


Predictors of Depression in Nurses During COVID-19 Health Emergency; the Mediating Role of Resilience: A Cross-Sectional Study

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Abstract

Background: Nurses are susceptible to several mental problems, such as fear, stress, and depression due to the COVID-19 pandemic, which affects their emotional well-being. However, resilience plays an important role in mitigating the effects of COVID-19. **Objective:** This study was to examine the mediating role of resilience in the relation between fear, stress, and depression of nurses during COVID-19 health emergencies. **Methods:** A cross-sectional—predictive study was carried out. The variables analyzed were fear, resilience, stress, and depression. A total of 286 nurses from 2 hospitals in the cities of Juliaca and Puno, Peru. Data analyses were performed using structural equation modeling (SEM). **Results:** Analyses showed that the variables were significantly related ($P < .01$). In addition, a confirmatory analysis of the hypothesized model using structural equation modeling shows that fear and stress are predictors of depression, and that resilience plays a role in mediating the effect of fear on stress ($X^2 = 534.69$, $gl = 372$, $P = .000$; $TLI = .902$, $CFI = .910$, $RMSEA = .039$ [95% $CI = 0.032-0.046$], and $SRMR = .065$). **Conclusion:** Nurses tend to develop fear, stress, and depression. Resilience reduces the impact of these psychological variables. Hospital management should provide psychological support and training for nurses in coping strategies.

Keywords

stress, depression, fear of COVID-19, resilience in the nursing professional

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Introduction

The World Health Organization (WHO), through the 72nd World Health Assembly, has designated 2020 as the International Year of Nursing and Midwifery.¹ On the other hand, since the advent of the COVID-19 pandemic, there have been increased reports of mental illnesses such as fear, stress, and depression among health care workers, particularly nurses.² The impact of the pandemic on the mental health of healthcare workers has not only short-term but also long-term consequences.³

Nurses are among the health care professionals on the front lines in the fight against the COVID-19 pandemic.⁴ According to the College of Nurses of Peru, 30% of nurses nationwide are infected by COVID-19.⁵ In addition, as of January 19, 2021, more than 7700 have been infected and 90 have died.⁶ This situation could negatively impact mental health by causing fear among nurses.⁷ Fear is a reality among

nurses, who spend more time in the patient environment. A survey conducted during the pandemic on the concerns and experiences of nurses during the initial phase of the pandemic in the United States found that 64% were concerned about the safety of their family and friends; while 85% expressed fear of going to their workplace.⁸ Fear of infection and the unknown regarding COVID-19 can contribute to serious mental health problems.^{9,10} Studies have reported that fear could be considered as one of the main causes of COVID-19

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related stress among health care workers.¹¹ This could be due to a sense of danger, the possibility of self-inoculation of the virus, and concern about infecting family members.¹¹ Indeed, the fear of becoming infected with a potentially deadly virus is an understandable and expected source of stress.¹²

One study showed that the main factors associated with stress in healthcare professionals during the COVID-19 outbreak were concern for personal and family safety and worry about patient mortality.¹³ In particular, a study conducted among nurses reported that leaving their children alone and high workload were the main causes of high levels of stress and anxiety.⁹ Similarly, a study conducted among nurses in China during the pandemic found that COVID-19-related stress was associated with an increased risk of depression and anxiety.¹⁴ These findings highlight the need to understand the mental health issues nurses face to implement potential interventions accompanied by emotional support and resilience. In addition to stress, nurses also experience a high level of depression, which could have long-term psychological implications. Findings from other studies reported that 94% of health care workers experienced mild to severe depression.¹⁵ Additionally, a study that looked at the mental health of health care workers during the COVID-19 outbreak reported significant levels of depression, anxiety, and insomnia.¹⁶

Resilience, defined as the ability to adapt and respond positively to hardship, trauma, tragedy, and adversity, influences the regulation of negative emotions.¹⁷ When people are exposed to adverse situations, resilience becomes a protective factor in maintaining mental health. Particularly, resilience can have significant impacts on fear, stress, and depression among healthcare professionals due to the COVID-19 pandemic.^{18,19} In fact, the beneficial effects of resilience lie in its ability to buffer stress and depression.¹⁹ One study showed that resilience plays a mediating role between fear of COVID-19 and depression.²⁰ Nurses with ample resilience would be able to meet and manage the challenges presented in the clinical environments that occurred during the SARS outbreak.

Although resilience could be considered a protective factor against mental health problems, particularly during this time of health crisis²¹; however, the role of resilience with respect to stress-related fear and depression due to COVID-19 among healthcare workers remains unknown. Consequently, there is a need to understand the mediating role of resilience in buffering the effects on emotional well-being. Therefore, this study aimed to determine the mediating role of resilience in the relation between fear, stress, and depression of nurses during COVID-19 health emergencies.

Materials and Methods

Study Design

A cross-sectional—predictive design study was carried out.²² Variables of interest, such as fear, resilience, stress, and depression, were considered.

Study Population

Participants were selected through the non-probability convenience sampling method. We analyzed the effect size which considers the number of observed and latent variables in the model, the anticipated effect size ($\lambda = .3$), the desired statistical significance ($\alpha = .05$), and the statistical power level ($1 - \beta = .95$) which considers a minimum recommended sample of 207; however, 286 nurses from 2 hospitals in the city of Juliaca and Puno, Peru, were considered. The age of the participants ranged from 21 to 69 years (mean age = 43.88 years). In terms of the academic levels attained by the participants, 68.2% had a specialty related to their professional career, 15% had a Master's degree, and 2.8% had a doctorate degree. Finally, 38.5% were single and 35% were married.

Ethical Aspects and Procedures

Ethical procedures followed the standards established in the 1964 Declaration of Helsinki and subsequent modifications. Prior to the application of the questionnaire, the study obtained the approval of the Ethics Committee of a Peruvian university: Registration number: 2021-CE-EPG-000001. Due to the state of emergency for COVID-19, the questionnaire was provided online using Google forms and was sent publicly via e-mails and WhatsApp, preserving at all times the anonymity of the participants. Only employees who agreed to participate in the study on a voluntary basis responded to the questionnaire. Participants who agreed to respond to the questionnaire received information about the objectives of the study with a commitment in return to respect their privacy and responsibility for the use of the data for research purposes only. In addition, they were informed of their voluntary withdrawal at any time during the data collection process. Only the records of persons who agreed to participate voluntarily and signed the informed consent form were included. The time to administer the questionnaire individually was 15 min.

Instruments

COVID-19 pandemic-related perceived stress scale (EEP-10-C)²³: The EEP-10-C is composed of 10 items and presents 5 response options (0 = never, 4 = always). It allows obtaining a score > 25 where a higher value expresses greater stress. Cronbach's alpha was considered between .65 and .86.

Patient Health Questionnaire-2 (PHQ-2)²⁴: The PHQ-2 is a short version of the 9-item Patient Health Questionnaire developed to assess depressive symptoms during the past 2 weeks using 2 items: (1) feeling discouraged, depressed, or hopeless, and (2) little interest or pleasure in doing things. The Spanish version was used,²⁵ presenting 4 response options with scores ranging from 0 to 3 (0 = not at all, 1 = several days, 2 = more than half of the days, and 3 = almost every day). The total score is in the range of 0 to 6, where higher scores indicate greater depressive symptoms. Internal consistency by means of coefficient alpha ($\alpha = .75$).

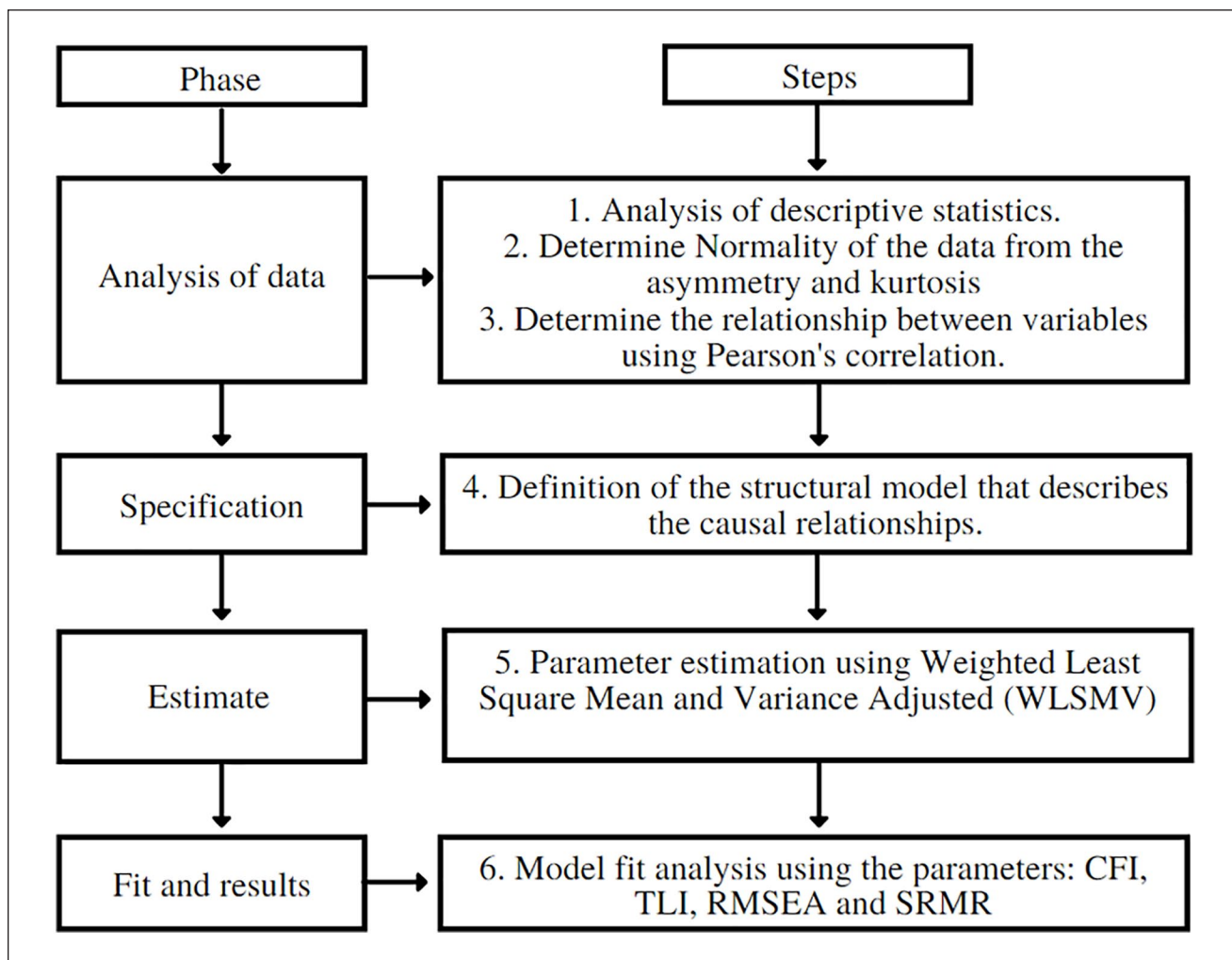


Figure 1. Procedural flow for designing an SEM.

*Fear of COVID-19 Scale (FCV-19S)*²⁶: This is a self-administered scale that assesses fear of COVID-19. The 7-item Spanish version was used,²⁷ which presents optimal internal consistency ($\omega > .89$ and $\alpha > .83$). It has a Likert scale from 1 (Strongly disagree) to 5 (Strongly agree). The higher the score, the greater the fear of COVID-19.

*Connor-Davidson Resilience Scale (CD-RISC)*²⁸: To evaluate resilience, the Spanish version of the scale was used,²⁹ which has 10 items and 5-point Likert-type response categories (0=totally disagree to 4=totally agree). The internal consistency of the scale was adequate (Cronbach's $\alpha = .87$).

Statistical Analysis

Figure 1 shows the flow of the procedure for the design of a structural equation model (SEM). Descriptive statistics were calculated and the normality of the items was evaluated considering the skewness and kurtosis coefficients

(>1.5). The correlations of the variables were analyzed using the Pearson correlation statistic.

A predictive model where fear of COVID-19 and stress predict depression was analyzed through structural equation modeling (SEM). Because it is an analytical technique that allows examining causal and complex relationships,³⁰ and considers factor analysis and linear regression modeling simultaneously to explore relationships between constructs.³¹ In addition, resilience was considered as a mediating variable. The Weighted Least Square Mean and Variance Adjusted (WLSMV) estimation method was used for this analysis. Moreover, the goodness-of-fit indices of the model were evaluated according to the proposals of Escobedo Portillo et al³² and Kline.³³ Comparative fit indexes (CFI) and Tucker-Lewis index (TLI) ranging between .90 and .95 would indicate an acceptable fit and values above .95 would indicate an adequate fit. Root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) indices with values between .05 and .08 would

Table 1. Sociodemographic Characteristics of the Nurses.

Variable	N	%
Marital status		
Single	110	38.5
Married	100	35.0
Cohabitant	57	19.9
Divorced	9	3.1
Widower	10	3.5
Academic degree		
Bachelor	40	14.0
Master	43	15.0
Doctor	8	2.8
Specialty	195	68.2
History of COVID-19 infection		
Yes	127	44.4
No	159	55.6
Health condition		
Cardiovascular disease	20	7.0
Diabetes	7	2.4
Respiratory disease	7	2.4
Cancer	1	.3
None	251	87.8
Financial income		
<\$1700.00	76	26.6
\$1700.00-3000.00	34	11.9
>\$3000.00	176	61.5

Table 2. Descriptive and Analysis of the Distribution of the Study Variables.

Variable	M	SD	95% CI		K-S	P-value
			(LL-UL)			
Stress	15.24	5.82	14.57	15.92	0.06	.01
Depression	1.20	1.41	1.03	1.36	0.28	.00
Fear of COVID-19	17.96	5.86	17.28	18.64	0.06	.01
Resilience	39.06	5.60	38.41	39.71	0.10	.00

Abbreviations: CI, Confidence Interval; K-S, Kolmogorov-Smirnov; LL, Lower Limit; M, mean; SD, standard deviation; UL, Upper Limit.

indicate an acceptable fit and values below .05 would indicate an adequate fit.^{34,35} Statistical analyses were performed using R (version 4.1.1) and R Studio programs.

Results

The descriptive analyses show that 38.5% of the participants were single and 35.0% were married. 68.2% reported that they were pursuing specialization studies. 44.4% had a history of having been infected with COVID-19. Regarding the health condition of the participants, 87.8% did not get sick with COVID-19 and more than 61.5% had a salary higher than \$3000.00 (Table 1).

Table 3. Análisis de correlaciones entre las variables de estudio.

	1	2	3	4	α
1. Stress	1.000				.85
2. Depression	.535**	1.000			.80
3. Fear of COVID-19	.549**	.528**	1.000		.91
4. Resilience	-.410**	-.236**	-.285**	1.000	.86

**The correlation is significant at the .01 level (bilateral).

Descriptive Analysis

The results show the descriptive data of the variables under study. The normality analyses of data through the Kolmogorov-Smirnov test yielded values of $P < .05$ and for this it is assumed that the data do not conform to a normal distribution, therefore, the study variables can be considered as nonparametric variables (Table 2).

Correlation analysis (Table 3) yielded that high stress scores correlated with high depression scores ($\rho = .535$, $P < .01$) and fear of COVID-19 ($\rho = .549$, $P < .01$), and correlated with low resilience scores ($\rho = -.410$, $P < .01$). Furthermore, it was observed that high depression scores correlated with high COVID-19 fear scores ($\rho = .528$, $P < .01$) and with low resilience scores ($\rho = -.236$, $P < .01$). Finally, high COVID-19 fear scores correlated with low resilience scores ($\rho = -.285$, $P < .01$).

For the variables that presented significant correlations, a predictive model of stress and depression was evaluated using structural equation modeling (Figure 2). Fear of COVID-19 and resilience were considered as predictor variables. The results showed that fear of COVID-19 was a variable that negatively influenced resilience ($\beta = -.34$, $P < .001$), but in turn positively influenced stress ($\beta = .62$, $P < .001$) and depression ($\beta = .36$, $P < .001$). Similarly, a negative influence of resilience to stress was observed ($\beta = -.31$, $P < .001$). However, a decrease in the effect of fear of COVID-19 on stress was observed. Likewise, stress had a positive influence on depression ($\beta = .39$, $P < .001$). Therefore, resilience can be considered as a variable that plays a mediating role in the relationship between fear of COVID-19 and stress. While fear of COVID-19 and stress are predictors of depression, resilience plays a role in mediating the effect of fear on stress. This analysis presents adequate goodness-of-fit indices indicating that the structural model adequately fits the hypothesized model ($\chi^2 = 534.69$, $g1 = 372$, $P = .000$; TLI = .902, CFI = .910, RMSEA = .039 [95% CI = 0.032-0.046], and SRMR = .065).

Discussion

During the COVID-19 pandemic, nurses were exposed to high levels of fear and stress leading to depressive disorders. As a result, work, psychosocial, and occupational

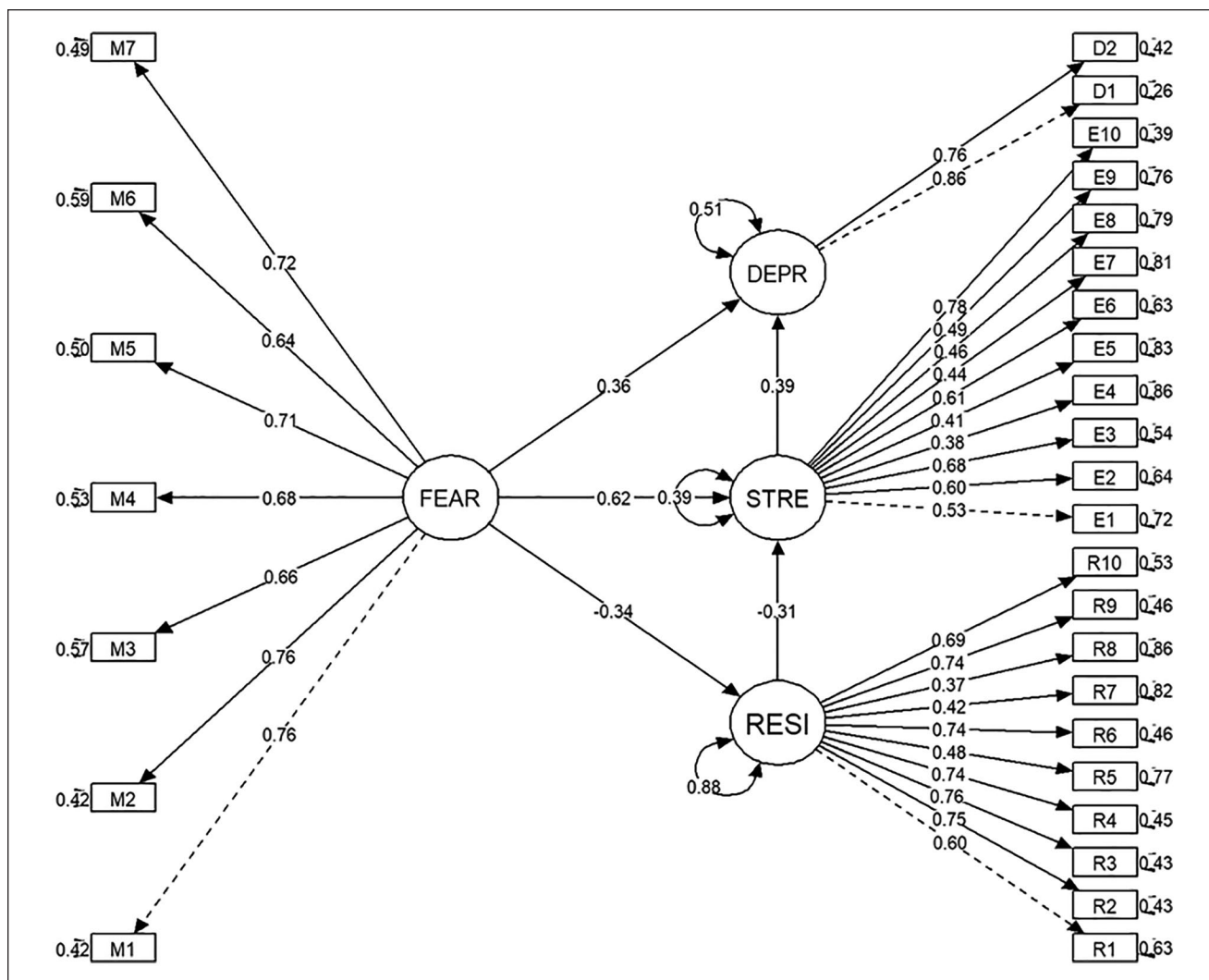


Figure 2. Structural equation model. Goodness-of-fit indices ($X^2=534.69$, $gl=372$, $P=.000$; $TLI=.902$, $CFI=.910$, $RMSEA=.039$ [95% $CI=0.032-0.046$], and $SRMR=.065$).

performance have been compromised, affecting quality of life. In this situation, the concept of resilience has become important in this scenario of health crisis.³⁶

The findings of this study support the hypothesized model and provide evidence on fear and psychological factors in nurses. Specifically, this study reports on the mediating role of resilience in relation to fear of COVID-19, stress, and depression. As predicted, correlation analyses indicated that nurses with a high fear of COVID-19 tend to have higher stress. These results are consistent with the literature, as fear of infection contributes to greater stress at work, due to the high risk of becoming infected, infecting family members, friends, and colleagues.^{37,38} Likewise, the findings also indicated that fear was related to depression, as in previous studies.³⁹ In other words, the higher the frequency of fear, the stronger the association with depression.^{2,40} This

is because nurses have worked with COVID-19 patients are more vulnerable to experiencing depression.⁴¹

Previous studies and the results of the current study showed that nurses' fear of COVID-19 was negatively related to resilience.⁴² Resilience was also associated with work stress and anxiety induced during the COVID-19 epidemic.⁴³ Increased stress leads to an increased risk of depression as shown by our results.⁴⁴ Previous studies indicate that lower levels of resilience are associated with higher levels of stress.⁴⁵ This is because resilience acts as a personal resource for reducing the negative effects of stress and is an important factor against the symptoms of depression.⁴⁴ In addition, resilience may buffer the effect of fear and a wide range of posttraumatic outcomes. The findings indicated that resilience functions as a moderator in relationship to fear, stress, and depression, meaning that fear

has a significant positive impact on stress, and depression in conditions of low resilience. In sum, resilience acts as a psychological force to preserve mental health.^{26,46} Therefore, there is a need to maximize support for nurses with high levels of stress and depression.⁴⁷ It is also suggested that, despite fear of infection, one of the reasons for staying and accepting risks in a resilient or altruistic manner is a sense of commitment and awareness as a nursing professional.⁴⁸ In view of this, to mitigate the depression and fear of nurses, it is important to improve their working conditions, favoring the allocation of resources, and better living conditions during the COVID-19 pandemic.

The contribution of the study is to clarify the interaction approaches between fear, resilience, and psychological factors. Resilience protects against levels of fear, stress, and depression; however, more research is needed to explore these long-term effects during the pandemic. Unfortunately, the COVID-19 crisis is a constant threat to the work of nurses. It is important to consider reducing the workload, increasing the number of nursing staff, and improving financial conditions. A better labor system that includes social protection for nurses should be prepared. As most nurses have direct contact with patients, they will have higher levels of stress, anxiety, and depression. Therefore, it is important to conduct ongoing training on how to deal with the constant psychological threats to which they are subjected. Since it is important to safeguard the psychological well-being of health care workers, one must be psychologically prepared to mitigate the ravages of COVID-19. It is important to propose interventions for the early identification of fear, stress, and anxiety to favor later preventive effects.

Limitations

The findings of the study should be interpreted considering some limitations. The study was conducted in a single specific region of Peru, so it is necessary to extend the sample to other hospitals nationwide to make generalizations to other hospitals. The health restriction and surveillance and control plans on workers with exposure in hospitals made it difficult for the researchers to reach the target population and collect the data, as they could not easily access the online survey. The study was cross-sectional and a survey questionnaire was used for data collection, so causal relationships cannot be revealed. Longitudinal designs could be used in future research, allowing for broader follow-up, greater benefits, and applications. In addition, the Neyman bias (incidence-prevalence) was present in the study given the time lapse between exposure and selection of participants. This eventuality could greatly reduce the fact that participants with higher anxiety could be absent due to lack of acceptance or desertion. Therefore, the study results tend to show a distorted exposure frequency.^{49,50}

Conclusions

The pandemic has contributed to fear, stress, and depression in nurses, negatively affecting their emotional well-being, work activities, and quality of care. Resilience plays an important role in the care and protection of nurses' mental health against the effect of psychological distress during health crisis by COVID-19. The present study contributes to the current literature by suggesting that resilience plays a crucial role in mitigating psychological effects. Hospital administration should prioritize the implementation of interventions in the reduction of fear, stress, and depression and expand knowledge about resilience in nurses.

Declaration of Conflicting Interests


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