







Predictive Model of the Psychological Well-Being of Nursing Students During the COVID-19 Lockdown

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Abstract

Introduction: Lockdowns due to the COVID-19 pandemic radically changed nursing education. Along with social isolation, the transition to distance education affected the well-being of students in several countries, particularly Portugal and Spain.

Objectives: To identify which variables are predictors of psychological well-being for Portuguese and Spanish nursing students during mandatory lockdowns.

Methods: A multicenter, cross-sectional, descriptive, correlational study involving a sample of 1075 students (944 women, mean age 22.46 +/−4.95 years). Data were collected from an online questionnaire which applied the following scales: Perceived Stress Scale ($\alpha = .820$); Brief COPE-14 Subscales ($\alpha = .430 < 0.930$); Well-being Manifestations Measure Scale ($\alpha = .940$); Herth Hope Index ($\alpha = .850$). A multiple regression model was created to predict the psychological well-being of nursing students.

Results: The following predictor variables were identified in the model of the psychological well-being of students during the COVID-19 pandemic: perceived stress ($\beta = .405$; $p \leq .001$); hope ($\beta = .404$; $p \leq .001$); and the mechanisms of active coping ($\beta = .405$; $p \leq .001$), planning ($\beta = .097$; $p \leq .001$), and positive reinterpretation ($\beta = .053$; $p = .12$). These five variables predicted 62.0% of the nursing students' psychological well-being ($R^2 = .620$; $F = 350.82$; $p \leq .001$).

Conclusion: Promoting students' mental health is essential, especially in periods of great adversity, such as a pandemic. Our results lead the way for the design and validation of an intervention program that addresses the five variables identified as predictors of students' psychological well-being.

Keywords

psychological adaptation, hope, stress, nursing students, COVID-19

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Introduction

COVID-19 lockdowns, as a temporary condition imposed by government authorities requiring that people are obliged to remain in their homes, limiting possible contacts with the outside to the minimum, negatively affect different aspects of life, particularly the physical, mental, and emotional well-being of individuals (Jiloha, 2020; Pfefferbaum & North, 2020; Wang et al., 2021). Scientific evidence has shown a significant increase in the stress symptoms experienced by the population (Brooks et al., 2020; Dubey et al., 2020),

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and highlighted stressors such as quarantine time, fear of infection, frustration, boredom, inadequate supplements and information, financial losses, and stigma.

Review of the Literature

Studies have pointed to college students as one of the groups at risk for changes in psychological well-being during the pandemic (Clabaugh, Duque, & Fields, 2021; Dodd, Dadaczynski, Okan, McCaffery, & Pickles, 2021; Khan et al., 2020). Distance education strategies adopted by universities to cope with compulsory lockdowns have exposed these young people to new risks, such as social isolation, work overload, computer system failures, and more family conflicts (Fawaz & Samaha, 2021; Giusti et al., 2020; Ihm, Zhang, van Vijfeijken, & Waugh, 2021; Lourenço et al., 2021). Higher stress levels have also been found among students who reported financial, family or emotional problems prior to lockdown (Gallego-Gomez et al., 2020).

There are other risks for nursing students, such as interruption in their clinical education, and possible delays in completing their training and entry into the labor market. However, the immediate integration of final-year students into the labor market has been encouraged in some countries in an attempt to meet resource and healthcare needs. Direct exposure to the disease causes fear and stress, which are exacerbated by the lack of knowledge about the virus (Del Pozo-Herce et al., 2021; Medina Fernandez et al., 2021). In addition to the changes relative to pedagogical, social, and technological aspects, nursing students have to deal with stress and early confrontations with reality in the context of providing care.

Aside from the aforementioned aspects, students have become isolated, changing the way they relate to their support network, namely family, friends, the community, and universities, which usually act as a source of emotional and material support (Kim, Sloan, Montejano, & Quiban, 2021). Promoting the psychological well-being of nursing students is essential in this context, particularly in managing hope, which can be understood as a future-oriented personal attitude, an individual perception of self-efficacy in meeting realistic goals (Herth, 1992; Viana, 2010).

Hope, along with gratitude, had already been identified as predictors of students' psychological well-being in the pre-pandemic period; both explaining 45.4% of their psychological well-being (Kardas, Cam, Eskisu, & Gelibolu, 2019). Two studies on college students during the pandemic period have found that stress was inversely related to well-being such that those with low levels of stress had higher levels of hope and thus, had higher levels of well-being (Genç & Arslan, 2021; Lourenço et al., 2021).

Besides hope and stress, studies have also found that coping mechanisms (i.e., family support and resilience, the use of humor, an optimistic attitude, and problem-focused coping) play a role in the psychological well-being of

nursing students during quarantine (Huang, Lei, Xu, Liu, & Yu, 2020; Kim et al., 2021; Savitsky, Findling, Erel, & Hendel, 2020).

Several studies have examined the impact of lockdowns on nursing students' psychological well-being by analyzing several variables. According to our research, however, studies have not analyzed hope, stress, and coping mechanisms as predictors of psychological well-being and the contribution of these variables have been overlooked. As a result, this study aimed to identify the predictor variables of the psychological well-being of Portuguese and Spanish nursing students during the compulsory lockdown period.

Methods

Study Design and Participants and Setting

This is a multicenter, cross-sectional, and descriptive, correlational study. A multiple regression model was created to predict the psychological well-being of nursing students.

The sample of this study included 1,075 students enrolled in a four-year undergraduate nursing program from seven public and private higher education institutions in Portugal and Spain. The total population was 3,003 nursing students (Portugal = 1,803; Spain = 1,200), which corresponds to a participation rate of 35.7%.

The inclusion criteria to participate in the study were as follows: (1) students should be enrolled currently in the undergraduate nursing program at one of the institutions in the consortium and (2) they should be interested in participating in the study. Each institution sent an online questionnaire to their respective students through e-mail during the lockdown from April 23–28, 2020.

Information about the research objectives and the participants' rights were presented at the beginning of the questionnaire. The students gave their informed consent and intentionally validated their answers at the end of the online questionnaire. This study obtained approval from an Ethics Committee, from one of the higher education institutions involved.

Measures

The researchers designed an online questionnaire to collect sociodemographic data (i.e., age, sex, residence, and year in the program), academic conditions and students' satisfaction. The questions asked students to characterize their distance learning experience during quarantine, namely the availability of a non-shared computer, webcam, microphone, and the average number of classes per day. Students were also asked about their satisfaction with the online learning measures adopted by the educational institution, such as their interaction with professors and assessment strategies. The data collection instrument included the Portuguese and Spanish versions of the scales used to assess stress,

psychological well-being, hope, and coping strategies, which had been validated in previous studies with higher education students. A pre-test was applied to 20 students who did not enter the final sample, small adjustments were made in the formulation of the questions, the completion of the instrument took 8 to 11 min.

The Portuguese (Trigo, Canudo, Branco, & Silva, 2010) and Spanish (Remor, 2006) versions of the perceived stress scale [PSS] (Cohen, Kamarck, & Mermelstein, 1983) were applied to assess stress. This scale contains 10 items and a Likert-type scale with 5 response options. Items 4, 5, 7, and 8 are scored inversely. Scores greater than or equal to the 80th percentile are considered pathological and/or suggestive of distress. The 90th percentile refers to people who perceive stress in a very intense, dysfunctional way. Internal consistency was measured by Cronbach's alpha, which was .820.

The Brief COPE instrument was utilized to assess coping styles and strategies (Carver, 1997; Ribeiro & Rodrigues, 2004) (Moran, Landero, & González, 2010; Ribeiro & Rodrigues, 2004). This inventory consists of 28 items distributed across 14 scales with the following Cronbach's alphas: active coping ($\alpha = .67$), planning ($\alpha = .60$), use of instrumental support ($\alpha = .75$), use of emotional social support ($\alpha = .80$), religion ($\alpha = .87$), positive reinterpretation ($\alpha = .77$),

self-blame ($\alpha = .43$), acceptance ($\alpha = 0.65$), expression of feelings ($\alpha = .69$), denial ($\alpha = .73$), self-distraction ($\alpha = .62$), behavioral disinhibition ($\alpha = .77$), substance use ($\alpha = .93$), and humor ($\alpha = .80$).

The well-being manifestations measure scale (WBMMS) (Massé et al., 1998; Monteiro, Tavares, & Pereira, 2012; Sáez Álvarez et al., 2020) was adopted to assess psychological well-being. The scale includes 25 items distributed across five subscales with the following Cronbach's alphas: happiness ($\alpha = .88$), sociability ($\alpha = .84$), self-control and control over events ($\alpha = .88$), social engagement ($\alpha = .69$), self-esteem and balance ($\alpha = .80$), in addition to an overall score or total well-being ($\alpha = .94$).

The Herth Hope Index [HHI] (Herth, 1992; Uribe, Bardales, & Herth, 2012; Viana, 2010) was utilized to assess the various dimensions of hope. It consists of 12 items in total, whose scores can range from 1 to 4 using a Likert-type scale, where "1" indicates "strongly disagree" and "4" indicates "strongly agree." Two items, statements number 3 and number 6, present inverse scores. The total score can range from 12 to 48. Higher scores correspond to higher levels of hope (Cronbach's alpha in this study $\alpha = .85$).

Data Analysis

Questionnaires with missing data were excluded. To process the data, we applied descriptive statistics (sample characterization variables) and inferential statistics, namely correlation coefficients and a Multiple Linear Regression Model, (Method Enter), to identify variables that were predictors of psychological well-being. All assumptions for using the model were verified.

Data were analyzed by Statistical Package for Social Sciences software (IBM SPSS® Statistics 25.0). The confidence level was 95%, for a significance of 5% ($p\text{-value} \leq 0.05$).

Results

Sample Characterization

A total of 705 Portuguese and 370 Spanish students participated in the study. The majority were female students (87.8%), and the mean age was 22.46 years ($SD = 4.99$). At the time of data collection, the participants had been in quarantine for an average of 44.65 days ($SD = 8.20$).

Academic Conditions and Students' Satisfaction

In terms of the conditions for online academic activities (Table 1), the greatest constraints were related to the privacy needed to attend online classes from home ($M = 2.43$; $SD = .81$) and the availability of a webcam and microphone to participate in video conferences ($M = 2.72$; $SD = .69$).

Table 1. Academic Conditions and Online Education Satisfaction During Mandatory Quarantine.

Variables	Min.	Max.	M	SD
During the online classes, I had access to (0 = never; 3 = almost always):				
5.1. Non-shared computer (PC or laptop)	0	3	2.80	0.61
5.4. Stable internet	0	3	2.81	0.54
5.5. Webcam and microphone	0	3	2.72	0.69
5.6. Privacy to attend classes	0	3	2.43	0.81
Satisfaction with the measures adopted by the institution for online education (0 = unsatisfied and 3 = very satisfied)				
8.1. The format of the online classes	0	3	1.92	0.73
8.2. The interaction with professors	0	3	2.06	0.74
8.3. The workload required of the students	0	3	1.36	0.91
8.4. The assessment methods	0	3	1.58	0.84
8.5. The time students need to spend daily at the computer	0	3	1.36	0.90
8.6. The interruption/suspension of internships or clinical education	0	3	0.85	0.93

Given the measures adopted by the institution, students were less satisfied with the interruption/suspension of internships or clinical education ($M = .85$; $SD = .93$); the workload ($M = 1.36$; $SD = .90$), and the time required to be spent on the computer daily ($M = 1.36$; $SD = .90$). In this abrupt transition process to online education, the students demonstrated the most satisfaction with their interaction with professors ($M = 2.06$, $SD = .74$).

The students obtained a mean score of 19.59 ($SD = 6.31$) on the stress scale, well below the maximum value of the scale (50). Conversely, they obtained higher scores close to the maximum values on the hope ($M = 37.54$, $SD = 5.12$) and psychological well-being ($M = 3.33$ $SD = .59$) scales.

Psychological Well-Being and Predictors Variables

Participants adopted some problem-focused coping strategies, namely planning ($M = 3.71$, $SD = 1.32$) and active coping ($M = 3.64$, $SD = 1.28$) however, they also employed emotion-focused coping strategies, such as acceptance ($M = 4.26$, $SD = 1.28$) and self-distraction ($M = 3.62$, $SD = 1.50$) (Table 2).

We set out to analyze the correlation coefficients between the perceived stress, coping, psychological well-being, and hope variables. The results are presented in Table 3.

Predictive Model for Psychological Well-Being During the COVID-19 Pandemic

To study the predictive model for psychological well-being during the COVID-19 pandemic, we were concerned with analyzing the correlations between the potential independent

variables to be introduced in the equation and the dependent variable—psychological well-being. A correlation above $r = .30$ was the criterion. We also verified whether there were no correlations higher than $r = .80$ between the potential independent variables in order to exclude the possibility of multicollinearity (Pallant, 2001). Based on these assumptions, the following variables could be included in the model: perceived stress, hope, active coping, coping by planning, and coping by positive reinterpretation.

For the statistical analysis, we applied the «enter» method of the multiple linear regression procedure. Table 4 demonstrates the predictive model for Psychological Well-Being during the COVID-19 pandemic.

An analysis of Table 4 indicates the following predictor variables for psychological well-being during the COVID-19 pandemic: perceived stress; hope; and the coping mechanisms such as active coping, planning, and positive reinterpretation. The five predictor variables together explain 62.0% of the total variance of psychological well-being, so the model presented herein is significant [$F(5, 1069) = 350.82$, $p \leq .001$].

An individual analysis of each predictor variable revealed that perceived stress is the factor that best explains and predicts psychological well-being as it had the highest contribution. The relationship between the two variables is negative; in other words, a more stressful experience corresponds to a lower level of psychological well-being. Hope is the second factor that predicts psychological well-being. The relationship between the variables is positive, suggesting that a greater feeling of hope contributes to better scores in psychological well-being. Active coping and coping by planning represent the third and fourth predictors of psychological well-being. These results indicate that greater use of these coping strategies is associated with higher levels of psychological well-being. Finally, with the smallest contribution, coping by positive reinterpretation is the fifth predictor variable. The relationship between the variables is also positive, which suggests that the use of this coping mechanisms favor the perception of psychological well-being.

Discussion

Despite the sudden transition to online education, students were able to access the resources needed for this type of education and were satisfied with the measures adopted by the institutions that allowed them to continue their studies. This transition to online education may even constitute an asset in the future as professionals, given the increasing implementation of telenursing programs (Hargreaves, Zickgraf, Paniagua, Evans, & Radesi, 2021).

The results point to a model of the psychological well-being of nursing students constructed with five of the 15 variables studied herein. Perceived stress was the variable that contributed the most to the proposed model ($\beta = -.405$, $p \leq .001$). Other studies on stress among nursing students

Table 2. Descriptive Values for the Variables in the Study.

Variables	Min	Max	Med	M	SD
Perceived Stress Scale (max 50)	0	36	20.00	19.59	6.31
Brief COPE					
Active coping	0	6	4.00	3.64	1.28
Planning	0	6	4.00	3.71	1.32
Instrumental support	0	6	3.00	2.92	1.56
Social and emotional support	0	6	4.00	3.44	1.61
Religion	0	6	2.00	1.79	1.84
Positive reinterpretation	0	6	4.00	3.62	1.64
Acceptance	0	6	4.00	4.26	1.28
Expressing feelings	0	6	2.00	2.84	1.44
Denial	0	6	0.00	0.94	1.30
Self-distraction	0	6	4.00	3.62	1.50
Disinhibition	0	6	0.00	0.94	1.22
Substance use	0	6	0.00	0.26	0.86
Humor	0	6	2.00	2.55	1.55
Hope (max 48)	17	48	37.00	37.54	5.12
Psychological well-being-max 5 (mean score)	1.32	5.00	3.32	3.33	0.59

Table 4. Predictive Model for Psychological Well-Being During the COVID-19 Pandemic.

Variables	Model		
	Standardized β	<i>t</i>	<i>p</i>
Perceived stress	-.405	-18.661	.001
Hope	.404	18.055	.001
Active coping	.097	4.032	.001
Coping by planning	.097	4.220	.001
Coping by positive reinterpretation	.053	2.507	.012
Adjusted R^2	.620		
<i>F</i>	350.82		.001

during the COVID-19 pandemic reported that stress was indicative of changes in the students' mental health (Fitzgerald & Konrad, 2021; Franco & Levi, 2020; Kalkan Ugurlu, Mataraci Degirmenci, Durgun, & Gok Ugur, 2021; Medina Fernandez et al., 2021). Our results corroborate previous findings and add stress as the main predictor of psychological well-being. The different demands felt during lockdown may help us comprehend the dynamics of perceived stress: the sudden transition from an in-person model to an online model of education, the long hours spent on the computer between classes and assignments ($x = 6.42$), the dissatisfaction with the time spent on the computer, and the required workload ($x = 1.36$). Other factors were associated with the students' experience of stress, such as the concern that they themselves ($x = 3.15$) or a family member ($x = 4.51$) might become infected with COVID-19. This concern has already been identified in other studies (Laranjeira et al., 2021; Sui, Gong, & Zhuang, 2021).

Hope was the second most important variable that contributed to the model. The literature on the association between hope and psychological well-being has been scarce. However, a study conducted on college students (Genç & Arslan, 2021) points to a positive correlation ($r = .42$, $p \leq 0.01$) between hope and subjective well-being, just as we found in our study relative to psychological well-being ($r = .67$, $p \leq .01$). Our results appear to be novel in relating these two variables among nursing students during the pandemic.

Hope that persists in the face of great adversity contributes to students' continuous drive (Watts Isley et al., 2021). Thus, a hopeful attitude towards the future should be cultivated by everyone involved in the teaching-learning process. This hopeful attitude can help orient the implementation of academic interventions for the students.

Based on the results presented herein, empowering students to set realistic goals and enhancing their self-efficacy may promote their mental health.

As for coping styles, the predictive model points to active coping, coping by planning, and coping by positive

reinterpretation as the variables that best predict psychological well-being. Several authors have observed the coping mechanisms of students during the pandemic. A study conducted in China compared the coping styles of nursing professionals and nursing students and found that the professionals applied problem-focused coping strategies more often than the students, which had a positive impact on the nurses' well-being (Huang et al., 2020). These results diverge somewhat from our results. The students adopted problem-focused coping (active coping and planning) mechanisms the most, which predicted psychological well-being. In line with our results, the positive reinterpretation strategy was identified as a predictor of well-being (Genç & Arslan, 2021).

Another study revealed a strong association between coping strategies and fatigue among nursing students relative to online education during the mandatory lockdown (Nurhidayati, Pambudi, Rahayu, Elengoe, & Ramuni, 2020).

Working with students and coping strategies, especially those identified in the model, are crucial to a higher level of psychological well-being.

Implications for Practice

The study findings open doors for timely and structured planning of an intervention program aimed at promoting students' mental health during new situations that call for mandatory lockdowns. Those in charge of the institutions are responsible for creating such conditions.

By promoting students' mental health, we ensure the quality of training for new nurses and reduce, as much as possible, potential setbacks legitimized by the anomalous context that we are currently experiencing.

Strengths and Limitations of the Study

The type and size of the sample are the limitations of the study. We recommend that similar studies use larger sample sizes to validate these results, and also the replication of this study in a non-pandemic context. One of the strengths was the support for future research projects, such as the validation of an intervention program that addresses the five variables identified as predictors of students' psychological well-being.

Conclusion

The COVID-19 pandemic has significantly changed the way teaching-learning processes are developed. The need to protect the community and to prevent the spread of infection have intensified the need for dialogue and shared responsibilities among the players involved in higher education institutions which in turn will protect everyone's mental health, particularly nursing students.

The results of this study identified stress, hope, active coping, coping by planning, and coping by positive reinterpretation as predictors of psychological well-being among Portuguese and Spanish nursing students during quarantine in 2020. This study will pave the way for programs aimed at promoting student's mental health during crisis situations like pandemics and in turn improve the quality of training received by new nurses.

Ethics

This study obtained approval from the Ethics Committee of the Institute of Health Sciences at the Catholic University of Portugal, no. 74.

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Supplementary Materials

The data supporting the findings of the article is available from the corresponding author [T. L.] on reasonable request.

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