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Original Article

Study of knowledge, attitude, and practice in over 20-year-old individuals regarding the new Coronavirus (COVID-19) in Iran

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Abstract

***Background & Aims*:** Due to the prevalence of the new Coronavirus (COVID-19), it is essential to know the level of people's knowledge, attitude, and practice toward this disease to plan preventive decisions. The purpose of the present study was to investigate knowledge, attitude, and practice in over 20-year-old individuals regarding the new Coronavirus in Iran.

***Materials & Methods*:** This cross-sectional study incorporated 506 individuals in Iran, in 2020. Data were collected by a valid and reliable researcher-made questionnaire through virtual and non-probable methods (available and snowball sampling). The questionnaire used in the current study entailed questions about demographic (9 questions), knowledge (3 questions, range 1-3), attitude (10 questions), and practice (6 questions). Finally, the data were entered into SPSS16 software, and independent t-tests and analysis of variance with a P-value less than 0.05 were used to analyze the data.

***Results*:** The average scores of knowledge, attitude, and practice of the studied subjects regarding the Coronavirus were 80.13, 75.6, and 66.5, respectively. In this study, 83% of people were aware of Coronavirus transmission methods, and more than 85% of people were fully aware of the symptoms of the disease. Also, more than 76% of people knew how to prepare the disinfectant solution. The average score of attitude and practice of women, compared to men, toward COVID-19 was markedly higher. There was also no significant association between the gender and score of knowledge, which its average was higher in individuals with non-university education than educated people.

***Conclusion*:** The study reveals that the knowledge, attitude, and practice of the people about the coronavirus are almost at the optimal level. However, more attention from the policymakers and the media is required to break the chain of infection.

***Keywords*:** Attitude, COVID-19, Iran, Knowledge, Practice

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Introduction

COVID-19 is an acute respiratory disease introduced as a public health emergency and an international concern by the World Health Organization (WHO) due to its rapid spread (1, 2). This infection is transmitted from human to human through respiratory droplets or contact with contaminated surfaces (3). The initial symptoms of the disease include fever, cough, fatigue, muscle pain, and in some cases phlegm and headache (4). According to the WHO statistics, until April 5, 2022, more than 489 million and 60 thousand people in the world were infected with this disease, and over 6 million and 150 thousand people died (5). In Iran, the official outbreak of COVID-19 was confirmed on February 29, 2018 (6).

Knowledge, attitude, and practice in human behavior are divided into three consecutive processes, acquiring knowledge, taking attitude, and forming behavior. Knowledge is the basis of changing behavior, and attitude and belief are the driving forces of behavior (7). Knowledge, attitude, and perceived threat are effective factors contributing to healthy behavior and are important predictors for health behaviors (8). In addition, increasing people's knowledge and attitude toward contagious diseases is the most pivotal solution for the control of the pandemic (9).

People's knowledge concerning COVID-19 has been reported differently in varied nations. In this regard, the knowledge of the people in Paraguay was at a good level (62%), but in the USA, this rate was low (30.3%) (10, 11). In Nigeria and South Korea, the average knowledge of people about the disease was over 80% (12, 13). In Iran, various studies have been conducted in this field. The study of Taghrir et al. showed that the majority of medical students had sufficient knowledge about COVID-19 and also demonstrated an acceptable practice (14). In another study, the average knowledge score for medical students about the COVID-19 disease was 41.64, but most of the students (98.7%) were aware of the infection routes (1). Study of Rahimi et al. showed that the average score of knowledge about COVID-19 in the elderly was 92.3% in Isfahan city (Isfahan, Iran) (15).

Attitude is defined as a person's overall evaluation of a subject, and the subject of attitude is defined as anything that a person distinguishes or has in mind (16). Tomar et al.'s study showed that several people in India had a positive attitude toward COVID-19 pandemic and performed well during this pandemic (17). According to the Al Ahdab's study in Syria, 60.1% of people believed that the COVID-19 disease can be well controlled (18). In a study conducted by Zhong et al. in China, the majority of people (90.8%) believed that COVID-19 would be successfully controlled in the end (19). Fallahi et al.'s study in Sabzevar confirmed the fact that people's practice cannot be improved unless by ameliorating people's knowledge (20). Shams Ghahfarokhi showed that sufficient knowledge about COVID-19 could led to achieving a high attitude and better practice among citizens (7). According to Ebrahimi et al.'s study in Mashhad, the average score of attitude among individuals was at a normal level (78.68%) and almost half of these individuals (51.6%) believed that the amount of knowledge about COVID-19 disease is not enough in the society (3). The study of Alzoubi et al. in Jordan demonstrated that students had an acceptable practice in doing preventive behaviors of COVID-19 such as washing hands (21).

WHO has recommended that the regular use of masks and gloves is essential for all therapeutic procedures during the COVID-19 pandemic (2). In this regard, a previous investigation in Tanzania showed that 77% of the people refused to visit crowded places, and 80% of people used masks when going out (22). In the study of Keyvanlo et al. in Sabzevar, the mean score of practice regarding the implementation of the home-quarantine policy was reported as 69.71 among women (23). In Hosseinkhani et al.'s study in Qazvin, the mean score of practice among people was 91% (24).

Due to the high incidence and mortality rate of COVID-19 and the lack of effective specific medicine for the treatment of this disease, preventive measures

and also increase in the level of awareness, attitude, and performance of the people can play an important role in the control of the disease. Based on conducted studies and considering the effective role of knowledge and attitude in adopting appropriate healthy behavior and the importance of preventing COVID-19 disease, as well as the newness of the disease and the necessity of identifying its behavioral predictors in the general population in the country, this research aimed to determine the knowledge, attitude, and practice of individuals over 20 years of age regarding the new coronavirus (COVID-19).

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Materials & Methods

The current cross-sectional study incorporated people over 20 years of age as the target population throughout the country in 2020. The sample size of the present study was 600 cases, which was selected based on similar studies and considering the significance level of 0.05%, the confidence interval of 95%, and the estimation accuracy of 0.2. In this study, the sampling method was used; a link to the questionnaire was provided to people all over the country through social media (such as Telegram, Instagram, and WhatsApp). To collect data, a valid questionnaire was used in Porsline. The validity of the questionnaire content was evaluated by 10 experts (in the field of health education and promotion, as well as communicable diseases). In this regard, the designed questionnaire was sent to the experts via email, and the suggested corrections were applied and resolved. Thereafter, the questionnaire was approved in terms of the total mean score content validity index of 0.79 and content validity ratio of 0.81. Also, the reliability of the questionnaire was evaluated based on the internal consistency (Cronbach's alpha coefficient) in a sample of 30 participants. This questionnaire includes four sections, comprising demographic information, knowledge questions, attitude questions, and practice questions. Demographic questions included gender, age, marital status, field of study, education level, occupation, and place of residence. Knowledge questions comprised people's knowledge of the disease symptoms and preventive behaviors. Regarding attitude, people were asked about the use of masks and gloves and avoidance of crowded places. The people's adherence to health recommendations was measured in the practice category. Answers to the attitude questions were recorded with a five-point Likert scale as very little, little, no effect, much, and very much. Concerning the knowledge questions, answers were also evaluated with a five-point Likert scale as completely disagree, disagree, no opinion, agree, and completely agree. The practice questions were measured with a seven-point Likert scale as not available, not doing, very little, little, somewhat, much, and very much. Getting a higher score in each category indicates more knowledge and attitude and adopting preventive behaviors against this disease. The minimum and maximum scores of knowledge were 1 and 5, raging 3-15, respectively. The minimum score of attitudes was 0, and the maximum score was 4 (range 0-40). For the practice questions, the minimum and maximum scores were 0 and 6 (range 0-36), respectively.

The inclusion criteria were being Iranian and giving consent, and having ability to use the website. The exclusion criteria were the lack of cooperation for completing the questionnaires and incomplete questionnaires. The study protocol was approved by the Ethics in Research Committee of Isfahan University of Medical Sciences, Isfahan, Iran (ethical code: IR.MUI.RESEARCH.REC.1399.457).

Before the initiation of the study, several points were explained to the participants, including the purpose of the research, how to complete the questionnaire, and the ethical points such as free participation, the right to withdraw from the study, no need for mentioning name, and confidentiality of information. Finally, 94 questionnaires were excluded from the study due to not being completed correctly, and 506 questionnaires were entered into SPSS16 software.

Descriptive statistics such as frequency (percentage) and mean (standard deviation) were used for data analysis. Independent t-tests and analysis of variance (with a P-value of 0.05) were used for the

statistical analysis. In order to compare the demographic variables with the knowledge, attitude, and performance of the participants based on the normality of the data, independent two-sample t-tests and one-way analysis of variance were used.

Results

The information of a total of 506 participants was analyzed. The demographic data of the participants are shown in Table 1. According to this table, 34% of the participants were men and 66% were women. The average age of the participants was 49.28 ± 5.1. Also, 62% of the study subjects were married. Concerning the field of study, 33% of participants studied in different fields of medical sciences. In addition, 35% of the participants had a bachelor's degree, which was the most frequent education level. Regarding occupation, 29.9% of the participants were employees and 23.3% were students.

The mean and standard deviation scores of knowledge, attitude, and practice were 80.13±7.4, 75.6±11.3, and 66.5±9.1, respectively.

Table 1. Demographic information of the participants

Percentage	Number	Variant
sex		
male	34	172
female	66	333
Marital status		
single	38	192
married	62	314
Level of education		
Secondary school	9.1	46
Diploma	19.6	99
Associate degree	7.9	40
Bachelor’s degree	35.4	179
Master’s degree and Ph.D.	28.1	142
Occupation		
housewife	20.3	102
employee	29.9	150
Self-employed	11.6	58
student	23.3 %	117
retired	5.4 %	27
other	9.6 %	48

Based on the results in Table 2, 85 of the participants had no idea, was agree or was fully agree relative to the methods of coronavirus transmission, and 416 people were aware of this issue. Also, 73 people had no idea, was agree or was fully agree relative to the lack of information about the symptoms of Coronavirus disease.

Table 2. Frequency distribution of answers to questions related to knowledge in the studied subjects

Knowledge questions	Totally disagree n (%)	Disagree n (%)	No idea n (%)	Agree n (%)	Fully agree n (%)
I don't know the modes of virus transmission	218 (43.5)	198 (39.5)	30 (6)	26 (5.2)	29 (5.8)
I don't know the symptoms of Coronavirus disease	210 (42.1)	216 (43.3)	30 (6)	27 (5.4)	16 (3.2)
I don't know how to make hand disinfectant	151 (30.2)	231 (46.2)	45 (9)	20 (4)	53 (10.6)

The results of attitude of subjects are depicted in Table 3. Looking at the data given, we found that 68.1% of the participants strongly believed in using masks for sick people, but only 22.5% strongly believed in using masks for healthy people. Also, 54.2% of the participants firmly believed in using gloves, and 87.2% believed in frequent hand washing with water and soap. More than half of the participants (68.2%) had a great belief in disinfecting hands, surfaces, and personal objects with disinfectants. More than half of the participants believed in maintaining a distance of two meters (60.8%) and proper ventilation in closed environments (60.6%). Also, 77.6% and 78.4% of the participants believed in home quarantine and not being in public and crowded places, respectively.

Table 3. Frequency distribution of answers to questions related to the attitude in the studied subjects

Attitude questions	Very low n (%)	Low n (%)	No effect n (%)	Much n (%)	Very much n (%)
Use of the mask in sick people	4 (0.8)	27 (5.4)	18 (3.6)	111 (22.1)	342 (68.1)
Use of the mask in healthy people	37 (7.4)	75 (14.9)	100 (19.9)	177 (35.3)	113 (22.5)
Use of gloves	12 (2.4)	34 (6.7)	31 (6.2)	154 (30.6)	273 (54.2)
Frequent hand washing with water and soap	0	1 (0.2)	1 (0.2)	62 (12.4)	437 (87.2)
Disinfect hands	2 (0.4)	13 (2.6)	8 (1.6)	141 (27.9)	341 (67.5)
Disinfect surfaces and personal objects	3 (0.06)	14 (2.8)	9 (1.8)	134 (26.6)	343 (68.2)
Not attending in crowded places	15 (3)	17 (3.4)	6 (1.2)	71 (14.1)	396 (78.4)
meter social distancing	3 (0.6)	19 (3.8)	16 (3.2)	159 (31.6)	306 (60.8)
Proper ventilation in enclosed areas	4 (0.8)	8 (3.6)	18 (3.6)	167 (33.4)	303 (60.6)
Home quarantine	3 (0.6)	7 (1.4)	8 (1.6)	94 (18.8)	388 (77.6)

The results related to practice questions in the subjects are shown in Table 4. According to the answers to these questions, more than half of the participants used masks. Also, 97% of the participants washed their hands frequently with soap and water and disinfect their hands with disinfectants. More than 70% of the subjects disinfected surfaces and personal items, and almost 80% of the participants maintained a proper distance (at least two meters) from others. Furthermore, 63% of the participants used gloves.

Table 4. Frequency distribution of answers to questions related to practice in the studied subjects

Practice questions	No available n (%)	I do not do it n (%)	Very low n (%)	Low n (%)	To some extent n (%)	Much n (%)	Very much n (%)
Use of mask	31 (6.2)	27 (5.4)	7 (1.4)	46 (9.2)	122 (24.4)	102(20.4)	166 (33.1)
Use of gloves	23 (4.6)	24 (4.8)	12 (2.4)	24 (4.8)	102 (20.4)	93 (18.4)	223 (44.5)
Frequent hand washing with water and soap	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	12 (2.4)	95 (19)	391 (78)
Disinfect surfaces and personal objects	14 (2.8)	14 (2.8)	5 (1)	17 (3.4)	74 (14.9)	105 (21.1)	268 (53.9)
Stay at home and not being out in crowded places	8 (1.6)	8 (1.6)	3 (0.6)	14 (2.8)	79 (15.9)	112 (22.5)	282 (56.6)
Keeping two-meter social distancing	0	4 (0.8)	0	7 (1.4)	90 (18.1)	145 (29.2)	251 (50.5)

The relationship between the average scores of knowledge, attitude, and practice with contextual variables is detailed in Table 5. Based on the results, the mean score of knowledge was significantly high in people with non-university education (86.1±13.5) compared to that of educated ones (74.3±12.7). Also, the level of knowledge among employees (84.5±10.5) was considerably more than that of housewives (78.1±9.5). The mean score of attitudes in women (79.7±7.9) was significantly higher than that of men (71.8±7.2), and the mean score of practice was markedly higher in women and housewives (P<0.05).

Table 5. Determining the relationship between the average scores of knowledge, attitude, and practice with background variables

Variant		Knowledge (Mean ±SD)	Attitude (Mean ±SD)	Performance (Mean ±SD)
sex	Male	12.54±84.3	7.2±71.8	15.2±62.8
	Female	11.2±76.7	7.9±79.7	16.5±70.1
	P value	0.06	0.01	0.001
Marital status	Single	11.4±81.3	7.9±74.1	12.5±65.7
	Married	10.9±79.1	8.1±76.5	15.7±67.4
	P value	0.64	0.9	0.4
Job	Housewife	9.5±78.1	6.2±74.5	11.5±69.4
	Employee	10.5±84.5	6.8±74.9	12.2±67.5
	Self-employed	11.5±76.3	7.1±75.3	9.8±62.1
	Other	12.4±79.8	7.4±76.7	10.5±65.9
	P value	0.01	0.5	0.01
Education	University	12.7±74.3	7.2±75.2	13.5±67.6
	Non-university	13.5±86.1	7.6±75.9	12.1±65.8
	P value	0.001	0.9	0.3

For the comparison of the data related to sex, marital status, and education, we used independent t-test, and the analysis of variance was used to compare data. P values <0.05 indicate the significance of the test.

Discussion

The primary goal of this study was to determine the scores of knowledge, attitude, and practice among people in the community regarding the Coronavirus.

The average score of knowledge in this study was desirably 80.13 % and is consistent with the study of Khazaee-Pool et al. in Mazandaran (25), Ebrahimi et al. in Mashhad (3), and Nasirzadeh and Aligol in Qom (8). In Olapegba et al.'s study, the majority of people had a high level of knowledge about COVID-19 (26), which affirms our results. However, the study of Haque and associates in Bangladesh showed that people's knowledge and attitude about COVID-19 is not noticeable (27). More than 80% of people knew the modes of Coronavirus transmission, while in the study of Nasser et al., only 43% of the participants were

aware of these transmission routs (28). Most people were aware of the symptoms of the disease, which agrees the results of the Kakemam et al.'s study (29). In the study of White and co-workers conducted in Saudi Arabia, participants had adequate knowledge of preventing the Coronavirus, which was in line with the aforementioned study (30). This behavior could be due to the positive contribution of media in increasing people's knowledge about preventing the Coronavirus.

The average score of attitude among subjects in the present study was 75.6%, which is in agreement with another study (8). Also, the study of Roy et al. reported the attitude of Indian adults regarding the preventive behavior of COVID-19 as optimal (31). In Kasemy's study in Egypt, 75.9% of people had a positive attitude towards COVID-19 (32). All the results obtained by the above-mentioned studies (31, 32) corroborate our results.

With regard to the results, most people believed in the efficiency of health protocols, including wearing masks and gloves, frequent hand washing with soap and water, hand and surfaces disinfection, maintaining social distance, not attending in crowded places, proper ventilation in closed environments, and home quarantine. It was also believed that comprehensive knowledge about the modes of Coronavirus transmission, the symptoms of the disease, and how to make hand sanitizer solutions resulted in following such protocols. These issues have been taken into consideration by the country's health system, including health centers, as well as mass media such as television. Therefore, to increase the knowledge of people in society, various programs are needed to be provided in different media. Although more than 90% of people believed in the use of masks in sick people, only about 50% of the participants believed in using masks in healthy people, which emphasizes the requisite need for education about the use of masks in healthy people in society. The majority (90%) of people believed in two-meter social distancing. Given the disease conditions in the country, it is still necessary to keep physical distancing in public places, including offices and banks.

Looking at the results of the present study, we found that almost 65% of the participants believed in staying at home and home quarantine during the Coronavirus disease pandemic, which is consistent with the study of Zhong et al. in China (19). In Iran, Keyvanlo and associates have stated that the average score of people's attitude towards quarantine was high (80.74 %) (23), which was in accordance with the results of the present study.

The mean score of people's practice was about 66 % out of 100%, which is normal and consistent with Mousavi et al.'s study (33). In the present study, more than half of the participants used masks, which is similar to of Zhong et al.'s study (19) in which over 90% of the participants used masks. However, Rahmanian et al. discovered that only 3.7% of the students in Jahrom used masks constantly and 46.5% used masks only in crowded places (34). This behavior could arise from students' misconception that due to their physical strength they are invulnerable to the disease, and only the elderly are susceptible to the infection owing to their weak immune system.

In the present study, more than 95% of the participants washed their hands frequently with soap and water and disinfected their hands with disinfectants, which is in line with the study of Mousa et al. in Sudan (35) and the study of Sakr et al. in Lebanon (36). More than half of the people avoided being in crowded places, which is consistent with a previous study conducted in Isfahan (7).

The results of the present study illustrate that education has no meaningful correlation with attitude and practice, and there is only a considerable association between people's knowledge and education. Consequently, the people's knowledge of non-university education is higher, which can be attributed to people's more contact with media such as television, which provides individuals with multiple informative programs. In the study of Roghani et al. regarding the knowledge and attitude of medical students towards COVID-19, the score of knowledge had a significant relationship with education, but the correlation between the score of attitude and education was not noticeable

(37), which was in accordance with our results. Kamate et al. have similarly revealed a significant association between knowledge and education (38).

In the current study, there was no significant relationship between gender and people's knowledge, which was inconsistent with Hosseinkhani's study in Qazvin (24). This outcome could be the result of our limited sample size and the difference in the target population. In this study, we found a significant association between gender and people's attitude; therefore, women had a more positive attitude than men, which is not in line with Rahimi et al.'s study in Isfahan, in which attitude scores had no noteworthy relationship with the participants' gender (15). This difference arises from the study group since in Rahimi et al.'s study, only the elderly was examined.

In the present study, the average practice score in women was significantly higher than that of men, similarly as observed in other studies such as Najimi and Golshiri's (39), Park et al.'s (40), and Nasirzadeh and Aligol's (8) studies. This result implies that women are more responsible than men for their health and other family members. In this study, employees had the highest average practice score, and the lowest score was observed for self-employed people. This result is contradicts Nasirzadeh and Aligol's study (8), which could be attributed to the limitation of the sample size in our study.

One of the main limitations of the current research work was the small sample size compared to similar studies. Besides many benefits, the online questionnaire had problems such as being unavailable to participants, as well as the non-participation of people who did not have a sufficient level of literacy or access to smartphones. Another limitation of our study was the self-report assessment of behavior; unavoidably, such studies can produce bias and false information. The strength of this study was the use of an online sampling method through Porsline website for data collection, which facilitates the well-timed collection of a wide spectrum of participants in Iran.

Conclusion

In the present study, the citizens had a high level of knowledge and an acceptable attitude towards the COVID-19 disease, but their practice was at an average level. It is important to improve the people's practice limitations, for instance, practicing should be mitigated and more education should be implemented through different mass media regarding the necessity of using masks. Health interventions and training recommendations should include practical and step-by-step health solutions for different age groups and occupations so that the performance score increases. It is worth mentioning that crisis management and basic training of changing people's behavior, and encouraging preventive measures have a direct relationship with the level of knowledge, attitude, and practice among people in society, which should be taken into consideration by health providers and officials.

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Conflict of interest

The authors have no conflicts of interest associated with the material presented in this paper.

Ethical Permission

Informed consent was obtained from all participants. This project was approved by the student research committee (code 199345). Ethical considerations such as information confidentiality about participants were observed and the ethics code was received from the ethics committee of Isfahan University of Medical Sciences with the number IR.MUI.RESEARCH.REC.1399.457.

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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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