Psychological Distress during the COVID-19 Pandemic in Nursing Students: A Mixed-methods Study

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Abstract: During such an unprecedented time of the largest public health crisis, the COVID-19 pandemic, nursing students are of the utmost concern regarding their psychological and physical well-being. It is important to identify and establish influences and associations within multilevel factors, including the effects of the COVID-19 pandemic on psychological distress among nursing students. The research in this study utilized a mixed-methods, convergent study design. The study population included a convenience sample of undergraduate nursing students from Southeastern U.S. with 202 students completing the quantitative survey and 11 students participating in the qualitative follow-up interview surveys. Statistical tests were performed and identified the effects of independent variables on psychological distress. Coding and qualitative content analysis were performed and identified overarching themes within participants' interviews. The findings are significant, specifically regarding contributing factors of nursing students' psychological distress, which will help to improve learning in the academic environment.

Keywords: Nursing education, nursing students, pandemic, psychological distress.

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Introduction

The high exposures to interpersonal, economic, and academic demands contribute to the major health concerns, which include a potential risk for psychological distress (Mitchell, 2018). Achievement of educational success among nursing students is directly affected to the high exposures of anxiety and depression from experiences within the program. Working relationships and achieving academic success are imperative to positive student outcomes within the nursing program. The purpose of this study is to identify and establish influences and associations within multilevel factors, including the effects of the COVID-19 pandemic on psychological distress in nursing students.

Background

It has been recognized and well established that nursing students are among those individuals that are highly susceptible to psychological distress, which is associated with the many stressors endured during nursing school (Tagher & Robinson, 2016). Research has found that in comparison within healthcare disciplines and programs, nursing students tend to experience a higher severity of anxiety and stress (Turner & McCarthy, 2017). The challenges that come along with nursing programs, which include the stressors of having to simultaneously balance life issues along with didactic and clinical courses, have the potential to exacerbate psychological distress (Tagher, 2017). Unfortunately, the relentless exposure to stressors may lead to a multitude of negative outcomes and effects on nursing students (Tagher, 2017).

Decreased academic performance can be seen in nursing students as a result of multilevel stressors, which can affect coping abilities, problem-solving abilities, and overall health (Tagher & Robinson, 2016). The COVID-19 Pandemic has thrown yet another curve ball in the challenges that nursing students already face. In efforts to prevent the further transmission of COVID-19, there was a rapid switch to online learning that was thrust upon nursing students who were already barely adapting to face-to-face courses. The rapid shift in the way nursing courses are being conducted as a response to the COVID-19 Pandemic can overwhelm nursing students even further, leading to negative consequences from unknown stressors.

Research has noted that psychological issues and problems are pervasive among nursing students (Thompson et al., 2019). They are also noted to rarely seek professional psychological help, potentially bypassing the opportunity to prevent further detrimental effects (Pumpuang et al., 2018). Academic experiences and practices within the nursing program may lead to challenges associated with psychological distress, which can negatively affect nursing students' mental well-being (Beanlands et al., 2019). In addition to the psychological stressors that nursing students already face, events resulting from the COVID-19 pandemic have influenced the many aspects of nursing education, including nursing students' mental and physical well-being, coping abilities, and perceptions of their educational environment (Beanlands et al., 2019). Limited knowledge and information associated with how the COVID-19 pandemic has truly affected nursing students has been noted. This limitation in research has highlighted the need to recognize and examine the occurrence of psychological distress and associated stressors among nursing students during such an unusually challenging time.

Method

A convenience sample was selected from southeastern nursing programs in the U.S. "The Southeastern United States include Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Maryland, Virginia, and West Virginia" (World Population Review, 2020, para 1). Inclusion criteria for participants included participants the age of 18 years or older and the admission to a nursing program as a Bachelor of Science in Nursing (BSN) student. BSN students did not hold any previous nursing licenses and Registered Nurse (RN) to BSN students were excluded.

Descriptive statistical analysis, bivariate analysis, multivariate multiple linear regression, and binary logistics regression analysis were performed to determine whether there were any correlational relationships between the outcome variable, psychological distress, and independent variables. Independent variables included: Socio-demographic variables such as age, gender, region, and employment status as well as nursing students' general health, stress, anxiety, educational environment, etc. The study assumed 13 independent variables in analyses. Table 1 provides an overview of study variables and corresponding measurement tools.

Table 1. Overview of Variables and Corresponding Measurement Tools

Variable	Instrument	Independent or Dependent	# of Questions or Items
Age	Demographics	Independent	1
Ethnicity	Demographics	Independent	1
Gender	Demographics	Independent	1
Location/Year	Demographics	Independent	1
Employment status	Demographics	Independent	1
Marital status	Demographics	Independent	1
Social support	Single-item indicator	Independent	1
Coping	Single-item indicator	Independent	1
COVID-19 stress	Single-item indicator	Independent	1
COVID-19 anxiety	Single-item indicator	Independent	1
General health	Single-item indicator	Independent	1
Perceived stress	PSS-4	Independent	4
Educational environment	DREEM-12	Independent	12
Psychological distress	K6	Dependent	6

A convergent, mixed-methods approach utilizing multiple measurements, including, single item indicator questions, the Kessler Psychological Distress Scale (K6), the Perceived Stress Scale (PSS-4), the Dundee Ready Education Environment Measure (DREEM), demographics survey tool, and phone interviews were used in data collection within the desired population. The measurement tools utilized Likert-type scale questions and self-reporting. Quantitative Data were collected over a 4-week period. Qualitative data were collected over a 4-week period shortly after quantitative data were collected. The use of a descriptive qualitative approach and specifically a directed content analysis approach was used to guide questions for the follow-up phone or zoom interviews. The interviews lasted approximately 12 minutes and participants were prompted to speak about their experience during the COVID-19 pandemic using the following open-ended questions:

1. In what ways has the COVID-19 pandemic changed your academic performance?
2. What are some stressors or things that have caused you stress or psychological stress during your time in nursing school?
3. What things have you done to cope with stressors caused as a result of the COVID-19 pandemic?
4. During the COVID-19 pandemic, what are some stressors or things that have caused you anxiety

during your time in nursing school?

5. What things have you done to cope with anxiety caused as a result of the COVID-19 pandemic?
6. How has your social support system, such as family and friends, and the nursing school, helped you progress through the nursing program?
7. What could your family and friends and nursing school have done differently to support your progress through the nursing program?
8. While you are attending nursing school, did you have any concerns that affected your physical or mental health during the COVID-19 pandemic?

Results

Demographic Information

A total of 202 participants completed the demographics section of the survey. Most of the participants were young adults with a mean age of 22 years (SD=4.38). Regarding race, the highest percentage of participants selected white (n=160, 79%); Participants that selected African American had a selection of 28 (14%). Participants that selected others accounted for 14 (7%). The selection of others included races such as Native Hawaiian, Pacific Islander, Asian, Alaskan Native and American Indian. This was noted to be the smallest portion of the sample. The majority of the students were female at 86%, and the other 28 (14%) participants were male. Participants had the opportunity to select multiple options for marital status. Regarding marital status, the highest percentage of participants selected single 193 (95%); participants that selected married had a selection of 9 (5%) and participants that selected either widowed or divorced had a selection of 1 (1%) each. Regarding employment, the highest percentage of participants were not working 129 (64%); however, some participants reported that they worked part-time (n=70, 35%). Very few participants reported working (n=3, 2%) (see Table 2 Descriptive Statistics of Variables for the complete demographic information on the data.).

Bivariate analysis was conducted between psychological distress and the following demographic variables, which can be seen in Table 3 and Table 4: Race, sex, employment status, age, and marital status. The analysis intends to determine whether a statistical association exists between psychological distress and the demographic variables, thus utilizing statistically significant variables for multivariate analyses later. From the results in Table 3 and Table 4 consisting of the bivariate analysis, we observe that marital status and psychological status are related to the outcome variable as the p-value is less than the significance level of 0.05.

A multiple linear regression analysis was conducted between psychological distress and demographic variables as identified in Table 5. The intention of the analysis is to predict multiple outcome variables utilizing one or more independent variables. Evidence from Model 1 in Table 5 does not show a linear relationship among the variables describing demographics and psychological distress at a significance level of 0.05. From Model 2 in Table 5, there does exist a linear relationship among the variables, which include the PSS4 and DREEM12 scale and the dependent variable, psychological distress. We can conclude that there is a statistically significant association between the PSS4 and DREEM12 scale with a p-value of less than or equal to the significance level

of 0.05. If one score increases in the DREEM12 scale holding the PSS4 scale, the psychological distress score will increase around 2.6 points. If one score increases in the PSS4 scale holding the DREEM12 scale, the psychological distress score will decrease almost 6 most. The R-squared for model 2 = 0.230. R-squared of a multiple regression model explains how close the data are to the fitted regression line so, within this model, only 23% of the variation in psychological distress can be explained by the independent variables of the PSS4 and DREEM12 scale.

A logistic regression analysis was conducted between psychological distress and the 5 single-item indicator questions to obtain an odds ratio. Psychological distress was converted into a binomial response variable; thus, the logistic regression analysis is appropriate. Odds ratios are obtained between one or more explanatory variables and a binomial response variable within a logistic regression analysis (Sperandei, 2014). As identified in Table 6, the overall test results are statistically significant, which means a nonlinear relationship is identified between psychological distress and other independent variables ($\chi 2 = 65.004$, df = 3, $p < 0.001$). Three independent variables are statistically significant with psychological distress. With an odds ratio greater than 1, there is a positive correlation identified among stress and psychological distress. Should the stress level increases, there will be more likely to be distressed. For every 1 unit increase in stress, the predicating odds are changing by a factor of 1.648.

If a randomly selected participant thinks he or she gets more social support during nursing school, there are around 65% fewer odds to be distressed. If a randomly selected participant thinks he or she copes well, there are about 48% less odds to be distressed. The goodness of fit of the model was measured by Hosmer and Lemeshow test. The combination of evaluating a statistical model and establishing the Hosmer-Lemeshow goodness of fit test is imperative to assessing goodness of a fit within a logistic regression model (Fagerland & Hosmer, 2012). A larger p-value means that the model is a good fit so we can determine that the logistic regression model is a very good fit with a chi-square test statistic of 3.199 and a p-value of 0.921.

Table 2. Descriptive Statistics of Variables

Variable	Frequency (%)	Mean (SD)
Race		
Caucasian	160 (79.2%)	
African American	28 (13.9%)	
Others	14 (6.9%)	
Gender		
Male	28 (13.9%)	
Female	174 (86.1%)	
Employment		
Working (full-time)	3 (1.5%)	
Working (part-time)	70 (34.7%)	
Not Working	129 (63.9%)	

Marital Status		
Married	9 (4.5%)	
Widowed	1 (0.5%)	
Divorced	1 (0.5%)	
Single	191 (94.6%)	
Age		22.61 (4.38)
DREEM		
Very Poor	1 (0.5%)	
Plenty of Problems	6 (3.0%)	
More Positive than Negative	56 (27.7%)	
Excellent	129 (63.9%)	
Perceived Stress (PSS4)		12.86 (1.59)
Psychological Distress (K6)		
Well	107 (53.0%)	
Mild Mental Disorder	51 (25.2%)	
Moderate Mental Disorder	33 (13.6%)	
Severe Mental Disorder	3 (1.5%)	
I have adequate social support during nursing school		
Strongly Disagree	3 (1.5%)	
Disagree	14 (6.9%)	
Unsure	13 (6.4%)	
Agree	102 (50.5%)	
Strongly Agree	66 (32.7%)	
I am able to cope well in nursing school		
Strongly Disagree	6 (3.0%)	
Disagree	31 (15.3%)	
Unsure	48 (23.8%)	
Agree	93 (46.0%)	
Strongly Agree	20 (9.9%)	
I have experienced stress related to COVID-19 during nursing school related to COVID-19		
Strongly Disagree	3 (1.5%)	
Disagree	9 (4.5%)	
Unsure	5 (2.5%)	
Agree	63 (31.2%)	
Strongly Agree	118 (58.4%)	
I have experienced anxiety related to COVID-19 during nursing school		

Strongly Disagree	1 (0.5%)
Disagree	8 (4.0%)
Unsure	37 (18.3%)
Agree	65 (32.2%)
Strongly Agree	87 (43.1%)
General Health	
Strongly Disagree	0 (0.0%)
Disagree	7 (3.5%)
Unsure	46 (22.8%)
Agree	78 (38.6%)
Strongly Agree	67 33.2%)

Table 3. Bivariate Analyses between Psychological Distress and Independent Variables.

VARIABLE	**INDEPENDENT VARIABLE**	**TEST**	**TEST STATISTIC**	**P**
Psychological distress				
	Race	χ^2	2.191	0.901
	Sex	χ^2	0.564	0.905
	Employment status	χ^2	8.611	0.197
	Marital status	χ^2	13.086	< 0.05
	Age	F	1.488	0.120
	DREEM -12	MH*	5.814	< 0.05
	PSS4	F	3.4661	< 0.05

* Mantel Haenszel Chi-square test was performed because both variables are ordinal scale variables.

Table 4. Bivariate Analyses with Outcome Variable, Psychological Distress (Dichotomous)

Variable	Distress n (%) /mean (SD)		Test Statistic	*P*
	Yes	No		
Gender				
Male	12 (13.8%)	16 (15.0%)	χ^2 = 0.052	0.082
Female	75 (86.2%)	91 (85.0%)		
Age	22.88 (5.75)	22.24 (2.44)	*t* = -1.024	0.307
Caucasian				
Yes	70 (80.5%)	82 (76.6%)	χ^2 = 0.414	0.520
No	17 (19.5%)	25 (23.4%)		

Married					
Yes		5 (5.7%)	4 (3.7%)	χ^2 = 0.438	0.508
No		82 (94.3%)	103 (96.3%)		
Employment					
Yes		27 (31.0%)	44 (41.1%)	χ^2 = 2.104	0.147
No		60 (69.0%)	63 (58.9%)		
Perceived Stress (PSS4)		12.23 (1.73)	13.38 (1.25)	t = 5.437*	**< .001**
DREEM					
Very Poor		0 (0.0%)	1 (1.0%)	Spearman γ	**0.024**
Plenty of Problems		0 (0.0%)	6 (5.7%)	= 0.162	
More Positive Than Negative		22 (25.3%)	34 (32.4%)		
	Excellent	65 (74.7%)	64 (61.0%)		
Social Support					
Strongly Disagree		0 (0.0%)	3 (2.8%)	χ^2 = 25.07	< .001
Disagree		3 (3.4%)	10 (9.3%)		
Unsure		1 (1.1%)	12 (11.2%)		
Agree		40 (46.0%)	60 (56.1%)		
Strongly Agree		43 (49.4%)	22 (20.6%)		
Coping					
Strongly Disagree		2 (2.3%)	4 (3.7%)	χ^2 = 35.91	< .001
Disagree		5 (5.7%)	25 (23.4%)		
Unsure		13 (14.9%)	35 (32.7%)		
Agree		49 (56.3%)	41 (38.3%)		
Strongly Agree		18 (20.7%)	2 (1.9%)		
Stress-related to COVID-19					
Strongly Disagree		2 (2.3%)	1 (0.9%)	χ^2 = 12.58	0.014
Disagree		5 (5.7%)	4 (3.7%)		
Unsure		4 (4.6%)	1 (0.9%)		
Agree		36 (41.4%)	26 (24.3%)		
Strongly Agree		40 (46.0%)	75 (70.1%)		
Anxiety-related to COVID-19					
Strongly Disagree		1 (2.3%)	0 (0.0%)	χ^2 = 5.71	0.222
Disagree		5 (5.7%)	3 (2.8%)		
Unsure		16 (18.4%)	20 (18.7%)		
Agree		33 (37.9%)	30 (24.3%)		
Strongly Agree		32 (36.8%)	54 (70.1%)		

General Health				
Strongly Disagree	0 (0.0%)	0 (0.0%)	χ^2 = 20.95	< .001
Disagree	2 (2.3%)	4 (3.7%)		
Unsure	12 (13.8%)	34 (31.8%)		
Agree	29 (33.3%)	47 (43.9%)		
Strongly Agree	44 (50.6%)	22 (20.6%)		

* Satterthwaite t-test was done due to unequal variances

Table 5. Multiple Regression Model

OUTCOME VARIABLE	**MODEL**	**T**	**P**	**F (p)**
Psychological distress	Model1			
	Race	-0.743	0.458	0.989 (0.420)
	Sex	-0.841	0.401	
	Employment status	0.608	0.544	
	Marital status	-0.052	0.959	
	Age	1.55	0.123	
Psychological distress	Model2			
	PSS4	-5.90	0.000*	7.583 (0.000) *
	DREEM-12	2.59	0.004*	
	Race	-1.06	0.288	
	Age	1.48	0.138	
	Sex	-0.35	0.724	
	Marital status	-0.76	0.447	
	Employment status	0.125	0.901	

*Statistically significant at 0.05 significance level. R^2 for model 2= 0.230

Table 6. Logistic Regression Analyses with Single Item Indicators

Variable	*B* (*p*)	Odds Ratio (CL)
Social Support	- 0.812 (0.002)	0.444 (0.265 – 0.744)
Coping	- 0.660 (0.002)	0.517 (0.342 – 0.781)
Stress	0.500 (0.006)	1.648 (1.150 – 2.362)

Follow-up interviews were conducted on 11 participants regarding qualitative questions exploring the following variables during the COVID-19 pandemic: Academic performance, stress, coping, anxiety, social support,

physical, and mental health. Coding and qualitative content analysis were used to identify overarching themes within the interviews. Each interview was carefully analyzed, and the following 12 codes resulted from the analysis of the participant's responses: Online learning, workload, finances, experience, breaks, time, unknown, support, encouragement, unchanged, communication, and transmission.

Integration of the quantitative and qualitative data were conducted in efforts to gain and develop an understanding and validation of the results (Johnson et al., 2007) of psychological distress in nursing students during the COVID-19 pandemic. Figure 1 depicts the meta-inferences drawn from the quantitative and qualitative data results. An enhancing approach was used as an integration strategy for analyzing and interpreting both quantitative and qualitative data and to derive meta-inferences or conclusions. Integration of qualitative and quantitative data ensued, and four major meta-inferences were determined. During the COVID-19 pandemic, we can conclude that disruptions in nursing student's educational environment such as online learning, workload, lack of communication, and financial issues can increase psychological distress; Social support in nursing students can increase coping, which decreases psychological distress; Nursing students' coping, such as time management and breaks can decrease stress leading to decreased psychological distress; and COVID-19 stress, concerns, and isolation in nursing students can increase psychological distress.

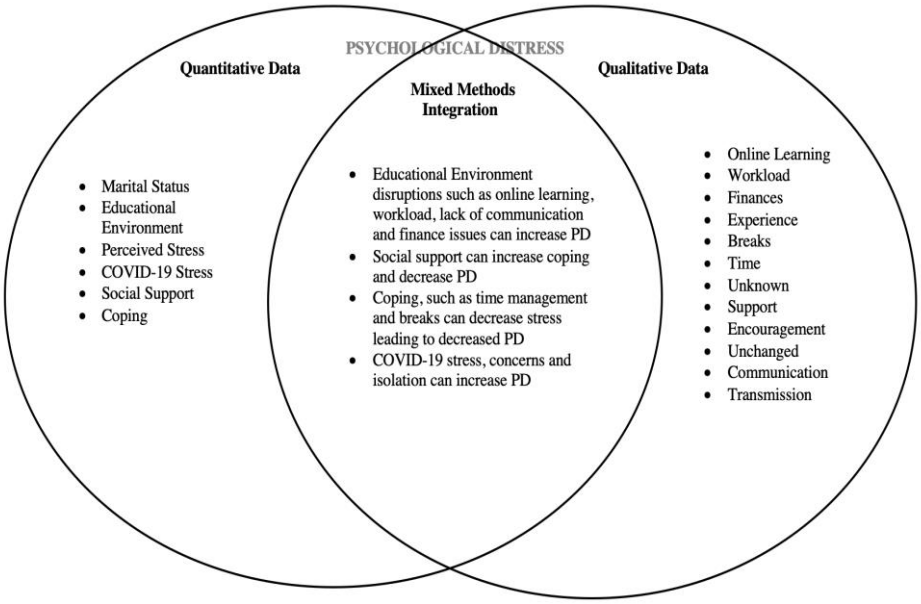

Figure 1. Mixed-methods Integration Results

Discussion

The study revealed multiple limitations and delimitations. One delimitation found was that the study was restricted to only nursing students attending a BSN program in Southeastern US. This delimitation of the study may not generalize to other nursing students from different geographical areas and other different types of nursing programs. Primarily female students were found to be another limitation within the study. Within the

study results, approximately 86% of the participants were female. This limitation of the study may not generalize to other BSN programs that include more male students. Another limitation of the study included a time frame of 8 weeks where the data was cross-sectionally collected and may not include such in-depth responses and discoveries that a longitudinal study may encounter. The study was limited by the honesty and clarity of the participants' responses on online questionnaires and phone interviews. It is assumed that all of the participants answered truthfully and accurately, but there is always a potential for dishonest respondents. Even with all the controls and measures taken in recruiting and motivating participants, dishonest respondents can occasionally provide dishonest answers (Zijlstra et al., 2007).

Conclusion

Practice recommendations include preventative measures such as screening tools or surveying to monitor the potential for psychological distress in nursing students. These screening tools can be incorporated within nursing programs and conducted throughout each course. Educators are often the first line of defense for their students (Barlie, 2021) and can implement these measures within their courses and conduct them throughout the semester. A simple questionnaire asking open-ended questions about their mental well-being can help to open up communication about mental health issues. The importance of nursing faculty being able to recognize mental health problems amongst nursing students should also be highlighted. Nursing educators should be provided with tools to recognize signs of developing psychological distress and given opportunities around the awareness and management of mental health crises which, include risk for suicide (Barlie, 2021). Providing nursing educators with the appropriate tools can be established by faculty training and education. NAMI (2021) provides resources to educators that include support for student wellness. Through NAMI, educators are prompted to look for the following amongst their students; increasingly more socially withdrawn, missing multiple days of school, falling behind academically, and expressing interest in harming themselves. Resources on how to appropriately respond to these situations should also be provided to nursing educators.

Other recommendations include incorporating content into the nursing curriculum to address psychological distress such as burnout and self-care. Faculty should work to promote mental health awareness with their students. Nurse educators that incorporate self-care into the curriculum can improve nursing student's self-awareness of the importance of reduction in stress while they endure the challenges of the rigorous workload within the program (Green, 2019). Teaching self-care behaviors that are proactive will contribute to maintaining a safe practice in their clinical environments (Green, 2019).

Nursing education and faculty are encouraged to uncover those students with an increased risk for exposure to difficulties and risks to their academic success. These precautions are ongoing challenges as a result of the COVID-19 pandemic (Gaffney et al., 2021) and will be necessary for efforts to ensure that our future nurses are appropriately equipped to face the challenges in health care that the pandemic has caused. Knowing the factors of psychological distress in nursing students during the COVID-19 pandemic can help faculty to better prepare nursing students and create an educational environment that accommodates a new type of patient care.

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