ORIGINAL RESEARCH

The Relationship between Self-Efficacy, Self-Care Behavior, and Generalized Anxiety Disorder in COVID-19: A Path Analysis Model

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Article Info

Abstract

Background: The outbreak of the COVID-19 pandemic has a strong impact on individuals and becomes a very stressful period. Long-term exposure to stress due to lockdown scenario may also increase psychological distress by reducing support resources, and in these circumstances, personal resources such as self-efficacy and its relationships appear important. It is essential to explore people's beliefs about their capabilities to produce designated levels of behavior in the face of COVID-19, which is not known in the target population, and also to show its effect on anxiety.
Purpose: This study aimed to investigate the relationship between self-efficacy, self-care behavior, and generalized anxiety disorder in COVID-19.
Methods: A cross-sectional online survey was performed after COVID-19 was confirmed in Iran. The samples of the study were 500 residents in the Razavi Khorasan province, Iran, that were randomly selected. Demographic data, general self-efficacy, self-care behavior, and the Generalized Anxiety Disorder (GAD-7) questionnaires were used for data collection. The data were analyzed using bivariate correlation and hierarchical linear regression models.
Results: The mean(SD) age of the participants was 31.9(11.9). Their GAD-7 scores had severe anxiety (score ≥17). There was a negative and significant relationship between generalized anxiety disorder and self-efficacy (r=-0.238, $p \leq 0.01$). Also, there was a positive and significant relationship between self-efficacy and self-care behavior. No significant relationship between generalized anxiety disorder and self-care behavior was found. The path analysis model estimated anxiety and self-efficacy as about 4% of the variance self-care behavior in COVID-19.
Conclusion: This study revealed that enhancing self-efficacy levels might reduce anxiety. Self-efficacy-enhancing programs should be used as part of the routine readiness effort drives and health care system change.

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1. Introduction

COVID-19 pandemic has become a severe health threat to people in Iran and around the world (Mailani et al., 2021; Pourhaji et al., 2022; Tuppal et al., 2021). The COVID-19 is now a virus disease with the fatality rates ranges from 2.5% to 3% (Wu & McGoogan, 2020). The outbreak of the COVID-19 pandemic has a strong impact among individuals and becomes a very stressful period. Zhang et al. (2020) showed that 33% of the study participants had not left their home at all during the previous month due to the restrictive measures to contain COVID-19 and 25% had to stop working due to the outbreak. Those who stopped working reported worse health conditions by Short Form-12 (SF12) as well as distress (Mahmoud et al., 2016; Zhang et al., 2020). Anxiety is one of the issues that people face in an epidemic era. Meanwhile, Generalized Anxiety Disorder (GAD) is specifically characterized by extreme and persistent anxiety that is uncontrollable and pervasive, and the resulting anxiety focuses on all daily life events (Mahmoud et al., 2016). It seems that due to inhibition of the sympathetic system in

these people, their physical symptoms have increased restlessness, fatigue, muscle tension, irritability and difficulty concentrating and sleeping (Abdi et al., 2013).

The study by Martin (2009) showed that stress can have adverse effects on the immune system. Therefore, in epidemic conditions, COVID-19 can affect on people's responsiveness and it seems to have destructive effects the rate of infection and body resistance to this disease. In addition, with the growth of information technology to obtain information from various sources, especially the Internet and social networks, people are aware of the various sources, and this may affect the perception of risk (Kwok et al., 2020).

Qian et al. (2020) in a cross-sectional study among 510 residents of Wuhan, China, and 501 residents of Shanghai, reported that the studies subjects had moderate to severe anxiety. The results of this study showed the efforts to disseminate accurate and reliable information in a timely manner to affect high levels of anxiety (Qian et al., 2020). Long-term exposure to stress due to the lockdown may also increase psychological distress by reducing support resources (e.g., family), increasing the importance of personal resources such as self-efficacy, and relationship variables (Mousavi et al., 2021; Losada-Baltar et al., 2020). This issue may have a profound effect on perceived loneliness, a factor that is broadly related to psychological distress as well as the outcome itself (Cacioppo & Cacioppo, 2018).

Self-efficacy is constructing preventive behaviors by reinforcing positive steps and the belief that one has ability to overcome a given situation. Self-efficacy is defined as perceived capability to perform a target behavior (Bandura, 1977). It refers to the confidence in one's ability to acquire a new behavior (Sharma, 2016). Self-efficacy is central to health behavior theories due to its robust predictive capabilities. One of the purported strengths of self-efficacy is that it explains why people are (or are not) motivated to perform health-related behaviors, rather than merely predicting who is (or is not) motivated to perform health-related behaviors (Bandura, 1977). Research shows a significant relationship between self-efficacy and behavior and anxiety. Simonetti et al. (2021) found a negative correlation between self-efficacy and anxiety. Xue et al. (2021) showed that the COVID-19 is a global issue which affects the entire population's mental health and there was a positive correlation between the quality of life and self-efficacy. In such a way, it can be said that self-efficacy is a necessary and important factor for self-care behavior during the COVID-19 pandemic.

Repeating mental health concerns that require the establishment of unauthorized views and encouraging lifestyle modification and motivating behavior change will help assess stress and coping strategies (Mukhtar, 2020). Similar studies have indicated this finding. Yildrim and Güler (2020) showed that COVID-19 severity, self-efficacy, and preventive behaviors uniquely predicted mental health and indicated findings may underscore development of interventions to improve mental health of individuals during pandemic. Pragholapati (2020) suggested people who are high in so-called Bandura overcoming self-efficacy, are more able and pleasant to take on threatening tasks, where they might experience many failures because they are not overcome by anxiety. They are confident in their ability to overcome difficult situations. Furthermore, long-term exposure to stress due to the lockdown scenario may also increase psychological distress by reducing support resources, and in these circumstances, personal resources such as self-efficacy, and its relationships appear important. It is not known regarding people's beliefs about their capabilities to produce designated levels of behavior in the face of COVID-19 in the population of Iran, and this study helps us to explore these beliefs in different cultural contexts as well as the effect on anxiety.

Obviously, by unbalancing mental health factors in case of low self-efficacy and causing negative outcomes such as anxiety, most part of self-care behaviors will be affected. However, data regarding the relationship between self-efficacy and self-care behaviors in COVID-19 pandemic are limited, and questions remain about how to interpret the relationship of self-efficacy to anxiety disorder or avoidance behavior in general (Tahmassian et al., 2011). Thus, it is interesting to find out whether the correlations between self-efficacy, self-care behavior and generalized anxiety disorder in COVID-19 hold up. Accordingly, this study aimed to investigate the relationship between self-efficacy, self-care behavior, and generalized anxiety disorder in COVID-19.

2. Methods

2.1 Research design

This study was a cross-sectional online survey that was performed after the confirmed spread of SARS-CoV-2 in Iran from February 19, 2020 to March 13, 2020.

2.2 Setting and samples

The participants in this study were 500 residents in the Razavi Khorasan province, Iran, that were randomly surveyed about their anxiety, self-efficacy, and self-care behavior status. Eligible participants in this study were the general population who: (i) were aged 17 years old or above, (ii) could understand Persian language, (iii) have lived in Razavi Khorasan for at least 6 months before the survey, (iv) not suffering from mental illness, and (v) have literacy and capability of working with computers and an Android phone. The respondents with incomplete responses were excluded from the study.

2.3 Measurement and data collection

The data were collected from February 19, 2020 to March 13, 2020. The instruments used in this study included demographic data (gender, age, education and occupational status, travel history in the past month), general self-efficacy scale, self-care behavior scale, and generalized anxiety disorder questionnaire with the 7-item GAD scale.

Self-efficacy was assessed using the General Self-Efficacy Scale which is a 10-item scale. Participants responded to questions concerning "to what extent did you feel capable of coping effectively with the current situation?" Answers were based on a five-point Likert scale from 0 "not at all true" to 5 "exactly true". Face and content validity were evaluated by an expert panel consisting of 10 specialists in health education and psychologists and attempted to obtain equivalents of semantic, empirical, and conceptual words and sentences. The experts answered to comment independently on the necessity and relevance of the items in order to calculate Content Validity Ratio (CVR) and the Content Validity Index (CVI). The CVR and CVI of the questionnaire were ≥0.80 and >0.78, respectively. According to Polit et al. (2007), these indicators were appropriate. The consistency of the scale was assessed among 70 participants. In this study's samples, good internal consistency was also found (Cronbach's α=0.89).

Generalized anxiety disorder was assessed using the 7-item GAD scale (Spitzer et al., 2006). The generalized anxiety disorder questionnaire measures the severity of its symptoms over the past two weeks on a 4-point Likert scale ranging from 0 (never) to 3 (nearly every day). The total score ranges from 0 to 21, with increasing scores indicate 17 more severe functional impairments as a result of anxiety (Spitzer et al., 2006). The scores of GAD 0-10 was categorized as low anxiety and the score of 10-16 was indicated as moderate level anxiety. A previous study (Naeinian et al., 2011) has shown that GAD is valid in the Iranian community population. A cut of the point was identified that optimized sensitivity (89%) and specificity (82%) (Spitzer et al., 2006). In this study, GAD-total score of 10 points or greater was defined as the presence of anxiety symptoms (Naeinian et al., 2011). Face and content validity was evaluated by an expert panel consisting of 10 psychologists. They reviewed the final version of the GAD scale and were answered to comment independently on the necessity and relevance of the items to calculate the CVR and CVI. The CVR and CVI of the questionnaire were ≥0.79 and >0.7, respectively. According to Polit et al. (2007), these indicators were appropriate. The consistency of the GAD Scale was also assessed in a pilot study of 70 similar participants. In this study's sample, good internal consistency was also found (Cronbach's α=0.81).

Self-care behavior was measured by six items as follows: (1) "I am trying to avoid public transportation to prevent a COVID-19 disease", (2) "I am trying to eat in restaurants to prevent a COVID-19 disease", (3) "I am trying to avoid visiting public places to prevent a COVID-19 disease", (4) "I am trying to wear masks to prevent a COVID-19 disease", (5) "I am trying to use gloves to prevent a COVID-19 disease", and (6) "I am trying to wash my hands for 40 seconds to prevent COVID-19 disease. Answers were based on a five-point Likert scale from 0 "Never" to 5 "Always". The total score for self-care behavior is calculated in these sub-scales. The scores were between 0-25. The higher scores indicated higher levels of self-care behavior. Face and content validity of the self-care behavior scale were evaluated by an expert panel consisting of 10 specialists in health education. The CVR and CVI of the questionnaire were ≥0.80 and >0.79, respectively. According to Polit et al. (2007), these indicators were appropriate. The consistency

of self-care behavior scale was assessed in a pilot study of 70 similar participants. Good internal consistency was found (Cronbach's α=0.78).

The instrument expanded online questionnaire in Persian language and adopted it from previous studies by social media such as Telegram and WhatsApp. To avoid duplicate responses from the same responder, the survey could only be taken once from the same electronic device. Data collection lasted about two months. Due to the specific prevention endorsed throughout the outbreak, including prevention in close contacts and touch precautions.

2.4 Data analysis

Analyses were carried out in SPSS statistical version (v.20). Descriptive analysis of the responses was performed to report the counts and frequencies. Furthermore, independent sample t-test, One-Way ANOVA, and bivariate correlation path analysis model were performed.

The hierarchical linear regression model was used to analyze the effects of self-efficacy and generalized anxiety disorder and self-care behavior. First, we tested the statistical assumption of the normal distribution of a research variable by the one-sample Kolmorov Smirnov (K-S) test. We followed the steps for evaluating a mediating effect as proposed by Baron and Kenny (1986). Step 1, we examined whether self-efficacy and generalized anxiety disorder was correlated. Step 2, we examined the association of self-efficacy and self-care behavior. Step 3, we examined the effect of generalized anxiety disorder on self-care behavior while controlling for self-efficacy.

2.5 Ethical considerations

This study was approved by the Ethics Committee of Torbat Heydariyeh University of Medical Sciences with the ethical clearance certificate number of IR.THUMS.REC.1398.055. Informed consent was completed by the participants prior to their participation.

3. Results
3.1 Characteristics of the respondents

As many as 500 participants responded to the survey in this study with a response rate of 98%. Ten questionnaires were omitted as they were incompletely augmented or filled out. The mean(SD) age of participants was 31.9(11.9). The majority were female (74.2%) and aged 18-27 years old (42.6%) (Table 1). The results also indicated that 167 (33.4%) of the participants were single, 327 (65.4%) were married, and 6 (1.2%) were divorced. Related to anxiety, the results showed that 7.6% (n=38) participants had low-level anxiety (0-10), 14.4% (n=72) had moderate level-level anxiety (10-16), and 78% (n=390) had severe level anxiety (GAD-7 score ≥17).

Table 1. Characteristics and travel history of the participants (n=500)

Variable	f	%
Gender		
Male	129	25.8
Female	371	74.2
Age (years)		
18-27	213	42.6
28-37	144	28.8
38-47	84	16.8
48-57	42	8.4
58 or above	17	3.4
Educational level		
Elementary and lower	35	7
Guidance school	18	3.6
High school and diploma	104	20.8
Graduate and above	343	68.6
Employment status		
Employee	188	43.6
Employer	14	2.8
Housewife	218	43.6
Retired	12	2.4
Unemployed	68	13.6

Table 1. Continued

Variable	f	%
Medical visit in the last 14 days		
Yes	60	12
No	440	88
Having had respiratory symptoms in the last 14 days		
Yes	132	26.4
No	368	73.6
Last month's travel history		
Yes	100	20
No	400	80

3.2 The relationship between participants' characteristics and self-efficacy, generalized anxiety disorder and self-care behavior

The results of the independent sample t-test showed no relationship between gender and self-efficacy (*p*=0.7). However, there was a relationship between gender and generalized anxiety disorder (*p*≤0.001), and between gender and self-care behavior (*p*≤0.001). The findings also indicated a relationship between age and self-care behavior; individuals aged 18-27 years old had the most self-care behavior (*p*≤0.001). Furthermore, results of One-Way ANOVA showed a relationship between educational level and self-care behavior, indicating that participants with high school and diploma had the most self-care behavior (*p*=0.01). Also, a relationship between employment status and self-care behavior was found, indicating that housewife participants had the most of the self-care behaviors against COVID-19 (Table 2).

Table 2. The relationship between participant characteristics and self-efficacy, generalized anxiety disorder and self-care behavior in COVID-19

Variable	N(%)	SE	GAD	SCB
		Mean(SD)	Mean(SD)	Mean(SD)
Gender				
Male	129 (25.8)	38.55(5.72)	4.85(4.27)	19.46(5.07)
Female	371 (74.2)	38.37(6.92)	7.07(5.4)	21.03(3.71)
Independent sample t-test		*p*=0.7	**p*≤0.001	**p*≤0.001
Age (years)				
18-27	213 (42.6)	38.15(6.57)	6.69(5.38)	21.28(3.21)
28-37	144 (28.8)	37.44(6.84)	7.07(5.06)	20.57(3.93)
38-47	84 (16.8)	40.73(6.94)	5.11(4.95)	20.32(4.69)
48-57	42 (8.4)	38.61(4.98)	6.61(4.91)	18.80(6.02)
58 or above	17 (3.4)	38.11(5.21)	5.64(6.26)	18.29(5.53)
One-way ANOVA		*p*=0.10	*p*=0.07	**p*≤0.001
Educational level				
Elementary and lower	35 (7)	38.37(5.80)	7.65(6.11)	19.17(5.48)
Guidance school	18 (3.6)	38.88(7.76)	6.16(5.69)	21.27(4.29)
High School and Diploma	104 (20.8)	39.03(7.62)	6.78(5.30)	21.63(3.48)
Graduate and above	343 (68.6)	38.21(6.33)	6.30(5.10)	20.48(4.08)
One-way ANOVA		*p*=0.7	*p*=0.4	*p*=0.01
Employment status				
Employee	188 (43.6)	39.15(6.26)	5.89(5.08)	20.03(4.51)
Employer	14 (2.8)	36.42(6.33)	7.57(5.7)	19.30(5.97)
Housewife	218 (43.6)	37.86(7.17)	6.94(5.28)	21.50(3.27)
Retired	12 (2.4)	40(5.52)	5.33(3.84)	19.16(5.67)
Unemployed	68 (13.6)	38.32(5.88)	6.72(5.53)	20.12(4.19)
One-way ANOVA		*p*=0.21	*p*=0.25	**p*=0.002

Note: *p<0.001. self-efficacy (SE), generalized anxiety disorder (GAD), and self-care behavior (SCB)

As seen in Table 3, the mean and standard deviation of self-efficacy, anxiety, and self-care behavior was 33.28(7.4), 6.4(5.23), and 20.66(4.12), respectively. There was a negative and significant relationship between generalized anxiety disorder and self-efficacy (r=-0.238,

$p\leq0.001$). Furthermore, there was a positive and significant relationship between self-efficacy and self-care behavior (r=0.102, p=0.02). On the other hand, the results also indicated no significant relationship between generalized anxiety disorder and self-care behavior.

Table 3. The correlation between self-efficacy, generalized anxiety disorder and self-care behavior

Variables	Mean(SD)	N	SE	GAD	SCB
1. Self-efficacy	33.28(7.4)	500	1		
2. Generalized anxiety disorder	6.4(5.23)	500	r =-0.238** p<0.001	1	
3. Self-care behavior	20.66(4.12)	500	r =0.102* p=0.02	r =-0.01 p=0.83	1

Note: **Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed)
Abbreviations: GAD-7 (Generalized anxiety disorder 7-item scale); SE (Self-efficacy); SCB (Self-care behavior)

Before examining the research questions, correlations among the three variables were calculated. Generalized anxiety disorder (M=6.4, SD=5.23) and self-efficacy (M=33.28, SD=7.4) were significantly and negatively related (r=-0.238, p<0.01). Self-care behavior was significantly and positively related to self-efficacy (r=0.10, p=0.02). In other words, self-care behavior scores increased with an increase in self-efficacy. However, generalized anxiety disorder was not related to self-care behavior (r=-0.01, p=0.83). We used the hierarchical linear regression model to analyze the effects of self-efficacy and generalized anxiety disorder, and self-care behavior. First, we tested the statistical assumption of the normal distribution of the research variable. Then the one sample Kolmorov Smirnov test showed that normal distribution was obtained. We followed the steps for evaluating a mediating effect as proposed by Baron and Kenny (1986), including: Step 1, we examined whether self-efficacy was a significant predictor of generalized anxiety disorder; Step 2, we examined self-efficacy as a significant predictor related to self-care behavior; Step 3, we examined whether the generalized anxiety disorder was a significant predictor of self-care behavior while controlling for self-efficacy. If the generalized anxiety disorder was a complete mediator of the relationship between self-efficacy and self-care behavior, then the effect of self-efficacy should be zero. The findings indicated that self-efficacy (ß=-0.24, p<0.001) and generalized anxiety disorder (ß=0.10, p<0.001) were significant predictors of self-care behavior (Table 4). They explained 4% of the variance in self-care behavior. As shown in Table 4, the effect of self-efficacy on generalized anxiety disorder was not zero (Step 3). Thus, generalized anxiety disorder was a partial mediator rather than a complete mediator.

Table 4. Effects on self-efficacy and generalized anxiety disorder self-care behavior in COVID-19

	Beta (ß)		
	Step 1	Step 2	Step 3
Age	-0.07	-0.18***	-0.18***
Gender (1=male)	0.01***	0.153***	0.152***
Marital status (1=married)	-0.01	0.062	0.055
Education	-0.08	-0.02	-0.02
Self-efficacy	-0. 24***	0.11***	-0. 023
Generalized anxiety disorder	-	-	0.10***
Adjusted r²	0.05	0.06	0.04
F	7.17	6.91	5.57
p	0.000***	0.000***	0.000***

*Note: ***p<0.001*

The indirect effect of self-efficacy on self-care behavior through generalized anxiety disorder was 0.011, calculated by multiplying the direct effects of 0.11 and 0.10. Thus, the total effect was -0.012 (-0.023 and 0.011) (Figure 1).
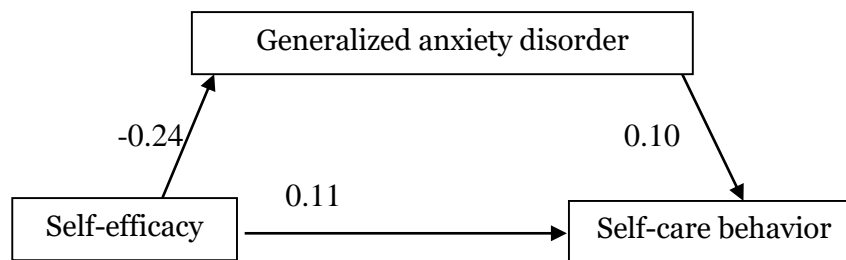
Figure 1. Path diagram of the self-efficacy, generalized anxiety disorder and self-care behavior

4. Discussion

The purpose of this study was to investigate the relationship between self-efficacy, self-care behavior, and general anxiety disorder in COVID-19 in Razavi Khorasan Province's population. The average score of anxiety in this study was high, 78% of the participants had scores of anxiety upper 17, which indicated high anxiety.

The results of this study indicated that after controlling for demographic data, self-efficacy had a direct negative effect on anxiety. Some scientific research and efforts identified that low levels of self-efficacy occur with high levels of anxiety. Self-efficacy can be a cognitive factor that plays a mediating role in the anxiety and when people become anxious, a low sense of self-efficacy will be activated (Muris, 2002). This finding was confirmed in the study by Xiao et al. (2020) and other studies (Tahmassian & Moghadam, 2011; Wang et al., 2019; Wu et al., 2013). In general, people with high self-efficacy can control their emotions even when they are under anxiety (Bihlmaier & Schlarb, 2016) and have increased self-focus and self-control (Przepiórkaet al., 2019), and therefore seems to has a positive impact on self-care behaviors of the individuals. An individual who has high self-efficacy indicates that she/he will have a positive evaluation of herself/himself (Bowsher & Keep, 1995), which also shows the individual's positive self-evaluation and ability. High self-efficacy means individuals believe in their own ability for being successful in certain behaviors. Having a positive belief in one's ability also engenders a sense of control and decreases negative emotional symptoms. People who have high self-efficacy also can use more different strategies to achieve their goals thereby decreasing anxiety (Muris, 2002). Self-care behaviors and activities related to disease and treatment are essential for the patient's physical and psychological health (Wenget al., 2008).

This study also showed that self-efficacy had a positive correlation with self-care behavior. This result is supported by previous research (Tharek et al., 2018). Another study also showed that COVID-19 self-efficacy and preventive behaviors uniquely predicted mental health over and above gender and age (Yıldırım & Güler, 2020). The results of a previous study indicated one of the effective factors in self-care behavior is awareness (Heo et al., 2008). In the present study, self-care behavior was higher in women than men. It seems that female participants' knowledge was higher than male participants. Another reason may be that in our study, there were more housewives who followed the news and the media more and paid more attention to self-care behaviors, when compared to males.

In current study, there was a relationship between gender and means of generalized anxiety disorder; women had a higher score than men. These findings are consistent with other studies (Du et al., 2020; Lau et al., 2010). This may be because women were more likely than men to follow illness and deaths due to illness, which made them more anxious. In contrast to our study, the results in the study of Lee (2020) and Huang and Zhao (2020) showed no relationship between gender and anxiety. In our study, there was a relationship between educational level and self-care behavior so that people with high school and diploma tend to have higher self-care behavior score. This finding is consisted with a study by Mohammadpour et al. (2020) which indicated a relationship between educational level and self-care behavior, such as hand washing.

The results in this study, despite the negative effect of anxiety on behavior, indicated that there was no significant relationship between generalized anxiety disorder and self-care behavior. Consistent with the present study, a study by Mohammadpour et al. (2020) also found that there was an association between anxiety and handwashing behavior. Similarly, Asadi et al. (2021) also reported a negative and significant correlation between generalized anxiety disorder and self-care behavior. Perhaps one of the reasons for this finding was the low perception of risk in the research samples.

5. Implications and limitations

The research findings indicate that self-efficacy has a positive and significant correlation with self-care behaviors and a negative and significant correlation with anxiety disorder. Considering the important roles that nurses have in caring for patients with COVID-19, it is necessary to provide appropriate interventions, including increasing self-efficacy to increase self-care behaviors and reduce anxiety disorder and ultimately improve the quality of life. This study also shows that self-efficacy can be best regarded as a cognitive factor that plays a mediating role in anxiety. The present results show that different domains of self-efficacy and symptoms of affective disorder are significantly correlated. However, more prospective studies are needed.

Our study has many limitations. First, in order to assess the public response to the major public health crisis, we shortened our survey questionnaire and obtain representative population samples using random sampling. Second, we asked participants to remember some of their behaviors; as a result, their answers might have recalled bias. This study did not inquire about the occupation of respondents who were employed. If this study recruited health care workers, they are at the highest risk of psychological distress during the COVID-19 outbreak and confound the results. We suggest that other studies focus on health and anxiety and the role of self-efficacy in their self-care behaviors in health workers. This study mainly focused on anxiety and did not explore other common psychiatric symptoms such as depression that is beyond anxiety and panic disorder. We suggest that other studies focus on common psychiatric symptoms because these disorders may affect self-efficacy and self-care behaviors.

6. Conclusion

On the basis of the results, this study showed that the scores of GAD for most patients were within the high range (upper than 17). However, 92.4% of the participants had mild-to-severe anxiety. Experiencing anxiety is still a problem that needs to be solved among participants. In the current study, self-efficacy had a moderate negative correlation with GAD and a positive correlation with self-care behavior. This study revealed that enhancing self-efficacy levels might reduce anxiety. Self-efficacy enhancing programs should be used as a part of the routine readiness effort drives and health care system change.

Author contribution

FP, FP, MHD: Performed the all study and had complete access to all the data for analysis. They confirmed the eligibility of the participations for the study. They were involved in drafting the article. MHD and FP: supervised the whole study and approved a final version of the manuscript. HAZ: Project consulting.

Conflict of interest

There is no conflict of interests.

References

Abdi, R., Bakhshi, A., & Mahmoud, A. M. (2013). Efficacy of unified transdiagnostic treatment on reduction of transdiagnostic factors and symptoms severity in emotional disorders. *Journal of Psychological Models and Methods, 3*(13),1-27.

Asadi, M., Kiani, A., Azimi, L., & Gharibi, Z. (2021). COVID-19 related anxiety and self-care behaviors in students based on demographic characteristics: A cross-sectional study. *Journal of Clinical Psychology, 13*(2), 169-80.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173. https://doi.org/10.1037//0022-3514.51.6.1173

Bihlmaier, I., & Schlarb, A. A. (2016). Self-efficacy and sleep problems. *Somnologie, 20*(4), 275-280. https://doi.org/10.1007/s11818-016-0085-1

Bowsher, J. E., & Keep, D. (1995). Toward an understanding of three control constructs: Personal control, self-efficacy, and hardiness. *Issues in Mental Health Nursing, 16*(1), 33-50. https://doi.org/10.3109/01612849509042961

Cacioppo, J. T., & Cacioppo, S. (2018). The growing problem of loneliness. *The Lancet, 391*(10119), 426. https://doi.org/10.1016/S0140-6736(18)30142-9

Du, J., Dong, L., Wang, T., Yuan, C., Fu, R., Zhang, L., Qin, J. (2020). Psychological symptoms among frontline healthcare workers during COVID-19 outbreak in Wuhan. *General Hospital Psychiatry, 67*(1), 144-145. https://doi.org/10.1016/j.genhosppsych.2020.03.011

Heo, S., Moser, D. K., Lennie, T. A., Riegel, B., & Chung, M. L. (2008). Gender differences in and factors related to self-care behaviors: A cross-sectional, correlational study of patients with heart failure. *International Journal of Nursing Studies, 45*(12), 1807-1815. https://doi.org/10.1016/j.ijnurstu.2008.05.008

Huang, Y., & Zhao, N. (2020). Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 epidemic in China: A web-based cross-sectional survey. *Psychiatry Research, 288*(1),112954. https://doi.org/10.1016/j.psychres.2020.112954

Kwok, K. O., Li, K. K., Chan, H. H., Yi, Y. Y., Tang, A., Wei, W. I., & Wong, Y. S. (2020). Community responses during the early phase of the COVID-19 epidemic in Hong Kong: Risk perception, information exposure and preventive measures. *Emerging Infectious Diseases, 26*(7), 1575-1579. https://doi.org/10.3201/eid2607.200500

Lau, J. T. F., Griffiths, S., Choi, K. C., & Tsui, H. Y. (2010). Avoidance behaviors and negative psychological responses in the general population in the initial stage of the H1N1 pandemic in Hong Kong. *BMC Infectious Diseases, 10*(1), 139. https://doi.org/10.1186/1471-2334-10-139

Lee, S. A. (2020). Coronavirus anxiety scale: A brief mental health screener for COVID-19 related anxiety. *Death Studies, 44*(7), 393-401. https://doi.org/10.1080/07481187.2020.1748481

Losada-Baltar, A., Jiménez-Gonzalo, L., Gallego-Alberto, L., Pedroso-Chaparro, M. D. S., Fernandes-Pires, J., & Márquez-González, M. (2020). "We're staying at home". Association of self-perceptions of aging, personal and family resources and loneliness with psychological distress during the lock-down period of COVID-19. *The Journals of Gerontology: Series B, 76*(2), e10-e16. https://doi.org/10.1093/geronb/gbaa048

Mahmoud, A. M., Hashemi, N. T., & Sohrabi, F. (2016). Effectiveness of combined intervention based acceptance and commitment therapy (ACT) with exposure techniques on patient's anxiety symptoms intensity and sensitivity dimensions in general anxiety disorder (GAD). *Journal of Clinical Psychology, 8*(3), 61-76.

Mailani, F., Huriani, E., Muthia, R., & Sarfika, R. (2021). Nurses' intention to work during the COVID-19 outbreak in West Sumatra, Indonesia. *Nurse Media Journal of Nursing, 11*(1), 50-60. https://doi.org/10.14710/nmjn.v11i1.34093

Martin, L. B. (2009). Stress and immunity in wild vertebrates: Timing is everything. *General and Comparative Endocrinology, 163*(1), 70-76. https://doi.org/10.1016/j.ygcen.2009.03.008

Mohammadpour, M., Ghorbani, V., Khoramnia, S., Ahmadi, S. M., Ghvami, M., & Maleki, M. (2020). Anxiety, self-compassion, gender differences and COVID-19: Predicting self-care behaviors and fear of COVID-19 based on anxiety and self-compassion with an emphasis on

gender   differences.   *Iranian   Journal   of   Psychiatry,   15*(3),   213-219. https://doi.org/10.18502/ijps.v15i3.3813

Mousavi, S. H., Delshad, M. H., Acuti Martellucci, C., Bhandari, D., Ozaki, A., & Pourhaji, F., Pourhaji, F., Hosseini, S. M. R., Roien, R., Ramozi, A. A., Wafaee, M., Qaderi, S., Delsoz, M., Sigdel, S., Kotera, Y., Sawano, T., Dhama, K., Rodríguez-Morales, A. J., Wang, J., ... Sah, R. et al. (2021). Community behavioral and perceived responses in the COVID-19 outbreak in Afghanistan: A cross-sectional study. *Disaster Medicine and Public Health Preparedness, 5*(1), 1-7.

Mukhtar, S. (2020). Mental health and emotional impact of COVID-19: Applying health belief model for medical staff to general public of Pakistan. *Brain, Behavior, and Immunity, 87,* 28–29. https://doi.org/10.1016/j.bbi.2020.04.012

Muris, P. (2002). Relationships between self-efficacy and symptoms of anxiety disorders and depression in a normal adolescent sample. *Personality and Individual Differences, 32*(2), 337-348.

Naeinian, M. R., Shaeiri, M. R., Sharif, M., & Hadian, M. (2011). To study reliability and validity for a brief measure for assessing Generalized Anxiety Disorder (GAD-7). *Clinical Psychology & Personality, 9*(1), 41-50.

Pourhaji F., Pourhaji F., Tehrani H., Talebi M., & Peyman N.(2022). Perceived threat and stress responses in the face of Covid-19 based on health belief model. *Journal of Health Literacy, 7*(1), 17-25.

Polit, D. F., Beck, C. T., & Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health, 30*(4), 459-467. https://doi.org/10.1002/nur.20199

Pragholapati, A. (2020). Self-efficacy of nurses during the pandemic Covid-19. https://www.academia.edu/43045687/Self_Efficacy_Of_Nurses_During_The_Pandemic_ Covid_19

Przepiórka, A., Błachnio, A., & Siu, N. Y. F. (2019). The relationships between self-efficacy, self-control, chronotype, procrastination and sleep problems in young adults. *Chronobiology International, 36*(8), 1025-1035. https://doi.org/10.1080/07420528.2019.1607370

Qian, M., Wu, Q., Wu, P., Hou, Z., Liang, Y., Cowling, B. J., & Yu, H. (2020). Psychological responses, behavioral changes and public perceptions during the early phase of the COVID-19 outbreak in China: A population based cross-sectional survey. *BMJ Open, 10*(10), e040910. https://doi.org/10.1136/bmjopen-2020-040910

Sharma, M. (2016). *Theoretical foundations of health education and health promotion.* Jones & Bartlett Publishers.

Simonetti, V., Durante, A., Ambrosca, R., Arcadi, P., Graziano, G., Pucciarelli, G., & Cicolini, G. (2021). Anxiety, sleep disorders and self-efficacy among nurses during COVID-19 pandemic: A cross-sectional study. *Journal of Clinical Nursing,* 30(9-10), 1360-1371. https://doi.org/10.1111/jocn.15685

Spitzer, R., Kroenke , K., Williams, J., & Bernd , L. (2006). A Brief Measure for Assessing Generalized Anxiety Disorder: The GAD-7. *Archives of Internal Medicine, 166(*10), 1092-1097. https://doi.org/10.1001/archinte.166.10.1092

Tahmassian, K., & Jalali Moghadam, N. (2011). Relationship between self-efficacy and symptoms of anxiety, depression, worry and social avoidance in a normal sample of students. *Iranian Journal of Psychiatry and Behavioral Sciences, 5*(2), 91-98.

Tharek, Z., Ramli, A. S., Whitford, D. L., Ismail, Z., Zulkifli, M. M., Sharoni, S. K. A., Jayaraman, T. (2018). Relationship between self-efficacy, self-care behaviour and glycaemic control among patients with type 2 diabetes mellitus in the Malaysian primary care setting. *BMC Family Practice, 19*(1), 1-10. https://doi.org/10.1186/s12875-018-0725-6

Tuppal, C. P., Ninobla, M. M. G., Ruiz, M. G. D., Loresco, R. D., Tuppal, S. M. P., Panes, I. I., Oducado, R. M. F., Prudencio, D. A. M., Vega, P. D., Eribal, M. J. E., Real, D. V. P., & Roa, M. N. T. (2021). Knowledge, attitude, and practice toward COVID-19 among healthy population in the Philippines. *Nurse Media Journal of Nursing, 11*(1), 61-70. https://doi.org/10.14710/nmjn.v11i1.36067

Wang, N., Wang, S., Qian, H.-Z., Ruan, Y., Amico, K. R., Vermund, S. H., Zheng, S. (2019). Negative associations between general self-efficacy and anxiety/depression among newly

HIV-diagnosed men who have sex with men in Beijing, China. *AIDS Care, 31*(5), 629-635. https://doi.org/10.1080/09540121.2018.1549721

Weng, L. C., Dai, Y. T., Wang, Y. W., Huang, H. L., & Chiang, Y. J. (2008). Effects of self-efficacy, self-care behaviours on depressive symptom of Taiwanese kidney transplant recipients. *Journal of Clinical Nursing, 17*(13), 1786-1794. https://doi.org/10.1111/j.1365-2702.2007.02035.x

Wu, S.-F. V., Huang, Y.-C., Lee, M.-C., Wang, T.-J., Tung, H.-H., & Wu, M.-P. (2013). Self-efficacy, self-care behavior, anxiety, and depression in Taiwanese with type 2 diabetes: A cross-sectional survey. *Nursing & Health Sciences, 15*(2), 213-219. https://doi.org/10.1111/nhs.12022.

Wu, Z., & McGoogan, J. M. (2020). Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: Summary of a report of 72314 cases from the Chinese Center for Disease Control and Prevention. *Jama, 323*(13), 1239-1242. https://doi.org/10.1001/jama.2020.2648

Xiao, H., Zhang, Y., Kong, D., Li, S., & Yang, N. (2020). The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (COVID-19) in January and February 2020 in China. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research, 26*, e923549-923541. https://doi.org/10.12659/MSM.923549.

Xue, A., Oros, V., La Marca-Ghaemmaghami, P., Scholkmann, F., Righini-Grunder, F., Natalucci, G., Restin, T. (2021). New parents experienced lower parenting self-efficacy during the COVID-19 pandemic lockdown. *Children, 8*(2),79. https://doi.org/10.3390/children8020079

Yıldırım, M., & Güler, A. (2020). COVID-19 severity, self-efficacy, knowledge, preventive behaviors, and mental health in Turkey. *Death Studies, 46(4),* 1-8. https://doi.org/10.1080/07481187.2020.1793434

Zhang, S. X., Wang, Y., Rauch, A., & Wei, F. (2020). Health, distress, and life satisfaction of people one-month into COVID-19 outbreak in China. *Psychiatric Research, 288*(1), 112958. https://doi.org/10.1016/j.psychres.2020.112958