

**Original Article** 



# Knowledge, Attitude, and Intention of Rural Elderly About Influenza Preventive Behaviors, Fasa, Iran, 2019

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#### Abstract

**Background & Aims:** Influenza is one of the leading causes of death in the world, especially in the elderly. This study examined the knowledge, attitudes, and intention of rural elderly about influenza prevention behaviors.

**Materials and Methods:** In this cross-sectional study was performed on 140 rural older people who were selected by multi-stage random sampling in Fasa, Iran. A questionnaire was developed to inform about individuals' knowledge, attitude, and practice on influenza prevention measures. Data were analyzed using frequency descriptive statistics and the Chi'square test by SPS-21. **Results:** A total of 61 men (mean age of  $69.32 \pm 6.81$ ) and 71 women (mean age of  $69.04 \pm 7.52$ ) responded to the questionnaire. The mean score of knowledge in women ( $6.8 \pm 2.1$ ) was significantly higher than in men ( $5.8 \pm 2.7$ ). The mean score of knowledge in illiterate people ( $6.45 \pm 2.43$ ) compared to literate people ( $6.08 \pm 2.58$ ) showed no significant differences. In addition, the differences between the mean score of attitudes in both men ( $5.67 \pm 5.67$ ) and women ( $6.05 \pm 29.59$ ) were not significant. Likewise, there were no significant differences between the mean scores of intention in men and women were  $6.18 \pm 1.76$  and  $6.13 \pm 1.53$ , respectively, which was not significantly different. Finally, the mean scores of intention in literate ( $5.85 \pm 2.14$ ) and illiterate ( $6.25 \pm 1.42$ ) participants were not significantly different.

**Conclusion:** The knowledge, attitude, and intention of rural elderly about influenza prevention behaviors are not satisfactory, and large-scale educational interventions are required in this regard, especially in rural areas.

Keywords: Influenza, Human, Elderly, Knowledge, Attitude, Professional practice, Prevention and control

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## 1. Introduction

Influenza is a contagious viral disease of the respiratory tract [1]. Severe acute respiratory viral infections, including influenza, are the leading causes of global morbidity and mortality [2]. The epidemic and pandemic of this disease occur in autumn and winter [3]. Influenza is one of the leading causes of death worldwide [4], thus it is responsible for 2-5 million severe illnesses and 250 thousand to 500 thousand deaths per year [4,5]. Due to the weakened immune system [6] and the possibility of risk factors, children and the elderly [7,8] are vulnerable to the poor outcomes of influenza over both short- and long-term time horizons [9]. Some ways of preventing and controlling the flu include performing vaccination, washing hands, especially after coughing, sneezing, and touching the nose and mouth, covering the mouth when coughing or sneezing, using a mask and properly disposing it afterward, avoiding crowded places, reducing contact with infected others, and staying at home during the disease outbreak [10].

Different studies have estimated the population's knowledge about ways of influenza transmission and

prevention below moderate level [2]. In some other studies, different proportions of participants had positive attitudes toward the effectiveness of recommended ways of preventing influenza so that in some studies, more than 60% of participants had positive attitudes in this regard [11,12], while some other studies reported weak attitudes of study participants toward influenza prevention [13]. Similarly, the findings of studies demonstrated different levels of intentions or adherence to influenza preventive behaviors, and the most common behaviors were hand washing and using a face mask, [14-17]. However, Loulergue et al in South Korea reported a low willingness to receive the vaccine [18].

Educational interventions are one of the most important strategies to promote influenza prevention behaviors, and planning for such interventions requires the identification of factors affecting such behaviors. Most studies conducted in this field have focused only on vaccination behavior, and a few studies have been performed on the elderly, especially in rural communities. Thus, this study examined the knowledge, attitudes, and behaviors of rural elderly in all the dimensions of



influenza prevention behaviors in different genders and literacy level groups.

# 2. Materials and Methods 2.1 Study design and setting

This descriptive cross-sectional study was conducted on rural elderly in Fasa, 2020. Fasa is the fourth most populous city of Fars province in the south of Iran.

## 2.2. Population and participant selection

Based on a previous study [19] and the use of NCSS PASS 15, a sample size of 140 was calculated for the study (P=40%,  $\alpha=0.05$ , d=0.18, non-response rate=10%). Hence, a sample of 140 rural elderly people was selected by multi-stage random sampling. To this end, five villages were randomly selected among the 30 villages in Fasa. The list of the names of all the elderly over 60 years old in these five villages was prepared, and then 28 people were randomly chosen from each village. Showing satisfaction to participate in the study and having no cognitive impairments were considered as the inclusion criteria, and participants who did not completely answer the questionnaires were excluded from the study.

# 2.3. Instruments

The data collection tool was a researcher-made questionnaire that was designed based on a literature review [11,19,20] and a panel of experts, including five specialists in health education and health promotion and a gerontologist. The designed questionnaire consisted of two parts; the first part included demographic information (age, gender, and level of literacy of participants) and the second part contained questions about the knowledge, attitude, intention, and past behaviors of participants. The knowledge questionnaire included 10 questions with Yes/No/I do not know answers, and each correct answer scored 1, while incorrect or I do not know answers scored 0, thus the total score of knowledge ranged from 0 to 10. The attitude questionnaire contained 18 questions for measuring attitudes on a 4-point scale, including much (3 points)/a little (2)/not at all (1)/no idea (0) item. The items were related to the areas of risk of getting influenza (2 questions), probable severity of influenza (4), the effectiveness of proposed methods for influenza prevention (4), and obstacles to do preventive measures (8), and the total range of attitude was 0-54. Intention to perform preventive behaviors was assessed through 4 questions on a 3-point scale, including definitely (2 points), maybe (1), and not at all scale (0) with a total score range of 0-8. The study was conducted during June 2019, which was not the time of the flu epidemic, thus participants were asked about the influenza vaccination behavior of participants in the last year and their lifetime. The questionnaires were completed by the researcher through 30-minute interviews with participants.

The face and content validity of the questionnaire were confirmed through a panel of 10 experts in health education and health promotion. The calculated content validity ratio for the questionnaire items was more than 0.91, and the content validity index of knowledge, attitude, and intention constructs were 0.93, 0.91, and 0.95, respectively, indicating appropriate content validity according to Lawshe's criterion 22. The internal reliability of the questionnaire constructs was measured by the Cronbach's alpha method, and values between 0.61 and 0.95 indicated the acceptable reliability of the questionnaire. The external reliability of the questionnaire was evaluated by test-retest on a pilot sample of 30 elderly people with a two-week interval, and the correlation coefficient of 0.76 (P<001) demonstrated the appropriate external reliability of the questionnaire.

# 2.4. Data analysis

Data were analyzed using SPSS statistical software (version 22) at P < 0.05. Frequency descriptive statistics were used to report the frequency of participants' responses, and the Chi<sup>2</sup> test was employed to compare the frequencies between groups participating in the study. The mean scores of the constructs between the participating groups were compared by independent t-test.

## 2.5 Ethical considerations

This study is part of a thesis on an MSc in geriatric health approved by the Ethics Committee of Shiraz University of Medical Sciences (ethics code: IR.SUMS.REC.1398.521). Before completing the questionnaire, the informed consent form was signed by the elderly. However, their participation in the study was also declared voluntarily, and they could refuse to participate in the research project if they did not wish to.

# 3. Results

A total of 61 men with a mean age of  $69.32 \pm 6.81$  and 71 women with a mean age of 69.04±7.52 participated in the study (95% response rate). 73.5% of the participants were illiterate. The mean score of knowledge in women  $(6.8\pm2.1)$  was significantly higher than men  $(5.8\pm2.7)$ , P=0.035). The mean score of knowledge in illiterate people  $(6.45 \pm 2.43)$  compared to literate people  $(6.08 \pm 2.58)$  represented no significant difference. Based on data in Table 1, in most knowledge questions, less than 50% of women and men answered the questions correctly, and only in the case of high-risk groups of influenza between men and women, there were significant differences between those who gave the correct answer. The frequency distribution of the correct answer to other questions demonstrated no significant differences between men and women, as well as literate and illiterate people.

The mean score of attitudes in both men  $(5.67 \pm 5.67)$ 

and women  $(6.05 \pm 29.59)$  was at the moderate level, and there was no significant difference between the two genders. Table 2 compares the frequency distribution of participants' answers to attitude-related questions. Based on the findings, only in the field of the effectiveness of using a mask (P=0.025) and avoiding crowded places (P=0.001) in the prevention of influenza, men further significantly believed in the effectiveness of these

Table 1. Comparing the frequency distribution of correct answers to knowledge questions based on gender and education	on levels
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Question	Ge	nder		Literacy	<b>Ρ</b> (χ <sup>2</sup> )	
	Male n (%)	Female n (%)	<b>Ρ</b> (χ <sup>2</sup> )	Illiterate (Unable to Literate (Abl read and write) read and wr		
Flu is contagious (correct/incorrect)	39 (63.9)	45 (63.4)	0.95	62 (62.9)	23 (65.7)	0.76
Is the flu transmitted through the following ways?	(Yes/No)					
Hand shaking with a person with the flu	28 (45.9)	30 (42.3)	0.67	45 (46.4)	13 (37.1)	0.345
Contact with objects infected with the flu virus	37 (60.7)	42 (59.2)	0.86	60 (61.9)	19 (54.3)	0.431
Coughing and sneezing	39 (63.9)	42 (59.2)	0.57	58 (59.8)	23 (65.7)	0.541
Rubbing with a person with the flu	41 (67.2)	52 (73.2)	0.45	71 (73.21)	22 (62.9)	0.252
Eat contaminated food or water	36 (59.0)	50 (70.4)	0.17	63 (64.9)	23 (65.7)	0.930
Which of the following is dangerous for the flu?						
Pregnant women	31 (50.8)	57 (80.3)	< 0.001	62 (63.9)	26 (74.3)	0.265
Children	35 (57.4)	52 (73.2)	.05	66 (68.0)	21 (60.0)	0.391
Older adult	26 (42.9)	54 (76.1)	< 0.001	60 (61.9)	20 (57.1)	0.632
Elderly	46 (75.4)	53 (74.6)	0.41	76 (78.4)	23 (65.7)	0.162

Table 2. Comparing the frequency distribution of answers to attitude questions based on gender

14		Male	n (%)		Fe male n (%)				D (-2)
	Much	A Little	Not at All	No Idea	Much	A Little	Not at All	No Idea	P ( <u>7</u> -)
How likely are you to get the flu in the next year given your age?	20 (32.8)	4 (6.6)	0 (0)	37 (60.7)	23 (32.4)	9 (12.7)	0 (0.0)	39 (54.9)	0.488
How likely are you to get the flu next year given your hand hygiene habits?	20 (45.0)	6 (9.8)	0 (0.0)	35 (57.4)	25 (35.2)	8 (11.3)	0 (0.0)	38 (53.5)	0.901
If you catch the flu, how likely are you to:									
Need to be visited by a doctor	15 (24.6)	24 (39.3)	9 (14.8)	13 (21.3)	25 (35.2)	21 (29.6)	14 (19.7)	11 (15.5)	0.360
Be hospitalized	16 (26.2)	19 (31.1)	8 (13.1)	18 (29.5)	20 (28.2)	24 (33.8)	11 (15.5)	16 (22.5)	0.830
Cannot pay the costs of treatment	20 (32.8)	21 (34.4)	9 (14.8)	11 (18.0)	23 (32.4)	19 (26.8)	20 (28.2)	9 (12.7)	0.272
Die	13 (21.3)	22 (36.1)	6 (9.8)	20 (32.8)	25 (35.2)	23 (32.4)	3 (4.2)	20 (28.2)	0.252
To what extent do you think each of the following a	measures is	effective in p	preventing ir	nfluenza?					
Washing hands with soap and water	7 (11.5)	30 (49.2)	16 (26.2)	8 (13.1)	12 (16.9)	29 (40.8)	23 (32.4)	7 (9.9)	0.59
Receiving influenza vaccine	8 (23.1)	24 (39.3)	15 (24.6)	14 (23.0)	22 (31.0)	22 (31.0)	19 (26.8)	8 (12.3)	0.05
Using a face mask in public places	18 (29.5)	24 (39.3)	12 (19.7)	7 (11.5)	20 (28.2)	13 (18.3)	27 (38.0)	11 (15.5)	0.025
Avoiding crowded places	17 (27.9)	31 (50.8)	6 (9.8)	7 (11.5)	31 (43.7)	13 (18.3)	18 (25.4)	9 (12.7)	0.001
To what extent do any of the following make you a	void getting	the influenz	a vaccine?						
Vaccine prices	16 (26.2)	6 (9.8)	0 (0.0)	39 (63.9)	15 (21.1)	9 (12.7)	0 (0.0)	47 (66.2)	0.731
The unavailability of the vaccine on where you live	24 (39.3)	15 (24.6)	0 (0.0)	22 (36.1)	20 (28.2)	13 (18.3)	0 (0.0)	38 (53.5)	0.133
Pain from the vaccine injection	17 (27.9)	30 (49.2)	0 (0.0)	14 (23.0)	37 (52.1)	26 (36.6)	0 (0.0)	9 (11.3)	0.013
Concern about the side effects of the vaccine	15 (24.6)	33 (54.1)	0 (0.0)	13 (21.3)	22 (31.0)	30 (42.3)	0 (0.0)	19 (26.8)	0.397
To what extent is each of the following true for you	?								
It is difficult for me to wash my hands regularly with soap and water in the cold season	39 (63.9)	16 (26.2)	0 (0.0)	6 (9.8)	28 (39.4)	32 (45.1)	0 (0.0)	11 (15.5)	0.193
Using a mask makes me short of breath	22 (36.1)	19 (31.1)	0 (0.0)	20 (32.8)	23 (32.4)	25 (35.2)	0 (0.0)	23 (32.4)	0.863
I'm embarrassed to wear a mask outside the house	22 (36.1)	19 (31.1)	0 (0.0)	20 (32.8)	12 (16.9)	25 (35.2	0 (0.0)	34 (47.9)	0.036
I'm worried that if I distance myself from the person with the flu, he or she will be upset	17 (27.5)	29 (47.5)	0 (0.0)	15 (24.6)	21 (29.6)	36 (50.7)	0 (0.0)	14 (19.7)	0.797

behaviors than women. Regarding barriers to these behaviors, women were significantly more concerned about the pain of vaccination than men (P=0.013), and men were significantly more than women embarrassed to wear a mask outside the house (P=0.036).

The mean score of attitudes in both groups of literate  $(28.74\pm5.74)$  and illiterate  $(29.87\pm5.89)$  elders was moderate, and there was no significant difference between the two groups. The only difference observed between the literate and illiterate groups was related to their attitudes toward the possible consequences of the flu. Literate people were more concerned about treatment costs (P=0.002), while illiterate people were more concerned about the possibility of hospitalization (P=0.016). Literate people also stated that it is difficult for them to wash their hands regularly in the cold weather, which was significantly more than illiterate people (P=0.005). Table 3 compares the frequency distribution of answers to attitude questions in literate and illiterate groups.

The mean score of the intention of the study participants in the two groups of men and women was  $6.18 \pm 1.76$  and  $6.13 \pm 1.53$ , respectively, which was evaluated as moderate, and there was no significant difference between the two groups in this regard. The only significant difference was in the intention to wash hands with soap and water, and women were more likely than men to do it (0.044). The important point is that less than 20% of the study participants intended to get a vaccine during the next flu season. More than 70% of men and 80% of women did not intend to use the mask, and more than 50% of people in both men and women did not intend to avoid crowded places during the flu epidemics (Table 4).

The mean scores of literate  $(5.85 \pm 2.14)$  and illiterate  $(6.25 \pm 1.42)$  participants were not significantly different and were evaluated as moderate in both groups. Based on the obtained data (Table 5), literate people significantly less than illiterates reported that they intended to wash their hands with soap and water to prevent the flu (P=0.001).

In terms of vaccine injection in previous years, there was no significant difference between the participating groups in terms of gender and literacy. Study results revealed that only 23.5% of study participants had received the flu vaccine in the previous year, and 75.2% of

Table 3. Comparing the frequency distribution of answers to attitude questions based on education levels

	Illiterate (Unable to read and write) n (%)				Literate (Able to read and write) n (%)				
Item	Much	A Little	Not at All	No Idea	Much	A Little	Not at All	No Idea	Ρ (χ²)
How likely are you?									
How likely are you to get the flu based on your age?	33 (34.0)	9 (9.3)	0 (0.0)	55 (56.7)	10 (28.6)	4 (11.4)	0 (0.0)	21 (66.0)	0.817
How likely are you to get the flu next year given your hand hygiene habits?	32 (33.0)	12 (12.4)	0 (0.0)	53 (54.6)	13 (37.1)	2 (5.7)	0 (0.0)	20 (57.1)	0.542
If you catch the flu, how likely are you to:									
Need to be visited by a doctor	31 (32.0)	37 (38.1)	16 (16.5)	13 (13.4)	9 (25.7)	8 (22.9)	7 (20.0)	11 (31.4)	0.076
Be hospitalized	28 (28.9)	36 (37.1)	15 (15.5)	18 (18.6)	8 (22.9)	7 (20.0)	4 (11.4)	16 (45.7)	0.016
Cannot pay the costs of treatment	35 (36.1)	21 (21.6)	26 (26.8)	15 (15.5)	8 (22.9)	19 (54.3)	3 (8.6)	5 (14.3)	0.002
To die	30 (30.9)	34 (35.1)	7 (7.2)	26 (26.8)	8 (22.9)	11 (31.4)	2 (5.7)	14 (40.0)	0.523
To what extent do you think each of the following measures is effective in preventing influenza?									
Washing hands with soap and water	14 (14.4)	45 (46.4)	31 (32.0)	7 (7.2)	5 (14.3)	14 (40.0)	8 (22.9)	8 (22.9)	0.090
Receiving influenza vaccine	22 (22.7)	38 (39.2)	21 (21.6)	16 (16.5)	8 (22.9)	8 (22.9)	13 (37.1)	6 (17.1)	0.224
Using a face mask in public places	31 (32.0)	22 (22.6)	31 (32.0)	13 (13.4)	7 (20.0)	15 (42.9)	8 (22.9)	15 (14.3)	0.124
Avoiding crowded places	40 (41.2)	27 (27.8)	17 (17.5)	13 (13.4)	8 (22.9)	17 (48.6)	7 (20.0)	3 (8.6)	0.098
To what extent do any of the following make you av	oid getting	the influenza	a vaccine?						
Vaccine prices	19 (19.6)	10 (10.3)	0 (0.0)	68 (70.1)	12 (34.3)	5 (14.3)	0 (0.0)	18 (5.4)	0.129
The unavailability of the vaccine on where you live	30 (30.9)	24 (24.7)	0 (0.0)	43 (44.3)	14 (40.0)	4 (11.4)	0 (0.0)	17 (48.6)	0.236
Pain from the vaccine injection	40 (41.2)	40 (41.2)	0 (0.0)	17 (17.5)	14 (40.0)	16 (45.7)	0 (0.0)	5 (14.3)	0.864
Concern about the side effects of the vaccine	30 (30.9)	45 (46.4)	0 (0.0)	22 (22.7)	7 (20.0)	18 (51.4)	0 (0.0)	10 (28.6)	0.449
To what extent is each of the following true of you?									
It is difficult for me to wash my hands regularly with soap and water in the cold season	41 (42.3)	41 (42.3)	0 (0.0)	15 (15.5)	26 (74.3)	7 (20.0)	0 (0.0)	2 (5.7)	0.005
Using a mask makes me short of breath	33 (34.0)	34 (35.1)	0 (0.0)	30 (30.9)	12 (34.3)	10 (28.8)	0 (0.0)	13 (37.1)	0.730
I'm embarrassed to wear a mask outside the house	27 (27.8)	32 (33.0)	0 (0.0)	38 (39.2)	7 (20.0)	12 (34.3)	0 (0.0)	16 (45.7)	0.639
I'm worried that if I distance myself from the person with the flu, he or she will be upset	24 (24.7)	50 (51.5)	0 (0.0)	23 (23.7)	14 (40.0)	15 (42.9)	0 (0.0)	6 (17.1)	0.225

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Table 4. Comparing the frequency distribution of intention to do preventive behaviors based on gender

Item -		Male n (%)			<b>Ρ</b> (χ <sup>2</sup> )		
	Definitely	Maybe	Not at All	Definitely	Maybe	Not at All	
To what extent do you plan to do any of the following in the event of a flu outbreak?							
Getting the flu vaccine	12 (19.7)	7 (11.5)	42 (68.9)	14 (19.7)	7 (9.9)	50 (70.4)	0.955
Using a face mask in public places	5 (8.2)	11 (18.0)	45 (73.8)	5 (7.0)	7 (9.9)	59 (83.1)	0.363
Avoiding crowded places	11 (18.0)	13 (21.3)	37 (60.7)	13 (18.3)	20 (28.2)	38 (53.5)	0.634
Washing your hands with soap and water regularly	7 (11.5)	32 (52.5)	22 (36.1)	5 (7.0)	43 (60.6)	23 (32.4)	0.044

Table 5. Comparing the frequency distribution of intention to do preventive behaviors based on education levels

Item -	Illiterate (Una	ble to read and	write) n (%)	Literate (Abl	D (-2)		
	Definitely	ly Maybe Not at All Definitely Maybe		Not at All	- P(χ-)		
To what extent do you plan to do any of the following	g in the event of	a flu outbreak?					
Getting the flu vaccine	15 (15.5)	13 (13.4)	69 (71.1)	11 (31.4)	1 (2.9)	23 (65.7)	0.05
Using a face mask in public places	7 (7.2)	14 (14.4)	76 (78.4)	3 (8.6)	4 (11.4)	28 (80.0)	0.886
Avoiding crowded places	18 (18.6)	28 (28.9)	51 (52.6)	6 (17.1)	5 (14.3)	24 (68.6)	0.185
Washing your hands with soap and water regularly	12 (12.4)	60 (61.9)	25 (25.8)	0 (0.0)	15 (42.9)	20 (57.1)	0.001

them did not receive the flu vaccine in years before that. In addition, less than 3% of participants had received the flu vaccine more than once.

### 4. Discussion

Influenza is a well-known viral disease that has killed many people throughout the world through its epidemics and outbreaks. This study aimed to investigate the knowledge, attitude, and practices of rural elderly toward influenza prevention behaviors.

The findings of the present study represented that the mean score of knowledge was higher in women than men (P=0.035), but less than 50% of women and men correctly answered the questions related to knowledge. In line with the results of the current study, Ren et al demonstrated that about 70% of the participants knew the ways of influenza transmission and its symptoms [21]. Likewise, Rezaeipandari et al [22] and AlMarzooqi et al [23] reported that public awareness was at a high level. On the other hand, the knowledge of the participants in the studies of Albattat et al [24] and Rezaeian et al [25] was at low and desirable levels, respectively. However, education level was known as one of the social factors affecting knowledge and health status [26]. In the present study, the mean of knowledge was not significantly different in illiterate and literate people.

The mean score of attitudes in the studied elderly was moderate, and there was no significant difference between the two genders in the present study. However, men more than women believed that using a face mask was effective in preventing the flu (P=0.025). Although Ermenlieva et al [27] and Loulergue et al [18] reported weak attitudes of study participants toward influenza prevention behaviors, in the study of Ren et al, 70% of participants considered hand washing and using

a mask to be effective in preventing influenza [21]. In some studies, the most common reasons for not being vaccinated against the flu are the impossibility or insignificance of the risk of catching the flu, doubts about the effectiveness and efficacy of the flu vaccine, and the fear of complications from the vaccine [28]. In the current study, most literate elderly were concerned about the cost of treatment and most illiterate people were concerned about hospitalization. Manski et al found that the use of medical care and referral to care centers increased in the elderly [29]. Khan et al [28] and Mehrara et al [30] also confirmed aging itself as a factor in increasing health costs. Grossman [31] and Diop et al [32] indicated that the cost of health care often increases simultaneously with an increase in the level of income and education of individuals. The results of these studies are consistent with those of the present study regarding the concern of literate people about the cost of treatment.

In the current study, more than 70% of men and 80% of women did not intend to use the face mask. More than 50% of the elderly did not intend to avoid crowded places, and less than 20% of the elderly intended to be vaccinated. Similarly, Rikin et al reported a low willingness to receive the vaccine. They considered the lack of confidence in the effectiveness of the vaccine, distribution of the vaccine at the wrong time, overconfidence in their health and non-acceptance of their mediating role in disease transmission, and fear of the side effects of vaccine as the possible reasons for this reluctance [33]. This is somewhat in line with the findings of this study about the attitude of the elderly toward influenza prevention ways. The results of Srivastav et al [34] showed that hand washing is the most common preventive behavior. In the present study, the intention to wash hands was at a moderate level and was more evident in women than men (P=0.044). In the study of Rezaeipandari et al, washing hands with soap and water and covering the mouth and nose when coughing and sneezing were the most common preventive behaviors of influenza, respectively [22]. Liu et al also found that participants' hand washing performance to prevent influenza was good and accounted for a significant percentage of people [35]. In another study by Torner et al, the highest mean score of influenza prevention behaviors was related to repeated hand washing behaviors with soap and water [36]. Washing hands and face seems to be a habit among the elderly in Iran, and considering that women spend more time at home and facilities of hand washing were more available for them, they intend to further do this preventative method.

#### 4.1. Study strengths and limitations

In the present study, it was attempted to pay attention to different aspects of influenza prevention methods as much as possible, and the frequency of participants' answers to the questions of the questionnaire was reported instead of mentioning only the average scores of the constructs. This provides the researchers and health professionals the possibility to identify the most important weaknesses and design educational content accordingly. However, the low sample size and a limited number of investigations on the rural population are the most important limitations of this study.

## 5. Conclusion

The results of the study revealed that the knowledge, attitude, intention, and practice of rural elderly about influenza prevention behaviors were at moderate levels, which were not satisfactory. Based on the findings, no significant differences were found between men and women and literacy levels, thus large-scale educational interventions, are necessary, especially in rural areas.

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#### **Competing Interests**

The authors declare that they have no conflict of interests.

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