



Effectiveness of Online Stress Management Intervention on Mental Health Status of Tehran Municipality Employees with COVID-19

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Authors

Choobineh H.¹ PhD,
Noorbala AA.*² MD,
Bagheri Yazdi SA.³ MSc,
Bollhari J.⁴ MD,
Golmakani MM.⁵ MD,
Haghani E.⁶ MSc

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¹School of Medical Sciences, Tehran University of Medical Sciences, Iran

²Department of Psychiatry and "Psychosomatic Medicine Research Center", Tehran University of Medical Sciences, Tehran, Iran

³Department of Mental Health, Ministry of Health and Medical Education of Iran, Tehran, Iran

⁴Research Center of Spiritual Health, Iran University of Medical Sciences, Tehran, Iran

⁵Comprehensive Mental Health Center, Healthy city Company of Tehran Municipality, Tehran, Iran

⁶SHAHR SALEM Company of Tehran Municipality, Tehran, Iran

*Correspondence

Address: Head of Psychosomatic Medicine Research Center, Imam Khomeini Hospital, Keshavarz Blv, Tehran, Iran.

Phone: +98 (21) 61190000

Fax: -

noorbala@tums.ac.ir

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ABSTRACT

Aims The outbreak of Coronavirus Disease 2019 in the world has raised not only public health concerns but also several psychological problems, including anxiety, fear, depression, and posttraumatic stress disorder. The main goal of this study was to investigate the effectiveness of online Stress Management on the mental health status of employees with COVID-19 from Tehran Municipality.

Materials & Methods In this semi-experimental study conducted in 2020, for the mental health status of 370 personnel of Tehran municipality who were affected by COVID-19, a rapid screening questionnaire and General Health Questionnaire-28 were used. Among those whose General Health Questionnaire-28 score was higher than cut-off point 6, 60 individuals were randomly selected and divided into two groups (experiment and control). The experimental samples had six sessions of online stress management training (each one took about an hour), based on a cognitive-behavioral approach. The control group did not receive any intervention during the study period. Data were analyzed by SPSS 24 using MANCOVA.

Findings The results showed that 38.4% of the subjects suspected a mental disorder (35.7% of males and 47.6% of females). The mean scores of the General Health Questionnaire-28 and its subscales were significantly higher in women than men ($p < 0.05$). Multivariate analysis of covariance on the mean score of individuals in the General Health Questionnaire-28 questionnaire showed that cognitive-behavioral stress management could statistically improve the mental health of samples from the experimental group compared to control.

Conclusions Online cognitive-behavioral stress management can be used in the COVID-19 crisis and can improve the mental health aspect of employee's health.

Keywords Mental Health; Health; Cognitive-Behavioral Stress Management; Coronavirus Disease-19; Municipality

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[1] The novel coronavirus outbreak in Wuhan ... [2] Public responses to the novel coronavirus in Japan: Mental health ... [3] Understanding the severe acute respiratory syndrome coronavirus ... [4] Wuhan coronavirus ... [5] Challenges to prevent and control the outbreak of novel coronavirus ... [6] The impact of COVID-19 epidemic declaration on psychological ... [7] Managing stress during COVID-19 ... [8] MH survey of the adult population ... [9] Mental health services for older adults in China during the ... [10] The role of perceived mental stress in the health of suspected cases ... [11] Psychiatric epidemiology: Selected recent advances and future ... [12] The psychological effects of quarantining ... [13] Psychological impacts of COVID-19 outbreak on MH status ... [14] The global burden of disease 2000 project: Aims, methods and ... [15] The detection of psychiatric illness by questionnaire: A technique ... [16] A scaled version of the general health ... [17] The validity of two version of GHQ in general ... [18] The validation of general health questionnaire 28 ... [19] Mental health survey of the adult population ... [20] Cognitive-behavioral stress -management ... [21] An epidemiological survey of psychiatric ... [22] Twelve-month prevalence and correlates of psychiatric ... [23] Trends in change of mental health status of Iranian ... [24] Mental health status of individuals fifteen years and older ... [25] Mental health changes in Tehran during ...

Introduction

In December 2019, a viral outbreak was reported in Wuhan, China. The cause of this disease was a genetically modified virus from the family of coronaviruses, which was officially named Coronavirus Disease 2019 (COVID-19) by the World Health Organization [1]. COVID-19 is an acute respiratory disease with pneumonia, fever, muscle aches, and fatigue [2,3]. Due to its very high contagious power, the disease spread rapidly throughout the world, and in a period of about seven months, it infected all countries of the world, and the number of patients with this disease and the resulting mortality in the countries of the world is increasing.

According to official reports, as of August 2020, more than 15 million people worldwide have been infected with the virus, and 615,000 have died from the disease. Of this number, 280,000 with COVID-19 and 15,000 deaths were related to Iran [4]. Due to the pandemic status of COVID-19 disease, its urgency, physical, psychological, social, and economic consequences, and its high mortality, it is predictable that some symptoms of mental disorders will occur in these patients. In this regard, health officials and practitioners in countries are responsible for preventing further spread and treatment of the cases [5].

The pandemic situation of COVID-19 has affected all-important economic, political, and social aspects of the world and has caused the psychological consequences of this viral disease to be considered [6]. Having this disease will bring much stress to the patient and the family, which by stress management training, we can greatly reduce its physical and psychological consequences and improve their mental health [7].

A review of studies conducted in Iran in the epidemiology of mental disorders with the GHQ-28 questionnaire (Table 1) shows that the prevalence of mental disorders in Iran varies between 21 and 34.2% [8].

A study in China indicated that COVID-19 had increased the prevalence of psychological disorders such as anxiety, fear, depression, insomnia, and posttraumatic stress disorder among affected individuals [9]. Research has also shown that patients with COVID-19 have a low psychological tolerance capacity, and due to the current state of the disease in the world, these people are highly exposed to psychological disorders such as anxiety, fear, depression, and negative thoughts [10]. One of the most important psychological disorders that can damage patients' mental health with COVID-19 is posttraumatic stress disorder, which occurs in people who experience a life-threatening condition [11]. Other important disorders include anxiety disorder and depression. The results of a study of patients admitted to a Chinese hospital showed that the prevalence of anxiety and depression in patients infected with COVID-19 was significantly higher than

healthy individuals and those with pneumonia. Psychological interventions were able to significantly reduce both anxiety and depression in patients with COVID-19 [9].

Table 1) Results of epidemiological studies of mental disorders conducted with GHQ-28 in Iran

Researchers	Year	Place	Sample size	Percentage of prevalence		
				Female	Male	Total
Palahang <i>et al.</i>	1995	Kashan	619	31.5	15.2	23.7
Yaghoubi <i>et al.</i>	1995	Someh Sara	652	30.8	15.8	23.8
Noorbala <i>et al.</i>	1999	Tehran	879	27.7	14.7	21.5
Noorbala <i>et al.</i>	1999	Iran	35014	25.9	14.9	21.0
Sadeghi <i>et al.</i>	2000	Kermanshah	501	32.2	16.9	25.2
Shams Alizade <i>et al.</i>	2001	Savojbolagh	640	35.7	16.6	26.9
Omidi <i>et al.</i>	2002	Natanz	650	24.3	17.2	21.3
Parvaresh <i>et al.</i>	2007	Kerman	1527	34.5	27.1	32.1
Ahmadvand	2008	Kashan	1800	35.5	21.2	29
Noorbala <i>et al.</i>	2008	Tehran	19370	37.9	28.6	34.2
Rahimi	2011	Iran	3759	28.2	17.4	22.7
Movaghar <i>et al.</i>						
Noorbala <i>et al.</i>	2014	Iran	35813	27.55	19.28	32.44

During the spread of COVID-19, although quarantine is considered as one of the prevention strategies, fear of re-infection or infecting others, lack of access to adequate medical care, fatigue, and boredom due to quarantine and isolation have been reported as the most common cause of stress and psychological disorders in people being quarantined and after that. Quarantine causes people to lose family psychological support, which exacerbates stress and psychological damage in the individual [12], so a review of prevention and treatment programs for this disease at the macro level of countries should be considered. The importance and necessity of this research can be summarized in the following: First, the prevalence of mental disorders has been increasing in recent years, and one in four people has been affected by these disorders, but this dimension of health has often been neglected. Second, there is currently no specific treatment or vaccine for COVID-19, and many people die from it, which, along with various other factors, has caused social anxiety around the world. Also, the fear of being exposed to the disease has led to irrational behaviors of people in society, and the irrational policies of some officials in countries have aggravated the situation. China's experience has shown that concerning preventing COVID-19 disease, the most appropriate strategy is to keep people of society at home, observe social distancing, and use a mask [13].

Since the turn of the century, the world has witnessed major changes in the epidemiology of disease and the health needs of individuals, so that mental illness has been at the forefront of the causes of disability and premature death and has caused mental illness to be considered as a health priority in all societies [14]. With the spread of COVID-19, the global burden of these diseases seems to be increasing dramatically. In this regard, SHAHR SALEM Company of Tehran

Municipality, at the same time with the launch of the Comprehensive Mental Health Center, has studied the mental health status of employees with COVID-19 and provided appropriate psychological and therapeutic interventions to be able to have fundamental planning for developing appropriate treatment structure and protocols for the target group by using the results of this study. It is hoped that the findings of this study can improve the level of mental health of employees working in Tehran Municipality and ultimately provide mental health within the society. Therefore, this study aimed to investigate the effectiveness of online Cognitive-Behavioral Stress Management on the mental health status of Tehran Municipality employees affected by COVID-19.

Materials and Methods

This semi-experimental research was a case-control study and a cross-sectional field survey, which was done from April 1 to July 1, 2020, and consisted of all employees of Tehran Municipality that suffering the COVID-19 (370 employees). They were selected from the list available in the Deputy of Treatment of Tehran Municipality, and while they were under treatment for their physical symptoms, their consent for entering the study was obtained through telephone. As inclusion criteria, employees should be under the coverage of Tehran municipality, diagnosed by physicians being affected by COVID-19, and were in quarantine for two weeks.

This study was conducted in the following two stages: In the first stage, two questionnaires were used to assess the mental health status of affected employees by COVID-19. To screen psychological-emotional impairments of the samples rapidly, a questionnaire containing nine questions was designed to identify people in need of counseling and psychological interventions. The content validity of this rapid screening questionnaire was obtained by a group of mental health professionals of the Strategic Council of Mental Health of the Tehran Municipality Mental Health Committee. To assess the mental health status of individuals, the General Health Questionnaire-28 item (GHQ-28) was used. This questionnaire was developed by Goldberg & Hillier in 1979, and its questions were extracted based on the factor analysis method of the initial form, which includes four subscales of somatization (Questions 1-7), anxiety and insomnia, (questions 8-14) social dysfunction (Questions 15-21), and depression (Questions 22-28) [15-16]. This questionnaire examines a person's health status over the past month. The questions are presented in four options, including never (0 scores), as usual (0 scores), almost more than usual (1 score), and far more than usual (1 score), based on the traditional method of scoring [16]. The average time spent completing each questionnaire was 30 minutes. Studies on the validity and reliability of GHQ-28 in different countries and Iran have indicated

that this questionnaire has high validity and reliability as a screening instrument for mental disorders in society [17-19]. Cronbach's alpha was used to determine the reliability of GHQ-28 in this research. Cronbach's alpha was 0.936 for the General Health Questionnaire, 0.878 for the somatization scale, 0.851 for the anxiety scale, 0.843 for the social dysfunction scale, and 0.804 for the depression scale, indicating good reliability for measuring mental health status and its dimensions. Pearson, correlation coefficient matrix indicates that the range of two-variable correlation coefficients between the components of the GHQ-28 questionnaire is between 0.303 and 0.883 and all calculated coefficients have a statistically significant difference at the level of 0.01. The questionnaire of this study was completed by four mental health experts working in the organization's Deputy of Treatment of Tehran Municipality, who attended a two-hour face-to-face training session. Through telephone conversations, the interviewers introduced themselves to the study's main purpose and completed questionnaires after gaining employees' consent. In the second stage, among those whose GHQ-28 score was higher than cut-off point 6 (142 individuals), 60 employees were randomly selected and divided into experimental and control groups. The samples in the experimental group have received six one-hour sessions of online stress management, introduced by Antoni *et al.*, based on the cognitive-behavioral approach [20], by four trained clinical psychologists. The control group did not receive any intervention during the study period. The samples in both groups completed GHQ-28 before and after the interventions. For the control group participants, a stress-management intervention program was set up after the end of the project. In case of need for psychiatric treatment, the drugs were prescribed by a psychiatrist, through WhatsApp and the follow-up of their treatment was performed by psychologists. The summary of the contents of the virtual training sessions showed in Table 2.

Table 2) Summary contents of training sessions of cognitive-behavioral stress management

Session	Objectives	A summary of topics and activities
1	Introducing the course	Pretest, the definition of stress, stressors and their psychological consequences
2	Introducing CBT	CBT approaches in stress management
3	Learning coping strategies	Self-care activities & Coping strategies in stressful situations
4	Understanding negative thoughts	How to change negative thinking and cognitive distortions
5	Teaching relaxation techniques	Logical thinking & Training relaxation techniques
6	Usage of Psychosocial Support activities in a crisis	Psychosocial supportive strategies and review of CBT techniques during the course, posttest

Data analysis was performed using SPSS 24 software. To study the effectiveness of the psychological intervention, multivariate covariance was used to compare the mean scores of the two groups before and after the interventions.

Findings

Out of 370 people, 286 were men (77.3%), and 84 were women (22.7%). The mean±SD age of the subjects was 43.54±8.86 (minimum 24 years and maximum 73 years). 41.8% of them had municipal insurance services, and 58.2% had social security insurance. In terms of education, 35.4% of the subjects had a diploma degree and less education level, 35.7% had a bachelor's degree, and 28.9% had a master's degree and higher. In terms of marital status, 16.8% of the patients were single, and 83.2% were married.

The results of rapid screening for psychological-emotional impairments showed that 44.9% of the patients suffered from symptoms of anxiety disorders during the past month, of which 35.7% was anxiety, 5.4% was a phobia, 9.2% was depression, and 6.1% was obsession (people may have mentioned more than one case). Also, 1.9% of them suffered from epilepsy, 1.4% from psychotic symptoms, and 4.9% from anger and aggression.

A total of 38.4% of the subjects were suspected of having a mental disorder (35.7% of men and 47.6% of women). The highest prevalence of mental disorders is related to the age group of 49-40 years with 42.6%, single subjects with 40%, and samples with master's degrees and higher education levels with 47.7% (Table 3).

Table 3) Distribution of absolute and relative frequency of mental health status of the subjects separately sorted by demographic factors (n=370)

Variables	Suspected of having a disorder (score seven or higher)	
	Frequency	Percentage
Gender		
Male (n=286)	102	35.7
Female (n=84)	40	47.6
Age group (Year)		
Less than 30 (n=15)	4	26.7
30-39 (n=125)	44	35.2
40-49 (n=150)	64	42.7
50 and more (n=80)	30	37.5
Marital status		
Single (n=62)	25	40.3
Married (n=308)	117	37.9
Education		
Diploma and less (n=131)	42	32.0
Bachelor's degree (n=132)	49	37.1
Master's and higher (n=107)	51	47.7
Total (n=370)	142	38.4

Comparison of the mean scores of the subjects showed that in the mental health variable and its scales, the mean scores of the subjects before the interventions in both experimental and control

groups were not significantly different from each other. However, after the interventions, the mean scores of the subjects in the experimental group decreased in all variables, but in the control group, no significant change was observed in the mean scores of the individuals after the interventions compared to before (Table 4).

Table 4) Comparison of experimental and control groups in terms of mean±SD scores of cognitive variables before and after the intervention

Intervention	Experimental group	Control group	P-value
Somatization Scale			
Before	4.75±1.90	4.45±1.54	0.928
After	2.80±1.45	3.65±1.43	<0.02
p-value	<0.0001	0.110	
Anxiety Scale			
Before	3.45±1.84	3.00±1.26	0.234
After	2.00±1.70	3.20±1.69	<0.005
p-value	<0.002	0.624	
Social dysfunction Scale			
Before	2.20±1.17	1.95±1.50	0.726
After	1.40±0.96	1.65±1.18	0.139
p-value	<0.01	0.408	
Depression Scale			
Before	0.85±1.15	0.90±0.80	0.140
After	0.35±0.49	0.75±0.73	<0.03
p-value	<0.02	0.553	
Total Score			
Before	11.25±4.43	10.20±2.73	0.337
After	6.65±2.84	9.45±3.90	<0.002
p-value	<0.0001	0.449	

Due to the similarity of dispersion (kurtosis and skewness) of the scores of the two groups before and after the intervention, establishing the precondition of equality of variances and equality of covariance matrices was allowed. The findings of Table 5 show a significant difference between the experimental and control groups in terms of mental health status and its components in the posttest stage.

Table 5) Results of multivariate analysis of covariance on posttest scores of mental health and its scales

Test	Value	F
Pillai's trace	0.447	10.302
Wilks' Lambda	0.553	10.302
Hotelling's Trace	0.808	10.302
Roy's largest root	0.808	10.302

df of hypothesis= 4; df of error= 51; p<0.001

The results of Table 6 show that there was a significant difference based on one-way ANCOVA in the context of MANCOVA on the total mean score of a general health questionnaire, somatization scale, anxiety scale, social dysfunction, and depression scale between the experimental and control groups.

Table 6) Results of one-way analysis of covariance in the context of MANCOVA on mental health scores and its components (df=1)

Dependent variable	Sum of squares	Mean square	F	p-value
Somatization	25.295	25.295	22.203	<0.001
Anxiety	21.279	21.279	14.638	<0.001
Social dysfunction	3.701	3.701	5.777	<0.02
Depression	2.855	2.855	8.179	<0.006
Total Scores	175.717	175.717	37.952	<0.001

Discussion

The main objective of this study was to investigate the effectiveness of online psychological interventions of Cognitive-Behavioral Stress Management on the mental health status of Tehran Municipality employees affected by COVID-19. The results obtained from the first stage showed that 44.9% of the samples suffered from symptoms of psychological problems (fear, anxiety, depression, and obsession) during the past month after being affected by COVID-19. This result is consistent with Yang *et al.* [9], which found that due to low psychological tolerance, most affected individuals suffered from anxiety, fear, and depression symptoms.

The results also revealed that by using GHQ-28, 38.4% of the samples were suspected of having a mental disorder. A review of studies conducted with GHQ-28 in Iran indicated that the prevalence of mental disorders varies from 21% to 34.2% [8]. Comparing the results of this study with the findings of Table 1 indicates that the prevalence of mental disorders with the incidence of COVID-19 has increased significantly (from 23.44% in 2014 to 38.3% in 2020); however, in addition to COVID-19, the role of social restructuring, sanctions and inflation and recession in the country should also be mentioned. This increase can lead to vulnerability of mental disorders within the society and reduce their resilience in dealing with life challenges and problems, which were consistent with the results of Yang *et al.* [9], and Rubin & Wessely [12].

The results indicated that the prevalence of suspected mental disorders cases in this study was higher in females with 47.6% than males with 35.7%. A review of the findings of studies conducted in the world and Iran also confirms that females were more prone to mental disorders than males. The higher prevalence of mental disorders in females can be attributed to biological factors, environmental stressors, and limited satisfaction in society.

The results of this study showed that the prevalence of suspected cases of mental disorders in the age group of 40-49 years was higher than other age groups, which is consistent with studies of Mohammadi *et al.* [21], and Sharifi *et al.* [22], but not with the results of Noorbala *et al.* [23]. Most studies have revealed the role of old age and retirement as a factor of high vulnerability to mental disorders, which did not confirm the results of this research.

In terms of education, the findings of this study indicated a higher prevalence of suspected cases of mental disorders in people with postgraduate and higher education levels than other groups, which was different from the results of more studies conducted in Iran, showing the higher prevalence of mental disorders in illiterate people or people with a low education level. Depression, inappropriate behavior of colleagues towards patient's return to work, biological conditions of the disease, and

understanding the conditions and cultural and political conditions of the country can be the reason for their higher vulnerability of employees with postgraduate and higher education than other groups. This study also demonstrated that the prevalence of suspected cases of mental disorders was higher in single individuals than married people, which was not consistent with the findings of other studies in Iran, which mentioned that married individuals were more prone to mental disorders. The less access of employees affected by COVID-19 to receive family and social support could be considered one of the reasons for higher prevalence among single samples [24-25].

This study indicated that the mean score of individuals on the scales of somatization, anxiety, social function, and depression was significantly higher in females than males, which was consistent with the results of other studies in Iran [8]. The results also indicated that performing appropriate therapeutic interventions in the difficult situation of COVID-19, especially stress management training based on a cognitive-behavioral approach through online services, could improve the mental health of people affected by COVID-19, which is consistent with the views of Dubravka [7], and Shahyad & Mohammadi [13]. By delivering stress management training, it was possible to reduce the physical, psychological and social pressures of the Qovid-19 in affected employees and provide resilience and rational solutions to life's problems and challenges.

Considering the efficiency of two screening questionnaires (the rapid screening device could identify 75.3% of people, and GHQ-28 identified 89.7% of individuals who required mental health services), it can be said that in crisis such as pandemic of coronavirus, using a 9-item questionnaire could be efficient to identify the symptoms of mental disorders; using GHQ-28 could screen suspected cases of mental disorders, who needed to receive online psychological interventions, and even online psychiatric drug treatment provided to psychiatrists. The main limitation of this study was the lack of access to participants in person due to COVID-19, which was solved by providing online services.

Based on the results of this study, the following statements suggested:

Tehran Municipality should establish and develop the Comprehensive Mental Health Centers in Tehran to deliver mental health services to employees affected by COVID-19 and their families through online facilities.

- The Comprehensive Mental Health Centers should provide psychiatric treatment and counseling services to people in need by launching online services in quarantine and after that.

- The centers should deliver psychosocial support to those in close contact with COVID-19 patients through video conferences and online services. In this regard, conducting psychological retraining sessions

for mental health experts and affected employees could be effective in providing and maintaining the population's mental health.

Conclusion

Online cognitive-behavioral stress management can be used in the COVID-19 crisis and can improve the mental health aspect of employee's health.

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Ethical Permissions: This study was confirmed by the Ethics Committee of Tehran University of Medical Sciences (IR. TUMS.IKHC. REC.1399.233).

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