

Research Paper

Relationships of Mental Health With Psychological Vulnerability in Nurses Working in COVID-19 Wards: Mediated by Emotional Processing and Perceived Social Support



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ABSTRACT

Background: Working in a hospital involves a lot of long-term stress, which affects people who work in helping professions and are immersed in others' problems. The present study aimed to determine the relationships between psychological capital, mental health, and health anxiety with psychological vulnerability through the mediating role of emotional processing and perceived social support in nurses working in COVID-19 wards in Shiraz City, Iran, in 2021.

Methods: This research is a correlational study using structural equation modeling (SEM). The sample size included 200 nurses from the COVID-19 unit of hospitals in Shiraz. The samples were selected through multistage random sampling. Accordingly, five hospitals in Shiraz were selected randomly, and then, 200 nurses were selected from their COVID-19 unit. The research instruments included the psychological vulnerability scale, the general health questionnaire-28, the psychological capital questionnaire, the health anxiety questionnaire, the emotional processing scale, and the multidimensional scale of perceived social support. The data were analyzed in AMOS-25 using SEM and Pearson correlation coefficient.

Results: The SEM showed that the proposed model fitted the data well. The direct paths from perceived social support, psychological capital, emotional processing, and mental health to psychological vulnerability were negative and significant ($P < 0.01$). The relationships of health anxiety with psychological vulnerability and perceived social support, emotional processing with mental health, and psychological capital with perceived social support were all positive and significant ($P < 0.01$). There was no significant direct relationship between health anxiety and perceived social support and between psychological capital and emotional processing.

Conclusion: Psychological capital and emotional processing played effective roles in reducing nurses' psychological vulnerability and could thus be used to mitigate psychological damages caused by working during the COVID-19 pandemic.

Keywords: Health, Anxiety, Social support, Emotions, Nurses, COVID-19

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1. Introduction

Coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was first identified in Wuhan, China in late December 2019 [1]. In January 2020, the World Health Organization (WHO) declared the COVID-19 pandemic a public health emergency of international concern (PHEIC) [2]. According to the published global records, the disease had a 2% mortality rate [3]. The early symptoms of COVID-19 are coughing, fever, muscle pain, and fatigue. The lack of a treatment or definitive prevention for this disease has caused a great deal of stress and concern among communities [4].

Nurses, who make up more than 75% of the healthcare workforce, have a critical position in the healthcare team and are at the frontline of the battle against the COVID-19 pandemic [5, 6]. The fear and anxiety caused by the possibility of infection have created a great deal of mental and destructive pressure, which can lead to mental disorders, weakening of the immune system, and weakening of the body's ability to fight diseases in members of the community, including healthcare staff (nurses, physicians, etc.) [7]. Working in a hospital involves a lot of long-term stress, which affects people who work in helping professions and are immersed in others' problems [8]. According to the American National Institute for Occupational Safety and Health (NIOSH), nursing is among the top 40 most stressful professions, and it is most likely the most stressful among healthcare professions [9]. In this regard, nurses working in COVID-19 wards are at risk due to the nature of their job, heavy protective gowns, wearing N-95 face masks, and the risk of becoming infected and infecting others, which can lead to psychological disorders [10].

Studies have shown that nurses are subjected to the most stress factors when compared to other professions, and their mental and physical health has an impact on the quality of their work as well as their patients' satisfaction [11, 12]. Schuster and Dwyer [13] conducted a study in China to investigate the mental health of 230 healthcare staff working at COVID-19 hospitals. Their findings revealed that the prevalence of anxiety was higher in females than in males and nurses than in physicians. People's daily lives have changed with the spread of COVID-19, and mental health issues such as fear, anxiety, obsession, and depression have emerged [14, 15].

During the COVID-19 pandemic, Li et al. [16] conducted a study in Wuhan, China, and the results revealed that healthcare staff had high levels of depression, anxiety, insomnia, and distress.

The psychological capital on evidence-based practice of nurses is a crucial factor that can influence healthcare services and the mental health of nurses during the COVID-19 outbreak. Evidence-based practice in nursing can reduce tensions and maladaptation caused by stressful workplaces and can increase job satisfaction in addition to improving nursing knowledge to provide better clinical services [17]. Psychological capital is an important factor in improving the performance of nurses in the workplace [18]. Studies have reported that psychological capital is related to a wide range of variables such as performance in social work situations, commitment and satisfaction, anxiety, and the ability to cope with stresses and problems [19].

Mental health is a state of well-being in which individuals realize their abilities, can cope with the normal stresses of life, can work productively, and can contribute to their community [20, 21]. The news of the increasing cases of COVID-19 infection can increase health anxiety in individuals by threatening their security and well-being. Health anxiety increases the risk of developing mental disorders such as anxiety and depression and the use of psychological, health, and treatment services [22]. The affected individuals are constantly concerned about their health and monitor their physical health and vital signs obsessively [23].

Emotional processing is another factor that can be linked to mental vulnerability. Emotional processing is a process in which emotional distortions are absorbed and resolved [24]. Most people successfully process traumatic events in their personal lives, but some people are unable to effectively resolve or process emotional distortions. As a result, such people have a high level of arousal with so much intrusion from their feelings in the long term, which causes emotional problems for them [25, 26]. The level of support and attention received from loved ones is one of the most important sources of adaptation in stressful situations. Social support entails receiving emotional, instrumental, and informational assistance from others [27]. Perceived social support is defined as an individual's cognitive evaluation of their environment and relationships with others [28, 29]. According to the findings of a study by Henry et al. [30], the level of social support provided by friends is a negative predictor of anxiety symptoms.

Nurses are among the occupational groups that are dealing with stress and psychological problems more than other groups and they are known as the group exposed to COVID-19. The review of the literature published in scientific sources showed inadequate research in Iran investigating these variables simultaneously, highlighting the research gap in this area, and the significance of conducting this study. Investigating the mediating role of emotional processing and perceived social support in the relationship between psychological capital, mental health, and health anxiety with psychological vulnerability in nurses working in COVID-19 wards is one of the most important innovations of the present study. Therefore, based on the above considerations, the present study aimed to determine the relationships of psychological capital, mental health, and health anxiety with psychological vulnerability through the mediating role of emotional processing and perceived social support in nurses working in COVID-19 wards in Shiraz.

2. Methods

Participants

The present study was descriptive-correlational research performed by path analysis. The statistical population of the study included all nurses of the COVID-19 unit in Shiraz, Iran, in 2021. The sample size included 200 nurses from the COVID unit of hospitals in Shiraz. The sample size was selected based on the number of research variables. In this study, there was a total of 15 observed variables ($15 \times 10 + 50 = 200$). The samples were selected through multistage random sampling. Accordingly, five hospitals in Shiraz were selected randomly, and then, 200 nurses were selected from their COVID-19 unit. After selecting the sample, the link to the research questionnaires was provided to the participants through cyberspace and they were asked to answer these questionnaires online.

Research inclusion criteria were individuals who have started working as a nurse in the COVID-19 unit before the commencement of the research, not suffering from any serious physical diseases, not having undergone psychotherapy for at least one month before research, and completing the informed letter of consent.

The exclusion criteria were failure to respond to all questions of the questionnaire. To practice the ethical considerations, all participants were asked to hand over their letter of informed consent and they were informed that they are entitled to leave the research

in case they are willing to. The sampling was carried out after conducting the coordination with the research unit and obtaining the required permits. The data were analyzed confidentially by the researcher.

Research Instruments

Psychological Vulnerability Scale (PVS): The PVS is the short form of the revised version of the symptom checklist-90-revised. The PVS was designed by Derogatis. This scale comprises 25 items, and it is based on the Likert scale. Its subscales include psychical complaints, obsessive-compulsive, depression, anxiety, fear of open spaces, paranoid thoughts, mental distress, and interpersonal sensitivity. Akhavan Abiri and Shairi, [31] reported that the factor structure of PVS was confirmed through confirmatory factor analysis (CFA) on non-clinical samples. Mohammadian et al. [32] reported the reliability of this scale as equal to 0.87 based on the Cronbach alpha coefficient. In this study, the Cronbach alpha coefficient was 0.83 for the scale.

General Health Questionnaire-28 (GHQ-28): Goldberg and Hiller developed this questionnaire in 1979 to diagnose mild mental disorders. GHQ-28 has 28 items and is scored on a 4-point Likert scale. The cut score is 23 to divide the respondents into two categories of normal and nonpsychotic mental disorders. People with <23 scores fall within the mentally healthy category and people with >23 scores fall within the mentally unhealthy group [33]. Abolfazl et al. [34] reported that the internal consistency of the GHQ-28 and SCL-90-R was highly acceptable, and CFA confirmed the convergent validity of both scales. The reliability of the GHQ-28 was 0.91 [35], and the Cronbach alpha coefficient was 0.87 for the questionnaire in the present study.

Psychological Capital Questionnaire (PCQ): Luthans et al. [36] developed the PCQ. This questionnaire constituents 24 questions, as well as four components, i.e., hope, resilience, optimism, and self-efficacy. Each subscale consists of 6 items and the participants respond to each item according to the 6-Point Likert scale (absolutely agree and absolutely disagree). To obtain the score of the psychological capital, first, the score of each subscale is obtained separately. Then, the sum of the scores is considered the total score of the psychological capital. The results of Mohsenabadi et al. [37] indicated the good validity of PCQ. The reliability of the PCQ was 0.89 [37], and the Cronbach alpha coefficient was 0.83 for the questionnaire in the present study.

Health Anxiety Questionnaire (HAQ): Salkovskis and Warwick [38] designed the HAQ. This questionnaire comprises 18 questions. HAQ constituents 3 components, i.e., general health anxiety, suffering from illness, and outcomes of health anxiety, each of which includes 4 items. Each item is scored from 0 to 3 and the highest score is an indication of health anxiety. Nargesi et al. [39] indicated the good validity of this questionnaire. The authors reported the reliability of this tool as 0.89 [39]. In the present study, the Cronbach alpha coefficient of HAQ was 0.87.

Emotional Processing Scale (EPS): The EPS was designed by Baker et al. [40]. The 25-item questionnaire includes 5 dimensions, i.e., suppression, impoverished emotional experience, unregulated emotion, avoidance, and the sign of unprocessed emotion. The participants answer each item on a 5-Point Likert scale (not at all to indefinitely). Kharamin et al. [41] reported that evidence for convergent validity of EPS was supported by significant positive correlations between five subscales and total scores of EPS and total scores of GHQ-28. The authors reported the reliability of this tool as 0.89 [41]. In this study, the Cronbach alpha coefficient was 0.85 for the scale.

Multidimensional Scale of Perceived Social Support (MSPSS): The MSPSS was developed by Zimet et al. [42] to measure social support. The 12-item scale has three subscales: perceived support from family (4 items), perceived support from significant others (4 items) and perceived support from friends (4 items). All of the items are scored on a 7-point Likert scale (from very strongly disagree as 1 to very strongly agree as 7). The score of the MSPSS ranges between 12 and 84. Bagherian-Sararoudi et al. [43] reported that the Persian version of the MSPSS is a valid instrument to measure three different sources of perceived

social support, family, and friends and significant others, among Iranian samples. The authors reported the reliability of this tool as 0.89 [44]. In the present study, the Cronbach alpha coefficient was 0.85 for the scale.

Statistical analyses

The data was analyzed through structural equation modeling using SPSS and AMOS software, version 25. All statistical analyses were performed at the 0.05 level of significance.

3. Results

Findings related to demographic variables revealed that 21.50% of participants were under 25 years old, 36.00% were 25 to 35 years old, 28.50% were 35 to 45 years old, and 14.00% were over 45 years old. Furthermore, 48.50% of the participants were male, while 51.50% were female. The descriptive statistics, including Mean±SD and correlation between the study variables, are presented in Table 1. The original suggested model to describe the connection between the variables is shown in Figure 1.

The results in Table 2 demonstrate that the original model has to be modified based on the root-mean-square error (RMSEA=0.147). To correct the model, the insignificant relationships from psychological capital to emotional processing, and health anxiety to perceived social support were removed. There was a root-mean-square error (RMSEA=0.023) in the final model, indicating that the model fits well. Figure 2 shows the final modified model.

Table 3 shows the results of estimating path coefficients for testing direct hypotheses. The results showed there was a direct relationship between mental health and psychological vulnerability ($\beta=-0.51$; $P=0.013$), emotional

Table 1. Mean±SD and Pearson correlation coefficients of the studied variables

Variables	Mean±SD	1	2	3	4	5	6
1. Psychological capital	87.42±32.12	1					
2. Mental health	93.28±37.19	0.13	1				
3. Psychological vulnerability	68.28±27.18	-0.51**	-0.53**	1			
4. Health anxiety	49.16±19.21	0.11	0.09	0.60**	1		
5. Perceived social support	43.16±15.22	0.66**	0.59**	-0.73**	-0.11	1	
6. Emotional processing	75.98±28.33	0.14	0.17**	-0.69**	-0.46**	0.08	1

** P <0.01.



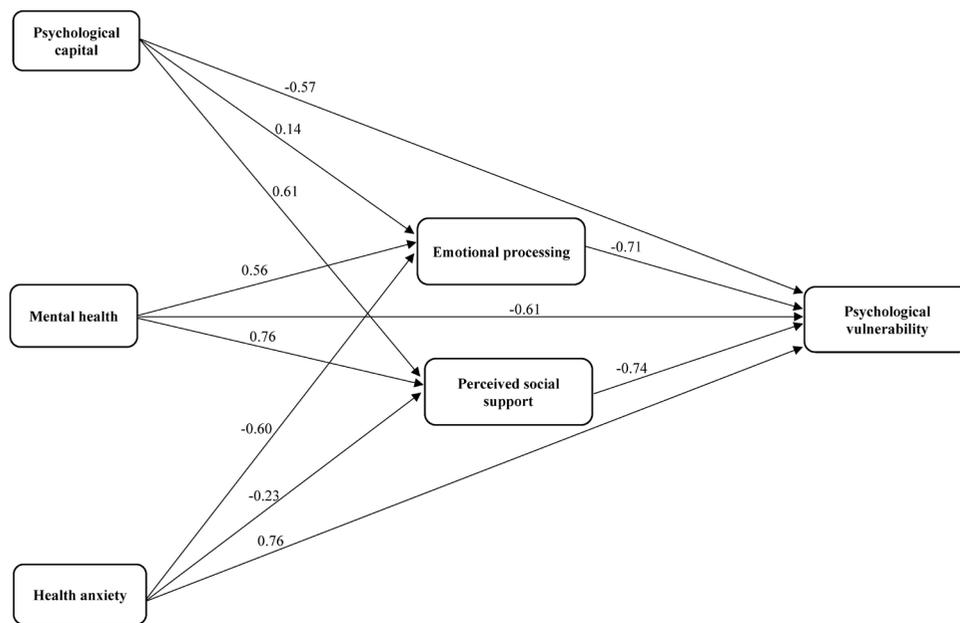


Figure 1. Initial model of the mediating role of emotional processing and perceived social support in the relationship between studied variables

Table 2. Fit indicators of the initial and final models

Fit indicators	χ^2	df	χ^2/df	IFI	TLI	CFI	NFI	RMSEA
Initial model	2.32	1	2.32	0.61	0.62	0.53	0.52	0.147
Final model	4.98	2	2.49	0.92	0.91	0.94	0.92	0.023

IFI: incremental fit index; TLI: the Tucker-Lewis index; NFI: normal fit index; RMSEA: root-mean-square error of approximation.

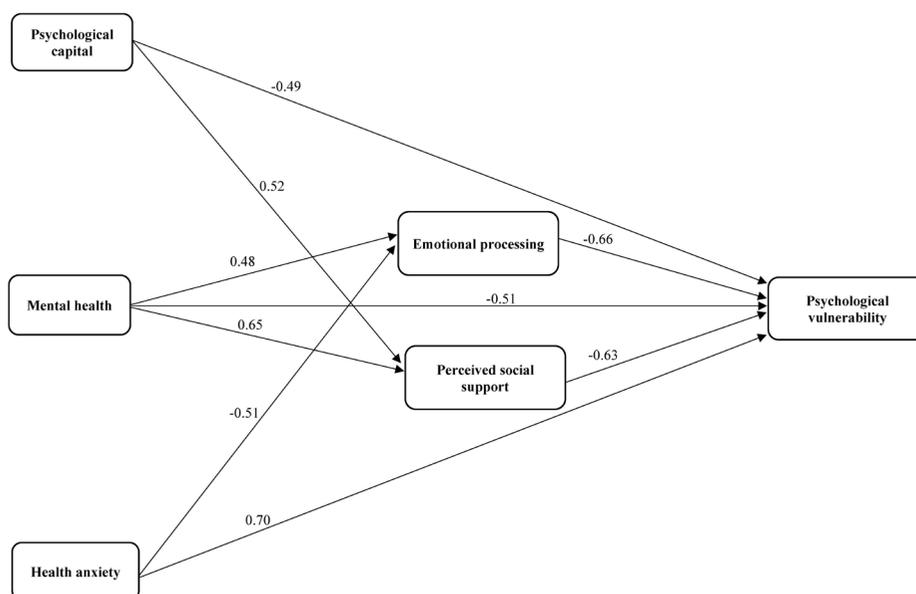


Figure 2. Modified final model of the mediating role of emotional processing and perceived social support in the relationship between studied variables

Table 3. Direct and indirect effects between research variables in the initial and final modified models

Paths	Initial Model		Final Modified Model	
	β	P	β	P
Psychological capital to psychological vulnerability	-0.57	0.012	-0.49	0.001
Mental health to psychological vulnerability	-0.61	0.002	-0.51	0.013
Health anxiety to psychological vulnerability	0.76	0.001	0.70	0.002
Emotional processing to psychological vulnerability	-0.71	0.001	-0.66	0.024
Perceived social support to psychological vulnerability	-0.74	0.001	-0.63	0.001
Psychological capital to emotional processing	0.14	0.127	-	-
Psychological capital to perceived social support	0.61	0.013	0.52	0.004
Mental health to emotional processing	0.56	0.010	0.48	0.017
Mental health to perceived social support	0.76	0.001	0.65	0.003
Health anxiety to emotional processing	-0.60	0.001	-0.51	0.011
Health anxiety to perceived social support	-0.23	0.149	-	-
Psychological capital to psychological vulnerability through emotional processing	0.11	0.067	0.13	0.213
Mental health to psychological vulnerability through emotional processing	0.15	0.033	0.17	0.001
Health anxiety to psychological vulnerability through emotional processing	0.14	0.021	0.15	0.001
Psychological capital to psychological vulnerability through perceived social support	0.17	0.043	0.19	0.001
Mental health to psychological vulnerability through perceived social support	0.13	0.029	0.16	0.001
Health anxiety to psychological vulnerability through perceived social support	0.11	0.112	0.12	0.157

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processing ($\beta=0.48$; $P=0.017$), and perceived social support ($\beta=0.65$; $P=0.003$) in nurses working in COVID-19 wards. There was a direct relationship between psychological capital and psychological vulnerability ($\beta=-0.49$; $P=0.001$), and perceived social support ($\beta=0.52$; $P=0.004$). Moreover, there was a direct relationship between health anxiety and psychological vulnerability ($\beta=0.70$; $P=0.002$), and emotional processing ($\beta=-0.51$; $P=0.011$). There was a negative relationship between emotional processing and psychological vulnerability ($\beta=-0.66$; $P=0.024$) and between perceived social support and psychological vulnerability ($\beta=-0.63$; $P=0.001$) in nurses working in COVID-19 wards. There was no significant relationship between psychological capital and emotional processing, and between health anxiety and perceived social support in the nurses (Table 3).

The bootstrap method was used to evaluate the significance of intermediary relationships. The results showed there was a significant indirect path from mental health to psychological vulnerability through the mediating role of emotional processing and perceived social support ($P=0.001$). Emotional processing had a mediating role in the relationship between health anxiety and psychological vulnerability ($P=0.001$). Also, perceived social support had a mediating role in the relationship between psychological capital and psychological vulnerability ($P=0.001$). The indirect path from psychological capital to psychological vulnerability through the mediating role of emotional processing was not significant. Moreover, the indirect path from health anxiety to psychological vulnerability through the mediating role of perceived social support was not significant (Table 3).

4. Discussion

This study aimed to determine the relationships between psychological capital, mental health, and health anxiety with psychological vulnerability through the mediating role of emotional processing and perceived social support in nurses working in COVID-19 wards in Shiraz, Iran. The results showed that there was a direct relationship between mental health and psychological vulnerability, emotional processing, and perceived social support in nurses working in COVID-19 wards. Also, there was a direct relationship between psychological capital and psychological vulnerability, and perceived social support. According to the results of the present study, there was a direct relationship between health anxiety and psychological vulnerability, and emotional processing. There was a negative relationship between emotional processing and psychological vulnerability and between perceived social support and psychological vulnerability in nurses. The results showed that there was a significant indirect path from mental health to psychological vulnerability through the mediating role of emotional processing and perceived social support. Emotional processing had a mediating role in the relationship between health anxiety and psychological vulnerability. Also, perceived social support had a mediating role in the relationship between psychological capital and psychological vulnerability. This finding is consistent with the results of previous studies [23, 45, 46].

The results indicated that there was a negative and significant relationship between psychological capital and psychological vulnerability in nurses working in COVID-19 wards. This finding is consistent with the results of previous studies [47]. In terms of psychological vulnerability, nurses working in COVID-19 wards are typically concerned about their future as a result of their working conditions. Psychological capital can help reduce psychological vulnerability and this clinical symptom by changing attitudes and reducing anxiety about the future [17]. The spread of COVID-19 has now become a global crisis, afflicting many countries, including Iran. The COVID-19 pandemic has had a variety of psychological effects on nurses. Under critical conditions, social and personal structures are challenged and encounter difficulties. Chaos in personal structures implies that an individual has less power and control and that life is less predictable. For instance, people's lifestyles are disrupted during home quarantine, and as a result, they are less able to predict and plan for their future. People believe they have less control over their lives and this can lead to a feeling of insecurity, which may cause anxiety and stress [22].

The finding showed that there was a significant and negative relationship between health anxiety, psychological vulnerability, and emotional processing in the nurses. This finding is consistent with the results of previous studies [48]. Psychological vulnerability denotes an individual's attempt to avoid or repress emotions, thoughts, and other personal experiences such as physical emotions and anxiety symptoms. This unwillingness to tolerate inner happenings and experiences, as well as specific dysfunctional beliefs about inner experiences, provides a more reliable empirical basis for the psychiatric understanding of health anxiety [23]. Emotional processing is an emotional cognitive characteristic that makes persons unable to adjust and understand their emotions. When emotional information cannot be perceived and evaluated in cognitive processing, individuals become distressed and helpless, and this inability can disrupt their emotional and cognitive structures [24]. Because of their emotional unawareness and inability to cognitively process their emotions, such people are usually incapable of identifying, perceiving, and/or describing their negative emotions, as well as discharging and expressing the emotions associated with depression and anxiety.

The findings showed that there was a significant and negative relationship between perceived social support with psychological vulnerability in the nurses. This finding is consistent with the results of previous studies [49]. Nurses who enjoy a high level of safe social support usually have others to help them when they are in need, and as a result, they may perceive potentially stressful events to be less stressful. Receiving various forms of social support can assist nurses indirectly avoiding or reducing the negative effects of potentially stressful situations [27].

Emotional processing, as a behavioral and cognitive ability, establishes individuals' relationship with the environment by coordinating mental, biological, and motivational processes, equipping them with efficient and appropriate reactions in dealing with situations. Thus, it can improve the person's self-efficacy (one of the components of psychological capital) [24]. However, the non-significant relationship between psychological capital and emotional processing may be caused by several factors. For instance, if this study had been conducted at a different time and location, the relationship between psychological capital and emotional processing could be significant. Additionally, the components of psychological capital on emotional processing may be dissimilar and/or come from two distinct philosophical and cultural contexts.

There was a significant and positive relationship between psychological capital and perceived social support in the nurses. This finding is consistent with the results of previous studies [50]. Social support is the most important and powerful coping force to confront stressful situations successfully and more easily, and it facilitates problem toleration. It appears that when people have social support at work, they can perform better when confronted with stressful working conditions, reflecting their psychological capital [28]. The reason is that they do not feel alone and unsupported in difficult and stressful working situations, and they have a positive feeling that their colleagues and supportive people are for them. In other words, the greater the level of social support, the greater the level of psychological capital, and vice versa.

There was a significant and positive relationship between mental health and emotional processing in nurses working in COVID-19 wards. This finding is consistent with the results of previous studies [51]. Emotional processing can help nurses working in COVID-19 wards become more aware of their positive and negative emotions and lead to acceptance and timely expression, playing a significant role in improving their mental health in COVID-19 critical situations. When people do not receive adequate support from society and their families, they may develop the cognitive distortion that no one loves and cares about them leading to feelings of emptiness and worthlessness. In this way, nurses may unconsciously develop unpleasant feelings [24]. As a result, these feelings of worthlessness and low self-esteem can lead to escaping from reality. Social support refers to three types of positive support from family, friends, and significant others in a person's life. If a person is deprived of all or one of them, his/her mental health is likely to deteriorate. Social support is regarded as a protective factor against health anxiety in nurses working in COVID-19 wards as it can alleviate health anxiety via psychological mechanisms or the nervous and endocrine systems [45]. However, the lack of a significant relationship between social support and health anxiety may be due to cultural differences. For example, while social support is considered a value in some cultures, it is not important in other cultures.

This research faced several limitations. This study was carried out on merely the nurses of the COVID-19 unit in Shiraz, Iran. Generalizing the results of this research to other nurses of the COVID-19 unit should be carried out with caution. The findings of this research were by scales and using a questionnaire. Accordingly, questionnaires can be manipulated due to subconscious findings and it might endanger the results of the research. Considering the importance of the vulnerability pattern during the COVID-19 pandemic, this

study can be used as help to develop other studies in other groups such as interpersonal problems, mood disorders, and behavioral disorders such as aggression, etc. to pave the ground for the psychological interventions following the results. In addition, it is advised to do proper planning in this department to identify the extent of psychological vulnerability caused by COVID-19 in nurses of the COVID-19 unit and provide the required psychological interventions.

5. Conclusion

Psychological capital and emotional processing played effective roles in reducing nurses' psychological vulnerability and could thus be used to mitigate psychological damages caused by working during the COVID-19 pandemic.

Ethical Considerations

Compliance with ethical guidelines

The study was approved by the Ethical Committee of [Tonekabon Branch, Islamic Azad University](#) (Code: IR.IAU.TON.REC.1400.034).

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Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declare no conflict of interest.

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