

## Research Paper



# Investigating the Psychological Risk and Protective Factors Related to Fear of COVID-19 During the COVID-19 Pandemic in Iran

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**ABSTRACT**

**Objective:** The current COVID-19 pandemic is associated with numerous psychological issues, such as anxiety and distress as a result of individual, health-related, social, and economic issues. This study aims to assess the general population in Iran for the negative impacts of the current pandemic on psychological well-being and to find possible protective and risk factors when facing such situations in the current COVID-19 pandemic.

**Methods:** A total of 317 people participated in an online survey in Iran from August 3, 2020, to September 20, 2020. Anxiety, depression, fear of COVID-19, emotion regulation, intolerance of uncertainty, illness perception, neuroticism, social support, and self-efficacy were evaluated.

**Results:** The results showed that measures that assess anxiety, depression, emotion regulation, intolerance of uncertainty, illness perception, neuroticism, social support, and self-efficacy were significantly related to fear of COVID-19. Meanwhile, the results of regression analysis demonstrated that neuroticism, intolerance of uncertainty, and illness perception could predict fear of COVID-19 beyond and above anxiety and depression.

**Conclusion:** Some factors, including neuroticism, illness perception, and intolerance of uncertainty are considered risk factors for mental health during this pandemic.

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## Highlights

- Assessing fear of COVID-19 in general Iranian population.
- The primary protective factors regarding fear of COVID-19 are; self-efficacy and emotional regulation.
- The main risk factors of fear of COVID-19 are; neuroticism, illness perception, and intolerance of uncertainty.

## Plain Language Summary

The current COVID-19 pandemic is associated with numerous psychological issues such as anxiety and stress as a result of individual, health-related, social, and economic, issues. This study aimed to assess the general population in Iran for negative impacts of the current pandemic on psychological well-being and to find possible protective and risk factors when facing such situations as the current COVID-19 pandemic. The results showed that anxiety, depression, being able to understand the emotions the individual experiences and being able to express them efficiently, intolerance of uncertainty, being pessimistic, having social support, and being able to take care of self were significantly important for experiencing the fear of COVID-19. Among all the mentioned factors, being able to understand the emotions the individual experiences and being able to express them efficiently, and having efficient social support are the most significant factors to protect one's mental health against the fear of COVID-19. On the other hand, intolerance of uncertainty, being pessimistic could be considered as the main risk factors of having fear of COVID-19.

### 1. Introduction

**C** COVID-19 is a cluster of acute respiratory diseases with unknown causes. In December 2019, the new coronavirus was diagnosed in individuals with viral pneumonia in Wuhan, China, and the virus was confirmed by the China Centers for Disease Control and Prevention (Huang et al., 2020). The World Health Organization (WHO) named this unknown virus COVID-19 on February 2020 (2019-nCoV, 11 February 2020). Nonetheless, the rapid and unexpected increase in the number of cases in Wuhan, the capital of Hubei Province, China, and several other provinces in this country and several other countries made WHO declare this virus as a pandemic on March 11, 2020. As of September 17, 2022, the number of confirmed cases in Iran is reported around 7 540 000 and the number of people who died because of this disease is 144 000. Numerous psychological issues and significant mental health consequences, including uncertainty, anxiety, stress, depression, and frustration during the COVID-19 outbreak have been continuously reported (Duan & Zhu, 2020). The most common psychological problems regarding the COVID-19 outbreak and the related sequential issues (e.g. quarantine) included generalized fear and persistent anxiety (e.g. fear of illness) which are naturally related to disease outbreaks. In this particular case, these issues were reinforced by the in-

creasing rate of new cases along with insufficient and stress-provoking information broadcasted by the media (Chen et al., 2020; Li et al., 2020; Maunder et al., 2003; Yang et al., 2020). The psychological symptoms of the COVID-19 outbreak can range from a panic attack or acute anxiety to persistent feelings of desperation and hopelessness (Rubin & Wessely, 2020). It is important to notice that other health-related issues can be compromised by abnormally escalated levels of anxiety (Wu et al., 2009).

As the general population was exposed to the COVID-19 pandemic, stress-provoking issues associated with this health and socio-economic crisis became a priority to be swiftly found because they could lead to the onset of psychiatric problems (Serafini et al., 2020). The ability to regulate emotions, including positive and negative emotions, when encountering conflicts, and in this case, the pandemic, is one of the most significant psychological well-being issues to be addressed (Abasi et al., 2018; Riaz, 2020). To reduce the fear of being contracted COVID-19, self-efficacy (i.e. the ability to adopt preventative behaviors to avoid spreading and being infected by the virus) is demonstrated to be one of the key factors associated with psychological well-being (Hernández-Padilla et al., 2020). Moreover, when facing challenges and threats, which in this case is the COVID-19 pandemic, social support can considerably mitigate the distress (Zysberg & Zisberg, 2020). However, the role of

social support and its effects on well-being are still controversial issues in the literature (Gur-Yaish et al., 2013; Morelli et al., 2015; Zysberg & Zisberg, 2020). Furthermore, neuroticism, as the tendency to be emotionally unstable and experience fear and anxiety, is an underlying personality trait that is associated with perceived stress and fear of COVID-19 (Liu et al., 2020). Another factor that can affect an individual's ability to tolerate the stress related to COVID-19 is uncertainty intolerance which is a transdiagnostic risk and sustaining factor for anxiety disorders (Shihata et al., 2017), and plays a moderating factor during the pandemic (Smith et al., 2020). Beliefs that individuals hold about their illness (illness perception) are another factor that could make individuals prone to the fear of COVID-19 (Aqeel et al., 2020).

Due to the growing importance of following up and addressing the psychological issues caused by the COVID-19 pandemic worldwide, the psychological consequences of this disease need to be carefully studied. Considering that the emergence of the COVID-19 pandemic is a new global phenomenon, few studies have been conducted on the protective and risk factors associated with this crisis; therefore, clarifying the nature of these factors at the community level can play a key role in controlling the related anxiety and physical illnesses to COVID-19 (Nania et al., 2020; Rajkumar, 2020; Petzold et al., 2020; Shi et al., 2020; Xiong et al., 2020). Moreover, assessing the relation of all these risks and protective factors about the fear of COVID-19 could determine the unique role of each of these factors regarding the fear of COVID-19 and can indicate which factor(s) could accurately explain the fear of COVID-19. To the best of our knowledge, no published studies are available on the risk and protective factors of psychological distress in the general population in Iran during the current situation. Consequently, this study aims to evaluate the relationship between effective psychological protection and risk factors following the COVID-19 pandemic. In the present study illness perception, intolerance of anxiety, difficulties in emotion regulation, and dampening are considered risk factors, while social support and self-efficacy are considered protective factors associated with psychological well-being during the COVID-19 pandemic.

## 2. Materials and Methods

### Study population

This was a cross-sectional study. The study population was chosen by utilizing the convenience sampling method of the general population ( $n=317$ ; 40.1% male) in Iran via online instruments. The participants' age ranged

from 18 to 63 years (Mean $\pm$ SD 36.33 $\pm$ 11.10). The marital status of the participants was as follows: 40.4% were single and 59.6% were married. In terms of the educational level of participants, 21.1% had a diploma, 61.8% had a bachelor's degree, and 17.1% had a master's degree or higher.

### Study instruments

An online questionnaire regarding demographic information was included in the assessment. Other questionnaires regarding study variables were used as well. In addition, questionnaires with appropriate Persian psychometric properties were used in the current study.

### COVID-19 stress scales

The COVID-19 stress scale (Taylor et al., 2020) is a 36-item self-report measure that assesses fear of getting contaminated, fear of exposure to possibly infected objects or surfaces, fear of outsiders who might be carrying contamination, fear of the socio-economic outcomes of the pandemic, checking compulsively, and seeking reassurance about COVID-19. CSS is scored based on a 5-point Likert scale and has shown very good internal consistency ( $>0.80$ ) and convergent validity (Taylor et al., 2020). The Persian version of CSS is under publication; nevertheless, the Cronbach  $\alpha$  of CSS in the current study was obtained at 0.95.

### Brief illness perception questionnaire (BIPQ)

The brief illness perception questionnaire (BIPQ) was developed by Broadbent et al. in 2006. BIPQ includes 9 items and measures outcomes, duration, personal control, treatment control, nature, being worried, knowledge, emotional responses, and causes of the illness, respectively. The scores of the first 8 questions range from 0 to 10. Items in BIPQ have shown agreeable test-retest reliability over time. It has also demonstrated good construct validity (Broadbent et al., 2006). This questionnaire has been validated in Iran (Aliakbari Dehkurdi et al., 2013). The Cronbach  $\alpha$  of the Iranian BIPQ was obtained at 0.80 and the reliability coefficient of the retest at 6-week intervals for different questions was reported in the range of 0.42 to 0.75. The Cronbach  $\alpha$  of BIPQ in this study was equal to 0.71.

### Intolerance of uncertainty scale (IUS)

The intolerance of uncertainty scale (IUS) was developed by Buhr & Dugas, in 2002. This scale was designed to measure individuals' tolerance for uncertain situations and has 27 items. IUS is scored based on a 5-point Likert scale. The Cronbach  $\alpha$  of 0.94 and a 5-week replication

validity coefficient of 0.74 were reported for this version (Buhr & Dugas, 2002). This scale is validated in Iran and the Cronbach  $\alpha$  of 0.88 and the reliability of the 3-week retest of 0.76 are reported. To assess the predictive validity, the correlation of this instrument with the Pennsylvania state Concern questionnaire was reported at 0.78 and with the cognitive avoidance questionnaire at 0.71 (Naghavi et al., 2018). The internal consistency of IUS in the current study was equal to 0.94.

### General self-efficacy scale (GSE)

The general self-efficacy scale (GSE) was developed by Ralf Schwarzer & Matthias Jerusalem, in 1995. The primary scale includes 20 items and has two subscales as follows: general self-efficacy and social self-efficacy. In 1981, GSE was transformed into a 1-factor scale that had ten 4-choice items and was called GSE-10. The minimum and maximum scores of 10 and 40 are considered in GSE. So far, GSE-10 has been translated into 28 different languages. The internal consistency of this scale in several countries, including Canada, Costa Rica, Germany, France, Iran, Japan, and India has been shown in the range of 0.75 to 0.91. This shows the internal reliability of this scale among different societies and cultures worldwide (Delavar & Najafi, 2013; Schwarzer & Jerusalem, 1995). The Cronbach  $\alpha$  of GSE in this study was obtained at 0.93.

### Multidimensional scale of perceived social support (MSPSS)

The multidimensional scale of perceived social support (MSPSS) was developed by Zimet et al. in 1988. The MSPSS is a 12-item tool that measures social support from 3 origins: family, community, and friends. It is scored based on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). The minimum score of 12 and the maximum score of 84 is considered the total score. For each of the subscales of family, social, and friends the total scores range from 4 to 28. Higher scores indicate more perceived social support. The reliability and validity of MSPSS have been confirmed in several studies (Pushkarev et al., 2020; Zimet et al., 1988). In preliminary research of psychometric properties of this scale in a sample of Iranian students and the general population ( $n=742$ ; 314 students and 431 general), the internal consistency (Cronbach  $\alpha$ ) of the whole scale and the items of the 3 subscales of family, social, and friends support, were 0.91, 0.87, 0.83, and 0.89 respectively (Besharat, 2018). The Cronbach  $\alpha$  of MSPSS in this study was obtained at 0.92.

### Responses to positive affect questionnaire

The responses to the positive affect questionnaire (RPA) were developed by Feldman et al. in 2008. The RPA has 17 items. It is a self-report questionnaire that evaluates positive emotion-regulation strategies. RPA is scored based on a 4-point Likert scale. The primary form of RPA included 3 subscales as follows: emotion-focus, dampening, and self-focus. The Cronbach  $\alpha$  of the subscales are obtained as follows: emotion-focus=0.76, dampening=0.79, and self-focus=0.73. RPA has yielded good construct and discriminant validity (Feldman et al., 2008). The Persian version of the RPA has shown two factors: positive rumination and dampening. We used the dampening subscale in the present study. The internal consistency (0.77) and test-retest (0.83) reliability of the Iranian version of dampening has been demonstrated as satisfactory (Abasi et al., 2018). The Cronbach  $\alpha$  of dampening in the current study was obtained at 0.84.

### Difficulties in emotion regulation scale

The difficulty in emotion regulation scale (DERS) was developed by Gratz & Roemer, in 2004. This scale has 36 items and is a self-report questionnaire that assesses individuals' regular inclinations toward emotion regulation. DERS is scored based on a 5-point Likert scale. It includes 6 subscales as follows: 1) not accepting responses to emotions, 2) problems in dealing with behaviors that are based on goals, 3) difficulties in controlling impulses, 4) deficiency in awareness of emotions, 5) restricted approach to access to emotion regulation strategies, and 6) deficiency in the clarity of emotions. The Cronbach  $\alpha$  of higher than 0.88 has been demonstrated for each subscale of DERS and the test-retest reliability of  $r=0.88$  is acceptable (Gratz & Roemer, 2004). The Persian version of DERS yielded agreeable reliability and validity (Asgari et al., 2009). The internal consistency of DERS in this study was equal to 0.94.

### The short-form version of the depression anxiety stress scales (DASS-21)

The short-form version of the depression anxiety stress scales (DASS-21) was developed by Lovibond & Lovibond in 1995. DASS-21 has 21 items and is a self-report measure that has 3 subscales as follows: anxiety, stress, and depression. The participants rate items on a Likert scale from 0 to 3. In terms of its reliability and validity, several studies have been published globally showing that DASS-21 is a reliable and valid measure for assessing symptoms of stress, anxiety, and depression in both non-clinical and clinical samples (Bottesi et al., 2015;

Sinclair et al., 2012; Vasconcelos-Raposo et al., 2013). The total score of each subscale can vary from 0 to 42 (Beaufort et al., 2017). The Persian version of the scales in the current study has demonstrated agreeable convergent validity, test-retest reliability, and construct validity (Asghari et al., 2008).

### Eysenck personality questionnaire short version (EPQ-R)

The Eysenck personality questionnaire-short version (EPQ-R) was developed by Eysenck in 1958. The neuroticism scale of EPQ-R was used in this study to evaluate neuroticism. It consists of 12 items with “Yes” and “No” answers. The internal consistency of neuroticism in males and females has been reported to range from 0.84 and 0.80, respectively. It also has yielded good construct validity (Eysenck, 1958). The Iranian version of neuroticism has shown acceptable internal consistency for males and females at 0.73 and 0.74, respectively. Furthermore, it has shown acceptable test-retest reliability (0.90) (Bakhshpour & Bagharian Khorroshahi, 2007). The internal consistency of neuroticism in this study was obtained at 0.84.

### Study procedure

To evaluate the potential psychological risk and protective factors regarding the COVID-19 pandemic, several online self-report measures (<http://porsall.com/Poll/Show/39b7b6618b4b4b1>) were used. The duration of data collection was from August 3, 2020, to September 20, 2020. Completing the entire assessment required 25 to 40 min. Informed consent was obtained from all participants. Eligible participants were adults (18 years old and above) who reside in Iran and could complete the questionnaires in Persian (online). Individuals who did not meet the aforementioned criteria were excluded from the study. The present study was accepted by the Ethics Committee of Shahid Beheshti University of Medical Sciences (IR.SBMU.MSP.REC.1399.263). In the current study, data collection was part of another investigation whose report is published (Abasi et al., 2021).

### Statistical analysis

The analysis procedure involved 3 steps. At first, the outliers were distinguished and removed and the multicollinearity and normality of the variables were evaluated. The correlations between study variables were performed to ensure that there are significant relations between variables for performing the regression analysis. For this step, the SPSS software, version 23 was used

to analyze the data. Secondly, a multivariate regression analysis was performed to predict fear of COVID-19 by some risk and protective factors that had significant relationships with CSS. Thirdly, a multivariate hierarchical regression analysis was performed to assess whether the variables could predict fear of COVID-19 above and beyond depression and anxiety levels.

## 3. Results

### Descriptive statistics

The descriptive statistics of the variables of the study, including Mean±SD, kurtosis, and skewness are provided in Table 1.

### Relationship between COVID-19 stress, depression, anxiety, and other risk and protective factors

The bivariate analysis showed a significant direct relationship between COVID-19 stress and neuroticism ( $r=0.46$ ,  $P<0.01$ ), illness perception ( $r=0.42$ ,  $P<0.01$ ), depression ( $r=0.47$ ,  $P<0.01$ ), anxiety ( $r=0.53$ ,  $P<0.01$ ), difficulties in emotion regulation ( $r=0.44$ ,  $P<0.01$ ), intolerance of uncertainty ( $r=0.46$ ,  $P<0.01$ ), and dampening ( $r=0.22$ ,  $P<0.01$ ). In addition, an inverse correlation was observed between COVID-19 stress and self-efficacy ( $r=-0.27$ ,  $P<0.01$ ). Furthermore, no significant relationship existed between COVID-19 stress and social support. The results of the bivariate correlation of all variables of the study are provided in Table 2.

### Prediction of covid-19 stress based on neuroticism, illness perception, intolerance of uncertainty, self-efficacy, difficulties in emotion regulation, and dampening

A multivariate linear regression using the stepwise method was conducted to predict COVID-19 stress based on neuroticism, illness perception, intolerance of uncertainty, self-efficacy, difficulties in emotion regulation, and dampening. The regression equation was demonstrated as significant ( $F_{3,313}=49.57$ ,  $P<0.001$ ,  $R=0.57$ ,  $R^2=0.32$ , Adjusted  $R^2=0.32$ ). The analysis showed that self-efficacy, difficulties in emotion regulation, and dampening did not predict COVID-19 stress; however, neuroticism ( $\beta=0.24$ ,  $t(316)=4.36$ ,  $P<0.001$ ), illness perception ( $\beta=0.22$ ,  $t(316)=4.14$ ,  $P<0.001$ ), and intolerance of uncertainty ( $\beta=0.25$ ,  $t(316)=4.50$ ,  $P<0.001$ ) did significantly predict COVID-19 stress. The participants' prediction of COVID-19 stress was equal to  $9.38+1.75$  (neuroticism)  $+0.36$  (illness perception)  $+0.27$  (intolerance of uncertainty).

**Table 1.** Mean±SD, skewness, and kurtosis of study variables (N=317)

Variables	Mean±SD	Skewness	Kurtosis
COVID Stress	53.22±24.69	0.36	-0.14
Neuroticism	5.59±3.43	0.19	-1.03
Illness Perception	34.75±14.91	-0.19	-0.42
Depression	6.26±5.06	0.71	-0.34
Anxiety	4.67±4.29	1.04	0.82
Difficulties in Emotion Regulation	88.04±24.28	0.61	-0.00
General Self-Efficacy	28.98±6.78	-0.22	-0.53
Intolerance of Uncertainty	78.97±22.85	0.07	-0.52
Dampening	12.16±4.24	1.02	0.83
Positive Rumination	27.70±6.17	-0.46	-0.58
Social Support	56.70±16.34	-0.36	-0.23

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**Table 2.** Bivariate Pearson correlation between study variables

	CS	N	IP	D	A	DER	GSE	IU	DAM	PR	SS
CS	1										
N	0.46	1									
IP	0.42	0.42	1								
D	0.47	0.62	0.48	1							
A	0.54	0.49	0.55	0.69	1						
DER	0.44	0.66	0.46	0.72	0.60	1					
GSE	-0.26	-0.47	-0.39	-0.49	-0.36	-0.56	1				
IU	0.46	0.50	0.40	0.55	0.52	0.63	-0.35	1			
DAM	0.22	0.28	0.27	0.28	0.33	0.38	-0.15	-0.35	1		
PR	0.01	-0.01	-0.11	-0.11	-0.02	-0.08	0.29	0.10	0.03	1	
SS	-0.05	-0.20	-0.15	-0.37	-0.19	-0.25	0.30	-0.16	-0.09	0.30	1

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**Table 3.** Hierarchical Multivariate Regression Analysis of Data

	Variables	B	SE B	Beta	t	ΔR <sup>2</sup>
Step 1	Constant	36.44	1.88		19.37	
	Depression	0.93	0.31	0.19	2.97	0.30
	Anxiety	2.33	0.37	0.70	6.27	
Step 2	Constant	16.90	4.49		3.76	
	Depression	0.04	0.35	0.01	0.13	
	Anxiety	1.67	0.39	0.30	4.34	
	Neuroticism	1.29	0.43	0.18	3.00	0.06
	Illness Perception	0.19	0.09	0.12	2.09	
	Intolerance of Uncertainty	0.18	0.06	0.17	2.92	

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To assess whether neuroticism, illness perception, and intolerance of uncertainty can predict COVID-19 stress above and beyond depression and anxiety, a hierarchical multivariate regression analysis was performed (anxiety and depression levels were controlled). Anxiety and depression levels were entered in block 1 and neuroticism, illness perception, and intolerance of uncertainty were added into block 2. In predicting COVID-19 stress, neuroticism, illness perception, and intolerance of uncertainty predicted an additional 7% of the variance in COVID-19 stress above and beyond depression and anxiety levels which accounted for 30% of the variance in COVID-19 stress (Table 3).

#### 4. Discussion

The COVID-19 outbreak was a health threat to several countries and populations. One of the primary concerns of many nations was anxiety and other psychological problems as a result of the COVID-19 outbreak (Duan & Zhu, 2020). The psychological outcomes of this pandemic can have major impacts on health. Accordingly, studying the psychological protective and risk factors regarding the fear of being contracted COVID-19 is important. The present study aimed to explore how the current COVID-19 pandemic can affect individuals psychologically, especially in terms of anxiety, among the general population in Iran along with investigating the psychological protective and risk factors regarding the current situation. This study found that the fear of being infected by COVID-19 has a significant relationship with neuroticism, illness perception, problems in emotion regulation, intolerance of uncertainty, dampening, depression, and anxiety. These results were in line with the literature (Abasi et al., 2018; Aqeel et al., 2020; Liu et al., 2020; Rubin & Wessely, 2020; Shihata et al., 2017; Smith et al., 2020). However, this study did not find any significant relationship between the fear of illness caused by COVID-19 and social support which was a new finding. It was previously demonstrated that social support can mitigate the distress resulting from the fear of being contracted COVID-19 (Zysberg & Zisberg, 2020). Psychological and instrumental social support may promote well-being. However, in the case of this pandemic in Iran, social support was not found as a significant protective factor against the fear of being contracted the virus. The mentioned finding could be in line with some studies that showed mixed results regarding the effect of social support (Gur-Yaish et al., 2013; Morelli et al., 2015).

The regression analysis results illustrated that among the psychological risk and protective factors, neuroticism, illness perception, and intolerance of uncertainty could predict COVID-19-related fear. In other words, neuroticism,

illness perception, and intolerance of uncertainty were significantly affecting the levels of stress associated with fear of being infected with COVID-19 (even after controlling the levels of depression and anxiety), which demonstrated these features as the psychological risk factors regarding encountering the current pandemic and similar situations. These results were in line with previous studies (Hernández-Padilla et al., 2020; Serafini et al., 2020; Liu et al., 2020; Smith et al., 2020; Shihata et al., 2017; Aqeel et al., 2020). On the other hand, the current study posited that self-efficacy, difficulties in emotion regulation, and dampening were not as much associated with the level of stress due to encountering the present situation as neuroticism, illness perception, and intolerance of uncertainty.

Neuroticism, as a more basic personality trait, illness perception, and intolerance of uncertainty could explain a significant amount of fear related to COVID-19 in the Iranian population. The results about the role of neuroticism support the notion that it may contribute to the fear of COVID-19 through high levels of perceived health threats and low levels of efficacy (Liu et al., 2020). Therefore, the results of this study are also in line with previous findings which state that neuroticism is related to pandemic-related psychopathology in adults (Lee, 2020). The present study results concerning the role of illness perception are following recent findings which showed that illness perception is related to lower levels of mental health because of higher anxiety and depression levels during the current pandemic (Aqeel et al., 2020). Additionally, the current study results regarding the role of intolerance of uncertainty are in line with previous studies, showing that intolerance of uncertainty is related to mental distress because of different coping styles during the pandemic (Rettie & Daniels, 2020). It also moderates the relationship between social isolation and mental health (Smith et al., 2020). The results of the present study are in line with previous studies demonstrating that neuroticism, illness perception, and intolerance of uncertainty are underlying, mediating, and moderating factors that are highly related to the fear of COVID-19 and it is important to consider them for planning interventions in the time of need.

This study was the first study that evaluated the protective and risk factors of the COVID-19 pandemic in Iran. The recruitment process was conducted quite fast so the participants were evaluated while they were experiencing the situation (the reported infected cases were rising and the media was broadcasting the news regarding COVID-19 extensively). As a result, the current study could scrutinize the psychological outcomes of this pandemic at an early stage and provide a good basis for future longitudinal studies (i.e. follow-ups).

Nonetheless, there are some limitations to this study. The recruited sample for the present study was relatively small and this could have decreased the generalizability of the results as the sample might not be a true representative of the general population in Iran. Additionally, the participants' recruitment was conducted using convenience sampling primarily through social media; therefore, this might have resulted in a sample bias. Individuals who may be more technology-savvy or have easy access to social media could more easily partake in this study and this could have resulted in a relatively homogenous (i.e. more educated) sample. Also, individuals who had higher levels of psychological distress and anxiety could be more likely to participate in the current study or similar studies. Consequently, an over-estimation of these issues could have affected the sample (although anxiety and depression levels were controlled through the analysis phase). Moreover, the recruitment process and, consequently, the sample, which was mainly from Tehran City, Iran residents, may have decreased the generalizability of the current study results. The present study was conducted as a cross-sectional examination and did not leave room for any causal interferences. The used questionnaires and scales were rather long; therefore, they could be tiring for the online participants. Subsequently, all results from the current study should rather be considered first hints that could be helpful for future studies as well as an empirical observation proposing recommendations toward the reduction of psychological distress in the current pandemic.

## 5. Conclusion

The current study results recommended that during the COVID-19 pandemic, there are fundamental issues related to this situation regarding the levels of anxiety and psychological distress. Finding ways to mitigate distress and anxiety in the general population of Iran seems to be a significant issue. Concerning the role of psychological risk and protective factors during the current pandemic, the results of this study posited that among the protective and risk factors found in this study, neuroticism, illness perception, and intolerance of uncertainty are the most predictive factors of the fear of COVID-19.

## Ethical Considerations

### Compliance with ethical guidelines

The study was conducted following the ethical guidelines of [Shahid Beheshti University of Medical Sciences](#) (Ethics Code: IR.SBMU.MPS.REC.1399.263) and under the ethical standards of the 1964 Declaration of Helsinki. Meanwhile, informed consent forms were obtained from all participants of the study.

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## Authors' contributions

Conceptualisation and writing – original draft: Imaneh Abasi, Azin Farzin and Amin Sohrabzadeh Fard; Developing the theory and computations: Imaneh Abasi, Azin Farzin; Methodology: Imaneh Abasi and Amin Sohrabzadeh Fard; Investigation: Amin Sohrabzadeh Fard; Final approval: All authors.

## Conflict of interest

All authors declared no conflict of interest.

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