Original Article

Preventive Behaviors, Psychological Distress, and their Associated Factors in Iranians during the SARS-CoV-2 Delta Variant Outbreak

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Abstract

Background: Up to now, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has affected and killed millions of people across the globe. In these conditions, Iran was experiencing the fifth wave of the Coronavirus disease 2019 (COVID-19) pandemic, accrued by the Delta variant, over the course of the present study.

Objectives: The present study aimed to reflect on preventive behaviors, psychological distress, and their associated factors in Iranians during the SARS-CoV-2 Delta variant outbreak.

Methods: Utilizing a descriptive-analytical cross-sectional research design, this study was performed on 1,015 Iranian individuals referred to the comprehensive healthcare centers in Kashan, central Iran, selected via simple random sampling. Data collection tools included the sociodemographic information questionnaire, the Preventive Behaviors against COVID-19 Questionnaire (PBCQ), and the 12-item General Health Questionnaire (GHQ-12).

Results: The study results revealed that the mean±standard deviation (SD) of PBCQ was 17.20±4.18 (12-36). In addition, involvement in preventive behaviors against COVID-19 was at higher levels in male (P=0.007), younger (P≤0.001), and self-employed (P=0.016) participants with a fair family economic status (P=0.007), as compared to other cases. Those receiving no vaccines (P=0.023), together with the subjects recently contracting COVID-19, also adhered to only some preventive behaviors (P≤0.001). The GHQ-12 mean±SD was equal to 2.15±2.41 (0-12). Moreover, the study results indicated that female (P=0.021) younger (P=0.017), married (P=0.024), self-employed (P=0.003) subjects with a fair or poor family economic status (P=0.001) and recent infection with COVID-19 (P=0.010) were more susceptible to psychological distress, as compared to others.

Conclusion: The present study demonstrated that engagement in preventive behaviors against COVID-19 significantly dwindled, and the incidence rate of psychological distress augmented in the course of the fifth wave of the pandemic in Iranians. These findings could provide healthcare planners and policymakers with valuable information.

Keywords: COVID-19, Outbreak Preventive behaviors, Psychological distress

1. Background

As an extremely contagious disease, coronavirus disease 2019 (COVID-19) originated in Wuhan, China, in late 2019 and rapidly turned out to be a pandemic (1). On June 28, 2023, there were 767,518,723 confirmed cases of COVID-19 globally, including 6,947,192 deaths, reported to the World Health Organization (WHO) (2). This pandemic has similarly claimed the lives of thousands of people in Iran [3]. During this study, Iran was experiencing the fifth wave of COVID-19 (3) and ranked 10th in the world regarding the infection rate (2).

In accordance with the WHO declaration, the Delta variant of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has been characterized by elevated transmissible or lethal modifications in the COVID-19 epidemiology, higher severity or some alterations in clinical mani-festations, plus the reduced efficacy of the existing vaccines, diagnoses, treatments, and many public health measures (4). The WHO has further affirmed a range of preventive recommendations at the individual level, including wearing face masks, staying at home, practicing social distancing, sticking to all quarantine limits, washing hands minimally for 20 sec, cleaning all possibly infected surfaces and objects, covering the mouth and the nose while sneezing or coughing, avoiding crowded places, and not using public transportation (5).

Due to incomplete vaccination and no definitive treatment for COVID-19, preventive measures are still the best strategies to prevent the infection outbreak (6). Nevertheless, the prolonged period of the pandemic, quarantine limits, stay-at-home orders, summer vacations, and practicing religious rituals have all made Iranians to let pass preventive behaviors against Covid-19 disease. Furthermore,

losing jobs and income, receiving bad news, reporting high mortality rates following the COVID-19 outbreak, and going through psychological and social pressures have given rise to some symptoms, such as stress, fear, depression, hopelessness, anxiety, and post-traumatic stress disorder (PTSD) (7, 8).

In some studies fulfilled in the course of the previous waves of the COVID-19 outbreak in Iran, the implementation of preventive measures against COVID-19 has been fairly satisfactory (9, 10). Nonetheless, stress, anxiety, and depression have been reported at severe and very severe levels in over half of the population and even higher among patients (11). Compared to the preceding COVID-19 waves, the incidence and mortality rates of the fifth wave in Iran have been considerably higher. Getting involved in preventive behaviors assumes more critical importance than before, and the risk of suffering from psychological distress seems higher. Given the utmost importance of identifying preventive behaviors, psychological distress, and their associated factors in individuals and society, planning, providing, and allocating resources by healthcare policymakers seems to be necessary measures.

2. Objectives

Moreover, to the best of our knowledge, no study has so far investigated preventive behaviors, psychological distress, and their associated factors in Iranian samples all through the fifth wave of the COVID-19 outbreak. In light of the aforementioned issues, the present study aimed to reflect on the given variables and their associated factors in Iranians during the fifth wave of the SARS-CoV-2 Delta variant.

3. Methods

3.1. Study Design and Samples
Using a descriptive-analytical cross-sectional research design, this study was conducted from August 25 to November 27, 2021, in the course of the fifth wave of the COVID-19 outbreak in the comprehensive healthcare centers in Kashan, central Iran. The main inclusion criteria were the Iranian nationality, willingness to participate in the research project, residence in Kashan, age range of 15 or over, absence of mental disorders, and taking no psychiatric medications before the COVID-19 pandemic. On the other hand, an incomplete questionnaire was considered the exclusion criterion. With reference to the formula for estimating population means, the sample size was determined in this study. In line with the study by Shoja et al. (2020) (12), reporting the mean score of the 12-item General Health Questionnaire (GHQ-12) in Iranian nurses (p=0.26, d=10% around p, and α=0.05), the sample size was initially estimated at 967. The final sample size was estimated at 1,015 cases, assuming 5% attrition.

3.2. Data Collection
Upon receiving the ethical approval from the Tehran University of Medical Sciences, and obtaining permission from Kashan University of Medical Sciences, for sampling in the comprehensive healthcare centers, 5 out of 36 centers affiliated to Kashan University of Medical Sciences, Kashan, central Iran, were randomly selected. Thenceforth, the estimated sample size was proportionally allocated to the study settings; therefore, 203 eligible individuals were randomly selected and invited from each center. Following that, they were contacted and explained the objectives and methodology of the study, the possibility of voluntary participation and withdrawal if desired, and the confidentiality of the data. If they were willing to participate in the study, an online questionnaire was sent via WhatsApp Messenger or email. All the study participants completed the sociodemographic information questionnaire, the Preventive Behaviors against COVID-19 (PBCQ), and the GHQ-12.

The required sociodemographic data included age, gender, level of education, family economic status, occupation, a history of COVID-19 vaccination, and recent infection with COVID-19. At the onset of the COVID-19 outbreak, Shamsalinia et al. (2020) designed the PBCQ based on WHO instructions (10). The items of this scale are scored using a three-point Likert scale (*never*, *sometimes*, and *always*). The questionnaire items, as a self-administered tool, dealt with staying at home, wearing a face mask in public places, practicing social distancing, avoiding public places as much as possible, washing or disinfecting surfaces and objects, washing hands for at least 20 sec, discarding gloves, masks, tissues, and all infected things into closed bags, covering the mouth and nose with a tissue while coughing or sneezing, not using public transportation, avoiding parties or visiting relatives or friends, refraining from handshakes, hugging, or kissing, and not reusing disposable gloves and masks. The content validity index (CVI) of this questionnaire and all its relevant items was >0.8, and its internal consistency, using Cronbach's alpha coefficient, was equal to 0.89 (10). The Cronbach's alpha coefficient in this study was further reported as 0.81.

The 12-item form of the GHQ, as a valid and reliable tool administered in many studies in Iran (12), was also applied to assess participants' mental health status (13). The total score of the questionnaire ranged from 0-12 (14). In addition, the mean±standard deviation (SD) of the GHQ-12 obtained by the participants was recommended for the cut-off threshold (14). The Cronbach's alpha coefficient in this study was reported as 0.72.

3.3. Ethical Considerations
The Research Ethics Committee of Tehran

University of Medical Sciences, Tehran, Iran, approved this study (IR.TUMS.MEDICINE.REC.1400.189). To meet all the study protocols, the Institutional/National Research Committee and the Declaration of Helsinki (DoH, 1964) ethical standards, as well as the later relevant amendments or comparable ethical guidelines, were also respected. In addition, the participants were given the required information about the study objectives and methodology, accompanied by the confidentiality of the data and their privacy, and then, informed consent was obtained.

3.4. Statistical Analysis

The data analysis was performed using the SPSS software (version 23). Descriptive methods, including frequency, mean, and SD, further illustrated the sociodemographic characteristics. The Mann-Whitney U test and the Kruskal-Wallis H test were correspondingly utilized to analyze the relationship between the sociodemographic variables and the preventive behaviors against COVID-19 once the one-sample Kolmogorov-Smirnov test established the normality of the data. The multiple linear regression technique was respectively applied to clarify the potential relationship between the factors associated with the given preventive behaviors while adjusting for other explanatory variables detected. The Chi-square (χ^2) test additionally demonstrated the association between the sociodemographic variables and psychological distress. Moreover, multiple logistic regression analysis was utilized to explain the potential association between the factors related to psychological distress, whereas adjusting for other explanatory variables was identified. The association between preventive behaviors against COVID-19 and psychological distress was further investigated using the Mann-Whitney U test. A p-value of less than 0.05 was considered statistically significant.

4. Results

In this web-based cross-sectional survey, the questionnaires were completed by 1,015 individuals, with an estimated mean duration of 4 minutes and 51 seconds. Here, females accounted for 85.1% of 1,015 participants. As well, the mean±SD age of subjects was 37.68±9.23. Only 200 (19.7%) participants had received two doses of the COVID-19 vaccines, and 189 (18.6%) cases had recently contracted COVID-19 (Table 1).

4.1. Preventive Behaviors against COVID-19

The PBCQ mean±SD was 17.20±4.18 (12-36), and merely 12% (N=121) of cases had always deferred to all preventive behaviors against COVID-19. The distribution of the PBCQ scores in different sociodemographic groups is illustrated in Table 1. In addition, "wearing a face mask in public places" was

observed by most participants (88%), and ngagement in "discarding gloves, masks, tissues, and all infected things into closed bags" was the least of all preventive behaviors (44.3%). The responses to all PBCQ items are presented in Table 2.

Upon determining the data normality, the Mann-Whitney U test and the Kruskal-Wallis H test were performed to find the association between the sociodemographic variables and the PBCQ outcomes (Table 1). The variables related to the PBCQ with P<0.2 were further included for multivariate regression analysis. Age, gender, occupation, family economic status, recent infection with COVID-19, and history of COVID-19 vaccination were then associated with the PBCQ (Table 3). The mean score of preventive behaviors also dropped by 0.08 points per year of age (β=0.08, 95% CI: 0.01 to 0.06; P≤0.001), and it was 0.98 points higher in female participants than males (β=0.98, 95% CI:0.26 to 1.69; P=0.007). In self-employed subjects, the mean value was 1.05 points higher as compared to that in homemakers (β=1.05, 95% CI:0.19 to 1.90; P=0.016), and it was 0.7 points higher in cases with a fair than good family economic status (β=0.70, 95% CI:0.95 to 1.00; P=0.007). The subjects who had not received any vaccines also scored 0.66 points lower than those who were vaccinated once (β=-0.66, 95% CI: -1.23 to -0.09; P=0.023), and the mean score was 1.2 points in cases with recent infection with COVID-19 more than those who had not contracted the disease (β=1.27, 95% CI:0.62 to 1.91; P≤0.001) (Table 3).

4.2. Psychological Distress

The mean±SD of GHQ-12 was 2.15±2.41 (0-12). In this vein, 21% of Iranian individuals had been subjected to psychological distress. The relationship between sociodemographic characteristics and the GHQ-12 groups (i.e., with and without distress) is presented in Table 1. Based on the χ^2 test results, the incidence rate of psychological distress in females (22.2%) was significantly higher than that in males (14.6%) (P=0.033). The variables associated with psychological distress based on the χ^2 test results (P<0.2) were accordingly selected to implement the multiple logistic regression analysis, demonstrating that age, gender, marital status, occupation, family economic status, and recent infection with COVID-19 were significantly correlated with psychological distress. The chance of having psychological distress correspondingly diminished by 3% per year of age (OR=0.98, 95% CI:0.95 to 1.00, P=0.017), and elevated by 88% in female cases compared to that in males (OR=1.88, 95% CI:1.10 to 3.22; P=0.021). This probability was also 98% greater in married cases than in single cases (OR=1.98, 95% CI:1.09 to 3.59; P=0.024). The chance of undergoing psychological distress also increased by 117% in the self-employed individuals, as compared to that in homemakers

Table 1. Association between sociodemographic characteristics of study samples, GHQ-12 groups, and PBCQ scores (n=1,015)

Variables	N (%)	PBCQ		GHQ-12			
		Mean±SD	P-value	Without psychological distress N (%)	With psychological distress N (%)	χ2	P-value ***
Gender							
Female	864 (85.1)	17.07±4.13	0.014*	672 (77.8)	192 (22.2)	4.524	0.033
Male	151 (14.9)	18.00±4.37		129 (85.4)	22 (14.6)		
Age (years old)							
≤20	26 (2.6)	18.76±5.47		23 (88.5)	3 (11.5)		0.195
21-30	193 (19.0)	18.13±4.13		148 (76.7)	45 (23.3)		
31-40	446 (43.9)	17.33±4.15	<0.001**	342 (76.7)	104 (23.3)	6.061	
41-50	266 (26.2)	16.62±4.29		217 (81.6)	49 (18.4)		
≥51	84 (8.3)	15.77±2.80		71 (84.5)	13 (21.1)		
Marital status							
Married	900 (88.7)	17.07±4.09	0.007*	704 (78.2)	196 (21.8)	2.300	0.129
Single	115 (11.3)	18.28±4.68		97 (84.3)	18 (15.7)		
Level of education							
Under high school diploma	176 (17.3)	17.29±5.02		138 (78.4)	38 (21.6)		0.350
High school diploma and higher	313 (30.8)	17.40±4.40	0.615**	240 (76.6)	73 (23.3)	3.284	
Bachelor's degree	387 (38.1)	17.16±3.77		306 (79.1)	81 (20.9)		
Master' degree and higher	139 (13.7)	16.79±3.52		117 (84.2)	22 (15.8)		
Occupation							
Homemaker	424 (41.8)	16.92±4.17		327 (77.1)	97 (22.9)		0.003
Self-employed	97 (9.6)	18.43±4.69		65 (67.0)	32 (33.0)		
Government employment	334 (32.9)	17.00±3.87	0.008**	278 (83.2)	56 (16.8)	13.667	
Other	160 (15.8)	17.65±4.35		131 (81.9)	29 (18.1)		
Economic status							
Good	324 (31.9)	16.87±4.01		278 (85.8)	46 (14.2)		<0.001
Fair	609 (60.0)	17.48±4.21	0.006**	474 (77.8)	135 (22.2)	27.756	
Poor	82 (8.1)	16.46±4.46		49 (59.8)	33 (40.2)		
Having children							
Yes	706 (69.6)	17.07±4.03	0.265	562 (79.6)	144 (20.4)	0.658	0.417
No	309 (30.4)	17.05±4.18	*	239 (77.3)	70 (22.7)		
Vaccination							
Yes, once	359 (35.4)	17.40±4.23		289 (80.5)	70 (19.5)		0.641
Yes, twice	200 (19.7)	16.76±4.24	0.108	155 (77.5)	45 (22.5)	0.891	
No	456 (44.9)	17.25±4.10	**	357 (78.3)	99 (21.7)		
Recent infection with COVID-19							
Yes	189 (18.6)	16.07±4.29	<0.001**	135 (71.4)	54 (28.6)	7.826	0.005
No	826 (81.4)	17.46±4.11		666 (80.6)	160 (19.4)		
Total	1015 (100)	17.20±4.18		801 (78.9)	214 (21.1)		

Note: Without psychological distress: GHQ-12 ≤2.15, with psychological distress: GHQ-12>2.15
*Mann-Whitney U test, **Kruskal-Wallis H test, ***Chi-square test (χ2)
12-Item GHQ-12: General Health Questionnaire, PBCQ: Preventive Behaviors against COVID-19 Questionnaire, SD: Standard Deviation

Table 2. Percentage of responses to PBCQ items

Items	Always N (%)	Sometimes N (%)	Never N (%)
Keeping a safe distance from others	521 (51.3)	446 (43.9)	48 (4.7)
Wearing a face mask in public places	893 (88.0)	115 (11.3)	7 (0.7)
Washing hands for at least 20 seconds	623 (61.4)	351 (34.6)	41 (4.0)
Staying at home and avoiding public places	531 (52.3)	364 (35.9)	120 (11.8)
Covering the mouth and nose when coughing	871 (85.8)	128 (12.6)	16 (1.6)
Avoiding a handshake, hugging, or kissing	756 (74.5)	193 (19.0)	66 (6.5)
Washing or disinfecting groceries	608 (59.9)	305 (30.00)	102 (10.0)
Avoiding going to parties or visiting relatives or friends	531 (52.3)	364 (35.9)	120 (11.8)
Avoiding reusing disposable glows and masks	776 (76.5)	201 (19.8)	38 (3.7)
Discarding used masks, tissues, or infected things into closed bags	450 (44.3)	404 (39.8)	161 (15.8)
Avoiding public transportation	727 (71.6)	246 (24.2)	42 (4.1)
Avoiding going to restaurants and cafes	608 (59.9)	362 (35.7)	45 (4.4)

PBCQ: Preventive Behaviors against COVID-19 Questionnaire

(OR=2.18, 95% CI:1.29 to 3.65; P=0.003). This probability elevated by 84% in subjects with a fair family economic status (OR=1.84, 95% CI 01.26 to 2.68, P=0.001), and by 363% in cases with a poor family economic status (OR=4.63, 95% CI:2.62 to 8.17; P=0.000), as compared to participants with a good family economic status. Moreover, it was 64% more common in subjects who had recently contracted COVID-19 in comparison with others (OR=1.64, 95% CI:1.13 to 2.39; P=0.010) (Table 4).

4.3. Association between PBCQ and GHQ-12

The study results ultimately demonstrated no significant association between the mean±SD of the PBCQ and the GHQ-12 (P=0.898) (Table 5).

Table 3. Multivariate linear regression analysis of factors associated with PBCQ

Variables	B	SE	T	P-value	95% CI for OR Lower	95% CI for OR Upper
Age (Reference: ≤20)	-0.088	0.014	-6.231	0.000	-0.115	-0.060
Gender (Reference: Male)	0.981	0.364	2.699	0.007	0.268	1.695
Recent infection with COVID-19 (Reference: No recent COVID-19 infection)	1.271	0.330	3.857	0.000	0.624	1.918
Vaccination (Reference: Yes, once)						
Yes, twice	-0.601	0.357	-1.680	0.093	-1.302	0.101
No	-0.662	0.291	-2.273	0.023	-1.233	-0.091
Occupation (Reference: Homemaker)						
Self-employed	1.051	0.437	2.406	0.016	0.194	1.909
Economic status (Reference: Good)						
Fair	0.705	0.260	2.705	0.007	0.194	1.216

PBCQ: Preventive Behaviors against COVID-19 Questionnaire

Table 4. Multiple logistic regression analysis of factors associated with GHQ-12

Variables	B	SE	Wald statistic	P-value	OR	95% CI for OR Lower	95% CI for OR Upper
Age (Reference: ≤20)	-0.023	0.010	5.321	0.017	0.977	0.959	0.996
Gender (Reference: Male)	-0.632	0.274	5.321	0.021	1.882	1.100	3.220
Marital status (Reference: single)	-0.685	0.304	5.085	0.024	1.984	1.094	3.598
Recent infection with COVID-19 (Reference: No recent infection with COVID-19)	-0.496	0.193	6.638	0.010	1.642	1.126	2.395
Occupation (Reference: Homemaker)							
Self-employed	0.776	0.265	8.574	0.003	2.174	1.293	3. 655
Government employment	-0.018	0.200	0.008	0.928	0.982	0.664	1.452
Other	0.055	0.269	0.041	0.840	1.056	0.623	1.790
Economic status (Reference: Good)							
Fair	0.610	0.191	10.151	0.001	1.840	1.264	2.677
Poor	1.533	0.290	27.929	0.000	4.630	2.623	8.174

GHQ-12: 12-item General Health Questionnaire

Table 5. Association between preventive behaviors and psychological distress

Variables	Psychological distress (GHQ-12) Without psychological distress Mean±SD	With psychological distress Mean±SD	P-value*
PBCQ	17.162±4.026	17.380±4.743	0.898

*Mann-Whitney U test

GHQ-12: 12-item General Health Questionnaire, PBCQ: Preventive Behaviors against COVID-19 Questionnaire

5. Discussion

The present study established that engagement in preventive behaviors in the course of the fifth wave of the COVID-19 pandemic was low among Iranians, and only 12% of subjects always respected them. The factors associated with such behaviors were age, gender, occupation, family economic status, recent infection with COVID-19, and a history of COVID-19 vaccination. As well, about one-fifth of cases had suffered from psychological distress, and the associated factors in this line included age, gender, marital status, occupation, family economic status, and recent infection with COVID-19. The present study demonstrated no significant relationship between preventive behaviors and psychological distress.

Compared to previous research conducted during the COVID-19 outbreak in Iran, involvement in preventive behaviors against COVID-19 had significantly dwindled in Iranian individuals. Nevertheless, engagement in some behaviors, such as "wearing a face mask in public places," increased, and

"staying at home and avoiding public places" decreased over time (9, 10). At the onset of the pandemic in Iran, COVID-19 was unknown but with high prevalence and mortality rates; therefore, the fear of virus transmission, as a determinant of making people get involved in preventive behaviors, was more (15). Some surveys in China evaluating preventive behaviors arising during the COVID-19 outbreak reported that over 90% of cases had used masks (16). This discrepancy in results can be attributed to various factors shaping people's behaviors, such as psychological, sociocultural, and demographic characteristics and situations, as well as differences in research methods.

The study results also confirmed that younger participants had obeyed the preventive behaviors against COVID-19 more than other age groups. Other studies on COVID-19 even found that younger individuals reported more perceived risk of contracting the virus compared to older age groups (17). Coping appraisal experienced in adults, such as

the acceptance of behavioral efficacy to protect against COVID-19 and the belief in their potential to make the recommended changes, had further encouraged them to observe such behaviors (18).

Moreover, in disagreement with the results of other surveys, the study findings revealed that male subjects were more susceptible to engagement in preventive behaviors against COVID-19. A bulk of studies concluded that females were more cautious regarding infections (9,19); nonetheless, this difference might be ascribed to the small sample size of males in the present web-based cross-sectional survey. Furthermore, a significant association was detected between family economic status and preventive behaviors. Consistent with other surveys, participants with a fair family economic status demonstrated higher preventive behaviors against COVID-19 than those with a poor one (19). This could be due to the low levels of amenities, knowledge, as well as beliefs in being resistant to infections.

In harmony with the results published in previous research, the study findings additionally highlighted a significant association between occupation and preventive behaviors, such that the self-employed subjects outperformed the homemakers (19). Consequently, more control over working environments among self-employed participants seemed to be one of the main reasons behind such findings. This study correspondingly clarified a significant association between a history of COVID-19 vaccination and preventive behaviors; therefore, the participants who had not received vaccines demonstrated fewer preventive behaviors. In view of that, numerous surveys worldwide have referred to the factors associated with COVID-19 vaccine acceptance. The results of these studies indicated that vaccine hesitancy is affected by various factors, including individual, contextual, group-based, and vaccine-related issues, such as mass media and communication, historical events, culture, religion, and socioeconomic status (20).

In the present study, a significant association was additionally noticed between recent infection with COVID-19 and preventive behaviors so that the subjects who had recently contracted the virus followed fewer preventive behaviors. In fact, it was concluded that the participants who were less involved in such behaviors were more likely to be infected (9). Here, one-fifth of subjects lived through psychological distress. The previous studies conducted in Iran had similarly reported the levels of anxiety and depression as 15.6% and 12.7%, respectively [36]. Therefore, the incidence rate of psychological distress in Iranian individuals augmented during the COVID-19 outbreak (21). In other studies performed all through the fifth wave of COVID-19 in Iran, psychological distress in older adults and medical students was further reported to be significantly higher (22, 23). This discrepancy in findings reported in the literature can be ascribed to statistical populations and study settings. Some surveys in China had retrieved higher levels of depression (18%-22%) and anxiety (34%-48%) than those illustrated in the present study (24), which could be attributed to the implementation of severe quarantine and traffic restrictions in this country.

According to the study findings, female cases were more susceptible to psychological distress, like that described in other studies (25), which was associated with the rise in women's responsibilities during quarantine and the full-time presence of all family members at home (25). In agreement with other surveys in similar situations, the study results also indicated that younger subjects were more prone to psychological distress (26). In contrast to these results, some studies demonstrated an upward trend in psychological distress in older adults (27). Accordingly, people on both sides of the age range were more at risk of psychological distress during the pandemic (28). Older individuals and those living alone or suffering from cognitive impairment were thus more prone to psychological distress (27).

A significant association was correspondingly observed between marital status and psychological distress-that is, single subjects underwent less psychological distress in comparison with married ones. In a similar vein, married participants in other studies were more likely to be burdened with stress and psychological distress (29). They could further face more worries than single cases, particularly in caring for children, the possibility of infecting their spouse and children with COVID-19, and dealing with family and economic problems during hospitalization (29).

In this study, there was a significant association between occupation and psychological distress-that is, the chance of psychological distress in self-employed participants was more than that in homemakers. In other surveys, unemployed individuals and those involved in self-employed businesses and the private sector were more likely to present with anxiety symptoms (26). In previous studies, permanent or temporary job losses during the COVID-19 outbreak, job insecurity, damage to private and personal jobs all through quarantine limits, and being forced to resort to home-based jobs or situations with a high chance of exposure to COVID-19 were among the positive predictors of intensified PTSD, depression, and psychological distress (25). Despite this, self-employed people experienced apparently less psychological distress at the time of COVID-19 once compared to other professions in some studies in developed countries (30). This discrepancy could be ascribed to a high level of development and good economic situation in the given countries.

The study results additionally elucidated a significant association between family economic status and psychological distress-that is to say, subjects with a

fair or poor family economic status were more prone to psychological distress than those with a good family economic status. Other studies pointed out that low-income and unemployed individuals, those losing some or all of their income during COVID-19, or socioeconomically vulnerable people were more likely to go through psychological distress during pandemics (31). Nevertheless, the pandemic-related social changes, such as staying at home and being with family, reduced stress and boosted well-being and mental health in some individuals with a good family socioeconomic status (32).

Moreover, the study results pinpointed that psychological distress in the subjects who had been recently infected with COVID-19 was higher as compared to that in others. The findings of other surveys also reported such outcomes (25, 33). Accordingly, those undergoing quarantine limits might have suffered from loneliness, boredom, anger, and even stigma. Infection-related symptoms and treatment complications, such as corticosteroid-induced insomnia, could even give rise to psychological distress and anxiety (33).

It is worth noting that there was no significant association between preventive behaviors and psychological distress among subjects. In some surveys, the fear of COVID-19 had been further introduced as an effective determinant of engagement in preventive behaviors against COVID-19 (15); nonetheless, extreme fear and disability to control could initially drive such individuals toward irrational thinking and then get in the way of such behaviors (34, 35).

Among the notable limitations of this study, we can refer to the utilization of online self-report questionnaires to evaluate preventive behaviors against COVID-19, which could have caused bias. Despite their advantages during pandemics, such online questionnaires might not be available to everyone, especially those with low literacy and cases without smartphones. The cross-sectional and correlational research design adopted in this study might have additionally prevented any causal inferences, and the associations might be related to a certain time point that could rapidly change. Furthermore, the distribution of males and females was different in this study; the number of male participants was less than the female ones since males would refer to comprehensive healthcare centers less often and were less willing to participate in health-related studies due to their busy schedules. Accordingly, the participants could not be considered representatives of the entire population of Iran.

6. Conclusion

The study results demonstrated that wearing face masks multiplied over time; nonetheless, staying at home dropped off. In addition, the factors associated with preventive behaviors against COVID-19 included age, gender, family economic status, occupation, recent infection with COVID-19, and history of COVID-19 vaccination. More to the point, one-fifth of the study samples were subjected to psychological distress. The study results could thus provide healthcare planners and policymakers with valuable information about preventive behaviors against COVID-10, psychological distress, and their associated factors during similar pandemics.

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