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The Prevalence of Psychological Distress and its Associations with Attentional Control and COVID-19 related Behaviors in an Iranian Sample

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Abstract

Introduction: The present study aimed to investigate the prevalence rates of depression, anxiety, and stress in residents of Mashhad in the early phases of COVID-19. Moreover, the current study investigated the associations of attentional control and responses related to the COVID-19 with depression, anxiety, and stress.

Method: This research was a cross-sectional correlational study that was conducted on 336 residents of Mashhad in 2020. The tools used in this study were researcher-made questionnaire, namely the COVID-19 related Behaviors scale (CB-19), the Depression Anxiety Stress Scale-21 (DASS-21), and the Attentional Control Scale (ACS). Data were analyzed by SPSS (version 22.0) and logistic regression analyses. A $P<0.05$ was considered statistically significant.

Results: The psychometric analyses showed a good model fit for the CB-19 with two factors, including health behavior and psychological behavior subscales. A prevalence rate of 41.37%, 31.85%, and 30.36% was observed for depression, anxiety, and stress, respectively. In the regression analysis, poor focusing, and high levels of psychological responses related to the COVID-19 were risk factors of depression, anxiety, and stress ($p<0.001$).

Conclusion: According to the findings of the present study it can be stated that high levels of psychological responses and poor focusing can predict depression, anxiety and stress during COVID-19.

Keywords: Mental Health, Depression, Anxiety, Stress, COVID-19

Introduction

The COVID-19 was first reported on 18 February 2020 in Iran [1] which 7,089,892 cases were infected, and 137,948 individuals were ceased to 6 March 2022 [2]. A higher prevalence rate of anxiety and depression was observed in the early stages of the COVID-19 outbreak [3]. Khademian et al. revealed a high prevalence rate of depression (52.1%), anxiety (42.1%), and stress (63.4%) in Iranians [1]. In a longitudinal study, Najafipour et al. showed that the prevalence rate of anxiety increased during the COVID-19 pandemic in comparison to before the pandemic among the residents of Kerman (a southeastern city in Iran)[4]. Hassannia et al. [5] reported a prevalence rate of 65.6% and 42.3% for moderate to severe anxiety symptoms and depression, respectively. It has been shown that unhealthy behaviors during the COVID-19 are related to higher depression scores [6, 7]. Other research showed an association between unhealthy lifestyle behaviors and the symptoms of depression and anxiety during the COVID-19 lockdown in Canada [8].

In response to COVID-19, people's behavioral and psychological responses have changed [9]. People had to increase their health behaviors to prevent the spread of COVID-19 [10]. Not leaving the house, washing hands, maintaining physical distance from others, avoiding handshakes, keeping cough/sneeze etiquette and working at home were among the behaviors that could reduce the spread of the disease [11]. Lack of concentration, changes in sleep pattern and appetite, obsessive thoughts and behaviors, anxiety, changes in sexual desire were among the psychological changes that were common in response to COVID-19 [12]. Although these behavioral and psychological changes have been noticed by researchers, few studies have addressed the issue of how these behavioral and psychological changes are related to depression, anxiety and stress.

One candidate to account for the relationship of behavioral and psychological responses to COVID-19, anxiety, stress, and depression is attentional control [13]. Attentional control is top-down cognitive processing that plays a role in maintaining attention while there is irrelevant information (focusing) and in allocating attention from irrelevant information [14]. Previous studies have indicated that attentional control deficits are associated with negative thoughts, rumination, depression, and anxiety [15, 16]. In the case of the COVID-19 pandemic, having efficient attentional control may serve as a protective factor when facing negative thinking and rumination about stressors, especially during lockdowns. Reversely, having less efficient attentional control should represent a factor of vulnerability which, in turn, leads to poorer mental health and healthy behaviors [13].

Although there have been such reports regarding the prevalence rates of depression, anxiety, and stress among the Iranian general population, evidence is still lacking concerning the risk factors of mental health problems in different cities of Iran. As well, it is also necessary to present the prevalence of depression, anxiety, and stress in the early phase of the COVID-19 pandemic in Iran. Furthermore, as unhealthy behaviors are responsible for high rates of death in COVID-19, we aimed to explore how these unhealthy behaviours and psychological responses are associated with depression, anxiety and stress. Therefore, we developed a scale, measuring psychological and behavioral responses related to the COVID-19. By using this tool, we measured people's commitment to some behaviors such as washing hands, maintaining distance from others, staying at home, etc. This scale also measured the psychological changes (such as changes in sleep patterns, appetite, sexual desire, obsessive thoughts, etc.) of people since the exposure to COVID-19. In fact, the current study aimed to investigate the prevalence rates of depression, anxiety, and stress and their associations with attentional control and COVID-19 related behaviors and psychological responses in an Iranian sample.

Method

An online-based cross-sectional study was conducted in Mashhad, Razavi Khorasan Province, Iran from 20 March to 20 June 2020, the initial phase of the COVID-19 outbreaks in Iran. For this survey, 380 participants were recruited. Fourty four of them did not complete some parts of the questionnaires, hence, a sample of 336 participants (M_{age} = 26.51, SD_{age} = 10.72; 78.27% female) was recruited using advertisements in Mashhad universities' social platforms. We advertised the recruitment notice on students' social media groups. Volunteers completed questionnaires on the Porsline.ir platform. The survey link was accessible for one month, from 20 March 2020 to 20 June 2020. The inclusion criteria included: not suffering from physical and psychological illness, not consuming alcohol, psychoactive substances and drugs, not suffering from COVID-19, and being above 12 years. Electronic informed consent was obtained from each participant before starting the survey. Researchers informed participants that all personal information will be deleted from the dataset and will be kept confidential. All data will be destroyed after five years of the data collection. This study was conducted according to the Helsinki Declarations.

The tools used in this study were as follows:

Demographic Form: The demographic form included information about gender (man/woman), education (diploma and below, undergraduate, and graduate), marital status (single, married, and other), and age.

Depression Anxiety Stress Scale-21 (DASS-21): The DASS-21 [17] is a 21-item self-report scale, measuring depression, anxiety, and stress symptoms. The DASS-21 is rated based on a 4-point scale (0 = Did not apply to me at all, 1 = Applied to me to some degree, or some of the time, 2 = Applied to me to a considerable degree, or a good part of the time, and 3 = Applied to me very much or most of the time). The scores of each subscale are summed up and then multiplied by two. The severity level of the DASS-21 consists of mild, moderate, severe, and extremely severe. For the current study, we reported the severity levels as well as dichotomous responses (normal/probable depression, anxiety, and stress). A score of ≥ 10 in depression, ≥ 8 in anxiety, and ≥ 15 in stress were considered probable clinical symptoms [18, 19] . The Cronbach's alpha of the DASS-21 was .92 in the current sample. The internal consistency of depression, anxiety, and stress in an Iranian sample was .90, .87, and .89, respectively [20].

Attention Control Scale (ACS): The ACS [8] includes 20 items that measures the ability to focus (focusing) and shift attention (shifting). The ACS is scored according to a 4-point scale from *almost never* to *always*. Higher scores on both components indicate higher attentional control. The Cronbach's alpha of the ACS was .81 in the current sample. The internal consistency of focusing and shifting in an Iranian sample was .80 and .76, respectively [21].

COVID-19-related Behaviors (CB-19): CB-19 is a self-report scale which measures health behaviors and psychological behaviors related to COVID-19. To develop this scale, we first created 25 items and then three researchers who were expert in psychology checked the face validity of the items and rated them based on the

item clarity and relevancy. Based on the panelists' comments, 8 items were dropped. In total, 17 items were included in exploratory factor analysis. Finally, 14 items were retained in the structure (7 items for psychological behaviors and 7 items for healthy behaviors). The analysis procedure and results are presented in the statistical analysis and results section.

The statistical analysis procedure included two parts. Part 1 involved an Exploratory Factor Analysis (EFA) and a reliability test of the COVID-19 scale. To perform an EFA, we firstly conducted a pairwise Polychoric correlation analysis on the remained items. The Polychoric correlation method is a suitable procedure to screen items before an EFA analysis when "response scale items are ordinal given that the distribution of data will most likely be asymmetric and violate the multivariate normality assumption" [22]. Second, we conducted a Parallel Analysis (PA) to determine the optimal number of factors. The PA is a recommended procedure in comparison with other methods [23]. Third, the Kaiser-Meyer-Olkin (KMO) measure was used to check sampling adequacy. Fourth, an EFA analysis was performed using an Unweighted Least Square (ULS) with an oblique rotation method. Oblique rotation methods are preferable when inter-correlations between factors are expected [24]. A factor loading cut-off of .35 was used to keep an item [25] provided that no cross-loaded items were observed. Three model fit indices, including Goodness-of-Fit Index (GFI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA), were reported to evaluate the model fit of the developed structure. A GFI ≥ .9, CFI ≥ .95 [26], and RMSEA ≤ .08 [27] shows a good model fit. Finally, Cronbach's alpha of the scale was reported. EFA analyses were conducted using FACTOR software [28].

Part 2 represented prevalence rates of depression, anxiety, and stress in the sample. Categorical and continuous variables were compared among participants with probable depression, anxiety, and stress using X^2 and independent *t*-tests, respectively. Alternative *t*-test and X^2 (e.g., Fisher's exact test) results were used when such assumptions were not met (e.g., the homogeneity of variances for continuous variables and an expected count less than five for cross-tabulation cells). We also conducted multiple logistic regression analyses for the associations controlling for demographic variables. Before conducting the multiple logistic regression analyses, influential observations and multicollinearity were checked using DFBETA values (intercept and slopes) and the Variance Inflation Factor (VIF). All continuous predictors were standardized for the multiple logistic regression. To control type I error rates, a significance level of .01 with 95% Confidence Intervals (CIs) was used.

Results

In total, 336 participants completed the survey. Most of thee participants were female (78.27%) and had a graduate and above education (60.42%). In addition, 30.06% had a diploma and below education and 9.52% had an undergraduate degree. Furthermore, 62.50% were single, 34.23% were married, and 3.27% had other relationship status. Mean and standard deviation of age was 26.51 and 10.72, respectively.

With respect to the Polychoric correlation, two items were dropped, and the PA analysis showed that two factors should be retained. For these data, Bartlett's statistic was significant, indicating the defined structure has a correlation matrix which differs from zero, $\chi^2(91) = 1092.9$, $p < .001$. The KMO test showed that the sampling adequacy is at a fair level (KMO = .71). Hence, the EFA analysis was run according to a two-factor solution. No cross-loaded items were observed. According to the EFA results, 7 items were loaded (<.30) to Factor 1 (health-related behaviors) and 7 items were loaded to Factor 2 (psychological-related behaviors). A good model fit for the current structure was found, RMSEA = .06, CFI = .95, GFI = .95. The Cronbach's alpha for the total score, Factor 1, and Factor 2 was .68., .56, and .70, respectively.

Of 336 participants, 41.37%, 31.85%, and 30.36% of participants reported probable clinical symptoms of depression, anxiety, and stress, respectively. Among 41.37% of participants with probable depression symptoms, 38.13%, 39.57%, 7.91%, and 14.39% of them had mild, moderate, severe, and extremely severe symptoms. Of 31.85% of participants with probable anxiety symptoms, 29.91%, 43.93%, 10.28%, and 15.89% of participants reported mild, moderate, severe, and extremely severe symptoms, respectively. Amongst 30.36% of participants with probable stress symptoms, 46.08%, 32.35%, 16.67%, and 4.90% had mild, moderate, severe, and extremely severe symptoms, correspondingly. No statistical associations were found between the severity levels and gender.

Table 1 shows the prevalence rates of depression, anxiety, and stress in the sample. There were no significant associations between the prevalence rate of depression/anxiety and demographic variables. Participants with significant depression ($M = 20.34$, $SD = 4.95$), anxiety ($M = 21.91$, $SD = 4.36$), and stress ($M = 21.65$, $SD = 4.48$) reported higher levels of psychological behaviors related to the COVID-19 in comparison with individuals without significant depression ($M = 18.25$, $SD = 5.24$), anxiety ($M = 17.91$, $SD = 5.08$), and stress ($M = 18.01$, $SD = 5.14$) symptoms. The Cohen's *d* of the group differences for depression, anxiety, and stress was -.41, -.84, and -.73, respectively. Lower levels of focusing were observed in individuals with significant depression ($M = 22.65$, $SD = 2.94$), anxiety ($M = 22.63$, $SD = 3.06$), and stress ($M = 22.37$, $SD = 2.86$) in comparison with individuals without significant depression ($M = 24.39$, $SD = 2.81$), anxiety ($M = 24.16$, $SD = 2.83$), and stress ($M = 24.24$, $SD = 2.87$). The Cohen's *d* of the group differences for depression, anxiety, and stress was .61, .52, and .65, correspondingly.

We also conducted multivariate analyses after controlling for demographic variables (Table 2). The results showed that psychological behaviors related to the COVID-19 were associated with depression ($OR = 1.45$, $p = .003$), anxiety ($OR = 1.68$, $p < .001$), and stress ($OR = 2.34$, $p < .001$). Moreover, focusing was significantly associated with depression ($OR = .53$, $p < .001$), anxiety ($OR = .61$, $p < .001$), and stress ($OR = .48$, $p < .001$).

Table 1. Participants' Characteristics

	Total sample	Depression ≥ 10		Anxiety ≥ 8		Stress ≥ 15	
Categorical variables	**N (%)**	**N (%)**	***χ2* (df), *p*-value**	**N (%)**	***χ2* (df), *p*-value**	**N (%)**	***χ2* (df), *p*-value**
Gender							
Man	73 (21.73)	31 (42.47)	.046 (1), .830	25 (34.25)	.248 (1), .619	24 (32.88)	.280 (1), .597
Woman	263 (78.27)	108 (41.06)		82 (31.18)		78 (29.66)	
Education							
Diploma and below	101 (30.06)	40 (39.60)	.530 (2), .767	31 (30.69)	1.260 (2), .533	34 (33.66)	1.018 (2), .601
Undergraduate	32 (9.52)	15 (46.88)		13 (40.63)		8 (25.00)	
Graduate and above	203 (60.42)	84 (41.38)		63 (31.03)		60 (29.56)	
Marital status							
Single	210 (62.50)	91 (43.33)	1.160 (2), .560	70 (33.33)	.596 (2), .742	70 (33.33)	2.366 (2), .306
Married	115 (34.23)	43 (37.39)		34 (29.57)		29 (25.22)	
Other	11 (3.27)	5 (45.45)		3 (27.27)		3 (27.27)	
Continuous variables		*M* (*SD*)	*t* (df), *p*-value	*M* (*SD*)	*t* (df), *p*-value	*M* (*SD*)	*t* (df), *p*-value
Age	26.51 (10.72)	25.78 (10.12)	1.056 (334), .292	26.46 (10.41)	.063 (334), .950	24.57 (9.31)	2.371 (228.78), .019
COVID-19 scale							
Health-related behaviors	28.93 (2.07)	29.18 (2.20)	-1.814 (275.71), .071	29.05 (2.49)	-.626 (162.90), .532	28.86 (2.37)	.401 (334), .689
Psychological behaviors	19.12 (5.22)	20.34 (4.95)	-3.692 (334), <.001	21.91 (4.36)	-7.184 (334), <.001	21.65 (4.48)	-6.183 (334), <.001
Attentional control							
Focusing	23.67 (2.99)	22.65 (2.94)	5.470 (334), <.001	22.63 (3.06)	4.473 (334), <.001	22.37 (2.86)	5.493 (334), <.001
Shifting	30.48 (3.52)	30.16 (3.31)	1.404 (334), .161	30.00 (3.44)	1.709 (334), .708	30.13 (3.56)	1.209 (334), .228

Table 2. Multiple Logistic Regression

	Depression [1]			Anxiety [2]			Stress [3]		
	***B* (SE)**	**Wald**	***OR* (95% CI)**	***B* (SE)**	**Wald**	***OR* (95% CI)**	***B* (SE)**	**Wald**	***OR* (95% CI)**
Woman	.04 (.30)	.017	1.04 (.58, 1.86)	.10 (.33)	.100	1.11 (.58, 2.12)	.05 (.34)	.021	1.05 (.54, 2.03)
Undergraduate	.17 (.45)	.136	1.18 (.49, 2.87)	.30 (.48)	.380	1.34 (.52, 3.45)	-.87 (.56)	2.419	.42 (.14, 1.25)
Graduate	.04 (.27)	.028	1.05 (.62, 1.77)	-.19 (.30)	.392	.83 (.46, 1.49)	-.19 (.31)	.405	.82 (.45, 1.50)
Married	-.37 (.32)	1.273	.69 (.36, 1.31)	-.67 (.38)	3.116	.51 (.24, 1.08)	-.33 (.37)	.764	.72 (.35, 1.50)
Other	.34 (.69)	.244	1.40 (.36, 5.43)	-.35 (.83)	.179	.70 (.14, 3.60)	.27 (.79)	.119	1.31 (.28, 6.62)
Age	.03 (.16)	.027	1.03 (.75, 1.40)	.28 (.18)	2.433	1.32 (.93, 1.87)	-.21 (.20)	1.153	.81 (.55, 1.19)
Health behaviors	.17 (.13)	1.839	1.19 (.93, 1.52)	-.04 (.13)	.092	.96 (.74, 1.25)	.29 (.14)	3.506	.77 (.59, 1.01)
Psychological behaviors	.37 (.12)	8.722*	1.45 (1.13, 1.85)	.98 (.16)	37.477**	2.68 (1.95, 3.67)	.85 (.16)	28.715**	2.34 (1.71, 3.19)
Focusing	-.64 (.14)	20.643**	.53 (.40, .70)	-.49 (.15)	11.277**	.61 (.46, .81)	-.73 (.16)	20.797**	.48 (.35, .66)
Shifting	-.04 (.13)	.076	.96 (.74, 1.25)	-.13 (.15)	.829	.87 (.66, 1.17)	-.01 (.15)	.003	.99 (.74, 1.32)

1 Nagelkerke *R* Square = .17, N = 336
2 Nagelkerke *R* Square = .26, N = 336
3 Nagelkerke *R* Square = .28, N = 335

Discussion

The current study investigated the prevalence rates of depression, anxiety, and stress in the general population of Mashhad, Iran. The findings revealed that 41.37%, 31.85%, and 30.36% of the participants experienced mild to extremely severe depression, anxiety, and stress symptoms in the initial phase of the COVID-19 pandemic. Concerning the prevalence rates during COVID-19 pandemic, Khademian et al. [1] showed that the prevalence rate of depression, anxiety, and stress is 52.1%, 42.1%, and 63.4%. In another study, Maroufizadeh et al. [29] showed that the prevalence of depression (using PHQ-9) and anxiety (using GAD-7) is 30.1% and 33.4%, respectively. Nakhostin-Ansari et al. [30] showed a prevalence of 38.1% and 27.6% for anxiety (using BAI) and depression (using BDI), respectively. Differences between the current study and previous studies could be due to differences in the population and measures. In the context of Mashhad city, Darchini-Maragheh et al. [31] investigated the prevalence of depression, anxiety, and stress using DASS-21 among adolescents residing in Mashhad. The results indicated a prevalence of 43.3%, 43.3%, and 38.9% for depression, anxiety, and stress, respectively. Although Darchini-Maragheh et al.'s study [31] was conducted before COVID-19 pandemic and on adolescents, the prevalence estimates are somewhat similar to the current results.

To test the relationship between the prevalence rates and the COVID-19 related behaviors, the CB-19 was developed. The psychometric results of the CB-19 showed an acceptable validity. The internal consistency of the CB-19 was acceptable. The prevalence rates of depression, anxiety, and stress symptoms were significantly associated with psychological behaviors related to the COVID-19. In other words, individuals with higher levels of psychological behaviors related to the COVID-19, experienced higher levels of depression, anxiety, and stress symptoms than those with lower levels of psychological behaviors related to the COVID-19. It seems that psychological reactions to a new health crisis might be an important risk factor to predict mental health problems. Consistently, Fancourt et al. [3] indicated that more psychological experiences happened in the early phases of the COVID-19 pandemic. That is, people might have not enough information to deal with the pandemic, especially health behaviors related to the COVID-19.

The findings also indicated that focusing is associated with higher prevalence rates of depression, anxiety, and stress. That is, individuals who had lower levels of focusing were at higher risks of mental health problems. Previous studies have shown that low attention control is associated with repetitive negative thinking which leads people to have more maladaptive thoughts and prolonged rumination, accordingly, resulting in anxiety and depression [18, 32]. Likewise, it has been reported that poor focusing is linked to attentional bias toward negative events that is often observed in individuals with anxiety symptoms [33]. However, the current study did not find any association between shifting and depressive, anxiety, and stress symptomology. Previous findings indeed reported a relationship between shifting and depression [32] and anxiety [16, 33], nonetheless, their analyses were based on linear regression/correlation while the current study was based on logistic regression analyses to explore risk factors of the suggested outcomes.

Findings from this study would be an asset for future studies to consider behavioral and cognitive profiles as risk factors to explain the prevalence rate differences among the general population which could guide for better screening. This study had some limitations. First, we used cut-off scores of the DASS-21 to estimate the prevalence of rates of depression, anxiety, and stress. Although self-reports' cut-offs have acceptable sensitivity for screening probable psychiatric disorders, diagnostic interviews are recommended for better generalizability of the prevalence rates. Second, the sample size was 336 which might impact statistical power, however, we tried to adjust type I error by using a lower significance level. Third, there were no documents related to the prevalence of mental health problems during COVID-19 in Mashhad. Also, the cross-sectional study was not able to reveal any trends of the prevalence rates for possible implications regarding the relationship between adaptation to the pandemic and people's experiences.

Conclusion

To test COVID-19 related behaviors, the CB-19 was developed. The results indicated that the CB-19 has enough structural validity to apply it for the current study, however, further studies are required to confirm the current structure by applying a confirmatory factor analysis. The present study revealed a high prevalence rate of depression, anxiety, and stress which was consistent with previous studies, nationally and internationally. Although demographic factors were not associated with the prevalence rates, psychological behaviors, and experiences in the early stage of the pandemic were correlated to the outcome measures. As well, poor focusing was associated with higher prevalence rates of depression, anxiety, and stress, indicating potential psychopathological implications underlying higher mental health problems' occurrence within individuals with lower levels of attentional control.

Conflict of Interest

The authors declare that the research was conducted in the absence of any potential conflict of interest.

Ethical Approval

All procedures carried out in this study were in accordance with the Helsinki Declaration.

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