Preventive behaviors and psychological effects of COVID-19 and their associated factors among Iranian older adults: A cross-sectional study

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Abstract:

BACKGROUND: The spread of the coronavirus disease 2019 (COVID-19) pandemic caused a variety of psychological complications. One way to control the spread of this pandemic is compliance with health protocols and standards. Considering the limited research into the psychological effects of COVID-19 and the preventive behaviors among older adults, this study aimed to determine these variables and their relationship with associated factors.

MATERIALS AND METHODS: This cross-sectional study was conducted on 153 older adults who were referred to the clinic of Pirouz Hospital in the east of Guilan, in the north of Iran, in 2022. The research instruments included the Impact of Event Scale-Revised (IES-R) and the preventive behavior questionnaires. Descriptive (mean, standard deviation, frequency, and percentage) and inferential (Kruskal–Wallis and Mann–Whitney tests) statistics were used to analyze the data using Statistical Package for the Social Sciences (SPSS) software version 20 with a significant level of 0.05.

RESULTS: The findings showed that the overall mean score for preventive behaviors was 107 ± 10.38. The highest mean score of preventive behaviors was related to personal behavior (43.00 ± 5.58) and instructions to enter the house (30.15 ± 4.84), respectively. The highest mean scores of psychological effects were related to the intrusion dimension (11 ± 5.33) and avoidance dimension (7 ± 4.74), respectively. There was a significant relationship between drug use (F = 27.136, P = 0.028) and the psychological effects of COVID-19.

CONCLUSION: Based on the results, the general condition of the preventive behaviors of older adults was average, and the majority of them were at a normal level of psychological effects. However, administrators and health policymakers should consider planning to develop interventions to encourage and improve preventive behaviors against COVID-19, especially among older adults during the COVID-19 pandemic.

Keywords:

Aging, behavior, COVID-19, primary prevention, psychology

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Introduction

Since December 2019, several suspected cases of viral pneumonia have been reported in Wuhan, China. The World Health Organization (WHO) officially named this new virus as coronavirus disease 2019 (COVID-19).[1] The pandemic of coronavirus disease has caused damage in various dimensions, including health.[2] Age is a significant risk factor for COVID-19-related death.[3] In a study, it was pointed out that demographic characteristics such as age and gender are related to the death rate caused by COVID-19.[4] The WHO stated that in many countries, the elderly face the greatest threats and challenges

of COVID-19.[5] Older adults are more susceptible to COVID-19 and at risk of its side effects.[6]

In most infectious diseases, compliance with hygiene standards is considered the cheapest and easiest way to prevent infection. Since there is no definitive treatment for this disease, the only way to control the spread of this disease is to stop the chain of infection.[7] The slow pace of vaccination and mutated forms of the virus raised many concerns among Iranians, which led to many efforts to find alternatives to prevent transmission or reduce the progression of the infection.[8] So far, most interventions have focused on improving people's knowledge and motivation to adopt preventive behaviors.[9] Preventive behavior mainly includes compliance with hygiene standards (e.g., hand washing), and avoidance behavior mainly refers to the physical distance.[10] Everyone was advised to stay at home and follow the self-care guidelines recommended by the WHO.[7] Research on COVID-19 has shown that preventive behaviors (e.g., hand washing and staying at home) are more commonly used after increased awareness of the risk involved.[11]

Despite the effectiveness of such measures in minimizing the spread of the disease, the severe and wide disruptions in people's lives lead to the new norm of living.[12] The strict COVID-19 preventive measures and their prolonged period posed further stress to an already strained population.[13] This disease has caused a tremendous psychological strain on patients and healthcare systems worldwide.[14] A wide range of psychological effects has been observed during the spread of COVID-19 at individual, social, national, and international levels.[15] Psychological symptoms such as stress, depression, anxiety, and confusion have increased significantly even among people with no history of mental illness.[13] The results of a study in China reported the emergence of several psychological disorders such as anxiety, fear, insomnia, emotional changes, and posttraumatic stress.[4] The emergence of psychological effects requires that people with severe and serious mental illnesses are provided with correct information about the strategies related to the medical treatment of COVID-19.[14] There is little knowledge about the psychological effects of the COVID-19 pandemic and preventive behaviors, especially among the elderly as one of the most vulnerable segments of society, and limited research has been conducted on this issue. A literature review shows that such a study has not been conducted in Guilan Province, which is the oldest province in Iran. With regard to the upward trend of the increase in the elderly population in Iran and the cultural, social, etc., differences in different countries and considering that by identifying the psychological effects of the COVID-19 pandemic and preventive behaviors, it is possible to design effective preventive interventions for this age group in a more organized manner, and this study was conducted to determine the preventive behaviors and psychological effects caused by COVID-19 and their relationship with associated factors in older adults.

Material and Methods

Study design and setting
The current research was a cross-sectional study that was conducted in 2022. The study setting was the clinic of Pirouz Hospital as a referral center in the east of Guilan Province, in the north of Iran.

Study participants and sampling
A total of 153 older adults were considered for the sample and were selected as convenience sampling. The inclusion criteria included older adults 60 years old and older, not having cognitive problems (getting a score of less than 8 on the Abbreviated Mental Test (AMT-10)), not suffering from hearing and vision problems that cause communication disorders, and not suffering from acute diseases and debilitating. Exclusion criteria included unwillingness to continue cooperation during the research.

Data collection tool and technique
Research tools included demographic characteristics (such as age, gender, marital status, economic status, level of education, etc.), preventive behaviors, and the Impact of Event Scale-Revised (IES-R) questionnaires, which are explained as follows.

The preventive behavior questionnaire was designed by Firouzbakht *et al*. (2021)[7] according to the prevention guidelines provided by the Iranian Ministry of Health and the WHO. It has 33 questions in four domains: individual behavior (13 questions), guidelines for entering and leaving the home (eight and eight questions, respectively), and preventive guidelines for using personal belongings (four questions). The answers to the items are on a 5-point Likert scale (always, most of the time, sometimes, rarely, and never). The answer "always" is given a score of "1," and the other options are given a score of "0." Therefore, the range of scores is from 0 to 33. A higher score indicates better preventive behavior and preventive behaviors. The validity of the questionnaire was calculated based on the content validity index (CVI) of 0.81, and its reliability was 0.82 using Cronbach's alpha coefficient. The reliability of the questionnaire in this study was calculated using Cronbach's alpha coefficient of 0.74.

The IES-R questionnaire was designed in 1997 by Weiss and Marmar according to Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV),

criteria.[16] It has 22 items that measure the frequency of posttraumatic symptoms in three separate subscales (avoidance–intrusion–hyperarousal) during the last week. Intrusion is characterized by nightmares, unwanted visual images of the traumatic event or its consequences while awake, and intrusive thoughts about aspects of the traumatic event, consequences, or self-images. Avoidance is characterized by deliberate efforts not to think about the event, not to talk about the event, and to avoid any reminders of the event. The hyperarousal scale covers factors such as anger, irritability, hypervigilance, difficulty concentrating, and severe panic.[17] Subjects give each item a score of 0–4. The overall score of the test is obtained from the set of scores, and its division is as follows: 0–23 (normal), 24–32 (mild psychological effect), 33–36 (moderate psychological effect), and above 37 (severe effect severe psychological).[2] This tool was also used by Khanehshenas *et al*. (2020)[2] to measure the psychological effects of the coronavirus pandemic on the workers of a beverage company in Tehran in 2019, and the results showed that this questionnaire with Cronbach's alpha of 0.67–0.87 to measure psychological works is approved in Iran. The reliability of the questionnaire in this study was calculated using Cronbach's alpha coefficient of 0.82.

To collect data, the researcher went to the clinic of Lahijan Pirouz Hospital after obtaining permission from the relevant authorities. After selecting the samples and introducing himself and providing sufficient explanations about the purpose of the research and obtaining their written consent, he gave them the questionnaires. If they were unable to write, the questionnaires were completed by asking them.

The data were analyzed by the Statistical Package for the Social Sciences (SPSS) software version 20 software (IBM Corp., Armonk, NY, USA). Descriptive (mean, standard deviation, frequency, and percentage) and inferential (Kruskal–Wallis and Mann–Whitney tests) statistics were used to analyze the data. Normality was measured by the Kolmogorov–Smirnov test. All calculations were carried out considering the significance level ($P < 0.05$).

Ethical consideration

This study is the result of a master's thesis approved by Ethics Committee of Guilan University of Medical Sciences in Rasht, Iran (Ethics Code No.: IR.GUMS. REC.1400.337). According to the principles of research ethics, all ethical principles are observed in this article. Participants could refuse to continue their cooperation if they did not want to. They were also reminded that, if they wished, the results of the research would be made available to them and that their information would be kept confidential.

Results

The findings showed that most of the samples were in the age range between 60 and 74 years (58.2%) and women (60.13%). In terms of education, most of the research samples (41.17%) were illiterate, and in terms of marital status, most of them (71.24%) were married.

The findings regarding the preventive behaviors against COVID-19 among older adults showed that the overall mean score of preventive behaviors was 107 ± 10.38, which according to the maximum score indicates the average status of their preventive behaviors. The highest mean score of preventive behaviors was related to personal behavior (43.00 ± 5.58) and instructions to enter the house (30.15 ± 4.84), respectively [Table 1].

The findings regarding the relationship between older adults' preventive behaviors against COVID-19 and demographic characteristics showed that the highest mean score of preventive behaviors (120 ± 10.87) belonged to older adults in the age range of 75 to 90 years. In terms of gender, the highest mean score for preventive behaviors was assigned to women (121.25 ± 10.87), and in terms of marital status, the highest mean score for preventive behaviors was assigned to married samples (121.62 ± 10.87). In terms of the number of children, samples with one child had the highest mean score of preventive behaviors (122.80 ± 11.21). In terms of underlying disease, samples with the underlying disease had a higher mean score of preventive behaviors (121.6 ± 10.40) than those without underlying disease. In terms of the drugs used, samples who used antihypertensive drugs had the highest mean score of preventive behaviors (123 ± 10.77) [Table 2].

Findings regarding the psychological effects of COVID-19 on older adults showed that the highest mean scores of psychological effects were related to the intrusion dimension (11 ± 5.33) and avoidance dimension (7 ± 4.74), respectively [Table 3].

The findings regarding the relationship between the psychological effects of COVID-19 and demographic characteristics showed that the majority of samples that were at a normal level in terms of psychological

Table 1: Dimensions of preventive behaviors against COVID-19 among older adults (*n*=153)

Dimensions of preventive behaviors	Mean±SD	Min	Max
Personal behavior	43.00±5.58	29	60
Instructions for leaving the house	29.00±3.78	12	38
Instructions for entering the house	30.15±4.84	16	40
Preventive guidelines for the use of personal devices	14.90±2.67	7	20
Total score of preventive behaviors	107±10.38	86	144

Note: standard deviation (SD), minimum (Min), and maximum (Max)

Table 2: Relationship between older adults' preventive behaviors against COVID-19 and demographic characteristics (*n*=153)

Preventive behaviors	Demographic characteristics	*n* (%)	Mean±SD	Min	Max	*P* and test
Age (year)	60-74	89 (58.2)	120±10.87	86	144	*P*=0.097, *F*[1]=2.371
	75-90	31 (20.3)	124±10.22	99	143	
	90>	33 (21.6)	117±8.69	100	136	
Sex	Female	92 (60.13)	121/5±10.87	86	144	*P*=0.491, *Z*[2]=-0.689
	Male	61 (41.17)	119.40±9.61	99	143	
Educational status	Illiterate	63 (41.17)	121.14±10.50	86	144	*P*=0.123, *F*=1.959
	Elementary degree	48 (31.37)	121.20±11.12	93	144	
	Middle school degree	28 (18.30)	117.67±9.75	100	136	
	Upper degree	13 (8.49)	116±5.89	107	126	
Marital status	Married	109 (71.24)	121.62±10.87	86	144	*P*=0.916, *F*=1.637
	Single	15 (9.80)	120.33±9.91	100	136	
	Widow	17 (11.11)	118±9.05	104	136	
	Divorced	12 (7.85)	115.50±6.04	107	126	
Children	1	33 (21.56)	122.80±11.21	86	144	*P*=0.884, *F*=1.937
	2-3	83 (54.24)	120.90±10.42	93	144	
	4>	37 (24.18)	116.75±8.93	100	136	
Living place	City	73 (47.71)	121.50±10.33	86	144	*P*=0.123, *F*=2.127
	Village	54 (35.29)	120.25±11.46	93	144	
	Outskirts of city	26 (17)	116.66±7.12	107	136	
Job	Retired	54 (35.29)	122.23±11.13	86	144	*P*=0.236, *F*=1.401
	Employee	23 (15.03)	120/25±7.66	106	138	
	Freelancer	45 (29.41)	121±11.42	93	144	
	Farmer	19 (12.41)	118±9.96	100	136	
	Driver	12 (7.86)	115.5±6.04	107	126	
Income	Enough	45 (29.41)	122.5±11.66	86	144	*P*=0.400, *F*=1.647
	Low	87 (56.86)	120.4±10.35	93	144	
	Average	21 (13.73)	117±6.27	107	127	
Underlying disease	Yes	72 (47.05)	121.6±10.40	86	144	*P*=0.124, *F*=-1.536
	No	81 (52.5)	119.4±10.30	93	144	
Reason for referral	Eye disease	28 (18.30)	122.25±11.67	86	144	*P*=0.399, *F*=1.045
	Ear disease	25 (16.33)	123±10.88	98	140	
	Glandular disorder	26 (16.99)	129±7.69	106	138	
	Orthopedic diseases	24 (15.68)	118.66±12.72	93	144	
	Heart disease	26 (16.99)	121.5±10.89	100	143	
	Urinary disease	16 (10.45)	119±7.46	108	136	
	Other	8 (5.22)	114±5.03	107	122	
History of infection	Yes	118 (77.12)	121.3±10.69	86	144	*P*=0.516, *Z*=-0.649
	No	35 (22.88)	117.2±8.87	100	136	
Family history of infection	Yes	97 (63.39)	121.25±11.02	86	144	*P*=0.847, *Z*=-0.193
	No	56 (36.61)	119.4±9.20	100	143	
Vaccine	Yes	153 (100)	120.58±10.38	86	144	-
	No	0	0	0	0	
Source of knowledge	Doctor and staff	29 (18.95)	122.4±11.46	86	144	*P*=0.323, *F*=1.178
	Internet	32 (20.91)	121.66±10.06	98	140	
	Radio and television	32 (20.91)	120±11.30	93	144	
	Newspapers and magazines	24 (15.68)	121.5±9.90	99	143	
	Friends and acquaintances	14 (9.15)	117.5±12.05	100	136	
	Satellite networks	22 (14.37)	116.66±6.25	107	127	
	Don't know	0	0	0	0	
Medicine	Antihypertensive	42 (27.45)	123±10.77	86	144	*P*=0.162, *F*=1.604
	Blood sugar reducer	25 (16.33)	120±9.70	98	140	
	Anticoagulant	27 (17.64)	120±11.87	93	144	
	Blood fat reducer	25 (16.33)	121.5±10.34	99	143	
	Antibiotic	25 (16.33)	118.66±9.13	100	136	
	Other	8 (5.26)	114±5.03	107	122	

[1]Kruskal–Wallis test, [2]Mann–Whitney test

Table 3: Dimensions of psychological effects of COVID-19 on older adults (*n*=153)

Dimensions of psychological effects	Mean±SD
Avoidance	7±4.74
Intrusion	11±5.33
Hyperarousal	6±3.97

effects were in the age range of 60 to 74 years (20.26%) and females (29.41%), and in terms of educational status, the majority of them were illiterate (20.26%). There was a significant relationship between drug use and the psychological effects of COVID-19 (F = 27.136, *P* = 0.028) [Table 4].

Discussion

This study was conducted to determine the preventive behaviors and psychological effects caused by COVID-19 and their relationship with associated factors in older adults, referring to the clinic of Pirouz Hospital in the east of Guilan. The findings regarding the preventive behaviors of older adults indicated the average status of their preventive behaviors. The highest preventive behavior was related to personal behavior followed by instructions for entering the home. The results of Pasion *et al*.'s (2021)[11] study showed that protective behaviors decrease with age. These researchers stated that older people try to be quarantined more and follow less recommended hygiene measures to prevent infection (such as washing hands or covering the nose and mouth when coughing or sneezing). This is while they were at a higher risk than other age groups and had more health problems such as high blood pressure and diabetes, which are associated with the risk of medical complications and mortality. The findings regarding the status of the preventive behaviors of older adults regarding COVID-19 in terms of individual and social factors showed that the highest average score of the preventive behaviors belonged to older adults in the age range of 75 to 90 years. In the results of the study by Lages *et al*. (2021)[18] who examined the relationship between the level of the threat of COVID-19 and age in the adoption of protective behaviors in Germany, there was a positive relationship between age and the adoption of protective behaviors. The results of a study showed that age differences in intensity affect the adoption of protective behaviors so that older adults are more likely to adopt protective and preventive behaviors.[19] However, the results of Pasion *et al*.'s study (2020)[11] showed that the adoption of protective behaviors decreases with age. Also, the results of Daoust's (2020) research, which examined the reaction of older adults to the COVID-19 pandemic in 27 countries, indicated that with increasing age, the adoption of protective behaviors, especially the use of masks, is less, with an irregular pattern[20], which are inconsistent with the results obtained from this

study. It seems that the older adult population of Iran had good health compliance with the health protocols and protective behaviors announced by the WHO and the Ministry of Health during the coronavirus pandemic, and it has shown the effectiveness of the training carried out regarding the prevention of COVID-19 by health treatment centers and news agencies of the country and the government. Because the results of the studies have shown that during the outbreak of the COVID-19 pandemic, people who received their information from the said sources had a higher level of awareness and, as a result, increased the adoption of more protective and preventive behaviors.[21-23]

The findings of this study regarding the status of the preventive behaviors of older adults in relation to COVID-19 in terms of gender showed that the highest average score of the preventive behaviors was assigned to women. The results of Bronfman *et al*.'s (2021)[24] study, which examined gender differences in psychosocial factors affecting protective behaviors against COVID-19, showed that women, due to having higher levels of fear and worry, actively engage in more protective behaviors than men do. In addition, due to their higher adaptability than men, women can more easily comply with behaviors such as wearing a mask, which reduces the spread of the COVID-19 epidemic.[25] The results of the study by Capraro *et al*. (2020)[26] indicated that men have less belief than women about contracting COVID-19, which makes them less willing to cover their faces. The results in this study confirmed the results of other studies.

The findings of this study regarding the status of the preventive behaviors of older adults regarding COVID-19 in terms of marital status showed that the highest average score of the preventive behaviors belonged to married people. This finding is in agreement with the results of Stickley *et al*.'s research (2021),[27] which investigated loneliness and preventive and protective behaviors among Japanese adults, and the results of their study indicated that loneliness increases the chance of not engaging in these behaviors. Psychological factors and negative stressors related to loneliness and COVID-19 lead to an increase in the tendency to adopt protective behaviors.[28]

The findings regarding the psychological effects of COVID-19 in terms of individual and social factors showed that the majority of older adults were at a normal level in terms of psychological effects, and the majority of samples that were at a normal level in terms of psychological effects were in the age range of 60 to 74. Many studies have been conducted regarding the psychological effects of COVID-19 on older adults, and some of their results have been contradictory.

Table 4: Relationship between the psychological effects of COVID-19 and demographic characteristics among older adults (*n*=153)

Psychological effects	Demographic characteristics	*n* (%)	Mean±SD	Normal *n* (%)	Mild *n* (%)	Moderate *n* (%)	Severe *n* (%)	*P* and test
Age	60 to 74	89 (58.2)	25.50±13.67	31 (20.26)	18 (11.76)	14 (9.15)	15 (9.80)	*P*=0.155, *F*=9.343
	75 to 90	31 (20.3)	26.66±10.78	14 (9.15)	7 (4.57)	8 (5.22)	2 (1.30)	
	90 and more	33 (21.6)	21.25±8/58	19 (21.41)	9 (5.88)	3 (1.96)	1 (0.65)	
Sex	Female	92 (60.13)	25±13.6	44 (29.41)	18 (11.76)	14 (9.15)	16 (10.45)	*P*=0.491, *Z*=-0.0689
	Male	61 (39.87)	23±9.56	31 (20.26)	17 (11.11)	11 (7.18)	2 (1.30)	
Educational status	Illiterate	63 (41.17)	22.66±14.64	31 (20.26)	12 (7.84)	9 (5.88)	11 (7.18)	*P*=0.447, *F*=8.896
	Elementary degree	38 (31.37)	27±11	21 (13.72)	11 (7.18)	11 (7.18)	6 (3.92)	
	Middle school degree	28 (18.30)	22.5±9.98	15 (9.89)	8 (5.22)	4 (2.61)	1 (0.65)	
	Upper degree	13 (4/98)	22±6.31	8 (5.22)	4 (2.61)	1 (0.65)	0 (0)	
Marital status	Married	109 (71.24)	26±13.23	51 (33.33)	23 (15.03)	18 (11.76)	17 (11.11)	*P*=0.435, *F*=9.024,
	Single	15 (9.80)	19±9.59	8 (5.22)	3 (1.96)	4 (2.61)	0 (0)	
	Widow	17 (11.11)	25.33±10.25	8 (5.22)	6 (3.92)	2 (1.30)	1 (0.65)	
	Divorced	12 (7.85)	20.50±6.24	8 (5.22)	3 (1.96)	1 (0.65)	0 (0)	
Children	1	33 (21.56)	24±14.56	16 (10.45)	5 (3.26)	6 (3.92)	6 (3.92)	*P*=0.28, *F*=7.46
	2 to 3	83 (52.24)	26.14±12.52	39 (25.49)	18 (11.76)	15 (9.80)	11 (7.18)	
	4>	37 (24.18)	22.33±8.74	20 (13.07)	12 (7.84)	4 (2.61)	1 (0.65)	
Living place	City	73 (47.17)	24.5±14.22	35 (22.87)	15 (9.80)	11 (7.18)	12 (7.84)	*P*=0.538, *F*=5.045
	Village	54 (35.29)	25±10.54	26 (16.99)	12 (7.84)	11 (7.18)	5 (3.26)	
	Outskirts of city	26 (17)	22.66±8.92	14 (9.15)	8 (5.22)	3 (1.96)	1 (0.65)	
Job	Retired	23 (15.03)	24±15.23	26 (16.99)	9 (5.88)	8 (5.22)	11 (7.18)	*P*=0.474, *F*=11.651
	Employee	45 (29.41)	26.66±10.43	10 (6.53)	6 (3.92)	6 (3.92)	1 (0.65)	
	Freelancer	12 (7.86)	26±11.01	21 (13.72)	11 (7.18)	8 (5.22)	5 (3.62)	
	Farmer	45 (29.41)	22±9.96	10 (6.53)	6 (3.92)	2 (1.30)	1 (0.65)	
	Driver	87 (56.86)	20.5±6.24	8 (5.22)	3 (1.96)	1 (0.65)	0 (0)	
Income	Enough	45 (29.41)	26±15.94	21 (13.72)	6 (3.92)	7 (4.57)	11 (7.18)	*P*=0.072, *F*=11.565
	Low	87 (56.86)	22.6±10.45	43 (28.10)	23 (15.03)	15 (9.80)	6 (3.92)	
	Average	21 (13.73)	23±8.28	11 (7.18)	6 (3.92)	3 (1.96)	1 (0.65)	
Underlying disease	Yes	72 (47.05)	24±14.27	35 (22.87)	15 (9.80)	10 (6.53)	12 (7.84)	*P*=0.914, *Z*=-0.108
	No	81 (52.5)	24±10	40 (26.14)	20 (13.07)	15 (9.80)	6 (3.92)	
Reason for referral	Eye disease	28 (18.30)	21.5±12.1	14 (9.15)	5 (3.26)	6 (3.92)	3 (1.96)	*P*=0.071, *F*=27.437
	Ear disease	25 (16.33)	27±18.09	11 (7.18)	4 (2.61)	2 (1.30)	8 (5.22)	
	Glandular disorder	26 (16.99)	23±10.08	13 (8.49)	6 (3.92)	6 (3.92)	1 (0.65)	
	Orthopedic diseases	24 (15.68)	27±12.02	11 (7.18)	6 (3.92)	2 (1.30)	5 (3.26)	
	Heart disease	26 (16.99)	21.5±9.49	13 (8.49)	7 (4.57)	6 (3.92)	0 (0)	
	Urinary disease	16 (10.45)	29±9.8	6 (3.92)	6 (3.92)	3 (1.96)	1 (0.65)	
	other	8 (5.22)	18±4.4	7 (5.47)	1 (0.65)	0 (0)	0 (0)	
History of infection	Yes	118 (77.12)	26.09±12.97	55 (35.94)	25 (16.33)	21 (13.72)	17 (11.11)	*P*=0.516, *Z*=-0.649
	No	35 (22.88)	12.25 (8.82)	20 (13.07)	10 (6.53)	4 (2.61)	1 (0.65)	
Family history of infection	Yes	97 (63.39)	24±13.56	47 (30.71)	19 (12.41)	14 (9.15)	16 (10.45)	*P*=0.847, *Z*=-0.193
	No	56 (36.61)	24.92±9.42	28 (18.30)	16 (10.45)	11 (7.18)	2 (1.30)	
Vaccine	Yes	153 (100)	24±12.17	75 (49.01)	35 (22.87)	25 (16.33)	18 (11.76)	-
	No	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Source of knowledge	Doctor and staff	29 (18.95)	24±12.13	14 (9.15)	5 (3.26)	6 (3.92)	4 (2.61)	*P*=0.404, *F*=15.668
	Internet	32 (20.91)	19.5±17.02	17 (11.11)	6 (3.92)	2 (1.30)	7 (4.57)	
	Radio and television	32 (20.91)	27±11.17	14 (9.15)	7 (4.57)	6 (3.92)	5 (3.26)	
	Newspapers and magazines	24 (15.68)	28±10.07	10 (6.53)	6 (3.92)	7 (4.57)	1 (0.65)	
	Friends and acquaintances	14 (9.15)	16±8.52	9 (5.88)	4 (2.61)	1 (0.65)	0 (0)	
	Satellite networks	22 (14.37)	25±8.23	11 (7.18)	7 (4.57)	3 (1.96)	1 (0.65)	
Medicine	Antihypertensive	42 (27.45)	26.33±16.21	19 (12.41)	6 (3.92)	6 (3.92)	11 (7.18)	*P*=0.028, *F*=27.136
	Blood sugar reducer	25 (16.33)	18±9.58	14 (9.15)	7 (4.57)	4 (2.61)	0 (0)	
	Anticoagulant	27 (17.64)	27±11.3	12 (7.84)	6 (3.92)	4 (2.61)	5 (3.26)	
	Blood fat reducer	26 (16.99)	27±10.71	11 (7.18)	6 (3.92)	8 (5.22)	1 (0.65)	
	Antibiotic	25 (16.33)	24±9.46	12 (7.84)	9 (5.88)	3 (1.96)	1 (0.65)	
	Other	8 (5.26)	18±4.4	7 (4.57)	1 (0.65)	0 (0)	0 (0)	

Some studies have stated that older people had fewer psychological symptoms during the COVID-19 pandemic compared with younger people.[29] It was also shown that older adults are better at controlling emotions and dealing with stressful events.[30-32] In contrast, some studies reported that older adults had more severe psychological symptoms than participants in other age groups,[33,34] and some studies reported no psychological symptoms for most participants.[35-37] However, older people typically experience loneliness, age discrimination, and excessive worry[38] and therefore are expected to experience more negative consequences related to the COVID-19 pandemic.[39] However, the results in this study and some existing texts do not confirm that.

The findings in this study regarding the psychological effects of COVID-19 in terms of gender indicated that the majority of people who were at the normal level of the psychological effects of COVID-19 were female. Regarding the psychological effects of COVID-19 in male and female gender groups, many studies have been conducted, and the results of this study were not consistent with the results obtained from those studies. The results of Meng *et al*.'s study (2020),[1] which analyzed the psychological impact of COVID-19 on elderly people in China, indicated that women suffered from anxiety and depression more than men. The results of some studies showed that women show higher levels of depression and anxiety than men during the outbreak of the COVID-19 pandemic and are more exposed to trauma-related complications such as post-traumatic stress disorder (PTSD) and reduced sleep quality.[24,40] Women are expected to experience higher levels of stress due to their neurobiological structures.[38] It seems that the difference in the results of different studies is due to cultural and social differences in different societies.

The findings in this study regarding the psychological effects of COVID-19 in terms of marital status indicated that the majority of people who were married were at a normal level of psychological effects. Regarding the impact of marital status on the psychological status of COVID-19, various studies have been conducted. The results of the studies showed that married status increases the feeling of well-being, and then, the psychological complications and depression of old age decrease so that the older adults who are married showed fewer psychological complications than the older adults who live alone, because these people have more support during the restrictions created during this period, and marital status is a moderating role of depression and mental health for older people.[41,42]

The findings in this study regarding the psychological effects of COVID-19 in terms of education status showed that the majority of the samples who were at the normal level of the psychological effects of COVID-19 were illiterate, which can be justified as generally illiterate people. Because of increasing their level of awareness, they have access to fewer information sources than literate people. On the contrary, people who have a higher level of education are looking for more information in different media, and the result of these many searches in different media can cause more fear and worry and the psychological effects of COVID-19 on them. The results of some studies have also shown that people who follow news related to coronavirus usually experience more anxiety.[43] In addition, news and rumors can aggravate the symptoms of depression in society.[44] A review of the existing studies did not include a finding that would provide the possibility of comparing the findings of this study with the results of other studies. Although this makes it difficult to compare with other studies to strengthen the discussion and is considered one of the limitations of the research, it can be considered a strength of this study to provide new information.

Conclusion

Identifying psychological effects and preventive behaviors can help elderly people to perform these behaviors in their daily life and adhere to them to avoid contracting COVID-19. The findings regarding the preventive behaviors of older adults indicated an average situation in their preventive behaviors. The results showed that the highest average preventive behaviors were related to personal behavior and then instructions to enter the house. Findings regarding the psychological effects of COVID-19 in older adults showed that the majority of them were at a normal level in terms of psychological effects. The average scores of psychological effects were higher than the average scores of other dimensions, respectively, in the dimension of intrusive thoughts/rumination and then in the dimension of avoidance. The highest rate of compliance with the protective function was assigned to women. Therefore, it is recommended to plan to use appropriate strategies to encourage older adult men to observe more behaviors that are protective, so that while controlling the disease of COVID-19, its psychological effects are reduced and the health of elderly people is improved. In addition, the findings showed that there is a significant relationship between drug use and the psychological effects of COVID-19.

Based on the present results, administrators and health policymakers should consider planning to develop interventions to encourage and improve preventive behaviors against COVID-19, especially among older adults during the COVID-19 pandemic. They should also emphasize the effectiveness of recommended preventive

measures. Planning to use appropriate strategies to encourage older adults to observe more preventive behaviors is recommended.

Limitations

This research had limitations like other studies. In this research, a questionnaire was used to collect data. As a result, some people may have refused to provide real answers and given unrealistic answers. Some of the participants were not literate. For this reason, the researcher read the questions for them or used his companion to read the questions, which caused a lot of time to complete the questionnaires. Some people refused to continue answering the questions due to their physical and health conditions and lack of concentration and patience while answering. This research was conducted on older adult patients, so it cannot be generalized to the whole society. It is suggested that similar research be done in different parts of the country and in different age groups and their results are compared with the findings of the present study.

Conflicts of interest

There are no conflicts of interest.

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