

## Assessment of Children's Knowledge, Attitudes, and Practices Regarding COVID-19 at Secondary Schools in Makkah Al-Mokarramah, Saudi Arabia 2021

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### Abstract:

### Background:

The coronavirus disease (COVID-19) is a highly transmittable and pathogenic viral infection caused by Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2), which emerges in December 2019 in Wuhan, China and spreads around the world at the beginning of 2020. The World Health Organization declares the outbreak a Public Health Emergency of International Concern on the 30th of January, and a pandemic on the 11th of March. On the 4th of March, the Saudi Arabia government orders the full closure of all schools and universities nationwide. Secondary Schools student are more likely to engage in risky health practices related to COVID-19. Their compliance with infection control measures is a key factor to mitigate the spread of the disease. Novel coronavirus-2019 is a highly infectious disease that caused a global pandemic around the world .Lack of knowledge about appropriate infection control practices has caused great concerns for human health, especially in the risk of many communicable diseases .and related to COVID-19 ).

**Aim of the study:** To assessment of Children's Knowledge, Attitudes, and Practices Regarding COVID-19 among school students secondary in Makkah Al-Mokarramah , Saudi Arabia2021.

**Method:** An online cross-sectional survey was utilized. study conducted among secondary school students at Makkah, during the April to June, 2021, a total of 200 studet aged 12–18 years, available students of secondary school children were included in the study. A structured online self-reported questionnaire sheet was used to assess children's knowledge, attitude, and practice about COVID-19

**Results** shows that most of the participants (66.0%) were in the age group more than 14-16 years follow by the (21.67%)were in the age >16 years and the data ranged from(20.0%) the majority of them were female (75.0%) while male (25.0%),also regarding Nationality the majority of participant are Saudi were(90.0%) while Previous training programs the majority of participant were (94.0%).

**Conclusion:** Regardless of the results,, it is suggested that people should continue to strengthen knowledge, attitude, and practice towards COVID-19, so that Saudi Arabia can win the battle against the disease, More emphasis should be placed on education of the student participants about biological meaning of this infection and relative preventive or future measures. Awareness educational programs should be implemented toward preventive measures of COVID-19.

**Keywords:** assessment, Children's, Knowledge, Attitudes, and Practices, COVID-19, Secondary, Schools, Makkah Al-Mokarramah .

## Introduction

Coronavirus disease 2019 (officially known as SARS-CoV-2 or COVID-19) is an 2 emerging acute respiratory illness that is caused by a novel coronavirus and is first reported in December 2019 in Wuhan, Hubei Province, China, [1] from where it spread 4 rapidly to over 198 countries [2,]. In response to this serious situation, the World 5 Health Organization (WHO) declares it a public health emergency of international 6 concern on 30th of January and calls for collaborative efforts of all countries to prevent 7the rapid spread of COVID-19. It is declared as a global pandemic by WHO on 12th of 8 March [3,4].The sources of infection are patients with symptomatic COVID-19 and asymptomatic patients and patients who are carriers of SARS-CoV-2 [5] The incubation period for the virus is typically 2–14 days, and the period from the onset of symptoms to death was estimated to range from 6 to 41 days [6]

The cause of an infectious disease that had not been previously detected before the outbreak reported in Wuhan, China, in December 2019. On February 11, 2020, the World Health Organization (WHO, 2020a) announced an official name for this disease, COVID-19. The COVID-19 has so far infected millions of people, causing hundreds of thousands of deaths worldwide (European Center for Disease Prevention and Control,(2020) and the numbers are escalating[7]. Since the WHO affirmed COVID-19 as a pandemic, recommended outbreak infection control measures are being globally employed [8]. Measures to prevent person-to-person transmission were widely implemented, including closing schools and college's school students secondary. After a 14-hour voluntary public

curfew named as 'Janta Curfew', Saudi Arabia immediately announced the implementation of a nation-wide complete lockdown for 21 d (i.e. up to 14th April 2020), which only allowed essential services to operate over the entire [9]. The battle against COVID-19 is still unending in Saudi Arabia. People's observance of the prevention measures is essential for controlling the spread of COVID-19, which is affected by their knowledge, attitudes, and practices (KAP) towards COVID-19. Especially high school students. Therefore, we conducted a survey to investigate the KAP towards COVID-19 among the students of a government during the rapid rise period of the COVID-19 outbreak, staying at home, working and studying from home, stopping public transportation, terminating all social gathering, employing social distancing, wearing face masks, and strict hand washing and hygiene practices [10]

Additionally, global efforts emphasizing special precautions to protect vulnerable population such as elderly people, health care providers, and children were recommended [11] Compliance with preventive measures is very important to prevent the spread of disease. It may be affected by the public's awareness and attitude towards COVID-19 (12). There is evidence that public knowledge is important for responding to epidemics (13,14). By assessing the public's awareness and knowledge of the coronavirus, deeper insights into existing public perceptions and practices can be obtained, which can help determine the attributes that influence the public's adoption of health practices and response behaviors (15). World Health Organization (WHO) has recommended strategies to control the pandemic, such as cancellation of social events, traffic restriction, home quarantine, and development of clinical care. In addition to management policies, laboratory capacity enhancement, surveillance strategies, infection prevention, implementation of health measures for travelers risk communications, and community engagement (16).

The COVID-19 outbreak is a worldwide traumatic event, creating a unique and unprecedented change in health care systems (17). Therefore, nursing care should focus on limiting the exposure and spread of the virus. Control practices are used to provide safe, quality supportive care and education (18).

## Literature Review

Dong et al., 2020 found that SARS-CoV and MERS-CoV are less common and severe among children. However, it is possible that true numbers of infected cases among children are underestimated or underreported, as children are frequently asymptomatic or have less severe symptoms, are usually well protected at home and have less exposure to the sources of infection transmission, and are often less tested [19]

Belluck et al, 2020 report that most diagnosed infected children exhibit less severe signs and faster recovery when compared with adults, except for infants and preschoolers who are more subjected to severe illness of corona infection [20]. study was conducted in Jordan in the early stages of COVID-19 pandemic to assess adolescents' KAPs toward the disease. In line with these findings came other national studies on Jordanian university, students [21] and dentists [22] are showing a good level of knowledge regarding COVID-19.

However, there seemed to be a knowledge deficit related to some issues, particularly transmission of CoV from asymptomatic carriers and the necessity of following preventive

measure among children and adult. This result is congruent with a study conducted on adult participants from Jordan, Saudi Arabia, and Kuwait, which also revealed low knowledge scores related to disease transmission [23]

study conducted in Iran reported lower scores on knowledge and noncompliance with wearing masks in public places among Iranian adolescents [24]

In a study that investigated Chinese adolescents' knowledge, attitudes, and practices (KAPs) toward COVID-19 [25], results affirmed that adolescents are more likely to engage in health risk behaviors .

### **Rationale**

There may be a gap between knowledge of COVID-19 and perceptions of COVID-19 among secondary school students and young adults in Saudi Arabia. the World Health Organization declares the outbreak a Public Health Emergency of International Concern on the 30th of January, and a pandemic on the 11th of March. On the 4th of March, the Saudi Arabia government orders the full closure of all schools and universities nationwide. Secondary Schools student are more likely to engage in risky health practices related to COVID-19 life-disorder. Prevention and health promotion is one of the cornerstones in our practice, thus investing in knowledge, attitudes, and practices toward management of COVID-19.

### **Aim of the Study**

To assessment of Children's Knowledge, Attitudes, and Practices Regarding COVID-19 among school students secondary in Makkah Al-Mokarramah , Saudi Arabia 2021.

### **Objectives**

- To assessment the knowledge of secondary school children regarding COVID-19 includes mode of transmission, clinical manifestations, treatment, precautions, and risk groups.
- To recognize the attitude of secondary school children regarding COVID-19 including social distance, hand washing, and the methods of controlling the infection .
- To recognize the practice of secondary school children toward prevention of COVID -19 infection includes cultural behavior, social distance, and hand washing.

### **Material and Methods**

Research Design: cross-sectional research design was utilized in the present study via a web-based survey to assess the level of KAP among secondary school students in Saudi Arabia regarding COVID-19.

#### **Setting:**

This study was conducted at Secondary Schools in the Makkah in Saudi Arabia 2021

#### **Sampling:**

In this study, a systemic random sample was used to include secondary school children in the above-mentioned settings (200 Child)

**Inclusion criteria:** The inclusion criteria for sampling were

Secondary school children who are available during the collection of data.

### **Exclusion criteria:**

Secondary school children who didn't complete the answers to the questionnaire sheet .

### **Tool of data collection**

One tool was used for data collection:

Tool: A structured online self-reported questionnaire sheet was implemented by using a Web-based survey platform. It was adapted from previously validated research (23) and composed of four parts:

Part 1: Socio-demographic data are collected including age, gender, nationality, and attendance of training programs about COVID-19.

Part 2: Knowledge regarding COVID-19 had 15 questions. These questions were responded on a Yes / No basis. The correct answer received one and the incorrect answer received zero. Adequate knowledge equal to  $\geq 75\%$  of the total score and  $< 75\% - 60\%$  was deemed moderately adequate knowledge while  $< 60\%$  of the total score was revealed poor knowledge.

Part 3: The attitude concerning the prevention of COVID-19 had 5 questions. The grading system is based on a 5-point Likert scale that ranges from (strongly disagree=1), (disagree=2), (uncertain=3), (agree=4) to (strongly agree=5). Favorable perception is  $\geq 60\%$  percent of total score, whereas  $< 60\%$  is considered unfavorable .

Part 4: Practice headed for COVID-19 had 5 questions. These questions were answered on a Yes / No basis. The result was expressed as a percentage. Incompetent practice:  $< 85\%$  of entire practices score, while competent practice:  $\geq 85\%$  of total practice score.

### **Ethical considerations**

Following an explanation of the purpose that participation in the study is voluntary, local authorities granted authorization to conduct the study. Those who agreed to participate in the study gave their informed consent. The collected information was kept secret.

### **Procedure for data collection**

Fieldwork: Data collection was conducted from January to April 2021.

### **Assessment phase**

Official permission was approved from the appropriate authoritative personnel. The questionnaire was converted to an online web-based survey. Before administration, the web-based survey was experienced on different web browsers to ensure robustness. Secondary school children who agreed to contribute in the study were interviewed through Zoom meetings according to their available time. The researchers illuminated to the students the purpose of the study and asked them to fill out the questionnaire (tool1) through Google form and it took 15 minutes. A message with a link to the web-based survey was sent to the class leaders to invite all the registered students to share in the study. The assessment phase took four months to complete the required data.

## Data processing and analysis

The IBM Statistical Package of Social Science (SPSS) version 26 was used to analyze the data. Descriptive statistics were used to resume the students' responses to the KAP statements in the form of frequencies, percentages, means, and standard deviations in the form of frequency distribution tables, numbers, and percentages.

## Results

**Table (1): Socio-demographic characteristic of studied children (N=200)**

	N	%
<b>Children Age</b>		
<14	28	14
14-16.	132	66
>16	40	20
<b>Sex</b>		
Male	50	25
Female	150	75
<b>Nationality</b>		
Saudi	180	90
Non-Saudi	20	10
<b>Previous training programs</b>		
Yes	12	6
No	188	94

Table 1 shows that most of the participants (66.0%) were in the age group more than 14-16 years follow by the (21.67%) were in the age >16 years and the data ranged from (20.0%) the majority of them were female (75.0%) while male (25.0%), also regarding Nationality the majority of participant are Saudi were (90.0%) while Previous training programs the majority of participant were (94.0%).

**Table (2) Distribution of the Attitude of the children towards COVID-19 (No=200)**

		Attitude of the children towards COVID-19					% Of agreement	Chi-square	
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree		X <sup>2</sup>	P-value
<b>1- It is important to keep distance from others to avoid the spread of COVID -19</b>	N	92	64	22	14	8	81.8	132.600	0.000
	%	46	32	11	7	4			
<b>2-Hand washing is an effective</b>	N	152	32	4	10	2	92.2	406.200	0.000
	%	76	16	2	5	1			

<b>measure against COVID-19.</b>									
<b>3-To protect myself from COVID-19 exposure, I should stay home or receive medical care while I am sick.</b>	<b>N</b>	164	22	4	6	4	93.6	486.200	0.000
	<b>%</b>	82	11	2	3	2			
<b>4-COVID-19 will eventually be controlled successfully</b>	<b>N</b>	158	26	4	4	8	92.2	443.400	0.000
	<b>%</b>	79	13	2	2	4			
<b>5-Compliance with the precautionary measures of the Ministry of Health will prevent the spread of COVID19.</b>	<b>N</b>	92	70	18	8	12	82.2	147.400	0.000
	<b>%</b>	46	35	9	4	6			

Table 2: clarified attitude of the children towards COVID-19, it was revealed that the mean attitude score show that is a significant relation between Attitude and demographic data regarding all items while P-value 0.000 and respectively ( $X^2$  132.600, 406.200, 486.200, 443.400, 147.4000. Saudi children COVID-19 was and the overall favorable perception was indicating positive attitudes for Saudi children . The majority of Saudi Arabian children had a positive attitude concerning keeping distance from others to avoid the spreading of COVID-19 and staying at home during the pandemic period. Saudi children were agreed that COVID-19 will be successfully controlled and compliance with the Ministry of Health precautions prevents the spread of infection. There were statistically significant differences in attitude among Saudi Arabian children concerning COVID-19.

## Discussion

**Table (3): Distribution of the responses of students to knowledge regarding COVID -19 (No=200).**

	knowledge regarding COVID -19				Chi-square	
	Correct		Incorrect		X <sup>2</sup>	P-value
	N	%	N	%		
1- COVID-19 spreads from individual-to-individual within close distance of each other	190	95%	10	5%	162.000	<0.001*
2- COVID-19 spread via respiratory droplets, like coughing and sneezing	186	93%	14	7%	147.920	<0.001*
3- COVID-19 can be contracted by touching a contaminated surface, followed by touching one's mouth, nose, or eyes.	164	82%	36	18%	81.920	<0.001*
4-Close contact or ingesting wild animals causes COVID -19.	166	83%	34	17%	87.120	<0.001*
5-People infected with COVID-19 can't transmit the virus to others while a fever is not present.	176	88%	24	12%	115.520	<0.001*
6-The main symptoms of COVID -19 are fatigue, fever, dry cough, shortness of breath, and myalgia	142	71%	58	29%	35.280	<0.001*
7-Antibiotics are an effective treatment for COVID -19.	130	65%	70	35%	18.000	<0.001*
8- People with serious chronic illnesses are at increased risk of developing more serious complications from COVID -19	146	73%	54	27%	42.320	<0.001*
9-Children appear to be at higher risk for COVID -19 than adults.	138	69%	62	31%	28.880	<0.001*
10-It is essential for children to take measures to avoid COVID -19 transmissions.	186	93%	14	7%	147.920	<0.001*
11-People should avoid touching their eyes, nose, and mouth with unwashed hands.	164	82%	36	18%	81.920	<0.001*
12-People should put on a mask if they are infected with the virus or caring for somebody with suspected COVID-19 infection	190	95%	10	5%	162.000	<0.001*
13-Isolation and treatment of people infected with the COVID-19 are effective	176	88%	24	12%	115.520	<0.001*



methods to decrease infection						
14-People in contact with someone infected with COVID -19 should be immediately quarantined, in an appropriate location, for an observational period of 14 days	160	80%	40	20%	72.000	<0.001*
15- To prevent transmission of COVID-19, people must avoid going to crowded places and avoid taking public transport.	184	92%	16	8%	141.120	<0.001*

Table 3: clarified the responses of children to knowledge regarding COVID -19, it was illustrated that the COVID-19 While the mean COVID-19 knowledge score of Saudi Arabian students was high, and the overall accuracy rate for the knowledge test also high Saudi Arabian children had correct knowledge regarding COVID-19. However, these results in Saudi Arabia, that the majority are responded correctly as follows respectively (95%,93%, 82%, 83%, 88% 71%, 65%, 73%, 69%, 93%, 82%95%, 88%, 80%, 92%). Therefore, there were statistically significant differences in knowledge among in all item were P-value <0.001\*and  $X^2$  respectively(162.000,147.920, 81.920, 87.120, 115.520, 35.280, 18.000, 42.320 28.880,147.920,81.920, 162.000, 115.520,72.000, 141.120

**Table (4): Distribution of the responses of students to Practice for preventing Covid-19 transmission (No=200).**

	Practice for preventing Covid-19 transmission				Chi-square	
	Yes		No		$X^2$	P-value
	N	%	N	%		
<b>Have you recently participated in a social event with a large number of people?</b>	32	16%	168	84%	92.480	0.000
<b>Have you been to a crowded place recently?</b>	42	21%	158	79%	67.280	0.000
<b>Have you avoided cultural behaviours such as shaking hands recently?</b>	132	66%	68	34%	20.480	0.000
<b>Are you practicing social distancing?</b>	178	89%	22	11%	121.680	0.000
<b>Recently, are you often wash your hands with soap and water for at least 40 seconds, especially after going to public places, or after –blowing your nose, coughing, or sneezing?</b>	186	93%	14	7%	147.920	0.000

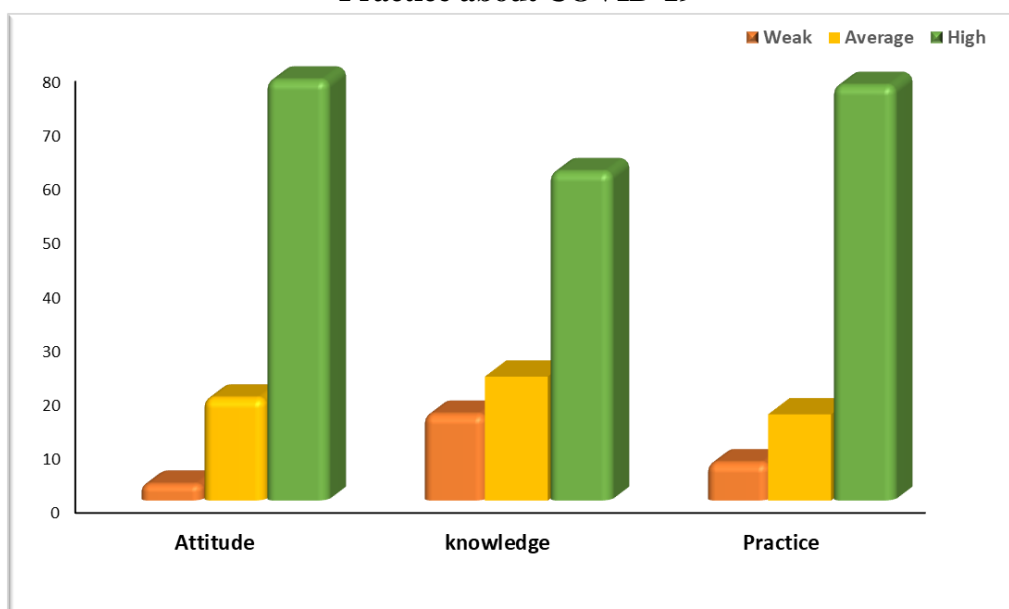
Table 4: represented practice for preventing COVID-19 transmission ,the overall practice score was average indicating incompetent practices for our groups. the results of Saudi Arabian children who revealed that the majority of them didn't involve in social events and avoiding crowded places . In Saudi Arabia, the majority of children are practicing social distancing and washing their hands with soap and water therefore, there were statistically significant differences in practice among Saudi Arabian children about COVID-19.while in the all items P-value and  $X^2$  (0.00092,480 ,67.280, 20.480,121.680,147.920.)

**Table 5 Distribution of the relation of responses of students to Attitude, knowledge, Practice about COVID-19**

		Weak	Average	High	Chi-square	
					$X^2$	P-value
Attitude	N	6	38	156	187.240	<0.001*
	%	3	19	78		
knowledge	N	32	46	122	70.360	<0.001*
	%	16	23	61		
Practice	N	14	32	154	174.040	<0.001*
	%	7	16	77		

Regarding attitude of the participant toward Attitude about COVID-19 high attitude were(78.0%)  $X^2$  187.240a significant relation were the P-value=0.001, also knowledge about COVID-19 high attitude were(61.0%)  $X^2$  70.360 a significant relation were the P-value=0.001.regarding Practice about COVID-19 were high(77.0%)  $X^2$  174.040 a significant relation were the P-value=0.001.

**Figure (1)Distribution of the relation of responses of students to Attitude, knowledge, Practice about COVID-19**



**Table 5 Distribution of the relation of responses of students to Attitude and knowledge about COVID-19**

		Attitude	knowledge
<b>knowledge</b>	r	0.897	
	P-value	<0.001*	
<b>Practice</b>	r	0.901	0.88
	P-value	<0.001*	<0.001*

Regarding knowledge of the participant toward Attitude about COVID-19 a significant relation were the P-value=0.001, also r (0.897%) . regarding Practice a significant relation were the P-value=0.001 with attitude were r 0.901 with attitude while knowledge r were (0.88) and a significant relation were the P-value=0.001.

## Discussion

The coronavirus disease is a highly infectious disease that has caused a global pandemic and poses a significant threat to public health. In our study, it shows that most of the participants (66.0%) were in the age group more than 14-16 years follow by the (21.67%) were in the age >16 years and the data ranged from (20.0%) the majority of them were female (75.0%) while male (25.0%), also regarding Nationality the majority of participant are Saudi were (90.0%) while Previous training programs the majority of participant were (94.0%). These results were consistent with [26] who reported that the age of participants ranges from 14 to 19 years old, with a mean  $\pm$  SD equal to  $17 \pm 3.64$ . This finding is similar to [72] who stated that the mean age of the respondents was 14.8 years. This age emphasizes the importance of delivering educational programs on pandemic numbers in order to avoid infection spread and enhance the quality of life .

Regarding the distribution of the studied children according to their gender, it was revealed that the majority of children were female (75%). This was in line with a study conducted by [26] revealed that 59.3% were female and 40.7% were male. As well as, [27] who stated that 65.5% were female vs. 34.5% were males. This was contradicted with results of Saudi children who showed that the entire sample was female (100%) and this is rendered to the distribution of students at schools according to their gender. Regarding attendance of previous training about COVID-19, it was illustrated that none of students attending any previous program, and only 6% of Saudi Arabian students were attending previous training programs. This clarifies the importance of applying educational programs to increase their awareness about preventive measures and prevent further infection. This is corroborated with [28] who recommended health education interventions to the vulnerable population at risk of contracting COVID-19 to have better knowledge and practices.

Concerning responses of children to knowledge regarding COVID-19, it was shown . While the mean COVID-19 knowledge score of Saudi Arabia children was and the overall accuracy rate for the knowledge test indicating adequate knowledge not good. Our results agree with

[28] who reported that the overall accuracy rate for the knowledge . The majority of Saudi Arabian children had correct knowledge regarding COVID-19. Similarly, [29] claimed that the findings indicated that the majority of study participants were familiar with COVID-19. Also, this finding is almost in line with studies[ 30,31 ] [32] who reported that the Saudi community has enough understanding about epidemics. This may be rendered to the provision of health teaching and awareness through Mass Media and telemedicine that facilitate the provision of health awareness that is very important for early quarantine to prevent the possible spread among the student community. Therefore a study conducted by [27] recommended that new applications and digital platforms during the pandemic facilitating the provision of health services including telemedicine and teleware.

The study revealed that the majority of children in Saudi Arabia are identified that people with serious chronic illnesses are at increased risk of developing more serious complications . This was similar to [12], who found that 95.5% of the respondents in the study said that persons with chronic conditions are more likely to experience major consequences using COVID-19. In addition to 42% of them reported that close contact or ingesting wild animals causes COVID-19. This was in line with [28]who mentioned that only 52.2% of students answered it correctly. However, these results were different in Saudi Arabia, it was revealed that the majority are responded correctly . Therefore, there were statistically significant differences in knowledge among Saudi Arabian students regarding COVID-19. This differentiation in knowledge may be rendered to access to information through the media and social networks and this will emphasize the value of educational initiatives to improve knowledge and awareness .

The study depicted that 75% of Saudi children. This finding aligns with [30] who showed that 87% of them were practicing preventive measures positively. In Saudi Arabia, the majority of children are practicing social distancing and washing their hands with soap and water therefore, there were statistically significant differences in practice among Egyptian and Saudi Arabian children. This was similar to [32] who stated that there was sufficient hand hygiene practice among all participants (87.5%). This result agreed with [32] who mentioned that 87% of participants practicing preventive measures positively as avoiding shaking hands and frequently washing their hands. This may be rendered to the information given about hand washing practice by all campaigns during the peak periods of infectious diseases transmission as one of the effective World Health Organization (WHO) recommendations for tackling the virus spread. This was comparable to the findings of [33] who revealed that during periods of infectious disease transmission, campaigns encourage people to wash their hands

## **Conclusion**

It was concluded that the majority of the study sample had adequate knowledge, and a positive attitude towards the preventive measures of COVID-19. Meanwhile, there was incompetent practice toward preventive measures of COVID-19.

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