The Future Capacity of the Nursing Workforce

COVID-19 Pandemic's Impacts on New Nurses and Nursing Students Toward the Profession

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ABSTRACT

Background: Nurses are concerned for their safety and conflicted about their career, because their duty to care for patients during the pandemic involved competing ethical obligations, including their own personal safety.
Purpose: The aim was to explore the impact of COVID-19 on new nurses and nursing students in terms of safety and interest in nursing specifically related to self-efficacy, geographic region case density, and frontline experience in health care.
Methods: New nurses and nursing students (N = 472) responded to an online survey examining self-efficacy, sense of safety, and interest in nursing. The survey included an open-ended question to support response interpretation.
Results: Researchers identified significant differences among new nurses and students from contrasting case-dense regions in terms of safety and interest in nursing.
Conclusion: Concerns about personal safety and the safety of others were apparent. Over time, this may lead to a decrease in willingness to enter or remain in the nursing profession.
Keywords: COVID-19, new graduate nurses, nursing students, nursing workforce, self-efficacy, workplace safety

N ew York State, the initial US epicenter of the COVID-19 pandemic, has experienced tremendous strain on its nursing workforce. Disproportionately affecting Downstate New York, New York City and its surrounding areas have experienced exponential rates of mortality.[1] Highest hospitalization rates consequently contribute to widespread risk among nurses as frontline health care workers. Nurses face conflict as they are ethically obliged to care for infectious patients and themselves.[2] When coupled with equivocal or ever-changing infection control guidelines, lack of personal protective equipment, and staffing shortages, nursing students preparing to be nurses and new graduate nurses may question their career choice.

The supply-demand ratio of nurses to need in New York State has been in balance.[3] However, the stability of this ratio for the next decade is contingent on training and retirement patterns remaining the same. A relatively small change in the supply chain of nurses, 10% reduction in nursing students entering the profession or an average of 2-year change in retirement age, will create insufficiency in the nursing workforce.

Early research exploring the stress the COVID-19 pandemic has had on health care workers demonstrates increased physiological, mental, and emotional stress.[4-6] Such stressors have been linked to nurse burnout and intent to leave the profession.[7] Nurses as frontline workers were confronted with insufficient staffing, inadequate protective gear, and an unknown virulent virus resulting in a heightened vulnerability to burnout. A rapidly changing and stressful environment is a leading precipitating factor for nurses intending to leave the workforce.[8] Widespread organized efforts from academia and the service industry will be needed to alleviate stressors and manage long-term consequences of the trauma associated with care environments.

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The American Association of Colleges of Nursing[9] has reported a 5.6% increase in enrollment for baccalaureate nursing programs from 2019 to 2020; in contrast, the increase from 2020 to 2021 was only 1.5%. Changing perceptions among nursing students and new graduate nurses toward the profession of nursing and a change in willingness to become nurses could have a devastating impact on human capital and the future capacity of the nursing workforce.

Theoretical Framework

Bandura's[10] Social Cognitive Theory guided this study. A belief about one's own competency is recognized as a predictor of behavior. If an individual judges themselves as capable, they are more likely to act and persist in the face of obstacles or adverse experiences. Concepts related to self-efficacy were used in demonstrating the influence of COVID-19 on students' and new nurses' attitudes toward nursing practice and projecting the relationship between students' and new nurses' experiences and the future of nursing.

Purpose

The purpose of this study was to explore the impact the COVID-19 pandemic may have on the future capacity of the nursing workforce. Exploring self-efficacy and the perceptions of new graduate nurses and current nursing students toward safety and the profession of nursing during the COVID-19 pandemic, stratified by geographical location within New York State, may provide important information about the nursing pipeline. The effects of the COVID-19 pandemic have been measured in terms of geographic region case density, sense of safety, and interest in the nursing profession as it relates to self-efficacy and frontline experience in a health care environment during the pandemic.

Method

This mixed-methods study used an online survey that included a single open-ended question to provide an enhanced interpretation of survey takers' responses. An email containing a survey link was distributed to current nursing students and first-year new graduate nurses of 3 baccalaureate nursing programs located in contrasting COVID-19 density regions in Upstate and Downstate New York. As of mid-December 2020, the upstate regions, which were considered low–COVID density regions, had 1562 cases and 30 deaths for every 100 000 people, and the downstate region, which was considered a high–COVID density region, had 5179 cases and 157 deaths per 100 000 people.[11]

The investigators conducted an a priori power analysis for required sample size, using G*Power version 3.1.9.4.[12] For correlation, a medium effect size ($f^2 = 0.3$), an α of .05, and a power of 0.95 were achieved with a sample size of N = 134. Data collection took place from July through October 2020. The study was approved by the institutional review board on human subjects at all participating schools.

Instrument

A questionnaire created by the investigators queried demographic information such as level of education and New York State geographic region of program, employment and volunteer experiences the respondents had during the pandemic, and their level of self-efficacy, sense of safety, and attitudes toward the nursing profession. One open-ended question was included that allowed respondents to share how the COVID-19 pandemic has impacted their perception of nursing. The survey took an average of 5 to 6 minutes to complete.

The level of self-efficacy was measured using the General Self-Efficacy (GSE) scale.[13] The scale is a summated 10-item rating scale designed to assess belief in one's ability to deal with difficult life demands. Responses to positively stated statements ranged from 1 to 4, with 1 representing "not at all true" to 4 representing "exactly true." The score on this scale reflects the strength of an individual's generalized self-efficacy belief. Thus, the higher the score, the greater is the individual's generalized sense of self-efficacy. The internal consistency of the GSE scale had a Cronbach's α of between 0.82 and 0.93. The T-norms were derived from a sample of US adults with a mean (SD) score of 29.48 (5.13).[14] Self-efficacy in nursing practice is the belief of individuals that they have the knowledge, skills, and abilities to provide safe, quality patient care.[15]

Sense of safety and attitudes toward the profession were measured by 4 quantitative items and an open response item to be answered qualitatively. Each contained an ordered-response 4-point scale to illicit respondents' level of agreement to statements probing the importance of safety, perceptions of safety in nursing, desire to stay in the nursing profession, and impact of COVID-19.

Statistical Analyses

The quantitative survey data were analyzed using SPSS version 23 (IBM Corp) for descriptive, correlational, and comparative analyses. Descriptive findings analyzed the demographic variables and structure of the sample (gender, race, age, level of education, geographic location, and experience). Additional descriptive findings characterized the results in terms of major variables of interest: self-efficacy, importance of workplace safety, sense of safety in the nursing profession, and interest in continuing to pursue a nursing career. Pearson correlation analysis examined the strength and statistical significance of the relationships among study variables, such as the relationship between self-efficacy and interest in continuing to pursue a nursing career. Analysis of variance (ANOVA) was used to analyze the differences in group means among the study respondents by geographic location, level of education/graduate status, and work experience, such as how responses of graduate nurses in higher and lower density COVID-19 case areas differed in terms of their interest in continuing to pursue a nursing career.

The final open-ended item was analyzed qualitatively. Data were first analyzed and interpreted independently by

all researchers and then together as a team. Free-text responses were sorted by a respondent's geographic region, level of education, and health care experience (or none) during the first wave of the pandemic. Using a comparative method of analysis, quotes were examined, manually coded, and grouped according to the overarching categories and then further analyzed for concepts and themes following Saldaña's[16] Codes-to-Theory model. Consensus was achieved among the research team members.

This item yielded rich narrative descriptions of the respondents' firsthand experiences as frontline workers either employed or volunteering in health care during the first wave of the pandemic. Their heartfelt voices and emotions shed light as to how the pandemic has impacted their perceptions of nursing. Responses representing self-efficacy, sense of safety, and interest in nursing were triangulated with the quantitative findings. Additional responses depicting emotions of anger and distress were analyzed separately and are beyond the scope of this article.

Results

Sample Characteristics

A total of 472 students and new graduate nurses from 3 baccalaureate degree–granting programs completed the survey, which represented 92.5% of those who accessed the emailed survey link. The demographic makeup of respondents was representative of the student population in programs they attended (Supplemental Digital Content, Table, http://links.lww.com/NE/A984). On-site clinical experiences for students were suspended as of March 2020 when all programs transitioned to remote clinical experiences, which included a mix of virtual simulation and case study analyses. Because of the move to remote instruction, there may have been cases where students resided in a region different from their nursing program, but this did not affect significance of the findings. More than a third (39.0%, n = 184) reported being employed by and/or volunteering in the health care service industry during COVID-19; of that, 17.4% (n = 82) were working nurses and 21.6% (n = 102) were students. The health care service industry includes hospital, extended care or long-term care facility, community health capacity, and/or first responder.

Self-efficacy

Overall, respondents scored high on the GSE scale (mean, 32.96; range, 20-40; n = 417) in which the T-norm among US adults was 29.48.[14] The ANOVA indicated no significant difference ($F_{2,414}$ = 2.55, P = .079) between the GSE of new graduates (mean, 32.66; n = 145), upper-level students (mean, 32.81; n = 178), and lower-level students (mean, 33.72; n = 94). Although respondents from the downstate region with health care experience scored slightly higher for GSE (mean, 33.18; n = 117), as compared with all other subgroups of respondents, significant differences in GSE were not identified (Table 1).

The following quotes are exemplars of self-efficacy, representing a belief in one's ability to succeed despite challenges of the pandemic: "I feel more confident in what I do," "It taught me how to be a stronger nurse…far faster than any new graduate could expect to be," and "I know I possess the skills to make a difference."

Sense of Safety

Across all levels, respondents (98.5%) place a high value on the importance of safety in the workplace (mean, 3.87; range, 1-4), and as a whole, this group had mixed feelings about the safety of the nursing profession (mean, 2.79; range, 1-4). Significant differences in the perceived safety of the nursing profession were seen between lower-level nursing students and practicing new graduate nurses. On average, new graduates felt that nursing had the lowest safety (mean, 2.71). Upper-level students reported similarly in regard to safety (mean, 2.77). In contrast, lower-level students felt nursing was the safest (mean, 2.94); the ANOVA indicates significant differences between new graduate nurses and lower-level nursing students, $F_{2,401}$ = 4.00, P = .019.

Significant differences in the perceived safety of the nursing profession were seen between upstate and downstate nurses and nursing students. The profession of nursing was perceived as most unsafe among respondents closest to the epicenter in the downstate region of New York State

Table 1. Health Care Experience as It Relates to Self-efficacy, Safety, and Interest in Nursing

| | | | GSE | Safety | | Interest in Nursing Career |
| | | | | Importance of Workplace Safety | Safety of Profession | |
		n (%)	Mean (SD)	Mean (SD)	Mean (SD)[a]	Mean (SD)
Experience	Upstate	57 (13.7)	32.92 (3.81)	3.91 (0.28)	2.83 (0.63)	2.98 (0.79)
	Downstate	127 (30.5)	33.18 (3.82)	3.81 (0.49)	2.71 (0.74)	3.29 (0.82)
No experience	Upstate	108 (25.9)	32.82 (3.38)	3.87 (0.41)	2.94 (0.56)	3.15 (0.70)
	Downstate	124 (29.8)	32.91 (3.92)	3.90 (0.30)	2.73 (0.63)	3.20 (0.76)

Health care experience includes paid employment and/or volunteer service. Health care service industry includes hospital, extended care or long-term care facility, community health capacity, and/or first responder. [a] There were significant differences among groups' feelings of safety in the profession, $F_{3,413}$ = 3.203, P = .023.

with health care experience during COVID-19. The ANOVA showed that differences among upstate and downstate regions with and without health care experience were significant, $F_{3,413} = 3.203$, $P = .023$ (Table 1).

Although the findings demonstrate that 99% of respondents are likely to continue to pursue a career in nursing, far fewer new graduate nurses and nursing students consider the profession of nursing to be safe (72.8%). The other 27.2% who disagreed with the profession as being safe reported factors out of their control, such as not having support and resources to do what they needed to do as nurses, made them feel less safe. These sentiments were echoed in the qualitative responses. Themes of "being unprotected" and "unsupported" emerged across the open-ended responses (Table 2).

A moderate positive correlation was identified between the respondents' GSE scale scores and the importance of workplace safety ($r = 0.232$, $P < .001$, $n = 403$). Higher self-efficacy was associated with placing a higher importance on workplace safety. Despite feelings of ambiguity about workplace safety, a weak positive correlation was identified between respondents who continued to desire a career in nursing and their GSE scale scores ($r = 0.198$, $P < .001$, $n = 403$).

Interest in Nursing

Concerns for safety did not seem to impact the respondents' desire to pursue a career in nursing. Nonsignificant relationships were identified among perceptions about the safety of nursing and pursuing a career in nursing for different levels of student and graduate nurses.

Although an overwhelming majority of the respondents (n = 327, 81%) reported that they have a higher interest in the nursing profession as a result of the COVID-19 pandemic (mean, 3.19; range, 1-4), practicing new graduate nurses reported slightly less interest in their chosen profession (mean, 2.93; n = 69). In addition, a moderate positive correlation was identified between the respondents' scores on the GSE scale (mean, 33) and the impact COVID-19 has had on their interest in nursing ($r = 0.304$, $P < .001$, n = 404). Higher self-efficacy scores were associated with a higher interest in nursing.

Despite widespread death, despair, and hardship experienced by so many, these respondents found encouragement. Themes of "more motivated to be a nurse," "something I want to be a part of," and "greater respect for the profession" emerged across the open-ended responses from those reporting a higher interest in nursing. Exemplar quotes are presented in Table 3.

Albeit to a lesser extent, some respondents (n = 77, 19%) reported a lower interest in a nursing career as a result of COVID-19. The working environment during the pandemic has caused them to question their own well-being, both mental and physical health, and the lack of support, resulting in feelings of conflict about putting themselves and others at risk. Exemplar quotes to support themes of "conflicted," "lack of support," and "fears of personal safety and fears of infecting loved ones" are presented in Table 3.

New graduates reported that their interest in nursing had been the most affected by the COVID-19 pandemic, although they still reported a moderate interest in continuing on in nursing. The ANOVA indicates significant differences in the level of interest in the profession, $F_{2,403} = 6.087$, $P = .002$, among new graduate nurses (mean, 3.01; n = 137), upper-level nursing students (mean, 3.25; n = 174), and lower-level nursing students (mean, 3.33; n = 93).

Discussion

This study explored the impact the COVID-19 pandemic has had on New York State first-year graduate nurses' and current nursing students' perceptions of safety and the profession of nursing. Researchers investigated effects of COVID-19 in terms of geographic region case density, sense of safety, and interest in the nursing profession as they relate to self-efficacy and frontline experience in a health care environment during the pandemic. Findings revealed that respondents had higher levels of self-efficacy as compared with US adults in general. They considered workplace safety as very important and yet had concerns about safety of nurses. However, most of the sample was more interested in entering and continuing in the nursing profession despite their fears and uncertainties about safety.

Analyses of the quantitative and qualitative data revealed mutually supported findings, such that quantitative

Table 2. Summary of Quantitative and Qualitative Responses Reflecting Sense of Safety	
Survey Item: Safety of Profession	**Quotes to Support Themes of Being Unprotected and Unsupported**
Disagree with the statement, "I consider the profession of nursing to be safe" (n = 110, 27%)	"This pandemic has made me realize how much risk is involved in any healthcare job and how little support hospitals are given from the government." "COVID-19 showed that management and government organizations make it difficult and unsafe for nurses due to lack of resources and communication." "The lack of PPE and subsequent neglect by hospital CEOs and government officials only illustrates the lack of respect, understanding and compassion that is absent toward nurses, but is desperately needed." "During the COVID-19 pandemic, it became clear to me that nurses do not receive enough care for what they are doing. Many nurses became sick due to their lack of supplies, which is something I had never previously thought about when imagining me working as a nurse."

Table 3. Summary of Quantitative and Qualitative Responses Reflecting Interest in Nursing

Survey Item: Interest in Nursing Impacted by COVID-19	Quotes to Support Themes
Higher interest (n = 327, 81%)	Higher interest themes: (1) more motivated to be a nurse, (2) something I want to be a part of, and (3) greater respect for the profession
	"[COVID-19] has strengthened my image of nursing. It has made me appreciate the profession even more and motivates me to be the best I can be."
	"My experiences have strengthened my desire to be a nurse, but it has also opened my eyes to just how much we really do as healthcare professionals."
	"I find it really empowering and motivating to continue aspiring to help others. It has increased my passion for nursing since I was in the frontline and sacrificed my health and well-being for the sake of this community."
	"[COVID-19] makes me want to be a nurse and part of that heroic team of nurses saving lives even more."
Lower interest (n = 77, 19%)	Lower interest themes: (1) conflicted, (2) lack of support, and (3) fears of personal safety and fears of infecting loved ones
	"I do not know if I can sacrifice or possibly put the people I love at risk for my profession. I have a lot of thinking to do."
	"Seeing this all go down; I could not help but wish I had chosen a different path for myself."
	"It has been apparent that nurses are not given the proper PPE, and the work conditions have deteriorated; these current changes have made me question the well-being (mental and physical health) of nurses and if it is worth pursuing a career in nursing."
	"While we are trying our best to save and advocate for our patients' lives, we also have to look out for ourselves and the fear from bringing this disease home to our loved ones."

measures were upheld qualitatively. For example, a quantitative response indicating the profession was unsafe was supported by the free-text response, "This pandemic has made me realize how much risk is involved in any health care job." A meta-matrix was used to integrate data and demonstrate mutually supported findings. Each row represents the respondents, and the columns represent the data source. Taken together, this contributes to an enhanced interpretation of the data.[17] Two matrices were created to represent subgroups of the sample in terms of the respondents' sense of safety and contrasting high and low interest in nursing. In vivo codes represent voices of the respondents in the subgroups. Analyzing the sorted data in this fashion revealed patterns in the responses. The underlying relationships among quantitative and qualitative data provided a greater understanding of the impact the COVID-19 pandemic has had on nursing students' and new nursing graduates' sense of safety and interest in the nursing profession.

Looking through the lens of self-efficacy was useful in demonstrating the relationship between student and new nurses' determinants, stressors, and coping during the COVID-19 pandemic. The higher self-efficacy shown by this study's sample suggests that it was a major factor in the nurses' motivation, persistence, and desire to continue in nursing. Bandura[18] suggested that mastery experiences are a powerful source in creating self-efficacy. Having health care experience during COVID-19 may have had an impact on the level of self-efficacy for the new graduates and nursing student respondents. Downstate new graduates with experience had higher self-efficacy scores than upstate new graduates and nursing students. Being in the initial US epicenter as a frontline hero during the pandemic may have contributed to the feelings of confidence and competence for the downstate new graduates, resulting in higher self-efficacy. Individuals with higher self-efficacy in nursing practice are more likely to embrace challenges.[19] The others who reported less experience with caring for patients in the depth of the crisis may have felt slightly less confident in facing unknown challenges not experienced firsthand.

COVID-19 case density, fatality differences in the regions, and direct exposure to the pandemic from a frontline perspective have led to differences in the perception of the profession's safety. Respondents in the downstate region of New York State with health care experience during COVID-19 reported the profession as most unsafe, in contrast to lower-level students who reported the profession as safest. Although most respondents in this study reported an increased interest in becoming nurses as a result of the pandemic and expressed honor and pride in their profession, sentiments of distress were evident. Respondents with health care experience during the pandemic questioned their role and the care being delivered not related to their own preparation, nor to their patient workload, or even to the severity of illness, but rather due to concerns about the failure of the health care service industry to address ambiguous infection control guidelines, inadequate supply of personal protective equipment, lack of support by administration, and staff shortages. Fears of personal safety and fears of infecting loved ones were prevalent in responses, which can lead to career choice regret and nurse burnout.[20]

Implications
The academic preparation of tomorrow's nursing workforce necessarily includes the development of self-efficacy

so that nurses are more apt to handle adversities of the profession. This can be achieved by deliberately selecting patients who challenge students in the clinical setting. Rather than shielding students, academics can expose students to difficult clinical situations, such as assigning them an angry or rude patient, while providing guidance and encouragement.[21] Overcoming the challenge of dealing with a difficult personality can help the student grow and build confidence. Similarly, students have demonstrated increased self-efficacy through targeted virtual and high-fidelity simulation.[22] Gaffney et al[23] suggested that a lack of confidence, particularly among newer nursing students, may contribute to increased attrition from educational programs and thus negatively impact the future nursing workforce.

Removing the stressor is not always possible, but engaging in self-care practices is beneficial in reducing the harmful effects of stress that can lead to burnout and attrition among nursing students. A self-care instruction module initiated early in the nursing curricula showed promise in that students were better equipped to moderate their stress over time.[24] When curricula changes are not feasible, students (and practicing nurses) can be encouraged to participate in self-care practices to promote physical and mental well-being. Some simple practices that do not require formal training include exercising, socializing with friends, spending quality time with family, reading a book, and watching a favorite movie. The American Nurses Association[25] has recognized the need for self-care during this pandemic and created a free COVID self-care package for nurses.

Support for the health and well-being of frontline workers is essential in identifying and addressing burnout, facilitating access to care, and removing stigma associated with treatment.[8] As novice nurses enter the workforce, increased opportunities for engagement and reflection are encouraged to address their emotional needs by providing a system of support. This can be achieved through peer groups, mentorship, and meetings with management. As new graduate nurses transition into practice, they need that extra support from their preceptor. Cotter et al[26] developed a preceptor selection instrument identifying characteristics of successful nurse preceptors who would be ideal candidates to serve as role models to support new nurses.

Understanding the underlying relationships among self-efficacy, perceptions of safety, and interest in nursing can provide greater insight into the impact pandemics and similar states of emergency may have on the profession. The information may lead to the discovery of better ways to meet the needs of new nurses and nursing students.

Limitations

Every factor that may have influence on nurses' or students' interest to continue in nursing could not be measured given the considerations of user response and resources. In addition, important to acknowledge is that self-report surveys can contain respondent bias. There were some limitations in the exploration of the effect of health care experiences. Because of the small sample size within the groups (n = 63

in the downstate vs n = 19 in the upstate), exploring perceptions of nurses from the high-density downstate pandemic experience against the low-density upstate pandemic experience was not possible. Furthermore, although 102 students worked in health care, their actual experience may have varied in their exposure to COVID-19 patients and resultant effects.

Conclusion

The COVID-19 pandemic will define the next generation of nurses. Workplace safety is extremely important, and concerns about personal safety and the safety of others were apparent. However, despite fears, most respondents reported an increased interest in the profession of nursing as a result of the pandemic. While expressing feelings of honor and pride in their chosen profession, new graduate nurses and nursing students were conflicted; sentiments of distress were evident in their responses. Fear and conflict over time may change attitudes, leading in the long run to a decrease in individuals' willingness to enter or stay in the nursing profession. If not addressed collaboratively by academia and service, this personnel issue will have a devastating impact on the future capacity of the nursing workforce.

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TEACHING TIP
Learn With the Aging Patients

Nurse practitioners (NPs) in the family and adult-gerontology primary care specialties are expected to provide care for patients from adolescents to end of life. However, many courses often focus on a specific age group or contain learning units organized by individual body systems. It is essential for NP students in these programs to learn the continuity of care across various developmental stages. "Learn With the Aging Patients" provides students with an opportunity to create their patients from adolescents to end of life, using a reverse case study method. Students are given the diagnoses and age brackets of their patients, along with a framework and guiding questions 1 week before class (Supplemental Digital Content, http://links.lww.com/NE/A914). Each hour in class, their patients age approximately 10 to 20 years. With each new age bracket, their patient develops a new condition. Students work in small groups during class, using Zoom breakout rooms. After creating their patients using the guide in the Supplemental Digital Content, every group presents their patient to the class, focusing on the pertinent positive and negative data, diagnostic reasoning, and care plan. Faculty and students then discuss unanswered questions and key takeaways from each case. Students reported that this was an effective learning activity. It helped them see the whole spectrum, hone their diagnostic reasoning skills, and improve their ability to establish an evidence-based plan for common conditions in primary care.

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