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EXPLORING STRESS AND RESILIENCE IN PRE-NURSING STUDENTS

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by

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ABSTRACT

EXPLORING STRESS AND RESILIENCE

IN PRE-NURSING STUDENTS

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Few studies have been published that focus on stress and resilience in pre-nursing students. Therefore, this study explores the relationship between stress and resilience in on-campus (OC) and accelerated online (AO) pre-nursing students. Using a comparative-descriptive design, 364 participants completed online questionnaires using the Perceived Stress Scale – 10 and the Resilience Scale – 14. Significant differences were noted in perceived stress (z= -2.984, p= .003) and resilience scores (z= -3.873, p= .000). The OC-intended students were statistically more likely to report higher levels of stress and lower resilience scores. The findings revealed that stress in general was negatively associated with resilience for both OC (r_o= -.370, p< .01) and the AO students (r_o= -.402, p< .01). As a result, educators should consider implementing stress management and resilience training in pre-nursing courses to prepare them for the demands of nursing school.

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CHAPTER 1

INTRODUCTION

1.1 Research Significance

The purpose of this chapter is to discuss the significance of the increasing demand for Registered Nurses (RN), the role of nursing programs to fill this ongoing demand, and the need for further research on pre-nursing students. Research literature about pre-nursing students is scarce. Further research is needed to understand stress and resilience in this population.

Even before the COVID-19 pandemic occurred, the demand for RN's in Texas was high. According to Health Resources and Service Administration (2016), a deficit of 27,786 RN's was predicted for Texas by 2032. In addition, in 2016, the Texas Department of State Health Services projected that the demand for RN's in Texas would grow by 53.8% by 2032, and they concluded that 16.3% of the projected demand would not be met. With the steady increase in population growth in Texas (Mendez, 2019) and the loss of nurses through retirement or leaving the field of nurses (American Association of Colleges of Nurses, 2020), it is clear that Texas will need more nurses.

The role of schools and colleges of nursing serves as a path to prepare students for their nursing careers and fill these projected shortages. Currently, there are 44 Bachelor of Science (BSN) and 58 Associates Degree (ADN) programs in Texas (RN Careers, 2019). Two types of students may be found in these schools and colleges of nursing. Students that are in their last few pre-requisite classes in preparation to apply for nursing school are

known as pre-nursing students. When accepted into a nursing program, these pre-nursing students become nursing students. Nursing students experience significant stress in their academic training and clinical practice (Delaney et al., 2016), but pre-nursing students are an under-studied population in nursing research.

Therefore, the purpose of this senior honors thesis is to describe what is known about stress and resilience in nursing and pre-nursing students and to share the results of a research study that focused on understanding the prevalence of stress and resilience in pre-nursing students at UTA during the COVID-19 pandemic.

CHAPTER 2

LITERATURE REVIEW

2.1 Background

The purpose of this chapter is for a brief review of literature that explores what is known about stress and resilience in nursing students and pre-nursing students. Moreover, this chapter identifies gaps in the literature and discusses the research purpose.

Stress is a subjective experience that can occur when the demands placed upon an individual exceed their perceived ability to cope (Galbraith et al., 2014). According to Delaney and colleagues (2016), nursing students experience stress in three key areas of their lives: academically, in the clinical setting, and personally. Academic stressors for nursing students include a content-heavy academic workload, frequent high-stakes testing, and fear of course failure. Nursing students also experience stress in the clinical setting. They fear making mistakes, have a lack of knowledge about how to use medical equipment, and fear of death or other serious situations that can occur with patients (Delaney et al., 2016). Nursing students are also at risk for encountering personal stressors while they are in school like financial hardship, death of a family member / friend, and relationship issues (Delaney et al., 2016; Lekan et al., 2018). In a study by Galbraith and colleagues (2014), 74.9% of undergraduate nursing students reported experiencing stress and 72.1% felt the level of stress in the nursing profession was higher than stress levels found in the general population.

In attempt to assist undergraduate nursing students with their perceived stress levels, several interventional studies have been designed to teach students useful skills to manage their stress. Burger and Lockhart (2017) instructed undergraduate nursing students on mindfulness and meditation techniques over four weeks. Students receiving this intervention had significantly higher scores on mindfulness (p= .013) and less stress (p= .000) afterwards than the control group (Burger & Lockhart, 2017).

In another study, Patterson (2016) taught undergraduate nursing students the emotional freedom technique (EFT), which combines the tapping of meridian points with a focus on the negative emotion to desensitize the fear or stress of a student's experience and promote relaxation. At the conclusion of the study, a decrease in anxiety was reported with 87% of the participants feeling calmer, 51% reporting a decrease in somatic symptoms and 17% reporting better sleep which reflects the benefits of reduced stress (Patterson, 2016).

While several studies have demonstrated success with lowering undergraduate nursing students stress levels through the use of mindfulness, meditation, EFT, or relaxation techniques, the reality of perceived stress remains a difficult subject for undergraduate nursing students to talk about with others. Most undergraduate nursing students (87.2%) preferred to disclose stressful situations to family and friends for coping (Galbraith et al., 2014). Only a few undergraduate nursing students would disclose to a professional institution due to the fear of stigma (24.7%) and career implications (45.2%), which creates a negative attitude towards help-seeking (Galbraith et al., 2014).

Pre-nursing students are also at risk for experiencing increased levels of stress and may be in need of interventions to assist them to manage their stress more effectively as

they plan for their entrance into nursing school. Few studies have been published that focus on stress in pre-nursing students. Manansingh et al. (2019) had pre-nursing students participate in a 6-week training for relaxation techniques. The pre-nursing students reported a decrease in test anxiety and academic stress ($p < .001$) showing a frequency mean stress scale score decrease from M= 2.36 to M= 1.98 ($p < .001$). As a result, pre-nursing students are also at risk for experiencing incivility, with 78.3% of pre-nursing students in a recent study reporting experience with uncivil, stressful situations (Clark & Gorton, 2019).

Resilience is defined as the capacity to prepare for, recover and adapt when facing stressful situations or challenges (Clark & Gorton, 2019). In attempt to assist undergraduate nursing students with their resiliency, several studies have been conducted to teach useful skills to build their resiliency level. According to Lekan and colleagues (2018), nursing students reported subjective comments to open-ended questions about their resilience strategies. The nursing students' resilience strategies included social support, hard work, and development of "tough skin". In this study, one-third of the undergraduate nursing students scored >80 on a resilience scale, which indicated resilience overall without any intervention (Lekan et al., 2018). In another study, Boardman (2016) found that pre-intervention levels of resiliency in nursing students reported a mean score of 132.89/175 on a resilience scale indicating high resilience in general.

Delaney and colleagues (2016) developed a simulation exercise, which used guided reflection and debriefing discussion of patient scenarios with the intent of assisting students to develop stress management skills and increase resilience. The simulation did not significantly decrease stress levels from pre-intervention levels, but a slight increase in

resiliency scores were noted at the end of the study period (Delaney et al., 2016). Boardman (2016) instructed undergraduate nursing students on relaxation techniques, like meditation and journaling, over 13 weeks. As a conclusion of this study, a 74.36% increase in resilience was reported with 69.2% reporting a decrease in stress. In another study, Clark and Gorton (2019) provided pre-nursing students tools to build resilience and address incivility with breathing exercise, cognitive rehearsal and simulation combined. Stress levels decreased significantly and showed 96% of pre-nursing students reported benefiting from the learning activities (Clark & Gorton, 2019). Overall, the students reported that 55.2% used cognitive rehearsal, 39% used breathing techniques, and 69% applied the learning tools from the simulation to future practice (Clark & Gorton, 2019). As a result, only Clark and Gorton (2019) focused on pre-nursing students' resilience, which adds to the limited body of research on pre-nursing students' stress and resiliency.

2.2 Research Purpose

The need for RNs in Texas continues to increase. As noted above, nursing school is stressful. However, many pre-nursing students report high stress levels (Manansingh et al., 2019) and dealing with stressful situations (Clark & Gorton, 2019). While many studies have demonstrated success with increasing undergraduate nursing students resiliency by using simulation, cognitive rehearsal, or relaxation, few studies have been published that focus on resilience in pre-nursing students. Today's pre-nursing students are tomorrow's nursing students and nurses. More knowledge is needed about stress and resilience levels in pre-nursing students in order to form future interventions to assist them as they transition into the demands of nursing school. Therefore, the aim of this study is to describe the

presence of and relationship between stress and resilience in pre-nursing students at the University of Texas at Arlington.

This chapter focused on identifying and reviewing literature that is focused on stress and resilience in nursing and pre-nursing students. After reviewing the literature, research is limited on stress and resilience in pre-nursing students. Therefore, this study will focus on pre-nursing student's stress and resiliency for further understanding and evaluation.

CHAPTER 3

METHODOLOGY

The purpose of this chapter is to describe the methodology for this study. The chapter discusses research design, sample characteristics, data analysis, and data collection.

3.1 Research Design and Sample

This research study used a prospective, correlational, comparative-descriptive design. Institutional review board (IRB) approval was obtained to conduct this study through the University of Texas at Arlington (UTA). The target population was undergraduate pre-nursing students from the College of Nursing and Health Innovation (CONHI) at UTA. Participants were invited to participated in the study if they were enrolled in a section of Introduction to Nursing (NURS 2200, NURS 2300) in Fall 2020 and are at least 18 years of age. Students under the age of 18 or undergraduate students who had already started the upper division nursing program were excluded from participation in this study.

3.2 Data Analysis

An online survey was created using QuestionPro for data collection during the Fall 2020 semester. Participants were able to take the online survey using a computer, tablet, or mobile phone. The survey included four sections: demographic questions, academic history questions, a survey to measure their perceived stress levels over the past month, and a survey to measure resilience. The demographic questionnaire gathered the participant's age, sex, race / ethnicity, and estimated number of hours worked weekly. The academic

questionnaire gathered information about the participant's total undergraduate hours completed, semester hours enrolled in the current semester, and if the participant was intending to start the nursing program. Participants were asked if they had previously dropped / withdrew from a course and if they were repeating the Introduction to Nursing course. Participants were also asked about any previous degrees earned and if the participant was a 1st generation college student.

Participants' perception of their stress levels over the past four weeks were measured by the 10-item Perceived Stress Scale (PSS), which uses a 5-point Likert scale. The score for the PSS is obtained by reversing the scores of four positive items and then summing up the scores from all items. Scores range from 0 to 40 with higher PSS-10 scores indicating higher levels of perceived stress (Cohen et al., 1983). The PSS is an established tool in the public domain with good internal consistency reliability and acceptable criterion validity. In a survey of 12 studies using the 10-item PSS, the Cronbach's alpha was found to be >.70 (Lee, 2012). In the current study, the Cronbach's alpha was .87.

Resilience was measured by the 14-item Resilience Scale (RS-14), which asks participants to rate their agreement with statements about resilience using a 7-point Likert scale (RS-14). Item scores are summed up and range between 14 to 98 with higher scores reflecting greater levels of perceived resilience. In previous studies, the Cronbach's alpha for the RS-14 is >.90 and it is reported to have good construct validity (Aiena et al., 2014). In the current study, the Cronbach's alpha value for the RS-14 was .86.

3.3 Data Collection

Recruitment e-mails were sent to a total of 1395 undergraduate pre-nursing students to invite their participation in this web-based study. Data from this study were

collected between August and November 2020, approximately 6 – 9 months into the COVID-19 pandemic. A total of 399 students responded to the survey. Of these, 6 students did not meet the inclusion criteria for participation and 29 students provided responses were one or fewer of the three surveys were completed. Their responses were removed from the survey database. The final sample for analysis consisted of data from 364 participants, for a 26.09% response rate. Once data collection was completed, the data was downloaded to a UTA password-protected one drive account that also required two-factor authentication to access and prepare for analysis. Only the study researchers had access to these research data files.

Continuous parameters are reported as mean ± standard deviation, and discrete parameters are reported as n and percent (%). Chi-square tests were computed to determine the differences between nominal and ordinal demographic and academic characteristics of the sample and t-tests were used with continuous variables. Shapiro-Wilk tests were computed on the PSS, RS-14, and PSOE-N to assess normality. Mann-Whitney U tests were computed to compare OC and AO-intended students on continuous variables. Spearman rank-order coefficients were computed to identify associations between continuous variables. Analyses were performed using the SPSS 27.0 for Mac.

This chapter explained the methodology for this study. The chapter included information on the research design, sample, data analysis and data collection.

CHAPTER 4

RESULTS

The purpose of this chapter is to describe the results of the statistical analyses of the data collected in this research study with pre-nursing students. The demographic characteristics and academic characteristics of the sample are explained and the results of the participants' responses on the PSS-10 and the RS-14 surveys are explored.

4.1 Demographic and Academic Characteristics

A total of 364 online pre-nursing students completed the study questionnaires. Of these, 89% were female with an average age of 27. Although pre-nursing courses during the study period were all offered online due to COVID-19, 48.9% of the study participants indicated that they planned to apply to the traditional face to face on-campus (OC) BSN program while the other 52% indicated that they were planning to apply to the accelerated online (AO) program. When analyzed as two separate groups, statistically significant differences were noted in age ($t(361)= 15.21$, $p< .001$) and race / ethnicity ($X_2(4, N= 364)= 38.419$, $p< .001$). OC-intended students were statistically more likely to be younger and to report their race / ethnicity as being Asian or Hispanic / Latino. See Table 4.1 for a description of the demographic characteristics of the sample. In this sample, 42% of the participants described themselves as being first generation college students. The majority (64.2%) reported that they intend to start in a nursing program in 2021. When analyzing on-campus program (OC) and accelerated online program (AO) groups for additional

academic characteristics, statistically significant differences were noted in earning a previous degree ($X_2(1, N= 364)= 55.701, p< .001$), number of semester hours enrolled in the current semester ($t(359)= -10.443, p< .001$), concurrent enrollment in another college or university ($X_2(1, N= 364)= -14.25, p< .001$) and previously dropped / withdrew from a course ($X_2(1, N= 364)= 10.667, p< .001$). AO-intended students were statistically more likely to have a previous degree, to report being concurrently enrolled in more than one academic setting, and to report that they had previously dropped or withdrawn from a course. However, OC-intended students were statistically more likely to be enrolled in more semester hours versus their AO counterparts. See Table 4.1 for a description of the academic characteristics of the sample.

4.2 Stress and Resilience

According to Cohen (1993), the average score on the PSS-10 for individuals aged 18 – 29 was 14.2 and the average score for ages 30 – 44 was 13.0. In this sample of pre-nursing students with data collected during the COVID-19 pandemic, scores on the PSS-10 for OC-intended students (mean age= 21.08) was 18.6 and for the AO intended students (mean age= 32.79) was 16.2. For the Resilience Scale (RS-14), the average score reported by Wagnild (2009) for individuals aged 18 – 29 was 72.9 with the average score for ages 30 – 44 was 77.1. Average scores on the RS-14 were 82.43 for OC-intended students and 86.35 for AO-intended students. According to Wagnild (2009), a resilience score between 82 – 90 reflects moderately high levels of resilience. When comparing on-campus program (OC) and accelerated online program (AO) groups, statistically significant differences were noted in perceived stress ($z= -2.984, p= .003$) and resilience scores ($z= -3.873, p< .000$). The OC-intended students were statistically more likely to report higher levels of perceived

stress and lower resilience scores. See Table 4.2 for the comparison of the stress and resilience scores of the sample.

Table 4.1: Demographic and Academic Characteristics of the Sample

Characteristics	Entire Sample (n = 364)	OC-Intended Pre-Nursing Students (n = 178)	AO-Intended Pre-Nursing Students (n = 186)	Are the OC and AO groups significantly different from each other? P value
Age *m, (sd), range*	27.08 (9.375) 18 - 65	21.08 (4.96) 18 - 43	32.79 (9.02) 19 - 65	*Yes* t = 15.21 (361), p <.001 AO older than OC
Sex	Male 39 (89.3%) Female 325 (10.7%)	Male = 18 (10.1%) Female = 160 (89.9%)	Male = 21 (11.3%) Female = 165 (88.7%)	
Race / Ethnicity %	Asian 71 (19.5%) Hispanic / Latino 92 (25.3%) Black 80 (22%) White / Non-Hispanic 105 (28.8%) Other 15 (4.1%)	Asian = 55 (30.9%) Hispanic / Latino = 46 (25.8%) Black = 25 (14%) White / Non-Hispanic 42 (23.6%) Other 10 (5.6%)	Asian = 16 (8.6%) Hispanic / Latino = 46 (24.7%) Black = 55 (29.6%) White / Non-Hispanic = 63 (33.9%) Other = 5 (2.7%)	*Yes.* X_2 = 38.419 (4), p <. 001 Asian: OC > AO Hispanic/Latino: OC = AO Black: AO > OC White: AO > OC Other
Total UG Hours Completed	0 – 6 = 24 (6.6%) 7 – 12 = 13 (3.6%) 13 – 18 = 11 (3%) 19 – 24 22 (6%) 25+ 290 (79.7%)	0 – 6 = 19 (10.7%) 7 – 12 = 11 (6.2%) 13 – 18 = 10 (5.6%) 19 – 24 = 13 (7.3%) 25+ = 123 (69.1%)	0 – 6 = 5 (2.7%) 7 – 12 = 2 (1.1%) 13 – 18 = 1 (0.5%) 19 – 24 = 9 (4.8%) 25+ = 167 (89.8%)	*Yes* z = -5.106, p < .001 AO > OC
Previous Degree	Yes = 171 (47%)	Yes = 49 (27.5%)	Yes = 122 (65.6%)	*Yes.* X_2 = 55.701 (1), p <. 001 AO > OC
1st Gen College Student	Yes = 155 (42.6%)	Yes = 75 (42.1%)	Yes = 80 (43%)	No
Semester hours enrolled *m, (sd), range*	11.43 (3.875) 3 - 23	13.33 (2.68) 3 - 19	9.59 (3.98) 3 - 23	*Yes* t = -10.443 (359), p <.001 OC > AO
Concurrently enrolled in more than one academic setting	Yes = 55 (15.1%)	Yes = 14 (7.9%)	Yes = 41 (22.0%)	*Yes* X_2 = 14.25 (1), p <. 001 AO > OC
Hours worked per week	Not working this semester = 118 (32.4%) 1 – 8 hours / week = 21 (5.8%) 9 – 16 hours / week = 34 (9.3%) 17 – 24 hours / week = 37 (10.2%) 25+ hours / week = 154 (42.3%)	Not working this semester = 94 (52.8%) 1 – 8 hours / week = 13 (7.3%) 9 – 16 hours / week = 22 (12.4%) 17 – 24 hours / week = 22 (12.4%) 25+ hours / week = 27 (15.2%)	Not working this semester = 24 (12.9%) 1 – 8 hours / week = 8 (4.3%) 9 – 16 hours / week = 12 (6.5%) 17 – 24 hours / week = 15 (8.1%) 25+ hours / week = 127 (68.3%)	*Yes.* z = -10.347, p < .001 AO > OC
Semester intending to start program	Spring 2021 = 50 (13.7%) Fall 2021 = 184 (50.5%) Spring 2022 = 82 (22.5%) Later than Spring 2022 = 47 (12.9%)	Spring 2021 = 22 (12.4%) Fall 2021 = 79 (44.4%) Spring 2022 = 38 (21.3%) Later than Spring 2022 = 39 (21.9)	Spring 2021 = 28 (15%) Fall 2021 = 105 (56%) Spring 2022 = 44 (23.7%) Later than Spring 2022 = 8 (4.3%)	
Previously dropped / withdrew from a course	Yes = 48 (13.2%)	Yes = 13 (7.3%)	Yes = 35 (18.8%)	*Yes* X_2 = 10.667 (1), p = . 001 AO > OC
Repeating Intro	Yes = 13 (3.6%)	Yes = 3 (1.7%)	Yes = 10 (5.4%)	*No, but close* X_2 = 3.598 (1), p = . 058 Fisher's exact p value 2 sided = .088

Spearman correlation coefficients were used to examine the relationship between levels of stress and resilience in OC and AO intended pre-nursing students. The finding revealed that stress in general was negatively associated with resilience for both OC-intended students (r_o = -.370, p< .01) and the AO-intended students (r_o= -.402, p< .01). As perceived stress levels increased in these pre-nursing students, resilience scores decreased. See Table 4.3 for the correlation matrix between the relationship among stress and resilience of the sample.

Table 4.2: Comparison of PSS-10 and RS-14 Scores

	Total Sample m *(sd)* range	OC Students m *(sd)* range	AO Students m *(sd)* range	*Difference?*
PSS Total Norms: Age 18- 29: 14.2 Age 30 – 44: 13.0	17.11 (*6.675*) 2 - 35	18.26 (*6.57*) 3 - 35	16.02 (*6.61*) 2 - 34	*Yes* z = -2.984, p = .003
RS-14 Total 82 – 90 = moderately high resilience. Norms: Age 18 – 29: 72.9 Age 30 – 39: 77.1	84.42 (*9.605*) 47 - 98	82.43 (*10.04*) 47 - 98	86.35 (*8.77*) 53 -98	*Yes* z = -3.873, p = .000

Table 4.3: Correlation Matrix: Relationships Among Stress and Resilience in Undergraduate Pre-Nursing Students

	Student Type	Resilience Scale (RS-14)
Perceived Stress Scale (PSS-10)	On Campus Intended Pre-Nursing Students	-.370**
	Accelerated Online Intended Pre-Nursing Students	-.402**

**. Correlation is significant at the 0.01 level (2-tailed)

This chapter explained the statistical analysis of the survey responses provided by the pre-nursing student participants. These participants intend to apply to a large public university with an on-campus and online pre-licensure Bachelor of Science in Nursing program. Although both groups are pre-nursing students, the results suggest that they are significantly different in their responses to the demographic and academic questions and in their self-reported perceived stress and resilience levels.

CHAPTER 5

DISCUSSION

The purpose of this chapter is to discuss the statistical and clinical significance of the study's findings. It is important to understand the role that stress and resilience play in pre-nursing students as they prepare to apply to nursing programs. Moreover, the chapter reviews the limitations of this study, makes recommendations for educators working with pre-nursing students, and suggests areas for future research with this population.

5.1 Significant Findings

This study sought to compare OC and AO-intended pre-nursing students on demographic and academic characteristics and in their perceptions of stress and personal resilience. These two pre-nursing groups differed significantly in both demographic and academic characteristics. In addition, statistically significant differences were noted in perceived stress levels and resilience. OC-intended pre-nursing students were statistically more likely to report higher levels of perceived stress than their AO-intended counterparts. Both groups of nursing students reported higher levels of stress than the normed values for their average age group. In general, college students have indicated increased levels of stress and anxiety due to the COVID-19 pandemic (Son et al., 2020). According to Son and colleagues (2020), new stressors have contributed towards the increased stress and anxiety due to the pandemic with 91% fearing health effects from the pandemic, difficulty concentrating (89%), and decreased social interactions due to distancing (86%). Therefore,

it is understandable that the pre-nursing students in our sample may have reported higher perceived stress scores than the nationally normed sample potentially due to the pandemic.

OC-intended and AO-intended pre-nursing students in this study reported average scores that were consistent with a moderate level of resilience and that were higher than the scores reported in a nationally normed sample for their age group. This is a positive finding in the midst of a global pandemic. The OC-intended pre-nursing students were statistically more likely to report lower resilience scores than their AO-intended counterparts. These findings of higher than average levels of resilience are consistent with those of Lekan and colleagues (2018), who reported than one third of undergraduate nursing students in their non-interventional study reported a higher than average score. Boardman (2016) also found higher than average levels of resiliency in nursing students.

In this study, the relationship between levels of stress and resilience in both OC-intended and AO-intended pre-nursing students were negatively associated. As their reported levels of perceived stress increased, their self-reported level of resilience decreased. It is clear in the literature that students who are enrolled in a nursing program experience high amounts of stress (Clark & Gorton, 2019; Delaney et al., 2016; Galbraith et al., 2014; Manansingh et al., 2019). Therefore, it is important to provide pre-nursing students with stress management resources and assist them with the development of resilience in order to prepare them for entry into a nursing program. According to McDermott and colleagues (2020), nursing students that show higher levels of resilience are more equipped to manage the demands of nursing school. In addition, nursing students report feelings of distress due to their high responsibilities in the nursing profession that could stretch them beyond their capacities (Lekan et al., 2018). However, students who

learn to be resilient will make a smoother transition into their professional nursing roles, effectively function in complex healthcare environments and decrease the likelihood of patient-related errors (Lekan et al., 2018).

5.2 Limitations

Limitations for this study include the use of a convenience sample, possible gender bias, and the timing of the data collection. Because the sample included only prelicensure students from one school of nursing in the Southwestern United States, the findings may lack generalizability to other academic settings and student populations. In addition, the sample size consisted of predominately female participants which makes it difficult to generalize to male pre-nursing students. Moreover, the data was collected during the COVID-19 pandemic, which may not reflect an accurate or more typical (non-pandemic) perceived levels of stress for pre-nursing students. Despite these limitations, the study provides support for the importance of assisting pre-nursing students with stress management and supporting resilience skills as they prepare to enroll in a formal nursing program.

5.3 Recommendations

Mediating the stress experienced by students within undergraduate nursing education requires the educational environment and empowering students to manage their stress with healthy coping mechanisms. Nursing educators should consider implementing stress management and resilience training interventions within pre-nursing courses, with the goal of providing skills and resources to aid students as they navigate the challenges of preparing to enter nursing school and eventually the nursing profession. Moreover, nursing students at all levels may benefit from wellness-oriented classes provided by the university

to promote mental health. From these classes, students can learn helpful relaxation techniques and discover accessible psychological therapies which can lead to decrease in stress levels.

Future research with pre-nursing students could include measuring the impact of curriculum additions that focus on stress management and resilience building. Specifically, studies should focus on strategies such as improving self-care and wellness practices or utilizing mindfulness or meditation for the reduction of stress in pre-nursing students. In addition, little is known about the perceived stress and resilience levels of pre-nursing students in Associate Degree in Nursing (ADN) programs, in rural settings, or private four-year universities. As a result, it is recommended that this study be replicated during non-pandemic times with pre-nursing students from multiple program lengths and settings to continue to add to the limited body of research knowledge regarding stress and resilience in pre-nursing students.

5.4 Conclusion

This study provided an estimate of perceived stress and resilience in pre-nursing students during COVID-19 and demonstrated an inverse relationship between these two variables. Overall, pre-nursing students are experiencing high levels of stress, yet they are also demonstrating a moderate level of resilience. Pre-nursing students represent a diverse group of individuals and form the pipeline for future cohorts of nursing students that will help to fill the ongoing need for Registered Nurses in the United States. It is essential that we develop interventions to assist them to manage their stress and to support their growing resilience along with preparing them with the foundational knowledge needed to enter a nursing program. As an under-studied population, more research is needed with pre-

nursing students to understand the best strategies to support their future success in nursing school and in nursing practice.

APPENDIX A

RECRUITMENT TEXT

Email Recruitment Text

My name is Regina Urban and my co-investigator, Leslie Jennings and I would like to invite you to participate in a UT Arlington research study titled, "*Stress, Resilience, and Persistence in Undergraduate Pre-Nursing Students*." The purpose of this research study is to describe the perceptions of stress, resilience, and persistence in undergraduate pre-nursing students at The University of Texas at Arlington (UTA) College of Nursing and Health Innovation (CONHI). It is an online survey that is made up of demographic questions, three questionnaires, and several short answer questions. Because we would also like to track your progress through your pre-nursing courses (Intro, Patho, and Pharm), your potential acceptance to the program, and your graduation from the nursing program, we are requesting you to share your 1000 number (Mav ID number) in the survey.

You can choose to participate in this research study if you are at least 18 years old and you are a nursing student who is taking pre-nursing classes (Intro to Nursing, Pathophysiology, or Pharmacology) in the Fall 2020 Semester. A good reason why you might want to participate in this study is that it will give you an opportunity to share your experiences as a pre-nursing student with stress, resilience, and persistence. There are no alternative options to participating in this research project. No course credit or extra credit is provided for participating in this study. Your decision about whether to participate is entirely up to you. If you decide not to be in the study, there won't be any punishment or penalty; whatever your choice, there will be no impact on any benefits or services that you would normally receive. If you choose to begin the study, you can also change your mind and quit at any time without any consequences.

If you decide to participate in this research study, you will be asked to complete a questionnaire and to answer several short answer questions. It should take about 10 to 15 minutes to complete the survey. Although you probably won't experience any personal benefits from participating, the study activities are not expected to pose any additional risks beyond those that you would normally experience in your regular everyday life or during routine medical / psychological visits.

All participants who complete the study will have an opportunity to enter their email address for a random drawing one of six $25.00 Amazon gift cards. This drawing will take place in the Fall 2020 semester after the survey is closed to participants. The Internal Revenue Services (IRS) considers all payments made to research subjects to be taxable income; this may require additional information to be collected from you for tax purposes, such as your social security number.

The research team is committed to protecting your rights and privacy as a research subject. We may publish or present the results, but your name will not be used. While absolute confidentiality cannot be guaranteed, the research team will make every effort to protect the confidentiality of your records as described here and to the extent permitted by law. If you have questions about the study, you can contact us at rurban@uta.edu or lesliej@uta.edu. For questions about your rights or to report complaints, contact the UTA Research Office at 817-272-3723 or regulatoryservices@uta.edu.

You are indicating your voluntary agreement to participate in this study by clicking the "Accept" button below.

APPENDIX B

DEMOGRAPHIC QUESTIONS

Appendix B: Demographic Questions

Demographic Questions:

1. How old are you?
2. What is your sex / gender?
3. Which racial or ethnic group do you belong to?
4. What semester are you planning to be a J1?
5. Do you have a previous degree?
    a. Associates' Degree yes / no
    b. Bachelor's Degree yes / no
    c. Master's Degree yes / no
6. On average, how many hours do you work each week while in school?
7. How many hours are you enrolled in this semester?
8. Are you taking courses at more than one college or university this semester?
9. Did either of your parents complete a 2 year college or 4 year university degree?
10. Are you repeating Intro to Professional Nursing this semester? Yes / No
11. Which nursing program are you in? AO/ OC-OL
12. What is your 1000 number?

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BIOGRAPHICAL INFORMATION

Mikayla Massara is a senior nursing student graduating in May 2021 with her Bachelor of Science in Nursing. She began studying at the University of Texas at Arlington in 2017, and she joined UTA's Honors College in 2018. She has appreciate the challenges and growth from completing many projects and an undergraduate research study over a variety of topics including thalassemia, acute respiratory stress syndrome (ARDS), nursing burnout rates, and the exploration of stress and resilience in pre-nursing students.

After completion of her Honors Bachelor of Science in Nursing in May of 2021, Mikayla will begin working as an intensive care unit (ICU) graduate nurse in June 2021 at Baylor Scott & White Medical Center in Waxahachie. She is overjoyed by this blessed opportunity to work as a nurse with an amazing team. She credits her achievements during her undergraduate studies to her family and friends, her mentor Dr. Urban, and UTA's Honors College.