

Investigating the Association between Health Literacy and Fear of COVID-19 among Caregivers of the Elderly in Tehran, Iran

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ABSTRACT

Background and Objectives: Caregivers' health literacy is an influential factor in the caregivers' efficiency to meet the physiological and psychological needs of the elderly. The prolongation of the COVID-19 pandemic and the problems of the elderly can be a reason for fear of infection in their caregivers. This study aimed to investigate the fear of COVID-19 in caregivers and its relationship with their health literacy.

Materials and Methods: This cross-sectional study was performed on 400 caregivers of the elderly, living in Tehran, Iran during the Summer of 2021. The tools consisted of health literacy, fear of COVID-19, awareness, attitude, and performance were collected through questionnaires. The data was gathered by using an online questionnaire. Data analysis was performed by using SPSS ver.23 with Pearson correlation and regression, and independent t-test. 23.

Results: For each increased unit of the health literacy score, the fear of COVID-19 score decreased by 0.185 units ($P=0.025$). The mean score of health literacy was 75.89 ± 14.51 in caregivers of the elderly. The mean score of fear of COVID-19 was 19.42 ± 5.02 in caregivers of the elderly. For each increased unit of the health literacy score, the awareness score increases by 0.311 units, the attitude score increases by 0.638 units, and the performance score also increase by 0.214 units.

Conclusions: As health literacy increases, the fear of COVID-19 decreases. In addition, most health caregivers have adequate levels of health literacy. It is suggested to set educational policies to increase the health literacy of the caregivers whose health literacy level is not desirable.

Paper Type: Research Article

Keywords: Aging, Caregivers, COVID-19, Fear, Health Literacy

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Introduction

Aging is a stage of human growth and development. The onset of aging in Iran is 60 years old. The rate of physiological and psychological changes increases with age so that most people after the age of 60 are not able to perform normal activities in their daily lives. As a result, they find themselves completely/relatively dependent on their caregivers (1). The caregivers of the elderly are formally or informally responsible for taking care of the elderly. Formal caregivers usually have short/long-term specialized training with clinical experience and are responsible for caring for the elderly in exchange for a legal contract (2).

In contrast, informal care is provided by family members, friends, and relatives (3). Therefore, home caregivers are directly involved in taking care of and helping the patients with their day-to-day activities such as nutrition, relocation, psychological, emotional, and social support, and liaising with the care team regarding changing circumstances, medication, and funding. These people have the most involvement in patient care, and helping patients adapt to and manage chronic diseases (4, 5).

During the COVID-19 pandemic, many older adults may experience new or worsened feelings of loneliness due to social dysfunction, often due to previous limitations following chronic illnesses, visual or auditory impairments, or severe functional impairments (6). One of the prominent features of infectious diseases compared to other conditions is fear (7). Also, one of the psychological aspects of the COVID-19 pandemic is fear. Fear is defined as an unpleasant emotional state created by perceiving threatening stimuli. Fear is an adaptive reaction to danger (8).

However, fear can become chronic and severe when there is an unspecified and persistent threat, i.e., the COVID-19 disease (9). Also, one

of the consequences of COVID-19 is fear in the caregivers of the elderly. Fear of the possibility of infection of COVID-19 through taking care of the elderly can affect the caring behavior of the health care providers of the elderly (10). Fear of COVID-19 comes in many forms, such as feelings of insecurity and health anxiety, which have created two major issues: high levels of anxiety and a high probability of being affected by the disease (11). The psychological adjustment of health care professionals can be hurt by the fear of COVID-19. Fear is a person's defense mechanism against dangerous situations and includes the primary responses of the person to survive and protect themselves against these threatening conditions. However, disproportionate levels of fear can lead to various psychological traumas. Fear of getting COVID-19 leads to severe emotional and behavioral consequences, i.e., boredom, loneliness, anxiety, sleep problems, and anger statistical population (12).

The vitality of health literacy has never been felt during the COVID-19 pandemic. Health literacy leads to the ability of individuals to reflect on complex health issues and critically evaluate information. The core of health literacy is the empowerment of individuals in increasing health control and its determining factors. Health literacy promotion in public health and occupational health can help manage COVID-19 threats in different aspects, i.e., psychological (13). Health literacy is a dynamic process that involves both the patient and the caregiver. Due to the prolongation of the COVID-19 pandemic and the problems associated with the elderly, especially the high mortality of the elderly (as a high-risk group) and non-compliance with quarantine conditions, COVID-19 can be a reason for fear of infection in their caregivers. Theoretically, low health literacy of the caregivers

of the elderly about COVID-19 may lead to the fear of COVID-19 and the reduction in quality of care. Therefore, this study was conducted to investigate the association between health literacy and the fear of COVID-19 among the caregivers of the elderly.

Material and Methods

Participants

This cross-sectional study was performed on 400 caregivers of the elderly registered via randomized sampling method through health information system in Tehran, Iran, from July to September 2021. The statistical population of the study included home caregivers of the elderly who were living in Tehran.

The subjects were selected by using the Sib system (governmental integrated healthcare system) that is available in urban and rural health care centers. All household's information such as demographic data, address, phone number and... is entered in this system. Therefore, by using the telephone numbers available in the Sib system, caregivers of the elderly were invited to participate in this research, and after providing the necessary information, the online questionnaires were provided to them if they were willing to participate. Due to social distancing, the data collection was done by using a website known as porsline.ir. In which, the link of the questionnaire was sent to the mobile phones of the caregivers through SMS or WhatsApp. The inclusion criteria consisted of: 1) Having at least 6 months of experience of elderly care and, 2) Being literate, 3) Being a resident of Tehran, and 4) Being able to use a mobile phone. The exclusion criteria consisted of: 1) Being unwilling to continue participating in the study.

The sample size was calculated by using $Z_{\alpha/2} * p * (1-p) / d^2$ with $p=0.5$ and alpha

0.5 and $d= 0.05$.

Questionnaires and Data Collecting

The following tools were used to collect data: a) Demographic questionnaire, b) Health literacy questionnaire, c) COVID-19 fear questionnaire, and d) Knowledge, attitude, and performance questionnaire.

The demographic questionnaire includes age, gender, marital status, job, level of education, economic status, health status, history of underlying diseases, history of COVID-19 infection, and history of vaccine injection.

The health literacy questionnaire, standardized by Montazeri et al. (13), has 33 five-point Likert items and health literacy in five dimensions; access, reading, understanding, appraisal, and decision-making. The qualitative content validity of the instrument was examined by 15 experts in various health fields and the necessary recommended corrections were applied. This tool was finalized with 47 questions. The Cronbach's alpha coefficient was 0.81.

The fear questionnaire, which was recently standardized by Oveisi et al. (14), was used in this experiment. This questionnaire has 5-point Likert questions with five options (with total score between 5 to 25). Convergence validity was used to evaluate the validity of this scale, and Cronbach's alpha coefficient (0.81) was used to assess the scale's reliability (14).

The awareness, attitude, and performance questionnaire is a researcher-made questionnaire which was used after assessing its validity and reliability. The awareness section includes 22 questions related to the necessary knowledge about COVID-19, the attitude section includes 13 questions related to people's attitude towards COVID-19 and the performance section includes 10 questions related to the performance of individuals during the COVID-19 epidemic. The Content Validity Ratio (CVR) was 0.83 and

the Content Validity Index (CVI) was 0.79 (with impact factor of 4.23).

Statistical Analysis

Data analysis was performed by using the SPSS software version 23. Frequency and percentages were used to report the description of qualitative variables, and mean \pm standard deviation (SD) was used to describe the quantitative variables. Pearson correlation and regression were used to determine the relationship between fear of COVID-19 and health literacy. Independent t-test, analysis of variance, Pearson correlation, and regression analysis were used to analyze the data depending on the type of variables. The significance level in all tests was considered less than or equal to 0.05 ($p < 0.05$).

Results

Demographic Results

The mean age of the participants (274 females and 126 males) was 43.94 ± 15.19 years. Also, 69.8% of the caregivers of the elderly were female (and 30.2% were male), and 60.1% were married. Most caregivers have no underlying disease (75.4%), no history of COVID-19 (58.5%), and no vaccination (56%). Most caregivers of the elderly had no fear of COVID-19 (63.2%). Also, most caregivers did not experience anger (71.0%), depression (71.8%), and sleep disturbance (89.8%) during the pandemic; But most caregivers felt stressed and anxious about the COVID-19 pandemic (57.5%). ($p < 0.001$ for all cases). Other demographic and descriptive data are summarized in Table 1.

Table1: Demographic data of elderly and caregiver

	Parameter	N	%	p-value	
Caregivers	Gender	Female	275	69.8	<0.001
		Male	119	31.2	
		Total	394	100	
	Marital status	Married	236	60.1	<0.001
		Non-married	157	39.9	
		Total	393	100.0	
	Education status	Illiterate	16	4.1	<0.001
		High school	33	8.4	
		Diploma	74	18.7	
		Associate degree	37	9.4	
		Bachelors' degree	146	37.0	
		Masters' degree	56	14.2	
		Doctorate	33	8.4	
		Total	395	100.0	
	Job status	Employed	211	53.3	<0.001
		Unemployed	19	4.8	
		Housewife	92	23.2	
		Retired	51	12.9	
		Other	23	5.8	
Total		396	100.0		

Caregivers	Economic status	Excellent	10	2.5	<0.001
		Good	104	26.3	
		Normal	235	59.5	
		Week	39	9.9	
		Very week	7	1.8	
		Total	395	100.0	
	Existence of underlying disease	Yes	97	24.6	<0.001
		No	297	75.4	
		Total	394	100.0	
	History of previous infection to COVID-19	Yes	164	41.5	<0.001
		No	231	58.5	
		Total	395	100.0	
	vaccination history	Both doses	99	25.1	<0.001
		A single dose	71	18.0	
		Not vaccinated	224	56.9	
		Total	394	100.0	
	Feeling angry against COVID-19 pandemic	No	284	71.0	<0.001
		Yes	116	29.0	
		Total	400	100.0	
	Feeling afraid of COVID-19 pandemic	No	253	63.2	<0.001
		Yes	147	36.8	
		Total	400	100.0	
	Feeling depressed against COVID-19 pandemic	No	287	71.8	<0.001
		Yes	113	28.2	
		Total	400	100.0	
	Feeling stressed and worried about COVID-19 pandemic	No	170	42.5	<0.001
		Yes	230	57.5	
Total		400	100.0		
Sleep disorder in COVID-19	No	359	89.8	<0.001	
	Yes	41	10.3		
	Total	400	100.0		
Elderlies	Existence of underlying disease	Yes	230	59.0	<0.001
		No	160	41.0	
		Total	390	100.0	
	History of previous infection to COVID-19	Yes	110	28.4	<0.001
		No	278	71.6	
		Total	388	100.0	
	vaccination history	Both doses	162	41.6	<0.001
		A single dose	135	34.7	
		Not vaccinated	92	23.7	
Total		389	100.0		

Health Literacy and Fear of COVID-19 Statuses

In the study group, health literacy was sufficient in 55.75% of people. Also, 17.50% of people had excellent health literacy, whereas 26.75% were illiterate. The mean score of health literacy was 75.89 ± 14.51 in the caregivers of the elderly.

Also, most caregivers of the elderly are afraid of COVID-19 (63.2%; $p < 0.001$). The mean score of fear was 19.42 ± 5.02 in caregivers of the elderly.

Association between Health Literacy and Fear of COVID-19

The primary purpose of this study was to investigate the relationship between health literacy and fear of COVID-19 in caregivers of the elderly. The results of our study showed that there is a significant relationship between health literacy and fear of COVID-19 in caregivers of the elderly ($p = 0.025$). Also, for each increased unit of the health literacy score, the fear of COVID-19 score decreases by 0.185 units. (Figure 1a)

Association between Health Literacy and Awareness, Attitude, and Performance

There is a significant relationship between health literacy and knowledge in caregivers of the elderly ($p < 0.001$). Our results showed that for each increased unit of the health literacy score, the awareness score also increases by 0.311 units. (Figure 1b) There is a significant relationship between health literacy and attitude in caregivers of the elderly ($p < 0.001$). Our results showed that for each increased unit of the health literacy score, the attitude score also increases by 0.638 units. (Figure 1c) Also, there is a significant relationship between health literacy and performance in caregivers of the elderly ($p < 0.001$). Our results showed that for each increased unit of the health literacy score, the performance score also increases by 0.214 units. (Figure 1d)

Association between Fear of COVID-19 and Awareness, Attitude, and Performance

The results of our study showed that there is no significant relationship between fear of COVID-19 and awareness in caregivers of the elderly ($p = 0.973$). There is a significant relationship between fear of COVID-19 and attitude in caregivers of the elderly ($p = 0.010$). Our results showed that for each increased unit of the fear of COVID-19 score, the attitude score also decreases by 0.178 units. (Figure 1e) The results of our study showed that there was a significant relationship between the fear of COVID-19 and performance in caregivers of the elderly ($p = 0.018$). Our results showed that for each increased unit of the fear of COVID-19 score, the performance score also decreased by 0.163 units. (Figure 1f)

Discussion

The presence of fear in the caregivers of the elderly during the COVID-19 pandemic can directly impact the provision of care services to the elderly and the physiological and psychological health of the caregivers. Due to the prolongation of the COVID-19 pandemic worldwide, problems related to the elderly, especially high mortality of the elderly as a high-risk group, irreversible complications following COVID-19 infection, and non-compliance with quarantine conditions can be a reason for fear in their caregivers (15). Theoretically, the low level of health literacy of the caregivers of the elderly regarding COVID-19 as an emerging and highly contagious disease, followed by the fear of COVID-19 in the caregivers of the elderly, directly impacts the quality of their performance in providing care to the elderly. In this study the association between the health literacy and awareness, attitude, and performance of the caregivers. We found a significant reverse association between the fear of COVID-19 and attitude and performance but not between the

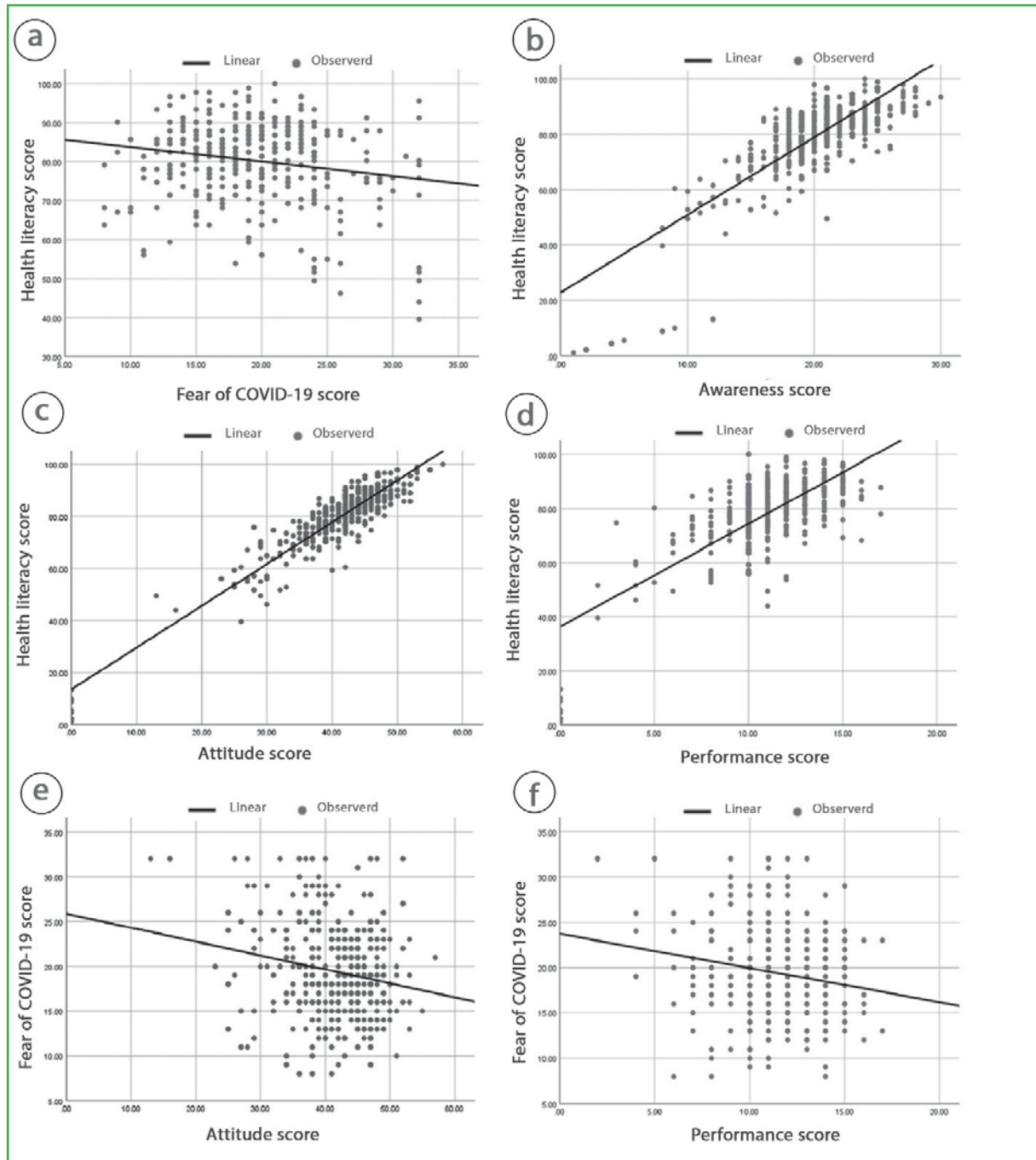


Figure 1) The association between the health literacy score, fear of COVID-19 score, and awareness, attitude, and performance scores of caregivers of the elderly. The association between a) health literacy score and fear of COVID-19 score, b) health literacy score and awareness score; c) health literacy score and attitude score, d) health literacy score and performance score, e) fear of COVID-19 score and attitude score, and f) fear of COVID-19 score and performance score.

fear of COVID-19 and awareness. In a similar study, Jafari et al. aimed to determine the relationship between caregivers' health literacy and their behavior towards patients with multiple sclerosis

(MS). As a result of this study, most caregivers' health literacy level is borderline and insufficient, which is a warning for caregivers and health care providers, so it is necessary to pay more

attention to health literacy in health promotion programs. In comparison, the caregivers of the elderly (whom we studied) appear to have higher than average health literacy than the caregivers of MS patients (16). Our results showed that about 27% of the caregivers of the elderly do not have good health literacy, so more attention should be paid to health promotion programs in health literacy education.

Regarding our study in evaluating the role of health literacy in the infected patients' caregivers, Ramazannia et al. conducted a study regarding the relationship between the behavior of patients with tuberculosis and health literacy in caregivers in Mashhad, Iran. This study was performed on 90 patients with tuberculosis and 90 caregivers. The results of this study showed that there was a positive and significant relationship between the preventive behaviors of patients with tuberculosis and the caregivers' health literacy. In line with our result, the findings of Ramazannia et al. showed that in the field of infectious diseases, the health literacy of caregivers is sufficient (borderline and higher); so, people with higher health literacy levels showed more preventive behaviors. (17). In an online study conducted on medical students, in Vietnam (2020), a similar result to our study was achieved in which the health literacy had a protective role in the fear of COVID-19. (18) On the contrary, in a study conducted on Pakistani students (2021), the health literacy was unable to predict the fear of COVID-19 but it predicted their protective behaviors (19).

Nguyen et al (2020), published a paper regarding the COVID-19 fear scale and its relationship to health literacy and health-related behaviors among medical students to validate the COVID-19 Fear Scale. The relationship between scores and health literacy and health-related behaviors was assessed among medical students.

The results showed that health literacy in this study has a protective effect on fear, and that increasing the health literacy skills of medical students is a strategic approach to reduce fear and improve their health (18). Therefore, in most studies, a higher health literacy is associated with a lower fear of COVID-19 and is also associated with more appropriate preventive behaviors. Strategic public health literacy interventions have been proposed to reduce the fear of COVID-19 and promote a healthy lifestyle.

In this regard, in 2018, a study by Asgarian et al. was conducted which assessed the relationship between the health literacy of the elderly and their home caregivers with the self-efficacy of the elderly in Ramsar, Iran. There is a positive relationship between health literacy and self-efficacy, which increases the independence of the elderly and reduces the financial burden of care for the elderly(20).

No significant relationship was found between the depression index and health literacy in our study. In 2016, another study was conducted by Hosseini et al., entitled the effect of mindfulness and health literacy program on perceived stress of family caregivers of the elderly with Alzheimer's disease. This study aimed to determine the effect of mindfulness and health literacy programs on the perceived stress of family caregivers of the elderly with Alzheimer's disease who were part of the Iranian Alzheimer's Association. This study showed that after performing the mindfulness program, the mean of perceived stress in the intervention group was reduced, which indicates a significant reduction in stress in this group. As a result, mindfulness and health literacy programs effectively reduce the stress of caregivers of Alzheimer's patients (21).

In a 2016 study by Brenes et al. in Germany, they cross-sectionally examined health literacy in different age groups. This study aimed to provide

information on health literacy for different age groups. In this study, health literacy was assessed through the HLS-EU-Q-47 questionnaire. While teenagers have an average health literacy score of 33.8 and teens 34.0, middle-aged people have an average score of 32.8, and seniors 30.7. The results showed that health literacy scores decreased significantly in older people (15). However, in our study, no correlation was found between the age of caregivers and their level of health literacy. In contrast, in a Turkish study (2022) that was conducted on the elderly, the predictors of health literacy consisted of age, education level, and the regularity of medication usage (22). The reason for the difference can be due to different age range in the two studies.

Also, we found a significant direct association between health literacy and awareness, attitude, and performance (KAP). In a study (2021) conducted on Portuguese university students, better literacy was associated with better attitudes toward COVID-19 and not with higher knowledge (23). Similar to this study, in Isfahan, Iran (2020), a significant correlation was reported between the health literacy of health care providers and their knowledge and performance regarding the use of educational strategies (24). Awareness, attitude, and performance are related to health literacy and have similar concepts. Health literacy promotion can improve the KAP of COVID-19. Among the limitations of the present study is being a cross-sectional and self-report study, and having an online questionnaire. Also, there are other variables that have an effect on the relationship between health literacy and fear, which were not included in our study.

Conclusion

Aging is a sensitive and inevitable moment in every person's life. Many people in their old age need to receive care services to meet their

needs. Receiving adequate and appropriate care and support in old age (Provided by caregivers) can significantly impact and increase the physiological and psychological performance of the elderly. Due to the prolongation of the COVID-19 pandemic worldwide and the more severe effects of this disease on the elderly, the community of caregivers for the elderly has faced particular challenges in this period. On the other hand, caregivers' health literacy is one of the most critical factors in providing care services to the elderly. The results in this study showed that most health care providers for the elderly have adequate and desirable levels of health literacy. But 25% of the older caregivers do not have a sufficient level of health literacy to care for the elderly. Therefore, due to the fact that health literacy can be improved upon and considering its direct impact on the health care efficiency of the elderly, it is suggested that the educational institutions increase the health literacy of the caregivers whose health literacy levels are undesirable.

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Conflict of interests: All authors declare that there is no conflict of interest in this study.

Ethical Consideration: This study was confirmed by the ethical committee of Qazvin's University of Medical Sciences [IR.QUMS.REC.1400.022]. The written informed consent was obtained from all participation and study protocols including interventions, procedures and methods was according to the principles of Helsinki declaration.

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Authors' contributions: Azam Navaei Kolvanagh

was the main researcher, she designed the study, collected the data, performed the analysis and wrote the first draft. Kazaem Hosseinzadeh supervised the study. Fatemeh Rahmati was an advisor and Mehdi Raei, were the statistical advisor. KH, FR and MR designed the study, helped with the data analysis and edited the article. All authors read and approved the final revision of the manuscript.

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