Original Article

Companions' knowledge, attitude, and practice which enable them to take safety precautions against Covid-19 in infectious wards in Iran: a cross-sectional study

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Abstract

*Background & Aims***:** The patients' companions need to take precautionary measures in the hospital for taking care of their patients. The relevant studies have not focused on the precautionary measures of the patients' companions. Considering this issue, this study aimed to determine the companions' knowledge, attitude, and practice which enabled them to take the safety precautions against Covid-19 in infectious wards.

*Materials & Methods***:** This study was a descriptive-analytical study. The researchers used convenience sampling to select 284 companions of the patients with Covid-19 in teaching hospitals in Kashan (Iran) from June to September 2021 as the participants of the study. The data collection instrument was a self-report researcher-developed questionnaire which examined the companions' knowledge, attitude, and practice which enabled them to take care of their patients. Data analysis was performed using SPSS v16 software. The Mann-Whitney, Kruskal-Wallis, and Spearman's correlation tests were used to analyze the obtained data.

*Results***:** The results of the study showed that the companions' level of knowledge (11.27±5.01) was weak. Nonetheless, their attitude (99.84±16.50) and practice (94.69±12.32) were moderate and acceptable. Moreover, there was a significant relationship between the companions' familial relationship with the patient, history of participation in the Covid-19 training classes, education, and occupation and their knowledge, attitude, and practice ($p < 0.05$). Furthermore, a significant correlation was found between the companions' history of being in the hospital as a companion of Covid-19 patients and the mean values of their attitude and practice ($p < 0.05$). Finally, on the basis of the results, there was a significant relationship between the mean values of the companions' practice and their knowledge and attitude ($p < 0.05$).

*Conclusion***:** Companions are not provided with satisfactory education regarding precautionary measures in the hospital wards. Therefore, there is a need for the protocols which inform them about the precautionary measures in hospitals.

*Keywords***:** Attitudes, Caregiver, Covid-19, Knowledge, Practices

Introduction

Covid-19 is an infectious disease which is caused by a novel coronavirus named severe acute respiratory syndrome coronavirus two (1). It was first identified in December 2019 in China, and was declared a pandemic in March 2020 by the World Health Organization (WHO) (2). According to the relevant reports, after China and Italy, Iran had the third highest number of Covid-19 cases among the countries which were affected by the epidemic (3). The most effective means of fighting this disease is breaking its transmission chain by following health guidelines and paying attention to self-care since it is highly contagious and there is not a definitive cure for it (4).

Self-care constitutes one of every individual's basic needs. The individuals' ability to follow high-quality self-care practices depends on their knowledge, attitudes, and skills in this field (5). WHO defines self-care as "the ability of individuals, families, and communities to promote health, prevent disease, maintain health, and to cope with illness and disability with or without the support of a healthcare provider"(6). Self-care measures can help patients in the long run, not just during the Covid-19 pandemic (5). In Iran, much care is provided by the health care team in the hospitals. Nonetheless, in addition to the treatment team, the patient's family members perform certain tasks including helping the patient to meet his/her basic needs such as going to the bathroom, eating, and moving in bed, and providing the patient with emotional support(4). In addition, providing the patients with care is difficult under the health system conditions in Iran. These conditions include lack of treatment staff, long work shifts, long working hours, decrease in the physical and mental strength of the treatment staff, existence of multiple disease peaks, and some of the patients' need for companions among others (7). Therefore, it is necessary to protect the patients' companions. Similar to the health and treatment center employees, the patients' companions are present in high-risk departments (7, 8). The presence of the patients' companions can reduce some

of this burden on the treatment staff in the hospitals. Studies have shown that the family plays a significant role in providing the patients with care. Moreover, it performs a major role in the prevention, treatment, and rehabilitation of the patients who suffer from mental and physical problems (9). The presence of companions in the hospital can be associated with the caregiver's distress, the feeling of being imprisoned, lack of free time, lack of other family members' help, poor awareness about care, caregiver's age, and feelings of guilt about ignoring the patient's complaints (10, 11). Caregivers who provide their family members with personal care are at higher risk of contracting Covid-19. This issue stems from the fact that the fear of infection and contamination may affect the caregivers when they visit the hospital regularly and meet the patients (12). Likewise, in Iran, the companions played a prominent role in providing the patients with care during the outbreak of Covid-19. The Covid-19-infected patient's companion helped him/her to do his/her daily activities and created the conditions under which the patient felt more comfortable (4). The researchers monitored the behavior of patients' companions in the hospital and noticed that most of the companions had problems in following precautionary principles regarding themselves or their patients in the Covid-19 wards. For example, they did not put the patient's food in an appropriate place or did not use the gown or mask properly. Neglecting to follow the precautionary principles can result in the companion's infection and may infect the others since it expedites the transmission of the disease at the community level. Therefore, the researchers consider that conducting research on the precautionary principles is necessary.

The people's behavior in society plays a vital role in the transmission of diseases and their preventive behaviors can break the cycle of this disease. Therefore, having knowledge, adopting a positive attitude, and following a proper practice can make people exhibit preventive behaviors and take precautions (13). People's lack of knowledge results in the delays in diagnosing their diseases, the spread of

the diseases, and poor practices in the field of infection control in society. Therefore, preventing the intra-hospital transmission of infectious diseases and providing the patients with care are necessary precautions. A part of this care is complying with the principles of protection and care and depends on the awareness of the patients' companions in the hospital (14). Mirzaei et al. stated that companions of the patients with Covid-19 face more serious challenges than the other companions due to the limited resources , their lack of knowledge about this emerging disease, and their lack of training in providing care for the patients (15).Likewise, in a qualitative study, Rahimi et al. discussed the experiences of family caregivers who provided the Covid-19 patients with care in Iran. As they stated, these experienced were related to the nature of the disease, and unmet needs. Moreover, they involved unpleasant physical, psychological, and social experiences. As they concluded, care facilitators resulted in the caregivers' positive experiences (4). The aforementioned study investigated the experiences of the caregivers who provided the patients with care at home. The review of the related literature shows that none of the relevant studies has focused on the companions of patients with Covid-19 in Iran. Moreover, these companions are constantly present in the hospital and exhibit non-standard precautionary behaviors in infectious departments. Finally, breaking the chain of the transmission of the disease and providing the companions with care are necessary precautions. Considering the above-mentioned issues, the present study was conducted to determine the companions' knowledge, attitude, and practice which enabled them to take the safety precautions against Covid-19 in infectious wards in the teaching hospitals in Kashan.

Materials & Methods

The present study was a descriptive-analytical cross-sectional study and involved 284 companions in Naghavi and Shahid Beheshti hospitals in Kashan. We used convenience sampling to select the above-mentioned companions as the participants of the study from June to September 2021. In order to determine the sample size, we followed the procedure in Belt's study. In the study which was conducted by Belt, the standard deviation for the attitude score was equal to 4.08. Considering α=0.05 and d=0.5 and using the following formula, we calculated the sample size. The obtained sample size was 256. Nonetheless, there was a need to take account of the 10% probability of the participates' tendency to drop out of the study. Consequently, the final sample size was 284 (16).

$$n = (\frac{z_{1-a/2}\partial}{d})^2 = \left(\frac{1.96 \times 4.08}{0.5}\right)^2 = 256$$

The inclusion criteria involved having a hospitalized patient with Covid-19, being able to understand Farsi, being present as a patient's companion for at least one shift, and expressing the desire and consenting to participate in the study. The exclusion criteria included answering the relevant questionnaires in an incomplete way.

The present instrument was developed by reviewing the texts, books, and health guidelines related to the precautionary standards of care during the Covid-19 disease (17-19). The first part of the instrument focused on the demographic information (i.e. age, gender, marital status, history of Covid-19 disease, occupation, education level, history of being in the hospital as a patient's companion, and the relationship between the companion and the patient). The second part of this instrument involved three categories of questions. The first category included 35 questions which evaluated the participants' knowledge about the compliance with the principles of prevention, self-care and patient care. The second and the third categories comprised 30 attitude and 30 practice questions respectively. The knowledge questions were scored on a three-point scale whose choices involved "True, False, and I don't know". The minimum score and the maximum score on these items were 0 and 35 respectively"(Box 1). Based on the study which was conducted by Ballot, the participants whose scores were equal or higher than

80% of the total score were at the good level. Moreover, the participants whose scores were between 40% (score: 14) and 80% (score 28) of the total score were at the average level. Finally, the participants whose scores were equal to or below 40% of the total score were at the weak level (16).

The attitude questions focused on a number of issues including a person's belief in the usefulness of the masks, hand washing, and quarantine, among others. Attitude items were scored on a five-point Likert scale ranging from " completely agree (score 1) to completely disagree (score 5) ". The minimum score and the maximum score on these items were 30 and 150 respectively)"(Box 1). The participants whose scores were equal to 120 (80% and above 80% of total score) were considered to have a good attitude. Furthermore, the participants whose scores were in the range of 60 to 120 were considered to have an average attitude. Lastly, the participants whose scores were below 60 (40% and below 40% of total score) were considered to have a poor attitude.

The practice questions determined the degree to which the participants' practices were in line with the standard practices in the items. The relevant practices involved dealing with the exacerbation of the patient's symptoms, feeding the patient, and paying attention to the patient's hygiene among others. The self-report practice items, were scored on a five-point scale whose choices involved "always (score 5), most of the time (score 4), sometimes (score 3), rarely (score 2), and never (score 1)"(Box 1). The minimum score and the maximum score on these items were 35 and 175 respectively. The participants whose scores were above 140 (80% and above 80% of the total score) were considered to be the companions who followed a good practice. Moreover, the participants whose scores were in the range of 70 to 140 were considered to be the companions who followed an average practice. Finally, the participants whose scores were below 70 (40% and below 40% of total score) were considered to be the companions who followed a poor practice. Obtaining a

higher score in each of the above-mentioned question categories indicated the companions' satisfactory knowledge, attitude, and practice in the field of care.

After preparing the initial draft of the instrument, first, the instrument was given to 10 professors at the nursing school, infectious diseases doctors, and educational supervisors of the hospital to determine its face validity and content validity. The researchers modified the initial draft of the instrument based on these experts' comments. Next, the experts were asked to classify each of the questions into three categories based on the three-part Likert spectrum (i.e. the item is necessary, the item is useful but not necessary, and the item is not necessary). Considering the number of the expert panel members (i.e. 10 people) and Lawshe table, the minimum acceptable value of content validity ratio (CVR) for each question was 0.62. Based on the results of the analysis, the CVRs of all of the questions were above 0.62 in the CVR measurement stage. Consequently, all of the questions remained in the questionnaire. Finally, the examination of the experts' opinions and the result of the CVR formula showed that the coefficient of the items was in the range of 0.78 to 0.96.

Moreover, the content validity index (CVI) was used to examine the validity of the questionnaire. In order to specify this index, we asked the experts to determine the degree of relevance of each item using a four-part spectrum (i.e. unrelated, needing basic revision, related but needing revision, and completely related). The items whose coefficients were more than 0.79 remained in the questionnaire. Based on the results of the analysis, the coefficients of all of the items were more than 0.79.

In order to calculate the reliability of the instrument, we provided 10 companions with the instrument and asked them to complete it in a one-week period of time. The Cronbach's alpha measures of the knowledge, attitude, and practice sections were equal to 0.96, 0.87, and 0.91, respectively.

Box 1. Sample instrument questions

Knowledge	Scale		
Infection through eating "animal meat"	True	False	I don't know
Infection through eating infected fruits and vegetables…			

Attitude					
I believe that wearing masks in hospital is effective	I completely agree	I agree	I have no opinion	I disagree	I completely disagree
I do not buy anything from a shopkeeper who has survived the coronavirus					

Practice					
In case of shortness of breath, decreased level of consciousness, worsening of fever, or worsening of cough, inform the nurse	Always	Most of the time	Sometimes	Rarely	Never
Avoid all types of physical contact and the bodily fluids of that person…					

Considering the structure of the questions, the researchers made an effort to prevent the instrument from inducing the participants to provide the answers to the questions which were considered to be the researchers' preferred answers. Consequently, the practice questionnaire, the knowledge questionnaire, and the attitude questionnaire were the first, the second, and the third questionnaires which were administered to the companions. After receiving the companions' completed questionnaires, we provided them with the correct answers along with the body of the questions on a separate sheet of paper to give them more general information.

The first researcher visited the inpatient wards of Covid-19 patients and selected the companions who were responsible for the patients' constant care. First, the researcher asked the companions to introduce themselves, provided them with information on the research objectives, and assured them of the confidentiality of their information. Next, the researcher provided the companions with the questionnaire and asked them to complete it in her presence. In order to help the illiterate companions or the patients whose literacy level was low (and who were unable to fill out the questionnaires by themselves) to answer the questionnaire items, the researcher completed the questionnaires by interviewing the patients and informing them about the questions and their answers.

The data were entered into SPSS software v.16 (SPSS Inc., Chicago, IL, USA). The Kolmogorov–Smirnov test was used to check the normality of the data distribution. Based on the results of this test, the data were not normally distributed. Therefore, Spearman's correlation coefficient was used to check the relationship between the variables. In order to compare the mean values of practice, knowledge, and attitude, the non-parametric Mann-Whitney test and Kruskal-Wallis test were used for binary variables and multiple variables respectively. The significance level was considered to be less than 0.05.

The permission for conducting the present study was obtained from the Vice-Chancellor for Research of Kashan University of Medical Sciences. The code of ethics number of the study was IR.KAUMS.NUHEPM.REC.1401.033. In this study, the researchers followed principles of the Declaration of Helsinki. The researchers obtained written consent from the participants before the beginning of the study.

Results

In this study, 60.5% (n=172) of the participants were women. Moreover 61.6% (n=175) of them were married, and 61.6% (n=175) of them were unemployed

(Table 1). The results showed that 71.5% (n=203) of the participants had a history of Covid-19 and 70% (n=216) of them had received the vaccine (Table 2).

Table 1. The mean value of the companions' knowledge, attitude, and practice according to their demographic information

Variable		Variable levels	n (%)	Mean ±SD	*p* value
Sex	Practice	Female	172(60.5)	94.60±11.81	0.134*
		Male	112(39.5)	94.80±12.94	
	Knowledge	Female	172(60.5)	11.04±5.11	0.454*
		Male	112(39.5)	11.53±4.90	
	Attitude	Female	172(60.5)	98.88±17.05	0.272*
		Male	112(39.5)	100.97±15.80	
Marital status	Practice	Single	109 (38.4)	94.38±11.51	0.154*
		Married	175 (61.6)	94.98±13.01	
	Knowledge	Single	109 (38.4)	10.86±4.65	0.438*
		Married	175 (61.6)	11.63±5.26	
	Attitude	Single	109 (38.4)	97.84±11.91	0.133*
		Married	175 (61.6)	101.58±19.35	
Education	Practice	Primary	35 (12.3)	105.00±0.00	0. 004**
		Pre-high school	133(46.8)	96.98±11.65	
		High school	70(24.7)	93.03±13.59	
		University	46(16.2)	92.41±9.00	
	Knowledge	Primary	35 (12.3)	5.00±1.09	0.001**
		Pre-high school	133(46.8)	11.10±3.74	
		High school	70(24.7)	11.12±5.06	
		University	46(16.2)	14.17±5.42	
	Attitude	Primary	35 (12.3)	88.00±2.00	0.001**
		Pre-high school	133(46.8)	95.45±15.90	
		High school	70(24.7)	105.19±14.77	
		University	46(16.2)	95.13±19.49	
Job	Practice	Employee	84(29.6)	94.36±10.99	0.012**
		Retired	25(8.8)	99.60±8.12	
		Free job	175(61.6)	94.08±13.38	
	Knowledge	Employee	84(29.6)	9.87±4.14	0.001**
		Retired	25(8.8)	14.20±1.82	
		Free job	175(61.6)	11.76±5.53	
	Attitude	Employee	84(29.6)	102.87±17.85	0.001**
		Retired	25(8.8)	118.12±15.55	
		Free job	175(61.6)	95.32±13.27	
Relationship with the patient	Practice	Family	193(68)	96.11±10.65	0.043**
		Relatives	50(17.6)	89.06±15.38	
		Friend	41(14.4)	95.53±13.09	

Variable	Variable levels	n (%)	Mean ±SD	*p* value
Knowledge	Family	193(68)	12.21±4.84	0.001**
	Relatives	50(17.6)	10.84±5.31	
	Friend	41(14.4)	7.87±3.66	
Attitude	Family	193(68)	97.81±17.25	0.002**
	Relatives	50(17.6)	104.88±15.14	
	Friend	41(14.4)	102.26±13.13	

* Mann-Whitney test   ** Kruskal-Wallis test

Table 2. The mean value of the companions' knowledge, attitude, and practice according to their relevant factors

Variable	Variable levels	n (%)	Mean ±SD	*p* value
A history of Covid-19 disease	Practice	yes	203 (71.5)	92.30±11.92	0.001
		No	81(28.5)	99.91±11.58	
	Knowledge	yes	203 (71.5)	11.51±5.35	0.442
		No	81(28.5)	10.61±4.02	
	Attitude	yes	203 (71.5)	102.32±17.65	0.001
		No	81(28.5)	94.07±11.84	
History of participation in the Covid-19 training classes	Practice	yes	75(26.4)	91.58±15.53	0.006
		No	209(73.6)	95.92±10.59	
	Knowledge	yes	75(26.4)	12.33±4.74	0.021
		No	209(73.6)	10.86±5.07	
	Attitude	yes	75(26.4)	96.14±13.29	0.041
		No	209(73.6)	101.29±17.42	
History of being in the hospital as a companion of a Covid-19 patient	Practice	yes	174(61.6)	92.64±11.65	0.016
		No	110(38.4)	97.41±12.93	
	Knowledge	yes	174(61.6)	45.11±5.31	0.750
		No	110(38.4)	11.04±4.70	
	Attitude	yes	174(61.6)	102.11±16.62	0.002
		No	110(38.4)	96.29±15.94	
Receiving a Covid-19 injection	Practice	yes	216 (70)	95.68±13.23	0.001
		No	68(30)	90.47±5.10	
	Knowledge	yes	216 (70)	11.00±5.28	0.013
		No	68(30)	12.50±3.32	
	Attitude	yes	216 (70)	99.94±16.88	0.522
		No	68(30)	99.92±14.94	
The experience of the death of loved ones due to Covid-19	Practice	yes	77(27.1)	90.64±13.08	0.035
		No	207(72.9)	96.41±11.81	
	Knowledge	yes	77(27.1)	13.41±4.64	0.001
		No	207(72.9)	10.26±4.91	
	Attitude	yes	77(27.1)	102.32±16.73	0.074
		No	207(72.9)	98.69±16.63	

* Mann-Whitney test

Moreover, based on the results of the present study, the mean values of knowledge, attitude, and practice of the patients' companions regarding the precautions against Covid-19 were 11.27±5.01, 99.84±16.50, and 94.69±12.32, respectively.

The results indicated that there was not a significant relationship between companions' gender and marital status and their knowledge, attitude, and practice ($p > 0.05$). Furthermore, on the basis of the results, there was a significant relationship between the companions' education and their knowledge ($p < 0.001$), attitude ($p < 0.001$), and practice ($p < 0.001$; Table 1).

In addition, based on the results, there was a significant relationship between the companions' occupation and their knowledge ($p < 0.001$), attitude ($p < 0.001$), and practice ($p = 0.012$). Moreover, the results highlighted the fact that there was a significant relationship between the companions' relationship with the patient and their knowledge ($p < 0.001$), attitude ($p = 0.002$), and practice ($p = 0.043$) (Table 1).

The examination of the obtained results underlined the fact that there was a significant relationship between the companions' history of Covid-19 disease and the mean value of their attitude ($p = 0.001$), and practice ($p < 0.001$). Nonetheless, the companions' knowledge was not significantly related to their Covid-19 history ($p = 0.442$). According to the results, there was a significant relationship between the companions' history of participation in the Covid-19 educational classes and the mean value of their knowledge

($p = 0.021$), attitude ($p = 0.041$), and practice ($p = 0.006$; Table 2).

Furthermore, there was a significant relationship between the companions' history of being in the hospital as a companion of a Covid-19 patient and the mean value of their attitude ($p = 0.002$) and practice ($p = 0.016$). Nonetheless, the companions' knowledge was not significantly related to their history of being the companion of Covid-19 patients ($p = 0.750$; Table 2).

Additionally, the results indicated that there was a significant relationship between the companions' injection of the Covid-19 vaccine and the mean value of their knowledge ($p = 0.013$) and practice ($p < 0.001$). Notwithstanding, the companions' attitude ($p = 0.522$) was not significantly related to their injection of Covid-19 vaccine. Moreover, on the basis of the results, there was a significant relationship between the companions' experience of the death of loved ones due to Covid-19 and the mean value of their knowledge ($p < 0.001$) and practice ($p = 0.035$). Nonetheless, the companions' attitude was not significantly related to their experiences of the death of their loved ones ($p = 0.074$; Table 2).

As shown in Table 3, there was a significant relationship between the companions' practice and their knowledge ($p = 0.029$) and attitude ($p < 0.001$). Nonetheless, there was not a significant relationship between their knowledge and their attitude ($p = 0.070$).

Table 3. Correlations between the mean values of the companions' knowledge, attitude, and practice

Variable	Knowledge	Attitude
Practice	r = -0.134 p=0.029*	r = 0.284 p=0.0001*
Knowledge	-	r = -0.111 p=0.070*

Discussion

The results of the present study showed that the level of knowledge of the patients' companions was weak. Likewise, another study showed that the knowledge level of the caregivers who provided Covid-

19 patients with care at home was week and they needed training in this field (20). Nonetheless, the results of the study by Kakamam et al. showed that people's level of knowledge of Covid-19 was high at the time of its outbreak (19). Similarly, the results of

the study which was conducted by Heidari et al. showed that Iranian people's level of knowledge about this disease was acceptable (17). Likewise, on the basis of the results of the study by Yazdi etal. more than half of the residents had good knowledge about Covid-19 in Isfahan (21). In a similar way, the results of the studies by Zhang et al. (22) and Shi et al. (23) highlighted the fact that the mean score of health workers' knowledge about Covid-19 was acceptable. The difference between the results of the above-mentioned studies, especially the studies which have been conducted in Iran, and the results of the present study may stem from the fact that the level of education of the participants of the present study was lower than the level of the participants' knowledge about this disease in the other studies. More specifically, most of the people who referred to the examined teaching hospitals lived in the suburbs and had a lower level of literacy in comparison with the people who lived in the urban areas. Moreover, it can be stated that receiving training with the help of programs including radio programs, television programs, social media programs, and the official authorities' efforts like their efforts to inform the people about this disease such as the programs which were developed by Ministry of Health were not able to increase the knowledge of the patients' companions in Kashan. Nonetheless, there is a need for more research on this issue.

Moreover, the above-mentioned difference may be ascribed to the fact that the present study focused on the patients' companions who needed to receive education regarding the ways of preventing Covid-19. Nonetheless, the studies which were conducted by Zhang et al. (22) and Shi et al. (23) focused on the treatment staff. As we know, during the Covid-19 epidemic, the medical staff received special training in the control and prevention of Covid-19. This kind of training affected their knowledge and attitude about Covid-19. The results of the study by Shams et al. showed that most of the people had a high level of knowledge about the Covid-19 disease. Moreover, their level of knowledge about the transmission of Covid-

19, the Covid-19 patients' need for care, and the treatment of Covid-19 was satisfactory (24).

Furthermore, on the basis of the obtained results, the companions' attitude towards the precautionary measures against Covid-19 in the hospital was average. Likewise, the results of the other studies have highlighted the people's good attitude towards the Covid-19 precautionary measures in Iran. These results are in line with the results of the present study (18, 19). In the studies which were conducted by Zhang et al. (21) and Shi et al. (22), the mean value of the health workers' attitude during Covid-19 pandemic was acceptable .These results may be ascribed to the time at which the present study was conducted. More specifically, the study was conducted at the end of the Covid-19 pandemic, and the people had developed more positive attitudes towards the protective measures over time. Regarding the attitude, most of the people have a positive attitude towards preventive measures and the concerns about Covid-19. However, the participants' attitude was not positive towards the actions of the government, the strictness of the control methods, and the control of this epidemic (24).

In this study, the companions' practice regarding their efforts to take care of themselves and their patients in the hospital was average. Likewise, the results of the study by Heidari et al. showed that people's practice regarding Covid-19 was acceptable in Iran (17). Similarly, the results of the study by Kakemam et al. indicated that the practice of the community regarding the Covid-19 virus was satisfactory in Iran (19). This finding can be attributed to the hospital environment during the Covid-19 pandemic. That is, all of the people who entered the hospital faced the risk of Covid-19 infection. Consequently, the people, who did not take proper protective measures at the community level, tried to pay more attention to these measures in the hospital.

On the basis of the results, there was not a significant relationship between the companions' gender and marriage and their knowledge, attitude, and practice. Nonetheless, the results of the study by Moradzadeh et al. indicated that despite the lack of a

difference between the knowledge and attitudes of men and women, women had higher Covid-19 practice scores than men (18). Likewise, a number of the other studies reported that men's awareness and practice levels were lower than women's awareness and practice levels (18, 25, 26). The study which was conducted by Bao-Liang Zhong et al. focused on Chinese residents and reported that women had good knowledge, optimistic attitudes, and appropriate practices regarding Covid-19 (27). Similarly, the study by Chen Yan et al. showed that men were less inclined to wear masks and to wash their hands than women (28). These results highlight the fact that there is a need to focus on men in the preventive and educational programs. The results of this study may be ascribed to the fact that the strict regulations of the hospital on the presence of people in the hospital and the use of health protocols in the wards forced the patients' companions to take precautionary measures. Consequently, there was not a difference between men and women.

The difference between the results of the aforementioned studies and the present study may be attributed to the time at which the studies were conducted during the Covid-19 pandemic. That is, the time of the studies may have affected their results. At the time of the present study, all of the people were aware of the seriousness of the disease and were required to take the health precautions. On the other hand, Branfman et al. stated that during the outbreak of Covid-19, all of the sections of the society including the single and married men and women made an effort to increase their knowledge of this disease due mainly to their fear of the mortality from it. Therefore, they tried to follow all of the health protocols and believed that they could reduce the transmission, contagion, and pathogenicity of Covid-19 by following the health protocols (29). The results of the study by Abdul-Hafeez et al. showed that single people had lower attitude and practice scores than the married people regarding the prevention and treatment of Covid-19 (30). In Iran, single and married people have relatively equal educational rights.

The results of the present study showed that there was a significant relationship between the companions' education, occupation, and relationship with the patients, and their knowledge, attitude, and practice. More specifically, the increase in their education was accompanied by the increase in their knowledge, attitude, and practice. Likewise, the study which was conducted by Zhong et al. showed that people with higher education and income had more satisfactory knowledge, attitude, and practice regarding the prevention and treatment of Covid-19 (27). These results are consistent with the results of the present study. Moreover, the results of this study showed that the retired people had more acceptable knowledge, attitude, and practice regarding the care which was provided for Covid-19 patients' in comparison with the freelancers and employees. This result may be ascribed to the fact that the retired people were more interested in the educational messages of the media such as radio and television and the cyberspace in regard to the control, and prevention of Covid-19 due mainly to their old age, less busy schedule, awareness of the danger of disease contagion, and fear of the mortality from the disease. Their interest in the above-mentioned messages improved their knowledge, attitude, and practice regarding the disease.

Picardi et al. stated that the patient's family fulfilled the role of health care providers during Covid-19 pandemic. As they pointed out, the companions' closer relationships with the patient (i.e. first-degree relatives) were accompanied by their efforts to provide the patients with special care (20). These results are in line with the results of the present study. The results of this study showed that there was a significant relationship between the companions' history of participation in the Covid-19 training classes and the mean value of their knowledge, attitude, and practice. Many studies have reported that the online training classes that were provided for people during the Covid-19 pandemic were able to improve their knowledge, attitude, and practice (31). This result supports the results of the present study.

Based on the results of the present study, there was a significant relationship between the companions' history of Covid-19 disease and history of being in the hospital as a companion of a Covid-19 patient and the mean values of their attitude and practice. Nonetheless, there was not a significant relationship between the companions' knowledge and the above-mentioned histories. The results of the study which was conducted by Sineq et al. showed that people who were hospitalized due to Covid-19 believed that they needed to wear masks and to pay attention to social distancing to prevent the transmission of the disease. They understood the necessity of following health protocols. This kind of understanding improved their practice (32). This result is consistent with the results of the present study. The non-significant relationship between the companions' history of contracting the Covid-19 disease and their knowledge may be attributed to the fact that they needed more education and knowledge about the disease and its transmission. That is, although they believed that they had to follow the health protocols, they did not have enough knowledge about them.

On the basis of the results, there was a significant relationship between the companions' injection of the Covid-19 vaccine and the mean values of their knowledge and practice. Notwithstanding, there was not a significant relationship between the companions' attitude and their injection of Covid-19 vaccine. The results of one of the relevant studies are in line with the results of the present study. According to the results of the aforementioned study, most of the people who were injected with the Covid-19 vaccine did not believe in its effects on the prevention of Covid-19 and received the Covid-19 vaccine due to a number of services which were provided to vaccinated people and the various advertisements for the benefits of the relevant vaccine (33). There is still a need to increase the people's knowledge about vaccination against Covid-19.

The results of the present study showed that there was a significant relationship between the companions' practice and their knowledge and attitude. Nonetheless,

there was not a significant relationship between their knowledge and their attitude. Several studies have reported that the increase in people's knowledge and the improvement in their attitude towards Covid-19 in society are accompanied by the increase in their practice (31-33). This result supports the results of the present study. The results of this study indicated that there was not a significant relationship between the companions' knowledge and their attitude. People may have enough knowledge about Covid-19. Notwithstanding, they still do not believe that preventive measures such as vaccination or hand washing can prevent it. A number of people considered vaccination to be a part of the policies of the government and refused to receive vaccine due to their lack of trust in the government (33). Likewise, in the present study, there was not a significant relationship between companions' knowledge and their attitude. Therefore, there is still a need to increase the people's knowledge about Covid-19 and to improve their attitude towards the preventive measures.

Conclusion

Based on the results of the present study, the companions' level of knowledge was weak. Nonetheless, their attitude and practice were moderate and acceptable. The results of this study indicated that, although the levels of the companions' awareness and attitude were not acceptable, their practice was satisfactory due to the differences between people in terms of gender, education, occupation, Covid-19 vaccine injection, history of Covid-19, the experience of the death of loved ones, and the history of participation in the Covid-19 training classes. Consequently, it is necessary to develop different training programs based on the needs of the society. One of the limitations of this study was that it was conducted in one treatment center. This issue may adversely affect the generalizability of the obtained results. On the other hand, one of the strengths of this study was its focus on the Covid-19 patients' companions as the research population. None of the relevant studies has examined this population. The

patients' companions are at the highest risk of Covid-19 infection. Consequently, it is necessary to pay attention to their knowledge, attitude, and practice in order to help them to take care of themselves, the patients, their family, and the society and to prevent the transmission of the disease.

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Conflict of interest

The authors declare that there is no conflict of interest.

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Data availability

The raw data supporting the conclusions of this article are available from the authors upon reasonable request.

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