



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، مامایی و مراقبت گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

A Predictive Study between Anxiety and Fear of COVID-19 with Psychological Behavior Response: The Mediation Role of Perceived Stress

Hamid Sharif Nia ¹, Long She ², Harpaljit Kaur ³, Christopher Boyle ⁴, Fatemeh Khoshnavay Fomani ^{5*}, Esmail Hoseinzadeh ⁶, Daniyal Kohestani ⁷, Pardis Rahmatpour⁸

¹ Amol Faculty of Nursing and Midwifery, Traditional and Complementary Medicine Research Center, Addiction Institute, Mazandaran University of Medical Sciences, Sari, Iran.

² Faculty of Business and Law, Taylor's University, Subang Jaya, Selangor, Malaysia

³ Taylor's University,

⁴ Graduate School of Education, University of Exeter, Exeter, UK

⁵ *Corresponding Author, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran.

⁶ School of nursing and midwifery, Tehran Islamic Azad University of Medical Sciences, Tehran, Iran

⁷ MSc in Nursing, School of nursing and midwifery, Iran University of Medical Science, Tehran, Iran.

⁸ Assistant Professor, Department of Nursing, Alborz University of Medical Sciences, Alborz, Iran.



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، ماما یی و مراقبت | گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

Abstract

Objective: Despite the abundance of studies linking fear and anxiety to Covid-19, there are limited studies that examine how these elements impact psychological behavioral responses, especially in Iran. The aim of this study was to investigate the relationship between anxiety and fear of COVID-19 with psychological behavior response, whether this relationship is mediated by role of perceived stress among Iranian population during the COVID-19 pandemic.

Methods: A predictive cross-sectional study was used to investigate the relationships between COVID-19 anxiety syndrome, fear of the COVID-19 with psychological behavioral responses due to the pandemic and the mediating role of the COVID-19 perceived stress in these relationships.

Results: The current study revealed that during the COVID-19 pandemic, fear and anxiety of COVID-19 can influence the psychological behavioral responses of the individuals, however this can be explained through perceived stress.

Conclusion: As such, the current study points to the individuals who perceived high stress due to COVID-19 were more likely to comply with guidelines, which was contrary to the findings of previous studies. The current study findings are applicable for health policy-makers in order to help them in understanding human behavior for developing health promotion programs and also for fostering resilience among the general population.

Key words: COVID-19, Anxiety, Perceived Stress, Psychological Behavior Response, Global Pandemic, COVID-19 Anxiety Syndrome



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، مامایی و مراقبت | گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

Introduction

The outbreak of the COVID-19 virus has led to millions of deaths globally, forcing governments to take crude measures to halt the spread of the virus. The global pandemic and the subsequent public health measures taken in order to contain the virus have created a profound effect on human life, producing alarming surges in mental health problems, and economic issues (Brooks et al., 2020; Kawohl & Nordt, 2020; S. A. Lee, Mathis, Jobe, & Pappalardo, 2020; A. Wilder-Smith & Freedman, 2020; Xiang et al., 2020). The prevalence of this virus since December 2019 has long surpassed the rates of infection and death tolls of severe acute respiratory syndrome (SARS), Middle East Respiratory Syndrome (MERS) and Ebola, causing immense psychological difficulties to the general population, that are sequelae linked to fear of infection, provoking a secondary mental health crisis (Gruber et al., 2020; Pfefferbaum & North, 2020; Sadeghzadeh, Abbasi, Khajavi, & Amirazodi, 2021; Wang, Pan, Wan, Tan, Xu, McIntyre, et al., 2020; Wilder-Smith, 2021).

On 19th February 2020, Iran reported its first confirmed case in the city of Qom (Batrawy, 2020) and by August 2021, the virus had infected over 4.1 million people and caused deaths of at least 94,000 Iranians, becoming the highest death toll in the Middle East (Press, 2021). Due to Covid-19's alarming speed of infection worldwide, WHO declared it as a pandemic in March 2020 (World Health Organization, 2020). National governments, including Iran, enforced unprecedented reforms, such as lockdowns, quarantine, closures of all nonessential business, social distancing, and intensified hygiene practices in attempt to prevent and reduce the spread of COVID-19 (Haug et al., 2020). By taking these strict measures a consequence was the exacerbation of negative psychological responses such as anxiety, stress, uncertainty, fear, and other substantial lifestyle changes among its people



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری، مامایی و مراقبت گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

(Paluszek, Landry, Taylor, & Asmundson, 2020). Studies have shown that healthcare workers (HCWs)(Chirico et al., 2021), alongside adolescents(Loades et al., 2020), elderly patients(Prendki et al., 2020), and people who were infected by the coronavirus, were the population hardest hit by the COVID-19 pandemic. Consequently, the Covid-19 psychological impact was observed to be prominent in healthcare workers(Chirico et al., 2021), students, people with poor health, and women (Parlapani, Holeva, Voitsidis, Blekas, Gliatas, Porfyri, Golemis, Papadopoulou, Dimitriadou, & Chatzigeorgiou, 2020; Wang, Pan, Wan, Tan, Xu, Ho, et al., 2020) but were lessened when preventive health measures were taken (Wang, Pan, Wan, Tan, Xu, Ho, et al., 2020) which complied with guidelines and government recommendations (Qian et al., 2020).

The moderate to high levels of anxiety in Iranians can have negative effects on can have a negative impact on people's lives and can lead to serious problems (Sharif Nia et al., 2021). Anxiety due to COVID-19 has been associated with contracting and/or dying from COVID-19, fear of their families or loved ones getting infected (Anderson-Shaw & Zar, 2020; Jamshaid, Haider, Jamshed, & Jamshad, 2020), financial issues (Morin, Carrier, Bastien, & Godbout, 2020), and fear of shortage of food, medicine, and other necessities due to panic buying and hoarding (Goddard, 2020; Jovančević, Miličević, & differences, 2020), thus negatively affecting one's mental health (Jamshaid et al., 2020). In the same vein, the pandemic has drastically impacted lifestyles creating anxiety due to social connectedness (Armitage & Nellums, 2020; Donovan & Blazer, 2020), isolation (Brenner & Bhugra, 2020; DeJong et al., 2020), loneliness (Hoffart, Johnson, & Ebrahimi, 2020) and economically (Bareket-Bojmel, Shahar, & Margalit, 2020; Brenner & Bhugra, 2020). This uncontrollable anxiety can lead to an emotional state that may overwhelm the behavior, feelings, and thoughts of the individuals, causing further mental or psychological disorders (Huang & Zhao, 2020). In addition, obsessive thinking, and other forms of perseveration about COVID-19 may escalate the emergence of clinical anxiety and maladaptive coping (S. A. Lee et al., 2020; A. V. Nikčević & M. M. J. P. r. Spada,



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، مامایی و مراقبت گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

2020). Studies have also highlighted that the post pandemic anxiety may be higher due to the difficulty of returning to 'normal' societal functioning which require unavoidably exposure to environments related with a greater risk of infection, such as public transport, offices, cinemas, and theatres (A. V. Nikčević & M. M. J. P. r. Spada, 2020).

During the COVID-19 pandemic, fear has been the most vital and common sentiment with substantial psychological effect on individuals, imploring them to sustain sanitation during the lockdowns and quarantines, thus experiencing stress, anxiety, worry, panic, phobia to some extent, if it is not well calibrated (Ahmadi & Ramezani, 2020; N. Liu et al., 2020). Fear can be ascribed to the individual's knowledge of the facts related to that virus either from the media or government bodies, or by directly experiencing the illness or exposure to the indirect experience of a disease outbreak (Blakey & Abramowitz, 2017; Gao et al., 2020; Garfin, Silver, & Holman, 2020; Khademian, Delavari, Koohjani, & Khademian, 2021; Moghanibashi-Mansourieh, 2020; Sadeghzadeh et al., 2021). Schimmenti, Billieux, and Starcevic (2020) categorized fear as: fear for the body, fear for significant others, fear of not knowing, and fear of inaction and past studies have linked fear positively with increased anxiety and depressive symptoms (Ahorsu, Lin, Imani, Saffari, Griffiths, Pakpour, et al., 2020; Mertens, Gerritsen, Duijndam, Saleminck, & Engelhard, 2020; Schimmenti, Billieux, & Starcevic, 2020). Parlapani et al. (2020) identified women to have substantially higher levels of fear towards COVID-19 as compared to the men, leading participants to have severe depressive and anxiety symptoms. In addition, they discovered that people less than 30 years old showed less fear of the pandemic. However, severe Covid-19 fear is linked with higher suicide risk (Dsouza, Quadros, Hyderabadwala, & Mamun, 2020; Mamun & Griffiths, 2020), psychological distress (Fernández, Crivelli, Guimet, Allegri, & Pedreira, 2020; Xiang et al., 2020), anxiety and depression (Ahorsu, Lin, Imani, Saffari, Griffiths, Pakpour, et al., 2020; Y. Zhang & Ma, 2020), xenophobia and discrimination (Devakumar, Shannon, Bhopal, & Abubakar, 2020;



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، مامایی و مراقبت گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

Lima et al., 2020), and pre-existing mental health disorders (Colizzi et al., 2020). On the other hand, insufficient fear of the pandemic, whereby the government restrictive measures and policies to combat the pandemic are ignored (Craig A Harper, Satchell, Fido, Latzman, & addiction, 2020; Mertens et al., 2020) and COVID-19 vaccine hesitancy (Willis et al., 2021), may harm the individual and society negatively.

The increasing numbers of COVID-19 infections and mortality have escalated stress (N. Liu et al., 2020) which is the main risk factors of mental health problems such as insomnia, anxiety and depression (Craig A Harper et al., 2020; A. H. Pakpour & M. D. J. J. o. C. D. Griffiths, 2020; Pappa et al., 2020; Taylor et al., 2020). Stress caused by the pandemic was found to be is higher in women (N. Liu et al., 2020; Moghanibashi-Mansourieh, 2020; Wang, Pan, Wan, Tan, Xu, McIntyre, et al., 2020), younger people (Huang & Zhao, 2021), those with poor sleeping habits (Huang & Zhao, 2021; N. Liu et al., 2020; Schäfer et al., 2020), support caregivers and other minority and disadvantaged groups (Park et al., 2020) as they have lower compliance with prevention behavior and/or are less adaptive coping strategies, leading to substantial long term mental health problems (Galea, Merchant, & Lurie, 2020). Interestingly, people with higher education were found to have higher level of stress, anxiety and depression during this pandemic (Salari et al., 2020) which may be due to their high self-awareness about their health (Y. Zhang & Ma, 2020).

Despite the abundance of studies linking fear and anxiety to Covid-19, there are limited studies, to the authors' knowledge, that examine how these elements impact psychological behavioral responses, especially in Iran. Hence, this current study was conducted to assess two research objectives, the first is to determine the effect of Covid-19 anxiety syndrome and fear of Covid-19 on psychological behavioral responses in Iran. The second objective evaluated the role of stress in mediating the relationships between Covid-19 anxiety syndrome and fear of Covid-19 on psychological behavioral



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، مامایی و مراقبت گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

responses among the Iranian people. The psychological and behavioral responses of Covid-19 in Iran is crucial to enhance resilience and to decrease the population's vulnerability.

Method

A predictive, cross-sectional online questionnaire-based survey was used in this study to investigate the relationships between COVID-19 anxiety syndrome, fear of the COVID-19 with psychological behavioral responses due to the pandemic and the mediating role of the COVID-19 perceived stress in these relationships.

Participants

The requisite sample size was estimated to be 1000. with a probability of 0.05, the statistical power of 80%, the anticipated medium effect size of 0.12, and 31 items measuring four constructs. This estimate was calculated a-priori using a sample size calculator for Structural Equation Models (SEM)(Calculator, 2021). The minimum statistical power analysis in humanities and social sciences studies should be 80% (J. Cohen, 1988). In total, 926 participants in Iran participated between October and November 2020 during the initial stages of the COVID-19 pandemic. The online scales were created via Google Forms and its URL link was sent by email or social networking applications such as a Telegram channel or WhatsApp group of adults. The inclusion criteria for participants were adults (age > 18) who were willing to participate in this study. The mean age of participants was 31.12 (SD=7.62) (range 18 to 67) years old, and most were female (85.2%), married (69.1%), and had a bachelor's degree (45.0%). The other socio-demographic information is provided in Table 1.



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، مامایی و مراقبت | گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

[Please insert Table 1 here]

Instruments

A demographic form and the Persian version of the following scales were used in this study.

Perceived Stress Scale

The PSS-10 is a self-reported scale to measure the global level of perceived stress (S. Cohen, 1988). This scale includes two factors include Factor 1 (Perceived Helplessness) is made of negatively phrased items (i.e., items 1, 2, 3, 6, 9, and 10; e.g., “In the last month, how often have you felt nervous and stressed”); and Factor 2 (Perceived Self-Efficacy) is made of positively phrased items (i.e., items 4, 5, 7, and 8; e.g., “In the last month, how often have you felt that things were going your way”).

The Persian version of the COVID-19 anxiety syndrome

This self-report measure includes nine items, loading on two factors, assessing features of the anxiety syndrome linked to COVID-19. These are (1) avoidance (e.g., of public transport because of the fear of contracting COVID-19); (2) checking (e.g., of symptoms of COVID-19); (3) worrying (e.g., researching symptoms of COVID-19 at the cost of other activities); and (4) threat monitoring (e.g., paying close attention to others displaying possible symptoms of COVID-19. Items relating to checking, worrying and threat monitoring load on the first factor (‘perseveration’) with a second factor comprising avoidance items (‘avoidance’). Participants are asked to rate how frequently they experience each feature of the anxiety syndrome using a 5-point time anchored scale (0 = ‘Not at all’ to 4 = ‘Nearly every day over the last 2 weeks’). Scores range between 0 and 36, with higher scores



indicative of increased levels of the anxiety syndrome. The C-19ASS has demonstrated good reliability and validity (A. V. Nikčević & M. M. Spada, 2020). In the current study, the Cronbach α was .82.

The Persian version of the fear of the COVID-19

The FCV-19S (Ahorsu, Lin, Imani, Saffari, Griffiths, & Pakpour, 2020) is a seven-item scale that assesses the fear of COVID-19. The seven items (e.g., “I am most afraid of coronavirus-19”) are rated on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree) with scores ranging from 7 to 35. The higher the score, the greater the fear of COVID-19.

The Persian version of the psychological behavioral responses

The PBR (M. Lee & You, 2020) is a self-reported measure that assesses the characteristics of psychological and behavioral responses in COVID-19. This measure includes 5 items with scores ranging from 1 (Never) to 4 (always) and has good validity and reliability.

Data Analysis

To assess factor structure, exploratory factors analysis (EFA) was performed through maximum likelihood with Promax rotation using SPSS version 26. The Kaiser–Meyer–Olkin (KMO) and the Bartlett’s test of sphericity were employed to ensure the study sample was appropriate to perform the factor analysis. Items with absolute loading below .5 were removed (S Pahlevan Sharif & Sharif Nia, 2018). Next, following the two-step approach, this study employed covariance-based structural equation modeling and Amos version 27 to test the measurement model and structural model. First, to assess the measurement model, the maximum likelihood confirmatory factor analysis (CFA) was performed. Model fit was assessed using several



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری، مامایی و مراقبت گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

model fit indexes and model was revised according to the modification indices (S Pahlevan Sharif & Sharif Nia, 2018). The internal consistency of each construct was assessed using its Cronbach's alpha. Construct reliability was assessed using composite reliability (CR) and maximal reliability (MaxR). The convergent validity was assessed through average variance extracted (AVE) of the latent constructs. Cronbach's alpha, CR, and MaxR were greater than .7 indicating good internal consistency and construct reliability. While AVE of greater than .5 indicate good convergent validity. To establish discriminant validity, the Heterotrait-monotrait ratio of correlation (HTMT) matrix with values less than .85 was considered acceptable discriminant validity (Henseler, Ringle, & Sarstedt, 2015). Next, the proposed model and hypothesis were tested. In order to test the hypotheses in the structural model, bootstrapping with 2000 replications was performed (S Pahlevan Sharif & Sharif Nia, 2018). All tests in this study were two-tailed, and p values of less than .05 were considered statistically significant.

Ethical considerations

The study aims, number of items, time to complete the survey, the researchers' affiliation and email for queries, and the ethical code of study were inserted on the first page of the online questionnaire. These items informed participants that their participation was voluntary and that their responses would be published anonymously as group data. The protocol of this study was approved by the Mazandaran University of Medical Sciences Research Ethics Committee (IR.MAZUMS.REC.1400.13728).

Results



The results of the maximum likelihood EFA with Promax rotation extracted five factors, in which, COVID-19 anxiety syndrome was divided into two factors, namely perseverate thinking (five items), and avoidance (fours items). The values of Kaiser–Meyer–Olkin (KMO) was .911 and Bartlett's test of sphericity showed the adequacy of the sampling and suitability of the data for performing the factor analysis ($p < .001$, $\chi^2 = 10557.720$, $df = 300$). One item from perceived stress, and two items from psychological behavioural responses were removed due to weak factor loadings of less than .5. The final factor structure explained 57.793% of the variance.

The maximum likelihood CFA was performed to assess the measurement model based on the factor structure obtained from EFA. The results showed that the initial measurement model with all first-order construct did not fit the data well [$\chi^2(242) = 1283.852$, $p < .001$, $\chi^2/df = 5.305$, $CFI = .898$, $IFI = .898$, $TLI = .883$, $SRMR = .059$, and $RMSEA (90\% CI) = .068 (.065, .072)$]. Following the results of modification indices, five pairs of the item measurement error (i.e., anxiety syndrome – two pair; fear of COVID-19– three pairs) were allowed to freely covary to improve the model fit. The revised measurement model with all first order constructs has improved significantly [$\Delta\chi^2 (\Delta df = 4) = 411.581$, $p < .001$] and fitted the data well [$\chi^2(238) = 872.271$, $p < .001$, $\chi^2/df = 3.665$, $CFI = .938$, $IFI = .938$, $TLI = .928$, $SRMR = .053$, and $RMSEA (90\% CI) = .054 (.050–.058)$]. Next, COVID-19 anxiety syndrome was included in the revised measurement model as second-order construct, the results showed that the final measurement model fit also fitted the data well [$\chi^2(240) = 1016.966$, $p < .001$, $\chi^2/df = 4.237$, $CFI = .924$, $IFI = .924$, $TLI = .912$, $SRMR = .053$, and $RMSEA (90\% CI) = .059 (.055, .063)$], and all factor loadings were greater than .5 and significantly.



Table 2 shows the results of the measurement model assessment. All constructs (both first-order and second-order constructs) showed good internal consistency (Cronbach's alpha ranged from .721 to .886), and construct reliability (CR ranged from .724 to .876, MaxR ranged from .732 to .889). As shown in Table 2, all constructs' AVE were greater than .5, except for construct of avoidance (.398) and psychological behavioural responses (.471). Although the AVE for these two constructs was less than .5, Fornell and Larcker (1981) recommended that if AVE is less than .5, CR of greater than .7 alone can be used to establish convergent validity of the construct. Indeed, AVE is a strict measure of convergent validity and a more conservative measure than CR (Saeed Pahlevan Sharif, She, Yeoh, & Naghavi, 2021). Therefore, all constructs have achieved convergent validity.

[Please insert Table 2 here]

Table 3 shows the results of HTMT matrix, all values in the HTMT matrix were less than .9, demonstrating the acceptable discriminant validity of all constructs.

[Please insert Table 3 here]

Next, the proposed structural model and hypotheses were tested while controlling for the effect of participants' age, gender, marital status, and education level. The results of the structural model assessment show in Table 4. The results of assessing total effect showed a significant positive relationship between COVID-19 anxiety syndrome and psychological behavioural responses ($b = .767, p < .001$), and between fear of COVID-19 and psychological behavioural responses ($b = .121, p < .001$), that providing support for H1 and H2. The total effect model explained 68% of the total variance of psychological behavioural responses. Moreover, the results of assessing direct effect showed a significant positive relationship between



COVID-19 anxiety syndrome and preceived Stress ($b = .113, p < .01$), between fear of COVID-19 and preceived Stress ($b = .455, p < .001$), and between preceived stress and psychological behavioural responses ($b = .100, p < .001$), thus H3, H4, and H5 were supported. Lastly, using a bootstrapping approach, the results of assessing indirect effects supported for H6 and H7 on the positive mediation role of preceived stress in the relationship between COVID-19 anxiety syndrome and psychological behavioural responses ($b = .011, p < .01$), and between fear of COVID-19 and psychological behavioural responses ($b = .046, p < .001$). The significant direct relationship between COVID-19 anxiety syndrome and psychological behavioural responses ($b = .756, p < .001$), and between fear of COVID-19 and psychological behavioural responses ($b = .075, p < .01$) indicating the mediation role of preceived stress for both relationships was partial.

[Please insert Table 4 here]

The mediation model explained 70% of the total variance of psychological behavioural responses, and 33% of the total variance of preceived stress.

Figure 1 shows the results of the structural model.

Please exhibit figure 1 here

Discussion

The current study sought to assess the relationship between COVID-19 anxiety syndrome and fear of COVID-19 with psychological behavioral responses. Moreover, the study aimed to examine whether the COVID-19 perceived stress mediates the relationship between COVID-19 anxiety syndrome, fear of the COVID-19, and psychological behavioral responses.



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، مامایی و مراقبت گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

The findings revealed that there was a significant positive correlation between COVID-19 anxiety syndrome and psychological behavioural responses. This finding aligns with previous studies in determining a positive relationship between the COVID-19 anxiety syndrome and psychological behavioral responses such as depression, feelings of helplessness, persistent worrying, never feeling clean after disinfecting (W. Zhang et al., 2020). Pandemic psychological distress can shape the behavior (A. V. Nikčević & M. M. Spada, 2020) and it has been identified that people usually experience fear, sense of isolation (Coelho, Suttiwan, Arato, & Zsido, 2020), and a wide range of behavioral change (J. Zhang, 2021) during novel pandemics (Ropeik, 2004). However, in response to the stress experienced by people as a result of COVID-19, there are many behavioral changes which have led to over-compliance with health protocols as well as many reports of non-compliance with these protocols such as wearing masks and hand washing (Gao et al., 2020). The current paper has identified that a person's gender, age, and educational level has increases the likelihood of non-compliance with COVID-19- related public health measures. The findings of a longitudinal cohort study have indicated that non-compliance, especially with hygiene-related measures, was more prevalent in males, and individuals with higher educations(Nivette et al., 2021). This is why we have controlled the effects of gender, age, and education during the data analysis.

The current study also, explored the positive correlation between fear of COVID-19 and psychological behavioural responses. According to the protection motivation theory (PMT) which proposed that key contributors to people's willingness to make behavioral changes(Rogers, 1975), the extent of the fear that the individual perceives, as well as the other factors such as coping skills, have the potential to determine individuals' behavioral response. The COVID-19 pandemic formed several fears for people such as fear of being contaminated (Coelho et al., 2020) or the fear of the unknown (Gallagher, Bentley, & Barlow, 2014; Nicholas, 2016) that can trigger elements related to psychological behavioural responses. Due to the novel nature



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری، مامایی و مراقبت گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

of the current pandemic with a rapid person-to-person transmission, as well as it's potential for transmission from asymptomatic carriers, individuals may experience a threat that causes fear (Organization, 2020; Parlapani, Holeva, Voitsidis, Blekas, Gliatas, Porfyri, Golemis, Papadopoulou, Dimitriadou, Chatzigeorgiou, et al., 2020). Fear of COVID-19 can lead to the protective behaviors (A. H. Pakpour & M. D. Griffiths, 2020). It has been revealed by (Craig A. Harper, Satchell, Fido, & Latzman, 2020) research that fear of COVID-19 was the only predictor of positive behavior change such as improved hand hygiene or social distancing. Interestingly, they found that the COVID-19 fear and anxiety were stronger predictors than moral and political orientation (Craig A. Harper et al., 2020). Similarly, fear can significantly increase individual engagement in preventive behaviors during the COVID-19 pandemic (Yıldırım, Geçer, & Akgül, 2021). It is worth mentioning that the relationship between fear and health behaviors is twofold. A study conducted in Greece (2020) among 3029 participants indicated that the greater application of safety or checking behaviors, as well as a high level of compliance with guidelines led to an amplification of fear, potentially due to increased contamination awareness (Parlapani, Holeva, Voitsidis, Blekas, Gliatas, Porfyri, Golemis, Papadopoulou, Dimitriadou, Chatzigeorgiou, et al., 2020).

It has been suggested by the current study that there is a significant positive relationship between COVID-19 anxiety syndrome and perceived Stress. Also, the significant positive correlation between fear of COVID-19 and perceived stress was shown by the current study's findings. The person's appraisal of a stressor as threatening or not, as well as her/his own abilities to cope can indicate the perceived stress level (S. Liu, Lithopoulos, Zhang, Garcia-Barrera, & Rhodes, 2021). Several factors such as the inconsistency between policies and scientific evidence (Pedrozo-Pupo, Pedrozo-Cortés, & Campo-Arias, 2020), the lockdown policies and quarantine (Achterberg, Dobbelaar, Boer, & Crone, 2021; Torales et al., 2020), evidences of possible fatal consequences of contracting the virus (Onder, Rezza, & Brusaferro, 2020), repeated exposure to media reports (Lima et al., 2020), and



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، مامایی و مراقبت گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

the individual psychological trait (Flesia et al., 2020) influence the perceived stress associated with COVID-19. The findings of an Iranian study have indicated that the most stressful event during the Covid-19 outbreak was the rise in essential goods prices. They have also found that the death of a family member due to the Covid-19 infection was the main source of perceived stress(Mousavi, Hooshyari, & Ahmadi, 2020). The anxiety and fear of contracting COVID-19 are also identified as the most important underlying factor influence the level of the COVID-19 perceived stress. The findings of a study (Yan, Gan, Ding, Wu, & Duan, 2021a) showed that higher COVID-19 perceived stress was associated with more emotional distress including fear and anxiety. It has been indicated that perceived stress due to COVID-19 among the Iranian general population was slightly high, and it has been correlated with using social media (Shokri et al., 2020). Previous studies have also shown, that in some cases, social media can increased the perceived risk of the outbreaks (Choi, Yoo, Noh, & Park, 2017). The findings of a large national study in Iran found a high level of stress among the general Iranian population during the COVID-19 outbreak in which those in middle age groups and low to moderate socioeconomic status experienced the highest stress due to worry about losing their jobs or income (Maarefvand, Hosseinzadeh, Farmani, Safarabadi Farahani, & Khubchandani, 2020).

This current study findings showed that there is a positive significant correlation between the perceived stress of COVID-19 and psychological behavioral responses. Furthermore, the perceived stress of COVID-19 mediated the relationship between the COVID-19 anxiety and fear of COVID-19, and psychological behavioral responses. Although there are studies that indicate the more the individual perceives the stress, the higher the potential for engaging in unhealthy behaviours(Ng & Jeffery, 2003), the current study showed a contradictory finding. As such, the current study points to the individuals who perceived high stress due to COVID-19 were more likely to comply with guidelines. This finding is supported by previous findings which indicated practicing precautionary behaviors during the COVID-19 pandemic is associated strongly with perceived stress (M. Lee & You, 2020;



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، مامایی و مراقبت گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

Lieberoth et al., 2021). Some existing studies addressed the mediating role of perceived stress in relationships between different concepts and psychological behavioral responses in different settings. For example, a study conducted by (Pfeffer, Englert, & Mueller-Alcazar, 2020) indicated the moderating role of perceived stress and trait self-control in the context of intention and physical activity behavior. It has also been found that nearly half of the total effect of self-compassion on health behavior occurred through perceived stress (Homan & Sirois, 2017). According to the transactional stress model (Lazarus & Folkman, 1984) individuals' reactions and adaptation to the objective stressful events are determined by their cognitive appraisal of the stressors such as perceived stress. It has been addressed by the studies' findings that those individuals who perceive the high levels of stress may have more difficulty in realizing positive cognition, emotion, and behaviors and are at a greater risk for health problems (Lindholdt et al., 2021; Yan, Gan, Ding, Wu, & Duan, 2021b). However, the current study indicated that the more individuals perceived the Covid-19 stress, the higher the compliance with the protective measures. In line with this finding, a cross-sectional study with 3727 Iranian participants revealed that respondents were motivated by the Covid-19 danger and fear control responses that indicates their high perceived efficacy (Jahangiry et al., 2020). The extended parallel process model (EPPM) (Popova, 2012) suggests supporting theoretical explanation for the current study finding. EPPM suggests that individuals who expose to a risky situation, usually apply two types of cognitive appraisal include the efficacy of the recommended advices and perceived threat. Accordingly, individuals who perceive the Covid-19 threat in high levels while perceive low efficacy, usually act to protect themselves from the fear rather than the danger itself (fear control process). Instead, those who perceive high efficacy, even if they perceive high level of threat, usually will be motivated to protect themselves from the danger (danger control process).

Study limitations



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، ماما یی و مراقبت | گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

While the study provides new information relative to the mediating role of the perceived stress on the relationship between COVID-19 anxiety syndrome, fear of COVID-19, and psychological behavioral responses, it is not without its limitations. The cross-sectional design of this study does not allow for firm causal conclusions. Conducting longitudinal studies by collecting data at different points in time as well as experimental studies are recommended for future research since there are numerous complex and dynamic processes by which spirituality relates to mental health outcomes. In terms of mediation studies, the most salient mediating processes seem to involve stress dimensions, values/attitudes, and social control/norms, which need to be investigated in further studies. Furthermore, the data were gathered via online data collection. Despite its advantages (e.g., affordability and accessibility), online surveys have been criticized for selection bias and difficulty reaching certain types of participants (Vaske, 2011; Wright, 2017).

Conclusion

The current study revealed that during the COVID-19 pandemic, fear and anxiety of COVID-19 can influence the psychological behavioral responses of the individuals, however this can be explained through perceived stress. The visibility of protective factors in addition to risk factors can offer a broader view on measures to deal with depression in the general population resulting from global adverse situations such as the ongoing COVID-19 pandemic. The current study findings are applicable for health policy-makers to help them in developing health promotion programs and fostering resilience among the general population. Also, it is useful for organizations and workplaces. Because they have been known as the best place to provide psychological support to the general population. Workplaces have a considerable role in prevention of the spread of COVID-19 infection, and



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، مامایی و مراقبت | گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

conducting health promotion programs to increase psychological skills and coping mechanisms to address the negative effects of the COVID-19 pandemic(Chirico & Ferrari, 2021).

Declarations

Acknowledgments

The authors would like to thank the Mazandaran University of Medical Sciences

Funding

No funding was received for conducting this study.

Conflicts of interest/Competing interests

Conflict of interest

There are no conflicts of interest by any of the authors of this study. All authors have participated in (a) conception and design, or analysis and interpretation of the data; (b) drafting the article or revising it critically for important intellectual content; and (c) approval of the final version. This manuscript has not been submitted to, nor is under review at, another journal or other publishing venue. The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.

Consent to participate

Informed consent was obtained from all individual participants included in the study.

Consent for publication: N/A



Availability of data and material: N/A

Code availability: N/A

References

- Achterberg, M., Dobbelaar, S., Boer, O. D., & Crone, E. A. (2021). Perceived stress as mediator for longitudinal effects of the COVID-19 lockdown on wellbeing of parents and children. *Scientific Reports*, 11(1), 2971. doi:10.1038/s41598-021-81720-8
- Ahmadi, K., & Ramezani, M. A. J. A. P. J. o. P. H. (2020). <? covid19?> Iranian Emotional Experience and Expression During the COVID-19 Crisis. 32(5), 285-286. Retrieved from <https://journals.sagepub.com/doi/pdf/10.1177/1010539520937097>
- Ahorsu, D. K., Lin, C.-Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020). The Fear of COVID-19 Scale: Development and Initial Validation. *International Journal of Mental Health and Addiction*. doi:10.1007/s11469-020-00270-8
- Ahorsu, D. K., Lin, C.-Y., Imani, V., Saffari, M., Griffiths, M. D., Pakpour, A. H. J. I. j. o. m. h., & addiction. (2020). The fear of COVID-19 scale: development and initial validation. 1-9.
- Anderson-Shaw, L. K., & Zar, F. A. J. J. o. B. I. (2020). COVID-19, moral conflict, distress, and dying alone. 17(4), 777-782.
- Armitage, R., & Nellums, L. B. J. T. L. P. H. (2020). COVID-19 and the consequences of isolating the elderly. 5(5), e256. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7104160/pdf/main.pdf>
- Bareket-Bojmel, L., Shahr, G., & Margalit, M. J. I. j. o. c. t. (2020). COVID-19-related economic anxiety is as high as health anxiety: findings from the USA, the UK, and Israel. 1-9.
- Batrawy, A. (2020, February 24). Iran says 12 dead from new virus, rejects higher death toll. *AP News*. Retrieved from <https://apnews.com/article/united-nations-health-ap-top-news-international-news-virus-outbreak-32540d09ec101aac057660ef1b0aa970>
- Blakey, S. M., & Abramowitz, J. S. J. J. o. c. p. i. m. s. (2017). Psychological predictors of health anxiety in response to the Zika virus. 24(3), 270-278.



- Brenner, M. H., & Bhugra, D. J. F. i. p. (2020). Acceleration of anxiety, depression, and suicide: secondary effects of economic disruption related to COVID-19. *11*, 1422.
- Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. J. T. l. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *395*(10227), 912-920. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7158942/pdf/main.pdf>
- Calculator, F. S. (2021). A-priori Sample Size for Structural Equation Models Calculator. Retrieved from <https://www.danielsoper.com/statcalc/calculator.aspx?id=89>
- Chirico, F., & Ferrari, G. (2021). Role of the workplace in implementing mental health interventions for high-risk groups among the working age population after the COVID-19 pandemic. *J Health Soc Sci*, *6*(2), 145-150.
- Chirico, F., Ferrari, G., Nucera, G., Szarpak, L., Crescenzo, P., & Ilesanmi, O. (2021). Prevalence of anxiety, depression, burnout syndrome, and mental health disorders among healthcare workers during the COVID-19 pandemic: a rapid umbrella review of systematic reviews. *Journal of Health and Social Sciences* *6*(2), 209-220. doi:10.19204/2021/prv17
- Choi, D. H., Yoo, W., Noh, G. Y., & Park, K. (2017). The impact of social media on risk perceptions during the MERS outbreak in South Korea. *Comput Human Behav*, *72*, 422-431. doi:10.1016/j.chb.2017.03.004
- Coelho, C. M., Suttiwan, P., Arato, N., & Zsido, A. N. (2020). On the Nature of Fear and Anxiety Triggered by COVID-19. *Frontiers in Psychology*, *11*(3109). doi:10.3389/fpsyg.2020.581314
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences (2nd Edition)*. Hillsdale, NJ: Lawrence Earlbaum Associates.
- Cohen, S. (1988). Perceived stress in a probability sample of the United States.
- Colizzi, M., Bortoletto, R., Silvestri, M., Mondini, F., Puttini, E., Cainelli, C., . . . immunity-health. (2020). Medically unexplained symptoms in the times of COVID-19 pandemic: a case-report. *5*, 100073.
- DeJong, C. A., Verhagen, J. G. D., Pols, R., Verbrugge, C. A., Baldacchino, A. J. B., & neuroscience, c. (2020). Psychological impact of the acute COVID-19 period on patients with substance use disorders: We are all in this together. *11*(2), 207.



- Devakumar, D., Shannon, G., Bhopal, S. S., & Abubakar, I. J. T. L. (2020). Racism and discrimination in COVID-19 responses. 395(10231), 1194. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7146645/pdf/main.pdf>
- Donovan, N. J., & Blazer, D. J. T. A. J. o. G. P. (2020). Social isolation and loneliness in older adults: review and commentary of a National Academies report. 28(12), 1233-1244. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7437541/pdf/main.pdf>
- Dsouza, D. D., Quadros, S., Hyderabadwala, Z. J., & Mamun, M. A. J. P. r. (2020). Aggregated COVID-19 suicide incidences in India: Fear of COVID-19 infection is the prominent causative factor. 290, 113145. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7832713/pdf/main.pdf>
- Fernández, R. S., Crivelli, L., Guimet, N. M., Allegri, R. F., & Pedreira, M. E. J. J. o. a. d. (2020). Psychological distress associated with COVID-19 quarantine: Latent profile analysis, outcome prediction and mediation analysis. 277, 75-84. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7413121/pdf/main.pdf>
- Flesia, L., Monaro, M., Mazza, C., Fietta, V., Colicino, E., Segatto, B., & Roma, P. (2020). Predicting Perceived Stress Related to the Covid-19 Outbreak through Stable Psychological Traits and Machine Learning Models. *Journal of Clinical Medicine*, 9(10). doi:10.3390/jcm9103350
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39-50. doi:10.2307/3151312
- Galea, S., Merchant, R. M., & Lurie, N. J. J. i. m. (2020). The mental health consequences of COVID-19 and physical distancing: the need for prevention and early intervention. 180(6), 817-818. Retrieved from https://jamanetwork.com/journals/jamainternalmedicine/articlepdf/2764404/jamainternal_galea_2020_vp_200009.pdf
- Gallagher, M. W., Bentley, K. H., & Barlow, D. H. (2014). Perceived control and vulnerability to anxiety disorders: A meta-analytic review. *Cognitive therapy and research*, 38(6), 571-584. doi:doi: 10.1007/s10608-014-9624-x
- Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., Chen, S., . . . Dai, J. J. P. o. (2020). Mental health problems and social media exposure during COVID-19 outbreak. 15(4), e0231924. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7162477/pdf/pone.0231924.pdf>
- Garfin, D. R., Silver, R. C., & Holman, E. A. J. H. p. (2020). The novel coronavirus (COVID-2019) outbreak: Amplification of public health consequences by media exposure. 39(5), 355. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7735659/pdf/nihms-1649806.pdf>



- Goddard, E. J. C. J. o. A. E. R. c. d. a. (2020). The impact of COVID-19 on food retail and food service in Canada: Preliminary assessment.
- Gruber, J., Prinstein, M. J., Clark, L. A., Rottenberg, J., Abramowitz, J. S., Albano, A. M., . . . Davila, J. J. A. P. (2020). Mental health and clinical psychological science in the time of COVID-19: Challenges, opportunities, and a call to action.
- Harper, C. A., Satchell, L. P., Fido, D., & Latzman, R. D. (2020). Functional Fear Predicts Public Health Compliance in the COVID-19 Pandemic. *International Journal of Mental Health and Addiction*. doi:10.1007/s11469-020-00281-5
- Harper, C. A., Satchell, L. P., Fido, D., Latzman, R. D. J. I. j. o. m. h., & addiction. (2020). Functional fear predicts public health compliance in the COVID-19 pandemic. 1-14.
- Haug, N., Geyrhofer, L., Londei, A., Dervic, E., Desvars-Larrive, A., Loreto, V., . . . Klimek, P. J. N. h. b. (2020). Ranking the effectiveness of worldwide COVID-19 government interventions. 4(12), 1303-1312. Retrieved from <https://www.nature.com/articles/s41562-020-01009-0.pdf>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115-135. doi:10.1007/s11747-014-0403-8
- Hoffart, A., Johnson, S. U., & Ebrahimi, O. V. J. F. i. P. (2020). Loneliness and social distancing during the COVID-19 pandemic: Risk factors and associations with psychopathology. 11, 1297.
- Homan, K. J., & Sirois, F. M. (2017). Self-compassion and physical health: Exploring the roles of perceived stress and health-promoting behaviors. *Health Psychol Open*, 4(2), 2055102917729542. doi:10.1177/2055102917729542
- Huang, Y., & Zhao, N. (2021). Mental health burden for the public affected by the COVID-19 outbreak in China: Who will be the high-risk group? , 26(1), 23-34. Retrieved from <https://www.tandfonline.com/doi/pdf/10.1080/13548506.2020.1754438?needAccess=true>
- Huang, Y., & Zhao, N. J. P. r. (2020). Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. 288, 112954. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7152913/pdf/main.pdf>
- Jahangiry, L., Bakhtari, F., Sohrabi, Z., Reihani, P., Samei, S., Ponnet, K., & Montazeri, A. (2020). Risk perception related to COVID-19 among the Iranian general population: an application of the extended parallel process model. *BMC Public Health*, 20(1), 1571. doi:10.1186/s12889-020-09681-7
- Jamshaid, S., Haider, N. I. M. A. A., Jamshed, K., & Jamshad, S. (2020). *Overthinking Hurts: Rumination, Worry and Mental Health of International Students in China During Covid-19 Pandemic*. Paper presented at the International Joint Conference on Arts and Humanities (IJCAH 2020).



- Jovančević, A., Miličević, N. J. P., & differences, i. (2020). Optimism-pessimism, conspiracy theories and general trust as factors contributing to COVID-19 related behavior—A cross-cultural study. *167*, 110216.
- Kawohl, W., & Nordt, C. J. T. L. P. (2020). COVID-19, unemployment, and suicide. *7*(5), 389-390. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7185950/pdf/main.pdf>
- Khademian, F., Delavari, S., Koohjani, Z., & Khademian, Z. J. B. P. H. (2021). An investigation of depression, anxiety, and stress and its relating factors during COVID-19 pandemic in Iran. *21*(1), 1-7.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*: Springer publishing company.
- Lee, M., & You, M. (2020). Psychological and Behavioral Responses in South Korea During the Early Stages of Coronavirus Disease 2019 (COVID-19). *International Journal of Environmental Research and Public Health*, *17*(9), 2977. doi:<https://doi.org/10.3390/ijerph17092977>
- Lee, S. A., Mathis, A. A., Jobe, M. C., & Pappalardo, E. A. (2020). Clinically significant fear and anxiety of COVID-19: A psychometric examination of the Coronavirus Anxiety Scale. *290*, 113112. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7237368/pdf/main.pdf>
- Lieberoth, A., Lin, S.-Y., Stöckli, S., Han, H., Kowal, M., Gelpi, R., . . . Rasmussen, J. (2021). Stress and worry in the 2020 coronavirus pandemic: relationships to trust and compliance with preventive measures across 48 countries in the COVIDiSTRESS global survey. *Royal Society open science*, *8*(2), 200589.
- Lima, C. K. T., de Medeiros Carvalho, P. M., Lima, I. d. A. A. S., de Oliveira Nunes, J. V. A., Saraiva, J. S., de Souza, R. I., . . . Neto, M. L. R. J. P. r. (2020). The emotional impact of Coronavirus 2019-nCoV (new Coronavirus disease). *287*, 112915. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7195292/pdf/main.pdf>
- Lindholdt, L., Labriola, M., Andersen, J. H., Kjeldsen, M. Z., Obel, C., & Lund, T. (2021). Perceived stress among adolescents as a marker for future mental disorders: A prospective cohort study. *Scand J Public Health*, 1403494821993719. doi:10.1177/1403494821993719
- Liu, N., Zhang, F., Wei, C., Jia, Y., Shang, Z., Sun, L., . . . Wang, Y. J. P. r. (2020). Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: Gender differences matter. *287*, 112921. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7102622/pdf/main.pdf>
- Liu, S., Lithopoulos, A., Zhang, C.-Q., Garcia-Barrera, M. A., & Rhodes, R. E. (2021). Personality and perceived stress during COVID-19 pandemic: Testing the mediating role of perceived threat and efficacy. *Personality and Individual Differences*, *168*, 110351-110351. doi:10.1016/j.paid.2020.110351



- Loades, M. E., Chatburn, E., Higson-Sweeney, N., Reynolds, S., Shafran, R., Brigden, A., . . . Crawley, E. (2020). Rapid Systematic Review: The Impact of Social Isolation and Loneliness on the Mental Health of Children and Adolescents in the Context of COVID-19. *Journal of the American Academy of Child & Adolescent Psychiatry*, 59(11), 1218-1239.e1213. doi:<https://doi.org/10.1016/j.jaac.2020.05.009>
- Maarefvand, M., Hosseinzadeh, S., Farmani, O., Safarabadi Farahani, A., & Khubchandani, J. (2020). Coronavirus Outbreak and Stress in Iranians. *International journal of environmental research and public health*, 17(12). doi:10.3390/ijerph17124441
- Mamun, M. A., & Griffiths, M. D. J. A. j. o. p. (2020). First COVID-19 suicide case in Bangladesh due to fear of COVID-19 and xenophobia: Possible suicide prevention strategies. 51, 102073.
- Mertens, G., Gerritsen, L., Duijndam, S., Salemink, E., & Engelhard, I. M. J. J. o. a. d. (2020). Fear of the coronavirus (COVID-19): Predictors in an online study conducted in March 2020. 74, 102258. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7286280/pdf/main.pdf>
- Moghanibashi-Mansourieh, A. J. A. j. o. p. (2020). Assessing the anxiety level of Iranian general population during COVID-19 outbreak. 51, 102076. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7165107/pdf/main.pdf>
- Morin, C. M., Carrier, J., Bastien, C., & Godbout, R. J. C. J. o. P. H. (2020). Sleep and circadian rhythm in response to the COVID-19 pandemic. 111(5), 654-657. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7375451/pdf/41997_2020_Article_382.pdf
- Mousavi, S. A.-M., Hooshyari, Z., & Ahmadi, A. (2020). The Most Stressful Events during the COVID-19 Epidemic. *Iranian journal of psychiatry*, 15(3), 220-227. doi:10.18502/ijps.v15i3.3814
- Ng, D. M., & Jeffery, R. W. (2003). Relationships Between Perceived Stress and Health Behaviors in a Sample of Working Adults. *Health Psychology*, 22(6), 638-642. doi:10.1037/0278-6133.22.6.638
- Nicholas, C. R. (2016). Fear of the unknown: One fear to rule them all. *Journal of Anxiety Disorders*, 41, 5-21. doi:10.1016/j.janxdis.2016.03.011
- Nikčević, A. V., & Spada, M. M. (2020). The COVID-19 anxiety syndrome scale: Development and psychometric properties. *Psychiatry research*, 292, 113322-113322. doi:10.1016/j.psychres.2020.113322
- Nikčević, A. V., & Spada, M. M. J. P. r. (2020). The COVID-19 anxiety syndrome scale: Development and psychometric properties. 292, 113322.



- Nivette, A., Ribeaud, D., Murray, A., Steinhoff, A., Bechtiger, L., Hepp, U., . . . Eisner, M. (2021). Non-compliance with COVID-19-related public health measures among young adults in Switzerland: Insights from a longitudinal cohort study. *Social Science & Medicine*, 268, 113370. doi:<https://doi.org/10.1016/j.socscimed.2020.113370>
- Onder, G., Rezza, G., & Brusaferro, S. (2020). Case-Fatality Rate and Characteristics of Patients Dying in Relation to COVID-19 in Italy. *Jama*, 323(18), 1775-1776. doi:10.1001/jama.2020.4683
- Organization, W. H. (2020). Coronavirus disease 2019 (COVID-19): situation report, 73. Retrieved from https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200402-sitrep-73-covid-19.pdf?sfvrsn=5ae25bc7_2.
- Pahlevan Sharif, S., & Sharif Nia, H. (2018). Structural equation modeling with AMOS. *Artin Teb, Tehran*.
- Pahlevan Sharif, S., She, L., Yeoh, K. K., & Naghavi, N. (2021). Heavy social networking and online compulsive buying: the mediating role of financial social comparison and materialism. *Journal of Marketing Theory and Practice*, 1-13. doi:10.1080/10696679.2021.1909425
- Pakpour, A. H., & Griffiths, M. D. (2020). The fear of COVID-19 and its role in preventive behaviors. *Journal of Concurrent Disorders*, 2(1), 58-63.
- Pakpour, A. H., & Griffiths, M. D. J. J. o. C. D. (2020). The fear of COVID-19 and its role in preventive behaviors. 2(1), 58-63.
- Paluszek, M. M., Landry, C. A., Taylor, S., & Asmundson, G. J. B. T. (2020). The psychological sequelae of the COVID-19 pandemic: Psychological processes, current research ventures, and preparing for a postpandemic world. 43, 158-163.
- Pappa, S., Ntella, V., Giannakas, T., Giannakoulis, V. G., Papoutsis, E., Katsaounou, P. J. B., behavior,, & immunity. (2020). Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. 88, 901-907. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7206431/pdf/main.pdf>
- Park, C. L., Russell, B. S., Fendrich, M., Finkelstein-Fox, L., Hutchison, M., & Becker, J. J. J. o. g. i. m. (2020). Americans' COVID-19 stress, coping, and adherence to CDC guidelines. 35(8), 2296-2303. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7259430/pdf/11606_2020_Article_5898.pdf
- Parlapani, E., Holeva, V., Voitsidis, P., Blekas, A., Gliatas, I., Porfyri, G. N., . . . Diakogiannis, I. (2020). Psychological and Behavioral Responses to the COVID-19 Pandemic in Greece. *Frontiers in Psychiatry*, 11(821). doi:10.3389/fpsy.2020.00821



- Parlapani, E., Holeva, V., Voitsidis, P., Blekas, A., Gliatas, I., Porfyri, G. N., . . . Chatzigeorgiou, A. F. J. F. i. p. (2020). Psychological and behavioral responses to the COVID-19 pandemic in Greece. *11*, 821. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7466648/pdf/fpsyt-11-00821.pdf>
- Pedrozo-Pupo, J. C., Pedrozo-Cortés, M. J., & Campo-Arias, A. (2020). Perceived stress associated with COVID-19 epidemic in Colombia: an online survey. *Cadernos de saude publica*, *36*.
- Pfeffer, I., Englert, C., & Mueller-Alcazar, A. (2020). Perceived stress and trait self-control interact with the intention–behavior gap in physical activity behavior. *Sport, Exercise, and Performance Psychology*, *9*(2), 244-260. doi:10.1037/spy0000189
- Pfefferbaum, B., & North, C. S. J. N. E. J. o. M. (2020). Mental health and the Covid-19 pandemic. *383*(6), 510-512. Retrieved from <https://www.nejm.org/doi/pdf/10.1056/NEJMp2008017?articleTools=true>
- Popova, L. (2012). The extended parallel process model: illuminating the gaps in research. *Health Educ Behav*, *39*(4), 455-473. doi:10.1177/1090198111418108
- Prendki, V., Tau, N., Avni, T., Falcone, M., Huttner, A., Kaiser, L., . . . on behalf of, E. S. G. f. I. i. t. E. (2020). A systematic review assessing the under-representation of elderly adults in COVID-19 trials. *BMC Geriatrics*, *20*(1), 538. doi:10.1186/s12877-020-01954-5
- Press, A. (2021, August 8). Iran sees highest daily virus case, death counts in pandemic. *CTV News*. Retrieved from <https://www.ctvnews.ca/health/coronavirus/iran-sees-highest-daily-virus-case-death-counts-in-pandemic-1.5539044>
- Qian, M., Wu, Q., Wu, P., Hou, Z., Liang, Y., Cowling, B. J., & Yu, H. J. M. (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.
- Rogers, R. W. (1975). A Protection Motivation Theory of Fear Appeals and Attitude Change1. *J Psychol*, *91*(1), 93-114. doi:10.1080/00223980.1975.9915803
- Ropeik, D. (2004). The consequences of fear. *EMBO reports*, *5*(S1), S56-S60. doi:<https://doi.org/10.1038/sj.embor.7400228>
- Sadeghzadeh, M., Abbasi, M., Khajavi, Y., & Amirazodi, H. J. C. P. (2021). Psychological correlates of anxiety in response to COVID-19 outbreak among Iranian University students. 1-10.
- Salari, N., Hosseini-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulpoor, S., Mohammadi, M., . . . health. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. *16*(1), 1-11.



- Schäfer, S. K., Sopp, M. R., Schanz, C. G., Staginnus, M., Göritz, A. S., Michael, T. J. P., & Psychosomatics. (2020). Impact of COVID-19 on public mental health and the buffering effect of a sense of coherence. *89*(6), 386-392. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7490493/pdf/pps-0089-0001.pdf>
- Schimmenti, A., Billieux, J., & Starcevic, V. J. C. N. (2020). The four horsemen of fear: An integrated model of understanding fear experiences during the COVID-19 pandemic. *17*(2), 41-45.
- Sharif Nia, H., Akhlaghi, E., Torkian, S., Khosravi, V., Etesami, R., Froelicher, E. S., & Pahlevan Sharif, S. (2021). Predictors of Persistence of Anxiety, Hyperarousal Stress, and Resilience During the COVID-19 Epidemic: A National Study in Iran. *Frontiers in Psychology*, *12*(3293). doi:10.3389/fpsyg.2021.671124
- Shokri, A., Moradi, G., Piroozi, B., Darvishi, S., Amirhosseini, S., Veysi, A., . . . Mohamadi Bolbanabad, A. (2020). Perceived stress due to COVID-19 in Iran: Emphasizing the role of social networks. *Medical journal of the Islamic Republic of Iran*, *34*, 55-55. doi:10.34171/mjiri.34.55
- Taylor, S., Landry, C. A., Paluszek, M. M., Fergus, T. A., McKay, D., Asmundson, G. J. J. D., & anxiety. (2020). COVID stress syndrome: Concept, structure, and correlates. *37*(8), 706-714. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7362150/pdf/DA-9999-na.pdf>
- Torales, J., Ríos-González, C., Barrios, I., O'Higgins, M., González, I., García, O., . . . Ventriglio, A. (2020). Self-Perceived Stress During the Quarantine of COVID-19 Pandemic in Paraguay: An Exploratory Survey. *Frontiers in Psychiatry*, *11*(1155). doi:10.3389/fpsy.2020.558691
- Vaske, J. J. (2011). Advantages and Disadvantages of Internet Surveys: Introduction to the Special Issue. *Human Dimensions of Wildlife*, *16*(3), 149-153. doi:10.1080/10871209.2011.572143
- Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *17*(5), 1729.
- Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., McIntyre, R. S., . . . immunity. (2020). A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. *87*, 40-48. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7153528/pdf/main.pdf>
- Wilder-Smith. (2021). COVID-19 in comparison with other emerging viral diseases: risk of geographic spread via travel. *7*(1), 1-11.
- Wilder-Smith, A., & Freedman, D. O. (2020). Isolation, quarantine, social distancing and community containment: pivotal role for old-style public health measures in the novel coronavirus (2019-nCoV) outbreak.



- Willis, D. E., Andersen, J. A., Bryant-Moore, K., Selig, J. P., Long, C. R., Felix, H. C., . . . Science, T. (2021). COVID-19 vaccine hesitancy: Race/ethnicity, trust, and fear.
- World Health Organization, W. (2020). WHO Director-General's opening remarks at the media briefing on COVID-19-11 March 2020. In: Geneva, Switzerland.
- Wright, K. B. (2017). Researching Internet-Based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages, and Web Survey Services. *Journal of Computer-Mediated Communication*, 10(3). doi:10.1111/j.1083-6101.2005.tb00259.x
- Xiang, Y.-T., Yang, Y., Li, W., Zhang, L., Zhang, Q., Cheung, T., & Ng, C. H. J. T. I. p. (2020). Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. 7(3), 228-229. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7128153/pdf/main.pdf>
- Yan, L., Gan, Y., Ding, X., Wu, J., & Duan, H. (2021a). The relationship between perceived stress and emotional distress during the COVID-19 outbreak: Effects of boredom proneness and coping style. *Journal of Anxiety Disorders*, 77, 102328-102328. doi:10.1016/j.janxdis.2020.102328
- Yan, L., Gan, Y., Ding, X., Wu, J., & Duan, H. (2021b). The relationship between perceived stress and emotional distress during the COVID-19 outbreak: Effects of boredom proneness and coping style. *Journal of Anxiety Disorders*, 77, 102328. doi:<https://doi.org/10.1016/j.janxdis.2020.102328>
- Yıldırım, M., Geçer, E., & Akgül, Ö. (2021). The impacts of vulnerability, perceived risk, and fear on preventive behaviours against COVID-19. *Psychology, Health & Medicine*, 26(1), 35-43. doi:10.1080/13548506.2020.1776891
- Zhang, J. (2021). People's responses to the COVID-19 pandemic during its early stages and factors affecting those responses. *Humanities and Social Sciences Communications*, 8(1), 37. doi:10.1057/s41599-021-00720-1
- Zhang, W., Yang, X., Zhao, J., Yang, F., Jia, Y., Cui, C., & Yang, X. (2020). Depression and Psychological-Behavioral Responses Among the General Public in China During the Early Stages of the COVID-19 Pandemic: Survey Study. *J Med Internet Res*, 22(9), e22227. doi:10.2196/22227
- Zhang, Y., & Ma, Z. F. (2020). Impact of the COVID-19 pandemic on mental health and quality of life among local residents in Liaoning Province, China: A cross-sectional study. 17(7), 2381.



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، ماما یی و مراقبت | گرجستان



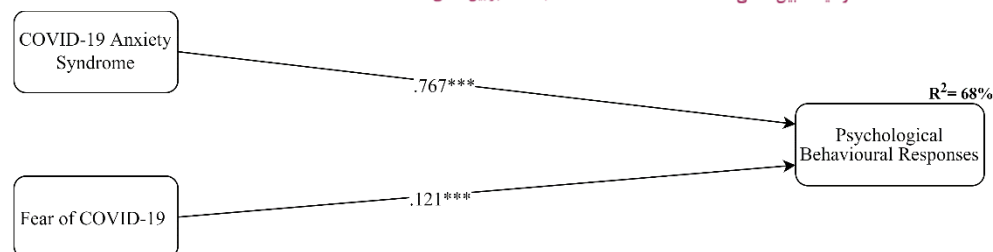
6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی



Total Effect Model



Mediation Effect Model

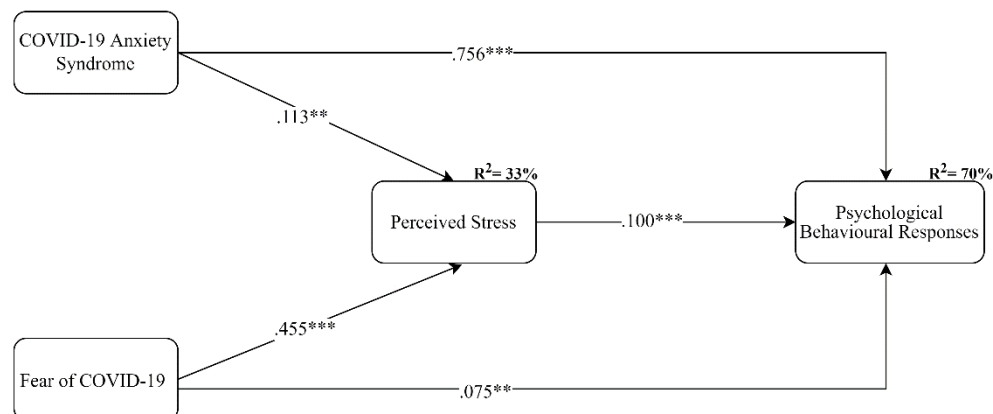


Figure 1. The results of the structural model assessment; *** $p < .001$, ** $p < .005$; Control variables: age, gender, marital status, and education level.

**Table1.** Demographic characteristics of participants (n=926)

Variables	n(%)
Gender	
Female	782 (85.2)
male	137 (14.8)
Marital status	
Single	286 (30.9)
Married	640 (69.1)
Education level	
Under diploma	19 (2.1)
Diploma	128 (13.8)
Upper Diploma	58 (6.3)
Bachelor	417 (45.0)
Master	243 (26.2)
PhD	54 (5.8)



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، ماما یی و مراقبت | گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

Table 2. Results of the Measurement model assessment

Construct	Factor loading	Cronbach's alpha	CR	MaxR	AVE
First order construct					
Perseverate thinking					
Item 1	.659	.846	.844	.860	0.524
Item 2	.588				
Item 3	.814				
Item 4	.825				
Item 5	.706				
Avoidance					
Item 1	.538	.721	.724	.732	.398
Item 2	.684				
Item 3	.671				
Item 4	.618				
Fear of COVID-19					
Item 1	.758	.886	.876	.889	.506
Item 2	.813				
Item 3	.611				
Item 4	.740				
Item 5	.793				
Item 6	.538				
Item 7	.678				



Perceived Stress					
Item 1	.722	.863	.863	.868	.559
Item 2	.789				
Item 3	.792				
Item 5	.683				
Item 6	.746				
Psychological Behavioural Responses					
Item 3	.546	.721	.724	.755	.471
Item 4	.798				
Item 5	.691				
Second order construct					
COVID-19 Anxiety Syndrome		.830	.749	.895	.559
Perseverate thinking	.578				
Avoidance	.943				

Table 3. Discriminant validity assessment using HTMT matrix

	(1)	(2)	(3)	(4)	(5)
Heterotrait-monotrait ratio of correlations (HTMT)	First order construct				
	(1) Perseverate thinking				
	(2) Avoidance	.552			
	(3) Fear of COVID-19	.615	.482		
	(4) Perceived Stress	.343	.237	.505	



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، ماما یی و مراقبت | گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

	(5) Psychological Behavioural Responses	.252	.834	.306	.065
	Second order construct				
	(6) COVID-19 Anxiety Syndrome			.645	.344 .564



6th International Conference on

Nursing , Midwifery and Care

Event Place: Tbilisi, Georgia

www.nmconf.ir

ششمین کنفرانس بین المللی

پرستاری ، مامایی و مراقبت گرجستان



6th International Conference on Nursing , Midwifery and Care

مجلات معتبر بین المللی

گواهینامه بین المللی

Paths	Unstandardized Path coefficients	95% confidence level (Lower Bound, Upper Bound)
Total Effect		
COVID-19 Anxiety Syndrome → Psychological Behavioural Responses	.767***	(.708, .832)
Fear of COVID-19 → Psychological Behavioural Responses	.121***	(.089, .155)
Direct Effects		
COVID-19 Anxiety Syndrome → Perceived Stress	.113**	(.043, .188)
Fear of COVID-19 → Perceived Stress	.455***	(.412, .496)
Perceived Stress → Psychological Behavioural Responses	.100***	(.074, .127)
COVID-19 Anxiety Syndrome → Psychological Behavioural Responses	.756***	(.698, .820)
Fear of COVID-19 → Psychological Behavioural Responses	.075**	(.041, .112)
Mediation Effects		
COVID-19 Anxiety Syndrome → Perceived Stress → Psychological Behavioural Responses	.011**	(.004, .021)
Fear of COVID-19 → Perceived Stress → Psychological Behavioural Responses	.046***	(.033, .060)