

# Evaluation Of Knowledge, Attitude and Practice During the COVID-19 Pandemic among the Public in Primary Health Care Center in Makkah Al- Mukarramah Saudi Arabia 2022

Areej Oweed Saeed Alharbi<sup>1</sup>, Nawaf Abdullah Alkathiri<sup>2</sup>, Ghalib Ibrahim Alsallmi<sup>3</sup>, Magbul Ali Saleh Al Magbul<sup>4</sup>, Fahad Salem Nasser AL Nasser<sup>5</sup>, Doaa Ahmed Alkhoudier<sup>6</sup>, Egbal Atiya Mashat<sup>7</sup>, Fatima Ahmad Abdulrashed<sup>7</sup>, Salma Khaled Baobaid<sup>8</sup>, Norah fahad albogami<sup>8</sup>, Amnah Side Ahmed<sup>8</sup>, Huda Ahmad Refai Alhusawi<sup>7</sup>, Hanin Saleh Alhelali<sup>8</sup>, Ohood majed marhomi<sup>7</sup>

<sup>1</sup>Bachelor degree in dental medicine and surgery (BDS), Aljumum Healthcare Cluster, Saudi Arabia.

<sup>2</sup>Anesthesia technician, Hera general hospital, Saudi Arabia.

<sup>3</sup>Pharmacy Technician, Maternity and Children Hospital in Makkah, Saudi Arabia.

<sup>4</sup>Health information technician, Thar General Hospital – Najran, Saudi Arabia.

<sup>5</sup>Pharmacy technician, Thar General Hospital - Najran, Saudi Arabia.

<sup>6</sup>Dental assistant, King Fahad hospital Madinah, Saudi Arabia.

<sup>7</sup>Nursing technician, Maternity and children hospital, Makkah, Saudi Arabia.

<sup>8</sup>Nursing Specialist, Maternity and Children Hospital, Makkah, Saudi Arabia.

## Abstract:

**Background:** The general Public compliance with preventive measures and legislation is mainly influenced by their knowledge level, attitude, and practices. This study evaluation the knowledge, attitude, and practices of public residents towards corona virus disease preventive measures in Makkah Al-Mukarramah Saudi Arabia 2022. On December 31, 2019, the World Health Organization (WHO) Regional Office in Wuhan City, Hubei Province, China, reported cases of pneumonia of an unknown cause. Most patients worked at or lived around the local Huanan seafood wholesale market, where live animals were also on sale. The symptoms ranged from those of a common cold to those of more severe diseases, such as Middle East respiratory syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV), which are examples of a large family of viruses called coronaviruses (CoV).

**Aim of the study:** To Evaluation of Knowledge, Attitude and Practice during the COVID-19 pandemic among the Public in primary health care center in Makkah Al-Mukarramah Saudi Arabia 2022.

**Method:** Cross sectional study, was conducted among Saudi Arabia Public in primary health care center in Makkah. The questionnaire collected socio-demographic characteristics, assessment of Knowledge, Attitude and Practice toward COVID-19. Our total participants were (300).

**Results:** shows regarding the age majority of the study groups were in the age range of (25 - 50%) years were (41.0%) the gender many of the respondents were male (58.0 %) education

status, the majority of the respondents had Postgraduate degree were (49.0%) while Occupation the most of the participants Students were (32.0%) the income The majority of them had an income from More than 5000SR-10000 were (40.0%) .

**Conclusion:** This study showed satisfactory knowledge, attitude, and practice towards corona virus disease-2019 in Saudi Arabia. The educational level is a dominant influencing factor for knowledge, attitude, and practice and three studies indicated that respondents have not good practices and followed such practices related to COVID-19. Good KAP is a tool that can hopefully be used to control the spread of COVID-19, in our Study participants not adequate knowledge, positive attitude, and acceptable practices towards COVID-19 Knowledge.

**Keywords:** Evaluation, Knowledge, Attitude, Practice, COVID-19, Public, primary health care, Makkah

## Introduction

COVID-19 has become a worldwide public health problem. No previous study has investigated factors associated with COVID-19 knowledge, attitude, and practice (KAP) after completely lifting the curfew in all Saudi Arabia regions and cities. Therefore, adequate knowledge, a positive attitude, and correct control of COVID-19 are essential to eradicate the disease among the Public.(1)

In 2020, the World Health Organization (WHO) stated that a new coronavirus strain had been identified in Wuhan City, China, and it was recognized as a novel coronavirus that caused new types of respiratory infections.(2) The disease was later called the Coronavirus Disease 2019 (COVID-19).(3) Coronavirus family strains can cause diseases that are known as respiratory infections including the common cold and up to serious infections such as Middle East respiratory syndrome (MERS) and severe acute respiratory syndrome (SAR-COV) . (4) the most recently discovered viruses that causes coronavirus are RAR-COV2 and COVID-19. This virus may remain on surfaces for a few hours or up to many days; this varies according to different conditions based on types of surfaces, temperatures, and humidity levels.(5) COVID-19 viruses lead to severe acute respiratory syndrome coronavirus (SARS-CoV-2), which is highly contagious.(6) In response to COVID-19, the WHO described COVID-19 as a pandemic .(7)

The common symptoms of COVID-19 include fever, dry coughing, and fatigue that may lead to serious symptoms, such as difficulty in breathing, chest pain, difficulty in talking, and moving.(8) SARS-CoV-2 can spread through human-to-human transmission and indirect contact with contaminated objects.8 SARS-CoV-2 can be transmitted through body fluid droplets from the mouth or nose, which can spread when a person with COVID-19 coughs, sneezes, and talks.(9) Droplets typically cannot transverse more than six feet (almost two meters).8 SARS-CoV-2 remains intact and contagious in droplets and can be suspended in the air for up to three hours.(10) Additionally, contaminated droplets can settle on objects such as plastic, stainless steel, copper, and cardboard.(11) A person can become infected if they touch the surface contaminated with SARS-CoV-2 objects and then make contact with mucous membranes such as the eyes, nose, or mouth.(12) Therefore, health experts advise frequent hand-washing with soap and water.(13)

During epidemics and pandemics, a hole in information about the emerging infection can cause tumult and frenzy among general public. Circulating the appropriate data can direct society through such occasions as well as increase epidemic preparedness that might occur in the future. Furthermore, negative attitudes and practices towards new COVID-19 diseases can aggravate epidemics which may eventually result in pandemics.(14) Awareness, attitude and practice have been about signs and Symptoms of the Vaccinate against COVID-19 and correspondence practices of Vaccinate about COVID-19 among Public in primary health care concentrated in many previous epidemics, for example, swine influenza(15), Middle East Respiratory Syndrome (MERS) and Dengue fever (16).

Surveys of knowledge, attitude, and practice (KAP) can collect information on what is known, believed, and done by a specific population.(17)Such information is necessary because unclear information and negative attitude toward infectious diseases among the community may lead to distress and panic.(18) In this time of crisis, research on KAP is vital for understanding the public's level of awareness about the knowledge, attitude, and practice toward COVID-19.(19) .

## Literature Review

Research conducted in the US and the UK revealed considerable knowledge among respondents about the transmission, spread, and symptoms of COVID-19.17 However, a portion of the populations cited misconceptions about the prevention of the disease. Nevertheless, the difference in knowledge and misperception between the US and the UK participants is non-significant.(22) Another study in China on 6910 residents argued that the level of knowledge of the residents was positive with a score of 10.8 (SD: 1.6; range: 0–12). (23)

Zhang et al (2020) reported that research conducted on 1357 health workers including doctors, nurses, and paramedics in China showed that medical doctors obtained higher knowledge scores compared with nurses and paramedics (doctors =  $38.56 \pm 3.31$ ; nurses =  $37.85 \pm 2.63$ ; paramedics =  $36.72 \pm 4.82$ ). (24)

Compared with frontline health workers who have direct contact with confirmed and suspected patients, non- frontline workers displayed low levels of confidence to fight the virus (OR = 0.562; 95% CI: 0.376, 0.839).13 In Italy, respondents from 2046 hospital staff showed that, in general, healthcare workers possessed good knowledge.(25) A research on medical students from Iran indicated that such students have an average of 96% correct answers with 79.60%, 13.8%, and 6.7% of students holding high, moderate, and low levels of knowledge, respectively.15 In Jordan, medical and non-medical students obtained an average score of  $0.81 \pm 0.15$  (SD), where 90% of the participants had good knowledge of COVID-19 symptoms and more than 80% are aware of the lack of vaccine and treatment for COVID-19. No significant differences were observed regarding knowledge between medical and non-medical students. (26) The cited sources of knowledge about COVID-19 are social media (34%), the WHO (19.9%), TV (17.6%), the Internet (13%), the Ministry of Health (10.1%), and colleagues (5.4%).(27)

The world has experienced several epidemics with novel coronaviruses; namely, SARS-CoV-1, which emerged in China in 2003 followed by Middle East respiratory syndrome coronavirus (MERS-CoV) in the Middle East in 2012, and the current Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2) pandemic (28). MERS-CoV continues to be endemic in Saudi Arabia with weekly reported cases. With the ongoing circulation of MERS-CoV and continuing zoonotic spillover with 70% of the cases resulting from hospital outbreak, the emergence of COVID-19 within the same setting will be overwhelming to healthcare facilities and workers (29). Therefore, it is of great importance to know the impact of such epidemics on HCWs.(30) This is an expected finding since there are established guidelines on the treatment of MERS-CoV and seasonal influenza and lack of comprehensive knowledge and experience with SARS-CoV-2. As the understanding of the epidemiology of SARS-CoV-2 evolved, human-to-human transmission was confirmed with the potential for asymptomatic transmission as well (31).

WHO and MOH have proposed a few practices that can help tallness the mindfulness about practices of manifestations of the spired about COVID-19 at an individual level and Saudi Population, For instance direct instructive classes on the significance of the COVID-19 Knowledge, Attitude and Practice toward COVID-19 (32), constructive information and guidance around building a COVID-19 awareness plan and its benefits this online course gives productive data and also direction around building a COVID-19 immunization plan, clinical outline of immunization, including dosages, adequacy, and need hazard gatherings, legitimate contemplations , the clarification an of the knowledge about COVID-19 an individual level and Population and communication plan, also the availability of a COVID-19 Knowledge has raised many important questions must be clarification.(27)

## **Rationale**

The world has experienced several epidemics with novel coronaviruses; namely, SARS-CoV-1, which emerged in China in 2003 followed by Middle East respiratory syndrome coronavirus (MERS-CoV) in the Middle East in 2012, and the current Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2) pandemic . MERS-CoV continues to be endemic in Saudi Arabia with weekly reported cases. With the ongoing circulation of MERS-CoV and continuing zoonotic spillover with 70% of the cases resulting from hospital outbreak, the emergence of COVID-19 within the same setting will be overwhelming to healthcare facilities and Public in primary health care center . Therefore, it is of great importance to Evaluation of Knowledge, Attitude and Practice such epidemics in Public in primary health care. This is an expected finding since there are established guidelines on the treatment of MERS-CoV and seasonal influenza and lack of comprehensive knowledge and experience with SARS-CoV-2. The Public worry levels regarding contracting or transmitting MERS-CoV were higher than for COVID-19 during the early stage of the COVID-19 pandemic.

### **Aim of the Study**

To Evaluation of Knowledge, Attitude and Practice during the COVID-19 pandemic among the Public in primary health care center in Makkah Al-Mukarramah Saudi Arabia 2022

### **Objectives**

To Evaluation of Knowledge, Attitude and Practice during the COVID-19 pandemic among the Public in primary health care center in Makkah Al-Mukarramah Saudi Arabia 2022

### **Subjects And Methods**

#### **Study design:**

This cross-sectional survey has been conducted among Population in the city of Makkah Al-Mukarramah. The study carried for 30 days, from the 1st December 2022 the 30 of January 2023, among Saudi Public attend to the primary health care center in Makkah, participants aged between 25 years and <50, the study investigators will share the survey link in social media (Twitter, Whats App, Telegram channel) and through emails to their primary contacts

#### **Study setting / study area:**

Study participants have been recruited on Makkah including primary health care centers under supervision of Directorate of Health Affairs of Makkah in Saudi Arabia. The study has been carried out in the city of Makkah Al-Mokarramah, Makkah is the holiest spot on Earth. It is the birthplace of the Prophet Mohammad and the principal place of the pilgrims to perform Umrah and Hajj. The most important cities in Saudi Arabian . It is the holy city for all Muslims, and is located in the western region. It is located in the western area in Kingdom of Saudi Arabia .Contains a population around 2.780 million.

#### **Study population:**

The study has been conducted among Public in the primary health care centers in the Makkah Al-Mokarramah at Saudi Arabia. Including Al-Ka'akya, Al-Adl, Al-Zahir primary healthcare centers.

#### **Selection criteria:**

##### **Inclusion Criteria :**

- All Saudi people who are more than 25 years of age. A study participant has been recruited from Makkah Al-Mukarramah.

##### **Exclusion criteria:**

- Saudi younger than 25 years
- Participants who did not consent to participate in the study, and/or did not answer the questions of the study.
- Participants with language barriers .
- Saudi younger than 25 years.

### **Study Sample:**

The sample size has been calculated by applying Raosoft sample size calculator based on (The margin of error: 5%, Confidence level: 95%, and the response distribution was considered to be 20%) accordingly the Sample size is 300 of Public attending in the primary health care centers and adding 10 more to decrease margin of error. After adding 5% oversampling, the minimum calculated sample has been 300. Computer generated simple random sampling technique was used to select the study participants.

### **Sampling technique:**

Systematic random sampling technique is adopted. By using systematic sampling random as dividing the total population by the required sample size; (300 )

### **Data collection methods:**

The self-administered questionnaire is designed based on previous studies and frameworks to assess the Knowledge, Attitude and Practice toward COVID-19 among the Public attending primary healthcare centers .

The questionnaire was developed in English and was then translated into Arabic. The questions were first pre-tested and were revised and finalized after it was pilot tested. Before completing the survey, participants were required to indicate their consent using a forced response question followed by the survey questionnaires. The survey is estimated to take 10 min to complete .

To collect the information, a set of questions were constructed and developed . The questionnaire consisted of two main sections; the first section focuses on Socio demographic and background information such as age, education level, outcome and gender of the participants .

Knowledge toward COVID-19 among the Public attending primary healthcare centers .

Attitude and Practice toward COVID-19 among the Public attending primary healthcare.

Practice toward COVID-19 among the Public attending primary healthcare centers .

### **Pilot study**

Was carried out at the questions were first pre-tested and were revised and finalized after it was pilot tested. Before completing the survey, participants were required to indicate their consent using a forced response question followed by the survey questionnaires. This study has been conducted and all suggestions taken into consideration.

### **Data analysis**

The Statistical Package for Social Sciences (SPSS) software version 24.0 has been used for data entry and analysis. Descriptive statistics (e.g., number, percentage) and analytic statistics using test for the association and the difference between two categorical variables were applied. A p-value  $\leq 0.05$  has been considered statistically significant.

### **Ethical consideration :**

- Permission from family medicine program was obtained .
- Permission from the regional Research and Ethical Committee was be given to conduct our study.
- All the subjects has been participate voluntarily in the study .
- Privacy of information and confidentiality has been maintained .

- Full explanation about the study and its purpose was carried out to obtain their participation.

**Budget:** Self-funded

## Result

**Table 1 Distribution of characteristics of participated in this study (n=300)**

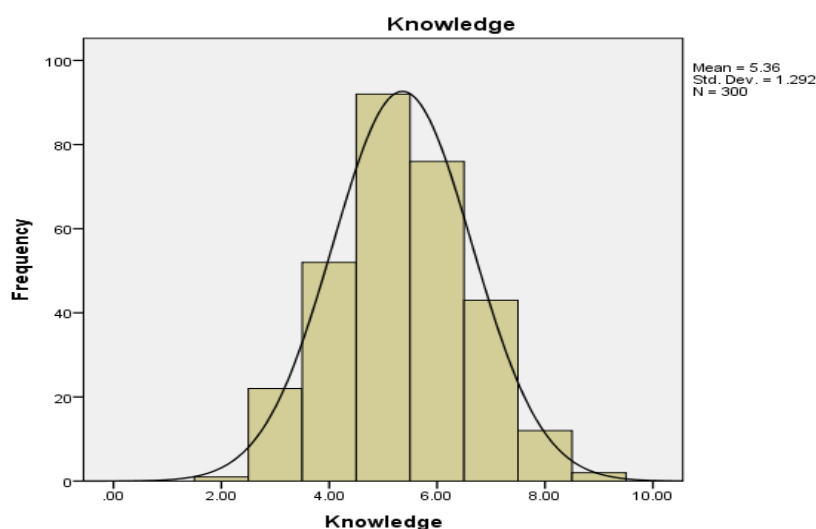
	N	%
<b>Age</b>		
<25	111	37
25-50	123	41
>50	66	22
<b>Gender</b>		
Female	126	42
Male	174	58
<b>Education</b>		
Primary	36	12
Secondary	66	22
University	51	17
Postgraduate	147	49
<b>Occupation</b>		
Students	96	32
Governmental employee	69	23
Private employee	33	11
Labour	30	10
Other	72	24
<b>Income</b>		
Less than 5000SR	114	38
5000-10000SR	120	40
More than 10000SR	66	22

Table 1 shows regarding the age majority of the study groups were in the age range of (25 - 50%) years were (41.0%) followed by age <25 were (37.0%) , regarding the gender many of the respondents were male (58.0 %) while female were (42.0%). Regarding the education status, the majority of the respondents had Postgraduate degree were (49.0%) followed by secondary were (22.0%), while Occupation the most of the participants Students were (32.0%) followed by other were (24.0%) but governmental employee were (23.0%). Regarding the income The majority of them had an income from More than 5000SR-10000 were (40.0%) but the less than 5000 SR were (38.0%).

**Table 2 Distribution of the relation of participant to knowledge, Attitude, Practice score towards COVID-19**

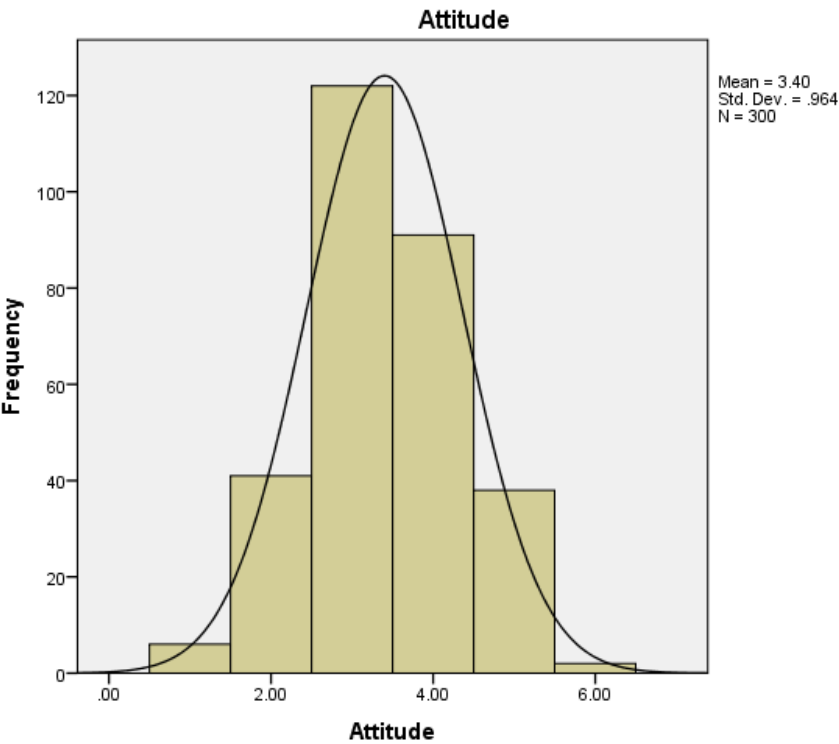
		Data		Score		Chi-square	
		N	%	Range	Mean+SD	X <sup>2</sup>	P-value
Knowledge	Weak	75	25.0	2-9.	5.357±1.292	117.42	<0.001*
	Average	186	62.0				
	High	39	13.0				
Attitude	Negative	94	31.3	1-6.	3.40±0.964	41.07	<0.001*
	Positive	206	68.7				
Practices	Weak	52	17.3	2-10.	6.513±1.564	80.64	<0.001*
	Average	172	57.3				
	High	76	25.3				

Table 2 show distribution of the relation of participant to knowledge, Attitude, Practice score towards COVID-19 regarding the knowledge the most of participants average knowledge were (62.0%) followed by weak were (25.0%) while have a significant relation were P-value <0.001 and X<sup>2</sup> 117.42, regarding the score Mean+ SD(5.357±1.292), while Range (2-9). while regarding the attitude the most of participants Positive attitude were (68.7%) followed by Negative attitude were (31.3%) while have a significant relation were P-value <0.001 and X<sup>2</sup> 41.07, regarding the score Mean+ SD(3.40±0.964), while Range (1-6). while regarding the Practice the most of participants average Practice were (57.3%) followed by high were (25.0%) while have a significant relation were P-value <0.001 and X<sup>2</sup> 80.64, regarding the score Mean+ SD (6.513±1.564), while Range (2-10).

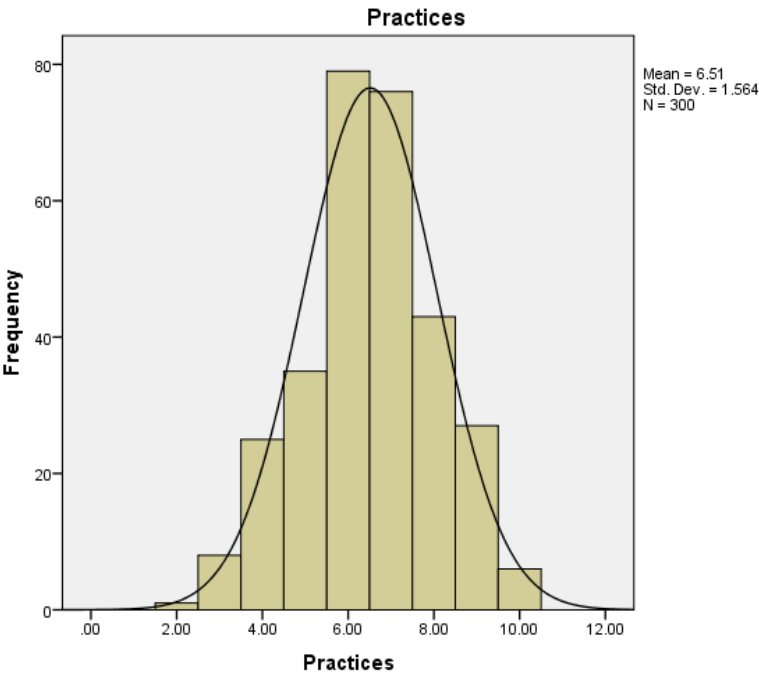
**Figure (1) Distribution of the relation of participant to knowledge score towards COVID-19 .**



**Figure (2) Distribution of the relation of participant to attitude score towards COVID-19**



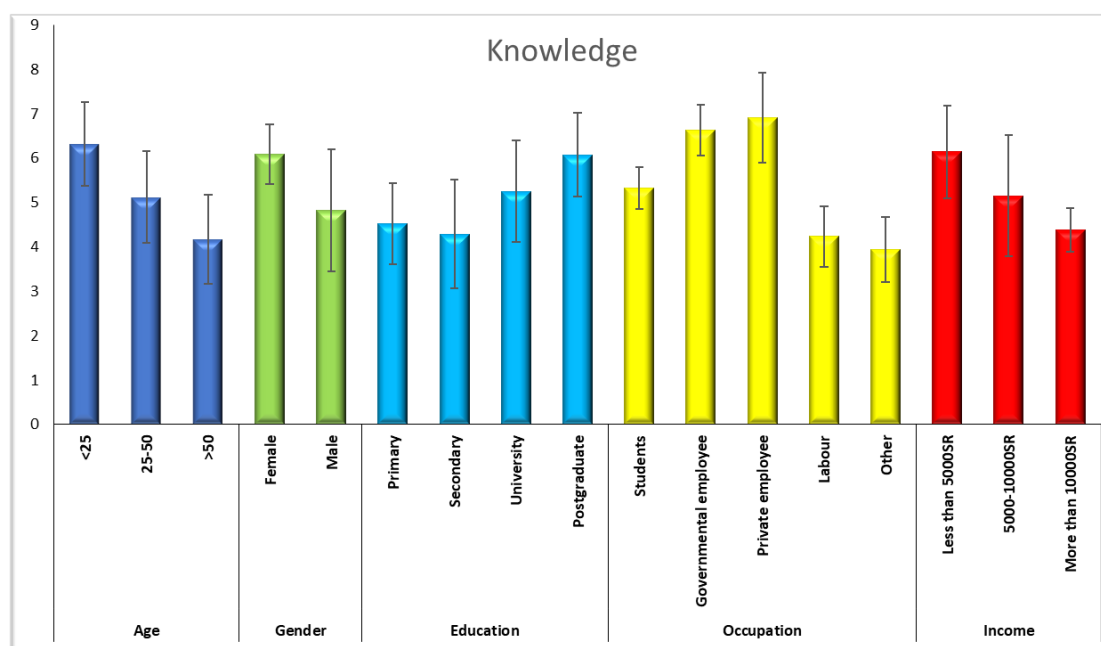
**Figure (3) Distribution of the relation of participant to practices score towards COVID-19**



**Table 3 Distribution of the relation of participant to knowledge score towards COVID-19 and Socio-demographic characteristics**

Demographic data		N	Knowledge		F or T	ANOVA or T-test	
			Mean	± SD		Test value	P-value
Age	<25	111	6.324	± 0.945	F	102.898	<0.001*
	25-50	123	5.122	± 1.037			
	>50	66	4.167	± 1.001			
Gender	Female	126	6.087	± 0.681	T	9.501	<0.001*
	Male	174	4.828	± 1.370			
Education	Primary	36	4.528	± 0.910	F	54.013	<0.001*
	Secondary	66	4.288	± 1.225			
	University	51	5.255	± 1.146			
	Postgraduate	147	6.075	± 0.944			
Occupation	Students	96	5.323	± 0.470	F	215.782	<0.001*
	Governmental employee	69	6.623	± 0.571			
	Private employee	33	6.909	± 1.011			
	Labour	30	4.233	± 0.679			
	Other	72	3.944	± 0.729			
Income	Less than 5000SR	114	6.140	± 1.038	F	56.936	<0.001*
	5000-10000SR	120	5.150	± 1.370			
	More than 10000SR	66	4.379	± 0.489			

Table (3) show that is a significant relation between Knowledge and demographic data regarding age increase in <25 years were (Mean± SD 6.324± 0.945), follow by 25-50 age were (Mean± SD, 5.122 ± 1.037) P-value=0.001, F= 102.898. Regarding the gender is a significant relation between knowledge and gender increase in Female were (Mean± SD 6.087 ± 0.681), follow male were (Mean± SD, 4.828 ± 1.370) also P-value=0.001, T= 9.501. Regarding the Educational level a significant relation between Knowledge and Educational level increase in Postgraduate were (Mean± SD 6.075 ± 0.944), follow by University were (Mean± SD, 5.255 ± 1.146) also P-value=0.001, F= 54.013. Regarding the Occupation is a significant relation between Knowledge and Occupation status increase in Private sector employee were (Mean± SD 6.909 ± 1.011), follow Governmental employee were (Mean± SD, 6.623 ± 0.571) also P-value=0.001, F= 215.782. Regarding Income is a significant relation between Knowledge and Income increase in Less than 5000SR were (Mean± SD 6.140 ± 1.038), follow by 5000-10000SR were (Mean± SD, 5.150 ± 1.370) also P-value=0.001, F= 56.936.

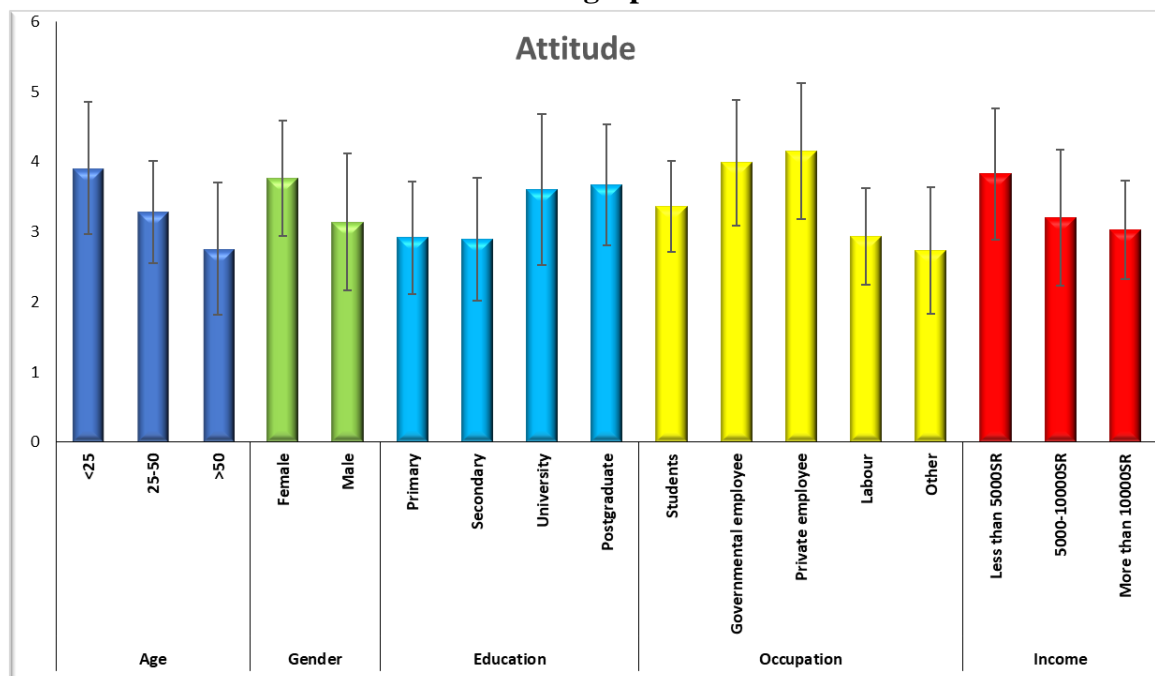
**Figure (4) Distribution of the relation of participant to knowledge score towards COVID-19 and Socio-demographic characteristics****Table 4 Distribution of the relation of participant to attitude score towards COVID-19 and Socio-demographic characteristics**

Demographic data		N	Attitude		F or T	ANOVA or T-test	
			Mean	± SD		Test value	P-value
Age	<25	111	3.910	± 0.940	F	38.928	<0.001*
	25-50	123	3.285	± 0.730			
	>50	66	2.758	± 0.946			
Gender	Female	126	3.762	± 0.824	T	5.829	<0.001*
	Male	174	3.138	± 0.976			
Education	Primary	36	2.917	± 0.806	F	15.865	<0.001*
	Secondary	66	2.894	± 0.879			
	University	51	3.608	± 1.078			
	Postgraduate	147	3.673	± 0.861			
Occupation	Students	96	3.365	± 0.651	F	30.155	<0.001*
	Governmental employee	69	3.986	± 0.899			
	Private employee	33	4.152	± 0.972			
	Labour	30	2.933	± 0.691			
	Other	72	2.736	± 0.904			
Income	Less than	114	3.825	± 0.943	F	20.949	<0.001*

	<b>5000SR</b>				
	<b>5000-10000SR</b>	120	3.200	± 0.967	
	<b>More than 10000SR</b>	66	3.030	± 0.701	

Table (4) show that is a significant relation between attitude and demographic data regarding age increase in <25 years were (Mean± SD 3.910 ± 0.940), follow by 25-50 age were (Mean± SD, 3.285 ± 0.730) P-value=0.001, F= 38.928. Regarding the gender is a significant relation between attitude and gender increase in Female were (Mean± SD 3.762 ± 0.824), follow male were (Mean± SD, 3.138 ± 0.976) also P-value=0.001, T= 5.829. Regarding the Educational level a significant relation between attitude and Educational level increase in Postgraduate were (Mean± SD 3.673 ± 0.861), follow by University were (Mean± SD, 3.608 ± 1.078) also P-value=0.001, F= 15.865. Regarding the Occupation is a significant relation between attitude and Occupation status increase in Private sector employee were (Mean± SD 4.152 ± 0.972), follow Governmental employee were (Mean± SD, 3.986 ± 0.899) also P-value=0.001, F= 30.155. Regarding Income is a significant relation between attitude and Income increase in Less than 5000SR were (Mean± SD 3.825 ± 0.943), follow by 5000-10000SR were (Mean± SD, 3.200 ± 0.967) also P-value=0.001, F= 20.949.

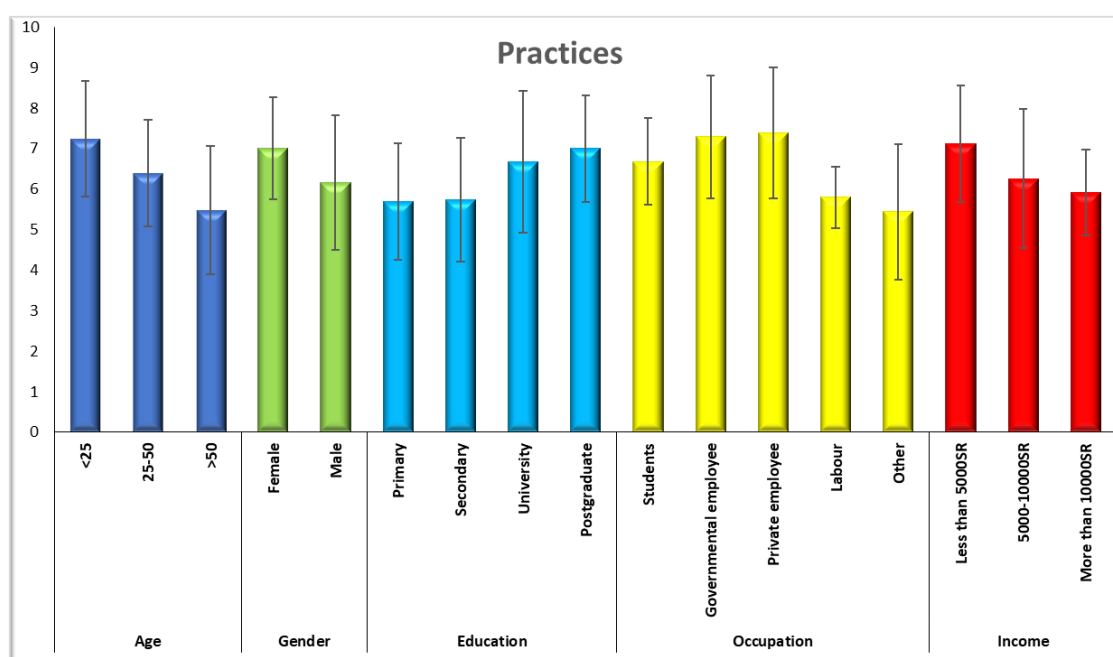
**Figure (5) Distribution of the relation of participant to attitude score towards COVID-19 and Socio-demographic characteristics**



**Table (5) Distribution of the relation of participant to attitude score towards COVID-19 and Socio-demographic characteristics**

Demographic data		N	Practices	F or T	ANOVA or T-test	
			Mean $\pm$ SD		Test value	P-value
Age	<25	111	7.252 $\pm$ 1.430	F	32.741	<0.001*
	25-50	123	6.398 $\pm$ 1.317			
	>50	66	5.485 $\pm$ 1.581			
Gender	Female	126	7.008 $\pm$ 1.262	T	4.834	<0.001*
	Male	174	6.155 $\pm$ 1.664			
Education	Primary	36	5.694 $\pm$ 1.431	F	15.703	<0.001*
	Secondary	66	5.742 $\pm$ 1.532			
	University	51	6.667 $\pm$ 1.751			
	Postgraduate	147	7.007 $\pm$ 1.316			
Occupation	Students	96	6.677 $\pm$ 1.071	F	21.890	<0.001*
	Governmental employee	69	7.290 $\pm$ 1.516			
	Private employee	33	7.394 $\pm$ 1.619			
	Labour	30	5.800 $\pm$ 0.761			
	Other	72	5.444 $\pm$ 1.669			
Income	Less than 5000SR	114	7.123 $\pm$ 1.446	F	16.490	<0.001*
	5000-10000SR	120	6.258 $\pm$ 1.713			
	More than 10000SR	66	5.924 $\pm$ 1.057			

Table (5) show that is a significant relation between Practices and demographic data regarding age increase in <25 years were (Mean $\pm$  SD 7.252  $\pm$  1.430), follow by 25-50 age were (Mean $\pm$  SD, 6.398  $\pm$  1.317) P-value=0.001, F= 32.741. Regarding the gender is a significant relation between Practices and gender increase in Female were (Mean $\pm$  SD 7.008  $\pm$  1.262), follow male were (Mean $\pm$  SD, 6.155  $\pm$  1.664) also P-value=0.001, T= 4.834. Regarding the Educational level a significant relation between Practices and Educational level increase in Postgraduate were (Mean $\pm$  SD 7.007  $\pm$  1.316), follow by University were (Mean $\pm$  SD, 6.667  $\pm$  1.751) also P-value=0.001, F= 15.703. Regarding the Occupation is a significant relation between Practices and Occupation status increase in Private sector employee were (Mean $\pm$  SD 7.394  $\pm$  1.619), follow Governmental employee were (Mean $\pm$  SD, 7.290  $\pm$  1.516) also P-value=0.001, F= 21.890. Regarding Income is a significant relation between Practices and Income increase in Less than 5000SR were (Mean $\pm$  SD 7.123  $\pm$  1.446), follow by 5000-10000SR were (Mean $\pm$  SD, 6.258  $\pm$  1.713) also P-value=0.001, F= 16.490.

**Figure (6) Distribution of the relation of participant to practices score towards COVID-19 and Socio-demographic characteristics**

## Discussion

The purpose of this study was Evaluation of Knowledge, Attitude and Practice during the COVID-19 pandemic among the Public in primary health care center in Makkah Al-Mukarramah Saudi Arabia 2022. Socioeconomic characteristics of the population to obtain information that could be used awareness campaign and to determine whether people's knowledge differed based on particular characteristics of the target population. Regarding the age majority of the study groups were in the age range of (25 - 50%) years were (41.0%) followed by age <25 were (37.0%) , regarding the gender many of the respondents were male (58.0 %) while female were (42.0%). Regarding the education status, the majority of the respondents had Postgraduate degree were (49.0%) followed by secondary were (22.0%), while Occupation the most of the participants Students were (32.0%) followed by other were (24.0%) but governmental employee were (23.0%). Regarding the income The majority of them had an income from More than 5000SR-10000 were (40.0% ) but the less than 5000 SR were (38.0%).(See table 1)

The COVID-19 pandemic is a global crisis that has had devastating effects on all countries worldwide, and there have been a huge number of cases and deaths within short period of time. The major challenges related to fighting this pandemic are largely related to matters concerning the behaviour and lifestyle that Public have for combatting the disease spread. In the absence of a vaccine and prompt treatment, the public's compliance with preventive measures and legislation is required to contain or reduce the burden of the COVID-19 pandemic.(33) This was found to be strongly linked to people's knowledge, attitudes, and practices.(34) Similarly, this study revealed that the general population's knowledge towards COVID-19 improves their attitude, and the attitude level then leads to proper implementation

of practice. The present study showed average knowledge levels towards COVID-19, and the greater frequency of correct answers regarding knowledge about COVID-19 was almost satisfactory. These findings are consistent with those of other studies that were conducted in the Kingdom of Saudi Arabia.(35) One study conducted in Saudi Arabia by Al-Hanawi et al. reported that the overall accuracy rate for the knowledge test which is similar to our findings. The findings of this study were also consistent with another study that was conducted by Azlan et al. in Malaysia, which showed that overall public knowledge was 80.5%.(36) However, a multinational study that was conducted in the three Middle East countries of Saudi Arabia, Kuwait, and Jordan and that enrolled 1,208 participants revealed that the overall knowledge score among the three countries was 66.1% . Show distribution of the relation of participant to knowledge, Attitude, Practice score towards COVID-19 regarding the knowledge the most of participants average knowledge were (62.0%) followed by weak were (25.0%) while have a significant relation were  $P\text{-value} < 0.001$  and  $X^2 117.42$  , regarding the score Mean+ SD( $5.357 \pm 1.292$ ), while Range (2-9). while regarding the attitude the most of participants Positive attitude were (68.7%) followed by Negative attitude were (31.3%) while have a significant relation were  $P\text{-value} < 0.001$  and  $X^2 41.07$ , regarding the score Mean+ SD( $3.40 \pm 0.964$ ), while Range (1-6). While regarding the Practice the most of participants average Practice were (57.3%) followed by high were (25.0%) while have a significant relation were  $P\text{-value} < 0.001$  and  $X^2 80.64$ , regarding the score Mean+ SD ( $6.513 \pm 1.564$ ), while Range (2-10). (See table 2)

The highest score was among Jordanians (70.3%), while the level of public knowledge in Saudi Arabia was less than 70.3%; 15, 20 compared to our study findings, the public level of knowledge in our study was higher (81.3%), and this may be attributed to later intense campaigns to raise awareness that were launched by the Saudi MOH through its effective wide-scale communication networks and effective health system. The knowledge level subscales in study .However, previous studies reported that only half of the participants knew the correct viral route of transmission. There were only a small percentage of participants who seemed to be unaware of disease complications, and they were only slightly aware of how the virus was transmitted. This is similar to a previous study that was conducted in three countries including Saudi Arabia, which revealed the lowest public knowledge regarding transmission (43.3%).(5) A similar proportion (91.5%) had correct knowledge regarding clinical symptoms of the disease, and distinctly poor knowledge (43.3%) concerning the possible viral route of transmission was also reported in the same study that was conducted in three countries in the Middle East.(23) In our study and a Malaysian study, subjects over the age of <25 years had higher knowledge scores, which possibly resulted from a higher risk perception of contracting COVID-19 and complications of the disease.(23) A Chinese study also reported surprisingly high COVID-19 knowledge in an epidemiological survey in the early stages of the epidemic, and these authors suggested that it was because the study participants had higher academic degrees,(26) which was similar to our findings. In the present work, respondents were educated from the Postgraduate level to the University level.(See table 3 Figure 4)

Roy, et al (2020) found that the awareness varied based on the category of healthcare worker, and there was also insufficient knowledge of participants, but they have a positive attitude.(37)(See table 4 Figure 5). The present study showed satisfactory attitudes towards COVID-19 were (68.7). This finding was consistent with other previous studies that were conducted in Saudi Arabia by Al-Hanawi et al. who reported that the overall attitudes were satisfactory.(35) The present study showed that the practices toward COVID-19 were Average. (See table 5 Figure 6) This finding was consistent with similar KAPs in a COVID-19 study that was conducted in Saudi Arabia by Al- Hanawi et al., which reported that the participants' score for practices concerning COVID-19, this indicated average practices (35), another study conducted by Zhong et al. (2020) in China in which 96.4% of participants avoided crowded areas and 98.0% used masks outside their homes during the COVID-19 outbreak. (23)

## Conclusion

Our findings reveal that most of the respondents had knowledge of the COVID- 19 pandemic, particularly those from the Makkah Al-Mukarramah of Saudi Arabia. The study demonstrated a few unexpected negative attitudes and practices towards using protective measures. In particular, a few of the participants had different practices of shaking hands and not washing hands. Additionally, a small number of participants considered that COVID-19 will not be successfully controlled, is not effective in controlling the COVID-19 pandemic. The biggest sources of respondents' information about the COVID-19 pandemic were the internet and health practitioners. Thus, providing effective health education programs may improve knowledge of COVID-19 and reduce negative attitudes and practices. Several aspects were less knowledgeable among respondents, including the symptoms of the mode of transmission, symptoms, incubation period and re-infection and the vulnerable people. It is therefore suggested that a well-planned and structured educational program should be undertaken to improve the level of knowledge and contribute to better attitude and practice. In this current pandemic, people should follow the ministry of health instructions and avoid close contact with others, especially immune compromised individuals.

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