FACTORS AFFECTING THE SUCCESS AND PERSISTENCE OF PRE-NURSING

STUDENTS

by

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DISSERTATION

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ABSTRACT

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The University of Texas at Arlington, 2023

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This article-based dissertation consists of two manuscripts related to factors affecting the success and persistence of pre-nursing students. The first manuscript was a matched cohort study that compared selected academic variables between two groups of pre-nursing students admitted to a pre-licensure baccalaureate nursing program via two different routes. The purpose of this study was to determine if there were any differences in academic performance between these two groups of students in the first semester of a formal nursing program. Analyses of the data revealed a difference in semester grade point average (GPA), but no significant differences in the RN Fundamentals Assessment Technologies Institute (ATI) score between students admitted directly from high school versus those admitted after completed pre-requisite courses. The results of this study suggest that students who meet benchmark criteria are just as successful as their counterparts in their first semester of their nursing program.

The second manuscript utilized a qualitative, descriptive approach to explore short answer study data of pre-nursing students enrolled in an introductory nursing course. This study described how PN students were affected by COVID-19 when all learning occurred in online formats during the Fall of 2020. Deductive thematic analysis was applied using the social determinants of learning framework as a guide. The results of this study provided a rich description of participants' experiences, including apprehension about getting the COVID-19

virus infection, mental health and financial difficulties, and isolation. Some reported little to no effect, and negative experiences were coupled with future goal confirmation.

This dissertation concludes with an analysis of the guiding theoretical models and the limitations of both studies. Implications for nursing education and future research recommendations are offered.

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The first person I would like to acknowledge is Dr. Daisha Cipher. I had the privilege of having this gifted teacher for three statistics courses and was beyond thrilled to have Dr. Cipher as my research advisor and dissertation chair. I am infinitely grateful for her kindness, encouragement, and expertise over the last three years. I have learned so much from her and am blessed to have her in my corner.

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DEDICATION

I became a daughter and sister first, both on the same day, and many years later became a wife and mother. I treasure each of these roles and dedicate this dissertation to my family.

To my parents: I was raised to value education, and even when I changed my major to nursing (surprise!), you supported me every step of the way. Mom, I watched your sacrifices to obtain your master's degree when it wasn't easy, and I knew I could do it, too. Dad, against the odds, you were the first one in your family to pursue a college degree and then earned two master's degrees, too. I have always known how proud all of my parents are of me.

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To Ryan and Madison: You are my favorites! When people ask what I consider to be my greatest life achievement is, the answer has always been the same. I am so grateful to God that He gave me the privilege of being your mom. That will not change, even with a PhD behind my name. I am so proud of both of you!

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CHAPTER 1

Introduction

This chapter includes a discussion of the significance of the success and persistence of PN students and a review of what is known in the literature. The rationale for the first manuscript, describing the differences in academic variables between two admission groups after they complete their first semester of nursing school, including a definition of terms, assumptions, and research questions will be offered. The rationale for the second manuscript, describing the experiences of PN students as they prepared for admission to nursing school during COVID-19, will be included. The definition of terms, assumptions, and research questions for this study will also be described.

Significance

The existing nursing shortage, combined with accelerating retirements due to the worldwide pandemic, continues to rise. More than 190,000 nurses will be needed annually until 2030 (U.S. Bureau of Labor Statistics, 2021). One key strategy to meet this demand is to increase the enrollment in nursing programs (American Association of Colleges of Nursing [AACN], 2020, National League of Nursing, 2020). Optimal program completion rates of pre-licensure undergraduate nursing students are required to meet the ongoing need for nurses in the United States (U.S. Bureau of Labor Statistics, 2021). There have been varied approaches to investigating the predictive factors that affect the retention and program completion rates of nursing students, but student attrition in nursing programs results in the loss of potential nursing graduates each year.

Pre-nursing (PN) students are defined as those who have not begun formal nursing education training, including clinical courses, and who come from a variety of academic backgrounds, including traditional first-year students, transfer students, and second baccalaureate holders (Urban et al., 2022). These students form the foundation for the nursing student pipeline, yet they are rarely the focus of research. Waiting to address the multifaceted factors that affect the persistence and retention until students are already in a nursing program may lead to negative outcomes that may prove detrimental to the goal of mitigating the growing nursing shortage.

Literature Review

Many academic variables have been studied involving PN students with the focus on predictors of successful admission into upper division programs. Research has been conducted on academic factors prior to entering the university setting, including standardized test scores and high school (HS) grade point average (GPA). Minimum ACT scores (Peruski, 2019) and SAT scores (Crow et al. 2004) have been positively associated with program completion and NCLEX pass rates. Higher HS GPAs and experience with dual credit courses were positively correlated with increased success in the first year of a baccalaureate nursing program (Ott et al., 2018). However, HS GPA was not related to successful completion of an associate's degree nursing program in another study (Marshall, 2020).

Additional research on PN student academic variables once enrolled in the university setting has been conducted. Preadmission cumulative GPA, prerequisite science GPA, and TEAS composite scores have all been utilized as predictors for academic success in first semester nursing courses and for student performance on standardized nursing tests as well as the NCLEX-RN (Bennett et al., 2016; Gartrell et al., 2020; Liu et al., 2018). A significant positive relationship was found between a PN chemistry course and academic success in the first and

second semesters of nursing school (Brown & Smith, 2019). Four courses were identified as predictors of successful matriculation in upper division programs in a group of PN students: Introduction to Psychology, Anatomy and Physiology I, Microbiology, and Statistics (Stankus et al., 2019). In another study, Stankus et al. (2018) created a dynamic modeling tool, used during the admission process, aimed to increase diversity in nursing students.

Studies that include psychosocial aspects of PN students are sparse. A significant negative relationship was found between both resilience and persistence measures and stress in both on-campus and online PN students (Urban et al., 2022). Campus based PN students, however, reported higher levels of stress and lower levels of resilience than those who attended online (Urban et al., 2022). Additional quantitative studies involving PN students explored their perceptions of sexual assault (Strunk, 2017) and the relationship between stereotype threat, social identity, and academic success (Sullivan et al., 2019).

Other research has focused on curriculum recommendations specific to the PN student population, including an innovative learning activity designed to inspire curiosity related to researching nursing topics (Kwon & Dean, 2021) and an introductory course aimed to engage the current generation (Owen & Amar, 2020). This course highlighted career paths and challenges students' perceptions of the role of the nurse (Owen & Amar, 2020). PN students who took an information literacy course reported increased self-efficacy for library skills, retrieving scholarly sources, and an improved understanding of global healthcare (Watwood et al., 2018).

Qualitative research that focuses exclusively on PN students is limited. Researchers have used a hermeneutic phenomenology approach to explore PN students' attitudes toward caring and their perspectives during the unique stage of education as they prepare for nursing program admission. Participants described fears, elevated levels of stress, difficulty meeting academic

expectations, and emotional struggles. Furthermore, these students described how a circle of support benefited them as they followed their dream to become a nurse (Packard & Hoffman, 2016).

Other phenomenological research explored elements that supported and hindered PN students' transition experiences as they began nursing school. Peer support, student groups, professors, tutoring, and advising were among the elements that facilitated the transition, while isolation and difficulty adjusting hindered the process (Bumby & Litwack, 2021). PN students described how experiences in a scholarship recruitment program supported their transition and influenced them to consider careers in rural and remote nursing areas (Kyle et al., 2020).

Results from a descriptive qualitative study that investigated the study habits of PN students and how they related to their study approach in upper division courses indicated that PN students employed poor study strategies during their general education and prerequisite science courses (Felicilda-Reynaldo et al., 2017). Thematic analysis was used to examine the changes in PN students' views on people different than themselves as a cultural diversity course progressed. A positive change was noted in the perspectives of culturally safe care in some, but not all students (Olukotun et al., 2018).

Theoretical Framework

The theoretical underpinning for both manuscripts is Shelton's (2012) model of nursing student retention. The purpose of Shelton's model is to consider the interaction of a student's past experiences and background, internal psychological processes, and external support factors and how those affect persistence and successful academic performance. The student's background includes previous coursework and academic variables such as high school or college GPA. The internal psychological processes reflect a student's ability and the motivating forces

that drive a student to view the benefits of continuing in nursing school to be worth the cost of that effort. External support may come from family, peers, faculty, or learning support services.

Persistence is defined as choosing to remain in an academic program, as opposed to choosing to withdraw, and academic performance is defined as achieving the required academic standards or passing (Shelton, 2012). Furthermore, successful academic performance and persistence, combined, are the desired outcome in the framework: retention (Shelton, 2012).

There are several relationships Shelton (2012) proposed in this framework. A visual figure created by Shelton (2012) illustrates the relationship between these constructs and the outcomes (see Appendix A). Academic variables can affect academic performance and influence a student's internal psychological processes. One proposition, according to this framework, is when academic variables increase, academic performance will increase, leading to increased student retention. The first manuscript explored selected academic variables and how those contributed to academic performance. Likewise, as internal psychological processes or external supports increase, persistence and academic performance will also increase. The second manuscript examined both internal and external supports as described by Shelton (2012), including psychosocial factors and aspects of self-motivation. It is not enough to simply recruit qualified applicants to nursing school; students must be provided with resources that facilitate their decision to persist in nursing school in addition to having resources that support their academic and success (Shelton, 2012).

Manuscript One

Rationale

Ensuring that the selection of PN students who enter a formal nursing program are the most likely to persist is an obvious approach to increasing the retention of pre-licensure students.

Multiple variables have been utilized in studies to operationalize academic success, but one comprehensive predictive model of nursing program retention has not yet been demonstrated in the literature. Many universities utilize a traditional, competitive admission route (TR) while others accept students into their programs directly from high school (AACN, 2021). One barrier to accepting students directly from high school and identifying them as early matriculators (EM) is the lack of indication of college-level success. The purpose of the research study in the first manuscript was to determine if EM students accepted using pre-university variables and benchmark criteria were just as successful in their first semester of nursing school as those students that are chosen for program acceptance after they complete pre-requisites. There are currently no published studies providing a direct comparison of academic predictors from these two types of admission routes to the same nursing program.

Definition of Terms

1. Pre-nursing (PN) students are defined as those who have not begun formal nursing education training, including clinical courses, and who come from a variety of academic backgrounds, including traditional first-year students, transfer students, and second baccalaureate holders (Urban et al., 2022).

2. Traditional route (TR) students are PN students who applied to the formal nursing program after completing prerequisite courses at the university level. TR students have been accepted via a competitive process based on a ranking system, comprised primarily of overall GPA and science GPA scores.

3. Early matriculation (EM) students are PN students who were offered acceptance into the formal nursing program based on academic scholarships awarded at the point of

admission to the university. EM students had to meet minimum benchmark criteria set by the program as they progressed through their prerequisite courses.

4. Pre-university variables included scores from the Scholastic Aptitude Test (SAT) taken prior to entering the university setting.

5. Pre-program science GPA was comprised of four courses taken as a PN student: Microbiology, Chemistry, and Anatomy and Physiology I & II.

6. Pre-program GPA was comprised of the lower division prerequisite courses (70 credit hours) required for application to the nursing program.

6. The RN Fundamentals Assessment Technologies Institute (ATI) is a course specific exam where scores are assigned to demonstrate content proficiency and predict future success on the National Council Licensure Examination (NCLEX)-RN exam (ATI, 2020).

7. In-program variables included the junior first semester GPA (excluding any elective courses) and the RN Fundamentals ATI correct percentage score.

Research Questions

1. Is there a difference in SAT scores between the EM and TR groups?

2. Are there differences in science GPA and pre-program GPA between the EM and TR groups?

3. Are there differences in J1 GPA and RN Fundamentals ATI exam scores between the EM and TR groups?

Assumptions

1. Universities believe the model they use for acceptance into a formal nursing program provides them with the best pool of PN students.

2. Standardized tests are valid and reliable measurements that mirror a student's academic aptitude.

3. Courses are congruent in learner outcomes whether offered across a university setting or if accepted via transfer credit.

4. GPA scores accurately reflect a student's academic performance in a course.

Manuscript Two

Rationale

Many psychosocial factors influence the ability of PN students to be successful. The psychological well-being, stress, and anxiety levels of nursing students have been well-researched (He et al., 2018; Labrague et al., 2018; Tung et al., 2018), but PN student research is lacking.

Healthy People 2020 links education and health, identifying access to educational opportunities and quality of education as key social determinants of health (Office of Disease Prevention and Health Promotion, 2020). With this emphasis, Sanderson et al. (2021) have outlined, for the first time, through a research-based framework called the social determinants of learning (SDOL^{TM}), the connections between education and social determinants. Understanding which SDOL^{TM} attributes threatens or supports PN students can help guide early interventions that support student success and retention in nursing programs. The original aim of the second manuscript was to explore the experience of PN students as they prepare for admission to nursing school. However, due to the pandemic, the focus of this study shifted. The purpose of this manuscript was to qualitatively describe PN students' experiences during COVID-19 using the lens of the SDOL^{TM} framework as a guide.

Definition of Terms

1. Pre-nursing (PN) students are defined as those who have not begun formal nursing education training, including clinical courses, and who come from a variety of academic backgrounds, including traditional first-year students, transfer students, and second baccalaureate holders (Urban et al., 2022).

2. The focus of the social determinants of learning (SDOL^{TM}) framework is to address learning disparities, expand learning opportunities for nursing students from under-resourced backgrounds, and provide structure about the influence and impact of the social determinants of health (Sanderson et al., 2021).

3. The six domains of the SDOL^{TM} include physical health, psychosocial health, economic stability, self-motivation, and the social and physical environment.

Research Question

1. How has the COVID-19 pandemic affected pre-nursing students?

Assumptions

1. The global pandemic influenced the PN student experience in a unique way.

2. All PN students in the study were actively pursuing a bachelor's degree in nursing.

3. At the point of data collection, all PN students (on-campus as well as online) in the study were required to attend the Introduction to Nursing course online.

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Conclusion

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This chapter included a discussion of the importance of studying PN students, as retention of nursing students is one solution to address the growing nursing shortage. A review of PN nursing literature was offered. The rationale for Manuscripts One and Two, and the definition of terms, assumptions, and research questions for each study, was provided.

Factors Affecting the Success and Persistence of Pre-Nursing Students

CHAPTER 2

Introduction

This chapter provides the abstract for the first manuscript and the final submission copy. The first manuscript, titled "Academic Differences in BSN Admission Routes: Implications for Persistence," was submitted to the Journal of Nursing Education (JNE-2022-327R1) on May 16[th,] 2022 and was accepted for publication on November 30th, 2022 (see Appendix C). The final submission, awaiting a doi be assigned, is included. Please see Appendix D for the IRB approval letter.

Abstract

Background

To increase retention of pre-licensure nursing students, several routes are used for admission to nursing programs. Students can be accepted as early matriculators (EM) at the point of university admission, or a traditional, competitive admission approach (TR) can be utilized.

Method

A retrospective matched cohort study design (n=136) was used to explore the differences among selected academic variables between two groups of pre-licensure undergraduate students in the same program.

Results

The EM students had significantly lower science GPAs, pre-program GPAs, and junior level GPAs than the TR students. However, there were no significant differences in the scores on the RN Fundamentals ATI exam, an important predictor of future NCLEX success.

Conclusion

EM students can be as successful in the first semester of a nursing program as their counterparts on standardized exams. More matched cohort research is needed to understand program outcomes associated with students entering nursing programs via different routes.

APA Reference

Jennings, L. A., Urban, R. W., & Cipher, D. J. (in press). Academic differences in BSN admission routes: Implications for persistence. *Journal of Nursing Education*.

Academic Differences in BSN Admission Routes: Implications for Persistence

As a solution to the growing nursing shortage, there have been multifaceted investigations of the predictive factors of pre-licensure undergraduate nursing school retention to support the nursing workforce (Barbé et al., 2018). Optimal program completion rates in pre-licensure nursing programs are needed to meet the ongoing demand for nurses in the United States (U. S. Bureau of Labor Statistics, 2021). However, student attrition in nursing programs results in the loss of potential nursing graduates each year and the varied causes of nursing student attrition are complex. Attrition is problematic for many reasons: vacant spots are difficult to fill due to the cohort education nature of nursing education, the number of students graduating from the program is reduced, and valuable tuition revenue is lost.

Theoretical Model

Internal and external factors affect the ability of nursing programs to increase their enrollment of nursing students as a solution to growing the pipeline of new nurses. Shelton's model of nursing student retention (2012) defines retention as a nursing student who persists, or chooses to continue in a program, and achieves academic success. Shelton proposed that both internal processes and external factors affect retention. An obvious approach to increasing retention of pre-licensure students is to ensure that the selection of students who enter nursing school are the most likely students to be successful. Because multiple variables have been utilized in studies to operationalize academic success, a comprehensive predictive model of nursing program retention has not yet been demonstrated in the literature.

Traditional Route Admission

In competitive, traditional route (TR) admission programs, students apply to the nursing program after completing prerequisite courses. Preadmission cumulative GPA, prerequisite

science GPA, and TEAS composite scores have all been utilized as predictors for academic success in first semester nursing courses and for student performance on standardized nursing tests as well as the NCLEX-RN (Bennett et al., 2016; Gartrell et al, 2020; Liu et al., 2018).

Early Matriculation Admission

More than 100 undergraduate nursing programs across the nation accept students into their programs directly from high school (American Association of Colleges of Nursing, 2021). For these programs, early matriculation (EM) students are admitted not based on the aforementioned predictors of success, rather they are required to meet minimum benchmark criteria set forth by the program as they progress through their prerequisite courses.

The most commonly measured predictors for success in EM students are high school (HS) GPA and standardized test scores. Minimum ACT scores (Peruski, 2019) and SAT scores (Crow et al. 2004) have been positively associated with program completion and NCLEX pass rates. Ott et al. (2018) demonstrated that higher HS GPAs and experience with dual credit courses were positively correlated with increased success in the first year of a nursing program. Another study reported that HS GPA was not related to successful completion of a nursing program (Marshall, 2020).

There are currently no published studies providing a direct comparison of academic predictors from these two types of admission routes (EM versus TR) to the same nursing program on students' academic performance during their first semester of nursing school.

As a recruitment tool and strategy to increase retention rates for students, universities may opt to move to the growing trend of accepting nursing students directly into the nursing program from high school, rather than traditional, competitive admission programs, after pre-requisites have been completed. The purpose of this retrospective matched cohort study design

was to explore the differences among selected academic variables between two groups of pre-licensure undergraduate students in the same program. Do the variables and benchmark criteria support the premise that the EM students are just as successful as those students that are chosen for program acceptance after they complete pre-requisites? It is not known how these pre-program variables predict intra and post program variable performance in two groups from the same college of nursing.

Methods

From 2018 - 2021, a pilot program has been in place at a large baccalaureate nursing program in the southwestern United States in which selected EM students have been provided an admission route to the upper division nursing program. This was based on scholarship criteria set forth by the university, which was primarily based on a student's HS GPA and ACT and or/SAT scores. These EM students were admitted to the formal nursing program alongside TR students. The matched cohort of TR students were accepted into the nursing program after completing all prerequisite coursework through a traditional ranking system. Both groups met the minimum benchmark criteria for nursing program admission set forth by the college. Institutional Review Board approval was received from the authors' institution. Inclusion criteria for both groups of students included >18 years of age and having completed at least their first semester of the junior year (J1) of the formal nursing program. The EM students were those identified by the admissions department, and the TR matching criteria included age, gender, ethnicity, and scholarship level. Exclusion criteria were any student <18 years of age and/or who did not complete the J1 semester.

Study Variables

Demographic variables collected for this study included age, gender, ethnicity, amount of annual merit scholarship received, and first-generation student status. Pre-university variables collected included earned dual credit and scores from the Scholastic Aptitude Test (SAT). Pre-nursing program academic variables that were utilized as study variables included science GPA, comprised of four courses: microbiology, chemistry, and Anatomy and Physiology I & II. Pre-program GPA, comprised of the lower division prerequisite courses (70 credit hours) required for application to the nursing program, was also collected. In-program variables that were utilized in this study included the J1 semester GPA (excluding any elective courses) and the RN Fundamentals Assessment Technologies Institute (ATI, 2020) correct percentage score.

Power analysis

An *a priori* power analysis using G*Power 3.1.9.6 indicated that a total of 128 students would be required based on the planned comparisons of the academic performance variables (SAT, ATI, and GPA). This sample size estimate was based on a moderate effect size (Cohen's *d* = .50), two-tailed alpha of .05, and beta = .20 (Grove & Cipher, 2020).

Data collection

This retrospective data collection included a convenience sample of 88 EM students and 1,906 TR students. All students were enrolled at the university between Fall 2018 and Spring 2021. Each EM student (case) was matched to a traditional student (control) based on age, gender, ethnicity, and scholarship level using the propensity score matching method (Rosenbaum & Rubin, 1983; Rosenbaum & Rubin, 1984). Propensity scores are a commonly employed matching procedure involving the predicted probabilities from a logistic regression model with cohort as the dependent variable (case versus control), and the set of individual characteristics as

predictors (Austin, 2011). Twenty students were excluded from the case pool due to lack of an adequate match. The final sample size consisted of 68 cases and 68 matched controls (n=136).

Statistical analysis

The SAT, ATI, and GPA variables were analyzed for missing data. Less than 5% of the data were missing, and Little's test for data missing completely at random was nonsignificant, $\chi^2(8)= 8.90$, p=.351, indicating that the missing data were likely missing at random. Missing data imputation was subsequently accomplished with the Expectation Maximization algorithm (Little & Rubin, 1987). Continuous parameters are reported as mean ± standard deviation, and discrete parameters are reported as n and percent (%). Pearson chi-square tests were computed to compare the nominal variables between the matched cohort groups. Shapiro-Wilk tests indicated that the distributions of the science GPA, pre-program GPA, 1st semester GPAs, ATI, and SAT scores all significantly departed from normality (p<.01). Subsequently, group comparisons were performed with Mann-Whitney *U* tests. Analyses were performed using SPSS 28.0 for Windows and SAS 9.4 for Linux.

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Results

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The average age of the final study sample was 20.54 ± .77 years and 83.09% were female, 32.35% Asian, 24.26% Hispanic/Latino, 23.53% White, 12.50% Black/African American, and 7.35% multiple or foreign. 75.47% of the students had dual credit and 55.15% were first generation college students. The average amount of yearly merit scholarship was $6,542.59 ± 2648.41. There were no significant differences in demographic variables, indicating the success of the matching procedure (Table 1).

The mean SAT score for the group was 1269.94 ± 91.999. The EM students had significantly higher SAT scores than the TR students (z=-2.49; p= .013; 1286.78 ± 89.890 and

1253.09 ± 91.639, respectively). The mean science GPA for the participants was $3.45 \pm .426$ and the mean pre-program GPA was $3.72 \pm .232$. The EM students had significantly lower science GPAs than the TR students ($z = -2.49$; $p = .013$; $3.35 \pm .448$ and $3.54 \pm .382$, respectively) and significantly lower pre-program GPAs than the TR students ($z = -2.33$; $p = .022$; $3.68 \pm .228$ and $3.76 \pm .230$, respectively).

Once in the program, the EM students also had significantly lower J1 GPAs than the TR students ($z = -2.02$; $p = .044$; $3.29 \pm .640$ and $3.46 \pm .606$, respectively). The mean J1 GPA for the group was $3.38 \pm .627$. However, there were no significant differences in the scores on the RN Fundamentals ATI exam between the EM and TR students ($z = -0.87$; $p = .384$; 66.97 ± 10.329 and 68.58 ± 10.110, respectively). The mean ATI score for the participants was 67.78 ± 10.21.

Discussion

The results of this study support the proposition that students identified as early matriculators prior to starting college and who met all benchmark criteria prior to admission in a nursing program can be as successful in the first semester as their counterparts accepted into the program in a more traditional route. This premise was supported by the study finding that there was no significant difference in RN Fundamentals ATI scores between the two groups. McCarthy et al. (2014) concluded that the RN Fundamentals ATI score significantly predicted the ability of students to pass the NCLEX-RN on the first attempt, so the assumption could be made that these students will also have no difference in their success on the licensure exam. Performance on the ATI Comprehensive Exam, taken just prior to graduation, is a highly predictive instrument, while the earlier products can be used to identify students at risk of failure early and throughout their programs (ATI, 2016).

Using this standardized test allows for direct comparison among students as an indicator for early program success as compared to GPA, as there are many factors that may affect a student's J1 GPA including a variety of clinical faculty and clinical sites. While the EM students did have lower J1 GPA's than the TR students, the average GPA was 3.29 which would not be considered at risk and is consistent with research that concludes that first semester GPA is related to program success (Peterson, 2009).

The EM group had significantly lower pre-program GPA and science GPA than the TR students, but still were well above the program's benchmark criteria. Because the TR students entered the program via a competitive, scored approach, this finding is expected. Many qualified applicants are turned away from nursing programs who would have been otherwise successful (National League for Nursing, 2021). Also, EM students were required to take all science courses at the university while the TR group were not, which may also influence the differences in GPA. While a plethora of research evidence supports high pre-admission GPA, particularly in science GPA, as one of the best predictors of nursing students' success in upper division courses (Brown & Smith, 2019; Ott et al., 2018) and program completion (Crouch, 2015; House et al., 2015; McCarthy et al., 2014), some research suggests that pre-program GPA and science courses are not related to successful completion of first semester success (Luna, 2014) or success on the NCLEX-RN (Robert, 2016). Furthermore, pre-program GPA was a weaker predictor than grades earned during the nursing program (Grossback & Kuncel, 2011). This brings to light the possibility that many other factors may influence attrition in nursing students that are not related to academic aptitude.

The EM students performed significantly higher on the SAT than the TR students. However, the research is unclear regarding standardized assessments as predictors of success in a

nursing program. Positive relationships between SAT scores and NCLEX-RN success have been established by researchers (Grossbach & Kuncel, 2011; Trofino, 2013) while Romeo (2013) found that SAT scores were not predictive of NCLEX-RN success. Following this group of students through program completion is warranted to further understand this finding.

Limitations of this study include the relatively small sample size, thereby potentially limiting generalizability. Twenty of the students were excluded due to a lack of match, thus reducing the sample size even further. If SAT scores were included in the matching criteria the outcome could have been different. Nonacademic factors, such as stress from the competitive nature of the process, or due to the pandemic, could have also contributed to the differences in pre-program and science GPA between these two groups.

Implications

The results of this study point to many areas for future research. These students' performance needs to be followed to explore the relevant connections among program entry routes, GPA, performance on additional ATI exams, and NCLEX-RN pass rates. Additional study of the EM students should include an exploration of internal and external factors related to retention of students in this group. There are many non-academic factors that influence attrition, particularly mental health, stress, and motivation. Influential variables such as varied course faculty, use of university resources, and varied clinical placements could also be incorporated in future studies.

Conclusions

To our knowledge, this was the first study of its kind to compare the first semester success of nursing students in the same program who are accepted via different routes. Future planned studies will continue to follow the program completion and NCLEX-RN pass rates of

this particular group of students. These results are encouraging, as they support the premise that benchmark criteria can be effectively used to predict the success of nursing students. In addition, identifying students as early matriculators may support retention efforts for students at universities throughout the U.S. More matched cohort research is needed to understand the outcomes associated with students who enter nursing programs via different routes. By investigating what differences exist, researchers may begin to understand how to promote learner well-being in pre-nursing students as they prepare for admission to nursing school.

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Factors Affecting the Success and Persistence of Pre-Nursing Students

CHAPTER 3

Introduction

This chapter provides the abstract for the second manuscript and the latest submission copy. Manuscript Two, titled "Through the Lens of the Social Determinants of Learning: A Qualitative Study of Online Pre-nursing Students during the COVID-19 Pandemic" was submitted to the *Nursing Education Perspectives* (NEP-2023-079) on January 30th, 2023 with revisions requested from the editor on February 28th, 2023. Please see Appendix E for the IRB approval letter, Appendix F for the submission confirmation, and Appendix G for the revision request.

Abstract

Background

Pre-nursing students represent the future pipeline of nursing students, yet their perceptions of how COVID-19 has affected their experience as pre-nursing students are unknown.

Methods

Qualitative study data ($n = 289$) in US pre-nursing students were collected in Fall 2020 using a descriptive approach. Deductive thematic analysis was used according to the social determinants of learning (SDOL™) framework.

Results / Discussion

Participants verbalized fears of contracting COVID-19 (physical health) and difficulties with stress and anxiety (psychosocial health). Participants shared pandemic-related financial challenges (economic instability), changes in living situations (physical environment), and the

lack of hoped-for social connections (social environment). Many struggled with focus; others confirmed their goals (self-motivation).

Conclusion

The SDOL^{TM} framework can be utilized by educators to conceptualize the influence of COVID-19 on the experiences of online pre-nursing students and be leveraged to develop targeted interventions to improve students' well-being as they apply to nursing programs.

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APA Reference

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Jennings, L. A. & Urban, R. W. (under review). Through the lens of the social determinants of learning: A qualitative study of online pre-nursing students during the COVID-19 pandemic. *Nursing Education Perspectives*.

Through the Lens of the Social Determinants of Learning: A Qualitative Study of Online

Pre-nursing Students during the COVID-19 Pandemic

More than one million new nurses will be needed by 2027 to counteract the current nursing shortage (American Association of Colleges of Nursing [AACN], 2020). One key strategy to meet this demand is to increase the number of students in nursing programs (AACN, 2020; National League for Nursing [NLN], 2020). Along with increasing enrollment in nursing programs, addressing the complex needs of students is critical to retention. The COVID-19 pandemic exacerbated existing hardships, stressors, and insecurities that college students already experience (Lederer et al., 2021), which may have a downstream effect on student persistence. Today's pre-nursing student is tomorrow's nursing student and waiting until students start a nursing program to address the factors that affect attrition may be too late.

Background

Healthy People 2020 links education and health, identifying access to educational opportunities and quality of education as key social determinants (Office of Disease Prevention and Health Promotion, 2020). The National Academy of Medicine's (NAM, 2021) Future of Nursing 2020-2030 report emphasizes the importance of increasing diversity and advancing health equity in the nursing profession. With this emphasis on social determinants of health (SDOH), the widely accepted model that outlines conditions influencing health status, Sanderson et al. (2021) have outlined, for the first time, through a research-based framework, the connections between education and social determinants. The focus of the social determinants of learning (SDOL™) is to address learning disparities, expand learning opportunities for nursing students from under-resourced backgrounds, and provide structure about the influence and impact of SDOH (Sanderson et al., 2021). The six domains of the SDOL™ include physical

health, psychosocial health, economic stability, self-motivation, and the social and physical

environment (see Table 1 for additional information about each domain's attributes), which have

the potential to support or undermine learner well-being. Understanding which SDOL™

attributes either threaten or support a student's success can guide the identification of

interventions that could mitigate the risk. Increasing diversity in the nursing profession starts

with developing an understanding of how the SDOL™ influences pre-nursing students.

Table 1

Domains and Attributes of the SDOL™ framework

Domain	Attributes
Physical Health	• Health issues/disabilities • Quality of life related to physical health • Health beliefs • Health care access
Psychosocial Health	• Perceived stress • Resilience • Ability to set goals • Degree of self confidence • Student engagement
Economic Stability	• Necessity to work while in school • Job loss/instability • Living in economically depressed geographic areas • Number of hours worked while in school
Physical Environment/Community	• Community incivility • Workplace violence • Homelessness • Neighborhood safety • Generational poverty
Social Environment/Community	• Social supports/social networks • Family emotional support • Discrimination perceptions • Culturally and linguistically diverse backgrounds
Self-Motivation	• Motivation to learn • Critical thinking skills • Focus of attention • Lifestyle choices

Note. From "Developing a Social Determinants of Learning™ Framework: A Case Study," by C. Sanderson, L. Hollinger-Smith, and K. Cox, *Nursing Education Perspectives, 42*(4), p. 207 Supplemental Content, (https://doi.org/10.1097/01.NEP.0000000000000842). CCBY-NC-ND

Review of the Literature

Pre-nursing (PN) students are defined as those who have not begun formal nursing education training, including clinical courses, and who come from a variety of academic backgrounds, including traditional first-time freshman, transfer students, and previous baccalaureate degree holders (Names withheld, 2022b). It is important for nurse educators to understand and even expect the diversity of ages, life experiences, responsibilities that today's PN student brings with them as they learn. These personal and academic challenges for nursing students can be further categorized using a SDOL™ framework.

Quantitative research on PN students is sparse and there are no studies that specifically utilize the SDOL™ framework with this population. Stankus et al. (2019) aimed to increase diversity in nursing students by creating a dynamic modeling tool that used PN academic data during the admission process. Sullivan et al. (2019) focused on the relationship between stereotype threat, social identity, and academic success in PN students and suggested implications for retention of diverse student populations. Owen and Amar (2020) described an introductory course as part of a strategy to engage PN students prior to starting upper division courses. Other quantitative research with PN students has explored academic factors and how they relate to future nursing program success (Brown & Smith, 2019).

Qualitative research regarding PN students' experiences is limited. One qualitative study conducted by Packard and Hoffman (2016) explored pre-nursing students' perspectives on this unique stage of education and their attitudes toward caring. Participants described high levels of

stress and fears of not achieving their dream to become a nurse. In a phenomenological study, Bumby and Litwack (2021) described factors that facilitated or hindered PN students' experiences as they transitioned to nursing school. Professors, tutoring, advising, peer support and student groups, were among the supportive factors. Isolation and difficulty adjusting were among those that hindered. Other qualitative studies described the experiences of PN students in a program designed to support recruitment in rural nursing careers (Kyle et al., 2020), PN students' reflections on a cultural diversity course (Olukotun et al., 2018) and PN students' study habits (Felicilda- Reynaldo et al., 2017).

Although PN student research is lacking, the psychological well-being, stress, and anxiety levels of nursing students have been well-researched (Tung et al., 2018). Over the last two years, research has been conducted across the U.S. on the effect of the pandemic on college students' mental and physical health (Wang et al., 2020). Most students experienced difficulty with academics, including trouble focusing on school work and navigating online learning (Kecojevic et al., 2020). Studies on nursing students during the first year of the pandemic also reported increased levels of stress, depression, and anxiety (Michel et al., 2021). However, PN students' perceptions of how the COVID-19 pandemic has affected them are unknown.

Many factors influence the ability of PN students to be successful. Exploring the SDOL™ as they occur in PN students can help to support early interventions to support student success and later retention in nursing programs. The purpose of this paper is to qualitatively describe PN students' experiences during the first year of COVID-19 using the lens of the SDOL™ framework.

Methods

Design, Setting, Sample

The researchers utilized a qualitative descriptive approach to explore short answer study data (n = 289) collected as a part of a larger observational, cross-sectional research study with PN students in a large public pre-licensure nursing program in the southwestern US (Names withheld, 2022a). The qualitative descriptive method is a suitable approach when clear descriptions of phenomena are sought and often uses content or thematic analysis. Data sources include open-ended short answer questions (Kim et al., 2017). Participants for this study were recruited, using convenience sampling, from 1395 students enrolled in an Introduction to Nursing course offered in Fall 2020. Recruitment occurred from August to December of 2020 when the dominant COVID-19 variant was Alpha, prior to vaccine availability, and when most colleges and universities in the U.S. had moved to online course modality (American Association of Collegiate Registrars and Admissions Officers, 2020). The Introduction to Nursing course was offered in both on-campus and online formats, but due to the pandemic, all students were required to take the course online. Many students apply for a nursing program during or within 6 months of taking this course. The first author has been an instructor in the Introduction to Nursing Course for more than 10 years, but potential participants were informed that study participation was voluntary, anonymous, and that completion of the study survey was not linked to any grade or extra credit. Approval to conduct the research study was obtained from the university's Institutional Review Board.

Inclusion criteria included the ability to read and understand English, be over 18 years of age, and enrolled in the Introduction to Nursing course during Fall of 2020. Exclusion criteria included students enrolled in upper division pre-licensure nursing program courses or any student less than 18 years of age. Students were recruited using email and announcements in the

learning management system with a link to the online survey, hosted in QuestionPro™, which could be completed at a time and place of their choosing, using a tablet, computer, or cellphone.

Data Collection

Demographic data from the larger study (n=364) was re-analyzed to include only those participants who provided an answer to the study question (n=289) and included information about their age, sex, and race/ethnicity. To further describe the academic characteristics of the sample, participants were asked if they were a first-generation college student and if they had earned a previous associate degree or any higher degree. They were asked to indicate the number of undergraduate hours they had completed, the number of hours they were currently enrolled in, and if they were concurrently enrolled in more than one college or university. Participants were also asked to identify whether they intended to apply to the 15-month accelerated online or the 18 to 24-month traditional campus-based pre-licensure program, what semester they intended to apply for, and to describe the number of hours currently worked per week. All study data was stored and analyzed on a password-protected shared drive accessible only to the study investigators, and required a two-step authentication process to retrieve.

Participants were asked to respond to a total of four short-answer questions in the larger survey. Because of the large number of responses provided, the analysis of the first three questions is reported separately in a study conducted by Names withheld (2022a). This manuscript focused on reporting the analysis of the fourth question "How has the COVID-19 pandemic affected you as a pre-nursing student?" with a focus on how the SDOL™ were reflected in the participants' responses.

Data Analysis

Demographic variables are reported as mean ± standard deviation and discrete parameters are reported as n and percent (%). Deductive thematic analysis is driven by theoretical interest to provide a detailed analysis of a focused aspect (Nowell, et al., 2017). The principles of deductive thematic analysis (Braune & Clark, 2019), using the SDOL™ framework as a guide, were used to analyze participants' short answer responses to the study question. First, using NVivo (QSR, released March 2020), each of the answers were read and then grouped according to the six domains of the SDOL™. Second, both researchers confirmed that each participant's answer was appropriately placed in the correct theme, and then further grouped the answers according to the attributes (see Supplemental Digital Content [SDC], Table 1) that correlated with the operational definitions of each domain as provided by Sanderson et al. (2021). From each subgroup of attributes, common keywords and sentences were summarized into codes, and then patterns among the codes were used to write the results. Both researchers worked concurrently to divide the raw data according to the SDOL™ framework. However, they coded the data according to each domain's attributes independently to strengthen the rigor of the data analysis process. Finally, the researchers met together to review the final codes, ensuring that the results were an accurate reflection of the experiences of the study participants.

Results

The study participants ($n = 289$) had an average age of 28 ($sd = 9.1$) and were female (89.7%). The ethnicity of the students was White (30.5%); Hispanic / Latino 75 (26%), Black (23.3%), and Asian (15.2%). About half of the students (57.4%) intended to apply to an accelerated online baccalaureate program, while the remaining 42.6% anticipated an in-person course modality. The majority of the students (71.9%) intended to start a nursing program within

9 months of completing the course. Seventy-two percent of the students were working while in school. For more demographic information, see Table 2.

Table 2

Demographic and Academic Characteristics of the Sample

Variable	Sample Characteristics ($n = 289$)
Age in years; *mean, (sd), range*	28 (9.1) 18 - 60
Sex	Male 30 (10.3%) Female 259 (89.7%)
Race / Ethnicity	Asian 44 (15.2%) Hispanic / Latino 75 (26%) Black 67 (23.3%) White / Non-Hispanic 88 (30.5%) Other 14 (5%)
Previous Degree	Yes = 129 (44.6%)
Total UG Hours Completed	0 – 24 = 38 (13.2%) 25+ = 250 (86.8%)
Semester hours enrolled; *mean, (sd), range*	11 (3.8) 3 - 23
Concurrently enrolled in more than one college or university	Yes = 43 (14.9%)
Semester intending to start program	Spring 2021 = 40 (13.9%) Fall 2021 or later = 167 (86.1%)
Intended Nursing Program	Traditional Campus-Based BSN = 123 (42.6%) Accelerated Online BSN = 166 (57.4%)
Hours worked per week	Not working this semester = 81 (28%) 1 – 24 hours / week = 69 (23.9%) 25+ hours / week = 139 (48.1%)

Out of the 289 total respondents, there were 89 students who responded to the study question, "How has the COVID-19 pandemic affected you as a pre-nursing student?", with answers that indicated no effects or even positive effects that did not fit within the attributes of the SDOL[TM] framework. Some participants expressed benefits, as one student shared: "*It has*

allowed me to give some time to myself and breathe, since I was overwhelmed with classes and work before COVID-19". Another student expressed: "*This has actually been beneficial to me as a student as I have more time for my studies.*" Others preferred the convenience that online education offered, as this student wrote: "*The pandemic actually provided me with the opportunity to take all my prerequisite classes online, which helped me to have a more flexible schedule with work*". The remaining responses (n=200) were analyzed and grouped according to Sanderson's six domains of SDOL™. See Table 3 for additional quotes to further illustrate the study findings.

Physical Health

When asked about how COVID-19 affected them as a PN student, respondents shared health beliefs related to protecting themselves and others and expressed concerns about the health risks associated with a COVID-19 infection. Students felt safe by being required to take classes online, sharing that safety and health were a priority. In addition, following the guidelines and being cautious allowed them to protect themselves as well as family members. As one student expressed, "*By keeping myself safe, I am keeping them safe.*" Others described fears about bringing it home, especially those students who worked in healthcare. One student wrote: "*Even though I have dealt with Covid-19 patients, I have not contracted the virus, but it has affected me in other ways like fear of eventually contracting and infecting my family and others around me with it.*" Students with compromised health issues had an increased fear of the disease, while a few expressed how contracting the infection themselves affected their lives. As one student explained, "*I was hospitalized with COVID-19 in April of this year, and it had a profound impact on me and my family.*" Other PN students reported that even though family members contracted the disease, they did not. "*I do worry at times but I have lived with my*

husband through his COVID. He made it out safely and no one in our home became sick after him."

Psychosocial Health

Thoughts and feelings reflecting their psychosocial health dominated the responses describing how the COVID-19 pandemic affected them as a PN student. Many factors influenced perceived stress, including financial stressors, work changes, and academic challenges. Some students reported feelings of isolation and loneliness. A compounding factor included fear and worry about the virus, while many experienced losses related to the pandemic. One student shared, *"It has affected everything in my life. I have lost family members to it; it has disrupted my daily routines. It's been very challenging; particularly related to school and work and personal issues."* Students described their well-being in many ways: feeling 'drained,' 'stuck,' 'suffocated,' 'exhausted,' or 'devastated.' As explained by one participant, *"As the pandemic drags on, I feel defeated and lost at times because it feels like there is no purpose anymore like learning just to do it."* A generalized pre-occupation with the pandemic was noted by many, with one student succinctly expressing: "*COVID-19 has increased my stress as a pre-nursing student."* Students also reported grieving the loss of a daily routine or what they expected college to be. One remarked: "*As a college student I wanted to experience the University feel.*" Those working in healthcare reported additional challenges at work that intruded upon their non-working time and well-being. As one student reflected:

> *It has a huge impact to me since we became so burned out and stressed at work. Working full time and dealing with a lot of things at work, the time I get home and have time to do my school work I am already almost drained.*

While there were many students who struggled with aspects of their psychosocial health, others shared that the pandemic caused them to re-evaluate their goals and priorities. As one student shared, "*It gave me clarity and a shift in perspective towards overall meaning of life, my goals, and what's important to me.*" Many expressed a reinforced passion and desire to help others, as well as feeling motivated by what nurses are doing for others in need during these unique times. Another expressed, *"The pandemic has made me more inspired to obtain my degree in order to properly care for my community."* Many PN students also exhibited resilience in their responses. Students reported that the pandemic required them to adapt and cope to what life brings and adjust their expectations. PN students had to figure out how to manage new situations, take time to think, and continue to hold their heads up. One student admitted, "*I've also given myself more grace because of it and decided that with all the chaos going on all the time, taking one semester longer isn't a big deal.*"

Economic Stability

When asked about how the pandemic affected them as a PN student, many reported experiencing economic challenges. Responses related to changes in their work status were common. Students experienced pay cuts, were deemed non-essential and were furloughed or laid off or chose to leave their jobs related to safety concerns. As one student expressed, *"I was furloughed for 5 months then I returned for 2 months and was laid off".* Other students had to work additional part-time jobs to get by, while some sectors saw an increase in work or job responsibilities related to the pandemic. Students also fell behind on bills, had to take out unexpected loans, or allocated school funds to cover other bills. As one student shared,

> *"This pandemic has affected me in so many ways, mainly being financially. I am still on the verge of losing my car and can't seem to get caught up with that payment or others. If*

I were out spending and blowing money it would be one thing, but I am basically working

to survive right now."

About a quarter of the PN students in this sample (28%) did not work during school, and

others did not report this as their primary stressor. Working while going to nursing school may

be prevalent in many nursing programs. PN students in this study shared how work had to be

prioritized over school due to financial responsibilities. Others reported how navigating a loss of

childcare required them to adjust their schedules to prioritize study times around work and

assisting their home responsibilities. Working outside of the home during the pandemic caused

worry related to COVID-19 exposure and how that may upend their schedule. One PN student

admitted, "*I desperately need an income to pay for tuition and materials. I am stressed with*

finding a new job and am worried that if I were hired anywhere, my work hours will make

excelling in my courses difficult."

Physical Environment/Community

The first year of the COVID-19 pandemic resulted in dramatic changes in students'

physical environments, including stay at home orders, social distancing, and online learning

requirements. Overwhelming responses related to homeschooling children while also attending

school themselves were shared. Many students had to work from home, which also brought

about many distractions. One PN student described her situation: "*Continuing to work from home*

full-time, being a full-time mommy and educating my new kindergartner in virtual learning, and

continuing my education as a pre-nursing student."

The physical limitations required by the pandemic, including lockdown restrictions,

business closings, and understaffing caused many barriers for many tasks the PN students needed

to complete in order to progress toward the goal of nursing school. Students were unable to

complete background checks, take necessary standardized tests, complete immunization requirements, or even volunteer and gain experience in healthcare. One student shared: "*I had to stop preparing for the requirements that pre-nursing student needs in order to apply to the nursing school.*" Being forced to be at home when they were used to studying at libraries or coffee shops, and not having a quiet study space at home was challenging, as one student expressed, *"I usually enjoy studying at the school library or Starbucks for peace and quiet which allows me to focus a lot better. But due to COVID, those are not an option."* The inability to take proctored tests previously held in person led to complicated online testing procedures, the need for special equipment, and slow internet challenges due to the increased demand for usage. Courses intended to be in-person, such as labs, and difficult courses were not ideal when moved to online modalities. PN students looking ahead to nursing school expressed concerns at how clinical time would occur if they were still in an online setting due to the pandemic.

Social Environment/Community

While many students preferred, or chose online learning, for some PN students, the dramatic change in their social environment as a result of the COVID-19 pandemic was at the forefront of their mind. The changes in learning, requiring them to stay home and attend classes, kept PN students from feeling engaged and making connections. One student described: "*I miss interacting with others and having the on-campus experience."* Many students were looking forward to making new friends in their PN courses, as connecting with others with similar interests was important to them. Being in class face-to-face allowed students to be around friends and instructors and was viewed as a key step to feeling positive and comfortable in classes. Students had to wait for responses to their questions via email, which gave a perception of a lack of faculty interaction. Online classes were seen as barriers for connecting with others for

friendship, and COVID-19 fears reduced chances for the formation of in-person study groups. As one student explained, "*It's caused almost all of my classes to shift online and has severely limited my ability to socialize. As this is my first semester, I had been hoping to easily meet other pre-nursing students and strike up a friendship with them.*" Working and learning from home reinforced feelings of loneliness and isolation for some. One student remarked, "*I also miss the social aspect of school. Making new friends and also having study groups is much harder to do when you can't see everyone.*" Another expressed: "*I feel isolated and suffocated at times because I can't really be involved and interact with society which does take away social skills.*"

Self-Motivation

When asked about how the pandemic affected them as a PN student, some respondents chose to describe the challenges of staying focused and what motivated them to learn. Issues that affected their focus of attention included work and family responsibilities, financial stressors, and feelings of isolation. Time management issues were prevalent as it was easy to be distracted by things that were not a priority. Students reported having difficulty keeping track of everything and having a hard time paying attention. One student wrote: "*I've found it a little difficult to concentrate and get work done.*" Having things on their mind, like safety concerns and negativity in the news, were directly related to a lack of focus, with one student sharing: "*It's affected how I retain information because I have so much on my mind.*" Online learning has proven to be a challenge for students to focus and some view it as more work and requiring more time. As one student described, "*Learning everything online has definitely been a struggle and made me have to study and focus way more.*" Other students acknowledged that the change in the learning environment was for safety reasons, and although it required more work and dedication, was acceptable.

While the online environment was a deterrent to motivation with some PN students, others reported that their motivation to learn was increased. A few students who got sick with COVID-19 were grateful that the online format allowed them able to push through their illness and continue to work hard towards their goals. The pandemic and shortage of healthcare workers motivated them to be a PN student so they could help. Many also felt the pandemic confirmed that they were in the right place. As one student offered: *"To know the importance of a nursing profession, nurses help to save lives in this pandemic and also I am in the right profession because it is my passion to care for sick people."*

Table 3

Additional Relevant Quotes

SDOL Domain	Relevant Quotes
Physical Health	• "I do understand the severity of COVID-19 and the precautions we must take for our safety but it does come with hardships."
	• "I am a diabetic and I am afraid of getting this virus and not being able to survive."
	• "I also contracted COVID in the last 2 weeks of my summer course. I was physically and mentally drained due to the symptoms I experienced."
Psychosocial Health	• "I would say mentally it has taken a toll seeing how COVID has affected so many people, it makes me want to help everyone and I can't just yet. It's sad what this pandemic have done to many individuals and families and it's awful the things they had to go through."
	• "Immensely. My stress level and anxiety has been a little higher grappling with my children home for a long time, unable to go to school."
	• "The loss of family friends from this virus has been devastating."
	• "It gave me clarity and a shift in perspective towards overall meaning of life, my goals, and what's important to me."
	• "It made me understand the importance of people choosing to become a nurse."
Economic Stability	• "I was laid off from my job and I am on unemployment looking for a different career."
	• "Financially it has been difficult for me because during this period I have experience pay cuts at my place of work. The pay cut has increased my stress levels due to difficulty in paying some bills that are due. This also has some effect on my study time and during study times. It's hard to take my mind off it."
	• "I am currently involved in a different career that COVID-19 has affected greatly, making extra overtime a necessity. I have really had to re-evaluate my goals and time management to continue pursuing a nursing degree."
	• "I am commuter student so I still live with my family it's very challenging since I have 3 younger sisters that are attending school from home which can make it difficult to focus."
	• "The first week of classes my daughter tested positive for COVID. Now me and two kids are trying to get all our work done on one sketchy laptop."

Physical Environment / Community	• "I had in mind to start working as a CNA, yet due to the pandemic everything shut down. I have not been able to take the CNA exam."
	• "It does take more discipline to stay on top of things when you are not meeting in classes and facing professors."
Social Environment / Community	• "I am an extrovert and love class time to talk and mingle with others. I miss interacting with others and having the on-campus experience."
	• "I liked interacting with new people within my major and making new friends and connections. Also feeling the same frustrations with a professor in person. It makes you feel connected to your classmates."
	• "I also miss the social aspect of school. Making new friends and also having study groups is much harder to do when you can't see everyone."
Self-Motivation	• "It's affected how I retain information because I have so much on my mind."
	• "It has made me disorganized and has me focusing on matters that should not be my priorities. It is an unfortunate situation and has changed the way I live my life for the better and worse."
	• "Not everyone is great at taking online classes, but you have to adapt to what life brings."
	• "The COVID-19 pandemic which motivated me to be a pre-nursing student. I see shortage of health providers and virus threat to people lives during this uncertain time, I think I need do something."

Discussion

Sanderson et al. (2021) defined social determinants as "socially imposed forces that are causative factors that have implications for or influence one's life" (p. 207). These barriers need to be assessed for PN students to move forward and progress and the responses from the study participants overwhelmingly supported each of the domains of the SDOL™.

Participants in this study verbalized fears of becoming sick with COVID-19 and encountered health challenges related to contracting the virus. This is consistent with a mixed-methods study among nursing students that reported fears related to getting the virus were higher than the general population, and physical health challenges emerged as a theme of lived experiences of nursing students in the first year of the pandemic (Rhode et al., 2022). The prevalence of PN students' stress, anxiety, and other mental health challenges, which is reflective of the psychosocial domain, is also congruent with the literature of nursing students, both during and in pre-pandemic times. For PN students, Packard and Hoffman (2016) described the struggle of meeting pre-requisite academic expectations while simultaneously juggling personal and emotional issues.

With regard to economic stability, these PN students described a variety of work-based changes that included increased work demands, furloughs, and getting laid off. Emory et al., (2021) reported similar findings with a group of undergraduate nursing students when school, work, and personal environments were examined during the pandemic. For nursing students, working while attempting to successfully complete nursing school can factor negatively toward retention. Working more hours per week was associated with negative impacts on students' grade point averages and perception of academic success (Wait, 2018) which can deter successful completion of school requirements. A student's financial status is often associated with a higher risk of leaving nursing school (Lott et al., 2018). Concerns surrounding financial resources and support, as well as the financial burden of acquiring debt, affect the ability to sustain a nursing education (Lekan et al., 2018).

In relation to their physical environment, PN students discussed significant changes in their living situations and difficulty balancing their academic needs with competing family demands. Prior to the pandemic, one qualitative study found that among nursing students with high attrition, those who had high demands of both work and family life found it difficult to manage their studies successfully (Kukkonen et al., 2016). Since the start of the pandemic, a study by Kecojevic et al. (2020) revealed that undergraduate students reported staying home with few social outings. Pandemic-related closures of college campuses negatively affected the mental health of most college students (Oh et al., 2021).

Some PN students in this study also developed an increased awareness of learning preferences and missed the hoped-for social connections that develop in PN courses. Bumby and Litwack (2021) reported pre-pandemic that isolation from peers and living at home hindered PN students' transition from preliminary nursing courses to the nursing major courses. Packard and

Hoffman (2016) revealed that participants acknowledged how a circle of support that consisted of friends, faculty, and other university resources was an essential component to help them succeed. In a research study that compared stress and depression amongst non-nursing and nursing undergraduate students during the COVID-19 pandemic, nursing students indicated that one of the biggest factors that helped them to persevere through the pandemic was social support (Black-Thomas, 2022).

PN students in this study reported difficulties with staying focused due to distractions and problems with self-motivation due to lack of face-to-face accountability. These findings are consistent with other studies that found that university students who attended school in online environments due to the pandemic struggled to focus on academic work, reported a decreased ability to learn and retain information, and had difficulty completing assignments and staying engaged (Kecojevic et al. 2020; Michel et al., 2021). Living during pandemic times caused many others to develop increased respect for nurses and feelings of confirmation for their academic and professional goals. This is similar to Heilferty et al. (2021) where nursing students reported increased perseverance toward their goals in spite of the COVID-19 pandemic.

<div align="center">

Limitations

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Study limitations included the use of convenience sampling, which may not represent the target population, and the use of qualitative short answer data collected via a survey. There was no opportunity to ask follow-up questions to provide additional clarity on students' answers. The open-ended question regarding the influence of the pandemic allowed for students to provide the most important answer to them but may not reflect the breadth of impact that the pandemic had in their lives. The large sample size and racial and ethnic diversity of the sample is a strength of this study; however, transferability will need to be assessed by other educational settings for

applicability. Furthermore, the use of NVivo to analyze study data and using two researchers to review the data added to the rigor and reduced bias in the data analysis process.

Recommendations

The SDOL™ framework can be utilized by educators to conceptualize the influence of the pandemic on the experiences of online PN students and create a deeper understanding of the PN student. Education is likely needed for nurse educators to become familiar with this framework. Knowledge of the pandemic's influence on students' psychosocial and financial health, self-motivation, and social and physical environments can be leveraged to develop specific interventions to target these areas and improve students' well-being as they apply to nursing programs. Furthermore, the SDOL™ framework can be used by educators to explore how social determinants affect undergraduate nursing students' retention and identify which are modifiable. For example, programs can choose to implement an assessment of PN students' stress, resilience, and self-motivation. Then, they can embed interventions into PN courses aimed at supporting these attributes when needed.

Many PN students work while going to school to maintain economic stability and research needs to be done in this area to better understand how-to support these students. One suggestion might be to evaluate the influence of number of hours working on course grades and persistence in PN students. In addition, the importance of the social environment should not be underestimated, and educators need to continue to prioritize how to better connect PN students in both traditional and online programs. Faculty can inform PN students about opportunities to connect with each other through participation in student organizations or other activities provided for both PN and nursing students.

While the literature reflects the impact of socioeconomic status, social support, and work responsibilities on the stress and attrition of nursing students, little is known about PN students. Furthermore, as PN students are emerging from the most difficult days of the pandemic, they are bringing with them the stress they encountered over the last two years. SDOL™ factors that influence PN students are often brought with them when they become nursing students. As they enter a formal nursing program, which inevitably is stressful, and prepare to become professional nurses, the importance of an integrated, interwoven, program-wide focused curriculum that promotes learner well-being is critical. Intervening and providing specific tools that can help them manage stress and enhance their mental health during their last courses prior to nursing program admission is crucial to producing successful future nurses entering the workforce.

Conclusion

The SDOL™ framework is useful for understanding the positive and negative experiences of PN students as they pursued academic goals during the first year of the COVID-19 pandemic. In addition, while there are many initiatives that support the retention of university students, the SDOL™ framework provides a useful foundation to guide research aimed at mitigating factors that influence attrition in pre-nursing and nursing students. Interventions aimed at addressing, eliminating, and supporting social determinants in these students are warranted as they represent the future of the nursing workforce.

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Factors Affecting the Success and Persistence of Pre-Nursing Students

CHAPTER 4

Introduction

This chapter will summarize the results of each manuscript and the concepts of the guiding theoretical models will be addressed in relation to the completed studies. Limitations of each study will be offered and implications for nurse educators will be covered. Last, implications for future research and general conclusions will be provided.

Summary of Results

The first study used a retrospective matched cohort study design to explore the differences between academic variables in students accepted into nursing school via two admission routes (Jennings et al., in press). This novel study found no significant differences in RN Fundamentals ATI exam scores between TR and EM students. There were significant differences in semester GPA and pre-program GPA between the two groups, but both the TR and EM students met minimum benchmark standards prescribed by the college of nursing (Jennings et al., in press).

The second manuscript utilized a descriptive, qualitative approach to analyze data collected from open-ended, short-answer, survey-based questions with PN students (Jennings & Urban, under review). The intention of this study was to explore the experiences of PN students just prior to applying to nursing school; however, due to the unexpected and extended global pandemic and data collection which occurred in the fall of 2020, the focus shifted to investigate how these students were affected by COVID-19 when all learning was delivered online. Deductive thematic analysis was conducted according to the social determinants of learning (SDOL™) framework (Sanderson et al., 2021). The experiences of online PN students during

this time included fears of contracting the virus, challenges to mental health, financial obstacles, and physical environment changes. Furthermore, social connections were lacking, and while many struggled with focus, others reported an increase in self-motivation and goal confirmation to enter the nursing program (Jennings & Urban, under review).

Analysis of Theoretical Framework

Shelton's (2012) model of nursing student retention was utilized as the guiding framework for both research studies. This model is a logical and parsimonious theoretical guide for nursing education research and offers clear relationships among the constructs and how they affect persistence and successful academic performance (Shelton, 2012). The first construct is a student's background, which consists of previous coursework, high school and college GPAs, financial resources, family responsibilities, and employment. The second construct, internal psychological processes, includes setting goals, goal commitment, and academic self-efficacy. The third construct, external supports, focuses on the support students receive from various sources, such as family, peers, or academic resources. According to Shelton's model, it is important to investigate each of these three constructs, as together they impact a student's retention (Shelton, 2012).

The first manuscript, a quantitative study, explored pre-university academic variables and pre-program academic variables in first-semester nursing students admitted using two different routes (Jennings et al., in press). Shelton (2012) proposed that students must attain a predetermined level of academic success in order to be retained in a nursing program, and the first manuscript supported the assumption that benchmark criteria can be used effectively to predict the ability for students to successfully complete their first semester of nursing school. While EM students had lower science and pre-program GPAs, their performance on the

standardized RN Fundamentals ATI did not significantly differ from the scores earned by TR students, suggesting that utilizing scholarship-level criteria based on high school achievements may be an effective admission route.

The second manuscript used a descriptive qualitative approach to investigate the experiences of PN students during the pandemic (Jennings & Urban, under review). This approach revealed many challenges that PN students endured as the public health crisis continued. The two remaining constructs in Shelton's (2012) model, internal psychological processes and external supports, influence a student's academic success and persistence. However, internal psychological processes in this model are constrained to academic and career goals, goal commitment, ability, and motivation (Shelton, 2012). Mental and physical health characteristics are not explicitly addressed in Shelton's (2012) model yet seemed to dominate participants' answers. With the complex responses obtained in the study along with the desire to seek a rich, meaningful picture of the PN student during the pandemic, a framework that included a broader scope was needed for data analysis.

The SDOL™ framework is based on the social determinants of health, which are key drivers that affect well-being (Sanderson et al., 2021). The six domains of the SDOL™ framework were useful and relevant for conducting a deductive thematic analysis of the study data and helped to better connect the interpersonal psychological and external support constructs of Shelton's model. In addition to providing structure and a comprehensive approach to understanding the positive and negative aspects of the PN student experience, this framework offered insight into the participant's responses as they reflected on the impact of the COVID-19 pandemic. Overall, both Shelton's (2012) model and the SDOL framework provided the

necessary tools to gain a clearer understanding of the many factors that influence the persistence and success of PN students.

Limitations

Manuscript One

Limitations of the first study include a relatively small sample size from a single site that could limit generalizability. Twenty students were excluded from the study due to a lack of match, reducing the sample size of each group from 88 to 68. Matching criteria were limited to demographic characteristics and scholarship level. If other academic variables were included, different outcomes may have been seen. No psychosocial factors were included in the analysis that may have contributed to the differences in the two groups.

Manuscript Two

Limitations of the second study included short answer data collected via a survey, which did not allow the research team to clarify participant's answers with follow-up questions when warranted. Convenience sampling was utilized which may not represent the target population fully. The influence of the pandemic could have skewed perceptions of students, and asking them a broad, open-ended question about the influence that the COVID-19 virus had on their PN experience may have limited them to providing a current perspective on what was most important at the time, without reflecting the broader experience of being a PN student as a whole. Using inductive thematic analysis may have revealed different themes.

Implications for Nursing Education

Academic institutions decide which students to accept into the limited spots available in nursing programs based on criteria established in a variety of studies. The challenges with this process are the generalizability of results across different programs, and varied course content

and high school graduation requirements, among others. The first manuscript supports the use of benchmark criteria while contesting the presumption that students accepted after they complete prerequisite courses and have higher GPAs will be more successful than those who were identified prior to starting nursing school. Nursing programs may want to reevaluate admission processes as a strategy to increase recruitment and retention efforts.

In addition to academic factors that influence persistence and success, nursing students experience challenges that affect their ability to complete nursing school. For example, a student's challenges with their physical or mental health or socioeconomic status do not start the moment they start a nursing program but are brought with them as a PN student. Waiting until these students are accepted into nursing school to target academic and psychosocial support and interventions may be too late. Offering support early could not only bolster the well-being of the PN student but alleviate the heightened threats to success that nursing students may face as they progress through their program face in their future. Nurse educators can use the SDOL™ framework as a guide to expand learning opportunities and identify which attributes in PN students may benefit from interventions. This framework can also provide nurse educators with a foundation from which to develop ideas targeted to individual and program-wide needs.

Future Research Directions

To the researcher's knowledge, Manuscript One (Jennings et al., in press) was the first study that compared two admission routes at the same university. Future research over the matched cohort group of students needs to continue to investigate the associations between the pre-university and pre-program variables and scores on additional ATI exams as they progress through the formal nursing program. Pertinent connections between these variables, graduation rates, and NCLEX-RN pass rates should also be explored. Differences in university experiences,

such as hospital unit assignments or the use of support resources, could be incorporated in future research. As universities aim to reduce the nursing shortage by increasing numbers of nursing students, more matched cohort research could be beneficial to inform nurse educators on admission routes that will produce the most successful nursing students.

Other non-academic factors that influence retention and success, such as employment status, perceived well-being, stress levels, and self-efficacy should be included in research of PN students. The SDOL™ framework can assist educators in identifying the role that social determinants play in persistence and how learner well-being can be supported in PN students as they prepare for nursing school. Investing in the well-being of PN students, coupled with efforts to support them academically, will provide the necessary groundwork for success and persistence.

Conclusion

PN students are often overlooked while efforts are focused on students who are in formal nursing programs. Many PN students never become registered nurses due to an array of reasons similar to those factors that contribute to nursing student attrition. The time has come to prioritize this unique population in research and recognize them as a meaningful part of the multifaceted solution needed for the ongoing nursing shortage.

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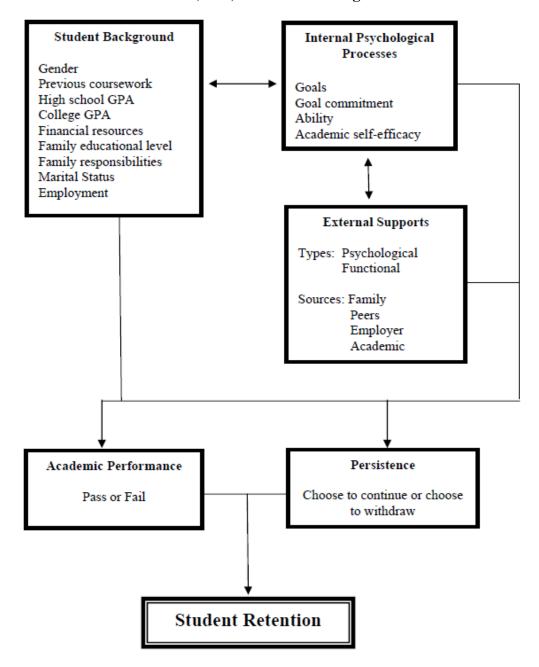
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Appendix A

Shelton's (2012) Model of Nursing Retention

Student Background

Gender
Previous coursework
High school GPA
College GPA
Financial resources
Family educational level
Family responsibilities
Marital Status
Employment

Internal Psychological Processes

Goals
Goal commitment
Ability
Academic self-efficacy

External Supports

Types: Psychological
       Functional

Sources: Family
         Peers
         Employer
         Academic

Academic Performance

Pass or Fail

Persistence

Choose to continue or choose to withdraw

Student Retention

From "A Model of Nursing Student Retention," by E. N. Shelton, 2021, *International Journal of Nursing Education Scholarship*, *9*(1), p. 3. Copyright 2012 by De Gruyter. Reprinted with permission (see Appendix B).

Appendix B

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Appendix C

Acceptance for Manuscript One

Date: Nov 30, 2022
To: "Leslie Jennings" lesliej@uta.edu
From: "Journal of Nursing Education" prs_staff@slackinc.com
Subject: Your Submission to Journal of Nursing Education: JNE-2022-327R2

Dear Leslie Jennings,

We are delighted to inform you that your manuscript titled "Academic Differences in BSN Admission Routes: Implications for Persistence," (JNE-2022-327R2, Research Brief), has been accepted for publication in the Journal of Nursing Education. No substantive revisions are necessary, but your manuscript will be copyedited by our staff.

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Congratulations!

Sincerely,
Shayna Bayard
Executive Editor
Journal of Nursing Education

Reviewers' comments:

Reviewer #1: Thank you for addressing all comments, the results section includes all relevant data. Wishes for further success in your research.

In compliance with data protection regulations, you may request that we remove your personal registration details at any time. (Use the following URL: https://www.editorialmanager.com/jne/login.asp?a=r). Please contact the publication office if you have any questions.

Appendix D

IRB Approval for Manuscript One

UNIVERSITY OF TEXAS ARLINGTON | OFFICE OF RESEARCH ADMINISTRATION
REGULATORY SERVICES

12/3/2021

IRB Approval of Minimal Risk (MR) Protocol

PI: Leslie Jennings
Faculty Advisor: Daisha Cipher
Department: Nursing – Graduate
IRB Protocol #: 2022-0017
Study Title: *Understanding the Differences in Selected Academic Variables in Nursing Students with Early Matriculation Versus Traditional BSN Program Admission: Implications for Persistence*

Effective Approval: 12/3/2021

The IRB has approved the above referenced submission in accordance with applicable regulations and/or UTA's IRB Standard Operating Procedures.

Principal Investigator and Faculty Advisor Responsibilities

All personnel conducting human subject research must comply with UTA's IRB Standard Operating Procedures and RA-PO4, Statement of Principles and Policies Regarding Human Subjects in Research. Important items for PIs and Faculty Advisors are as follows:

- **Notify Regulatory Services of proposed, new, or changing funding source**
- Fulfill research oversight responsibilities, IV.F and IV.G.
- Obtain approval prior to initiating changes in research or personnel, IX.B.
- Report Serious Adverse Events (SAEs) and Unanticipated Problems (UPs), IX.C.
- Fulfill Continuing Review requirements, if applicable, IX.A.
- Protect human subject data (XV.) and maintain records (XXI.C.).
- Maintain HSP (3 years), GCP (3 years), and RCR (4 years) training as applicable.

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202 E. Border Street, Suite 300, Arlington, Texas 76010, Box #19188
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Appendix E

IRB Approval for Manuscript Two

UNIVERSITY OF TEXAS ARLINGTON | OFFICE OF RESEARCH ADMINISTRATION REGULATORY SERVICES

8/11/2020

IRB Approval of Minimal Risk (MR) Protocol

PI: Regina Urban
Department: Nursing
IRB Protocol #: 2020-0982
Study Title: *What They Bring With Them: The Relationships Among Resilience, Stress, and Persistence in Online Pre-Nursing Students*

Effective Approval: 8/11/2020

The IRB has approved the above referenced submission in accordance with applicable regulations and/or UTA's IRB Standard Operating Procedures.

Principal Investigator and Faculty Advisor Responsibilities

All personnel conducting human subject research must comply with UTA's IRB Standard Operating Procedures and RA-PO4, Statement of Principles and Policies Regarding Human Subjects in Research. Important items for PIs and Faculty Advisors are as follows:

- **Notify Regulatory Services of proposed, new, or changing funding source**
- Fulfill research oversight responsibilities, IV.F and IV.G.
- Obtain approval prior to initiating changes in research or personnel, IX.B.
- Report Serious Adverse Events (SAEs) and Unanticipated Problems (UPs), IX.C.
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Appendix F

Submission Confirmation for Manuscript Two

Date:	Jan 31, 2023
To:	"Leslie A Jennings" lesliej@uta.edu;ljennings1414@gmail.com
From:	"Editorial Office" nepeditorialoffice@kwfco.com
Subject:	A manuscript number has been assigned to your NEP submission

TODAYS_DATE%

Dear Mrs. Jennings,

Your submission entitled "Through the Lens of the Social Determinants of Learning™: A Qualitative Study of Online Pre-nursing Students during the COVID-19 Pandemic" has been assigned the following manuscript number: NEP-2023-079.

You may check on the progress of your paper at any time by logging on to Editorial Manager as an author.

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Your username is: ********
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Thank you for submitting your work to Nursing Education Perspectives.

Kind Regards,

Patrick Szostak, .
Managing Editor
Nursing Education Perspectives

_____

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Appendix G

Request for Revisions on Manuscript Two

Date: Feb 28, 2023
To: "Leslie A Jennings" lesliej@uta.edu;ljennings1414@gmail.com
From: "Editorial Office" nepeditorialoffice@kwfco.com
Subject: Your Submission to Nursing Education Perspectives

Feb 28, 2023

RE: NEP-2023-079, entitled "Through the Lens of the Social Determinants of Learning™: A Qualitative Study of Online Pre-nursing Students during the COVID-19 Pandemic"

Dear Mrs. Jennings,

I have received the comments of the reviewers on your manuscript; a copy is included below. The reviewers believe that your work is of potential interest to our readers but feel that substantial revision would be necessary before the paper could be considered again for publication in Nursing Education Perspectives.

I hope that you are willing to revise the manuscript, taking into consideration the suggestions of the reviewers. The revisions should be completed by Mar 30, 2023 to avoid being considered as a new submission. I will attempt to send the revised paper to the original reviewers for their appraisal. Please include with your revised submission an itemized, point-by-point response to the comments of the reviewers. In addition, please use yellow highlighting in the manuscript file to indicate all revisions to your manuscript.

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