

Research Article

COVID-19 Knowledge and Perception Among HealthCare Professionals in Two Arabian Gulf Countries

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ABSTRACT

Introduction: The WHO announced on 30 January 2020 the respiratory tract infection outbreak caused by Coronavirus 2019 (COVID-19) that was first recognized in China to be a global public health emergency. **Objective:** To investigate healthcare professional's knowledge and awareness about COVID-19. **Methods:** The study was conducted across four hospitals in Saudi Arabia and two hospitals in Kuwait. The questionnaire was completed between 18th May and the end of June 2020. **Results:** A total of 460 healthcare professionals completed the questionnaire, 37.8%(n=174) were males. The age of the participants ranged from 18 to 64 and 80.4% (n=370) of the participants were aged 34 or below. Official government websites 54.8% (n=252) and social media 43.3% (n=199) were the major reliable information sources related to COVID-19. only 37% (n=170) mentioned that the coronavirus disease could transmit through contact. In addition, only 42% (n=191) of the study participants had the correct knowledge about the incubation period of the disease. Moreover, 43.5% (n=200) of the participants were able to identify the symptoms of COVID-19. **Conclusion:** The study recommended the need to focus more on educational and awareness programs targeting all healthcare professionals to ensure the best practice and provide the optimal care.

Keywords: Awareness; COVID-19; Global Health Emergency; Healthcare Professionals; Knowledge; Novel coronavirus; Outbreak; Saudi Arabia; Kuwait

INTRODUCTION

The World Health Organization (WHO) announced on 30 January 2020 the respiratory tract infection outbreak caused by Coronavirus 2019 (COVID-19), first recognized in China to be a global public health emergency which poses a high risk to countries with inferior health systems. Since its outbreak, COVID-19 has resulted in 13, 616, 593 cases globally, with 267,061 in Saudi Arabia and 57,668 in Kuwait as of 17th July 2020

(WHO, 2020a). The emergency committee stated that COVID-19 could be controlled by timely identification, isolation, prompt treatment and the integration of a highly efficient contact management system (Sohrabi et al.,2020). No recent evidence from randomized controlled trials suggests any new treatment for those suspected or known to have COVID-19 disease (Alshammari, 2020). The FDA authorized the use of some medications approved for other diseases to be

used to treat hospitalized patients with COVID-19 when no other options are available. Two malaria drugs (hydroxychloroquine and chloroquine) and an antiviral drug, remdesivir, have been authorized for this emergency use (FDA, 2020, NIH, 2020). Favipiravir, a drug extensively tested for Ebola disease has been included in a number of ongoing trials, together with other antiviral drugs, such as lopinavir/ ritonavir (Alshammari, 2020).

Healthcare professionals are at the frontline facing COVID-19 outbreak and as such they are exposed to the risk of infection as well as psychological and physical distress. The lack of comprehensive knowledge of the disease among healthcare professionals can result in delayed medical attention and warrant infection spread. This is why the World Health Organization initiated procedures for raising global awareness and assessing risk (WHO,2020b). Moreover, exploring knowledge and perceptions that influence healthcare professionals to undertake precautionary behavior can also assist policy makers initiate proper measures to enhance both individual and community health. It is therefore important to understand people's knowledge and perceptions and to recognize their sources of information in order to communicate effectively and frame key strategies in response to the emerging pandemic (Zhong & Wong, 2004).

Two studies from China and Uganda with noticeable undesirable practice concluded that optimizing health awareness is of priority (Olum et al.,2020, Zhong et al., 2020). The first study conducted by Olum et al., sought to examine knowledge, attitude as well the practices (KAP) of health care professionals in Makerere University Teaching Hospitals in Uganda (Olum et al.,2020). The authors used an online cross-sectional descriptive approach delivered to study participants in four Makerere University Teaching Universities through WhatsApp Messenger. All the study participants were 18 years and above. The authors used a pre-validated questionnaire to assess the knowledge, attitude, and practices of the study population towards the coronavirus disease. The response rate of the study was 23%, and most of the participants were male (64%). Of the study participants, 62% were medical doctors, while 92% had at least a bachelor's degree. The outcome of the study showed that 69% of the study participants had adequate knowledge of the coronavirus disease, 21% had a positive attitude, 74% carried out good practices towards COVID-19 (Olum et al.,2020). Some of the factors associated with knowledge were age and news media. Age, together with holding a diploma were factors influencing good practices. Based on the study

findings, the authors note the need for continued professional education among healthcare professionals to enhance their knowledge, reduce negative attitudes, and encourage positive therapeutic as well as preventive practices (Olum et al.,2020). The other study conducted by Zhong et al., used a sample of Chinese residents to examine their knowledge, attitudes, and practices towards the coronavirus disease. The authors recruited the study sample through their networks, consisting of residents in Hubei, China. A KAP questionnaire was self-developed and completed by the participants. The questionnaire featured 12 questions related to the clinical features and prevention of the coronavirus disease. To assess the attitudes and the practices of the sample towards the coronavirus disease, the questionnaire included questions on their confidence in winning the battle against COVID-19 as well as the culture of wearing masks when going out. 65.7 of the study participants were women, 63.5% had a minimum of a bachelor degree, while 56.2% participated in mental labor. The outcome of the study revealed a correct rate of knowledge of 90%. Most of the respondents (97.1%) were confident that their country could win the battle against the coronavirus disease. Besides, almost all the participants (98.0%) wore masks whenever going out. The findings from multiple regression analyses also revealed that knowledge of the coronavirus disease was mostly associated with a lower chance of negative attitudes and the adoption of preventive practices that help deal with COVID-19. A majority of the study participants of a very high socioeconomic status, more so women, had very good knowledge on the coronavirus disease. Besides, this group of participants also held optimistic attitudes and engaged in the most appropriate practices towards COVID-19. The health education initiatives in China also focused on enhancing knowledge about the coronavirus disease, developing optimistic attitudes, and establishing suitable practices (Zhong et al., 2020). Recent research was conducted to measure the awareness and understanding of healthcare professionals about COVID-19. However, the research used a small sample size compared to similar research, indicated that the outcome must be interpreted with caution (Alshammari et al.,2020). With the above literature in mind, the aim of this study was to investigate healthcare professionals' knowledge and perceptions about COVID-19 in two Arabian gulf countries – Saudi Arabia and Kuwait.

MATERIALS AND METHODS

Study design, participants and setting: The study focused on investigating the various domains of

knowledge and perception of healthcare professionals towards COVID-19 in two Arabian gulf countries - Saudi Arabia and Kuwait. In order to achieve the study aim, a questionnaire consisting of a set of questions was adopted from another study published recently in the United Arab Emirates (Bhagavathula et al., 2020). The questionnaire was reviewed and modified by the emergency medicine consultant and distributed randomly via an online link using Google Forms. The modified questionnaire required around 5 minutes to be completed and was divided into three sections. The first section included the characteristics of the participants. The second section focused on participant's knowledge and perception of the COVID-19 disease. The final section identified the source of information among the participants. Where clarifications were needed, communication between the participants and the researcher was initiated.

The study participants included healthcare professionals working in a health institution. The study was conducted across four hospitals in Saudi Arabia and two hospitals in Kuwait. The online questionnaire was carried out between May 18th, 2020 and the end of June. The questionnaire was sent to any healthcare professional including physicians, pharmacists, nurses and those who work within the in-patient and outpatient settings. Professionals involved in this study worked in the adult or pediatric intensive care units, emergency departments, internal medicine department, dental department and all other hospital departments. The questionnaire was sent to a key healthcare professional in each of these areas to facilitate the distribution process. Since the questionnaire were

distributed through a key healthcare professional in each area, it was not possible to estimate the response rate as these numbers were largely unknown.

Statistical analysis: Collected data was analyzed using the SPSS software, version 25 (SPSS Inc., Chicago, IL, USA). Categorical variables were reported as frequencies and percentages. A Chi square test was carried out to analyze the categorical data. A confidence interval of 95% ($p < 0.05$) was applied to represent statistical significance of the results and the level of significance was assigned as 5%.

Ethical approval: Bioethical principles of Institutional review board (IRB log number with KACST, KSA: 20-0198) have been obtained and applied and considering the national regulations that govern the

RESULTS

Demographic characteristics of the study participants: A total of 460 healthcare professionals participated in the study (Table 1). The participants were distributed as follows - Kuwait ($n = 102$) and Saudi Arabia ($n=358$). The majority of participants were recruited from Saudi Arabia 77.8% ($n= 358$). Out of the participants, 62.2% ($n=286$) were female and 37.8% ($n=174$) were male. The age of the participants ranged from 18 to 64 and 80.4% ($n=370$) of the participants were either 34 years old or below. The majority of participants were pharmacists, physicians or other health care providers $n=111$ (24.1%), $n=107$ (23.3%), $n=136$ (29.6%), respectively.

Table 1: Demographic characteristics of the study participants

Variable	Overall (n=460)	Percentage (%)
Gender		
Female	286	62.2
Male	174	37.8
Age (years)		
18-24	146	31.7
25-34	224	48.7
35-44	62	13.5
45-54	23	5
55-64	5	1.1
Profession		
Pharmacist	111	24.1
Physician	107	23.3
Physiotherapist	28	6.1
Nurse	27	5.9
Dentist	23	5

Laboratory specialist	18	3.9
Dietitian	10	2.2
Other health care providers	136	29.6

COVID-19 information sources

Participants reported that official government websites 54.8% (n = 252) and social media (n = 199, 43.3%) were the most reliable sources of information related to COVID-19. Among the least used sources of information, were family members, colleagues, and friends (Figure 1). Majority of the participants 60.9% (n = 280)

reported attending a lecture or having discussions about the COVID-19 disease. In terms of healthcare professionals, those who reported attending lecturers or having discussion related to COVID-19, the most were laboratory specialists 94.4%, nurses 85.19% and dietitians 80% (Figure 2).

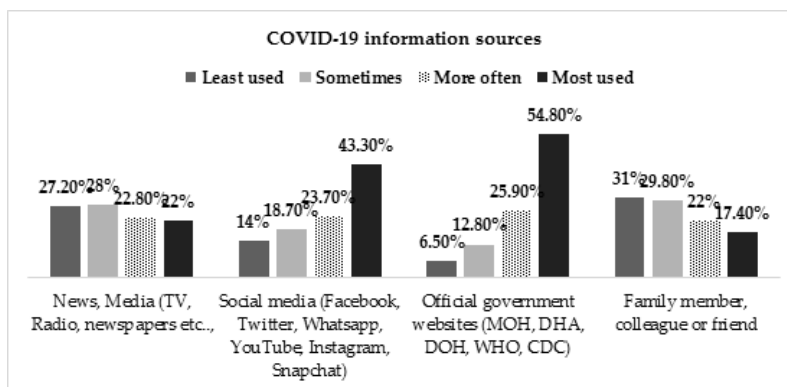


Fig.1: COVID-19 information sources reported by the study participants

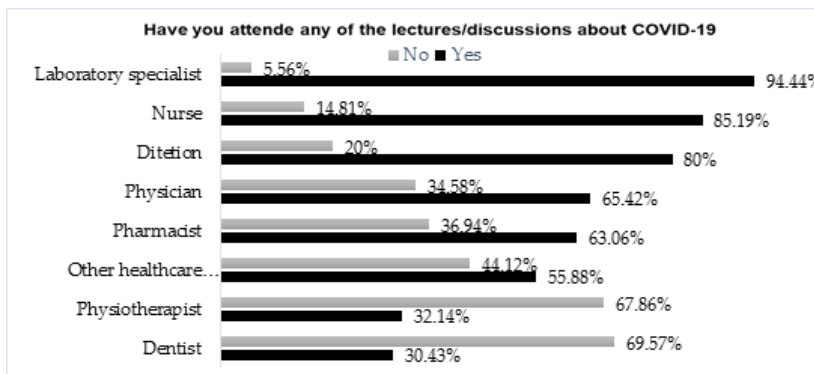


Fig.2: Attending COVID-19 lectures by profession

Knowledge about COVID-19

The results showed that over 42 % (n = 191) identified the incubation period of COVID-19 correctly. A considerable percentage 43.5% (n=200) of participants were able to identify the symptoms of COVID-19 correctly. However, most of the study participants 45.4% (n=209) were unable to identify skin rash as a symptom of COVID-19. Participants had very poor knowledge on the method of coronavirus disease transmission since only 37% (n=170) mentioned that the COVID-19 disease could transmit through contact. Moreover, 48% (n=221) of the participants were uncertain about the method of COVID-19

transmission. The vast majority of the participants 90% (n=413) identified the complications of the disease correctly, while less than 10% (n=47) only chose a single complication. Around 74% (n = 340) of the participants agreed that supportive care is the currently available treatment for COVID-19 and 5% (n =22) thought vaccination was the most viable treatment for COVID-19. A vast majority of the participants 88.3% (n=406) identified all the risk minimization measures. However, 11.3% (n=52) of the study participants identified only one risk minimization measure (Figure 3).

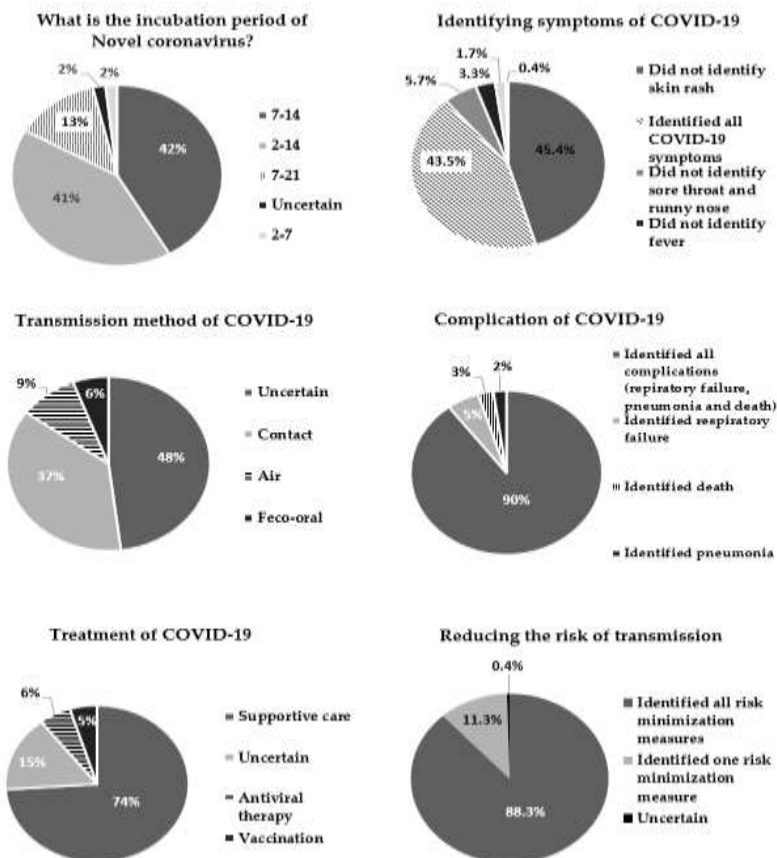


Fig.3: Descriptive analysis for the knowledge related questions

Perceptions about COVID-19

Overall, there was a positive perception of COVID-19 among all health care professionals in the two countries. Participants were asked to identify correct answers to the questions listed in table 2. Around 92.74% of the participants from Saudi Arabia as well as 85.29% from Kuwait believed that symptoms of the novel coronavirus may appear in as few as 2 days or as long as 14 after exposure (Figure 4). The majority of health care

professionals believed that the COVID-19 disease is not fatal and that there is possibility of survival after infection. A few of the health care professionals agreed that infected patients should not share the history of recent travel the percentage ranged between 0%-6.6% among health care professionals' specialties. In addition, only 14.6% (n= 67) of the health care professionals answered "true" when they were asked about washing hands only when they are visibly dirty.

Table 2: Healthcare professionals' perceptions of COVID-19

Variable	TRUE (%)	FALSE (%)	Chi-square value	P-value
Q1- It is believed that symptoms of the novel coronavirus may appear in as few as 2 days or as long as 14 after exposure. (TRUE)				
Country			5.417	0.02
Saudi Arabia (n=358)	332 (92.74%)	26 (7.26%)		
Kuwait (n=102)	87 (86.29%)	15 (14.71%)		
Gender			0.259	0.611
Male (n=174)	160 (91.9%)	14 (8.05%)		
Female (n=286)	259 (90.55%)	27 (9.44%)		
Age			2.272	0.686
18-24 years (n= 146)	132 (90.4%)	14 (9.6%)		
25-34 years (n= 224)	207 (92.4%)	17 (7.6%)		
35-44 years (n= 62)	54 (87%)	8 (12.9%)		

45-54 years (n=23)	21 (91.3%)	2 (8.7%)		
55-64 years (n= 5)	5 (100%)	0		
Profession			8.554	0.286
Pharmacist (n=111)	99 (89.2%)	12 (10.8%)		
Physician (n=107)	103 (96.3%)	4 (3.7%)		
Physiotherapist (n=28)	26 (92.8%)	2 (7.1%)		
Nurse (n=27)	24 (88.9%)	3 (11.11%)		
Laboratory specialist (n=18)	15 (83.3%)	3 (16.7%)		
Dentist (n=23)	22 (95.7%)	1 (4.3%)		
Dietitian (n=10)	10 (100%)	0		
Other health care provider (n=136)	120 (88.2%)	16 (11.76%)		
Q2- If anyone get the novel coronavirus, there is no possibility of survival. (FALSE)				
Country			1.373	0.241
Saudi Arabia (n=358)	22 (6.1%)	336 (93.9%)		
Kuwait (n=102)	3 (2.9%)	99 (97.1%)		
Gender			0.001	0.973
Male (n=174)	9 (5.2%)	165 (94.8%)		
Female (n=286)	16 (5.6%)	270 (94.4%)		
Age			0.919	0.922
18-24 years (n= 146)	8 (5.5%)	138 (94.5%)		
25-34 years (n= 224)	12 (5.4%)	212 (94.6%)		
35-44 years (n= 62)	3 (4.8%)	59 (95.2%)		
45-54 years (n=23)	2 (8.7%)	21 (91.3%)		
55-64 years (n= 5)	0	5 (100%)		
Profession			3.702	0.813
Pharmacist (n=111)	5 (4.5%)	106 (95.5%)		
Physician (n=107)	5 (4.7%)	102 (95.3%)		
Physiotherapist (n=28)	2 (7.1%)	26 (92.9%)		
Nurse (n=27)	2 (7.4%)	25 (92.6%)		
Laboratory specialist (n=18)	0	18 (100%)		
Dentist (n=23)	2 (8.7%)	21 (91.3%)		
Dietitian (n=10)	0	10 (100%)		
Other health care provider (n=136)	9 (6.6%)	127 (93.4%)		
Q3- If anyone had a flu shot, protection against the novel coronavirus is sufficient. (FALSE)				
Country			1.187	0.276
Saudi Arabia (n=358)	30 (8.4%)	328 (91.6%)		
Kuwait (n=102)	5 (4.9%)	97 (95.1%)		
Gender			1.1331	0.249
Male (n=174)	16 (9.2%)	158 (90.8%)		
Female (n=286)	19 (6.6%)	267 (93.4%)		
Age			13.646	0.009
18-24 years (n= 146)	20 (13.7%)	126 (86.3%)		
25-34 years (n= 224)	13 (5.8%)	211 (94.2%)		
35-44 years (n= 62)	2 (3.2%)	60 (96.8%)		
45-54 years (n=23)	0	23 (100%)		
55-64 years (n= 5)	0	5 (100%)		
Profession			12.497	0.085
Pharmacist (n=111)	3 (2.7%)	108 (97.3%)		
Physician (n=107)	7 (6.5%)	100 (93.5%)		
Physiotherapist (n=28)	3 (10.7%)	25 (89.3%)		
Nurse (n=27)	2 (7.4%)	25 (92.6%)		
Laboratory specialist (n=18)	1 (5.6%)	17 (94.4%)		
Dentist (n=23)	1 (4.3%)	22 (95.7%)		

Dietitian (n=10)	0	10 (100%)		
Other health care provider (n=136)	18 (13.2%)	118 (86.8%)		
Q4- If anyone has a fever, cough and difficulty breathing seek medical care early and share previous travel history with the health care providers. (TRUE)				
Country			2.161	0.142
Saudi Arabia (n=358)	344 (96.1%)	14 (3.9%)		
Kuwait (n=102)	101 (99.0%)	1 (1.00%)		
Gender			3.34	0.072
Male (n=174)	165 (94.8%)	9 (5.2%)		
Female (n=286)	280 (97.9%)	6 (2.1%)		
Age			1.321	0.858
18-24 years (n= 146)	142 (97.3%)	4 (2.7%)		
25-34 years (n= 224)	214 (95.5%)	10 (4.5%)		
35-44 years (n= 62)	61 (98.4%)	1 (1.6%)		
45-54 years (n=23)	22 (95.7%)	1 (4.3%)		
55-64 years (n= 5)	5 (100%)	0		
Profession			9.177	0.24
Pharmacist (n=111)	108 (97.3%)	3 (2.7%)		
Physician (n=107)	105 (98.1%)	2 (1.9%)		
Physiotherapist (n=28)	28 (100%)	0		
Nurse (n=27)	26 (96.3%)	1 (3.7%)		
Laboratory specialist (n=18)	17 (94.4%)	1 (5.6%)		
Dentist (n=23)	23 (100%)	0		
Dietitian (n=10)	10 (100%)	0		
Other health care provider (n=136)	127 (93.4%)	9 (6.6%)		
Q-5 As per WHO guidelines for the novel coronavirus, you ONLY need to wash your hands when they are visibly dirty. (FALSE)				
Country			1.161	0.281
Saudi Arabia (n=358)	49 (13.7%)	309 (86.3%)		
Kuwait (n=102)	18 (17.6%)	84 (82.4%)		
Gender			2.739	0.098
Male (n=174)	31 (17.8%)	143 (82.2%)		
Female (n=286)	36 (12.6%)	250 (87.4%)		
Age			6.227	0.183
18-24 years (n= 146)	26 (17.8%)	120 (82.2%)		
25-34 years (n= 224)	27 (12.1%)	197 (87.9%)		
35-44 years (n= 62)	10 (16.1%)	52 (83.9%)		
45-54 years (n=23)	2 (8.7%)	21 (91.3%)		
55-64 years (n= 5)	2 (40%)	3 (60%)		
Profession			22.363	0.057
Pharmacist (n=111)	11 (9.9%)	100 (90.1%)		
Physician (n=107)	10 (9.3%)	97 (90.7%)		
Physiotherapist (n=28)	6 (21.4%)	22 (78.6%)		
Nurse (n=27)	6 (22.2%)	21 (77.8%)		
Laboratory specialist (n=18)	2 (11.1%)	16 (88.9%)		
Dentist (n=23)	0	23 (100%)		
Dietitian (n=10)	0	10 (100%)		
Other health care provider (n=136)	32 (23.5%)	104 (76.5%)		

Subgroup analysis

According to participants who reported attending a lecture about COVI-19, it was checked whether country, gender, age or profession had an effect on attending any lectures or having discussions related to the COVID-19 pandemic. The outcome of the test showed that country $\chi^2 = 2.656$, ($p >$

.05) and gender, $\chi^2 = 0.00$, ($p > .05$) had no significant effect on attending lectures. However, age, $\chi^2 = 12.17$, ($p < .05$) and profession, $\chi^2 = 15.75$, ($p < .05$) had a significant impact on one's ability to attend a lecture or discussion related to the COVID-19 disease. Age had a positive and significant relationship with attending lectures,

where the vast majority of participants in 35-24 (79.03%), 45-54 (96.65%) and 55-64 (60%) age groups attended lectures. (Figure 5)

The study checked whether country, gender, age or profession had an effect on identifying the correct incubation period for COVID-19 disease. The results showed that gender, $\chi^2 = 8.327$, ($p > .05$), age, $\chi^2 = 23.874$, ($p > .05$) and profession, $\chi^2 = 18.053$, ($p > .05$) had no significant impact on identifying the correct incubation period of the novel coronavirus disease. However, country $\chi^2 = 25.357$, ($p < .05$) had a significant impact on the identification of the correct incubation period where participants from Saudi Arabia (44.97%) had more correct answers compared to participants from Kuwait (30.39%) (Table 3). Moreover, Chi-Square test were conducted to identify the weather country, gender, age and profession have an effect on correctly identifying the symptoms of novel coronavirus. Country, $\chi^2 = 2.723$, $p > .05$, gender, $\chi^2 = 2.207$, $p > .05$,

Age, $\chi^2 = 18.16$, $p > .05$ and profession, $\chi^2 = 30.456$, $p > .05$ had no significant impact on correctly identifying symptoms of novel coronavirus (Table 3).

Chi-square test was used to check whether country, gender, age and profession had an impact on the responses to the perception related questions. The outcome of the test showed that only two questions were impacted by the different factors examined. The country factor had a significant impact on this outcome, $\chi^2 = 5.417$, $p < .05$ (Table 2).

Moreover, age had a significant impact on the responses given for question 3, $\chi^2 = 13.647$, $p < .05$ and it reached to 100 % in age groups of 45-54 and 55-64 years old. The question was as follows: "If anyone had flu shot, is protection against the novel Coronavirus sufficient?" Also, there was a positive correlation between age and answering this question correctly, which means the correct answers percentage increased with the age (Figure 6).

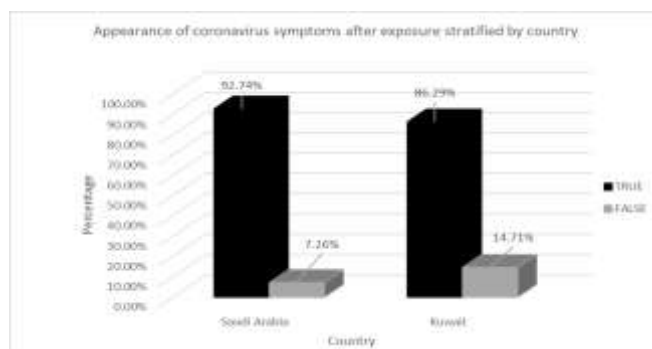


Fig.4: Appearance of coronavirus symptoms after exposure stratified by country

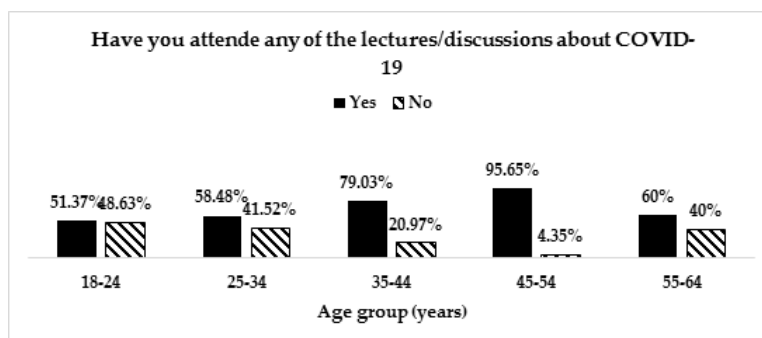


Fig.5: Attending COVID-19 lectures stratified by age group

Table 3: knowledge of COVID-19 by variables

Variable	Yes	No	Chi-square value	P-value
Identified the incubation period of COVID-19				
Country			25.357	0.000
Saudi Arabia (n=358)	153 (42.7%)	205 (57.3%)		
Kuwait (n=102)	38 (37.2%)	64 (62.8%)		
Gender			8.327	0.080
Male (n=174)	85 (48.9%)	89 (51.1%)		

Female (n=286)	106 (37%)	180 (63%)		
Age			23.874	0.092
18-24 years (n= 146)	51 (44%)	95 (56%)		
25-34 years (n= 224)	97 (43.3%)	127 (56.7%)		
35-44 years (n= 62)	29 (46.8%)	33 (53.2%)		
45-54 years (n=23)	10 (43.5%)	13 (56.5%)		
55-64 years (n= 5)	4 (80%)	1 (20%)		
Profession			18.053	0.925
Pharmacist (n=111)	51 (46%)	60 (54%)		
Physician (n=107)	48 (44.9%)	59 (55.1%)		
Physiotherapist (n=28)	9 (32.1%)	19 (67.9%)		
Nurse (n=27)	14 (51.9%)	13 (48.1%)		
Laboratory specialist (n=18)	9 (50%)	9 (50%)		
Dentist (n=23)	6 (26%)	17 (74%)		
Dietitian (n=10)	4 (40%)	6 (60%)		
Other health care provider (n=136)	50 (36.8%)	86 (63.2%)		
Identified the symptoms of COVID-19 correctly				
Country			2.723	0.436
Saudi Arabia (n=358)	152 (42.5%)	206 (57.5%)		
Kuwait (n=102)	48 (47%)	54 (53%)		
Gender			2.207	0.531
Male (n= 174)	88 (50.6%)	86 (49.4%)		
Female (n=286)	112 (39.2%)	174 (60.8%)		
Age			18.16	0.111
18-24 years (n= 146)	57 (39%)	89 (61%)		
25-34 years (n= 224)	94 (42%)	130 (58%)		
35-44 years (n= 62)	31 (50%0	31 (50%)		
45-54 years (n=23)	13 (56.5%)	10 (43.5%)		
55-64 years (n= 5)	5 (100%)	0		
Profession			30.456	0.083
Pharmacist (n=111)	37 (33.3%)	74 (66.7%)		
Physician (n=107)	58 (54.2%)	49 (45.8%)		
Physiotherapist (n=28)	9 (32.1%)	19 (67.9%)		
Nurse (n=27)	12 (44.4%)	15 (55.6%)		
Laboratory specialist (n= 18)	8 (44.4%)	10 (55.6%)		
Dentist (n=23)	13 (56.5%)	10 (43.5%)		
Dietitian (n= 10)	5 (50%)	5 (50%)		
Other health care provider (n=136)	58 (42.7%)	78 (57.3%)		

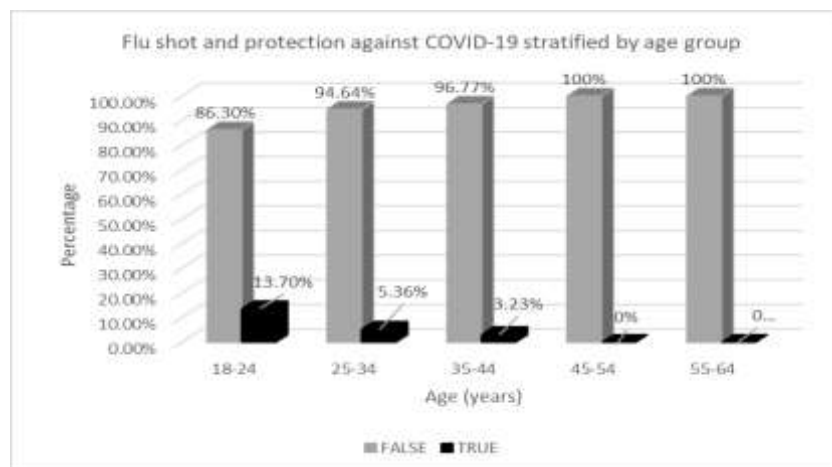


Fig.6: Flu shot and protection against COVID-19 stratified by age group

DISCUSSION

COVID-19 is a current global health crisis and considered an important topic of discussion in the world particularly among healthcare professionals. The spread of COVID-19 elevates the level of tension for everyone, including health administrators and the overall health care system. A major concern arises over how to best manage information to support healthcare professionals during such a public health crisis. Therefore, the study investigated the various domains of knowledge and perception of healthcare professionals towards the COVID-19 pandemic.

Our study revealed that healthcare professionals have fair knowledge about COVID-19. It was identified that around 54.8% (n=151) of healthcare professionals reported using official government websites as their main source of COVID-19 related information. This shows that the COVID-19-related information announced by the health authorities in the respective governments have been accessed and used by healthcare professionals. Obtaining information from reliable sources is essential for distributing reliable and unbiased material about COVID-19 which positively impacts the readiness and response of healthcare professionals. Nevertheless, around 43.4% (n=199) of healthcare professionals reported the use social media as an information source related to COVID-19. At present, there is a lot of information related to COVID-19 accessible over the internet, including unproven information, that can misguide healthcare professionals. A concern was raised regarding the extensive misinformation related to COVID-19 (Shimizu, 2020, Thomas, 2020). Accordingly, healthcare professionals must evaluate information related to COVID-19 carefully utilizing authentic, scientific and official sources of information. Similar results were found where 61% of healthcare professional used social media as their main source of information related to COVID-19. In line with the current study, a study conducted by Elham et al., conclude that the worldwide threat of the coronavirus disease continues to emerge and it is very important to enhance the knowledge and perceptions of healthcare professionals. Further noted that there is need for educational interventions to be developed as quickly as possible to reach health care professionals across the world (Bhagavathula et al., 2020).

The study findings indicate a fair knowledge compared to the current available information about COVID-19, particularly about the coronavirus disease incubation period, method of transmission and symptoms. Knowledge about the incubation period was correct in 41.7% of the participants. This result was similar to a multinational study that found that 40.4% of the

participants identified the estimated incubation period for COVID-19 correctly (Alhaj et al., 2020). Around 43% of the participants were uncertain about the symptoms of COVID-19 and surprisingly almost half of the participants were not aware of skin rash as a symptom of COVID-19. From the literature a study found that 32.1% could not identify skin rashes as a symptom related to covid-19 (Alshammari et al., 2020). Moreover, some healthcare professionals reported the availability of a vaccine. This was a disappointing as healthcare professional were expected to be aware of this issue especially with the availability of extensive resources offered by governments in order to educate and improve the knowledge of healthcare professional on the novel coronavirus disease.

Generally, this study found that the majority of participants had a positive perception towards the prevention and control of COVID-19. However, a minimal difference in the perceptions was identified among countries, gender, age groups and specialties of health care professionals. For instance, a vast majority of participants believed that the appearance of COVID-19 symptoms appeared as early as 2 or as late as 14 days and that COVID-19 was not fatal. They also believed in sharing the recent travel history when patients are infected and the importance of maintaining hand hygiene was highly recommended in the prevention and control of COVID-19 outbreak.

STRENGTH AND LIMITATION

This study has some limitations. The questionnaire was conducted in only three regions of Saudi Arabia, and only a small proportion of HCPs in each hospital were questioned. This approach to data collection may affect the generalizability of the study. A larger study sample would be useful to add to the results of this study. Additionally, this was an online questionnaire and the data obtained from this study was self-reported and heavily relied on the participants' ability to recall. Therefore, the data collected in this study may be subject to recall bias. Regardless of these limitations, the results of the study delivered valuable information regarding the knowledge, and perceptions of healthcare professionals during the period of the coronavirus pandemic.

CONCLUSION

This study has examined the knowledge and perception of healthcare professionals in Saudi Arabia and Kuwait toward COVID-19. The findings showed that the healthcare professionals have fair knowledge about the coronavirus pandemic based on the available information about the disease. Based on these findings, the

study recommends the need to focus more on educational and awareness programs targeting all healthcare professionals to ensure the best practice and optimal care.

AUTHOR CONTRIBUTIONS

Conceptualization, N.A, E.A and Al.A Y.Y.; methodology, N.A, E.A, Al.A and M.A; data collection, N.A, E.A, Al.A, M.A, A.A, Ab.A, An.A and Ah,A analysis, N.A, E.A, Al.A and M.A; data collection, N.A, E.A, Al.A, M.A, A.A, Ab.A, An.A and Ah,A ; data curation, ,N.A, E.A, Al.A.; writing—original draft preparation, N.A, E.A, Al.A and M.A; data collection, N.A, E.A, Al.A, M.A, A.A, Ab.A, An.A and Ah,A ; analysis, N.A, E.A, Al.A, M.A, A.A, Ab.A. An.A, Ah,A; writing—review and editing N.A, E.A and Al.A, project administration N.A, E.A and Al.A .All authors have read and agreed to the published version of the manuscript.

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