



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



A national survey of the impact of COVID-19 on personal, academic, and work environments of nursing students

Jan Emory, PhD, RN, CNE^{a,*}, Thomas Kippenbrock, EdD, RN^a, Bill Buron, PhD, MSN^b

^aUniversity of Arkansas – Fayetteville, Epley Center for Health Professions, Fayetteville, AR

^bThe University of Tulsa, Tulsa, OK

ARTICLE INFO

Article history:

Received 29 January 2021

Received in revised form

3 June 2021

Accepted 12 June 2021

Available online June 21, 2021.

Keywords:

COVID-19

Nursing students

Academic policies

Workforce

Fear

Politics

ABSTRACT

Background: Nursing students are experiencing life changing events in their personal, academic, and work environments since the onset of the pandemic.

Purpose: The purpose of this study was to describe and explore the effects of COVID-19 on personal, workforce, and academic experiences of nursing students (N = 620).

Method: A 68-item survey with three areas of focus surrounding academic, workforce and personal experiences was distributed to multiple schools across the United States. The analysis compares student responses from the five regions of the US.

Findings: Significant differences were found in the pairwise comparisons. The analysis revealed the academic changes were generally viewed as negative. Fear/anxiety and political influences impacted the outcomes of the pandemic.

Discussion: Understanding the effects of the pandemic on the personal, work and academic experiences of nursing students will assist academia and healthcare in adapting existing policies to meet student needs in the various regions of the United States.

Cite this article: Emory, J., Kippenbrock, T., & Buron, B. (2021, November/December). A national survey of the impact of COVID-19 on personal, academic, and work environments of nursing students. *Nurs Outlook*, 69(6), 1116–1125. <https://doi.org/10.1016/j.outlook.2021.06.014>.

Introduction

In early 2020, the [Centers for Disease Control and Prevention \(CDC\) \(2021\)](#) reported the first case of the 2019 novel coronavirus (COVID-19) in the United States (US). A public health emergency followed as the COVID-19 virus rapidly spread throughout the country and the globe. By January 21, 2021 the CDC reported more deaths (404,689) from this virus than the US

service men and women killed in World War II. At that point in time, the total reported cases had surpassed 24.3 million people in the US alone ([Centers for Disease Control 2020, November 20](#)). There is no question that COVID-19 has changed the ways in which people live and work. Social distancing, staying home and wearing masks have become the “new normal.”

Locations where people congregated and remained in close proximity became breeding grounds for virus spread. University campuses were considered

*Corresponding author: Jan Emory, University of Arkansas – Fayetteville, Epley Center for Health Professions, 606 Razorback Road, Fayetteville, AR 72701.

E-mail address: demory@uark.edu (J. Emory).

0029-6554/\$ -see front matter © 2021 Elsevier Inc. All rights reserved.

<https://doi.org/10.1016/j.outlook.2021.06.014>

a liability to the health of the population. These campuses were largely avoided as students were transitioned to online learning environments to continue academic programs while slowing the spread of the deadly virus. In late August of 2020, [The Chronicle of Higher Education \(2020\)](#) reported a third of 3,000 US colleges would offer courses primarily online during the fall 2020 semester. Another 16% would implement a hybrid model and 6% would transition to completely online. As plans were made for the fall sessions, the traditional learning approach of fully in-person, and primarily in-person represented only 21% of reopening models with many campuses electing an on-campus presence only in essential capacities.

For nursing programs requiring clinical practicum experiences, the American Association of Colleges of Nursing (AACN) advised schools to reduce student interactions of known or suspected patients with COVID-19 ([AACN, 2020](#)). In addition, many healthcare facilities suspended clinical learning activities determining nursing students were nonessential personnel ([Zerwic et al., 2021](#)). One outcome from these recommendations was conserving crucial personnel protective equipment (PPE). These rapid changes in societal norms, educational interactions, and policy changes in healthcare environments caused by COVID-19 and the resulting pandemic have created significant challenges for nursing students in their personal, academic, and work environments.

The effects of a pandemic on nursing students have not been a topic of study simply because the phenomenon did not exist prior to 2019. Several studies have been completed in recent months focused on higher education. The study with the largest sample from multiple countries was conducted by [Aristovnik et al. \(2020\)](#). The authors surveyed more than 30,000 students enrolled in higher education institutions from 62 countries exploring the impact of COVID-19 on academic life. The majority (86.7%) of students reported that traditional on campus classes ceased due to the COVID-19 pandemic and transitioned to online. Students reported general satisfaction with their faculty, online communications, and access to technology for real-time video conferences and video recordings, browsing online for information, and sharing digital content; however, lower satisfaction was reported when using advanced settings of some software and programs, and online teaching platforms such as group meetings. Students' personal experiences because of COVID-19 were a mixture of boredom, anxiety, frustration, anger, hopelessness, and shame. Students also expressed concerns about their future professional career paths.

[Khalil et al. \(2020\)](#) conducted a qualitative study using data from group discussions among 60 Saudi Arabian medical students about the impact of COVID-19 on learning. Some of the findings included reports of learning improvements because of enhanced content delivery using technology. Also, more

opportunities for students to use effective time management skills and study more with online delivery were noted. Students did voice concerns about internet access problems and poor image quality. Other concerns were that some students learning styles were not well suited for online learning even though students generally wanted online class delivery in the future.

Two studies investigated the impact of the pandemic on nursing students. [Ramos-Morcillo et al. \(2020\)](#) conducted interviews of Spanish undergraduate and graduate nursing students at two universities. Thirty-two students responded to questions about their learning experiences during COVID-19. Some of the key findings were the students' lack of concentration with studies, uncertainty about academic outcomes, initial shock, feeling uncertain about future plans, and unknown expectations for obtaining degrees and jobs.

Additional work by [Masha'al et al. \(2020\)](#) studied stress among undergraduate nursing students during the COVID-19 pandemic. The authors used a mixed-methods strategy to gather data on 355 Jordanian students that transitioned from traditional classroom to distance learning. The authors found the students increased workload was the most stressful factor during the pandemic. Paying for internet services constituted an additional financial burden for the students. The qualitative themes that emerged were disorganization, limited resources, and distracting study environments. [Aslan and Pekince \(2020\)](#) sampled nursing students ($n = 662$) in Turkey finding significant increases in stress when compared to students in previous years. The COVID-19 pandemic was found to negatively affect stress levels of nursing students.

Of the few research studies published to date, none collected data from a nationwide sample of nursing students in the US or investigated the impact of the pandemic on personal, and workforce variables. The purpose of this study was to describe and explore the effects of COVID-19 and the pandemic on personal, workforce, and academic experiences in a sample of nursing students enrolled in programs of study across the US. Student responses were compared across the five regions. The regions were defined by the National Geographic map available on the website www.nationalgeographic.org/maps/united-states-regions/.

Methods

Design and Sample

A cross-sectional design was used for the purpose of the study. Students enrolled in participating nursing programs during the time of the pandemic were included in the study. The data were collected between September 22 and December 4, 2020.

Instrument

The survey was created using items from similar work completed in the last year (Aristovnick et al., 2020; Khali et al., 2020; Ramos-Morcillo et al., 2020). Multiple surveys were combined, and additional items were added based upon qualitative findings from studies with samples of nursing students (Aslan & Pekince, 2020; Christopher et al., 2020; Savitsky et al., 2020). The researchers asked for feedback on the survey from students and faculty. Questions were modified to eliminate bias in the demographics collected. Two items were edited for clarity. The final survey was placed in the Qualtrics® platform.

The survey consisted of 68 closed and open-ended questions to capture the phenomenon of COVID-19 and nursing students. The survey used binary, ranking, categorical or ordinal responses that included yes/no, 1-5 scale (1 = low to 5 = high) measuring levels of fear/anxiety or satisfaction. Seven items gathered demographic information. The responses were categorized by content into three distinct areas of work, academic, and personal experiences. Thirty survey items asked students about their academic experiences during the pandemic. Fourteen items asked about experiences in students' respective work environments. Sixteen items asked about personal experiences and feelings of fear/anxiety surrounding COVID-19. The final item was an open-ended question asking students to provide narrative descriptions of experiences associated with the COVID-19 pandemic.

Data Collection

The researchers contacted academic administrators at schools of nursing across the United States by telephone and electronic mail asking for participation. Approximately 50 schools were contacted by the authors selected for their regional representation. Appropriate approvals were sought and received from each participating school. Most nursing schools offered multiple program types including prelicensure, degree completion, and graduate. The survey link was provided to the designated contact and then distributed by school authorities using students' institutional email addresses. The survey link contained a cover page that explained the purpose of the study, and statements of voluntary participation and implied consent. All responses were made anonymous through the options available in Qualtrics.

Analysis

The measures of central tendency were calculated for the demographic variables to describe the sample. One of the seven items asked students to identify the geographic region of the country where they were attending nursing school. The categorical options were Northeast, Southeast, Southwest, Midwest, West or attending an online program in a state different from

residence. The last category was included to capture those students that may not have been directly impacted by the rapid change in learning environments. Student responses in this category were omitted in the between group analysis where appropriate because these students likely did not experience the rapid change of learning environments as a result of the pandemic.

Further analysis was completed using the functions available in the StatIQ application provided by Qualtrics®. The Chi-square test for independence was employed to analyze the ordinal and categorical variables for significant differences in the regional groups. Cramer's V was calculated for effect size. Alpha was established at the traditional 0.05 level.

The final question in the survey was open-ended asking students to share any additional insights and other related factors associated with the COVID-19 pandemic. This question was intentionally added to create a greater depth of understanding to explain the pandemic as a phenomenon experienced by nursing students. Content analysis was the approach that guided the data categorization process to explain the phenomenon of student experiences during the pandemic. Inductive content analysis is appropriate because of the limited evidence surrounding the impact of a pandemic on nursing students (Elo & Kyngäs, 2008). Concept analysis was found to be appropriate to identify critical meaning, intentions, and context to the students' experience.

Findings

Description of Sample Characteristics

Responses were received from students physically located in each of the five regions across the US and those attended an online program in another state. Students from the Midwest region completed the most surveys (36.6%) followed by the Northeast (34.2%), Southeast (10.6%), Southwest (6.5%), and West (4%). Students reporting attendance in online programs from a different state represented the remaining 8.4%. This last category was removed from the analysis for the pairwise comparisons as these students likely did not experience the transition in learning environments like those taking face-to-face courses. Table 1 provides demographics of the students by US region.

COVID Experiences

Significant differences were found in the pairwise comparisons of student responses to several items in the three categories queried since the onset of the pandemic. Academic variables found to be significantly different were educational delivery methods, interactions with both instructors and classmates, and presence on campus. Work variables differing between

Table 1 – Sample Demographics by Region

Region	Northeast	Southeast	Southwest	Midwest	West	N
Frequency	210	65	40	225	24	564
Age ranges						563
18–25	61.7%	46.3%	40%	50.2%	37.5%	
26–39	27.8%	38.5%	37.5%	36.9%	41.7%	
40–59	10%	13.8%	22.5%	12.9%	20.8%	
60–79	0.5%	1.5%	0%	0%	0%	
Gender						564
Male	6.2%	15.4%	12.5%	6.7%	12.5%	
Female	92.9%	83.1%	87.5%	92%	87.5%	
Nonbinary	0.5%	0%	0%	0.9%	0%	
Prefer not to answer	0.5%	1.5%	0%	0.4%	0%	
Race						564
White	80.8%	78.5%	77.5%	86.2%	50%	
Asian	9.5%	6.25	7.5%	3.6%	33.3%	
African American	6.7%	7.7%	2.5%	3.1%	4.2%	
American Indian et al.	0%	1.5%	12.5%	3.1%	0%	
Hawaiian et al.	0%	1.5%	0%	0.4%	0%	
Other	3.8%	4.6%	0%	3.6%	12.5%	
Ethnicity						551
Non-Hispanic	91.3%	94.9%	89.7%	94.6%	70.8%	
Hispanic	8.7%	5.1%	10.3%	5.4%	29.2%	
Marital status						563
Single	76.2%	63.1%	55%	59.4%	75%	
Married	23.3%	35.4%	45%	40.2%	20.8%	
Prefer not to answer	0.5%	1.5%	0%	0.4%	4.2%	
Type of academic institution						561
Public	25.5%	78.1%	77.5%	90.2%	16.7%	
Private	69.2%	18.8%	22.5%	7.1%	79.2%	
Not sure or don't know	5.3%	3.1%	0%	2.7%	4.2%	

Note. The students attending online programs in a different state than residence were removed in the demographic analysis.

students in the regional comparisons include those required or asked to care for COVID patients, those providing direct care to COVID patients, and those receiving safety training. Personal experiences were found to be significantly different by region for students who had received positive COVID test results, for levels of fear, and anxiety of spreading the virus, for dying from the virus, and for safety for self, family and friends. [Table 2](#) displays the significant findings and associated statistics in the regional comparisons.

Academic Environment

Students in the sample represented both private (52%) and public (38%) institutions of higher learning. The remaining 10% selected “not sure” for type of academic institution where they were enrolled. The Northeast (69.2%) and West (79.2%) regions were represented by a larger percentage of students attending private institutions. See [Table 1](#).

Sixty-one percent of students reported the pandemic had caused them to avoid the campus of their respective institutions. Students from the Northeast (75.5%), and West (70.8%) reported the highest percentages of avoiding campus followed by the Southwest (62.5%), Southeast (62.5%), and Midwest (54.9%).

The most noted change (identified by 65.5% of all students) that affected learning was “classes normally taught in person moved to a distance learning format.”

Students selecting this option ranged from 83.3% and 79% in the Northeast, and West, respectively, followed by the Midwest (66.7%), Southeast (58.5%), and Southwest (57.5%). Some classes were reported as cancelled by students (22.9% Northeast, 20.8% West, 20% Midwest, and 7.7% Southeast). Few students changed enrollment status by increasing (2.1%) or decreasing (3.1%) the number of courses.

Students were asked to rate the level of impact the changes in the traditional classroom and clinical settings to the online environment have had on their quality of learning. Over 65% rated the impact level at 4 or 5 (high). Clinical experiences before the pandemic (61.4%) were reported in hospitals, and facilities providing hands-on care. Only 28% of students reported their clinical learning experience included a combination of simulated and hands-on learning before the pandemic. After the onset of the pandemic, only 20.5% of students enrolled in clinical courses reported no impact on their clinical learning leaving almost 80% of students experiencing changes.

Students rated the changes in education had impacted interactions with classmates in the classroom and clinical environments at 4 or 5 (high) over 70% of the time and again 69% of the time for interactions with their respective instructors. Students also rated the level of impact high (4 or 5) at 57.5% for receiving feedback on assignments.

Table 2 – Significant Relationships Between Regions of the US and COVID-19 Experiences*

Area of Experience	Question	Northeast	Midwest	Southeast	Southwest	West	Chi-square Tests of Independence
Academic	Method of delivery of program changed	Yes (41.1%)	Yes (37.7%)	Yes (11.5%)	Yes (5.2%)	Yes (4.5%)	$X^2(4) = 16.8$ $p = .00$ $\Phi = 0.15$ $n = 394$
	Interactions with instructors	78% [†]	69.4% [†]	63.9% [†]	54.8%	80% [†]	$X^2(4) = 30.8$ $p = .01$ $\Phi = 0.14$ $n = 374$
	Interactions with classmates	79.1% [†]	73.3% [†]	65% [†]	63.5% [†]	84.2% [†]	$X^2(16) = 36.9$ $p < .00$ $\Phi = 0.17$ $n = 555$
	Avoid campus	Yes (43.7%)	Yes (34.3%)	Yes (10.3%)	Yes (7%)	Yes (4.7%)	$X^2(4) = 21.5$ $p = .01$ $\Phi = 0.20$ $n = 560$
Work	Asked to care for COVID patients	Yes (34.2%)	Yes (45.2%)	Yes (12%)	Yes (6.5%)	Yes (2.1%)	$X^2(4) = 12.9$ $p = .01$ $\Phi = 0.15$ $n = 563$
	Direct care for COVID patients	Yes (38.9%)	Yes (53.3%)	Yes (56.3)	Yes (37.5%)	Yes (29.2%)	$X^2(4) = 12.8$ $p = .01$ $\Phi = 0.15$ $n = 561$
	Required to care for COVID patients	Yes (32.5%)	Yes (47.4%)	Yes (12%)	Yes (5.6%)	Yes (2.4%)	$X^2(4) = 13.3$ $p = .01$ $\Phi = 0.15$ $n = 561$
	Received safety training	Yes (33.3%)	Yes (43%)	Yes (12.8%)	Yes (7.8%)	Yes (3.1%)	$X^2(4) = 12.7$ $p = .013$ $\Phi = 0.15$ $n = 561$
Personal	Received positive COVID test results	Yes (46.5%)	Yes (27.9%)	Yes (18.6%)	Yes (4.7%)	Yes (2.3%)	$X^2(8) = 24.4$ $p = .00$ $\Phi = 0.15$ $n = 560$
	Fear/anxiety caring for COVID patients	54.2% [†]	27.7% [†]	27.9% [†]	36.9% [†]	32.8% [†]	$X^2(16) = 51.2$ $p = .00$ $\Phi = 0.16$ $n = 514$
	Fear/anxiety for personal safety	53.2% [†]	26.1% [†]	35.8% [†]	30.3% [†]	27.2% [†]	$X^2(16) = 46.8$ $p = .00$ $\Phi = 0.16$ $n = 462$
	Fear/anxiety for safety of family/friends	85.6% [†]	71.7%	67.3% [†]	62% [†]	65% [†]	$X^2(16) = 33.9$ $p = .01$ $\Phi = 0.14$ $n = 467$

(continued)

Table 2 – (Continued)

Area of Experience	Question	Northeast	Midwest	Southeast	Southwest	West	Chi-square Tests of Independence
	Fear/anxiety of hospitalization	43% [†]	23.1% [†]	41.5% [†]	29.7% [†]	35.3% [†]	X ² (16) = 46.7 p = .00 Φ = 0.16 n = 466
	Fear/anxiety of dying from COVID	37.5% [†]	17.5% [†]	34% [†]	21.6% [†]	38.1% [†]	X ² (16) = 42.7 p = .00 Φ = 0.15 n = 482
	Fear of spreading COVID to family/friends	85.3% [‡]	70.8% [‡]	62.9% [‡]	66.7% [‡]	65% [‡]	X ² (16) = 33.7 p = .01 Φ = 0.13 n = 469

* Students in online only programs different from state of residence were removed for the between group analysis

† Ratings of 4 or 5 were combined for reporting to indicate the highest levels of fear/anxiety.

‡ Ratings of 4 or 5 were combined to indicate the significant impact.

Students were asked about their agreement with the statement “The changes in learning that have occurred because of the pandemic will affect my success on licensure and certification exams.” Fifty-eight percent of students selected 1 (strongly agree) or 2 (agree) with the statement. Similar results were found for agreement with the statement “The changes in learning that have occurred because of the pandemic will affect the quality of patient care” with over 53% selecting 1 (strongly agree) or 2 (agree).

Students were asked about their satisfaction with their respective schools’ support services (tutoring, writing assistance), including mental health services, housing, and advising. Students were consistently split between being satisfied/dissatisfied. One example is the level of satisfaction for mental health services, which was split with 42% selecting satisfied or very satisfied and 40% selecting dissatisfied or very dissatisfied. Students responded to the survey item asking about their satisfaction with the school’s COVID-19 testing and monitoring services since spring 2020. Again, the distribution was 44.5% satisfied or very satisfied compared to 41.5% dissatisfied or very dissatisfied. Students responded to a question about satisfaction with online resources for testing knowledge, skills and attitudes to meet course outcomes, such as Proctor U. The percentage of satisfied or very satisfied students was 41% and those students dissatisfied or very dissatisfied reported at 51% (n = 412). See [Table 2](#) for factors found to have significant regional differences.

Work Environments

Twenty-four survey items asked students about work experiences during the pandemic. Most students reported either full-time, part-time or PRN employment in a healthcare facility (62.2%). The changes identified by students in their respective work environments were varied. Over thirty-six percent (36.8%)

of students indicated an increase in the number of shifts/hours of work. Thirty-two percent of students reported a decrease in the number of shifts/hours worked and 31.1% indicated changes to their assigned units. Twenty-four percent of students working in health care experienced furloughs and another 10% reported layoffs. Approximately 8% sought employment at a different healthcare facility. Only 15.2% reported no changes in work assignments since the onset of the pandemic.

Fifty-three percent of students were asked to care for COVID-19 patients. Over thirteen percent (n = 82) of students volunteered to care for COVID-19 patients. A large percentage of students (45.2%; n = 277) reported their employing healthcare facility *required* them to care for COVID-19 patients. Many students received safety training from their respective healthcare facility (69.2%). However, 30.8% reported receiving no safety training about COVID-19 or caring for patients with the disease. Students were also asked if personal protective equipment was available in adequate quantities. The responses showed 62.6% indicated “yes” while 37.4% indicated “no.” Only 8.3% of students had received a positive COVID-19 test result at the time of survey completion. Another 2.6% were “not sure” of receiving a positive test result. Sixty-six percent of students indicated that at least one person at their place of employment, healthcare facility or other, had been diagnosed with COVID-19 and another 12.4% selected “not sure or don’t know.” The work-related responses were found to be significantly different in the between region comparisons. See [Table 2](#).

Personal

The majority of students n = 435 reported they knew someone who died from COVID-19. Surprisingly, approximately 80% of those indicated the death had no impact on their wellbeing/mental health. Students reported immediate family members diagnosed with

COVID-19 at 16.8%. When rating level of fear/anxiety for personal safety, 37.7% of students across all regions selected either 4 or 5 (highest).

When asked about fear/anxiety related to safety of friends and family, 75.2% of students across all regions selected 4 (32.4%) or 5 (42.8%). A much smaller (5.1%) indicated having no fear/anxiety for safety of friends and family. See [Table 2](#) for significant differences in responses between the regions.

The majority of students indicated they have little to no fear/anxiety of being hospitalized due to COVID-19 (58.9%). The percentage of students in the Midwest (7.7%) rating their fear/anxiety at level 5 was significantly lower than students in the Northeast (27.3%). Similarly, many students from all regions indicated little to no fear of personally dying from COVID-19 (67%; 1 or 2). See [Table 2](#) for additional significant regional differences in responses.

Thirty-two percent of students reported being required to self-quarantine because of COVID-19 exposure or suspected exposure. Thirty-one percent rated their level of fear/anxiety at 4 or 5 for being quarantined one or more times from COVID-19 exposure. However, 74.6% of students indicated a level of fear/anxiety at 4 or 5 for spreading the COVID-19 virus to family and friends. Significant differences were found in student responses from the northeast region of the US. See [Table 2](#).

Students were asked to select statements thought to reflect their personal beliefs about current events associated with COVID-19. The statement "The long-term effects of the pandemic will be a significant" was selected by 75% of students followed by "The response has been influenced and fueled by political agendas" at 64.4% of student responses. "The response was not enough, and more stringent policies should have been in place" and "The response has been ineffective in stopping the transmission of the virus" received 49% and 48.1% of student selections. "The response to COVID seems inconsistent with other serious infectious disease outbreaks (flu, SAR, etc.)" was selected by 41.8% of students and the final option was "The response has been an overreaction creating unnecessary hardships" was selected by 22.4% of students.

Students were asked if their views about the impact of the pandemic have changed since the onset in early 2020. Over fifty-four percent ($n = 568$) responded "no" their views about the pandemic had not changed. Of those responding "yes" and explaining further, the seriousness of the disease and length of time that has transpired without controlling the spread were common themes. See [Table 2](#) for regional comparisons.

The impact of the pandemic on students' abilities to manage childcare was rated in the academic classroom and clinical survey items. Approximately 70% rated the level of impact at 1 (none) for both learning environments. Approximately 15% of students rated the impact at 5 (significant). Of course, the lower levels of impact reported could be because a large number of students were not responsible for managing childcare.

Qualitative Findings

One hundred forty-one narrative responses were received from student participants. Data were reviewed and those responses with "none" or N/A were removed. The final number of narrative responses ($n = 119$) were analyzed and synthesized using the steps consistent with content analysis. Through inductive data coding processes, responses were coded and then categorized by theme based upon word use and contextual reference. Coded words were combined and tabulated based upon the context. Patterns emerged that added a deeper understanding of the phenomenon of students' experiences during the pandemic. Three distinct categories emerged: teaching/learning environment, fear, and political actions.

The most frequently documented category was related to teaching/learning. Thirty-seven statements included one or more of the words class(es), school (ing), teach(er)(ing), grades, instructors and/or learning. Each statement was analyzed for context related to teaching/learning for inclusion in the category. Examples of students' narrative responses in this category are provided.

"Online schooling is not an effective place holder for in-person learning."

"....a pressing issue is the Zoom learning has not been nearly as thorough and understandable compared to face to face. There needs to be extra time given to cover these classes. Technical issues make it hard to keep a class going on track for the time we are logged on. Cuts in internet connectivity can create havoc when taking an exam. Sitting in front of a little screen for 3+ hours at a time doesn't foster retention of new information."

Only one of the 37 responses in the category indicated a positive learning experience during the pandemic:

"My learning experience has been positively influenced due to extreme flexibility, dedication and compassion exhibited by instructors."

Eighteen responses contained coded terms related to the category of fear. Coded and categorized words included fear, anxious, anxiety, afraid, concern(ed), worried, worry and scared or scary. Each statement was analyzed for context that fit the category. The context for students' fear was related to spreading COVID-19 to family and friends, licensure exams, finding a job after graduation and providing safe patient care. Examples of student narrative responses were

"I'm worried most for my friends and family. I'm not as worried for myself, I feel mostly safe at work."

Traditional BSN	267
LPN to BSN	43
Associate Degree	3
RN to BSN	68
MSN non-licensed	6
DNP	40
MSN advanced practice	94
Accelerated BSN	75
Other	9

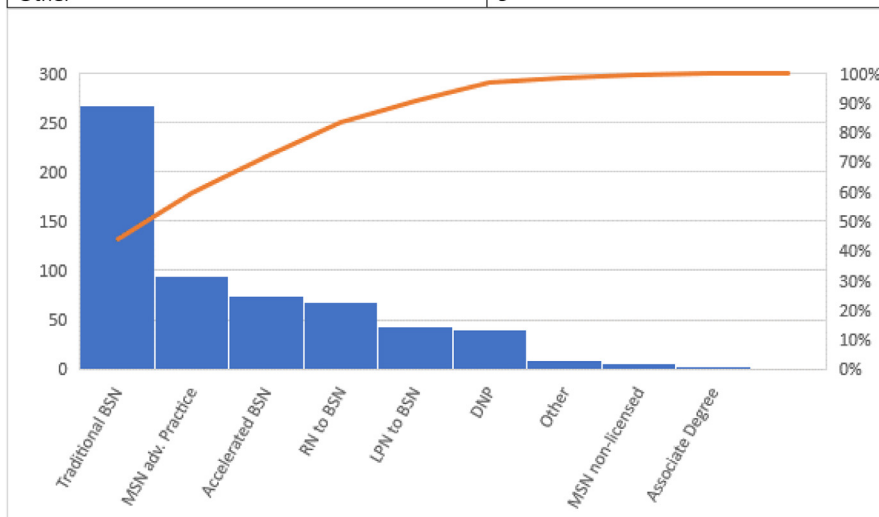


Figure 1 – Sample by Program Type.

“My experience has been extremely limited due to COVID. We can no longer go in the hospitals as much which severely impacts my nursing skills and job prospects.”

“A lot of us fear we will not be good nurses.”

Sixteen responses were categorized in the category of politics. The terms President, Trump, government, CDC, policy(ies), leadership and authority were found and categorized based upon the context associated with the COVID-19 pandemic. One quote is provided as an example,

“I’m well versed in the care required to save their (COVID patients) lives but am disgusted at the way government is handling fighting it. Civil unrest is not helping. I’m fed up.”

Discussion

The purpose of this study was to describe and explore the effects of COVID-19 and the pandemic on personal, workforce, and academic experiences in nursing students enrolled in programs of study across the US. The findings show that the impact of the pandemic on nursing students is multifaceted. COVID-19 has resulted in unprecedented changes in academic learning and working environments and personal lives of nursing students across all regions of the US. Nursing

students feared transferring COVID-19 to family and friends as a significant percentage (45.2%) reported being required to care for COVID-19 patients in their healthcare work environments. What was concerning, is that approximately one-third (30.8%) of students reported that they received no safety training and that adequate quantities of PPE (37.4%) were unavailable in their work environments. However, these deficiencies are consistent with recent reports of inadequate PPE and shattered standards of care that have left frontline professional nurses susceptible and vulnerable (Ulrich et al., 2020).

Overall, nursing students reported low levels of fear/anxiety in contracting COVID-19 themselves. Their highest levels of reported fear/anxiety were because of possible spread of the disease to family and friends. The level of fear/anxiety was found to be higher in specific geographic locations in the US. Nursing students in the Northeast experienced significantly more fear of spreading COVID-19 to family and friends compared to nursing students in the Midwest. Furthermore, nursing students in the Northeast indicated significantly greater fear of dying from COVID-19 than students in the Midwest.

The spread of the disease in the more populated regions across the country may provide an explanation for these findings (Wang, 2020). New York City, the most populated city in the Northeast, quickly became an epicenter for COVID-19 with reports of devastating spread of the disease 2.5 times faster than in Oak Harbor, Washington where the population is approximately 84,000 (The New York Times 2020, December

14). Early in the pandemic, the reporting of morbidity and mortality rates in large metropolitan cities were a constant focus of the media. This could have led to higher levels of anxiety and fear in those areas (Aslan & Pekince, 2020). Political implications were also a focus of media as the pandemic became a “hot topic” during the election year (Oliphant, 2020). The political positioning was also found to be a theme in the qualitative analysis.

The sudden changes to academic learning environments as a result of the pandemic were reported by students to impact their quality of learning on a number of variables. Universities all over the world transitioned to online learning platforms (Masha'al et al., 2020) in rapid succession as the disease spread. In addition, the perceived lack of quality learning likely contributed to student perceptions of being underprepared for licensure/certification exams and ultimately having the skills/ability to provide the level of care expected in their future roles. Findings were consistent with the themes that emerged in the qualitative component showing students fear an uncertain future for job prospects and adequate knowledge for professional practice. These perceptions are consistent with recent research in Turkey where authors found similar concerns of students worried about knowledge acquisition for future professional expectations (Masha'al et al., 2020).

While evidence exists to show a relationship between the COVID-19 pandemic and increase in mental health conditions in students (Reverte-Villarroya et al., 2021) and professional nurses (Hong et al., 2021), it is unclear if mental health was a concern in this study. Mental health did not appear to be a major theme from student responses across the US. Contrary to this finding, Hong et al. (2021) sampled licensed nurses ($n = 4,692$) from 42 government institutions in China finding mental health related issues in 66.7%. Work by Alsan and Pekince (2020) found the age of the student to be a significant factor in the stress level of nursing students. The 18 to 20 age range was found to have higher levels of stress when compared to their older peers. Reverte-Villarroya et al., (2021) compared emotional exhaustion scores between students ($N = 320$) experiencing the pandemic and those from a three-year period prior to the pandemic. The researchers discovered a direct association with those students who experienced the pandemic and mental exhaustion scores compared to those who had not. The variability in the evidence would suggest that mental health concerns to be individualized. Further research on the relationship is needed to clearly understand the relationship.

Faculty members should also be aware that not all regions of the US have been impacted in the same manner. Each student's experience is unique based on a number of factors. Faculty should be empathetic to these situations as much as possible and encourage and assist students' in finding the most appropriate resources to fit their personal needs (Christopher et al., 2020). The long-term effects for students attending

nursing programs during the pandemic remain to be seen. Outcomes of licensure examinations and readiness for nursing practice following graduation are rich sources of information for future research that can provide evidence for unforeseen pandemics of the future.

There are several limitations to this study. The survey had not been tested for reliability and validity. Students may have felt coerced into completing the survey since it was distributed from their respective schools. All students did not respond to all questions which could result in unreliable data. The number of students electing to complete the survey through the narrative response option was significantly decreased from the total possible. This could be because the survey was quite long or because students chose not to answer for other reasons. Student interpretation of the survey items could be inconsistent and variable. The survey items could contain unknown bias even though feedback was sought from students and faculty (Figure 1).

Conclusions

COVID-19 has greatly impacted nursing students and their perceived quality of learning in educational environments. Higher education and leaders in nursing education reacted with sudden changes that have moved students to a virtual teaching/learning environment regardless of their preferences. Nursing programs and healthcare facilities reacted to the pandemic with restrictions on student and faculty access to quality clinical learning environments that further limited academic resources. At present, the pandemic seems to be receding. However, many healthcare facilities are continuing to limit nursing students' access to quality learning. Partnerships with healthcare facilities could be formed to assist in such national and global emergencies to further education and learning. Navigating the challenges presented by the pandemic for health care and education could inform unprecedented relationships to complement and augment a stressed and diminishing workforce. Nursing faculty and researchers should continue to explore the impact of changes in academic learning environments on program outcomes. At this time, it is unknown when the global pandemic will end as new variants of the disease emerge. Acting now to change existing partnerships and policies related to academic nursing could provide needed support and progress toward caring for those in need.

Author Contribution

Jan Emory: Conceptualization, methodology, validation, formal analysis, investigation, writing original

draft and reviews with final editing, visualization, supervision, project administration. Thomas Kippenbrock: Conceptualization, methodology, investigation, writing of original and revisions. Bill Buron: Writing of original and revisions, visualization of data.

REFERENCES

- American Association of Colleges of Nursing. (2020). Considerations for reopening U.S. Schools of nursing during COVID-19. <https://www.aacnnursing.org/Portals/42/News/AACN-Guidance-Reopening-Schools-COVID-19-July-2020.pdf>.
- Aristovnik, A., Keržič, D., Ravšelj, D., Tomaževič, N., & Umek, L. (2020). Impacts of the COVID-19 pandemic on life of higher education students: A global perspective. *Sustainability*, 12(20), doi:10.3390/su12208438.
- Aslan, H., & Pekince, H. (2020). Nursing students' views on the COVID-19 pandemic and their perceived stress levels. *Perspectives in Psychiatric Care*, doi:10.1111/ppc.12597.
- Center of Disease Control and Prevention. (2021, January 21). First travel-related case of 2019 novel coronavirus detected in United States. <https://www.cdc.gov/media/releases/2020/p0121-novel-coronavirus-travel-case.html>.
- Centers for Disease Control (2020, November 20). COVID-19 Outbreak – New York City, February 29 – June 1, 2020. <https://www.cdc.gov/mmwr/volumes/69/wr/mm6946a2.htm>
- Christopher, R., de Tantillo, L., & Watson, J. (2020). Academic caring pedagogy, presence, and *Communitas* in nursing education during the COVID-19 pandemic. *Nursing Outlook*, 68(6), 822–829, doi:10.1016/j.outlook.2020.08.006.
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, 62, 107–115, doi:10.1111/j.1365-2648.2007.04569.x.
- Hong, S., Ai, M., Xu, X., Wang, W., Chen, J., Zhang, Q., Wang, L., & Kuang, L. (2021). Immediate psychological impact on nurses working at 42 government-designated hospitals during COVID-19 outbreak in China: A cross-sectional study. *Nursing Outlook*, 69, 6–12, doi:10.1016/j.outlook.2020.07.007.
- Khalil, R., Mansour, A. E., Fadda, W. A., Almisnid, K., Aldamegh, M., Al-Nafeesah, A., Alkhalifah, A., & Al-Wutayd, O. (2020). The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: A qualitative study exploring medical students' perspectives. *BMC Medical Education*, 20, 285, doi:10.1186/s12909-020-02208-z.
- Masha'al, D., Rababa, M., & Shahrouf, G. (2020). Distance learning–related stress among undergraduate nursing students during the COVID-19 pandemic. *Journal of Nursing Education*, 59(12), 666–674, doi:10.3928/01484834-20201118-03.
- Oliphant, J. (2020, December 10). U.S. election year shaped by pandemic and Trump's defiance. *Reuters*. <https://www.reuters.com/article/global-poy-usa-election/u-s-election-year-shaped-by-pandemic-and-trumps-defiance-idUSKBN28K1FU>.
- Ramos-Morcillo, A. J., Leal-Costa, C., Moral-García, J. E., & Ruzafa-Martínez, M. (2020). Experiences of nursing students during the abrupt change from face-to-face to e-learning education during the first month of confinement due to COVID-19 in Spain. *International Journal of Environmental Research and Public Health*, 7(15), doi:10.3390/ijerph17155519.
- Reverte-Villarroya, S., Ortega, L., Lavedan, A., Mascot, O., Burjales-Martí, M. D., Ballester-Ferrando, D., Fuentes-Pumarola, C., & Botigue, T. (2021). The influence of COVID-19 on the mental health of final-year nursing students: Comparing the situation before and during the pandemic. *International Journal of Mental Health Nursing* <https://onlinelibrary.wiley.com/doi/epdf/10.1111/inm.12827>.
- Savitsky, B., Findling, Y., Ereli, A., & Hendel, T. (2020). Anxiety and coping strategies among nursing students during the COVID-19 pandemic. *Nurse Education in Practice*, 46 102809, doi:10.1016/j.nepr.2020.102809.
- The Chronicle of Higher Education. (2020, August 31). Here's our list of colleges' reopening models. <https://www-chronicle-com.eu1.proxy.openathens.net/article/heres-a-list-of-colleges-plans-for-reopening-in-the-fall/>
- The New York Times. (2020, December 14). Tracking COVID-19 at U.S. colleges and universities. <https://www.nytimes.com/interactive/2020/us/covid-college-cases-tracker.html>.
- Ulrich, C. M., Rushton, C. H., & Grady, C. (2020). Nurses confronting the coronavirus: Challenges met and lessons learned to date. *Nursing Outlook*, 68, 838–844.
- Wang, J. (2020, March 31). Coronavirus is hitting larger cities harder. How should they respond? *U Chicago News*. <https://news.uchicago.edu/story/coronavirus-hitting-larger-cities-harder-how-should-they-respond>.
- Zerwic, J. J., Montgomery, L. A., Dawson, C., Dolter, K. J., & Stineman, A. (2021). Planning and implementing a practice/academic partnership during COVID-19. *Journal of Professional Nursing*, 37(1), 24–28, doi:10.1016/j.profnurs.2020.11.007.