

The Relationship Between Personality Traits and Clinical Decision-Making, Anxiety and Stress Among Intern Nursing Students During COVID-19: A Cross-Sectional Study

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Purpose: The aim of this study was to investigate whether the personality traits of intern nursing students could serve as valid predictors of their psychological status and clinical decision making. Additionally, we aimed to understand the psychological state of intern nursing students during the regular epidemic prevention and control stage of COVID-19.

Participants and Methods: This study was designed as a cross-sectional survey. A total of 181 intern nursing students involved in clinical placements participated in this study. Participants provided relevant data by completing the Big Five Inventory-44, the Self-Rating Anxiety Scale, the Perceived Stress Scale 14, and the Clinical Decision-Making in Nursing Scale.

Results: The results showed that neuroticism ($\beta = -0.282$, $p < 0.01$) and openness ($\beta = 0.302$, $p < 0.001$) played significant roles in predicting clinical decision-making skills among intern nursing students. Regression analysis also showed extraversion ($\beta = -0.249$, $p < 0.01$), openness ($\beta = 0.2$, $p < 0.01$), and neuroticism ($\beta = 0.391$, $p < 0.001$) could significantly predict stress in intern nursing students. The agreeableness ($\beta = -0.354$, $p < 0.001$) and neuroticism ($\beta = 0.237$, $p < 0.01$) could also predict the anxiety of intern nursing students. Additionally, some intern nursing students still suffered from anxiety and stress in the context of the ongoing pandemic.

Conclusion: Personality traits are good predictors of clinical decision-making, anxiety and stress among intern nursing students. In conclusion, the openness in personality traits of intern nursing students should be valued and cultivated in clinical work, which will benefit the development of nursing talents.

Keywords: nursing students, personality, COVID-19, psychology, decision-making

Introduction

The outbreak of COVID-19 caused great fear in various countries in 2019. Although a long time has passed since the COVID-19 outbreak, the impact of COVID-19 on patients, families, communities, and medical workers is ongoing. In a cross-sectional survey, medical workers in cities with severe epidemics were found to be more likely to show depression, anxiety, sleeplessness, distress and high stress.¹ As medical workers comprise a high-risk group, these negative psychological responses in medical workers may persist for 6 months to 3 years after an epidemic/pandemic outbreak.² Among these medical workers, nurses are more likely to suffer from adverse mental health than doctors when faced with an epidemic/pandemic outbreak,²⁻⁴ which may be related to the length of time nurses spend in contact with patients.

As a reserve force for nurses, nursing students' mental health is also worthy of our attention. Before COVID-19, the mental health of nursing students was already problematic. A meta-analysis found that nursing students were more likely to be depressed than normal, with Asian students having a 43% prevalence rate of depression.⁵ After the COVID-19 outbreak, this anxiety or depression was more evident in nursing students.^{6,7} With the regular epidemic prevention and control stage, nursing students' anxiety or depression may have subsided, but their psychological problems still existed.^{8,9} Meanwhile, anxiety or depression could have negative effects on nursing students, such as lower quality of life and negative coping styles.^{10,11} Therefore, the mental health of nursing students is an issue of concern. In addition, due to the specificity of the nursing profession, the majority of intern nursing students in China are female, and the results of related studies showed no significant differences in mental health by gender factors.⁷

The clinical decision-making skills of nursing students have been a hot topic of concern over the years, as these skills are critical to their future clinical work. In recent years, many experts have performed many studies in this area to improve the clinical decision-making skills of nursing students. For example, nursing educators use concept maps, lectures, role plays, clinical journal clubs, clinical conferences, case demonstrations, and student-centered teaching methods to improve nursing students' theoretical knowledge and clinical decision-making skills.^{12,13} The topic of how to improve the clinical decision-making skills of nursing students or nurses is a permanent conversation in the literature. Although intern nursing students are supervised by nurses during the clinical internship, good clinical decision-making skills are also important as they actually enter the clinical work. The development of good clinical decision-making skills must be carried out as early as possible.

Personality is a unique characteristic that each person possesses, and personality traits vary from person to person. In the field of psychology, the personality trait model is widely distributed as a tool for studying personality traits known as the Big Five, namely, neuroticism, extraversion, openness, agreeableness and conscientiousness. Neuroticism reflects individual emotion regulation processes, mainly reflecting the tendency to experience negative emotions and emotional instability. Extraversion primarily indicates the amount and density of interpersonal interactions, the need for stimulation, and the ability to obtain pleasure. Openness refers to the desire to gain new and unfamiliar experiences. Agreeableness examines the attitudes individuals hold toward others. Conscientiousness refers to the way we control, manage and regulate our impulses. In recent years, some scholars have performed many studies on the association between the Big Five and psychological problems (such as anxiety, depression, stress) among different populations (including community residents, children, patients).^{14–16} Although the populations studied were different, the results showed that neuroticism was inextricably linked to more severe psychological problems. In medical students, there was also an association between neuroticism and adverse psychological problems such as anxiety and depression.¹⁷ However, research on specific medical students such as intern nursing students regarding personality traits and psychology is relatively scarce. Therefore, in this study, we want to understand the relationship between personality traits and stress and anxiety in intern nursing students in the context of COVID-19. In addition, the personality traits of the Big Five could influence medical students' career, professional choices, clinical clerkship satisfaction and coping strategies.^{18–20} However, there is a lack of research on the relationship between intern nursing students' personality traits and clinical decision-making. Only a small amount of literature has reported the relationship between personality traits and nursing competencies among nurses.^{21,22} Of these, the personality trait of neuroticism had a negative impact on nursing competence, while the others had a positive impact on nursing competence.

Therefore, to better guide clinical practice and train more nursing talent, this study will investigate the relationship between personality traits, psychological health (mainly including stress and anxiety) and clinical decision-making. By the way, to understand the psychological state of intern nursing students during the regular epidemic prevention and control stage.

Materials and Methods

Participants and Data Collection

This study was designed as a cross-sectional survey. The intern nursing students in this study specifically referred to the nursing students who were involved in clinical practice. The intern nursing students were required to satisfy the

following inclusion criteria: (a) subjects must be nursing students in clinical practice; (b) the time of the clinical practice had to occur during the regular epidemic prevention and control stage. The sample size was calculated using an electronic estimation tool with a statistical power level set at 0.8, an effect size value of 0.15, an alpha value of 0.05, and 9 explanatory variables (age, gender, education level, marriage, extraversion, agreeableness, conscientiousness, neuroticism, and openness), resulting in a minimum sample size of 113.²³ The 10% increase was mainly to deal with the common missing data problem in the study, and the final minimum sample size required was 127.

In this cross-sectional survey, we collected clinical data from intern nursing students who practiced at Jiangnan University Hospital from February to June 2022. The information of all intern nursing students in the hospital were collected through the nursing department, and there were 201 intern nursing students who met the requirements. We distributed the link of the questionnaires to these 201 intern nursing students online by using the APP software WeChat. All participants were informed of the purpose of the study and signed an informed consent form before participating in the survey. The entire questionnaire took about 20 minutes to fill out for intern nursing students. After the exclusion of 20 participants due to missing or incomplete responses, data of 181 intern nursing students were retained for final analyses, resulting in an effective response rate of 90.04%. The high number of incomplete questionnaires was due to the large number of items in the questionnaire, which resulted in some items not answered or randomly answered.

Data Collection

Basic Information

Basic information about the intern nursing students, including gender, age, education, and marital status, was included.

Measurement of Personality Traits

The version of the Big Five Inventory-44 (BFI-44) that we were used in this study was obtained from John and Srivastava's Chinese translation.²⁴ The BFI-44 contains five key dimensions: extroversion, agreeableness, conscientiousness, neuroticism and openness to experience. This self-report measure has 44 items and is rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The BFI-44 was proved to have acceptable validity in the Chinese population, with acceptable internal consistency for all personality traits (from 0.75 to 0.91).^{25,26} The Cronbach's alphas for extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience were 0.85, 0.708, 0.80, 0.746, and 0.715, respectively, in the current study.

Measurement of Anxiety

The Self-Rating Anxiety Scale (SAS) is a common anxiety self-rating scale that consists of 20 items covering a variety of anxiety symptoms, both psychological and somatic.²⁷ The SAS is rated on a 4-point scale ranging from 1 (none, or very little) to 4 (most or all of the time). The higher the standard score is, the more anxious the participant is. SAS showed good reliability in the study of the Chinese population with a Cronbach's α value of 0.777.²⁸ The internal consistency of the SAS, estimated using Cronbach's alpha, was 0.836 in this current study.

Measurement of Perceived Stress

The Perceived Stress Scale 14 (PSS-14) is a measure of perceived stress that consists of 14 items.²⁹ Participants' responses are given on a 5-point scale ranging from 0 (never) to 4 (very often). The total score for all items is summed together, which can range from 0 to 56, with higher scores reflecting higher levels of perceived stress. The PSS-14 had good reliability in a study related to Chinese nurses, with a Cronbach's alpha value of 0.819.³⁰ The Cronbach's alpha for the internal consistency of this research was determined to be 0.73.

Measurement of Clinical Decision-Making

The Clinical Decision-Making in Nursing Scale (CDMNS) is used to measure clinical decision-making. The scale was developed by Jenkins and translated for use.³¹ The scale is divided into four dimensions, namely, (1) finding alternative options; (2) clarifying goals and values; (3) evaluating or repeatedly evaluating outcomes; and (4) finding information or new information. Forty items are included in the CDMNS and are rated on a scale ranging from 1 (never) to 5 (very often). The total score can range from 40 to 200. Higher scores on the scale indicate better awareness of clinical decision-

making. The internal consistency reliability of the CDMNS had a Cronbach's alpha coefficient of 0.83 in a sample of nursing students, and CDMNS have been used in more than 90 studies.^{32,33} Regarding the sample of participants in this study, the Cronbach's alpha for internal consistency amounted to 0.899.

Ethical Considerations

The research protocol was approved by the Jiangnan University Medical Ethics Committee (Approval number: JNU20220310IRB49). Each participant was informed of the purpose of the study and signed an informed consent form before completing the questionnaire. The privacy of the participant was fully respected and protected.

Statistical Analysis

All statistical analyses were performed using IBM SPSS Statistics for Windows version 25.0 (IBM, Armonk, NY, USA). The internal consistency of the scales in this study will be expressed by Cronbach's alpha coefficient. Since the data approximated a normal distribution, the data in this study were presented as the mean \pm standard deviation (SD). Independent samples *t*-test was used to compare two independent groups, while one-way ANOVA was used to compare more than two independent groups. Pearson correlation analysis was used to describe the correlation between the variables. Multiple regression analysis was used to assess the relationship between several independent variables and a dependent variable. Data were tested for multicollinearity prior to multiple linear regression analysis, and a variance inflation factor (VIF) (≤ 10) indicated that the independent variables could reasonably be entered into the multivariate analysis. Statistical significance was determined by a *p*-value < 0.05 .

Results

Relevant demographic information about the participants was shown in Table 1. In this study, female intern nursing students accounted for 91.1% of the total, and unmarried intern nursing students accounted for 96.7% of the participants. The educational distribution of intern nursing students was relatively even, with junior students accounting for 40.3%, undergraduates accounting for 30.4%, and graduate students accounting for 29.3%.

In this study, the mean \pm SD of extroversion, agreeableness, conscientiousness, neuroticism and openness of intern nursing students were 26.72 ± 5.11 , 34.24 ± 4.13 , 31.29 ± 4.59 , 22.78 ± 4.28 , and 33.69 ± 4.32 , respectively. The average SAS and PSS-14 scores were 43.61 ± 10.87 and 40.29 ± 4.79 , respectively. The mean \pm SD of the CDMNS score was 127.94 ± 15.44 . The scores of these five personality traits were significantly correlated with the total CDMNS, SAS and PSS-14 scores, as

Table 1 Demographic Data of the Respondents (N=181)

Variables	Number	N (%)
Gender		
Male	16	8.8%
Female	165	91.1%
Age		
<25 (17–24)	160	88.4%
≥ 25 (25–33)	21	11.6%
Education		
Junior college	73	40.3%
Undergraduate	55	30.4%
Graduate student	53	29.3%
Marital Status		
Yes	6	3.3%
No	175	96.7%

shown in Table 2. Correlation analysis revealed a significant positive correlation between clinical decision-making and extraversion ($\beta = 0.224$, $p < 0.01$), agreeableness ($\beta = 0.190$, $p < 0.05$), conscientiousness ($\beta = 0.194$, $p < 0.01$), and openness ($\beta = 0.346$, $p < 0.01$). Also, clinical decision-making was significantly and negatively correlated with neuroticism ($\beta = -0.312$, $p < 0.01$). Significantly negative correlations with SAS scores were found for extraversion ($\beta = -0.332$, $p < 0.01$), agreeableness ($\beta = -0.484$, $p < 0.01$), conscientiousness ($\beta = -0.442$, $p < 0.01$), and openness ($\beta = -0.217$, $p < 0.01$). Negative correlations with PSS-14 scores were found for extraversion ($\beta = -0.464$, $p < 0.01$), agreeableness ($\beta = -0.280$, $p < 0.01$), and conscientiousness ($\beta = -0.417$, $p < 0.01$). Also, neuroticism was significantly and positively correlated with stress ($\beta = 0.562$, $p < 0.01$) and anxiety ($\beta = 0.429$, $p < 0.01$). Table 3 showed that the intern nursing students' anxiety, stress, clinical decision-making and personality traits did not differ by gender, age, education or marital status.

Through multiple linear regression, there were three models showing the variables affecting anxiety, stress, and clinical decision-making among intern nursing students. Before the multiple linear regression analysis, VIF was tested and the values of VIF were all less than 5, indicating that there was no multicollinearity problem in these variables. In Table 4, stress was considered the dependent variable, where extroversion ($\beta = -0.249$, $P = 0.004$), openness ($\beta = 0.2$, $P = 0.008$) and neuroticism ($\beta = 0.391$, $P = 0.000$) could significantly affect stress scores. These variables explained 35.2% of the variation in stress among intern nursing students ($R^2 = 0.352$, $F = 10.774$, $p = 0.000$). In Table 5, the dependent variable was anxiety, where agreeableness ($\beta = -0.354$, $P = 0.000$) and neuroticism ($\beta = 0.237$, $P = 0.006$) could significantly affect anxiety scores. These variables explained 29.5% of the variation in anxiety among intern nursing students ($R^2 = 0.295$, $F = 8.542$, $p = 0.000$). In Table 6, clinical decision-making was used as the dependent variable, and neuroticism ($\beta = -0.282$, $P = 0.003$) and openness ($\beta = 0.302$, $P = 0.001$) could significantly affect the level of clinical decision-making. These variables explained 12.8% of the variation in clinical decision-making among intern nursing students ($R^2 = 0.128$, $F = 3.651$, $p = 0.000$). To better show the relationship between the respective variables and the dependent variable, a scatter plot was drawn to visualize the results (see Figure 1). In this study, personality traits were effective in predicting clinical decision-making skills, anxiety and stress among intern nursing students.

The results also showed that some intern nursing students still suffered from anxiety and stress in the context of the regular epidemic prevention and control stage. The percentage of intern nursing students with severe anxiety and very high levels of stress was very small. However, the percentage of intern nursing students with moderate stress was still very high. Specific data were summarized in Table 7.

Table 2 Means, Standard Deviations, and Intercorrelations of Study Variables (N=181)

	Mean	Std. Deviation	1	2	3	4	5	6	7	8
1. BFI-44-Ext	26.72	5.11	I							
2. BFI-44-Agr	34.24	4.13	0.398**	I						
3. BFI-44-Con	31.29	4.59	0.492**	0.504**	I					
4. 4BFI-44-Neu	22.78	4.28	-0.593**	-0.346**	-0.565**	I				
5. 5BFI-44-Ope	33.69	4.32	0.529**	0.390**	0.423**	-0.361**	I			
6. CDMNS	127.94	15.44	0.224**	0.190*	0.194**	-0.312**	0.346**	I		
7. SAS	43.61	10.87	-0.332**	-0.484**	-0.442**	0.429**	-0.217**	-0.168*	I	
8. PSS-14	40.29	4.79	-0.464**	-0.280**	-0.417**	0.562**	-0.142	-0.148*	0.485**	I

Notes: * $p < 0.05$; ** $p < 0.01$.

Abbreviations: BFI-44-Ext, the Big Five Inventory-44-Extraversion; BFI-44-Agr, the Big Five Inventory-44-Agreeableness; BFI-44-Con, the Big Five Inventory-44-Conscientiousness; BFI-44-Neu, the Big Five Inventory-44-Neuroticism; BFI-44-Ope, the Big Five Inventory-44-Openness; SAS, the Self-Rating Anxiety Scale; PSS-14, the Perceived Stress Scale 14; CDMNS, the Clinical Decision-Making in Nursing Scale.

Table 3 Distribution of Intern Nursing Students' Levels of SAS, PSS-14, CDMNS and Personality Traits According to Personal Characteristics (N=181)

Variables	BFI-44-Ext Means ± SDs	BFI-44-Agr Means ± SDs	BFI-44-Con Means ± SDs	BFI-44-Neu Means ± SDs	BFI-44-Ope Means ± SDs	CDMNS Means ± SDs	SAS Means ± SDs	PSS-14 Means ± SDs
Gender								
Female	26.7 ± 5.01	34.36 ± 4.05	31.44 ± 4.28	22.84 ± 4.03	33.74 ± 4.16	128.05 ± 15.02	43.54 ± 10.42	40.27 ± 4.76
Male	26.94 ± 6.17	32.94 ± 4.92	29.75 ± 7.09	22.19 ± 6.47	33.13 ± 5.88	126.88 ± 19.82	44.21 ± 15.14	40.5 ± 5.33
t	-0.175	1.32	0.934	0.397	0.542	0.29	-0.236	-0.18
P-value	0.861	0.188	0.364	0.696	0.589	0.772	0.814	0.857
Age								
≥25 (25–33)	26.48 ± 4.99	34.19 ± 3.20	30.24 ± 4.31	22.38 ± 4.13	33.29 ± 4.46	127.05 ± 11.68	46.55 ± 10.69	39.86 ± 4.53
<25 (17–24)	26.76 ± 5.13	34.24 ± 4.25	31.43 ± 4.63	22.84 ± 4.31	33.74 ± 4.32	128.06 ± 15.89	43.22 ± 10.86	40.35 ± 4.84
t	-0.236	-0.055	-1.113	-0.458	-0.449	-0.283	1.323	-0.442
P-value	0.814	0.956	0.267	0.647	0.654	0.778	0.188	0.659
Education								
Junior college	27.34 ± 5.33	34.97 ± 4.26	31.81 ± 4.72	22.49 ± 4.34	34.51 ± 4.01	128.63 ± 16.93	42.28 ± 10.40	40.37 ± 4.56
Undergraduate	25.62 ± 5.53	33.38 ± 4.22	30.62 ± 5.06	23.36 ± 4.54	33.25 ± 4.96	126.93 ± 16.85	44.54 ± 11.86	41.09 ± 5.59
Graduate student	27.02 ± 4.16	34.11 ± 3.74	31.26 ± 3.85	22.58 ± 3.93	33 ± 3.92	128.06 ± 11.46	44.46 ± 10.42	39.36 ± 4.12
F	1.935	2.392	1.053	0.727	2.289	0.191	0.913	1.791
P-value	0.147	0.094	0.351	0.485	0.104	0.826	0.403	0.170
Marital Status								
No	26.69 ± 5.09	34.23 ± 4.16	31.23 ± 4.58	22.79 ± 4.21	33.67 ± 4.35	127.83 ± 15.48	43.58 ± 10.82	40.3 ± 4.76
Yes	27.83 ± 5.78	34.33 ± 3.61	33 ± 5.22	22.67 ± 6.62	34.17 ± 3.87	131.17 ± 15.13	44.16 ± 13.29	40 ± 6.29
t	-0.54	-0.058	-0.928	0.068	-0.277	-0.519	-0.128	0.152
P-value	0.59	0.954	0.355	0.946	0.782	0.605	0.898	0.88

Note: t, Student's t-test; F, one-way ANOVA.

Abbreviations: BFI-44-Ext, the Big Five Inventory-44-Extraversion; BFI-44-Agr, the Big Five Inventory-44-Agreeableness; BFI-44-Con, the Big Five Inventory-44-Conscientiousness; BFI-44-Neu, the Big Five Inventory-44-Neuroticism; BFI-44-Ope, the Big Five Inventory-44-Openness; SAS, the Self-Rating Anxiety Scale; PSS-14, the Perceived Stress Scale 14; CDMNS, the Clinical Decision-Making in Nursing Scale.

Table 4 Regression Analysis (the Impact of Personality Traits on PSS-14) (N = 181)

Predictor Variables	β	SE	Beta	t-value	P-value	95% Confidence Interval		VIF
						Lower	Upper	
(Constant)	35.416	6.643		5.331	0	22.302	48.529	
Education (Undergraduate)	-0.137	0.778	-0.013	-0.176	0.86	-1.674	1.399	1.555
Education (Graduate student)	-1.043	1.093	-0.099	-0.955	0.341	-3.2	1.114	3
Gender (male)	0.227	1.048	0.013	0.217	0.829	-1.841	2.295	1.073
Marital Status (Yes)	0.298	1.703	0.011	0.175	0.861	-3.063	3.658	1.127
Age	0.027	0.217	0.012	0.125	0.901	-0.402	0.456	2.618
BFI-44-Ext	-0.234	0.079	-0.249**	-2.961	0.004	-0.39	-0.078	1.96
BFI-44-Agr	-0.072	0.085	-0.062	-0.845	0.4	-0.239	0.096	1.482
BFI-44-Con	-0.133	0.086	-0.128	-1.551	0.123	-0.303	0.036	1.883
BFI-44-Neu	0.438	0.091	0.391***	4.797	0	0.258	0.619	1.848
BFI-44-Ope	0.222	0.083	0.2**	2.691	0.008	0.059	0.385	1.536

Notes: PSS-14 was the dependent variable. β is the unstandardized coefficient, SE is the standard error, and Beta is the standardized coefficient. VIF is variance inflation factor. $R^2 = 0.388$; adjusted $R^2 = 0.352$; Durbin-Watson is 2.081. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Abbreviations: BFI-44-Ext, the Big Five Inventory-44-Extraversion; BFI-44-Agr, the Big Five Inventory-44-Agreeableness; BFI-44-Con, the Big Five Inventory-44-Conscientiousness; BFI-44-Neu, the Big Five Inventory-44-Neuroticism; BFI-44-Ope, the Big Five Inventory-44-Openness; PSS-14, the Perceived Stress Scale 14.

Table 5 Regression Analysis (the Impact of Personality Traits on SAS) (N = 181)

Predictor Variables	β	SE	Beta	t-value	P-value	95% Confidence Interval		VIF
						Lower	Upper	
(Constant)	58.944	15.688		3.757	0	27.975	89.913	
Education (Undergraduate)	-0.491	1.838	-0.021	-0.267	0.79	-4.119	3.137	1.555
Education (Graduate student)	0.01	2.581	0	0.004	0.997	-5.084	5.105	3
Gender (male)	-0.448	2.474	-0.012	-0.181	0.857	-5.332	4.437	1.073
Marital Status (Yes)	0.313	4.021	0.005	0.078	0.938	-7.624	8.25	1.127
Age	0.36	0.513	0.071	0.703	0.483	-0.652	1.373	2.618
BFI-44-Ext	-0.05	0.186	-0.024	-0.269	0.789	-0.418	0.318	1.96
BFI-44-Agr	-0.93	0.2	-0.354***	-4.647	0	-1.325	-0.535	1.482
BFI-44-Con	-0.368	0.203	-0.156	-1.813	0.072	-0.769	0.033	1.883
BFI-44-Neu	0.602	0.216	0.237**	2.788	0.006	0.176	1.028	1.848
BFI-44-Ope	0.234	0.195	0.093	1.2	0.232	-0.151	0.618	1.536

Notes: SAS was the dependent variable. β is the unstandardized coefficient, SE is the standard error, and Beta is the standardized coefficient. VIF is variance inflation factor. $R^2 = 0.334$; adjusted $R^2 = 0.295$; Durbin-Watson is 2.012. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Abbreviations: BFI-44-Ext, the Big Five Inventory-44-Extraversion; BFI-44-Agr, the Big Five Inventory-44-Agreeableness; BFI-44-Con, the Big Five Inventory-44-Conscientiousness; BFI-44-Neu, the Big Five Inventory-44-Neuroticism; BFI-44-Ope, the Big Five Inventory-44-Openness; SAS, the Self-Rating Anxiety Scale.

Table 6 Regression Analysis (the Impact of Personality Traits on CDMNS) (N = 181)

Predictor Variables	β	SE	Beta	t-value	P-value	95% Confidence Interval		VIF
						Lower	Upper	
(Constant)	143.242	24.789		5.778	0	94.308	192.176	
Education (Undergraduate)	1.364	2.904	0.041	0.47	0.639	-4.369	7.097	1.555
Education (Graduate student)	4.509	4.078	0.133	1.106	0.27	-3.541	12.558	3
Gender (male)	-1.434	3.91	-0.026	-0.367	0.714	-9.152	6.283	1.073
Marital Status (Yes)	5.459	6.353	0.063	0.859	0.391	-7.082	18	1.127
Age	-0.96	0.811	-0.133	-1.184	0.238	-2.56	0.64	2.618
BFI-44-Ext	-0.265	0.295	-0.088	-0.899	0.37	-0.846	0.317	1.96
BFI-44-Agr	0.222	0.316	0.059	0.7	0.485	-0.403	0.846	1.482
BFI-44-Con	-0.306	0.321	-0.091	-0.954	0.341	-0.939	0.327	1.883
BFI-44-Neu	-1.015	0.341	-0.282**	-2.976	0.003	-1.688	-0.342	1.848
BFI-44-Ope	1.077	0.308	0.302***	3.498	0.001	0.469	1.685	1.536

Notes: CDMNS was the dependent variable. β is the unstandardized coefficient, SE is the standard error, and Beta is the standardized coefficient. VIF is variance inflation factor. $R^2 = 0.177$; adjusted $R^2 = 0.128$; Durbin-Watson is 1.915. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Abbreviations: BFI-44-Ext, the Big Five Inventory-44-Extraversion; BFI-44-Agr, the Big Five Inventory-44-Agreeableness; BFI-44-Con, the Big Five Inventory-44-Conscientiousness; BFI-44-Neu, the Big Five Inventory-44-Neuroticism; BFI-44-Ope, the Big Five Inventory-44-Openness; CDMNS, the Clinical Decision-Making in Nursing Scale.

Discussion

The aim of this study was primarily to investigate the relationship between personality traits and anxiety, stress and clinical decision-making among intern nursing students. Second, we investigated intern nursing students' anxiety and stress in the context of the regular epidemic prevention and control stage.

Previous studies have found that openness (intelligence/imagination) was closely related to academic ability and divergent thinking. In general, medical students with higher openness scores are more flexible, more people-oriented, more inquisitive, and more adaptable.³⁴ In addition, they may encounter fewer barriers or fears of close contact with patients.³⁵ In critical care nurses, their openness was significantly and positively associated with the nursing competence (including decision making, collaboration, nursing intervention, principles of nursing care).²¹ Among nurses, a study also showed that openness of nurses was inextricably linked to good nursing competence.²² The subjects of this study were intern nursing students, and the results showed that the openness of intern nursing students was positively associated with clinical decision-making. These suggest that openness is beneficial to clinical nursing, both for nursing students and nurses. Furthermore, in this study, the higher openness scores of the intern nursing students, the lower their SAS score. In previous studies, although the subjects were different (such as nurses and residents), the results were same which high scores of openness associated with low levels of anxiety.^{36,37} Notably, in this study, the multiple linear regression showed that openness was positively associated with stress. The results of this study replicated some of the results from previous

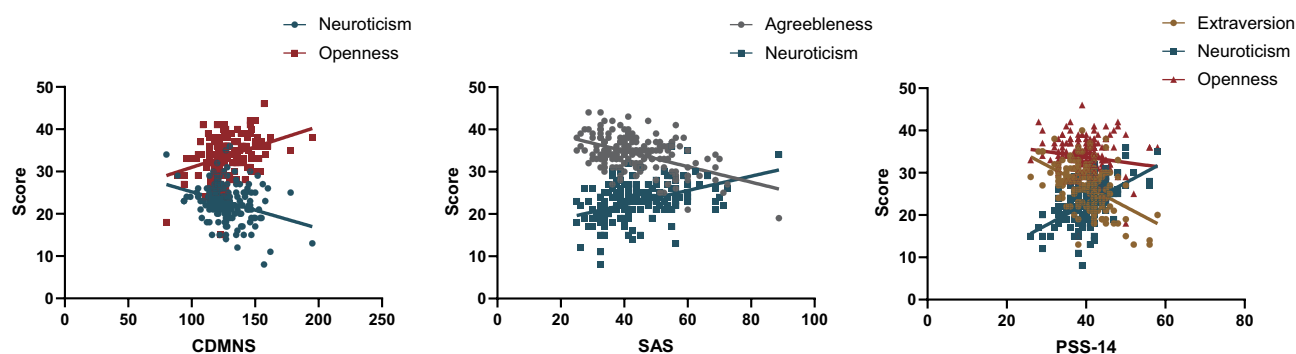


Figure 1 The Relationship Between the Respective Variables and the Dependent Variable.

Table 7 The Levels of Participants' Anxiety and Stress (N=181)

PSS-14		SAS	
Levels	Number (%)	Levels	Number (%)
Low stress levels (14–28)	2 (1.1%)	Normal (<50)	130 (71.8%)
Moderate stress level (29–42)	141 (77.9%)	Mild anxiety (50–60)	41 (22.7%)
Higher stress levels (43–56)	37 (20.4%)	Moderate anxiety (61–70)	7 (3.9%)
Very high stress levels (57–70)	1 (0.6%)	Severe anxiety (>70)	3 (1.6%)

Abbreviations: SAS, the Self-Rating Anxiety Scale; PSS-14, the Perceived Stress Scale 14.

studies.^{38,39} In one study, the authors concluded that higher openness stimulated short-term stress responses for 74 healthy young female adults.³⁹ In another study, the outcomes have showed that openness to experience was positively associated with more stressful life events, more severe depressive symptoms, and higher IQ.³⁸ Because openness has characteristics including fantasy, imagination, and willingness to explore new ideas, openness may be more reflective and attentive to negative experiences.⁴⁰ Therefore, the result that stress was positively correlated with openness was unexpected but plausible. In summary, the association between greater openness and more stress is surprising, and it is worth exploring about the deeper mechanisms between the two.

Recently, one study reported that greater extraversion indicated better adaptation to pandemics; in other words, greater extraversion represented better resilience.⁴¹ Another study analyzed personality traits and anxiety-depression in adults during COVID-19 and showed that extraversion, agreeableness, and conscientiousness were negatively associated with health anxiety and COVID-19 anxiety.³⁷ In medical and nursing students, their extroversion and conscientiousness were also inseparable from lower levels of anxiety and depression.⁴² These were also consistent with our findings that extraversion, agreeableness and conscientiousness were negatively related to stress and anxiety. Although these personality traits did not correlate significantly with clinical decision-making for intern nursing student in this study, these personality traits were associated with good nursing competence for nurses in previous study.^{21,22} For nursing students, the development of these personality traits is also needed to some extent.

In contrast to the other personality traits of the Big Five, the main characteristics of high neuroticism represent worry, nervousness, moodiness, insecurity, agitation and apprehension. People with high neuroticism scores react more strongly to external stimuli, which means that they are unable to control their emotions well and often experience negative emotions such as anger, anxiety, and depression.^{43,44} They are often perceived as lacking the ability to think and make decisions, as well as a lack of effective responses to external pressures.^{45,46} Numerous studies have confirmed that neuroticism played an important positive role in adverse emotions (such as anxiety, stress, depression) in different populations.^{37,47} In nursing students, neuroticism was correlated with the manifestation of stress (such as behavioral escape, cognitive escape, and use of alcohol and drugs) and anxiety.^{48,49} This study also showed that intern nursing students with high neuroticism scores had higher anxiety or stress scores. Additionally, intern nursing students with higher neuroticism scores had lower clinical decision-making scores. Although previous studies have focused on nurses, their neuroticism was also detrimental to the development of nursing competence.²¹ In conclusion, in this study, the personality traits of intern nursing students were better predictors of anxiety, stress, and clinical decision-making skills.

Moreover, this study also showed that some intern nursing students still suffered from anxiety and stress during the regular epidemic prevention and control stage. Previous studies have mentioned that nursing students experienced anxiety for a variety of reasons, including academic burden, exam stress, challenges in the clinic, job finding, and complex interpersonal relationships.^{50,51} After the occurrence of COVID-19, adverse emotions such as anxiety and depression were more pronounced in nursing students. This was a predictable outcome, as the occurrence of COVID-19 increased the risk of infection in nursing students and their families.⁵² In addition, the teaching program for nursing students was significantly disrupted; thus, they feared that the interruption of their education would affect their ability and

job search, resulting in worsened anxiety.^{53,54} In the regular epidemic prevention and control stage, most nursing students' anxiety was relieved to some extent.⁸ This study showed the same result; there were some intern nursing students who were still experiencing anxiety and stress. As a result, we still need to continue to pay attention to the demands of intern nursing students.

Implications for Nursing Education and Practice

The COVID-19 outbreak has exposed the shortage of medical staff. Therefore, the training of nursing talent has become particularly important. The results of this study suggest that personality traits are effective predictors of anxiety, stress, and clinical decision-making in intern nursing students. These outcomes also have many implications and reflections for the psychological intervention of clinical nursing students and the development of clinical talent. Concrete contents would include: (1) In daily clinical work, we could actively cultivate the personality trait of openness in nursing students or nurses. For example, openness can be cultivated through cognitive thinking training games, appreciation of works of art, and frequent use of imagination. When a public emergency strikes, we will have enough nursing students or nurses with the personality trait of openness (associated with better clinical decision-making) to provide an adequate talent pool for the front lines. (2) When a public emergency occurs, we can screen high-risk nursing students or nurses who have high neuroticism scores for early psychological crisis intervention to reduce the occurrence of adverse psychological reactions and inappropriate clinical decisions. (3) Additionally, when hospitals recruit nurses, we may be able to select intern nursing students with high openness and low neuroticism as our candidates. This study provides a new perspective and insight for future nursing management.

Innovation and Limitations

Our innovation aims to explore the relationship between intern nursing students' personality traits and clinical decision-making and psychological states, which has not been previously addressed in the literature, and to provide new ideas for future talent development.

At the same time, this study also had certain shortcomings. Since the majority of participants were female and unmarried, the participants in this study may not have been representative of the general population. This limitation could be addressed in future studies by ensuring a more diverse sample of participants. Second, the study was determined through self-reported analysis rather than professional clinical diagnosis, which may lead to reporting bias. In addition, because the study was cross-sectional, no causal inferences could be drawn from the findings. Therefore, a deeper analysis could be conducted in the future using a longitudinal study approach.

Conclusion

This study provides insight into the relationship between the personality traits of intern nursing students and their clinical decision-making, anxiety, and stress in the context of COVID-19. In this study, neuroticism was negatively correlated with clinical decision-making, while openness was positively correlated with clinical decision-making. Furthermore, the psychological health of intern nursing students can be influenced by personality traits. Neuroticism was associated with worse psychological status among intern nursing students. In addition, the majority of intern nursing students still suffered from anxiety and stress, and their mental health should not be neglected.

Abbreviations

BFI-44, the Big Five Inventory-44; SAS, the Self-Rating Anxiety Scale; PSS-14, the Perceived Stress Scale 14; CDMNS, the Clinical Decision-Making in Nursing Scale; SD, standard deviation; VIF, variance inflation factor.

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author.

Ethics and Consent

The ethical consent was approved by the Jiangnan University Medical Ethics Committee (Approval number: JNU20220310IRB49). We confirm that a written informed consent was obtained from the study participants. The guidelines outlined in the Declaration of Helsinki were also followed.

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Disclosure

The authors report no conflicts of interest in this work.

References

- Lai J, Ma S, Wang Y., et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Netw Open*. 2020;3(3):e203976. doi:10.1001/jamanetworkopen.2020.3976
- Preti E, Di Mattei V, Perego G, et al. The psychological impact of epidemic and pandemic outbreaks on healthcare workers: rapid review of the evidence. *Curr Psychiatry Rep*. 2020;22(8):43. doi:10.1007/s11920-020-01166-z
- Alsubaie S, Hani Temsah M, Al-Eyadhy AA, et al. Middle East Respiratory Syndrome Coronavirus epidemic impact on healthcare workers' risk perceptions, work and personal lives. *J Infect Dev Ctries*. 2019;13(10):920–926. doi:10.3855/jidc.11753
- Carmassi C, Foghi C, Dell'Oste V, et al. PTSD symptoms in healthcare workers facing the three coronavirus outbreaks: what can we expect after the COVID-19 pandemic. *Psychiatry Res*. 2020;292:113312. doi:10.1016/j.psychres.2020.113312
- Tung YJ, Lo KKH, Ho RCM, Tam WSW. Prevalence of depression among nursing students: a systematic review and meta-analysis. *Nurse Educ Today*. 2018;63:119–129. doi:10.1016/j.nedt.2018.01.009
- Savitsky B, Findling Y, Erel A, Hendel T. Anxiety and coping strategies among nursing students during the covid-19 pandemic. *Nurse Educ Pract*. 2020;46:102809. doi:10.1016/j.nepr.2020.102809
- Zhu Y, Wang H, Wang A. An evaluation of mental health and emotion regulation experienced by undergraduate nursing students in China during the COVID-19 pandemic: a cross-sectional study. *Int J Ment Health Nurs*. 2021;30(5):1160–1169. doi:10.1111/inm.12867
- Savitsky B, Findling Y, Erel A, Hendel T. Nursing students in crisis mode: fluctuations in anxiety during the COVID-19-related lockdown. *Nurse Educ*. 2021;46(3):E33–e38. doi:10.1097/nne.0000000000000955
- Kumar R, Beniwal K, Bahrupi Y. Pandemic fatigue in nursing undergraduates: role of individual resilience and coping styles in health promotion. *Front Psychol*. 2022;13:940544. doi:10.3389/fpsyg.2022.940544
- Berdidá DJE, Grande RAN. Academic stress, COVID-19 anxiety, and quality of life among nursing students: the mediating role of resilience. *Int Nurs Rev*. 2022. doi:10.1111/inr.12774
- Miao Q, Xie L, Xing B, Wang X, Tang S, Luo H. Emotional states and coping methods in nursing and non-nursing students responding to COVID-19: a cross-sectional study in China. *BMJ Open*. 2021;11(8):e054007. doi:10.1136/bmjopen-2021-054007
- Bilik Ö, Kankaya EA, Deveci Z. Effects of web-based concept mapping education on students' concept mapping and critical thinking skills: a double blind, randomized, controlled study. *Nurse Educ Today*. 2020;86:104312. doi:10.1016/j.nedt.2019.104312
- Sayyah M, Shirbandi K, Saki-Malehi A, Rahim F. Use of a problem-based learning teaching model for undergraduate medical and nursing education: a systematic review and meta-analysis. *Adv Med Educ Pract*. 2017;8:691–700. doi:10.2147/amep.S143694
- Lyon KA, Juhasz G, Brown LJE, Elliott R. Big Five personality facets explaining variance in anxiety and depressive symptoms in a community sample. *J Affect Disord*. 2020;274:515–521. doi:10.1016/j.jad.2020.05.047
- Wauthia E, Lefebvre L, Huet K, Blekic W, El Bouragui K, Rossignol M. Examining the hierarchical influences of the big-five dimensions and anxiety sensitivity on anxiety symptoms in children. *Front Psychol*. 2019;10:1185. doi:10.3389/fpsyg.2019.01185
- Koorevaar AML, Hegeman JM, Lamers F, et al. Big Five personality characteristics are associated with depression subtypes and symptom dimensions of depression in older adults. *Int J Geriatr Psychiatry*. 2017;32(12):e132–e140. doi:10.1002/gps.4670
- Shi M, Liu L, Wang ZY, Wang L, Voracek M. The mediating role of resilience in the relationship between big five personality and anxiety among Chinese medical students: a cross-sectional study. *PLoS One*. 2015;10(3):e0119916. doi:10.1371/journal.pone.0119916
- Milić J, Škrlec I, Milić Vranješ I, Jakab J, Plužarić V, Heffer M. Importance of the big-five in the future medical specialty preference. *BMC Med Educ*. 2020;20(1):234. doi:10.1186/s12909-020-02151-z
- Rezapour-Mirsaleh Y, Aghabagheri M. The relationship between personality dimensions, spirituality, coping strategies and clinical clerkship satisfaction among intern nursing students: a cross-sectional study. *BMC Nursing*. 2020;19(1):76. doi:10.1186/s12912-020-00469-z

20. Kumar R. Personality traits, academic stress and adjustment styles among nursing students. *Nurs J India*. 2018;CIX(4):184–188. doi:10.48029/NJI.2018.CIX404
21. Okumura M, Ishigaki T, Mori K, Fujiwara Y. Personality traits affect critical care nursing competence: a multicentre cross-sectional study. *Intens Crit Care Nurs*. 2022;68:103128. doi:10.1016/j.iccn.2021.103128
22. Takase M, Yamamoto M, Sato Y. Effects of nurses' personality traits and their environmental characteristics on their workplace learning and nursing competence. *Japan J Nurs Sci*. 2018;15(2):167–180. doi:10.1111/jjns.12180
23. Soper DS. A-priori sample size calculator for multiple regression [software]. Available from: <https://www.danielsoper.com/statcalc/calculator.aspx?id=1>. Accessed December 14, 2022.
24. John OP, Srivastava S. The big five trait taxonomy: history, measurement, and theoretical perspectives. *Handbook Person*. 1999;2(1999):102–138.
25. Guo J, Zhang J, De Fruyt F, Pang W. The bright and dark personality correlates of creative potentials, creative activities, and creative achievements. *Current Psychol*. 2021;1–12. doi:10.1007/s12144-021-01710-x
26. Xia J, Wu D, Zhong X, Nie X. Reliability and validity of Chinese big five personality inventory (CBF-PI) among nurses. *Chin J Health Psychol*. 2013;1(21):1684–1687.
27. Zung WWK. A rating instrument for anxiety disorders. *Psychosomatics*. 1971;12(6):371–379. doi:10.1016/s0033-3182(71)71479-0
28. Tian Y, Wang Y, Li J, Wang M, Dang S. Reliability and validity evaluation of anxiety and depression scale in clinical application of patients with liver cirrhosis. *J Pract Liver Dis*. 2019;22(1):105–108.
29. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav*. 1983;24(4):385–396. doi:10.2307/2136404
30. Leng M, Wei L, Shi X, et al. Mental distress and influencing factors in nurses caring for patients with COVID-19. *Nurs Crit Care*. 2021;26(2):94–101. doi:10.1111/nicc.12528
31. Jenkins HM. Improving clinical decision making in nursing. *J Nurs Educ*. 1985;24(6):242–243. doi:10.3928/0148-4834-19850601-07
32. Cowin LS, Craven RG, Johnson M, Marsh HW. A longitudinal study of student and experienced nurses' self-concept. *Collegian*. 2006;13(3):25–31. doi:10.1016/s1322-7696(08)60529-6
33. Canova C, Brogiato G, Roveron G, Zanotti R. Changes in decision-making among Italian nurses and nursing students over the last 15 years. *J Clin Nurs*. 2016;25(5–6):811–818. doi:10.1111/jocn.13101
34. Mulla S, Hakulinen C, Presseau J, et al. Personality traits and career choices among physicians in Finland: employment sector, clinical patient contact, specialty and change of specialty. *BMC Med Educ*. 2018;18(1):52. doi:10.1186/s12909-018-1155-9
35. Fino E, Agostini A, Mazzetti M, Colonnello V, Caponera E, Russo PM. There is a limit to your openness: mental illness stigma mediates effects of individual traits on preference for psychiatry specialty. *Front Psychiatry*. 2019;10:775. doi:10.3389/fpsy.2019.00775
36. De la Fuente-Solana EI, Gómez-Urquiza JL, Cañadas GR, Albendín-García L, Ortega-Campos E, Cañadas-de la Fuente GA. Burnout and its relationship with personality factors in oncology nurses. *Eur J Oncol Nurs*. 2017;30:91–96. doi:10.1016/j.ejon.2017.08.004
37. Nikčević AV, Marino C, Kolubinski DC, Leach D, Spada MM. Modelling the contribution of the Big Five personality traits, health anxiety, and COVID-19 psychological distress to generalised anxiety and depressive symptoms during the COVID-19 pandemic. *J Affect Disord*. 2021;279:578–584. doi:10.1016/j.jad.2020.10.053
38. Chiappelli J, Kvarta M, Bruce H, Chen S, Kochunov P, Hong LE. Stressful life events and openness to experience: relevance to depression. *J Affect Disord*. 2021;295:711–716. doi:10.1016/j.jad.2021.08.112
39. Ó Súilleabháin S, Howard S, Hughes BM. Openness to experience and adapting to change: cardiovascular stress habituation to change in acute stress exposure. *Psychophysiology*. 2018;55(5):e13023. doi:10.1111/psyp.13023
40. Khoo S, Simms LJ. Links between depression and openness and its facets. *Personal Ment Health*. 2018;12(3):203–215. doi:10.1002/pmh.1417
41. Morales-Vives F, Dueñas JM, Vigil-Colet A, Camarero-Figuerola M. Psychological variables related to adaptation to the COVID-19 lockdown in Spain. *Front Psychol*. 2020;11:565634. doi:10.3389/fpsyg.2020.565634
42. Milić J, Škrlec I, Milić Vranješ I, Podgornjak M, Heffer M. High levels of depression and anxiety among Croatian medical and nursing students and the correlation between subjective happiness and personality traits. *Int Rev Psychiatry*. 2019;31(7–8):653–660. doi:10.1080/09540261.2019.1594647
43. Ikizer G, Kowal M, Aldemir ID, et al. Big Five traits predict stress and loneliness during the COVID-19 pandemic: evidence for the role of neuroticism. *Pers Individ Dif*. 2022;190:111531. doi:10.1016/j.paid.2022.111531
44. Flint J, Cohen L, Nath D, et al. The association between the suicide crisis syndrome and suicidal behaviors: the moderating role of personality traits. *Eur Psychiatry*. 2021;64(1):e63. doi:10.1192/j.eurpsy.2021.2235
45. Gori A, Topino E, Palazzeschi L, Di Fabio A. Which personality traits can mitigate the impact of the pandemic? Assessment of the relationship between personality traits and traumatic events in the COVID-19 pandemic as mediated by defense mechanisms. *PLoS One*. 2021;16(5):e0251984. doi:10.1371/journal.pone.0251984
46. Starcevic V, Janca A. Personality dimensions and disorders and coping with the COVID-19 pandemic. *Curr Opin Psychiatry*. 2022;35(1):73–77. doi:10.1097/ycp.0000000000000755
47. Shokrkon A, Nicoladis E. How personality traits of neuroticism and extroversion predict the effects of the COVID-19 on the mental health of Canadians. *PLoS One*. 2021;16(5):e0251097. doi:10.1371/journal.pone.0251097
48. Fornés-Vives J, García-Banda G, Frias-Navarro D, Rosales-Viladrich G. Coping, stress, and personality in Spanish nursing students: a longitudinal study. *Nurse Educ Today*. 2016;36:318–323. doi:10.1016/j.nedt.2015.08.011
49. Zhang Y, Zhao Y, Mao S, Li G, Yuan Y. Investigation of health anxiety and its related factors in nursing students. *Neuropsychiatr Dis Treat*. 2014;10:1223–1234. doi:10.2147/ndt.S61568
50. Gazzaz ZJ, Baig M, Al Alhendi BSM, et al. Perceived stress, reasons for and sources of stress among medical students at Rabigh Medical College, King Abdulaziz University, Jeddah, Saudi Arabia. *BMC Med Educ*. 2018;18(1):29. doi:10.1186/s12909-018-1133-2
51. Heinen I, Bullinger M, Kocalevent RD. Perceived stress in first year medical students - associations with personal resources and emotional distress. *BMC Med Educ*. 2017;17(1):4. doi:10.1186/s12909-016-0841-8
52. Kuru Alici N, Ozturk Copur E. Anxiety and fear of COVID-19 among nursing students during the COVID-19 pandemic: a descriptive correlation study. *Perspect Psychiatr Care*. 2022;58(1):141–148. doi:10.1111/ppc.12851

53. O'Flynn-Magee K, Hall W, Segaric C, Peart J. GUEST EDITORIAL: the impact of Covid-19 on clinical practice hours in pre-licensure registered nurse programs. *Teach Learn Nurs*. 2021;16(1):3–4. doi:10.1016/j.teln.2020.07.007
54. Dewart G, Corcoran L, Thirsk L, Petrovic K. Nursing education in a pandemic: academic challenges in response to COVID-19. *Nurse Educ Today*. 2020;92:104471. doi:10.1016/j.nedt.2020.104471

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