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Original Article

Knowledge, attitude and practice towards COVID-19 among healthcare workers in Iraq

Ru'ya Abdulhadi Al-Rawi[1]

Abstract

Background: In the absence of effective treatment, coronavirus disease (Covid-19) poses severe risks to public health. This study aimed to explore the knowledge, attitude, and practice towards the COVID-19 pandemic among healthcare workers.

Methods: An online approach was adopted to conduct a cross-sectional study from 1st to 31st October 2020 among Iraqi healthcare workers in Anbar Province, west of Iraq. A semi-structured and self-administered questionnaire was recruited to collect the data. The study tool contains four parts sociodemographic, knowledge, attitude, and practice assessment. Multiple Linear regression was performed to test the association between the dependent and the independent variables. SPSS version 16 was used to analyze the data, and the statistical significance level was considered at less than 0.05 p-values.

Results: A total of 209 health workers were included in this study. Most of the respondents (54.5%) were Doctors (Physician, dentist, and pharmacist), males (60.8%), married (74.2%), aged less than 45 years (53.1%), urban region (64.6%), with a monthly income of USD 400 and above (61.7%) and 75.1% of them perceived their health good. The mean knowledge, attitude, and practice level of participants were 14.43 (± 2.01), 27.68 (± 2.74), and 4.33 (± 0.97), respectively. In the regression analysis, doctors (P-value = 0.000) aged 45 years and above (P-value=0.008) and urban residents (P-value=0.007) were significantly associated with upper knowledge scores. Female gender (P-value =0.022) was significantly related to positive attitude scores. While married (P-value = 0.038), those with experience of 10 years and above (P-value=0.041) showed better practice.

Conclusion: The level of knowledge, attitudes, and practices of healthcare workers in Anbar Province was adequate. However, with the expected new waves of pandemics, the policy of continuous training to update healthcare workers is inevitable to control and prevention of COVID-19.

Keywords: COVID-19, Knowledge, Attitude, Practice, Healthcare Workers, Anbar, Iraq

Background

Almost all world countries have been invaded by the covid-19 pandemic, regardless of economic power, the quality of services, and the availability of human and logistical resources for health. Since the World Health Organization announced that the epidemic had turned into a pandemic on March 11, 2020, the world should have prepared to meet successive waves [1,2]. The most prominent means of addressing the pandemic were the sustainable health system and health education. Therefore, the success of countries in responding to the pandemic depends on the integrity of the health system infrastructure and the

competence of health workers. Several studies have been conducted to evaluate the knowledge, attitude, and practice of the population and healthcare workers towards the COVID-19 pandemic [3-13]. Most surveyed people showed acceptable KAP towards COVID-19 [14-17]. The biggest challenge was to ensure the competence of health personnel to face the pandemic. Lake et al. [3] systematically reviewed eleven studies concerned with evaluating the KAP toward COVID-19 among health professionals. The authors found that respondents have good knowledge, positive attitude, and bad practices on average 79.4%, 73.7%, and 40.3%, respectively. Service providers bear an additional burden and greater responsibility than the rest of society due to the direct confrontation with the pandemic and the high possibility of infection. Mbachu et al. [4] found that 48.64% of health professionals were negatively affected by COVID-19.

*Correspondence: ruyasaeed73@gmail.com
[1]Department of Family and Community Medicine, Faculty of Medicine, Anbar University, Iraq
A full list of author information is available at the end of the article

Moreover, Asdaq et al. [5] concluded that practicing healthcare professionals toward COVID-19 has improved significantly with increasing the knowledge and attitude. Iraq has witnessed multiple epidemic waves since the first case was announced in March 2020 [18]. Despite the weakness of the health system [19], healthcare providers showed their interest in taking responsibility for responding to the pandemic. However, the risks in the workplace have escalated with the increasing spread of COVID-19 across Iraq. Most healthcare workers are exposed to COVID-19 infection due to direct contact with patients [20]. The International Red Cross and Red Crescent (ICRC) report indicate that Iraqi healthcare workers' workplace is not safe. Many Iraqi health care workers have become the target of unjustified physical and verbal violence by patients and their relatives [21]. Iraq already has a high turnover intention among healthcare workers [22,23]. Therefore, the situation could worsen due to the battle to contain the Covid-19 pandemic, especially in the absence of scientific competencies that handle crisis management. This study aimed to assess the knowledge, attitude, the practice of Iraqi healthcare workers toward the COVID-19 pandemic.

Methods
Study population
A cross-sectional study designed to evaluate healthcare workers' knowledge, attitude, and practice towards the COVID-19 pandemic. Data was collected using a self-administered survey from October to December 2020 in Anbar province, Western Iraq. The current study is part of a larger research initiative [14-16], in which we recruited a web-based survey to explore the knowledge, attitude, and practice among the general population.

Inclusion and exclusion criteria
Both private and public healthcare workers (Academic and non-academic sectors), whatever the gender and willingness to participate, are invited to participate in this study. At the same time, employees in the health unit, such as recorders, cleaners and porters, students, and those not willing to participate or provided incomplete data, were excluded from the study.

Sample size
The sample size calculator arrived at 195 participants, using a margin of error of $\pm$ 7%, a confidence level of 95%, and a 50% response distribution [24]. Non-response correction = 10%. Thus, the total sample size was (195+20) 215. Supervision during the data collection phase was ensured in all stages. After excluding six incomplete documents, the sample was 209 for final analysis.

Study instrument and data collection
In this study, an earlier tried semi-structured and self-administered questionnaire was modified and recruited to collect the data [3-13]. Media such as WhatsApp have been employed to distribute the Google form link among social groups, including healthcare workers. The questionnaire was written in the English language, and then it was translated into the Arabic language. Fifteen respondents (not included in the study) were used to test pilot the study tool. The first page of the questionnaire contains full details of the purpose of the study and how to answer the questions, along with "assurance

of the freedom to participate or withdraw and that all information and opinions submitted would be anonymous and confidential". Moreover, there will be a consent form that must be signed before respondents are allowed to participate in the study. The questionnaire was divided into four sections. The first section was about the participants' social and demographic characteristics, including age, gender, marital status, place of residency, occupation, income level, and self-rated health status. The second, third, and fourth sections include 17,7,5 close-ended questions to test the healthcare knowledge, attitude, and practice about COVID-19.

Independent variables
For sociodemographic variables, gender was coded as one for females and zero for males. The age variable was reported in five groups: "25–34", "35-44", "45-54", "55-64", and ">64" years old. Moreover, the age was categorized into two categories: zero for less than 45 years and one for 45 years and above. Marital status was captured as binary, and a value of one was used for married and zero for otherwise (unmarried). Place of residency coded as zero for rural and one for urban. Monthly income (Iraqi Dinar (IQD)1 = United State Dollar (USD) 0.0008, the exchange rate on October 15, 2020) was divided into two categories: less than USD 400 and more than USD 400.

The occupation was recorded and coded into "one" for doctors (physician, dentist, pharmacist) and the code of "zero" for axillary staff (nurses, laboratory scientists, etc.). Years of experience categorized into "less than ten years" and has given the code of "zero" and code of "one" has given to the experience of "10 years and above". The self-rated health status was reported on a scale ranging from "very bad" to "very good," a scale ranging from "1" to "5". Moreover, the self-rated health status was categorized into poor health (very bad, bad, moderate) and good health (good and very good).

Dependent variables
Three options, "true/false/I do not know," were appointed to determine the answers have given in response to knowledge-related questions. Each correct response was given a "1" point code, while the incorrect and unknown responses were given "0" points. The overall knowledge score ranged from zero to 17, with higher scores indicating better knowledge of COVID-19. Items were evaluated for internal reliability using Cronbach's alpha. Cronbach's alpha coefficient was 0.72, indicating internal reliability.

Likert scale was recruited to calculate the respondents' answers on the questions related to attitude toward COVID-19: "1=strongly disagree, 2=disagree, 3=undecided, 4=agree, and 5=strongly agree". Scores were calculated by averaging respondents' answers to the seven statements. Total scores ranged from seven to 35, with high scores indicating positive attitudes. The Likert scales were assessed for internal reliability, using Cronbach's alpha. Cronbach's alpha coefficient was 0.78, indicating internal reliability. The options "yes" or "no" allowed respondents to rank their practice toward COVID-19 infection. Each answer that reflected good practice was given one score, and a score of zero was given for answers that reflected bad practice. The total score ranged from zero to five, with high scores indicating better practices.

Statistical analysis

Univariate analysis was recruited to tabulate the frequency of social and demographic statistics. Numerical variables like age were summarized using mean and standard deviation. Age was further categorized during the analysis. Categorical variables such as gender, age group, marital status, tribe, profession, denomination, and years of experience were summarized using frequency and percentages. An independent sample t-test was used to assess differences in mean values for KAP scores. A multivariable linear regression analysis was performed to identify knowledge, attitudes, and practice factors. All analyses were conducted using SPSS version 16.

Results

Sociodemographic factors

A total of two hundred and nine respondents were included in the study. Most of them were men (60.8%), aged less than 45 years (53.1%), married (74.2%), and residents in the urban region (64.6%). Doctors (physicians, dentists, and pharmacist) constitute more than half (54.5%) of the surveyed sample, with a monthly income of USD 400 and above (61.7%), and 75.1% of them perceived their health good (Table 1).

Table 1: Social and demographic characteristics of the study participants (n=209)

Variables	Category	Number (%)
Gender	Male	127 (60.8)
	Female	82 (39.2)
Age group	< 45 years	111 (53.1)
	45 years and more	98 (46.9)
Marital status	Married	155(74.2)
	Single	54 (25.8)
Area Residence	Urban	135 (64.6)
	Rural	74 (35.4)
Occupation	Doctors	114(54.5)
	Axillary staff	95(45.5)
Years of experience	Ten years and more	126 (60.3)
	<10 years	83 (39.7)
Level of income	$ 400 and above	129(61.7)
	$ <400	80 (38.3)
Self-rated health status	Good health	157 (75.1)
	Poor health	52 (24.9)

Descriptive statistics of KAP scores

As shown in Table 2, the knowledge score (14.43 ± 2.01, range: 0-17) having an overall 85.12% (14.47/17*100) of correct rate was significantly varied across residency occupation, years of services, income level, and self-ranked health status (P <0.05). The mean attitude score for COVID-19 was 27.68 (SD = 2.74, range: 7-35), indicating positive attitudes and significantly varied across gender (P <0.05). The mean score for practices for COVID-19 was 4.33 (SD = 0.97, range: 0–5), indicating good practices and significantly varied across marital status and years of services (P <0.05).

KAP scores by social and demographic characteristics

Table 3 presents the mean of KAP scores towards COVID-19 by different social and demographic characteristics in Iraq. Knowledge scores significantly differed across occupation, years of services, income level, and self-ranked health status.

Gender has been shown as an influential factor in attitude scores, while marital status and years of service influenced the practice scores (P <0.05).

Regression results of KAP-related factors

Regression analysis showed that doctors (P-value = 0.000, <0.05), aged 45 years and above (P-value=0.008, <0.05) and urban residents (P-value=0.007, <0.05) were significantly associated with upper knowledge score. Female gender is significantly associated with positive attitude scores. Regarding practice score, married (P-value = 0.038, <0.05), and those with experience of 10 years and above (P-value=0.041, <0.05) had better practice (Table 4).

Discussion

The healthcare workers in Anbar province showed high awareness of the COVID-19 epidemic. The correct answer rate on the knowledge side was 85.12%, with a positive attitude (79.10%) and adequate use of preventive practices (86.60%). Participants in our study demonstrated a good knowledge of the clinical symptoms related to COVID-19 infection, such as high fever, cough, fatigue or myalgia, and shortness of breath. Moreover, most of them were well aware of the effectiveness of hygiene principles such as wearing medical masks, regular hand washing, use of sanitizer, isolation from patients, self-isolation in homes, maintaining social distancing, and covering mouth and nose during coughing and sneezing as effective means to prevent and limit the spread of the coronavirus. Similar findings were reported in several earlier studies conducted in Baghdad [25] and in other different countries such as Nigeria [4], Saudi Arabia [5], Nepal [6], South Korea [7], Chine [8], Ethiopia [9], Pakistan [10], Egypt [11], Greece [12], and Vietnam [13]. When the study samples were collected, coronavirus information constantly spread globally across various social media. Therefore, the closest explanation for the encouraging results in this study is the multiplicity of information sources with the keenness of healthcare workers to learn about the pandemic and take the necessary protection measures at the personal and societal levels. Unsurprisingly, older doctors, dentists, and pharmacists demonstrated greater knowledge about COVID-19 than their fellow health care workers. This can be attributed to many reasons, including the curriculum, the accumulated experience, and the scientific dilemma related to Coronavirus. Moreover, it is the professional responsibility of the doctors to be familiar with the characteristics of the disease, the ways of transmission, and how to protect people from being contracted. Our findings align with an earlier study conducted in Lebanon [26]. The authors found that physicians aged 40 and over were 2.16 times more likely to have good knowledge than physicians under 40. In the linear regression analysis, women showed a more positive attitude (P=0.022) toward COVID-19 than men. Several previous studies [14-16,27-31] reported higher morbidity and mortality rates among men than women. Peckham et al. [28] found that the likelihood of needing an intensive therapy unit is approximately three times higher for men than for women. The results of our study coincide with the results of previous studies conducted by Galasso et al. [30] and de la Vega et al. [31], which confirmed that women take the COVID-19 pandemic more seriously and adhere to the standards of protection from the coronavirus more than men.

Table 2: Number of questions, range, scores, and levels of knowledge, attitude, and practice

Variables	Number of questions	Range of score	Total scores (mean ± SD)	Accuracy rate (%)
Knowledge	17	0-17	14.43± 2.01	85.12
Attitude	7	7-35	27.68 ± 2.74	79.10
Practice	5	0-5	4.33 ± 0.97	86.60

Table 3: KAP scores by sociodemographic and economic characteristics (n=209)

Variables	Categories	Total (%)	Knowledge score (mean ± SD)	p-value	Attitude score (mean ± SD)	p-value	Practice score (mean ± SD)	p-value
Gender	Male	127 (60.8)	14.34 ±2.30	0.235	27.35 ±2.71	0.026	4.26±1.01	0.165
	Female	82 (39.2)	14.69±1.79		28.21 ±2.72		4.45±0.85	
Age	< 45 years	111 (53.1)	14.26±1.95	0.115	27.82 ±2.68	0.448	4.36±0.95	0.688
	45 and above	98 (46.9)	14.72±2.28		27.53±2.81		4.31±1.00	
Marital status	Married	155(74.2)	14.61±2.18	0.139	27.64 ±2.62	0.685	4.25±1.04	0.023
	Unmarried	54 (25.8)	14.11±1.90		27.81 ±3.09		4.59±0.69	
Residency	Urban	135 (64.6)	14.89±2.00	0.000	27.47 ±2.81	0.121	4.31±0.99	0.633
	Rural	74 (35.4)	13.72±2.12		28.08 ±2.57		4.38±0.93	
Occupation	Doctors	114 (54.5)	15.87±0.79	0.000	27.76 ±2.75	0.649	4.25±1.08	0.190
	Axillary staff	95(45.5)	12.71±1.64		27.59±2.73		4.43±0.82	
Years of services	Ten years and above	126 (60.3)	14.13±1.90	0.035	27.69 ±2.71	0.927	4.22±1.09	0.039
	<10 years	83 (39.7)	14.71±2.22		27.66 ±2.70		4.51±0.72	
Income level	$ 400 and above	129 (61.7)	14.70±2.02	0.039	27.64 ±2.79	0.746	4.32±0.95	0.748
	< $ 400	80 (38.3)	14.11±2.23		27.76 ±2.66		4.36±1.00	
Self-ranked health status	Good health	157 (75.1)	14.78±2.03	0.000	27.63±2.76	0.624	4.29±1.01	0.280
	Poor health	52 (24.9)	13.56±2.13		27.85 ±2.71		4.46±0.83	

Table 4: Regression results of KAP-related factors for COVID-19 (n=209)

Variable	B	SE	Beta	t	*P*-value	95% CI lower-Upper	Tolerance	VIF
Knowledge (Durbin-Watson= 1.865)								
Doctors (VS Axillary staff)	3.101	0.179	0.770	17.334	0.000	(2.748,3.453)	0.927	1.079
45 and above (VS < 45 years)	0.309	0.178	0.077	1.735	0.008	(0.042,0.659)	0.934	1.071
Urban (VS Rural)	0.343	0.189	0.082	1.809	0.007	(0.031,0.716)	0.896	1.116
Attitude (Durbin-Watson= 1.798)								
Female (VS male)	0.912	0.396	0.163	2.304	0.022	(0.131,1.692)	0.940	1.064
Practice (Durbin-Watson= 1.754)								
Married (VS Unmarried)	0.277	0.159	0.125	1.739	0.038	(0.037,0.590)	0.908	1.007
10 years and above (VS < 10 years)	0.209	0.142	0.105	1.467	0.041	(0.072,0.489)	0.951	1.105

In line with previous studies [14,16, 32], regression analysis showed that married (P=0.038) and those who have experience of 10 years and above (P=0.038) showed an optimistic attitude towards the COVID-19 pandemic. Moreover, senior health professionals have acquired the skills and knowledge to act wisely when dealing with health crises such as the COVID-19 pandemic [33]. Shi et al. [8] found that among the determinants of knowledge, attitude, and practice toward the COVID-19 were practical experience and continuous training. The study complained of some limitations, including the cross-sectional study design, which cannot establish a causal relationship between the variables. The study was conducted in one Iraqi province; therefore, the results would not be nationally generalized. The web-based study may be subject to response bias because the author does not have information on non-responders, especially those who have difficulty accessing the Internet.

Conclusion

In conclusion, Iraq healthcare workers in Anbar province had adequate knowledge, attitude, and practice towards the COVID-19 pandemic. In the regression analysis, age, gender, marital status, place of residence, occupation, years of experience, and income, were the most determinants of knowledge, attitudes, and practices toward the coronavirus. Doctors (physician, dentist, and pharmacist) showed higher knowledge levels than nurses and auxiliary staff. Therefore, we suggest that the Health Directorate take additional measures to train and qualify all employees to prepare for emergencies and face any environmental or health disaster.

Abbreviation
COVID-19: Coronavirus Disease 2019, KAP: Knowledge, Attitude and Practice; ICRC: The International Red Cross and Red Crescent; PSU: Postgraduate Studies Unit; IQD: Iraqi Dinar; USD: United State Dollar

Declaration
Acknowledgment

Funding

Availability of data and materials
Data will be available by emailing ruyasaeed73@gmail.com

Authors' contributions
Ru'ya Abdulhadi Al-Rawi is the responsible for the concept, design, literature search, data analysis, and data acquisition, manuscript writing, editing, and reviewing. Author has read and confirmed the final draft.

Ethics approval and consent to participate
We conducted the research following the Declaration of Helsinki. The ethical protocol was approved by the Ethics Committee of the Scientific Issues and Postgraduate Studies Unit (PSU), College of Medicine, University of Anbar (Ref: SR/368 at 19-July-2020). Moreover, web-based informed consent was obtained from each participant after explaining the study objectives and the guarantee of secrecy.

Consent for publication
Not applicable

Competing interest
The authors declare that they have no competing interests.

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Author Details
[1]Department of Family and Community Medicine, Faculty of Medicine, Anbar University, Iraq.

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