



Comparison of Knowledge, Attitude, and Practice of Patients with Chronic Diseases Referred to Clinics Affiliated with Iranian and Iraqi Teaching Hospitals Regarding COVID-19

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Abstract

Background: The effectiveness of health education programs depends on the knowledge, attitude, and practice of research units. Patients with chronic diseases are among the high-risk groups of COVID-19. Due to the large number of Iranian and Iraqi pilgrims in the two countries, the present study aimed to compare the knowledge, attitude, and practice of chronic patients regarding COVID-19.

Materials and Methods: This cross-sectional study was performed on 1000 patients over 18 years of age with chronic diseases referred to Baghdad Medical City (مدينة الطب) in Baghdad (Iraq), and Imam Reza and Ghaem Hospitals in Mashhad (Iran), in 2021. Available sampling was performed, and the standard Akalu knowledge, attitude, and practice questionnaire was used for data collection. Data were analyzed using SPSS software (version 16.0).

Results: The mean age of patients was 54.08 ± 11.13 . A total of 35.7% of research units had a high school diploma, more than 77% were married, more than 57% were female, and more than 46% were employed. The mean of knowledge scores in Iranian patients was 7.40 ± 1.54 and in Iraqi patients was 7.03 ± 1.79 , which showed no significant difference ($p = 0.63$). The mean of attitude scores in Iranian patients was 27.30 ± 3.58 and in Iraqi patients was 26.62 ± 6.72 , which showed no significant difference ($p = 0.36$). The mean of performance scores in Iranian patients was 4.31 ± 1.03 and in Iraqi patients was 3.67 ± 1.32 , which showed a significant difference ($p < 0.05$).

Conclusion: The mean scores of knowledge, attitude, and practice in both groups were unfavorable, but the level of practice in Iranian patients was better than in Iraqi patients.

Key Words: Attitude, Chronic Diseases - COVID-19, Knowledge, Practice.

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1- INTRODUCTION

Successful control and minimization of COVID-19-related complications and mortality require change in behavior, which is influenced by the knowledge and perception of the general public, especially high-risk groups (1). One of the high-risk groups against COVID-19 is patients with chronic diseases (2). Chronic disease is a condition in which the disease lasts six months or longer and requires ongoing medical care and/or limits daily activities. Chronic diseases are usually treated within a prolonged time and the recovery stages are difficult. Examples of chronic diseases include heart disease, cancer, chronic respiratory disease, diabetes, and hypertension. Assessing the knowledge, attitude, and practice (KAP) of patients with chronic diseases helps predict the preventive measures for COVID-19. Most of the previous related studies have focused mainly on ordinary people and health workers, and patients with chronic diseases are studied less frequently (3).

Chronic diseases or non-communicable diseases (NCDs) persist for a long time and are caused by a combination of genetic, physiological, environmental, and behavioral factors. All age groups are at risk for NCDs. Although chronic diseases are more common among older adults, there is evidence that more than 15 million NCDs deaths occur between 30 and 69 years of age. Children, adults, and older adults are prone to risk factors for NCDs such as improper diet, lack of physical activity, smoking, and alcohol. Urbanization, unhealthy lifestyles, population aging, and globalization accelerate this process (4). According to the World Health Organization (WHO), NCDs cause 41 million deaths annually. A total of 85% of these premature deaths occur in low-income or middle-income countries (5). COVID-19 patients who suffer from chronic diseases are more likely to have severe COVID-19-related

complications and may have a higher mortality rate than other COVID-19 patients who have no chronic underlying diseases (6). The COVID-19 pandemic has posed serious challenges in the management of NCDs (7). Studies have shown a higher risk of severe diseases and subsequent death among people with NCDs such as diabetes, cardiovascular disease, cancer, and chronic lung disease than the general population if they develop COVID-19 (3, 8). Besides, the COVID-19 pandemic has reduced access to other health services, such as services for NCD patients, which can ultimately lead to increased mortality and disability due to these diseases. In a previous study conducted in 41 countries, the World Health Organization (WHO) showed that access to malaria medications has dropped by 75% since the onset of the COVID-19 pandemic and that malaria deaths in sub-Saharan Africa have doubled in 2020 as compared to the same figure in 2018 (9).

In another study on NCD services in 155 countries, the WHO reported delay in services for hypertension in 53% of cases, diabetes and its complications in 49% of cases, cancer treatment in 42% of cases, and cardiovascular emergency services in 31% of cases (10). To achieve the ultimate success against COVID-19, public commitment to COVID-19 prevention measures is essential (11). According to experts, this can be influenced by the public KAP concerning COVID-19 (12). In a study on 8591 participants in Iran, Erfani et al. (2020) showed that 60% of the participants have moderate knowledge about the disease. Also, 90% of the research subjects had a positive attitude towards disease prevention (8). Al-Hanawi et al. (2020) demonstrated in a cross-sectional study in Saudi Arabia that 3388 participants had optimal KAP. They also reported better KAP in men than women and older adults than young people (13). In a study on 909 participants in Mosul, Iraq,

Saeed et al. (2020) showed similar results (14). Based on the results of these studies conducted in the Middle East, it can be concluded that the KAP towards COVID-19 in most of the participants was satisfactory. However, the COVID-19 outbreak is spreading alarmingly in some Middle Eastern countries. A study in China showed a higher risk for COVID-19 among patients with heart diseases, diabetes, hypertension, and respiratory diseases. A total of 64% of inpatients in Wuhan had an underlying disease at the same time, which was mainly hypertension. A total of 72.2% of these patients needed Intensive Care Unit (ICU) admission, while this figure was 37.3% in patients with non-chronic diseases (2). The prevalence of chronic hypertension, diabetes, and obesity was 56.6%, 33.8%, and 41.7% among 212,802 COVID-19 inpatients in Mexico, respectively (11).

Akalu et al. (2020) reported that 33.9% and 47.3% of patients with chronic diseases have poor knowledge and performance towards COVID-19 (3). Results of a study on KAP towards COVID-19 in Malaysia showed that only 51.2% of people carried a mask (12). Moreover, only 29% of Nigerian people expressed willingness to undergo COVID-19 vaccination (15). It was also found that students in Iraqi Kurdistan, despite relatively good knowledge, had the least knowledge about the transmission routes of COVID-19 (16). In a study on KAP, Nasirzadeh and Aligol (2020) found inappropriate perceived threat levels (17). Gholampour et al. (2020) also reported a significant relationship between COVID-19 infection and chronic obstructive pulmonary diseases (18). The KAP level in the research subjects in the aforementioned studies, which were conducted in Malaysia, Nigeria, and Iraqi Kurdistan, was often appropriate (12, 15, 16), but some studies have reported poor KAP towards COVID-19 (3). Some global

studies of KAP towards COVID-19 have focused mainly on healthcare professionals and the general public and have paid less attention to chronic patients (3). Public behaviors and measures in the face of pandemics are effective factors in controlling them or, conversely, aggravating their destructive effects (19). Studies have mainly focused on the components of the general public or medical staff, while high-risk patients, such as those with chronic diseases, are more vulnerable to COVID-19. Despite control interventions, the COVID-19 prevalence still remains at an alarming level. One of the main reasons for the increase in disease prevalence and the resulting mortality is poor knowledge on the disease, especially among high-risk groups. Investigating the KAP in patients with chronic diseases can help predict their behavior towards COVID-19.

Human relations between Iran and Iraq have greatly increased in the last decade and the number of pilgrims in both countries is growing. Differences between the two countries can affect self-care behaviors in patients with chronic diseases. Considering the high risk of COVID-19 infection among patients with chronic diseases and the role of KAP in preventive behaviors, as well as contradictory results of previous studies, the present study aimed to compare KAP towards COVID-19 among patients with chronic diseases referred to teaching hospitals in Iran and Iraq.

2- MATERIALS AND METHODS

2-1. Study design and population

This cross-sectional analytical study was performed on 1000 patients with chronic diseases referred to three hospitals in Baghdad Medical City (مدينة الطب) (Baghdad, Iraq, n=500), and Imam Reza and Ghaem teaching hospitals (Mashhad, Iran, n=500) in 2020. The process of sampling and collecting data began

simultaneously in Iran and Iraq on April 1, 2021, and ended on June 30, 2021. Four research assistants were employed in Iran and three in Iraq. The research assistants in Iran were selected from undergraduate nursing students and those in Iraq were selected from the staff of the Chronic Diseases Clinic of Medina Hospital. They received a one-hour explanation about the objectives of study by the researcher. Assistant researchers attended the clinics in the evening shifts which were dedicated to the chronically ill patients every day of the week and carried out available sampling.

2-2. Method

In this study, the available non-random sampling method was used. For the parameters of mean and standard deviation of knowledge, attitude, and practice scores of patients with COVID-19, the findings of the pilot study were used in the following sample volume formula. In this way, first, the scores of knowledge, attitude, and practice of 40 patients (20 Iranian patients and 20 Iraqi patients) were obtained and then, the mean and standard deviation of the two communities were used for the sample size formula:

$$N = [(Z_{(1-\alpha/2)} + Z_{(1-\beta)})^2 \times (s_1^2 + s_2^2)] / (m_1 - m_2)^2$$

$Z_{(1-\alpha/2)} = 1.96$ (Critical value for 95% confidence interval for two-domain study).
 $Z_{(1-\beta)} = 1.28$ (Critical value for test power 80%).
 $S_1 =$ Awareness score in Iranian patients .
 $S_2 =$ Awareness score in Iraqi patients.
 $m_1 =$ Mean knowledge score in Iranian patients.
 $m_2 =$ Mean knowledge score in Iraqi patients.
 $n = 1000$

After the necessary explanations, written consent was obtained from the people who were referred to the outpatient clinic and a questionnaire was given to them by research units to answer within 20-30 minutes. The procedure was done in the presence of the researcher and questions and possible problems were answered.

After completing the questionnaire, an educational pamphlet about COVID-19 was given to the research units.

2-3. Measuring tools

2-3-1. Baseline characteristics

Demographic information questionnaire includes questions on nationality, age, gender, level of education, marital status, employment status, income level, place of residence, type of chronic disease, history of COVID-19, source of health care information, access to health and care equipment, and name of the hospital. These questions were designed based on previous studies and in consultation with nursing professors.

2-3-2. Questionnaire of KAP of individuals about COVID-19

The questionnaire consisted of 45 questions that assessed three areas of knowledge, attitude, and practice of individuals in relation to COVID-19 (3).

Knowledge assessment: Questions 1 to 16 were related to the individuals' knowledge. The answers in this section were "correct (1 point)", "wrong (0 points)", and "I don't know (0 points)". The total knowledge score was from 0 to 16. A score between 12.16-16 points indicated good knowledge, a score between 9.6-12.6 points indicated average knowledge, and a score less than 9.6 points indicated poor knowledge.

Attitude Assessment: Participants' attitudes toward COVID-19 were assessed with 14 questions. Responses were assessed as high (score 4), medium, low, and very low (score 1) using the Likert scale. The total score was between 14 and 56. A higher score indicated a better attitude towards COVID-19.

Performance measurement: Performance was evaluated with 15 questions. The answers were "yes" and "no". The correct answer was assigned one score and the incorrect answer had a 0 score. The total

score was between 0 and 15. A score between 12-15 points indicated good performance, a score between 9–11.9 points indicated moderate performance, and a score below 9 points indicated poor performance.

In the present study, content validity was used to determine the scientific validity of the instrument, so that after reviewing the opinions of seven faculty members of the School of Nursing and Midwifery and adapting this instrument to the objectives of the present study, the necessary corrections were applied and used in the research.

Akalu et al. (2020) used the internal consistency method to determine the reliability of this tool and reported the Cronbach's alpha coefficient for the three areas of knowledge, attitude, and practice as 0.79, 0.79, and 0.85, respectively (3). In the present study, to calculate the Cronbach's alpha coefficient, the instrument was used by 40 patients (20 in Iran, and 20 in Iraq) and for the three areas, KAP was 0.78, 0.81, and 0.78, respectively.

It should be noted that the questionnaire used in this study (3) was first translated from English to Persian by a language expert. An English language expert in Iraq was then asked to translate the questionnaire into Arabic. At the same time, an Arabic language expert was asked to translate the Persian version of the questionnaire into Arabic. In the final stage, the translations were matched and approved by the nursing and English professors.

2-4. Ethical consideration

The Institutional Review Board (IRB) at the University of Mashhad, college of nursing, approved the study to be conducted. The study protocol met both the global and the committee publication ethics (COPE) standards of respecting human subjects' rights. After obtaining

informed consent, the purpose of the research was explained to eligible participants. The researchers assured participants that their data were kept private and safe during and after research. The code of ethics for this research was obtained from the ethical committee of the College of Nursing at Mashhad University.

2-5. Data analysis

To express the characteristics of the research sample, evaluate, and summarize the data, descriptive statistics consisting of mean indices, standard deviation, and frequency distribution (frequency and frequency percentage) were used separately for the two groups of Iranian and Iraqi patients. In the analytical statistics section, quantitative variables of normal distribution were first determined by Kolmogorov-Smirnov and Shapiro-Wilk tests. To examine the homogeneity of the two groups in terms of intervening and contextual variables, the Chi-square and Fisher's exact (qualitative variables), independent t-test (quantitative variables with natural distribution), and Mann-Whitney (non-rated quantitative variables) test were used. To achieve the research objectives, either the independent t-test or Mann-Whitney test (depending on normality) was used for intergroup comparison. Data analysis was performed with SPSS software version 16.0, and p-value less than 0.05 was considered statistically significant.

3- RESULTS

The mean \pm age of patients with chronic diseases referred to clinics affiliated to teaching hospitals in Iran and Iraq was 54.08 ± 11.13 years and the possible age range was between 18 and 69 years. There were 205 (41%), and 212 (42.4%) male participants among Iranian and Iraqi patients, respectively. Married participants also made up 77.2% of Iranian and 80.2% of Iraqi patients. With regard to the level of education, 308 people (30.8%)

had no high school diplomas and 36 people (3.6%) had a doctorate. Regarding the chronic disease, in general, 81 (8.1%), 307 (30.7%), and 265 (26.5%) of the total

patients had a respiratory disease, heart disease, and hypertension, respectively (**Table 1**).

Table-1: Baseline characteristics of studied nurses (n=1,000).

Variables	Sub-group		Frequency (%)	Mean \pm Standard deviation	P-value
Age, year	Iranian		500 (100)	54.31+11.24	T=0.69
	Iraqi		500 (100)	53.73+10.66	P=0.41
Gender	Female	Iranian	295 (59.0)		P=0.20 df=1 Chi-square=0.89
		Iraqi	288 (57.6)		
	Male	Iranian	205 (41.0)		
		Iraqi	212 (42.4)		
Marital status	Single	Iranian	24 (4.8)		P=0.16 df=2 Chi-square=2.41
		Iraqi	21 (4.2)		
	Married	Iranian	386 (77.2)		
		Iraqi	401 (80.2)		
	Widowed	Iranian	90 (18.0)		
		Iraqi	78 (15.6)		
Education level	< Diploma	Iranian	147 (29.4)		Mann Whitney U = 1.73 P<0.08
		Iraqi	161 (32.2)		
	Diploma	Iranian	176 (35.2)		
		Iraqi	181 (36.2)		
	Associate Degree	Iranian	41 (8.2)		
		Iraqi	43 (8.6)		
	Bachelor	Iranian	82 (16.4)		
		Iraqi	77 (14.4)		
	Master	Iranian	30 (6.0)		
		Iraqi	26 (5.2)		
	PhD	Iranian	24 (4.8)		
		Iraqi	12 (2.4)		
Employment status	Retired	Iranian	128 (25.6)		Chi-square: 2.63 df=3 P<0.19
		Iraqi	121 (24.2)		
	Unemployed	Iranian	30 (6.0)		
		Iraqi	26 (5.2)		
	Housewife	Iranian	109 (21.8)		
		Iraqi	86 (17.2)		
	Employed	Iranian	233 (46.6)		
		Iraqi	267 (53.4)		
Economic situation	Good	Iranian	31 (6.2)		Mann Whitney U=0.69 P=0.55
		Iraqi	35 (7.0)		
	Moderate	Iranian	206 (41.2)		
		Iraqi	213 (42.6)		
	Low	Iranian	263 (52.6)		
		Iraqi	252 (50.4)		
Location	Village	Iranian	58 (11.6)		Chi-square: 0.38 df=1 P=0.64
		Iraqi	63 (12.6)		
	City	Iranian	442 (88.4)		
		Iraqi	437 (87.4)		
Type of chronic disease	Respiratory disease	Iranian	38 (7.6)		Chi-square: 5.53 df=5 P=0.11
		Iraqi	43 (8.6)		
	Heart disease	Iranian	158 (31.6)		
		Iraqi	158 (31.6)		

	Hypertension	Iraqi	149 (29.8)		
		Iranian	136 (27.2)		
	Kidney disease	Iraqi	129 (25.8)		
		Iranian	30 (6.0)		
	Diabetes	Iraqi	39 (7.8)		
		Iranian	120 (24.0)		
	Other cases	Iraqi	109 (21.8)		
		Iranian	18 (3.6)		
History of Covid-19	Yes	Iraqi	31 (6.2)		Chi-square: 5.42 df=1 P=0.001
		Iranian	165 (33.0)		
	No	Iraqi	98 (19.6)		
		Iranian	335 (67.0)		
		Iraqi	402 (80.4)		

The results showed that in general, the mean \pm standard deviation of the knowledge score concerning COVID-19 in patients with chronic diseases referred to clinics affiliated to teaching hospitals in Iran and Iraq was 7.22 ± 1.66 out of 16. Also, the mean \pm standard deviation of the knowledge score concerning COVID-19 in

Iranian and Iraqi patients was 7.40 ± 1.54 and 7.03 ± 1.79 , respectively ($p > 0.05$). The results of the independent t-test showed no statistically significant difference between Iranian and Iraqi patients in terms of mean knowledge score concerning COVID-19 ($p = 0.63$) (**Table 2**).

Table-2: Mean of knowledge score towards Covid-19 among patients with chronic diseases who referred to teaching hospitals in Iran and Iraq.

Knowledge score	Number	Mean \pm SD	P-value*
Iranian patients	500	7.40+1.54	T=0.41
Iraqi patients	500	7.03+1.79	P=0.63

Independent t-test, SD: Standard deviation.

The results showed that in general, the mean \pm standard deviation of the attitude score regarding COVID-19 in patients with chronic diseases referred to clinics affiliated to teaching hospitals in Iran and Iraq was 26.96 ± 5.49 out of 14. The mean \pm standard deviation of the attitude score regarding COVID-19 in Iranian and Iraqi

patients was 27.30 ± 3.58 and 26.62 ± 6.72 , respectively. The results of the independent t-test showed no statistically significant difference between Iranian and Iraqi patients in terms of mean attitude score towards COVID-19 ($p = 0.36$) (**Table 3**).

Table-3: Mean of attitude score towards Covid-19 among patients with chronic diseases who referred to teaching hospitals in Iran and Iraq.

Attitude score	Number	Mean \pm SD	P-value*
Iranian patients	500	27.30+ 3.58	T=1.12
Iraqi patients	500	26.62+6.72	P=0.36

Independent t-test, SD: Standard deviation.

The results showed that in general, the mean \pm standard deviation of the performance score towards COVID-19 in patients with chronic diseases referred to clinics affiliated to teaching hospitals in Iran and Iraq was 3.99 ± 1.29 out of 15. The mean \pm standard deviation of the performance score concerning COVID-19 in Iranian and Iraqi patients was $4.1 \pm$

31.03 and 3.67 ± 1.32 , respectively. The result of the Mann-Whitney test showed a statistically significant difference between Iranian and Iraqi patients in terms of mean performance score regarding COVID-19 ($p < 0.05$). So, the performance score of Iranian patients was 0.64 higher than that of Iraqi patients (**Table 4**).

Table-4: Mean of practice score towards Covid-19 among patients with chronic diseases who referred to teaching hospitals in Iran and Iraq.

Practice score	Number	Mean \pm SD	P-value*
Iranian patients	500	4.31+1.03	Z=2.89
Iraqi patients	500	3.67+1.32	P=0.03

Mann-Whitney U test, SD: Standard deviation.

4- DISCUSSION

The results of the present study showed that the COVID-19 knowledge score was lower than the average optimal range in both groups (Iranian and Iraqi populations). These results were inconsistent with the study by Saeed et al. (2021). They compared KAP of patients with chronic diseases in two age groups in India, i.e., over and under 50 years of age, and did not report a significant difference (20). This inconsistency is attributed to demographic differences and the different types of the instrument used in these studies. Consistent with the results of the present study, the results of a study by Akalu et al. (2020) in Ethiopia showed that 33.9% of the participants with chronic disease have poor COVID-19 knowledge (3). This consistency can be attributed to the almost equal mean age range in Akalu's study (56.5 ± 13.5 years), and the present study (54.08 ± 11.13 years), and also the use of the same instrument. The results of the study by Addis et al. (2021), also showed that out of 413 people with chronic diseases in Ethiopia, more than 65% of them had poor or moderate COVID-19 knowledge (6). Studies

conducted in Iran and Iraq on the KAP of different groups towards COVID-19 showed different and sometimes contradictory results. For example, Erfani et al. (2020) in a cross-sectional study investigated KAP towards COVID-19 in 8,591 individuals over 15 years of age and reported a moderate COVID-19 knowledge score (8). However, Saeed et al. (2020) carried out a cross-sectional study titled "Correlation of social and demographic characteristics with knowledge and practice regarding COVID-19" on 909 participants over 18 years of age in Mosul, Iraq, and reported an above-average COVID-19 knowledge score (14). The results of the present study were inconsistent with the study by Lee et al. (2021) who investigated the KAP towards COVID-19 in South Korea (7). This inconsistency may be due to social, economic, and educational differences of the participants as well as the differences between the study groups in the two studies. The present study investigated KAP in patients with chronic diseases, but Lee et al.'s study was performed on normal individuals. The results of the present study showed that the mean \pm standard deviation of the COVID-19 attitude score

in Iranian and Iraqi patients was 27.30 ± 3.58 and 26.62 ± 6.72 , respectively ($p=0.36$). The maximum attitude COVID-19 score obtained in the present study was 56. In other words, both Iranian and Iraqi research subjects had no optimal COVID-19 attitude status which is consistent with the results of the study by Akalu et al. (2020). Akalu et al. investigated the KAP towards COVID-19 in 404 patients with chronic diseases at a hospital in Northwestern Ethiopia. With regard to the COVID-19 attitude score, 36.1% of the participants stated that they had a moderate risk of developing COVID-19. Also, 51.7% of participants believed that preventive behaviors regarding COVID-19 were very difficult (3). This consistency may be due to the similarity of the study groups in terms of chronic disease. However, patients with chronic diseases in developing countries experience the same needs and concerns about a variety of diseases, including COVID-19. This can affect their attitudes towards disease prevention and health-oriented behaviors.

These results were inconsistent with the study by Sah et al. (2020) titled "KAP towards COVID-19 in cancer patients" in Central Nepal. This study was performed on 224 cancer patients in the early phase of COVID-19 quarantine. COVID-19 attitude score of the research subjects was investigated and the results showed that 81% considered themselves to be at risk of COVID-19, 69% were worried about getting the disease from relatives or the medical staff, and 90% of them had a positive attitude towards isolation (21). This discrepancy may be due to the use of a different instrument. A 14-item attitude instrument was used in the present study, but a four-item attitude instrument was used in Sah et al.'s research. Normally, due to the small number of questions, some attitude dimensions may not be measured. The results of the present study showed that the mean \pm standard deviation of

COVID-19 performance score in Iranian and Iraqi patients was 4.1 ± 31.03 and 3.67 ± 1.32 , respectively ($p < 0.03$). The maximum COVID-19 performance score obtained in the present study was 15. In other words, the research subjects in both Iranian and Iraqi populations had no optimal COVID-19 performance score. These results are consistent with the results of a study by Nguyen et al. (2021) that investigated KAP towards COVID-19 and its associated factors in Vietnam. This cross-sectional study was performed on 2,769 patients aged 18-90 years in a university hospital in Ho Chi Minh City.

The results showed that 93.7% of patients had an optimal COVID-19 knowledge score but only 57.7% had a good COVID-19 performance score (22). This study revealed that the COVID-19 performance score was higher than the average level, but the COVID-19 performance score of the present study was lower than the average level. This discrepancy may be due to different mean ages, differences in participants' educational levels, and the use of different instruments in the two studies. It should be noted, however, that the results of both studies on the inadequate and non-optimal COVID-19 performance scores in research subjects are consistent, which may be due to the difficulty of adhering to practical protocols during the long quarantine period and social constraints. Whenever people are supposed to engage in relatively strict health behaviors over a long time, they are more likely to become tired after a while and follow practical protocols less frequently.

In a study by Pal et al. (2020) titled "KAP towards COVID-19 of 212 young adults with type 1 diabetes in India", the mean of patients' age was 25.1 ± 4.3 years. The results of this study showed that 51% of the research subjects left their houses during quarantine and all of them (100%) used masks. A total of 49% of them left their houses not for purchasing diabetes-

related equipment and supplies. A total of 96% of them observed social distancing and 100% of them washed their hands. These results indicate the optimal performance of participants in most functional areas (23). The inconsistency between the results of this study and the present research may be related to age and education. The mean age of the participants in the present study and Paul et al.'s study was over 50 and 25 years, respectively. On the other hand, more than 70% of the patients in the Pal et al.'s study had a bachelor's degree or higher, which could certainly have a positive effect on their healthy COVID-19 preventive behaviors. Although the two groups of Iranian and Iraqi patients were different from each other in terms of all three variables related to KAP, this difference was significant only in terms of the performance variable. The important goal in health education and health promotion programs is behavior change in practice. In fact, change is the intended result of education. It can be stated that an educational program has achieved its goals when its target group achieves the intended behavior change and appropriate performance.

5- CONCLUSION

The results showed that the mean knowledge score concerning COVID-19 in patients with chronic diseases referred to clinics affiliated to teaching hospitals in Iran and Iraq was 7.22 ± 1.66 out of 16 ($p > 0.05$). Also, the mean attitude score regarding COVID-19 in patients was 26.96 ± 5.49 out of 14 ($p = 0.36$). The results showed that in general, the mean performance score towards COVID-19 in patients was 3.99 ± 1.29 out of 15 ($p < 0.03$), and this difference was statistically significant. It means that the mean scores of knowledge, attitude, and practice in both groups were unfavorable, but the level of practice in Iranian patients was better than in Iraqi patients.

6- AUTHORS' CONTRIBUTIONS

Study conception or design: AJ, HZ, and ZJ; Data analyzing and draft manuscript preparation: AJ, and HB; Critical revision of the paper: AJ, and HZ; Supervision of the research: HZ and ZJ; Final approval of the version to be published: AJ, HZ, ZJ, and HB.

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8- CONFLICT OF INTEREST: None.

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