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Evaluation of Depression, Anxiety and Stress in Graduate Nursing Students

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Abstract

Mental health issues are growing in the United States. Postgraduate school is widely known to increase the level of psychological difficulties (Dyrbye et al., 2006) experienced by students. There is a need to address mental health care in graduate nursing students. This project was a descriptive observational comparison pre-post-intervention design used to see if online modes of delivery would aid in decreasing mental health issues for nursing graduate students. Participants were provided with access to three podcasts and encouraged to use the Sanvello mobile application provided to all students at this university. The first podcast focused on using the Sanvello application, mindfulness and positive thinking, managing stress and incorporating healthy coping habits, the importance of sleep, and healthy eating and movement on mental well-being; the second focused on problem solving skills, setting goals, strategies to overcome barriers, strategies to improve sleep, dealing with emotions in healthy ways, and the importance of nutrition and physical activity; and the third integrated information from the previous podcasts and focused on setting long term goals. It occurred virtually over 12 weeks at a large Midwestern public urban university during the Spring 2021 semester. A convenience sample of 30 nursing graduate students who “opted in” completed the pre intervention survey and 7 students completed the post-survey. These surveys included a demographic survey, healthy lifestyle behaviors, use of Sanvello and the following validated evidence-based scales: the Generalized Anxiety Disorder Scale (GAD-7), Personal Health Questionnaire-8 (PHQ-8), and The Perceived Stress Scale (PSS). Both the pre and post intervention surveys found participants had mild anxiety, mild depression, and moderate stress levels. This project did not result in any statistically

significant results; however, the post-intervention survey means of the PHQ-8 and PSS decreased, indicating a clinically significant difference. All post-intervention participants did use the Sanvello application and 85% of those participants found it at least “somewhat helpful”. This result suggests that the Sanvello application could continue to be an effective mental health aid for graduate nursing students. Further research is needed to determine if podcasts could aid in delivering mental health care aid to graduate nursing students.

Evaluation of Depression, Anxiety and Stress in Graduate Nursing Students

During the COVID-19 pandemic and the various stages of the country-wide lockdowns, the state of the nation's mental health has become increasingly more important. It is undeniable that the pervasiveness of mental health issues is growing in the United States. Graduate healthcare education is very challenging and places a large amount of pressure and stress on its students. This stress level results in health care graduate students experiencing greater levels of mental illness when compared to their age-matched peers (Dyrbye et al., 2006). There is an ever-growing need to address this health disparity at the university level. The lack of mental health care support for graduate students continues to be an important challenge faced by educational institutions.

Graduate nursing school students face very unique challenges. Unlike other graduate programs, nursing school culture is structured in such a way that students traditionally do not go straight into graduate programs. Prospective nursing graduate students are encouraged to gain experience as a Registered Nurse before applying and entering a graduate program. This results in students typically entering graduate school at a later age than those of other graduate programs. This age difference adds an additional layer of stress and pressure for many students. Often, graduate students are balancing family demands and working at least part-time, all while trying to juggle the stressors that having enrolled in a graduate program places on them.

The profession of nursing is emotionally and physically demanding. The level of burnout, depression, physical illness, and substance use issues are reported to be higher than the general public (Sampson et al., 2020; Ivey, 2015). It is reported that nurses are

two times as likely to experience depression (Letvak et al., 2012) and alarmingly, they complete suicide at higher rates than that of the general public (Hall et al., 2016). The ability to manage the stress that comes with the academic, employment and life workload can affect the student's health and wellbeing (Jacob et al., 2013).

It is well documented in the literature that the effects of increased levels of depression, anxiety and stress in healthcare students can manifest in many ways. Some notable ways are decreased academic performance, decreased self-care activities, decreased empathy and compassion towards patients, and an increase in medical errors (Klawonn et al., 2019). Hoying et al. (2020) found that almost half of healthcare graduate students had an increased self-reported depression score and nearly a third of students had an elevated self-reported score of anxiety in their first year of graduate school. These students are future health care practitioners and their mental health needs are incredibly important. Safeguarding them while they are in their educational programs are of utmost importance.

The literature indicates that healthy lifestyle behaviors can help decrease levels of depression and anxiety in adult populations (Hoying et al., 2020; Loprinzi & Mahoney, 2014). These lifestyle behaviors are increasing regular physical exercise, eating nutritious foods, decreasing the amount of alcohol and caffeine, and getting adequate sleep. The graduate student population does not participate in the recommended amount of exercise, nor eat a well-balanced diet (Downes, 2015; Garcia-Williams et al., 2014).

The purpose of this project is to assess the current mental health of nursing graduate student population in a Midwestern urban public research institution and to evaluate the effectiveness of providing strategies to improve the quality of their mental

and emotional health. Additionally, this study will examine the use of the current mobile application, Sanvello, that is offered for free to the entire student population. The objectives of this project in the short term are to give graduate nursing students tools to aid in lowering their depression, anxiety, and stress levels; in the long term it may assist in the development of a departmental program to aid in the mental health and emotional wellbeing of future graduate nursing students. This will be a descriptive observational comparison study, using pre- and post-intervention results. The aims of this project are as follows: (a) to examine the prevalence of depression, anxiety, and stress in a graduate nursing student population, (b) to evaluate the effectiveness of stress reducing and wellbeing interventions delivered by podcast, (c) to exam the use of the Sanvello application on depression, anxiety, and stress in the graduate nursing student population, and (d) to determine if there is a reduction in depression, anxiety and stress in UMSL graduate nursing students after the interventions.

Literature Review

Three electronic databases, including PubMed, CINAHL, and EBSCO were searched in August-October 2020. Search terms were developed through a literature search and in collaboration with a UMSL Librarian. These terms were Nursing Graduate Students which resulted in 7291 results; the MeSH terms Education, Nursing, Graduate, Stress, psychological with the sub-title psychology was then used, this resulted in 318 articles. There was no restriction in year or language of publications at that time. Another search was performed with the key terms “mental health” or “depression” or “anxiety” or “stress” and “nursing graduate students”, the addition of the filter peer reviewed was added. This resulted in 133 articles. The filter of 20 years was then placed on the search

and this resulted in a reduction of the number of articles to 72. These journal articles were then reviewed to determine the relevance to this current study. Seventeen articles were retained for use (Appendix A).

This literature review supports the common theme throughout several sources that graduate students are at an elevated risk for higher rates of anxiety, depression, and stress than their peers who are not in graduate school (Vallance et al., 2011; Peynenburg et al., 2019). Several studies have highlighted the exposure of multiple stressors to which graduate students are experience (Rith-Najarian et al., 2019; Beiter et al., 2015; Drake et al., 2016). Brown et al. (2016) reports that the highest level of stress reported by graduate nursing students were reported by those who were unpartnered, had one or more children, and were employed at least part time.

Another common theme throughout the search was that healthcare graduate students often experience several barriers to accessing treatment. These barriers include time constraints, privacy concerns, and access to care. These same sources have reported that internet-based interventions can provide a viable option for reducing this barrier (Day et al., 2013; Peynenburg et al., 2019; Rith-Najarian et al., 2019; Davies et al., 2014). There is some evidence that this is due to the highly connected culture of the university system/culture. Computer and internet delivered interventions have been trialed and studied at an increased rate in recent years (Proudfoot et al., 2011). Peynenburg et al. (2019) report that although internet delivered treatments were found to be acceptable by participants, face to face treatments were still preferred. Their study revealed no statistically significant differences in adherence to treatment between internet and face to face, suggesting that this is a viable option. This is an area where more research needs to

be done, and education could be provided to the public to help change the perception of receiving help via internet/computer-based options.

Another important gap in the literature is that nearly every study found in this literature search based its sample on students who actively volunteer for the study. This may be leaving out an important group of students who struggle with the most severe levels of mental health issues. More research is needed to discover how to recruit and retain a more diverse cohort.

A meta-analysis by Yusuf et al. (2019) found that psychoeducation interventions, coping skills training and cognitive behavioral therapy were statistically significant methods for aiding in the reduction of stress in graduate students. Phang et al. (2015) found that mindfulness training aided in the reduction of healthcare students stress levels. Mindfulness training in various forms is a common theme throughout the literature (Klanin-Yobas et al., 2014; Padilla-Melendez et al., 2014; Lazarus, 1999).

Sanvello (Lo Health, 2021) is a mobile application that uses evidence-based techniques such as cognitive behavioral therapy, mindfulness training and meditation to aid in the reduction of depression, anxiety, and stress in its mobile users. It also serves as a mood and health tracker, allowing the user to input self-reported data about their own daily symptoms to notice trends. One randomized control study found that Sanvello (was named Pacificia at the time of the study) did have a clinically significant change in lowering anxiety, depression, and stress (Moberg et al., 2019). In that same study it was reported that participants felt an increase in self-efficacy. Another study found participants used Sanvello up to five times more often than that of traditional therapy (Lan et al., 2018). Ventura & Chung (2019) reported that Sanvello users continued to

reap the benefits of lower depression, anxiety and stress levels even after the participant stopped using the application.

The evidence-based practice model that was selected to guide this project was the Plan-Do-Study-Act (PDSA) model. This was selected because it gives a structured method to see if the interventions aid in lowering stress, anxiety, and depression in the graduate nursing student population. Going through the prescribed four steps helped guide the thinking process into breaking down the tasks into steps. It also provides rapid feedback about what works and what does not.

This literature review supports the idea that graduate nursing school students are at an elevated risk for mental health disorders. It also revealed that access to treatment is a common barrier faced by many students seeking mental health help. It provided evidence that there is a large need to improve services offered to graduate students. There is a gap in the literature when it comes to sampling, this is due to many factors. Addressing this gap is beyond the scope of this project further research will be needed to address this. The PDSA model will aid in guiding this project by giving it a framework to break down the specific steps.

Methods

Design

This project was a descriptive observational comparison pre-post intervention design. It took place over 12 weeks during the Spring 2021 semester.

Setting/Sample

This project occurred at a large Midwestern public urban university, using a convenience sample of nursing graduate students who “opted in” via an email recruitment process. The process occurred virtually.

Data Collection

Data collection occurred using a Qualtrics survey at the beginning of the spring semester and then 12 weeks later near the end of the semester. The pre-intervention survey included demographic items including age, sex/gender, race/ethnicity, marital status, number of hours worked, number of children, year of graduate school, and part-time/full-time status in graduate school. Questions asked about current mental health activities such as currently utilizing therapy services and if the participant is currently taking medication for mental health issues (Appendix B). Also, participants were asked in the pre-survey if they were currently using the Sanvello application (Appendix C) and how often they used Sanvello in the post-survey (Appendix D). Additionally, the following evidence-based surveys were used at the beginning of the study and at the end of the 12 weeks: Generalized Anxiety Disorder Scale (GAD-7) (Appendix E), Personal Health Questionnaire-8 (PHQ-8) (Appendix F), and The Perceived Stress Scale (PSS) (Appendix G).

The GAD-7 was used to measure anxiety and its associated symptoms (Appendix E). This tool measures feelings and behaviors associated with anxiety that occur within the past two weeks (Lowe et al., 2008). It is based on a four-point Likert scale. Scores range from 0 to 21 (Sampson et al., 2020). A totaled score between five and nine are consistent with mild anxiety, results between ten and fourteen are considered moderate anxiety, scores fifteen and higher are considered severe anxiety (Sampson et al., 2020).

This tool is a widely accepted tool and, according to Peynenburg et al. (2019) with an 89% sensitivity and an 82% specificity. Additionally, studies report that although it was originally designed to assess Generalized Anxiety Disorder, there is enough research to support that it can be used to measure overall anxiety as well (Peyneburg et al., 2019).

The PHQ-8 was used to measure depression symptoms (Appendix F). This is a widely used and accepted questionnaire that uses a four-point Likert scale to rate depressive symptoms over a two-week period (Kroenke et al., 2001). Symptoms can be rated from a zero (not at all) to three (nearly every day). Total scores range from 0 to 24. Participant scores up to a four are considered to have minimal depression symptoms, results of five to nine are considered to have mild depressive symptoms, scores between ten and fourteen are moderate, scores between fifteen and nineteen are considered moderately severe symptoms, and a score of greater than or equal to 20 are considered severe depressive symptoms (Sampson et al., 2020). The short length of this tool makes it a useful instrument in myriad settings ranging from primary care to inpatient psychiatric hospitals. Additionally, Kroenke et al. (2001) report that it has a longstanding history in the literature as being a reliable and valid tool for measuring depression severity, with a sensitivity of 88% and a specificity of 88%.

The PSS was used to measure the level of stress that students identify that they are experiencing (Appendix G). Cohen et al. (1983) explain that this scale assesses self-perceived thoughts about stress during the past 30 days. Responses range from never, almost never, sometimes, fairly often and very often. Questions two, four, five, six, seven, and eight have reversed scores. Results on the items are totaled, with the lowest score being zero and the highest score being 40. The higher the score the higher the

perceived stress the person is experiencing. According to Sampson et al. (2020) the PSS has established validity with good reliability with many populations, as it has been translated into 25 different languages (Taylor, 2015).

The use of the Sanvello application was measured by self-report. Questions in the pre-intervention survey asked whether participants were currently using the application (Appendix C). In the post-intervention survey participants were asked about the frequency of use of the application and the subject's perception of whether it helped in decreasing stress, anxiety, and depression in their lives (Appendix D). Additionally there are questions that assessed how often the student participated in healthy lifestyle behaviors. These questions included how often a participant exercised in a week and how many servings of vegetables and fruits they ate in a day (Appendix H).

Approval Process

Approvals were obtained by UMSL IRB. Consent (Appendix I) was understood to be signed by pressing "next" on the Qualtrics survey. This was due to the sensitive nature of mental health issues. Due to the possibility of a person participating in the study needing immediate mental health intervention, the crisis number and contact information for the UMSL Health, Counseling and Disability Services was provided during the pre- and post-surveys and during each podcast.

Procedures

On February 11th, 2021, a recruitment email was sent out via the UMSL College of Nursing graduate student listserv to all graduate nursing students (Appendix J). The email introduced the project and contained a link that routed the person to the Qualtrics survey. If a person chose to participate, the link took the user to an informed consent page

(Appendix I) and the pre-intervention questions. The students who opted-in implied consent when they pressed “next”. On February 20th, 2021, a second request for participants was sent. On February 28th, March 22nd, and April 19th, 2021, emails were sent out to the graduate nursing listserv, with encouragement to listen to the podcasts and to use the Sanvello application. The final email, that contained the link to the post-intervention survey was sent out on April 28th, 2021. Final data cut-off time was May 6th, 2021.

The pre-intervention survey included demographic questions along with the following evidence-based questionnaires: PHQ-8, GAD-7, and the PSS. The participants included their preferred email. The email was used to send out the post-intervention survey. Instructions to sign up for the Sanvello app were also provided.

There was a total of three podcasts released on Anchor, a free public platform for podcasts. The link was provided to the whole graduate nursing body with the recruitment email sent with its link to the whole listserv. These podcasts were around 10 to 20 minutes in length and focused on tools to aid in the reduction and management of stress, anxiety, and depression (Appendix K).

All three podcasts were available at the beginning of the project for the participants to listen to. On February 28, 2021, the first email with information about the podcast was sent out via email using the graduate nursing school listserv. The first podcast focused on: using and signing up for the Sanvello application, introduction of mindfulness and positive thinking, introduction of managing stress with the incorporation of healthy coping habits, the importance of sleep, healthy eating, and movement on mental well-being. The second email about the podcast was sent on March 22, 2021, and

focused on problem solving skills, setting goals, strategies to overcome barriers, the importance of sleep and ways to improve sleep during stressful times, dealing with emotions in healthy ways, and the importance of nutrition and physical activity. The third email with the final podcast was sent on April 19th, 2021 and focused on combining the information from the previous podcasts and setting long-term goals.

The post-intervention included the same evidence-based questionnaires used during the pre-intervention data collection with the PHQ-8, GAD-7, The Perceived Stress Scale. Additionally, it included a self-reported post-intervention questions about the participants usage of the Sanvello application (Appendix D).

When the surveys were completed, the data was compiled and analyzed using Microsoft Excel. Unpaired t-tests were used to compare pre- and post-intervention results, and descriptive statistics were used to describe the sample. Results were reviewed to identify a statistically significant difference in pre- and post-intervention results.

Results

Most data was descriptive in nature and descriptive statistics were analyzed using Microsoft Excel. Unpaired t-tests were performed to compare the pre- and post-intervention results. The graduate nursing listserv included about 355 students. A total of 30 students participated in the pre-intervention survey and seven students participated in the post-intervention survey. Table 1 describes the demographics of the participants in the pre- and post-survey.

Table 1

Demographic Survey: Pre-intervention/Post-intervention

	Pre-intervention		Post-intervention	
	n		n	
	n=30		n=7	
	Number	%	Number	%
Age				
18-24	1	3.3%	0	0%
25-34	13	43.3%	1	14.3%
35-44	6	20%	3	42.9%
45-54	7	23.3%	2	28.6%
Over 55	3	10%	1	14.3%
Gender/sex				
Female	28	93.3%	7	100%
Male	2	6.7%	0	0%
Ethnicity/Race				
White/Caucasian	24	80%	6	85.7%
Black/African American	4	13.3%	0	0%
Native American	0	0%	0	0%
Asian/Pacific Islander	2	6.6%	1	14.3%
Marital status				
Married	19	63%	3	42.9%
Divorced	3	10%	3	42.9%
Single/Never Married	7	23%	1	14.2%
Domestic Partnership	1	3%	0	0%
Hours Worked				
0	1	3.3%	0	0%
1 to 12	3	10%	0	0%

12 to 24	5	16.7 %	1	14.2
24 to 40	14	46.7 %	2	28.6%
40 plus	8	26.7 %	3	42.9%

***Number of
Children***

0	12	40%	2	28.6%
1	6	20%	1	14.3%
2	5	17%	1	14.3%
3	7	23%	3	10%
4	0	0%	0	0%
Greater than 4	0	0%	0	0%

***Year in
graduate
school***

1 st year	2	6.7%	0	0%
2 nd year	5	16.7 %	1	14.2%
3 rd year	13	43.3 %	3	42.9%
4 th year	5	16.7 %	1	14.2%
Greater than 4 th year	5	16.7 %	2	28.6%

***Full or Part
time in
school***

Part time	24	80%	5	71.4%
Full time	6	20%	2	28.6%

Seeking help

Yes	12	40%	1	14.2%
No	18	60%	6	85.7%
Prefer not to answer	0	0%	0	0%

***Counseling
or therapy***

Yes	8	26.7 %	0	0%
No	22	73.3 %	7	100%
Prefer not to answer	0	0	0	0%

Medications

Yes	14	46.6 %	3	42.9%
No	16	53.3 %	4	57.1%
Prefer not to answer	0	0%	0	0%

The demographics of the 30 participants in the pre-intervention were as follows: almost half were between the ages of 25-34, they were overwhelmingly female, white, married, reported that they worked between 24 and 40 hours per week, were part-time students, in their third year of graduate school, and had one child. The demographics of the seven post-intervention participants were as follows: almost half were between the ages of 35-44, all were female, the majority were white, divorced, reported that they worked between 24 and 40 hours, had two children, were part-time graduate students and in their fourth year of graduate school.

Table 2 includes the results of the GAD-7, PHQ-8, and PSS.

Table 2

GAD-7, PHQ-8, Perceived Stress Scale: Pre-intervention/Post Intervention results

	Pre-intervention		Post-intervention	
	<i>n=30</i>		<i>n=7</i>	
	Mean	Range	Mean	Range
GAD-7	7.966	0-20	7.428	5-18
PHQ-8	7.633	0-21	5.428	1-12
PSS	18.133	8-27	16.857	11-30

Results for the GAD-7 in the pre-intervention found that participant scores ranged from 0 to 20 with a mean of 7.966. Results in the post-survey found participant scores ranged from 5 to 18 with a mean of 7.428. These mean scores fall into the “mild anxiety”

for pre- and post-intervention group. The unpaired t-test between groups was ($t=0.263$, $p=.398$).

Results for the PHQ-8 in the pre-intervention found that participant scores ranged from 0 to 21 with a mean of 7.633. Results in the post survey found participant scores ranged from 1 to 12 with a mean of 5.428. These mean scores fall into the “mild depression” range. An unpaired t-test between the groups was ($t= 1.302$, $p=.109$).

Results for the PSS in the pre-intervention found that participant scores ranged from 8 to 27 with a mean of 18.133. Results in the post-survey found participant scores ranged from 11 to 30 with a mean of 16.857. These mean scores fall in the “moderate stress” level. An unpaired t-test between the groups was ($t= 0.444$, $p=0.334$).

The podcasts that were streamed on Anchor and available to all graduate nursing students were played a total of 36 times, 24 of those were the first episode, six times for the second episode and six times for the third episode.

The application Sanvello was used by 2 out of the 30 pre-intervention participants, and all seven of the post-intervention participants reported using Sanvello. Two post-intervention participants reported using it two to four times a week, two reported using it two times a week and three participants reported using it less than two times a week. Three post-intervention participants reported that they felt as though they did benefit from using the application, three reported that they felt that they somewhat benefited, and one reported that they did not benefit.

The pre-intervention participants averaged one to two days per week of exercise, reported eating one to two servings of fruit and vegetables daily, and drinking one to two caffeinated beverages daily. Post-intervention participants averaged at least three days a

week of exercise per week, reported eating an average of three to four servings of vegetables and fruit daily, and drank two to three caffeinated beverages daily. Pre-intervention participants averaged six to eight hours of sleep per night, with two to three nights taking more than 30 minutes to fall asleep and woke at least four nights per week. However, pre-intervention participants did not attribute their sleep issues to worries or stress. Post-intervention participants averaged at least six hours of sleep per night, took more than 30 minutes to fall asleep at least four nights per week, only slept through the night four nights per week, and contributed their sleeping issues to worries and stress. Both the pre- and post-intervention participants reported that they “somewhat often” practiced mindfulness, intentional living, and self-acceptance. They both reported that meditation was “not often” part of their daily routine.

Discussion

The purpose of this study was to assess the current mental health status of the nursing graduate students in a large Midwestern urban public university and to evaluate the effectiveness of providing strategies to improve the quality of these students’ mental and emotional health. Because of the low post-survey response rate, it is difficult to make any meaningful comparisons between the two groups. Participants of this project overall did experience some mental health issues with a group mean GAD-7 score result of “mild anxiety”; a PHQ-8 result of “mild depressive symptoms” and a PSS result of “moderate stress level”. However, these scores are lower than expected when compared to the current literature (Dyrbye et al., 2006).

These unexpected findings may be due to the cultural shift of acceptance in America for seeking mental health support. This may be reflected in the result of 12 of

the 30 pre-intervention participants reporting that they were already engaged in some sort of support for mental health.

Although none of the results were statistically significant, the lower means in the post-intervention group from the PHQ-8 and the PSS may be clinically significant, especially when coupled with the information that all the post-intervention participants participated in using the Sanvello application. Additionally, six out of seven post-intervention participants reporting that the application was either helpful or at least somewhat helpful. This result is indicative that the Sanvello application could continue to be an effective mental health aid to graduate nursing students. This is consistent with the current literature (Moberg et al., 2019). This may be due to the current programs that were provided; this is unclear, however, because two of the pre-intervention participants were already using the Sanvello application that is provided for free to all students.

It is also unclear if the podcasts were an effective vehicle in aiding in mental health reduction, as no post-intervention questions were included to assess if they aided the participants. It is known that the podcasts were accessed 36 times, 24 of which were the first episode. The implication is that they were not widely used by the participants throughout the 12 weeks. This is an area where further study would be beneficial.

Limitations

Although the intention of this project was to match pre- post-participant results, the Qualtrics survey results were unable to be matched. Additionally, there was a lack of participation in the project which led to a small sample size. Another limitation was that the platform used for the podcasts released all three podcasts simultaneously, instead of the planned three separate times.

Implications for Education and Future Research

For future research, it would be helpful to be able to pair participants in a pre-post-intervention design. This would allow observers to identify if individual pre-post-test results were improved with intervention. Another suggestion for future studies is to establish a better way to recruit and retain participants.

This project does suggest that mental health support for nursing graduate students is important. The unique challenges faced by this population means that traditional support systems that universities offer may not be sufficient. Flexibility to access care is important. This could be accomplished using a virtual platform to provide counseling, prescribe medications and teach skills that would aid in the improvement of mental health and wellbeing for graduate nursing students. Future studies in this area are needed to assess if quality, effective care could be delivered through this type of platform to this specific population.

Another suggestion is to develop a method to track graduate nursing students' mental health throughout their graduate program. This could be accomplished by annual or bi-annual surveys. This information could be used to identify if there is a decline in mental health in the nursing graduate school population.

Conclusion

The literature is clear that graduate school students are at an increased risk for mental health issues. They have higher rates of anxiety, depression, and stress than their peers who are not in graduate school. Overall, the scores of the participants in this project were lower than what is reported in the literature but still showed mild levels of anxiety and depression and moderate levels of stress. It is unclear if this is due to small sample

size, the mental health programs available to participants, the number of students already under care or the overall culture shift of mental health acceptance in America.

This project does support the continued use of Sanvello to aid in the mental wellbeing of the graduate nursing students. The results of the pre-and post-intervention were not statistically significant, but the means of the PHQ-8 and the PSS were lower post-intervention. This may be clinically significant and further supportive of keeping the Sanvello application available to the student population. Further research is needed to identify if podcasts are an effective vehicle for aiding in mental health in this population.

Reference:

- Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *The Journal of Affective Disorders*, 173, 90-96. <https://doi.org/10.1016/j.jad.2014.10.054>.
- Brown, K., Anderson-Johnson, P., & McPherson, A. (2016). Academic -related stress among graduate students in nursing in a Jamaican school of nursing. *Nurse Education in Practice*, 20, 117-124. <http://dx.doi.org/10.1016/j.nepr.2016.08.004>.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386-396.
- Davies, E., & Morriss, R., & Glazebrook, C. (2014). Computer-delivered and web-based interventions to improve depression, anxiety, and psychological well-being of university students: a systematic review and meta-analysis. *Journal of Medical Internet Research*, 16(5), 130. Doi:10.2196/jmir.3142
- Day, V., & McGrath, P., & Wojtowicz, M. (2013). Internet-based guided self-help for university students with anxiety, depression and stress: a randomized controlled clinical trial. *Behavior Research and Therapy*, 51, 344-351. <http://dx.doi.org/10.1016/j.brat.2013.03.003>
- Downes, L. (2015). Physical activity and dietary habits of college students. *Journal for Nurse Practitioners*, 11(2), 192-198.
- Drake, E., Sladek, M., Doane, L. (2016). Daily cortisol activity, loneliness and coping efficiency in late adolescence: a longitudinal study of the transition to college. *International Journal of Behavioral Development*, 40, 334-345.
- Dyrbye, L., Thomas, M., & Shanafelt, T. (2006). Systematic review review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Academic Medicine*, 89, 443-451.
- Garcia-Williams, A., Moffitt, L., & Kaslow, N. (2014). Mental health and suicidal behavior among graduate students. *Academic Psychiatry*, 38, 554-560. <http://doi.org/10.1007/s40596-014-0041-y>
- Hall, L., Johnson, J., Watt, I., Tsipa, A., & O'Connor, D. (2016). Healthcare staff wellbeing, burnout, and patient safety: a systemic review. *PloS ONE*, 11, e0159015. <http://doi.org/10.1371/journal.pone.0159015>.
- Hoying, J., & Melnyk, B., & Hutson, E., & Tan, A. (2020). Prevalence and correlates of depression, anxiety, stress, healthy beliefs, and lifestyle behaviors in first-year

- graduate health sciences students. *Worldviews on Evidence-Based Nursing*. 17 (1), 49-59.
- Jacob, T., Itzhak, E., & Raz, O. (2013). Stress among healthcare students--a cross disciplinary perspective. *Physiotherapy Theory Practice*. 29(5):401-12. doi: 10.3109/09593985.2012.734011. Epub 2012 Oct 24. PMID: 23094641.
- Ivey, M. (2015). Substance abuse among nurses. *Kentucky nurse*, 63(4), 8-10.
- Kroenke, K., Spitzer, R., & Williams, J. (2001). The patient health questionnaire-8: Validity of a brief depression severity measure. *Journal of Internal Medicine*, (16)606-613.
- Klainin-Yobas, P., Keawkerd, O., Pumpuang, W., Thunyadee, C., Thanoi, W., & He, H. (2014). The mediating effects of coping on the stress and health relationships among nursing students: A structural equation modelling approach. *Journal of Advanced Nursing*, 70, 1287-1298. <http://dx.doi.org/10.1111/jan.12283>
- Klawonn, A., Kernan, D., & Lynskey, J. (2019). A 5-Week Seminar on the Biopsychosocial-Spiritual Model of Self-Care Improves Anxiety, Self-Compassion, Mindfulness, Depression, and Stress in Graduate Healthcare Students. *International journal of yoga therapy*, 29(1), 81-89.
- Lan, A., Lee, A., Munroe, K., McRae, C., Kaleis, L., Keshavjee, K., & Guergachi, A. (2018). Review of cognitive behavioral therapy mobile apps using a reference architecture embedded in the patient-provider relationship. *Biomedical engineering online*, 17
- Lazarus, R., (1999). *Stress and emotion: A synthesis*. New York, NY: Springer.
- Letvak, S., Ruhm, C., & McCoy, T. (2012). Depression in hospital-employed nurses. *Clinical nurse specialist*, 26(3), 177-182.
- Lo Health. (2021). A place to feel better, wherever you go. Retrieved June 12, 2021, from <https://www.sanvello.com/>
- Lowe, B., Decker, O., Muller, S., Brahler, E., Schellberg, D., Herzog, W., & Herzberg, P. (2008). Validation and standardization of the generalized anxiety disorder screener in the general population. *Medical Care*, 46 (3), 266-274.
- Loprinizi, P., & Mahoney, S. (2014). Concurrent occurrence of multiple positive lifestyle behaviors and depression among adults in the United States. *Journal of Affective Disorders*, 165, 126-130. <https://doi.org/10.1016/j.jad.2014.04.073>
- Moberg, C., Niles, A., Beermann, D. (2019). Guided self-help works: randomized waitlist controlled trail of pacifica, a mobile app integrating cognitive behavioral therapy

and mindfulness for stress, anxiety, and depression. *Journal of Medical Internet Research*. 2019; 21 (6):e12556

- Padilla-Melendez, A., Fernandez-Gamez, M., & Molina-Gomez, J. (2014). Feeling the risks: Effects of the development of emotional competences with outdoor training on the entrepreneurial intent of university students. *International Entrepreneurship and Management Journal*, 10, 861-884. <http://dx.doi.org/10.1007/s11365-014-0310-y>
- Peynenburg, V., & Mehta, S., & Hadistavropoulos, H. (2019). Postsecondary student perceptions and preferences for the treatment of depression and anxiety: comparison of internet-delivered cognitive behavior therapy to face-to-face cognitive behavior therapy and medication. *Canadian Journal of Behavioral Science*. 52 (3), 220-230.
- Phang, C., Mukhtar, F., Ibrahim, N., Keng, S., & Sidik, S. (2015). Effects of a brief mindfulness-based intervention program for stress management among medical students: The Mindful-Gym randomized controlled study. *Advances in Health Sciences Education*, 20, 1115-1134. <http://dx.doi.org/10.1007/s10459-0159591-3>
- Proudfoot, J., Klein, B., Barak, A., Carlbring, P., Cuijpers, P., Lange, A., Ritterband, L., & Anderson, G. (2011). Establishing guidelines for executing and reporting internet intervention research. *Cognitive Behavior Therapy*. 40 (2): 82-97. Doi: 10.1080/16506073.2011.573807.
- Rith-Najarian, L., & Boustani, M., & Chorpita, B. (2019). A systematic review of prevention programs targeting depression, anxiety, and stress in university students. *Journal of Affective Disorders*. 257, 568-584. <http://doi.org/10.1016/j.jad.2019.06.035>
- Sampson, M., & Melnyk, B., & Hoying, J.(2020). The mindbodystrong intervention for new nurse residents:6-month effects on mental health outcomes, healthy lifestyle behaviors, and job satisfaction. *Worldviews on Evidence-Based Nursing*. 17(1), 16-23.
- Taylor, J. (2015). Psychometric analysis of the ten-item perceived stress scale. *American Psychological Association*. 27(1), 90-101. <http://dx.doi.org/10.1037/a0038100>
- Vallance, J., & Winkler, E., & Gardiner, P., & Healy, G., & Lynch, B., & Owen, N. (2011). Associations of objectively-assessed physical activity and sedentary time with depression. *Preventive Medicine*. 53, 284-298. Doi: 10.1016/j.ypmed.2011.07.013
- Ventura, J., & Chung, J. (2019) The lighten your life program: an educational support group intervention that used a mobile app for managing depressive symptoms

and chronic pain. *Journal of Psychosocial Nursing and Mental Health*. 2019 Jul 1;57(7):39-47. doi: 10.3928/02793695-20190221-01

Yusufov, M., Nicoloro-SantaBarbara, J., Grey, N., Moyer, A., & Lobel, M. (2019). Meta-analytic evaluation of stress reduction interventions for undergraduate and graduate students. *Internatinal Jouranl of Stress Management*. 26 (2), 132-145 . <http://dx.doi.org/10.1037/str0000099>

Appendix A

Reference Matrix

Citation	Purpose/Background	Participants/ Setting	Methods/Design	Results/ Limitations
<p>Klawonn, A., & Kernan, D., & Lynskey, J. (2019). <i>A 5-week seminar on the biopsychosocial-spiritual model of self-care improves anxiety, self-compassion, mindfulness, depression, and stress in graduate healthcare students</i>. <i>International Journal of Yoga Therapy</i>. 29, 81-89.</p>	<p>This study aimed to determine the effects a yoga-inspired self-care study on graduate health care providers to improve their mental and emotional health.</p>	<p>-21 students were included in the study -The mean age was 25. -took place over 10 weeks at A. T. Still University, in Mesa Arizona.</p>	<p>-the study was a quasi-experimental within-group repeated measures design. -It was a 10 week study in total: measurements were taken at baseline, week 5 and week 10..</p>	<p>It was found that significant changes occurred during the post intervention period in anxiety, self-compassion, mindfulness, depression and stress outcomes. -There was a lack of a control group as well as no randomized participant assignments.</p>
<p>Sampson, M., & Melnyk, B., & Hoying, J.(2020). <i>The mindbodystrong intervention for new nurse residents:6-month effects on mental health outcomes, healthy lifestyle behaviors, and job satisfaction</i>. <i>Worldviews on Evidence-Based Nursing</i>. 17(1), 16-23.</p>	<p>-To aid in the rising epidemic of health care burnout, depression and suicide.</p>	<p>-89 participants who were newly license RN's hired between July 2018 and September at a large Midwestern academic medical center.</p>	<p>This study was a 6 month follow up study to a prospective, blinded, cluster randomized controlled trail pilot study. -it tested the effects of the program on stress, anxiety, depressive symptoms, job satisfaction, and healthy lifestyle behaviors -Measurements occurred immediately following the program and after 3 months</p>	<p>Strengths of this study were that both short- and long-term effects were measured - limitations of this study were small sample size and a nonrandom sample. -Also, the RN's all worked together so contamination may have occurred.</p>
<p>Hoying, J., & Melnyk, B., & Hutson, E., & Tan, A. (2020). <i>Prevalence and correlates of depression, anxiety, stress, healthy beliefs, and lifestyle behaviors in first-year graduate health sciences students</i>. <i>Worldviews on Evidence-Based Nursing</i>. 17 (1), 49-59.</p>	<p>-The purpose of this study was to examine the prevalence of depression, anxiety, stress, physical health, healthy beliefs and lifestyle behaviors in incoming first-year health professional students. It also attempted to describe the relationship between those variables as a predictor of depression and anxiety.</p>	<p>-first year graduate health students from 7 health professions colleges -average age was 24.5 -majority of students were white</p>	<p>-A cross-sectional descriptive correlational study design. -197 students from the school of dentistry, medicine, nursing, optometry, pharmacy, social work and veterinary medicine.</p>	<p>-elements that predicted depression and anxiety in this study were obtaining less sleep each night, having worse physical health, having a higher perceived level of stress, and not having healthy lifestyle routines -reiterated the importance of regular screening of health sciences students for depression and anxiety is needed</p>
<p>Vallance, J.,& Winkler, E., & Gardiner, P., & Healy, G., & Lynch, B., & Owen, N. (2011). <i>Associations of objectively-assessed physical activity and sedentary time with depression</i>. <i>Preventive Medicine</i>. 53, 284-298. Doi: 10.1016/j.ypmed.2011.07.013</p>	<p>-To examine the associations of physical activity and its aid in decreasing depression</p>	<p>2862 participants -average age was 45.7 years old -50.2% were women. - 67.7% were either overweight</p>	<p>-This was a Cross-sectional study. - it used 2,862 adults from the 2005-2006 US National Health and Nutrition Examination survey.</p>	<p>-a strong association between physical activity and depression exists -even a low amounts of physical activity shows an improvement in depression levels. -a strong strength of this study is that it</p>

				objectively measures exercise time
Beiter, R., & Nash, M., & McCrady, M., & Rhoades, M., & Linscomb, M., & Clarahan, M. & Sammut, S. (2014). <i>The prevalence and correlates of depression, anxiety, and stress in a sample of college students</i> . Journal of Affective Disorders. 173, 90-96. http://dx.doi.org/10.1016/j.jad.2014.10.054 .	- The aim/purpose of this study is to explore the possible relationships of depression, anxiety and stress in college students	-374 students at Franciscan University between the ages of 18-24.	-This study occurred over 3 weeks. It was surveys administered in college classes. -survey consisted of a demographics section, a list of stressors and the standard 21 question DASS.	-the results indicated that the top three concerns were academic performance, pressure to succeed, and post-graduation plans.
Rith-Najarian, L., & Boustani, M., & Chorpita, B. (2019). <i>A systematic review of prevention programs targeting depression, anxiety, and stress in university students</i> . Journal of Affective Disorders. 257, 568-584. http://doi.org/10.1016/j.jad.2019.06.035	-this review is to address the effectiveness of prevention programs that targeted anxiety, depression and stress	-62 articles included in review.	-systematic review of programs providing in a group-based, online/computer mental health programs	-Relaxation, psychoeducation and cognitive monitoring were most frequently practiced -Many programs were limited by uneven gender requirement of female, mismatched symptom and treatment management and inconsistent reporting of retention data.
Peaynburg, V., & Mehta, S., & Hadistavropoulos, H. (2019). <i>Postsecondary student perceptions and preferences for the treatment of depression and anxiety: comparison of internet-delivered cognitive behavior therapy to face-to-face cognitive behavior therapy and medication</i> . Canadian Journal of Behavioral Science. 52 (3), 220-230. http://dx.doi.org/10.1037/cbs0000165	The aim of this study was to exam the preference and viability of internet-delivered therapy	-participates where recruited using Qualtrics -the total sample consisted of 314 participants ages 18-61 enrolled in postsecondary institutions across Canada.	-PHQ-9, GAD-7, AUDIT, GHSQ, TAAS, CEQ, ICBT preferences and perceptions questionnaire were used -multiple regression analyses	-in general students have positive attitudes toward the use of internet-delivered cognitive behavior therapy -Women and students with milder symptoms perceived internet-delivered services more favorable
White, M., & Mayer, M., & Vanderlind, W., & Allswede, D. (2017). <i>Evaluation of behavioral self-care intervention for public health students</i> . American Journal of Health Education. 49 (1), 40-47. http://doi.org/10.1080/19325037.2017.1369199	-The aim was to determine if self-care enhancing behaviors would aid in preserving student mental health	- 91 graduate students in public health in a large survey course at Yale.	-students completed an anonymous survey at the first and last week of the semester. -The self-care intervention included behavior changes within 4 areas: nutrition, mental health, physical activity, and social support.	-results revealed significant increase in health-promoting behaviors within 4 areas. -mental health did not get worse as the semester went on. -the study provides evidence that self-care interventions for students in the health sciences is useful in maintaining mental health. -More study is needed to see if it would help improve mental health
Davies, E., & Morriss, R., & Glazebrook, C. (2014). <i>Computer-delivered and web-based interventions to improve depression, anxiety, and psychological well-being of university students: a systematic review and meta-analysis</i> . Journal	-The purpose of this study was to systematically review Web-based and computer-delivered interventions to improve mental health in college students.	-A total of 1795 participants consented and were randomized -Sample sizes ranged	-Several databases were searched using keywords relating to higher education students, mental health, and eHealth interventions. -trials were reviewed and outcome data	-This study implies that computer-delivered interventions can be effective in improving students' mental health -A more diverse student selection needs to be trailed.

<p>of Medical Internet Research. 16(5), 130. Doi:10.2196/jmr.3142</p>		<p>from 38 to 240. -The majority of trails where conducted in HEIs in the United States, with three trials in Canada and Australia, two in the United Kingdom, one in Spain and Norway.</p>	<p>analyzed through random effects meta-analyses for each outcome and each type of trial arm comparison -Meta-Analysis</p>	
<p>Day, V., & McGrath, P., & Wojtowicz, M. (2013). <i>Internet-based guided self-help for university students with anxiety, depression and stress: a randomized controlled clinical trial</i>. Behavior Research and Therapy. 51, 344-351. http://dx.doi.org/10.1016/j.brat.2013.03.003</p>	<p>-The study assessed the value of internet/computer-based guided self-help programs for anxiety, depression and stress.</p>	<p>66 students from Dalhousie University, Universities of King's College and Nova Scotia College of Art and Design, in Halifax, Canada.</p>	<p>-The program was based on cbt -It used trained student coaches. They focused their training on 5 core modules that aided in depression, anxiety and stress reduction via email or brief weekly phone calls.</p>	<p>The results supported that IBT can help decrease depression, anxiety and stress -importantly improvements were maintained at a six month follow up. The results of this study provide positive results suggesting that effective help can be provided via internet modalities to university students.</p>
<p>Yusufov, M., Nicoloro-SantaBarbara, J., Grey, N., Moyer, A., & Lobel, M. (2019). Meta-analytic evaluation of stress reduction interventions for undergraduate and graduate students. <i>Internatinal Jounral of Stress Management</i>. 26 (2), 132-145 http://dx.doi.org/10.1037/str0000099</p>	<p>-The aim of this study was to use meta-analytic techniques to examine the interventions that were in place to reduce undergraduate and graduate students anxiety and stress.</p>	<p>-the studies used included graduate students and undergraduate students.</p>	<p>Met-analytic techniques were used in a systematic literature search that was conducted for articles from 1/1/1980-12/31/2015. - 58 eligible studies</p>	<p>This study showed that CBT may be more effective on anxiety in people who are not students. It also showed that relaxation techniques were effective in the reduction of anxiety levels. IT also showed that psychoeducation was effective in the reduction of perceived stress and anxiety. -One limitation of this study is the number of studies included.</p>
<p>Brown, K., Anderson-Johnson, P., & McPherson, A. (2016). Academic -related stress among graduate students in nursing in a Jamaican school of nursing. <i>Nurse Education in Practice</i>. 20, 117-124. http://dx.doi.org/10.1016/j.nepr.2016.08.004.</p>	<p>The goal of this study was to add to the body of literature about the study of stress and graduate nursing students and its relation to academic load, perceived stress level, socio-demographic variables, enrollment status or specialty track.</p>	<p>-The study took place in an urban Jamaican nursing school. The undergraduate population is larger then 100 people and the graduate population is over 80 people. -The sample size of 67 was used.</p>	<p>-A descriptive correlational cross-sectional design was used. And the Lazarus and Folkman's Transactional Model of Stress and Coping formed the theoretical framework of the study. -The PSS-14 and the Stress Survey were used to gather information.</p>	<p>-The results of this study are that graduate students experience a moderate level of stress due to academics. -One limitation to this study is that it is self reported data.</p>

<p>Dyrbye, L., Thomas, M., & Shanafelt, T. (2006). Systematic review re-view of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. <i>Academic Medicine</i>, 89, 443-451.</p>	<p>-The goal of this study was to systematically review the literature about depression, anxiety and burnout among US and Canadian medical students.</p>	<p>-40 articles were used for the study</p>	<p>Medline and PubMed were searched for publications between June 1980 and May 2005</p>	<p>-the study suggest that psychological stress may be higher among women during medical school -there was limited data available to the researches about student distress and its influence on academic performance -The researchers report that larger multicenter studies are needed to identify more factors that influence psychological stressors among students.</p>
<p>Klainin-Yobas, P., Keawkerd, O., Pumpuang, W., Thunyadee, C., Thanoi, W., & He, H.(2014). The mediating effects of coping on the stress and health relationships among nursing students: A structural equation modelling approach. <i>Journal of Advanced Nursing</i>, 70, 1287-1298. http://dx.doi.org/10.1111/jan.12283</p>	<p>The aims of this study was to see the impact stress on mental and physical health of nursing students. As well as examine the protective benefits of coping skills.</p>	<p>A sample of 335 nursing students from the University of Thailand.</p>	<p>This study used a cross sectional, descriptive correlational research design. This study used self-reported questionnaires.</p>	<p>This study found that students who had higher level of stress had higher level of detrimental physical and psychological effects. -Limitations of this study are that a convenience sample was used and a cross-sectional research design hindered the ability to draw any causal relationships among study variables.</p>
<p>Melnyk, B., Hrabe, D., & Szalacha, L. (2013). Relationships among work stress, job satisfaction, mental health, and healthy lifestyle behaviors in new graduate nurses attending the nurse athlete program. <i>Nursing Administration Quarterly</i>, 37(4), 278-285</p>	<p>The purpose of this study was to find the relationship between job satisfaction of new graduate nurses and lifestyle behaviors. These behaviors included workplace stress, the work environment, and mental health.</p>	<p>61 new graduates attended a Nurse Athlete program</p>	<p>This study used a descriptive correlational design</p>	<p>Higher levels of workplace stress were associated with higher levels of anxiety and depression. They were also inversely correlated with resiliency, job satisfaction and healthy lifestyle behaviors</p>
<p>Loprinzi, P., & Mahoney, S. (2014). Concurrent occurrence of multiple positive lifestyle behaviors and depression among adults in the United States. <i>Journal of Affective Disorders</i>, 165, 126-130. https://doi.org/10.1016/j.jad.2014.04.073</p>	<p>The aims of this study was to examine the relationship between lifestyle behaviors and depression symptoms. It looked at things like diet, physical activity and smoking.</p>	<p>A national sample of adults in the United States was used. Ages spanned from 20 to 85 years old. They used data from the 2005-2006 NHANES.</p>	<p>This was a cross-sectional design study. They assessed the participants diet from the healthy eating index variable. They assessed physical activity from accelerometry. They assessed smoking from cotinine levels in and depression was assessed via PHQ-9.</p>	<p>The results of this study were that each behavior was associated with depression. For example the less sugar a person ate the less depressive symptoms they experienced. It was found that the more positive lifestyle behaviors a person had the less likely they were to have depressive symptoms. -A limitation of this study is that directionality could not be determined due to the nature of the study.</p>

<p>Cheung, T., Wong, S. Y., Wong, K. Y., Law, L. Y., Ng, K., Tong, M. T., Wong, K. Y., Ng, M. Y., & Yip, P. S. (2016). Depression, Anxiety and Symptoms of Stress among Baccalaureate Nursing Students in Hong Kong: A Cross-Sectional Study. <i>International journal of environmental research and public health</i>, 13(8), 779. https://doi.org/10.3390/ijerph13080779</p>	<p>The aim of this study was to examine the prevalence of depression, anxiety and stress among nursing students in Hong Kong in relation to the student's socioeconomic status.</p>	<p>A total of 661 participants. 479 of the participants were female. The mean age was between 18 and 22.</p>	<p>This study used a cross-sectional design. It also drew upon a five-section cross sectional survey that had been administered to nursing students.</p>	<p>Gender and age were found not to be statistically significant in predicating depression, anxiety and stress. Family, financially and poor lifestyle choices all were statistically significant in predicating depression, anxiety and stress.</p>
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Appendix B

Demographic Survey

Question	A	B	C	D	E	F
1. What is your age?	18-24	25-34	35-44	45-54	Over 55	
2. What is your gender/sex?	Female	Male	Prefer not to say	Non-binary		
3. What is your ethnicity/race?	White or Caucasian	Black or African American	Native American or American Indian	Asian or Pacific Islander	Prefer not to say	other
4. What is your marital status?	Married	divorced	Single/never married	In a domestic partnership		
5. How many hours a week do you work	0	0-12 hours	12-24 hours	24-40 hours	40 plus hours	
6. How many children do you have?	0	1	2	3	4	Greater than 4
7. What year in graduate school are you in?	First year	Second year	Third year	Fourth year	Greater than fourth year	
8. Are you a full time student or part time student?	Full time	Part time				
9. Are you currently seeking help for any mental health issues?	yes	no	Prefer not to answer			
10. Are you currently participating in any counseling or therapy sessions for mental health issues?	Yes	no	Prefer not to answer			

11. Are you currently on any medications for Anxiety/Depression/Stress?	Yes	No	Prefer not to answer			
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Appendix C

Sanvello Pre-Intervention Questions

Question	A	B	C	D	E
Do you currently use the free Application Sanvello that is provided by UMSL?	Yes	No	Prefer not to answer		
If you have used the application, how long have you been using it for?	Less than 1 month	1-3 months	Greater than 3 months	I have not used the application	
If you have used the application how often during the week would you say you use it?	Daily	1-3 times a week	Less than weekly	I have not used the application	
Do you feel as though you have benefited from the Sanvello application?	yes	No	I do not currently use the application		

Appendix D**Sanvello Post-Intervention Questions**

Question	A	B	C	D
1. How often did you use the Sanvello application a week during the past 12 weeks?	Everyday	2-4 times a week	2 times a week	Less than 2 times a week
2. Do you feel as though you benefited from using the Sanvello Application?	yes	no	somewhat	

Appendix E

GAD-7

Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all	Several Days	More than half of the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

Appendix F

PHQ-8

Over the last two weeks, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half of the days	Every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3

Appendix G

PSS

1. In the last month, how often have you been upset because of something that happened unexpectedly?	0 = Never	1 = Almost Never	2 = Sometimes	3 = Fairly often	4 = Very Often
2. In the last month, how often have you felt that you were unable to control the important things in your life?	0 = Never	1 = Almost Never	2 = Sometimes	3 = Fairly often	4 = Very Often
3. In the last month, how often have you felt nervous and “stressed”?	0 = Never	1 = Almost Never	2 = Sometimes	3 = Fairly often	4 = Very Often
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	0 = Never	1 = Almost Never	2 = Sometimes	3 = Fairly often	4 = Very Often
5. In the last month, how often have you felt that things were going your way?	0 = Never	1 = Almost Never	2 = Sometimes	3 = Fairly often	4 = Very Often
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	0 = Never	1 = Almost Never	2 = Sometimes	3 = Fairly often	4 = Very Often
7. In the last month, how often have you been able to control irritations in your life?	0 = Never	1 = Almost Never	2 = Sometimes	3 = Fairly often	4 = Very Often
8. In the last month, how often have you felt that you were on top of things?	0 = Never	1 = Almost Never	2 = Sometimes	3 = Fairly often	4 = Very Often

9. In the last month, how often have you been angered because of things that were outside of your control?	0 = Never	1 = Almost Never	2 = Sometimes	3 = Fairly often	4 = Very Often
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0 = Never	1 = Almost Never	2 = Sometimes	3 = Fairly often	4 = Very Often

Appendix H

Extra questions to be included in pre- and post-intervention surveys

Question	a	b	c	d	e
How often do you exercise in a week?	Never	1-2 days	3-4 days	Greater than 4 days	
How many servings of vegetables and fruits do you eat in a day?	Never	1-2 servings	3-4 servings	4-6 servings	Greater than 6 servings
How many hours a night of sleep do you get on average?	Less than 4	4 to 6 hours	6-8 hours	8 or more hours	
How often does it take you more than 30 mins to fall asleep at night?	Every night	More than 4 nights a week	2-3 nights a week	1-2 nights a week	never
If you have trouble sleeping do you attribute this to worries you have in your life?	yes	no	somewhat	Not applicable	
How many drinks that contain caffeine do you drink in a day?	0	1-2	2-3	3-4	More than 4
How many times do you go to bed and have a full night of sleep without any middle of the night wake ups?	Every night	1-2 nights	2-3 nights	3-4 nights	4-6 nights
How often do you feel like you take time in your daily routine to pay attention to enjoyable moments? For example when you eat your favorite food, take the time to smell, taste and truly enjoy it?	Often	Very often	Somewhat often	Not often	Never
How often in your daily routine do you try to intentionally live in the moment?	Often	Very often	Somewhat often	Not often	Never
How often in your daily routine do you accept yourself and treat yourself like the way you would treat a good friend?	Often	Very often	Somewhat often	Not often	Never
How often in your daily routine would you say you use mediation?	Often	Very often	Somewhat often	Not often	Never

Appendix I

Consent

UMSL

Department of Nursing

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 St. Louis, Missouri 63121-4499
 Rachel Dunston Telephone: 609-234-0402
 Dr. Susan Dean-Baar Telephone: 314-516-7529
 E-mail: rchgb@umsystem.edu

Informed Consent for Participation in Research Activities Evaluation of Depression, Anxiety and Stress in University of Missouri-Saint Louis Graduate Nursing Students

Participant _____

HSC Approval Number

Principal Investigator __Ms. Rachel Dunston and Dr. Susan Dean-Baar_ PI's Phone Number_609-234-0402_____

Summary of the Study

You are being invited to participate in a project conducted by DNP graduate student Rachel Dunston, it is completely voluntary. The purpose of this research is to assess the current mental health level of the UMSL Graduate Nursing School population and provide strategies to improve the quality of these students' mental and emotional health. It will occur over 12 weeks during the Spring 2021 semester. There will be a pre and post intervention questionnaires to fill out and three 10-20 minute podcasts to listen to. The benefits to participation in this study is that you will learn about strategies to use to manage your stress and anxiety. There may be a minimal risk to participation in this study since the surveys ask you to identify behaviors that may be associated with stress, anxiety and depression which may cause discomfort in responding to the questions.

1. You are invited to participate in a research study conducted by Rachel Dunston and Dr. Susan Dean-Baar. The purpose of this research is to assess the current mental health level of the UMSL Graduate Nursing School population and to provide strategies to improve the quality of these students' mental and emotional health. Additionally, this study will examine the use of a mobile application that is offered for free to the entire UMSL student population, Sanvello. The objectives of this project in the short term are to give UMSL Graduate Nursing students some tools to potentially aid in lowering their stress, anxiety, and depression levels; in the long term it will aid in the development of a departmental program to aid in the mental health and emotional wellbeing of future graduate students.

2. a) Your participation will involve answering a pre intervention survey, signing up for and using the Sanvello application at your own pace (no data will be collected from the Sanvello app), listening to three 10-20 minute podcasts, and answering a post-intervention survey. All procedures will be delivered virtually. In total, your participation will be approximately 2 hours over approximately 12 weeks time.

Approximately 284 participants may be involved in this research at the University of Missouri-St. Louis.

b) The amount of time involved in your participation will be 20 minutes for the pre-intervention, 10-20 minutes for each podcast, and 20 minutes for the post intervention survey. This will total close to 2 hour's worth of time.

3. There may be a minimal risk to participation in this study since the surveys ask you to identify behaviors that may be associated with stress, anxiety and depression which may cause discomfort in responding to the questions. In addition, as email addresses are being requested, participants are at risk for confidentiality breach. To protect against this breach email addresses will be kept on a locked university computer only accessed by the research team and only entered into secure Qualtrics software to collect post survey information. Email addresses will be destroyed following the study completion.
4. There may be no direct benefit to participating in the research study. The possible benefits to you from this research are that you will learn about strategies to use to manage your stress, anxiety, and depression.
6. Your participation is voluntary and you may choose not to participate in this research study or withdraw your consent at any time. You will NOT be penalized in any way should you choose not to participate or withdraw.
7. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication that may result from this study. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection) that would lead to disclosure of your data as well as any other information collected by the researcher.
8. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Rachel Dunston at 609-234-0402 or the Faculty Advisor, Dr. Susan Dean-Baar 314-516-7529. You may also ask questions or state concerns regarding your rights as a research participant to the Office of Research, at 516-5897.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. By clicking the "NEXT" button, I hereby consent to my participation in the research described above.

Appendix J

Recruitment email

Dear Graduate Nursing Student,

You are being invited to participate in a research study conducted by DNP graduate student Rachel Dunston, it is completely voluntary. The purpose of this study is to assess the current mental health level of the UMSL Graduate Nursing School population and to improve the quality of these students' mental and emotional health. Additionally, this study will examine the effectiveness of the current mobile application that is offered for free to the entire UMSL student population, Sanvello. The objectives of this project in the short term are to give UMSL Graduate Nursing students some tools to aid in lowering their depression, anxiety and stress levels; in the long term it will aid in the development of a departmental program to aid in the mental health and emotional wellbeing of future graduate students.

This study will last over 12 weeks and will include a pre and post questionnaire, as well as three podcasts that will last 10 to 20 mins in length. There are no direct benefits to participation in this study. There are no known risks to participation in this study.

Your participation is voluntary and you may choose not to participate in this research study or withdraw your consent at any time. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication that may result from this study. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection) that would lead to disclosure of your data as well as any other information collected by the researcher.

If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Rachel Dunston at 609-234-0402 or the Faculty Advisor, Dr. Susan Dean-Barr at 314-516-7529. You may also ask questions or state concerns regarding your rights as a research participant at the Office of Research, at 516-5897.

By clicking the link below and answering the questionnaire you are providing consent to participate in this study.

If at any time you have any thoughts of hurting yourself or anyone else please either go to the nearest Emergency room, call 911, or call the national crisis line at 1-800-273-8255.

Thank you for your time and consideration,

Rachel Dunston BSN, RN
PMH-DNP Student

Appendix K

Podcast information

3 10-20-minute Podcasts that focus on

- healthy ways to cope with stress
- the importance of self-care through movement and healthy eating
- importance of positive thinking, and being kind to oneself in building resilience

Podcast 1 will focus on:

- using/signing up for Sanvello
- introduction of mindfulness
- Stress and how to begin incorporating healthy coping habits
- healthy eating and its importance on mental wellbeing
- importance of movement
- importance of sleep

Podcast 2 will focus on:

- Problem solving
- setting goals and strategies to overcome mental barriers in stressful times
- importance of sleep and ways to improve sleep
- Handling emotions in mindful positive ways
- nutrition and physical activity goals

Podcast 3 will focus on:

- pulling it all together
- establishing long-term goals