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Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_1623_22

Relationship between spiritual intelligence and intolerance of uncertainty, anxiety and fear of Corona in the elderly

Ahmad Maghool, Mahmoud Bakhshi^{1,2}, Sedigheh Rastaghi³, Mostafa Rad⁴

Abstract:

INTRODUCTION: The COVID-19 pandemic has caused physical and psychological health problems in the elderly. Spiritual intelligence has an effect on health and healing. The aim of this study determining the relationship between spiritual intelligence and intolerance of uncertainty, anxiety, and fear of corona in the elderly.

METHODOLOGY: A cross-sectional study was done on 207 elderly people who referred to comprehensive health service centers in Mashhad in 2022. The samples were selected based on the inclusion criteria using multistage and cluster sampling. To collect data, various questionnaires were used, including demographic characteristics (age, gender, marital status ...), King's Spiritual Intelligence Questionnaire, Freestone's Intolerance of Uncertainty Questionnaire, Corona Anxiety Scale, and Coronavirus Fear Scale. Statistical analysis of variables was done using descriptive and analytical (independent *t*-test, Mann-Whitney, analysis of variance, linear regression) tests by means of STATA version 14.

RESULTS: The average level of spiritual intelligence was 54.1. Participants reported a high level of intolerance of uncertainty ($M = 79.2$) and fear of corona ($M = 14.09$). Education, economic status, and marital status were the predictors of spiritual intelligence of the studied subjects ($r = 0.24$, $P < .05$). Spiritual intelligence and gender were also related to uncertainty intolerance ($r = 0.12$, $P < .05$). Another finding of the study was the superiority of variables of spiritual intelligence and gender in predicting the level of anxiety of corona compared to other variables ($r = 0.17$, $P < .05$).

CONCLUSION: There was a relationship between spiritual intelligence, education, and gender with the level of fear and anxiety of corona. Therefore, planning and implementing educational projects based on increasing spiritual intelligence for the elderly with priority for elderly women and with a low level of literacy and income is recommended.

Keywords:

Anxiety of corona, COVID-19, elderly, fear of corona, intolerance of uncertainty, spiritual intelligence

Introduction

SARS-CoV-2 is a new virus causing COVID-19 infection and acute respiratory syndrome.^[1] Aging is considered as a risk factor for mortality caused by COVID-19, which, along with quarantine-related restrictions on family and social relationships, has also had a psychological impact on the

elderly during the pandemic.^[2,3] Studies have shown that anxiety about the coronavirus due to its unknown nature and uncertainty has become common.^[4,5] Fear is another negative psychological consequence of this pandemic.^[6]

One of the most annoying obsessions is fear of getting sick, resulting in excessive worrying and controlling and restrictive

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How to cite this article: Maghool A, Bakhshi M, Rastaghi S, Rad M. Relationship between spiritual intelligence and intolerance of uncertainty, anxiety and fear of Corona in the elderly. *J Edu Health Promot* 2023;12:399.

School of Nursing and Midwifery, Sabzevar University of Medical Sciences, Sabzevar, Iran, ¹Nursing and Midwifery Care Research Center, Mashhad University of Medical Sciences, Mashhad, Iran, ²Department of Medical-Surgical Nursing, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran, ³Department of Biostatistics, School of Public Health, Mashhad University of Medical Sciences, Mashhad, Iran, ⁴Department of Nursing, Nursing and Midwifery School, Iranian Research Center on Healthy Aging, Sabzevar University of Medical Sciences, Sabzevar, Iran

Address for correspondence:

Dr. Mostafa Rad, Department of Nursing, Nursing and Midwifery School, Iranian Research Center on Healthy Aging, Sabzevar University of Medical Sciences, Sabzevar, Iran. E-mail: mostafarad633@yahoo.com

Received: 12-11-2022
Accepted: 25-12-2022
Published: 27-11-2023

behaviors toward oneself and his/her surrounding people.^[7,8] Anxiety can also weaken the immune system of individual's body and make him/her vulnerable to the coronavirus.^[9] Studies on the prevalence of the previous pandemics have also shown that individuals who are suffering from pandemic-related anxiety are more likely to experience increased post-traumatic stress, general stress, anxiety, health anxiety, and suicide.^[10,11]

Intolerance of uncertainty is a kind of cognitive bias that affects the way by which one receives, interprets, and reacts to an uncertain situation at the emotional, cognitive, and behavioral levels.^[12] Theories on intolerance of uncertainty claim that this structure is involved in the formation of anxiety and mood disorders.^[13]

Spiritual intelligence leads one to gain a deep insight into the life events and incidents, deal with them with patience and thinking, and find better solutions for them.^[14] Spiritual intelligence is the ability of understanding oneself and the world through God-centeredness and adapting his/her life with respect to this understanding.^[15] Amram believes that spiritual intelligence can be considered as skills and abilities that use spirituality for making adaptation and taking effective action.^[16] The study related to spiritual intelligence showed that existential concept, will to live, positive attitude, spiritual values, and its resources are so powerful that they can protect a person from disease-causing factors. As awareness and spiritual experiences increase, spiritual intelligence increases along with age and reaches its peak in middle age, but in the last years of life, the decreasing trend of this ability appears.^[17] There are a large number of factors that can affect spiritual intelligence. It is expected that demographic variables be part of these factors.

Alizadefard *et al.*^[18] showed that there is a direct relationship between fear of corona and intolerance of uncertainty and health anxiety. They also found that the intolerance of uncertainty has an indirect impact on the fear of corona through health anxiety. Satici *et al.*^[4] indicated that fear of corona can be considered as a mediator between intolerance of uncertainty and mental health, as this feeling increases negative psychological outcomes during the corona epidemic. In their study on intolerance of uncertainty and loneliness in the elderly during the corona epidemic, Parlapani *et al.*^[3] showed that a considerable number of the participants reported symptoms of moderate to severe depression (81.6%) and moderate to severe anxiety (84.5%). Del Valle *et al.*^[19] also observed a significant effect of uncertainty intolerance on anxiety and depression symptoms was. Askary *et al.*^[20] findings indicated that spiritual intelligence can reduce the perceived stress in the elderly and improve their psychological wellbeing. The results of Majidi and

Moradi^[21] research also showed that teaching the spiritual intelligence components can reduce the death anxiety in the elderly. Safavi *et al.*^[22] showed that spiritual intelligence and religious beliefs play a significant role in cancer patients' adaptation and help them achieve their goals in the course of the disease. Saad *et al.*^[23] found that elderly men have higher spiritual intelligence compared to elderly women. However, there are several studies conducted in western environments showing that spirituality is higher in elderly women than in elderly men.

Although scientific medical treatments cannot be replaced by attitudes, emotions, or spiritual resources, these factors can be combined to design an integrated strategy to reinforce the individual. It is a fact that spiritual intelligence is innate but it can be strengthened through training and practice. Sense of responsibility, initiative, love and sympathy, cooperation, and social justice are very important in strengthening spiritual intelligence.^[24] Unfortunately, there are not enough evidences and studies on the role of spiritual intelligence in elderly's psychological problems in Iran. On the other hand, without having access to enough information, it is difficult to understand, among different groups with specific sociodemographic variables (e.g., gender, age, education, ethnicity, marital status, etc.), in which groups and where educational and prevention programs are needed. Considering the above facts, the aim of this study was to determine the relationship between spiritual intelligence and intolerance of uncertainty, anxiety and fear of corona, and to evaluate the factors affecting it in the elderly of Mashhad in 2021.

Materials and Methods

Study design and setting

The research is a descriptive-analytical cross-sectional study on the elderly (aged 60 years and more) living in 13 districts of Mashhad during 2021. Comprehensive health service centers located in Mashhad were selected as the research environment.

Study participants and sampling

Based on Askary's study^[20] and using the G*Power software, the required sample size for sampling was calculated as 201 people, which increased to 220 people considering a 10% drop. Five people were excluded from the list due to their fatigue and inability to complete the questionnaire and eight people were excluded based on the exclusion criteria. Ultimately, 207 questionnaires were completed. Due to the large number of elderly people. First, three comprehensive health service centers were randomly selected from all the five health centers located in Mashhad using the cluster sampling method. Then, the researcher attempted to visit the selected centers

and the research participants were selected from the list of elderly people in the Samane Iekparche Nezame Aettelaat (SINA) system (The electronic health record software of Mashhad University of Medical Sciences is called (SINA)) using the simple random sampling method. Based on the inclusion and exclusion criteria, 15 elderly people from each center who were willing to participate in the study were invited to complete the questionnaire. The inclusion criterion was being aged 60 years and more. The exclusion criteria included the elderly with psychological illness, cognitive impairments such as dementia and Alzheimer's disease (determined based on the Mini-Mental State Examination [MMSE]), or the use of psychiatric drugs within the past 6 months, and severe physical debilitating illnesses based on their information in the SINA system. Noncooperation in continuing to answer the questionnaire properly was also considered as a criterion for exclusion. One hundred thirty six questionnaires were completed in person and 71 ones were completed over the phone due to the coronavirus restrictions.

Data collection tool and technique

Data collection tools included demographic questionnaire (age, gender, marital status, education, residential area, place of residence, economic status, and ethnicity), King's Spiritual Intelligence Self-Report Inventory, Freestone's Intolerance of Uncertainty Scale, Coronavirus Anxiety Scale (CAS), and Fear of Disease Coronavirus Scale (FDACS).

King's Spiritual Intelligence Self-Report Inventory was designed and developed by King in 2008. This inventory includes 24 items and four subscales: critical existential thinking, personal meaning production, transcendental awareness, and conscious state expansion. The higher score an individual gains in this inventory, the more spiritual intelligence he has. The scoring range of this inventory is based on a five-point Likert scale. Of course, this scoring method is reversed in question 6. The minimum and maximum scores in this inventory are 0 and 96, respectively. In Raghieb *et al.*'s (2012) study, the reliability of this scale was estimated to be 0.88 using Cronbach's alpha coefficient. The face and content validity of the scale was confirmed by psychological experts. Ghobari Bonab's Spiritual Experience Scale was used simultaneously to estimate the convergent validity and the correlation coefficients of these two inventories were 0.94. The exploratory factor analysis and the first-order confirmatory factor analysis were used to calculate the structure validity of the inventory. The results indicated that this inventory is a reliable tool for measuring spiritual intelligence.^[25] Also, to evaluate the reliability of the questionnaires, before starting the study, the questionnaire was given to 30 elderly people and their answers were entered into the SPSS software.

Cronbach's alpha method was used to measure the reliability of this tool and value of 0.93 indicated the excellent reliability of this tool.

Intolerance of Uncertainty Scale includes 27 items and is graded based on a five-point Likert scale [never (1), rarely (2), sometimes (3), often (4) and always (5)]. Score of 54 is the cut-off point of the scale, so that scores less than 54 indicate low uncertainty intolerance and the higher scores indicate high uncertainty intolerance. This tool has been translated into Farsi and its psychometric properties have been described as desirable. Using the test-retest method, its reliability has been reported to be 0.79, having a good face validity.^[26] Also, to measure the reliability of this tool in our study, Cronbach's alpha score was calculated as 0.94, indicating the excellent reliability of the tool.

The CAS has five questions that measure the cognitive, behavioral, emotional, and physiological aspects related to corona anxiety during the last two weeks. The questions are measured based on a five-point Likert scale ranging from 0 (not at all) to 4 (almost every day) and are scored in the range from 0 to 20. The CAS differentiates individuals with and without dysfunctional anxiety well with a cut-off score of 9. The internal consistency of this tool was calculated as 0.915 using Cronbach's alpha method. The validity and reliability of this scale has been measured by Mohammadpour *et al.*^[10] Also, to measure its reliability in our study, Cronbach's alpha score was calculated as 0.757, indicating an acceptable reliability.

The FDACS includes five standardized questions to measure the fear of getting the corona infection in adults. It is graded on a five-point Likert scale (very low = 1, low = 2, average = 3, high = 4, and very high = 5) and its scores range between 5 and 25. To check the convergent validity of FDACS, the Dark Future Scale with a Pearson correlation coefficient of 0.59 and Veisi, *et al.* Thanatophobia Scale (TS) with a coefficient of 0.58 and a significance level of 0.01 were used. Also, Cronbach's alpha was used to check the validity of the scale, with the coefficient calculated as 0.81, which confirms the validity of the FDACS.^[27] Also, to measure the reliability of this tool in our study, Cronbach's alpha score was calculated as 0.612.

The data were analyzed using the STATA statistical software (version 14). The Shapiro-Wilk test was used to check the quantitative data in terms of having a normal distribution, and the mean, standard deviation, frequency, and relative frequency distribution table were used to describe the individual information and individual characteristics. To analyze the data, nonparametric Mann-Whitney and Kruskal-Wallis statistical methods were used for variables with non-normal distribution and

the *t*-test and analysis of variance were used for variables with normal distribution. Also, the Pearson correlation coefficient and linear and stepwise linear regression were used to evaluate the relationship between variables. Significance level of 0.05 was considered in the statistical tests used in this study.

Ethical considerations

All the elderly participants were assured that their information would remain confidential. This project was approved by the ethics committee of Sabzevar University of Medical Sciences with code IR.MEDSAB.REC.1400.065 and then it was carried out.

Results

The research subjects' mean age was 68.38 years and standard deviation of 6.50. Other variables are listed in Table 1.

The results of the *t*-test showed that there is a significant difference between the level of spiritual intelligence, intolerance of uncertainty, corona anxiety, and fear of corona in the two groups of male and female ($P < .05$). The Mann-Whitney test showed that there is a significant difference between the level of spiritual intelligence and anxiety of corona among two groups of married and single people and different educational degree. The level of spiritual intelligence, uncertainty intolerance, corona anxiety, and corona fear based on other demographic variables presented in Table 2.

The result of the univariate linear regression analysis indicated a significant positive relationship between spiritual intelligence and intolerance of uncertainty, so

that as the score of spiritual intelligence increases by one point, the intolerance of uncertainty score increases by 0.194 ($P = .009$) on average. The variable of intolerance of uncertainty explained about 3% of the variance of the variable of spiritual intelligence. This test showed that there was a significant negative relationship between spiritual intelligence and coronavirus anxiety, so that as the score of spiritual intelligence increases by one point, the score of corona anxiety decreases on average by 0.054 ($P < .001$). The variable of coronavirus anxiety explained about 8% of the variance of the variable of spiritual intelligence. A significant negative relationship was observed between spiritual intelligence and fear of coronavirus, so that as the score of spiritual intelligence increases by one point, the score of fear of corona decreases on average by 0.053 ($P < .001$). The variable of fear of coronavirus explained about 8% of the variance of the variable of spiritual intelligence.

The results of the multivariable linear regression analysis in a step-by-step approach indicated that the variables of education, economic status, and marital status can be considered as the predictors of spiritual intelligence in the research subjects and 0.245% of the changes in spiritual intelligence were expressed by these predictors [Table 3].

Discussion

The results of this study indicated an acceptable average level of spiritual intelligence in the elderly living Mashhad. Also, these elderly people have experienced a high level of intolerance of uncertainty during the corona pandemic period. The average scores of coronavirus anxiety and fear of coronavirus also indicated the high level of fear of coronavirus in the elderly who are living Mashhad. There was a positive relationship between spiritual intelligence and intolerance of uncertainty. There was no study for comparing the results in this field. Due to the high level of intolerance of uncertainty expressed by the elderly and since the three main predictors of spiritual intelligence in this study (i.e., marital status, level of education, and economic status) did not play a role in predicting intolerance of uncertainty, the researcher believes that there are variables outside the study and with high complexity and influence that have played a role in the level of intolerance of uncertainty in the time period of the study, which cannot be measured and identified in this study. Ahadi and Moradi^[12] have measured the effects of some of these variables, and in their meta-analysis titled "psychological correlates of intolerance of uncertainty" that, respectively, the highest size of effect on intolerance of uncertainty was related to the variables of metacognitive beliefs, stress, inability to take action, and repetitive negative actions thoughts, respectively, and this effect size is

Table 1: Characteristics of the participants

Variable	n (%)
Sex	
Male	129 (62.3)
Female	94 (37.7)
Marital status	
Single	17 (16)
Married	174 (84)
Under Diploma and Diploma	184 (88.8)
University degree	23 (11.2)
Place of residence	
Nursing home for the elderly	2 (1)
With family	183 (88.4)
Alone	22 (10.6)
Economic situation	
Very good	17 (8.21)
Good	89 (43)
Medium	76 (36.71)
Weak	23 (10.63)
Very weak	3 (1.45)

Table 2: The level of spiritual intelligence, uncertainty intolerance, corona anxiety, and corona fear based on demographic variables

Variable	Spiritual intelligence Mean (SD)	Intolerance of uncertainty Mean (SD)	Coronavirus anxiety Mean (SD)	Fear of coronavirus Mean (SD)
Sex				
Male	57 (19)	76 (21)	7 (4)	13 (4)
Female	50 (20)	83 (20)	9 (3)	15 (3)
Probability Value	0.009*	0.012*	0.001*	0.001*
Marital status				
Married	57 (19)	79 (22)	8 (4)	14 (4)
Single	42 (18)	81 (17)	10 (3)	15 (3)
Probability Value	0.001**	0.50**	0.001**	0.001**
Educational status				
Under Diploma and Diploma	52 (19)	79 (21)	8 (4)	14 (4)
University degree	68 (16)	82 (24)	6 (4)	12 (3)
Probability Value	0.001**	0.57**	0.012**	< 0.001**
Place of residence				
Nursing home for the elderly	29 (7)	77 (21)	10 (0)	14 (0.7)
With family	56 (19)	79 (22)	8 (4)	14 (4)
Alone	29 (19)	85 (15)	10 (3)	15 (3)
Probability Value	0.001***	0.40***	< 0.001***	0.61***
Economic situation				
Very good	67 (13)	84 (23)	8 (3)	13 (4)
Good	59 (18)	81 (24)	8 (4)	14 (4)
Medium	51 (19)	75 (17)	7 (4)	14 (4)
Weak	37 (20)	81 (14)	10 (3)	15 (3)
Very weak	42 (26)	82 (24)	11 (3)	16 (2)
Probability Value	0.001***	0.23***	0.85***	0.17***

SD=Standard deviation, *t-test, **Mann-Whitney test, ***Kruskal-Wallis test

Table 3: Correlation between spiritual intelligence and intolerance of uncertainty, coronavirus anxiety, fear of corona and important predictors

Predictors	Multivariate linear regression model*		R ²
	Beta	Sig.	
Intolerance of uncertainty	0.194	0.009	0.03
Coronavirus anxiety	-0.054	0.001	0.08
Fear of coronavirus	-0.053	<0.001	0.08
Marital status	-0.131	0.046	0.245
Education	0.292	<0.001	
Economic status	-0.228	0.001	

*The results are related to the full model

above average as per Cohen’s Table. On the other hand, in their study titled “Comparing metacognitive beliefs and cognitive impairments in the elderly with and without religious behaviors”, Abolghasemi and Kiamarsi^[28] found that there is no significant difference between the average scores of cognitive beliefs in the elderly with and without religious behaviors, which can be attributed to considerable changes in memory, intelligence, perception, metacognition, recall, problem solving skill, and other metacognitive abilities in old age. The mentioned cases can explain the result of our study.

Other results of the study showed that there was a significant negative relationship between spiritual

intelligence and coronavirus anxiety. There was no similar study in this field on the elderly, but these results were consistent with those of Mohammadipour’s *et al.*^[29] study entitled “Determining spiritual intelligence and distress tolerance in predicting coronavirus anxiety in students”. Their study showed that there was a significant negative correlation between spiritual intelligence and coronavirus anxiety. Also, Majidi and Moradi^[21] indicated the role of spiritual intelligence training in reducing death anxiety.

It was shown that there was a significant negative relationship between the variable of spiritual intelligence and fear of coronavirus. Alizadefard *et al.*^[18] found that health anxiety is related to fear of coronavirus. Considering their study and the finding of our study that there is a significant negative relationship between spiritual intelligence and coronavirus anxiety, this finding can be justified.

There was a relationship between spiritual intelligence and the variable of education. Also, there was a statistically significant difference between the level of spiritual intelligence in the two groups of the elderly with university education and the group with a diploma or a lower educational degree. The results of Mohammadyari’s study^[30] showed that parents with

university education had higher spiritual intelligence compared to parents with secondary and lower education; this difference was significant and consistent with our study. Also, Sajadinezhad and Akbari Chermahini^[17] in their study titled “Developmental investigation of spiritual intelligence from adolescence to old age” also showed that there was a significant positive relationship between spiritual intelligence and education, which is consistent with our study.

There was no significant relationship between spiritual intelligence and age. This result is consistent with Mohammadyari’s study,^[30] but not in line with Sajadinezhad and Akbari Chermahini’s study.^[17] Sajadinezhad and Akbari Chermahini’s study showed that as awareness and spiritual experiences increase, spiritual intelligence increases along with age and reaches its peak in middle age, but in the last years of life, the decreasing trend of this ability emerges. The reasons expressed by him/her include the decrease in openness of mind and patience and the lower educational level. The discrepancy between the results of our study and those of his/her study can be attributed to the dissimilarity of the age range of the subjects evaluated in the two studies. Another reason is the lack of considering the exclusion criterion of the elderly with mental problems in that study. Therefore, the variables affecting the score of spiritual intelligence, that is, Alzheimer’s disease and other cognitive disorders, had not been excluded from his/her study.

In their study on the elderly in Malaysia, Saad *et al.*^[23] found that the elderly men had higher spiritual intelligence than the elderly women did. This result was consistent with our study. This is while many studies have been conducted in western environments that show that spirituality is higher in elderly women than in elderly men.^[31-33] Saad claimed that this finding can be attributed to the higher level of education and health in the men than in the women in his study. It can be related to cultural difference as well because in Muslim society, men are expected to be leaders and teachers for their families.^[23] In our study, factors such as men’s education and better economic status than women’s can justify this difference between the result of our study and those of western studies. Mohammadyari’s study^[30] also did not consider the role of gender to be effective in spiritual intelligence. This difference can be due to the age range of the research subjects and the decreased difference in the level of education and economic status between the men and women in the age range of his study and the larger group of married people in this study.

There was a significant relationship between spiritual intelligence and the elderly’s marital status. Also, there was a statistically significant difference between the level

of spiritual intelligence in the two groups of married and single people, which is consistent with Sajadinezhad and Akbari Chermahini’s study.

In terms of the variable of the place of residence, there was a statistically significant difference between the level of spiritual intelligence in the three groups based on the place of residence, so that the elderly who were living with their families had higher spiritual intelligence compared to the elderly who were living alone or in a nursing home. Roy *et al.*^[34] showed that the elderly people living alone were more depressed compared to the elderly living with their family. Amirian and Fazilat-Pour^[35] also found that there was a significant negative relationship between depression and dimensions of personal meaning and transcendental consciousness. Also, Shaw explained the significant impact of the dimension of personal meaning production on happiness as the activities people do in search of spirituality, such as helping others and caring for them.^[36]

There was a statistically significant difference between the level of spiritual intelligence in different groups in terms of economic status, so that the groups with better economic status had higher spiritual intelligence. This result can be justified by the higher level of education.

This result was consistent with Majidi^[21] and Parlapani *et al.*^[3]

One of the limitations of the study was the noncooperation of some participants due to the fear of attending in health centers due to corona virus, fatigue, old age, or fear of fraud in telephone calls. To solve this problem, university telephone systems such as 4030 were used to contact the participants. In addition, a significant number of elderly people were not literate, and in this context, the researcher directly asked the questions and wrote down the answers directly.

Conclusion

The results of this study showed that the average level of spiritual intelligence in the elderly of Mashhad was acceptable. Also, they have experienced a high level of intolerance of uncertainty during the corona period. The average scores of corona anxiety and fear of corona also showed the high level of these variables in the elderly. The analysis showed that the economical, educational, and marital status were better predictors for the spiritual intelligence of the elderly, so that the married elderly had a higher level of spiritual intelligence and also expressed less corona anxiety. Also, in the group of elderly people with university education, a higher level of spiritual intelligence and a lower level of anxiety and fear of

corona were seen compared to other elderly people. Therefore, planning and implementing educational programs based on increasing spiritual intelligence for the elderly, with priority given to elderly women with low literacy levels, and only by the training units of health centers virtually or in person in gathering centers for the elderly such as parks, mosques, retirement offices, and in all levels of the society through mass media are recommended. Also, empowerment plans for healthcare workers associated with this age group can guarantee the success of these programs.

Acknowledgments

The researcher considers it necessary to express his gratitude to the respected Research and Technology Departments of Sabzevar and Mashhad Universities of Medical Sciences and the staff of the Health Department of Mashhad University and the participants in this research.

Financial support and sponsorship

Nil.

Conflict of interest

The authors had no conflict of interests.

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