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Assessing the general health of the public population in South Khorasan Province before and during the COVID-19 epidemic

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ABSTRACT

Background and Objective: During epidemics of infectious diseases, individuals' health, especially their mental health, is affected. This study aimed to evaluate general health and its dimensions during the COVID-19 epidemic in South Khorasan province, Iran.

Methods: This study is a cross-sectional study. Individual information was collected voluntarily on the web. General health evaluation was performed by a standard questionnaire (GHQ-28). The collected data were entered into the SPSS v.23 and statistical tests were performed.

Findings: This study was performed on 320 people, most of the subjects were in the age range of 20-30 years. Also, 80 (25.0%) participants reported nonspecific symptoms of COVID-19 such as headache, sore throat, and dry cough, and 216 people (67.5%) used personal protective equipment (PPE). The mean score of the GHQ-28 one month before the COVID-19 epidemic (BE) was 16.5 ± 9.1, while the mean of this score during the epidemic (DE) increased by 1.8 points and reached 18.3 ± 10.2 ($P \leq 0.003$, effect size=10.9%). The score of anxiety/insomnia subscale showed the highest increment. Adjusted R2 values for the scores of somatic symptoms, anxiety/insomnia, and social dysfunction subscales, and the score of the GHQ-28 were 14.8%, 10.5%, 13.8%, and 13.1%, respectively.

Conclusion: This study showed that with the COVID-19 epidemic, the community has been faced with conditions in which individuals' anxiety, depression, social function, and in general, various dimension of health, has been deteriorated. The results of this study can be beneficial for appropriate planning for maintaining, promoting, and improving health in the community.

Keywords: Anxiety; COVID-19 epidemic; Depression; GHQ-28; Mental health

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Introduction

Coronavirus disease 2019 (COVID-19) is an emerging respiratory disease caused by the new coronavirus and its main clinical symptoms include fever, fatigue, dry cough, muscle pains, and shortness of breath [1]. In late December 2019, a group of patients was hospitalized with an initial diagnosis of pneumonia of unknown cause in Wuhan, China [2, 3]. The infection spread rapidly around the world. So that on January 30, 2020, the World Health Organization (WHO) declared SARS-CoV-2 a Public Health Emergency of International Concern (PHEIC) [4] and On March 11, 2020, the disease was declared a pandemic [5]. According to the situation report-132 published by the WHO, until May 31, 2020, a total of 5,934,936 cases have been identified and 367,166 cases deceased worldwide. Also, on the same date since the beginning of the COVID-19 epidemic, a total of 148,950 infected cases and 7,734 deaths have been reported in Iran [5]. According to the experimental data, the mortality rate of this disease varies between 2-5% in different parts of the world, which is much less than the mortality of Severe Acute Respiratory Syndrome (SARS) (9.5%) and Middle East Respiratory Syndrome (MERS) (34.4%) [1, 6, 7].

According to the Centers for Disease Control and Prevention (CDC), the new coronavirus is primarily transmitted through human-to-human contact or infected objects and surfaces. Therefore, the best ways to prevent the disease are frequent hand washing, wearing a mask, and isolating confirmed and suspected cases [8, 9]. A study conducted during the 2003 SARS epidemic in Hong Kong found that 93% of participants washed their hands frequently and 82% wore masks [10] Also, in studies conducted during the COVID-19 epidemic in different countries, the prevalence of using masks was estimated about 75-80% [11, 12].

Previous outbreaks of coronaviruses such as SARS-CoV and MERS-CoV have been identified as "damaging to public health" [2, 3]. Due to the high mortality rate and infectivity, the SARS epidemic led to fear and anxiety among the population [13-15]. A Hong Kong study on the SARS epidemic found that 11.5% of respondents had difficulty falling asleep due to SARS-related thoughts. Besides, 18.6% of respondents reported that their sleep was restlessly and 6.9% of respondents also experienced psychosomatic symptoms such as nausea, difficulty breathing, palpitations, and sweating when thinking about the SARS epidemic [16]. Also, in a study conducted during the COVID-19 epidemic in China, the prevalence of generalized anxiety disorder, depressive symptoms, and impaired sleep quality were reported to be 35.1%, 20.1%, and 18.2%, respectively [17]. Numerous studies have shown that quarantine due to the COVID-19 epidemic can cause problems such as depression [18], stress [19], and insomnia [20]. Therefore, due to the COVID-19 epidemic and forced or voluntary quarantine, as well as public concerns about the disease, it can be realized that all physical, mental, and social dimensions of health are threatened during this period and these conditions can persist even after the epidemic [21]. Therefore, due to the lack of study in this field in this region and the need to pay attention to the impact of this epidemic on various dimensions of health, this study was conducted on people residing in South Khorasan province, Iran.

Methods

Study design and study population

The present study is a descriptive-analytical study with a before-and-after method. The target population was the general population of South Khorasan province, Iran whose general health status was

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retrospectively assessed Before the COVID-19 Epidemic (BE) as well as During the Epidemic (DE). Based on the formula for estimating the mean, and defaults of S=0.64, d=0.8, and a missing rate of 20%, 320 people were estimated to enter the study. Therefore, a web-based self-report questionnaire was completed [22]. The inclusion criterion was having complete satisfaction to participate in the study and the exclusion criterion included incomplete completion of the questionnaire. Data collection started on May 9, 2020, which is between the two peaks of COVID-19 on March 31 and June 4 in Iran [23]. This study was approved by Birjand University of Medical Science's Ethics Committee (Approval ID: IR.BUMS.REC.1399.055).

Data collection

The data collection tools included a demographic data checklist and a 28-item version of the Goldberg Standard General Health Questionnaire (GHQ-28). Various studies have been proved that this questionnaire can be used in psychological and clinical studies [24-30]. The reliability and validity of this questionnaire in Iranian society were assessed (Cronbach's alpha = 0.92) [31].

This questionnaire consists of 4 subscales of somatic symptoms, anxiety/insomnia, social dysfunction, and severe depression. Each subscale has 7 questions and each question has 4 Likert scale options which are scored 0-3. Therefore, the score of each of the subscales and the GHQ-28 could be 0-21 and 0-84, respectively, and a lower score indicates a better health status. The cut-off points in the subscales and the whole questionnaire is 6 and 24, respectively. The lower scores of these cut-off points indicate healthy individuals and vice versa [27]. In this study, the scores of anxiety/insomnia and severe depression subscales were considered as indicators of mental health status. The questions of the GHQ-28 were separate for the conditions of BE and DE. So that the questions for the BE referred to the month before the start of the outbreak of COVID-19 in Iran, while the questions for DE referred to the beginning of the outbreak until the completion of the questionnaire. For completing the questionnaire, first, the people were introduced to the purpose of the study and then they were taught how to complete the questionnaire online.

Data analysis

Demographic and the GHQ-28 information were entered into SPSS v.23. Quantitative and qualitative data were reported as Mean ± SD and frequency percentage, respectively. The adjusted mean was calculated as the percentage of the mean score from the maximum score. For measuring the effect size, the difference between the mean score BE and DE was divided by the mean score BE and reported as a percentage. The normality of all quantitative data was checked by Kolmogorov-Smirnov test. Pearson test was used to evaluate the correlation between quantitative data. Also, t-test and ANOVA with post-hoc Tukey were used for two-state and multi-state variables, respectively. Linear regression was used to examine the correlation between the variables. Significance level was considered $P < 0.05$.

Results

This study was performed on 320 people in 11 cities of South Khorasan province, Iran with an age of 30.9 ± 9.8 years, and most of the subjects were in the age range of 20-30 years. Among the respondents, 194 (60.6%) were female. Five participants (1.6%) had close contact with confirmed COVID-19 cases. Out of a total of 320 participants, 80 (25%) reported nonspecific symptoms of COVID-19 such as headache and dry cough. Among the participants, 92 (28.7%) were single and 226 (70.6%) were married. Also, in terms

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of education, 32 (10.0%) had a degree less than a high school diploma, 95 (29.7%) had a diploma, 41 (12.8%) had an associate degree, 106 (33.1%) had a bachelor's degree, 34 (10.6%) had master's degree, 8 (2.5%) had a professional doctorate, and 4 (1.3%) had Ph.D (Table 1).

Table 1. Demographic information and nonspecific symptoms of COVID-19 among participants (N = 320)

Variables	Subgroups	Frequency (%)
Demographic information		
Sex	Male	126 (39.4)
	Female	194 (60.6)
Age	0–20	31 (9.6)
	20–30	117 (36.5)
	30–40	115 (35.9)
	40–50	41 (12.8)
	50–60	13 (4.0)
	>60	3 (0.9)
Close contact with confirmed COVID-19 cases	No	315 (98.4)
	Yes	5 (1.6)
Using PPE	No	104 (32.5)
	Yes	216 (67.5)
Marital status	Single	92 (28.7)
	Married	226 (70.6)
	Widow	2 (0.6)
Level of education	Diploma	95 (29.7)
	Associate degree	41 (12.8)
	Bachelor’s degree	106 (33.1)
	Master’s degree	34 (10.6)
	Doctoral	8 (2.5)
	Ph.D.	4 (1.3)
	Others	32 (10.0)
County	Birjand	123 (38.4)
	Qaen	21 (6.6)
	Tabas	27 (8.4)
	Ferdows	16 (5.0)
	Nehbandan	27 (8.4)
	Sarbisheh	12 (3.8)
	Darmian	17 (5.3)
	Sarayan	51 (15.9)
	Boshruyeh	14 (4.4)
	Zirkuh	6 (1.9)
	Khusf	6 (1.9)
Nonspecific COVID-19 symptoms		

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	Without symptoms	240 (75)
	Fever	12 (3.7)
	Dry cough	21 (6.6)
	Shortness of breath	12 (3.7)
	Chest pain	7 (2.2)
	Weakness	16 (5)
	Muscle pain	21 (6.6)
	Contusion	6 (1.9)
	Vomiting	6 (1.9)
	Diarrhea	8 (2.5)
	Headache	30 (9.4)
	Sore throat	29 (9.1)
	Smell and taste loss	1 (0.3)
	Other symptoms related to COVID-19	3 (0.9)

Abbreviation: PPE = personal protective equipment

The results showed that 216 people (67.5%) used Personal Protective Equipment (PPE) such as medical gloves, masks, or shields. People who were in contact with confirmed COVID-19 cases and people with nonspecific symptoms of COVID-19 used PPE more frequently (80.0% vs. 67.3% and 67.9% vs. 67.4%, respectively). The use of PPE was the same in men and women. Also, 64.2% of those with a bachelor's degree used PPE (Table 2).

Table 2: Frequency of using PPE and changes in the scores of the GHQ-28 and its subscales among participants (N = 320)

Variables	Subgroups	not using PPE	Masks and gloves	Only masks	Only gloves	P-value
Frequency (%)		104 (32.5)	138 (43.1)	62 (19.4)	15 (4.7)	
N (%)						
Sex	Male	41 (32.5)	57 (45.2)	20 (15.9)	8 (6.3)	0.493[a]
	Female	63 (32.5)	81 (41.7)	42 (21.6)	7 (3.6)	
Having COVID-19 nonspecific symptoms	No	78 (32.6)	107 (44.8)	42 (17.6)	11 (4.6)	0.639[a]
	Yes	26 (32.1)	31 (38.3)	20 (24.7)	4 (4.9)	
Level of education	Diploma	29 (30.5)	42 (44.2)	21 (22.1)	3 (3.1)	0.165[a]
	Associate	16 (39.0)	15 (36.6)	9 (21.9)	0 (0)	
	Bachelor	38 (35.8)	45 (42.4)	16 (15.1)	7 (6.6)	
	Master	14 (41.2)	14 (41.2)	5 (14.7)	1 (2.9)	
	Doctoral	1 (12.5)	4 (50)	2 (25)	1 (12.5)	
	Ph.D.	1 (25)	0 (0)	3 (75)	0 (0.0)	

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	Others	5 (15.6)	18 (56.2)	6 (18.7)	3 (9.4)	
Close contact with confirmed COVID-19 cases	No	103 (32.7)	135 (42.8)	61 (19.4)	15 (4.8)	0.934[a]
	Yes	1 (20)	3 (60)	1 (20)	0 (0)	
Mean ± SD						
Subscales of the GHQ-28	Somatic symptoms	3.4 ± 2.5	3.6 ± 2.7	3.6 ± 2.6	4.1 ± 2.1	0.864[b]
	Anxiety/insomnia	4.7 ± 3.6	4.4 ± 4.1	4.5 ± 3.7	4.9 ± 3.4	0.867[b]
	Social dysfunction	7.1 ± 2.9	6.7 ± 2.9	7.9 ± 2.3	7.7 ± 3.4	0.086[b]
	Severe depression	2.8 ± 3.3	2.9 ± 3.9	3.6 ± 3.9	3.9 ± 5.5	0.611[b]
	Total score of the GHQ-28	18.0 ± 9.2	17.6 ± 10.9	19.7 ± 9.8	20.7 ± 11.7	0.590[b]

a. Chi-square

b. ANOVA

Abbreviations: GHQ-28 = General Health Questionnaire-28, PPE=personal protective equipment

According to the results, the mean score of the GHQ-28 one month BE was 16.5 ± 9.1, while DE it increased by 1.8 points and reached 18.3 ± 10.2 (P ≤0.003, effect size=10.9%). The score of four subscales increased DE compared to one month BE, which indicates a decrease in health status. Anxiety/insomnia subscale score showed the highest increment, so that BE the mean score was 3.8 ± 3.3, while DE, it increased by an average of 0.8 points and reached 4.6 ± 3.8 (P=0.001, ES=%21.1). The score of social dysfunction subscale did not change much in the community and increased by 0.3 points (from 6.8 ± 2.6 to 7.1 ± 2.9), and there was no significant difference (P=0.057, ES=4.4%). According to the cut-off point of the GHQ-28, only the mean score of social dysfunction subscale DE entered the unhealthy range (Table 3).

Table 3: Mean and standard deviation in the scores of the GHQ-28 and its subscales before and during the COVID-19 epidemic

Variables	Before the epidemic/ During the epidemic	Mean ± SD	Median {first quartile, third quartile}	Adjusted means (percent)	P-value
Somatic symptoms	Before	3.2 ± 2.5	3 {1,4}	15.2	P = 0.026 [a]
	During	3.6 ± 2.6	3 {1,5}	17.1	
Anxiety/insomnia	Before	3.8 ± 3.3	3 {1,5}	18.1	P = 0.001 [a]
	During	4.6 ± 3.8	4 {2,7}	21.9	
Social dysfunction	Before	6.8 ± 2.6	7 {6,8}	32.4	P = 0.057 [a]
	During	7.1 ± 2.9	7 {6,8}	33.8	
Severe depression	Before	2.7 ± 3.6	1 {0,4}	12.8	P = 0.078 [a]
	During	3.1 ± 3.8	2 {0,4}	14.8	

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Total score of the GHQ-28	Before During	16.5 ± 9.1 18.3 ± 10.2	14.5 {10,21} 16.5 {11,23}	19.6 21.8	P = 0.003 [a]

a. T-test
Abbreviation: GHQ-28 = General Health Questionnaire-28

The results also show an increase in the adjusted mean based on the maximum score and a decrease in the scores of the GHQ-28 and its subscales DE compared to BE. The highest adjusted mean DE was for social dysfunction subscale (33.8%), while the lowest adjusted mean was for severe depression subscale (14.8%). Moreover, the highest mean change compared to one month BE was for anxiety/insomnia subscale (Figure 1).

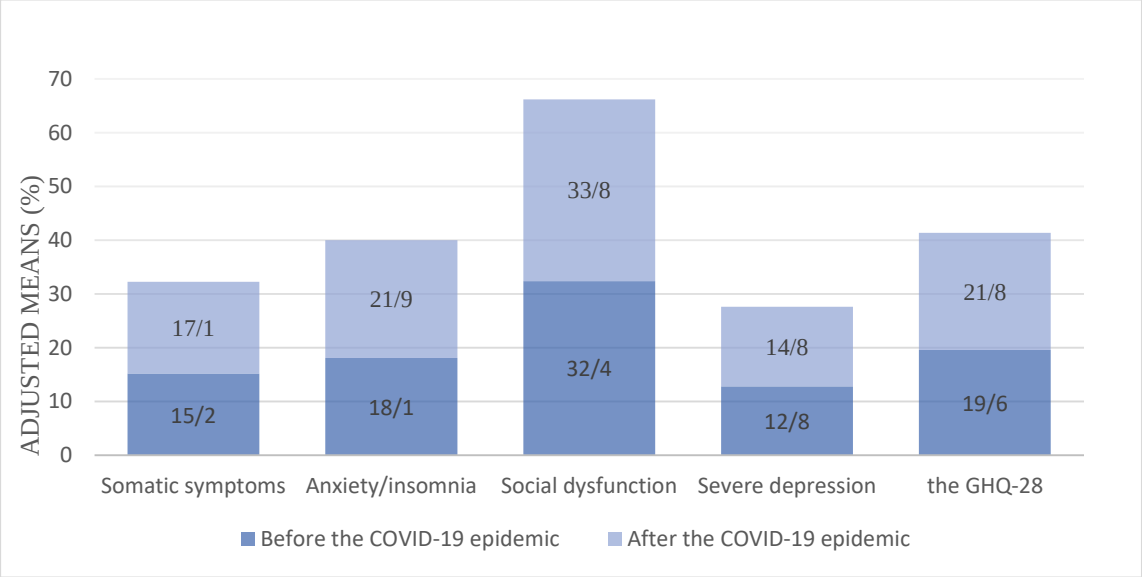

Figure 1. Adjusted means of the scores of the GHQ-28 and its subscales before and during the COVID-19 epidemic

In general, in terms of the GHQ-28 and its subscales, the number of healthy people DE had decreased compared to one month BE. One month BE, the somatic symptoms (90.6%) and social dysfunction (36.9%) subscales had the highest and lowest percentages of healthy individuals, respectively. DE, social dysfunction (65.9%) and the somatic symptoms (13.4%) subscales had the highest and lowest percentages of unhealthy individuals, respectively. The largest change in the number of unhealthy people BE and DE was for anxiety/insomnia subscale with 26 individuals (8.1%). Comparing the mean scores of healthy and unhealthy individuals of the GHQ-28 and its subscales BE and DE, no significant change was observed (Table 4).

Table 4. Mean and standard deviation of the scores of the GHQ-28 and its subscales before and during the COVID-19 epidemic in healthy and unhealthy groups

Variables	Before the epidemic/During the epidemic	Healthy/unhealthy	Frequency (%)	Means ± SD	Adjusted mean (%)
Somatic symptoms	Before	Healthy Unhealthy	290 (90.6) 30 (9.4)	2.6 ± 1.7 8.8 ± 2.3	12.4 41.9

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	During	Healthy	277 (86.8)	2.9 ± 1.8	13.8
		Unhealthy	43 (13.4)	8.4 ± 1.8	40
Anxiety/insomnia	Before	Healthy	264 (82.5)	2.6 ± 1.9	12.4
		Unhealthy	56 (17.5)	9.4 ± 2.5	44.8
	During	Healthy	238 (74.4)	2.8 ± 2.0	13.3
		Unhealthy	82 (25.6)	9.8 ± 3.1	46.6
Social dysfunction	Before	Healthy	118 (36.9)	4.4 ± 1.7	20.9
		Unhealthy	202 (63.1)	8.2 ± 1.9	30.0
	During	Healthy	109 (34.1)	4.3 ± 1.8	20.5
		Unhealthy	211 (65.9)	8.6 ± 2.1	40.9
Severe depression	Before	Healthy	282 (88.1)	1.6 ± 1.9	7.6
		Unhealthy	38 (11.9)	10.6 ± 3.7	50.5
	During	Healthy	271 (84.7)	1.7 ± 1.9	8.1
		Unhealthy	49 (15.3)	10.3 ± 3.5	49.0
Total score of the GHQ-28	Before	Healthy	252 (78.7)	12.7 ± 4.9	15.1
		Unhealthy	68 (21.2)	30.4 ± 7.2	36.2
	During	Healthy	231 (72.2)	13.2 ± 5.3	15.7
		Unhealthy	89 (27.8)	31.6 ± 7.8	37.6

Abbreviation: GHQ-28 = General Health Questionnaire-28

The results show that with increasing age, the average score of severe depression subscale decreases (P = 0.028). Most people who were unhealthy in terms of severe depression subscale DE ranged in age from 18 to 40 years. The mean score of somatic symptoms subscale was higher in people who had nonspecific symptoms of COVID-19 (4.5 vs. 3.2). The mean score of the GHQ-28 and its subscales DE was higher in women than men, and the highest score difference was observed in the anxiety/insomnia subscale (4.9 vs. 4.1). The mean score of the GHQ-28 and its subscales in married people was lower than other people, so their health was in a better status. Scores of the GHQ-28 and its subscales were higher in those who had close contact with confirmed COVID-19 cases. Individuals who had close contact with these cases had higher mean scores of the anxiety/insomnia and social dysfunction subscales, and also had higher mean scores of the GHQ-28 than the cut-off point (7.4, 7.4, and 26.2, respectively). The mean score of the GHQ-28 of individuals with low levels of education and degrees less than a high school diploma compared to educated people was significantly lower (14.0 vs. 19.5, P <0.05). The mean score of social dysfunction subscale of individuals with low levels of education and degrees less than a high school diploma, unlike others, was below the cut-off point (5.8 vs. 7.4) (Table 5).

Table 5: Changes in the mean scores of the GHQ-28 and its subscales before and during the COVID-19 epidemic in terms of socio-economic variables

Variables	Subgroups	Somatic symptoms	Anxiety/insomnia	Social dysfunction	Severe depression	Total score of the GHQ-28

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Sex	Male	3.4 ± 2.7	4.1 ± 3.4	6.8 ± 2.8	3.0 ± 4.1	17.3 ± 10.2
	Female	3.6 ± 2.6	4.9 ± 4.1	7.3 ± 2.9	3.1 ± 3.5	19.0 ± 10.2
Age	0-20	3.4 ± 2.4	4.1 ± 3.1	7.1 ± 2.5	3.1 ± 3.1	17.7 ± 8.4
	20-30	3.7 ± 2.8	4.4 ± 3.7	7.3 ± 3.0	3.6 ± 4.1	19.1 ± 10.3
	30-40	3.6 ± 2.6	4.8 ± 3.9	7.1 ± 2.5	2.7 ± 3.7	18.1 ± 10.1
	40-50	3.2 ± 2.4	5.0 ± 4.7	7.0 ± 3.1	2.6 ± 3.0	17.8 ± 11.3
	50-60	3.6 ± 2.7	3.6 ± 3.1	6.3 ± 3.5	2.8 ± 5.1	16.4 ± 10.5
	>60	2.7 ± 2.5	6.7 ± 6.1	8.3 ± 7.5	2.3 ± 4.0	20.0 ± 16.5
Marital Status	Single	3.8 ± 2.8	4.6 ± 3.7	7.2 ± 2.7	3.5 ± 3.9	19.1 ± 9.9
	Married	3.5 ± 2.5	4.6 ± 3.9	7.0 ± 2.9	2.8 ± 3.7	17.9 ± 10.3
	widow	5.0 ± 1.4	5.5 ± 4.9	9.0 ± 4.2	5.5 ± 2.1	25.0 ± 9.9
Close contact with confirmed COVID-19 cases	No	3.5 ± 2.5	4.5 ± 3.8	7.1 ± 2.9	3.0 ± 3.7	18.2 ± 10.0
	Yes	5.6 ± 5.2	7.4 ± 5.7	7.4 ± 2.1	5.8 ± 7.7	26.2 ± 19.3
Nonspecific COVID-19 symptoms	No	3.2 ± 2.4	4.7 ± 3.9	7.1 ± 3.1	3.0 ± 3.6	18.0 ± 10.2
	Yes	4.5 ± 3.0	4.3 ± 3.6	7.2 ± 2.2	3.3 ± 4.2	19.4 ± 10.3
Level of education	Diploma	3.5 ± 2.8	4.5 ± 3.7	7.0 ± 2.5	3.1 ± 4.0[a,b]	18.1 ± 9.9[a]
	Associate degree	3.3 ± 2.4	4.6 ± 3.8	7.4 ± 3.4	3.7 ± 4.5[a,b]	18.9 ± 11.4[a]
	Bachelor's degree	3.9 ± 2.7	5.2 ± 4.1	7.5 ± 3.1	3.3 ± 3.5[a,b]	19.9 ± 10.4[a]
	Master's degree	3.2 ± 2.2	3.7 ± 2.9	7.1 ± 2.7	1.6 ± 2.2[a]	15.5 ± 7.1[a]
	Doctoral	4.2 ± 2.7	6.5 ± 6.0	7.2 ± 1.7	6.9 ± 6.3[b]	24.9 ± 14.3[a]
	Ph.D.	2.7 ± 2.9	5.0 ± 6.0	8.2 ± 3.2	3.5 ± 4.0[a,b]	19.5 ± 13.3[a]
	Others	3.1 ± 2.4	3.1 ± 2.9	5.8 ± 2.8	1.9 ± 2.4[a]	14.0 ± 8.8[a]

a, b. Anomalous English letters mean statistical differences in data (P <0.05).

To determine the effective factors on the score of the GHQ-28 and its subscales, linear regression was performed with the presence of demographic and socio-economic variables, the total questionnaire/subscale score of BE as the baseline, and having nonspecific symptoms of COVID-19. The results indicate that the presence of nonspecific symptoms of COVID-19 increases the score of somatic symptoms subscale by approximately 1 unit (Beta=0.89, P=0.01). Also, the level of education in presence of other variables could increase the score of anxiety/insomnia, social dysfunction, and severe depression subscales and the GHQ-28 by 0.31, 0.24, 0.28, and 1.01 points, which were statistically significant. Adjusted R2 was used to determine the amount of variance explained in each of the subscales by the variables entered in the model. The results show that the variables included in the model explain 18.7% of the variance of the severe depression subscale. In other words, 18.7% of the dependent variable changes are attributed to the effect of variables entered in the regression model and the remaining 81.3% is due to the effect of variables that are not entered or measured in the model. Adjusted R2 values for scores of

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somatic symptoms, anxiety/insomnia, and social dysfunction subscales and the GHQ-28 were 14.8%, 10.5%, 13.8%, and 13.1%, respectively (Table 6).

Table 6. Investigation the regression of the scores of the GHQ-28 and its subscales in terms of socio-economic subgroups

Variables	After the epidemic														
	Somatic symptoms			Anxiety/insomnia			Social dysfunction			Severe depression			Total score of the GHQ-28		
	B	SD	P-value	B	SD	P-value	B	SD	P-value	B	SD	P-value	B	SD	P-value
Age	-0.01	0.02	0.83	-0.01	0.03	0.97	-0.02	0.02	0.41	-0.02	0.02	0.45	-0.04	0.07	0.55
Sex	0.06	0.30	0.83	0.61	0.45	0.17	0.38	0.33	0.25	0.24	0.42	0.57	1.28	1.18	0.28
Nonspecific symptoms of COVID-19	0.89	0.32	**0.01**	-0.59	0.47	0.21	0.09	0.35	0.78	0.03	0.44	0.95	0.38	1.24	0.76
Level of education	0.16	0.10	0.13	0.31	0.16	**0.05**	0.24	0.12	**0.04**	0.28	0.15	**0.05**	1.01	0.41	**0.01**
Marital Status	-0.23	0.36	0.52	0.15	0.55	0.79	0.06	0.40	0.89	-0.14	0.52	0.79	-0.19	1.44	0.89
County	0.01	0.05	0.95	-0.02	0.07	0.79	0.02	0.05	0.65	0.09	0.07	0.22	0.09	0.19	0.62
Close contact with confirmed COVID-19 cases	1.30	1.11	0.24	2.20	1.68	0.20	0.36	1.22	0.77	1.55	1.57	0.33	5.41	4.40	0.22
Personal protective equipment	0.32	0.30	0.26	-0.1	0.44	0.82	0.06	0.32	0.85	0.60	0.41	0.15	0.89	1.15	0.44
Before the epidemic[a]	0.35	0.05	<0.001	0.37	0.06	<0.001	0.41	0.06	<0.001	0.45	0.05	<0.001	0.40	0.06	<0.001
Adjusted R Square	0.148			0.105			0.138			0.187			0.131		

a. The scores of before the epidemic for the GHQ-28 and its subscales.
P <0.05 is bolded.
Abbreviation: GHQ-28 = General Health Questionnaire-28

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Discussion

Main results

In emergencies such as the COVID-19 epidemic, the situation can cause various psychological disorders and endanger the health of the community. Any factor that endangers the peace of mind of people in the community can cause mental disturbances and it is necessary to study its effect. The COVID-19 epidemic

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has been one of the most important events that have affected different aspects of life. Therefore, the GHQ-28 was used to evaluate the general health of people residing in South Khorasan province, Iran.

According to the results, the scores of the GHQ-28 and its subscales DE changed compared to one month BE and the mean scores showed a decrease in mental health status DE. Based on the results, in the present study, the increase in the general health score DE was less than in another study, which was to be expected given the short time that elapsed between the start of the epidemic and the time study performed [32]. DE, mental health scores, including severe depression and anxiety/insomnia subscales, were higher than BE, which was lower than other studies [32-35]. Due to the difference in study time and different statistical population, this difference in score seems reasonable [32, 36]. Due to the relatively slow trend of the epidemic impact on mental health, over time and up to one year after the epidemic, an increase in mental problems can be observed; therefore, if the current study is repeated in the coming months and after the epidemic, we can expect a further increase in mental health scores [32]. Quarantine conditions and reduced social interactions can impair mental health and cause/worsen depression DE [37]. Also, with the continuation of epidemic-related conditions and concerns related to the disease, an increase in the prevalence of depression, anxiety, and insomnia is expected [33]. Due to the increase of scores of severe depression and anxiety/insomnia subscales and impairment of mental health status in the community, planning to prevent and improve the mental condition of the community DE should be considered [38].

In the present study, the symptoms of depression, anxiety, and mental disorders were observed more in younger ages which were consistent with similar studies. This finding might be related to concerns of infecting with SARS-CoV-2, more participation of the young people in the community, the anxiety related to the new conditions of education, and the reduction of job opportunities [8, 33]. Based on the results, the GHQ-28 scores in men and women were not significantly different and this finding was consistent with a similar study [32]. In this study, the score of anxiety/insomnia subscale was higher in women than men, which was consistent with some similar studies. This finding can be attributed to the greater concern of women DE [8, 9, 39]. According to the results, people with low levels of education had better mental health status, which could be due to a lack of awareness of critical situations and avoidance of media and social stress [8]. The results showed that the scores of severe depression and anxiety/insomnia subscales in people with nonspecific symptoms of COVID-19 and people without symptoms were not significantly different. However, over time, there is a possibility of creating a significant correlation between nonspecific symptoms of COVID-19 and mental health scores [35]. The present study, consistent with similar studies, showed that scores of mental health, which is the sum of the scores of anxiety/insomnia and severe depression subscales, had a significant relationship with the residence of individuals [34, 40].

According to the results, most people in the community used PPE, which can be attributed to effective publicity, fear of COVID-19, and knowledge of disease transmission methods. Men and women used PPE almost equally, and there was no significant difference. People who were in close contact with confirmed COVID-19 cases used PPE more frequently, which might be due to the risk of developing the disease. People with nonspecific symptoms of COVID-19 used PPE more frequently. Having nonspecific symptoms of COVID-19 can be the reason for using PPE to prevent the transmission of the disease. On the other hand, people who used PPE more frequently may falsely report nonspecific symptoms of COVID-19, which might be due to their concerns and sensitivities. Using masks as the most used PPE can indicate the awareness of individuals that wearing masks can prevent the transmission of COVID-19. The scores of the GHQ-28 and social dysfunction subscale were higher in people who used PPE, but due to its importance and role in preventing COVID-19, it is necessary to use PPE.

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Strengths and limitations

The present study was performed with a before-and-after method, so it was possible to evaluate the impact of the epidemic by comparing the scores of BE and DE. This study was performed after the initial peak and between the two epidemic peaks. As a result, the epidemic had been affected the individuals and provided a more accurate conclusion. This study is limited due to its cross-sectional nature. Moreover, DE, due to health conditions, it was not possible to collect information with a paper questionnaire or interview people. So, the information of individuals was collected once with a web-based self-report questionnaire, while it was better to do it longitudinally and with several follow-ups.

Conclusion

In conclusion, this study showed that with the COVID-19 epidemic, the community has been faced with conditions in which individuals' anxiety, depression, social function, and in general, various dimension of health, has been deteriorated. Headache was the most common nonspecific symptom of COVID-19, and most people used PPE. The results of this study can provide a good perspective for policymakers, which can help make policies related to the provision of PPE and policies which can help deal with the epidemic. This study showed the importance of paying attention to general health, especially mental health DE. The results of the present study can be beneficial for appropriate planning for maintaining, promoting, and improving health in the community.

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Conflicts of Interest

None of the above authors have any conflict of interest.

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