cohen et al., 1983).

In the last month, how often have you been upset because of something that happened unexpectedly?

In the last month, how often have you been unable to control the important things in your life?

In the last month, how often have you felt nervous and “stressed?”

In the last month, how often have you felt confident about your ability to handle your personal problems?

In the last month, how often have you felt that things were going your way?

In the last month, how often have you found that you could not cope with all of the things that you had to do?

In the last month, how often have you been able to control irritations in your life?

In the last month, how often have you felt that you were in control of things?

In the last month, how often have you been angered because of things that were outside of your control?

In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

- ▶ 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

Additional Questions

Do you feel that COVID-19 has increased your stress level throughout nursing school?

- Yes/No

Do you feel that you experience higher levels of stress than your peers who are not in the nursing program?

- Yes/No

How often are you able to make time to relax and take a break from school/work/responsibilities?

- Everyday
- 5-6 times a week
- 3-4 times a week
- 1-2 times a week
- Maybe once a week
- Never

How often are you able to perform self-care activities?

- Everyday
- 5-6 times a week
- 3-4 times a week
- 1-2 times a week
- Maybe once a week
- Never

What activities do you participate in to help reduce your stress levels as a nursing student? Select all that apply.

- Yoga
- Meditation
- Deep Breathing
- Mindfulness
- Jogging/Running
- Walking
- Pilates
- Dance
- Other: please list -

How often do you engage in mind/body modalities such as activities such as yoga, meditation, or deep-breathing?

- Everyday
- 5-6 times a week
- 3-4 times a week
- 1-2 times a week
- Maybe once a week
- Never

How often do you engage in exercise modalities such as activities such as jogging, running, or walking?

- Everyday
- 5-6 times a week
- 3-4 times a week
- 1-2 times a week
- Maybe once a week
- Never

How often do you experience a decrease in your stress level following practicing activities like yoga, meditation, or deep breathing?

- Every time
- Most of the time
- Sometimes
- Rarely
- Never

How often do you experience a decrease in your stress level following practicing exercise modalities such as jogging, running, or walking?

- Every time
- Most of the time
- Sometimes
- Rarely
- Never

Which of the modalities to you use most often:

- Mind/Body Modalities such as Yoga, Meditation and Deep Breathing
- Exercise modalities such as Jogging, Running, and Walking

How often are you taught/reminded about stress-reduction techniques for yourself in nursing school?

- 6+ times per semester
- 4-5 times per semester
- 2-3 times per semester
- Once during a semester
- Never

Do you feel that the nursing program supports and encourages students to perform self-care activities?

- Yes
- Most of the time
- Sometimes
- Unsure
- No

Do you think it would be beneficial for nursing programs to offer/ integrate mind/body modalities in classes for students ?

- Yes
- Unsure
- No

Has your participation in self-care mind/body modalities activities such as yoga, meditation, and deep breathing increased since the pandemic?

- Yes
- Unsure
- No

Has your participation in self-care exercise modalities activities such as jogging, running, or walking increased since the pandemic?

- Yes

- Unsure

- No

Do you feel that the pandemic has made it increasingly difficult to integrate self-care activities in your day-to-day activities?

- Yes

- No

Do you feel that the nursing faculty recognize, and support students increased need for self-care activities during the COVID-19 Pandemic ?

- Yes

- No

The following questions are open ended, please respond based on your experiences

If you would like, please share any experiences you have with utilizing activities such as yoga, meditation, and deep breathing and how the activities have impacted your stress levels as a nursing student.

If you would like, please share any experiences you have with utilizing other self-care activities and how the activities have impacted your stress levels as a nursing student.

Appendix D – Perceived Stress Scale

For each question choose from the following alternatives:

0 - never 1 - almost never 2 - sometimes 3 - fairly often 4 - very often

- _____ 1. In the last month, how often have you been upset because of something that happened unexpectedly?
- _____ 2. In the last month, how often have you felt that you were unable to control the important things in your life?
- _____ 3. In the last month, how often have you felt nervous and stressed?
- _____ 4. In the last month, how often have you felt confident about your ability to handle your personal problems?
- _____ 5. In the last month, how often have you felt that things were going your way?
- _____ 6. In the last month, how often have you found that you could not cope with all the things that you had to do?
- _____ 7. In the last month, how often have you been able to control irritations in your life?
- _____ 8. In the last month, how often have you felt that you were on top of things?
- _____ 9. In the last month, how often have you been angered because of things that happened that were outside of your control?
- _____ 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Figuring Your PSS Score

You can determine your PSS score by following these directions:

- First, reverse your scores for questions 4, 5, 7, and 8. On these 4 questions, change the scores like this:
 $0 = 4, 1 = 3, 2 = 2, 3 = 1, 4 = 0.$
- Now add up your scores for each item to get a total. **My total score is _____.**
- 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 your perception of what is happening in your life is most important. Consider the idea that two individuals could have the exact same events and experiences in their lives for the past month. 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.