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Research Article

COVID-19 awareness among the public in Saudi Arabia

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Abstract

Introduction: *In December 2019, COVID-19 was publicly announced as a global pandemic. The Saudi government has taken preventive and precautionary measurements against it that can significantly limit the spread of infection. However, public commitment is influenced by the level of knowledge, attitude, and practice (KAP). This study aims to assess the level of (KAP) in the Saudi population towards COVID-19 pandemic.*

Method: *A cross-sectional study was conducted from 15th of January 2021 to 11th of February 2021 to assess (KAP) among the population of Saudis via an online self-reported questionnaire. The questionnaire was made available through social media. Data were analyzed using IBM® SPSS®, and ANOVA (F-test) was used to compare mean values for (KAP), p-value of ≤ 0.05 was considered significant. This research was applied to Institutional Review Board to acquire ethical approval.*

Result*: Our study involved 1679 participants. The findings show that participants aged between 43-50 years showed a higher level of knowledge, attitude, and good practice ($p=0.016$, $p<0.001$, and $p=0.003$, respectively). Postgraduate reported higher knowledge ($p=0.031$); however, respondents with elementary school education showed higher practice ($p=0.051$). Participants who had income between 16000 and 25000 reported a higher level of knowledge ($p=0.002$), participants who had income between 11000 and 15000 reported a higher level of attitude ($p<0.001$). Governmental sector workers showed higher knowledge ($p=0.002$) and attitude ($p<0.001$) levels.*

Conclusion: *This study provides evidence that most of Saudi Arabia's population has sufficient knowledge and good practice. However, a more negative attitude was found. This study emphasized that a higher level of education and adequate income are positively associated with increased public awareness regarding COVID-19 disease.*

Keywords: *COVID-19, KAP, Knowledge, Attitude, Practice, awareness, Saudi Arabia*

Introduction

In December 2019, COVID-19, which is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), emerged in Wuhan, China. It is a highly contagious virus that causes progressive respiratory symptoms, and it can lead to severe complications, including organ failure [1][2][3]. Moreover, it is mostly asymptomatic or generally has an incidence of symptoms that include dry cough, fever, dyspnea, and fatigue. In a short time, it spread all over the world and became a global concern. Due to the rapid spreading of the virus globally, Saudi Arabia implemented proactive precautionary measures to prevent the virus from reaching the country.

Despite these initial efforts, Saudi Arabia confirmed its first case of COVID-19 on the 2nd of March 2020, and the numbers of confirmed positive cases escalate. Immediately, a stricter precaution has been implemented to contain the virus from an outbreak. [4][5] These measures include curfews, lockdown, and travel restrictions [6]. Besides, the government started encouraging public health protocols that involve practicing social distancing, proper hand hygiene or sanitizing, and staying at home. Although these measures are significant, pandemic management's success or failure depends on the public's commitment to country regulations, and effective pandemic management requires support from the population.

Unfortunately, all the implementations have resulted in fear and created a physiological reaction. Thus, a lesson learned from the SARS outbreak is that knowledge, attitude, and practice are associated with anxiety, panic, and mental health issues. Therefore, it will affect the measures taken to contain the spread of disease and the population behavior. [7].

Nevertheless, spreading awareness for such measures and increasing the level of knowledge is essential to improve people’s adherence to protective measures [8]. To spread knowledge about the disease, Saudi Arabia utilized different platforms to raise awareness. Moreover, evidence showed that social media plays a significant role in people's awareness. It is a powerful tool if used correctly to change behavior and improve health awareness among the public during COVID-19 pandemic [9]. Twitter was used by ministers, physicians, healthcare providers, and academics to answer people’s concerns. [10].

Therefore, a common tool used to quantify and analyze data is knowledge, attitudes, and practices (KAP) study. In this crisis, KAP plays an essential role in recognizing people's behavior toward COVID-19 [11].

It provides baseline information that helps understand the level of awareness, And It provides better insight into poor KAP regarding COVID-19. Consequently, determining the intervention required to control the spread of infection, realizing the gap, and improving public campaigns.

In order to stand against the pandemic, useful information must be provided. Our study was conducted to determine and assess the KAP of the Saudi population towards COVID-19. It also looks for the association between socio-demographic factors and the population behavior related to disease prevention.

We are expecting that the majority of participants are aware of COVID-19. We also predict that the level of knowledge, attitude, and practice will be noticeably varying among the population. The findings are also expected to provide information that will influence the population's behavior.

Methodology

This is a cross-sectional study conducted from 15th of January 2021 to 11th of February 2021 among the general population of Saudi Arabia. Data were collected using an online google form; the questionnaire was based on a previously published study, Knowledge, Attitude, and Practice toward COVID-19 among Egyptians [12]. The local ethical committee approved the questionnaire (IRB-UGS-2020-03-438). The link was made available to the participants through social media. This study aimed to assess public awareness and commitment to preventative measures. The inclusion criteria were Saudi residents aged between 18 and 65. All participants agreed on being part of this study, and informed consent was obtained before starting the questionnaire.

The survey consists of four primary sections, (1) demographic information, (2) Knowledge of COVID-19, (3) Attitude toward the pandemic, and (4) Practice of preventive measurements questions. Demographic data were considered as independent variables. While the level of knowledge, attitude, and practice were considered as a dependent variable. The answers were scored from high to low values, with a higher score denoting a satisfactory level of knowledge, positive attitude, and good practice. Data were statistically analyzed using IBM® SPSS® Statistics software version 26. ANOVA (F-test) was used to compare mean values for knowledge, Attitude, and Practice scores.

Results

A total of 1679 participants were included in this study, disturbed as (73.3%) females and (26.3%) males. The majority of the sample (59.9%) were between the age of 18 and 25 years. Participants from the eastern region represented (85.9%) of the total sample. (74.3%) of the participants were undergraduates. Students represented (49.4%) of the sample. Income was >5000 SR for the majority of the participants (62.6%). [Table 1].

Demographic data		No	%
	(18-25)	1005	59.9
	(26-35)	217	12.9
Age (Years)	(36-42)	148	8.8
	(43-50)	134	8.0
	(51-65)	175	10.4
Gender	Female	1238	73.7
	Male	441	26.3
	Centre	98	5.8
	North	14	0.8
Residence	South	29	1.7
	East	1442	85.9
	West	95	5.7
	Elementary school	5	0.3
	Middle school	25	1.5
Education	High school	339	20.2
	Undergraduate	1247	74.3
	Postgraduate	63	3.8
	Governmental sector	290	17.3
Sector of occupation	Privet sector Unemployed	216 343	12.9 20.4
	Student	830	49.4
	<5000	1051	62.6
Income (SAR)	5000-10000 11000-15000	251 195	14.9 11.6
	16000-25000	122	7.3

(99.2%) of the respondents heard of COVID-19 and (94.7%) reported that a virus causes it. The main reported modes of transmission were cough and sneezing (97.2%), infected hands (70.6%), and infected surface (68.7%). The majority of the respondents reported fever (92.7%) and dry cough, and difficulty in breathing (92.1%) as the symptoms of COVID-19, diarrhea, no fever, and lack of knowledge were reported by (46.6%),(4.5%), and (2.6%) respectively. Regarding COVID-19 vaccine availability and seasonal

influenza vaccine protection against COVID-19, (77.9%) reported that there is a vaccine for the disease, and (68.7%) reported that the seasonal influenza vaccine could not protect from COVID-19. [Table 2].

The knowledge section showed that (98.8%) of the participants think that crowding and gatherings are the reason behind increasing COVID-19 cases. Read for disease containment, (53.2%) believe that the disease will be contained soon, while (18.3%) think that it will not, and (28.4%) did not know. (45.6%) of the respondents were afraid of COVID-19; however, (47.9%) were not. [Table 3].

To evaluate the attitude, seven questions were asked. Only (10.5%) of the respondents tested positive for COVID-19; however, (3.5%) were not aware if they had the infection or not. When feeling sick, (53.1%) believe that the best behavior is to consult the physician by telephone, (34.5%) think it is better to stay at home, and (12.4%) prefer to consult a physician at the clinic. (95.8%) of the participants are committed to the country's institutions to limit the disease [Table 4].

Regarding the population practice, (51.8%) of the respondents had sufficient knowledge [Figure 1], (39%) had a positive attitude [Figure 2], and (51.2%) reported good practice. [Figure 3]. Participants aged between 43-50 years showed a higher level of knowledge, attitude, and good practice ($p=0.016$, $p<0.001$, and $p=0.003$, respectively). Postgraduate reported higher knowledge ($p=0.031$); however, respondents with elementary school education showed higher practice ($p=0.051$). Participants who had income between 16000 and 25000 reported a higher level of knowledge ($p=0.002$), participants who had income between 11000 and 15000 reported a higher level of attitude ($p<0.001$). Governmental sector workers showed higher knowledge ($p=0.002$) and attitude ($p<0.001$) levels. [Table 5]

Table 2 | knowledge of the participant groups toward COVID-19		**No**	**%**
Have you heard about COVID-19?	Heard about COVID-19	1666	99.2
	Did not hear about COVID-19	13	0.8
Cause of COVID-19	Virus	1590	94.7
	Bactria	12	0.7
	Fungi	2	0.1
	Low immune	32	1.9
	Lack of knowledge	43	2.6
Mode of transmission	Cough and sneezing	1632	97.2
	Infected injections or blood	235	14.0
	Infected hand	1185	70.6
	Infected surface	1153	68.7
	Lack of knowledge	33	2.0

Symptoms of COVID-19	Fever	1557	92.7
	Dry cough and difficult breathing	1547	92.1
	No fever	75	4.5
	Diarrhea	783	46.6
	Lack of knowledge	44	2.6
Incubation period	<2 days	191	11.4
	2-14 days	1438	85.6
	> 14 days	50	3.0
People at high risk of COVID-19	Old people	1417	84.4
	Patients with chronic diseases	1316	78.4
	Immunodeficient patients	1360	81.0
	Travelers to infected regions	1087	64.7
	Pregnant women	446	26.6
	Health care practitioners Contacts	935	55.7
	of infected cases	1377	82.0
	Lack of knowledge	20	1.2
Is COVID-19 infectious disease?	COVID-19 is infectious	1621	96.5
	COVID-19 is not infectious Lack	24	1.4
	of knowledge	34	2.0
Is early diagnosis considered essential to decreasing complications?	Early diagnosis decreases complications	1280	76.2
	Early diagnosis does not decrease complications	230	13.7
	Lack of knowledge	169	10.1
Is there a vaccine for COVID-19?	There is a vaccine for COVID-19	1308	77.9
	There is no vaccine for COVID-19	151	9.0
	Lack of knowledge	220	13.1
	Seasonal influenza vaccine can be used against COVID-19	133	7.9
Can seasonal influenza vaccine be used against COVID-19?	Seasonal influenza vaccine can not be used against COVID-19	1154	68.7
	Lack of knowledge	392	23.3
Is there a treatment for COVID-19?	There is a treatment for COVID-19	532	31.7
	There is no treatment for COVID-	730	43.5
	19 Lack of knowledge	417	24.8
	Isolation of cases help with the treatment	1525	90.8
Does isolation of cases help with the treatment?	Isolation of cases does not help with the treatment	112	6.7
	Lack of knowledge	42	2.5
Can COVID-19 patients be treated at home?	COVID-19 patients can be treated at home	1303	77.6
	COVID-19 patients can not be	187	11.1
	treated at home Lack of knowledge	189	11.3
	Handwashing with soap and water	1589	94.6
What are the preventive measures against COVID-19?	Disinfection of hands with alcohol	1347	80.2
	Avoid touching eyes and nose	1479	88.1
	Avoid contact with infected patients	1529	91.1
	Lack of knowledge	11	0.7
Sources of information	TV	169	10.1
	Social media	1286	76.6
	Friends	129	7.7
	Physicians	95	5.7

Table 3 | Attitude of the participant groups toward COVID-19		No	%
Does COVID-19 infectionincrease in crowding and gatherings?	Crowding and gathering increase COVID-19 infection Crowding and gathering do not increase COVID-19 infectionLack of knowledge	1659 11 9	98.8 0.7 0.5
Can health education protectagainst COVID-19	Health education can protect against COVID-19 Health education can not protect against COVID-19Lack of knowledge	1553 69 57	92.5 4.1 3.4
Does disinfecting the publicand buildings protect againstCOVID-19?	Disinfecting public buildings protects us from COVID-19 Disinfecting public buildings does not protect us from COVID-19 Lack of knowledge	1528 111 40	91.0 6.6 2.4
Have you heard of the government instructions to limit the spread of COVID-19?	Heard about the country instructions to limit the spread of COVID-19 Did not hear about the country instructions to limit the spread ofCOVID-19 Lack of knowledge	1609 46 24	95.8 2.7 1.4
Are government instructionsenough to compact infection spreading?	Country instructions are enough Country instructions are not enoughLack of knowledge	1136 412 131	67.7 24.5 7.8
Do you think COVID-19will be contained soon?	COVID-19 will be contained soon COVID-19 will not be contained soonLack of knowledge	894 308 477	53.2 18.3 28.4
Are you afraid ofCOVID-19?	Afraid of COVID-19 Not afraid of COVID-19Lack of knowledge	766 805 108	45.6 47.9 6.4

Table 4 | practice of the participant groups toward COVID-19		No	%
Have you tested positive forCOVID-19?	Positively tested Negatively tested Lack of knowledge	176 1444 59	10.5 86.0 3.5
Do you have a friend/relative testedpositive for COVID-19?	Friend/relative positively tested Friend/relative negatively testedLack of knowledge	1268 392 19	75.5 23.3 1.1
What is the best behavior whenfeeling sick?	Consult a physician by telephone Consult a physician in clinicsStay at home	892 208 579	53.1 12.4 34.5

Are you committed to thegovernment instructions?	Committed to the country instructions Did not commit to the country instructions	1609 70	95.8 4.2
Knowing a traveler to infected regions	Know a traveler to an infected region Do not now a traveler to infected regions	126 1433	7.5 85.3
	Lack of knowledge	120	7.1
Reporting travelers to infected regions	Reported a traveler to an infected region Did not report a traveler to an infected region Lack of knowledge	12 1563 104	0.7 93.0 6.2

Table 5 | Distribution of the studied participants' demographic data regarding scores of knowledge, attitude, and practice toward COVID-19

Demographicdata	**KNOWLEDGE**			**ATTITUDE**			**PRACTICE**		
	Mean ± SD		**P-value**	**Mea**	**n ± SD**	**P-value**	**Mean ± SD**		**P-value**
Age			.016			.000			.003
(18-25)	36.22	6.607		17.36	3.744		2.91	1.128	
(26-35)	37.23	7.378		18.29	3.550		3.02	1.020	
(36-42)	36.18	7.702		17.70	3.815		3.15	1.046	
(43-50)	37.84	6.424		18.54	3.025		3.24	.975	
(51-65)	35.63	6.791		18.21	3.224		2.98	1.003	
Gender			.507			.103			.128
Female	36.48	6.651		17.60	3.503		3.00	1.069	
Male	36.23	7.331		17.93	4.010		2.91	1.134	
Residence			.212			.185			.944
Center	35.22	6.985		16.94	4.043		3.02	1.121	
North	33.00	8.218		16.57	4.988		3.00	1.038	
South	36.00	7.191		17.45	4.469		2.90	1.145	
East	36.53	6.877		17.72	3.610		2.98	1.088	
West	36.51	5.496		18.19	3.170		2.97	1.046	
Education			.031			.365			.051
Elementary school	34.00	4.000		18.40	2.608		3.60	.894	
Middle school	35.68	7.064		17.84	3.363		2.56	.917	
High school	35.57	7.245		17.57	3.685		2.94	1.068	
Undergraduate	36.58	6.715		17.67	3.635		2.98	1.098	
Postgraduate	38.10	6.598		18.57	3.775		3.24	.979	

Income			.002			.000			.013
<5000	36.11	6.802		17.35	3.734		2.91	1.122	
5000-10000	36.65	6.404		18.12	3.352		3.08	1.014	
11000-15000	36.25	6.954		18.54	3.245		2.99	1.003	
16000-25000	38.23	6.204		18.02	3.435		3.16	.991	
>25000	37.53	9.135		18.43	4.151		3.33	1.084	
Occupation			.002			.000			.188
Governmental sector	37.50	6.814		18.61	3.429		3.10	.997	
Privet sector	36.95	7.443		18.43	3.873		2.90	1.086	
Not working	35.58	7.223		17.59	3.423		2.97	1.035	
Student	36.24	6.455		17.22	3.661		2.96	1.136	

Figure 1 | Knowledge level among participants

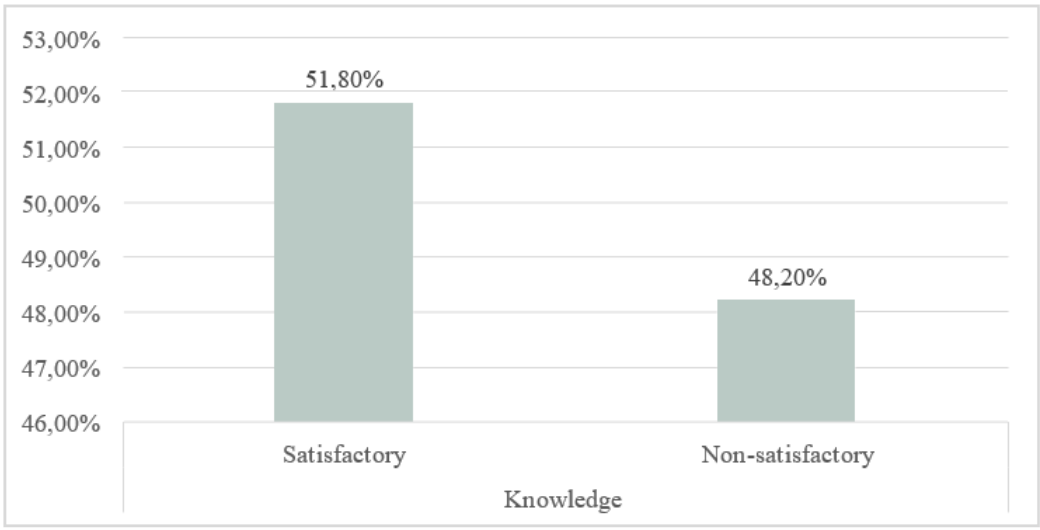


Figure 2 | Attitude level among participants

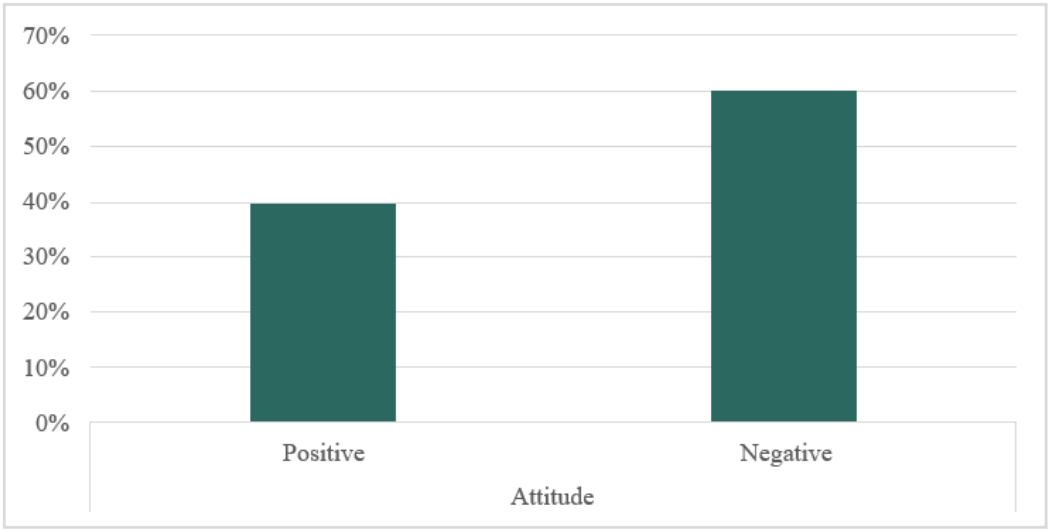
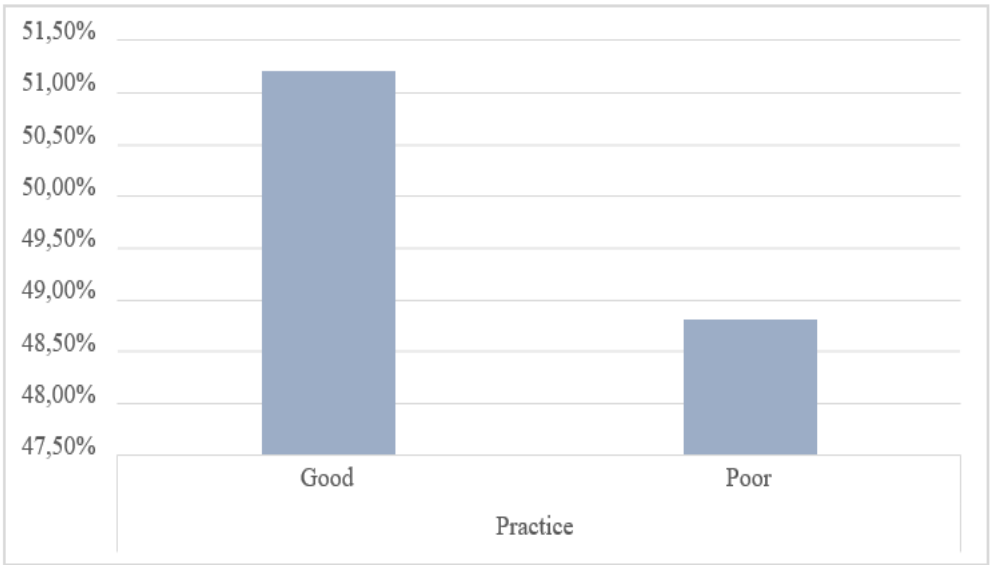


Figure 3 | Practice level among participants



Discussion

This cross-sectional study was conducted to evaluate the level of KAP among the public in Saudi Arabia towards COVID19. KAP can significantly influence the public adherence to preventative measures and regulations enforced by the government, which is vital to contain the pandemic [12]. A study conducted in Havana, Cuba, concluded that in case of an increase in knowledge, the attitudes toward disease prevention would improve and subsequently related practices [13]. A variety of socio-demographic characteristics were considered in an attempt to guide future awareness campaigns. Given this, our study included 1679 participants, and the findings indicated that the respondents have good knowledge about COVID-19 and good practice [Figure 1][Figure 3]. However, they showed a negative attitude towards the pandemic [Figure 2].

Significant predictors of knowledge and practice in this study were age, educational level, and income level. These findings were not surprising. It is possible to have since most participants were between the age of 18-25 years (59.9%) [Table 1]. This could be attributed to the fact that the majority reported that social media was their primary source of information on COVID-19 (76.6%) [Table 2]. Our study findings show that COVID-19 knowledge, attitude, and practice are differed by socio-demographic factors. The participant with groupage from 43-50 years and the postgraduate had a Significant impact on knowledge and practice. This can be explained by the fact that they are more involved in COVID-19 campaigns. They are aware of the preventive measure presented in social media that disseminates knowledge [15]. It is also due to the better understanding by the highly educated group.

We also found that participants with high income (>16000 SAR) have high KAP about COVID-19 ($p=0.002$, $p<0.0001$, and $p=0.013$, respectively). This agrees with the previously mentioned study in Havana, Cuba, that reports that there is a direct association higher level of knowledge was detected among participants aged between 43 to 50 years, postgraduate, participants with income between 16000 to 25000 SAR, and governmental sector workers. Meanwhile, good practice was reported among the same age group as with the higher level of knowledge and participants with elementary school education. The negative attitude was significantly associated with participants aged 18 to 25 years, high school education participants, students, and participants with income below 5000 SAR. This study emphasized that a higher level of education and sufficient income are positively associated with an increase in the level of public awareness regarding COVID-19 disease.

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