Research Article

Knowledge, Attitudes and Practices of Medicine Student towards Novel Corona Virus (COVID-19)

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Abstract

Background: The emerging respiratory disease is caused by the novel type of corona virus which is named as COVID-19. This respiratory illness has received internal attention and it is categorized as highly threaten disease in the US by the Centers for Disease Control and Prevention. The purpose of the study was to assess the knowledge, attitude and practice of undergraduate medical students towards COVID-19.

Methods: Descriptive cross-sectional design was used to assess knowledge, practice and attitudes of 255 undergraduate medical students towards COVID-19. Study participants were recruited from the Fakeeh College for Medical Sciences between April and August 2020.

Results: The results of study participants showed that undergraduate medical students had moderate knowledge towards COVID-19 (Mean=20.54, SD ± 4.67). Also, participants had high level of knowledge regarding nature of diseases and precautionary measures by health care providers dimensions. However, they expressed limited knowledge towards mode of transmission. Moreover, study participants demonstrated an optimistic attitude toward disease as the average 43.78 and good practice towards COVID-19 (average 18.67).

Conclusions: The study results revealed that study participants demonstrated good knowledge with favorable and accepted practice. This study suggests the importance of emphasis on infectious disease in medical curriculum.

Keywords: Student; Knowledge; Attitudes and practices; COVID -19; Pandemic

Introduction

The emerging respiratory disease is caused by the novel type of corona virus which is named as COVID-19. This respiratory illness has received internal attention and it is categorized as highly threaten disease in the US by the Centers for Disease Control and Prevention (CDC) [1]. The first case of COVID-19 was diagnosed in Wuhan city, China in late December 2019. The world health organization announced the disease as pandemic in February 2020. Around 62 countries reported 85176 confirmed cases with more than of 3000 death cases [2]. In the Kingdom of Saudi Arabia, the first case was conformed in March 2020.

The exact method of transmission of novel virus of corona is not clear yet. However, it has been hypothesis it spreads through direct contact, air droplet or animal transmission. Also, the virus has 14 days of incubation before the clinical symptoms of illness becomes apparent [3,4]. The symptoms are fever, cough, myalgia, shortness of breath, dyspnea, hypoxemia and respiratory distress [5]. Adults and children are reported to experience less severity of symptoms compared to people with immunocompromised [6]. One of treatment modality of affected individual is quarantine and isolation in order to protect surrounded people. Especially, there is no drug is effective against virus and the treatment is supportive. There is no antiviral drug or vaccine is approved and great effort from several pharmaceutical companies to discover such vaccine.

Universities are likely to become explosive, infected, and epidemic places due to their large young students, high levels of close social contact and permeable restrictions [7]. It is very important to know the knowledge and attitudes of university students on COVID-19 virus [8]. Because this can give an idea about what information they have and their attitude towards this crisis [9]. Whereas, attitude defined by Abdelrahman [10] as something that "represents the positive or negative readiness towards certain things; a person, place, an event. Following to the WHO declaration about global pandemic, the government of Saudi Arabia has monitored the country health condition closely, particularly after the first national case diagnosis confirmation on 2 March 2020. The Kingdom of Saudi Arabia implemented preventive measures to control the spread of COVID-19. These measures included national curfew to restrict people movement most of day hours and lockdown of schools, universities, national and international flights as well as suspend visits for umrah, and visiting the Prophet's Mosque. The assessing KAP plays an integral role in identifying behavioural changes acceptance, identify the required type of interventions to achieve the change. In addition, novelty of Corona virus, along with its uncertainties, make it critical for assessing medical students' Knowledge, Attitudes and Practice (KAP) towards COVID-19. The purpose of the study was to assess the knowledge, attitude and practice of undergraduate medical

students towards COVID-19.

Methods

Design and setting

The study employed descriptive cross-sectional survey. All undergraduate medical students, as well as the medical interns, who are enrolled in Fakeeh College for Medical Sciences in Jeddah. Students who satisfied the inclusion criteria were included in the study, as follows:

- The participants must be enrolled in the undergraduate medical or medicine program in Fakeeh College for Medical Sciences.

Sample size and sampling technique

Based on Cohen [11], sample power calculation, the minimum required sample size for observational study, with the desired probability level of (0.05), and small effect size of (0.05), and the statistical power level of (0.8), the required sample size is 255.

Data collection procedure

The study was used several strategies to enhance the response rate of medical students. The survey was administered online by Survey monkey, google form, Facebook, Twitter and WhatsApp. The research team sent several reminders to encourage all students completing the survey. The data collection was undertaken place between April and July 2020.

Outcome measures

The outcome measures of the study included two parts, the first part was related to sociodemographic data of the study participants such as age, gender, education level, and marital status. The Second part of the scale was COVID-19 knowledge questionnaire was developed by Hassan [12]. It has five dimensions, including 7 questions about the nature of disease. 5 questions concerned of mode of transmission, 13 questions related to action taken to handle suspected or confirmed cases and 4 questions rated to precautionary measures by health care providers and 4 question related to treatment of the disease. Each question is answered as a true/false basis with an additional "I don't know" option. The potential knowledge score ranged from zero to 33, the highest scores indicated better knowledge towards COVID-19. The internal consistency of knowledge items was 0.83. Attitudes towards COVID-19 were measured by 11 questions rated on 5 Likert scale strongly agree to strongly disagree. Scores ranged from 11 to 55, with high scores indicating positive attitudes. The Cronbach alpha od attitude subscale was 0.81. Also, the participants practice towards COVID-19 were assessed by five questions rated on 5 Likert scale strongly agree to strongly disagree. Overall score ranged from 5 to 25, with high scores indicating better practices. The internal consistency of practice items was 0.83.

Data analysis

Data were analyzed using the Statistical Program (SPSS) version 24. The research student coded data appropriately and enter in software. Data satisfied statistical assumptions such as normality, linearity and homogeneity of variance. Descriptive statistics was used to report frequency and percentage as well as mean alongside standard deviation. Moreover, inferential tests such as independent sample t test and one-way analysis of variance were used to compare the differences in study outcomes in relation to sociodemographic data. Pearson correlation test was used to examine the relationship between study outcomes and study participants characteristics. $P < 0.05$ was considered as statistically significant.

Ethical consideration

The study sought ethical approval from Scientific Research Committee at Fakeeh College for Medical Sciences (Ref: 1F-25). In addition, the data were collected online. Therefore, authors added one paragraph explaining the study purpose and participants commitment. Authors emphasized their participation is voluntary questionnaire was anonymous, and participants were assured of the confidentiality of their responses.

Results

A total of 255 undergraduate medical students completed the survey questionnaire. Of these, one-third of study participants aged between 18-21 years old and 100% of study participants were females, 33.72 of students were in the second year in college compared to 21.56% were in the fourth year. Moreover, almost two thirds of study participants resided with family in the same home in rural area (70%), as socio-demographic characteristics are shown in Table 1.

A total of 32 questions were used to measure knowledge on the COVID-19 virus. The first dimension has seven questions, the average of study participants knowledge regarding nature of disease showed that they had moderate level of knowledge regarding the nature of diseases. In the present study, the second dimension was measured by five questions and the average revealed that they limited knowledge about the disease transmission (average 2.14 ± 1.01). Furthermore, dimension three was measured by 13 questions in the used scale, the average reflected that study participants had moderate level of knowledge about appropriate intervention to deal with suspected or confirmed cases with COVID-19 (average 8.65 ± 2.27). Additionally, study participants had adequate knowledge about the precaution measures to control COVID-19 spread in the community. However, the results of survey indicated that study participants expressed moderate level of knowledge towards treatment of COVID-19 cases. Overall, average knowledge scores of participants were 20.54. This reflects limited level of knowledge about the pandemic disease, as described in Table 2.

Table 3 shows the number and percent of true, false and do not know

Table 1: Sociodemographic Characteristics of Participants.

Characteristics	Frequency	Percentage
Age		
18-21	175	77.8
22-26	25	11.1
>26	25	11.1
Gender		
Male	100	56.6
Female	115	44.4
Education Level		
Second Year	86	33.72
Third Year	114	44.7
Fourth Year	55	21.56
Living with		
Family	186	72.94
Friend	24	9.41
Alone	45	17.64
Place of Living		
Rural	178	69.8
Urban	77	30.19

Table 2: Overall Knowledge Scores and its Dimensions of Study Participants.

Subscale	Potential Range of Scores	Mean	Standard Deviation
Dimension 1: Nature of Disease	0 -7	4.6	1.86
Dimension 2: Transmission of Disease	0-5	2.14	1.01
Dimension 3: Actions in Dealing with Suspected, Probable and Confirmed Cases	0-13	8.65	2.27
Dimension 4: Precautionary Measures by Health Care Providers	0 - 5	4.35	1.14
Dimension 5: Treatment of the Disease	0-5	3.01	1.16
Overall Knowledge Scale	0-33	20.54	4.67
Attitudes Scale	1-55	43.78	5.74
Practice score	1-25	18.67	3.45

Table 3: Study Participants Reponses on knowledge Scale about coronavirus.

Knowledge Questions	TRUE	FALSE	Don't Know
Dimension 1: Nature of Disease			
The symptoms of Corona Virus are fever with/without chilling, cough, and dyspnea	173 (67.8%)	66 (25.8%)	16 (6.2%)
Recommended diagnostic approach in human is sampling of upper and lower airways secretions and PCR (polymerase chain reaction) examination	174 (68.2%)	47 (18.4%)	34 (13.3%)
The causative agent of corona infection is coronavirus	203 (79.6%)	18 (7.0%)	34 (13.3%)
Corona Virus can be eliminated with 70% alcohol	168 (65.8%)	82 (32.1)	5 (1.9%)
Corona Virus can be prevented with the injection of a vaccine	194 (76.0%)	37 (14.5%)	24 (9.4%)
The incubation period of CoV is 2–14 days	187 (73.3%)	7 (2.7%)	61 (23.9%)
The corona virus can survive for 48 h in the environment	90 (35.2%)	111 (43.5%)	54 (21.1%)
Dimension 2: Transmission of Disease			
Corona virus is transmitted through direct contact with respiratory tract secretions	167 (65.4%)	83 (32.5%)	5 (1.9%)
The disease can be transmitted through direct contact with contaminated human's secretions, including urine, saliva, respiratory secretions, and blood	51 (20.0%)	176 (69.0%)	28 (10.9%)
Corona virus is transmissible through hemodialysis	46 (18.0%)	162 (63.5%)	47 (18.4%)
Corona Virus is probably transmissible from infected diseased patients	111 (43.5%)	127 (49.8%)	17 (6.6%)
The disease can be transmitted from asymptomatic patients or those who are in the latent period of the disease	97 (38.0%)	139 (54.5%)	19 (7.4%)
Dimension 3: Actions in Dealing with Suspected, Probable and Confirmed Cases			
The use of personal protective equipment is necessary during aerosol production procedures, such as suction sputum sampling and intubation	182 (71.3%)	49 (19.2%)	24 (9.4%)
It is advisable to sample all respiratory secretions from all patients admitted to the hospital with a primary diagnosis of pneumonia and suspicion of CoV infection	164 (64.3%)	47 (18.4%)	44 (17.2%)
Suspected and probable cases of CoV infection must be reported immediately to the infectious disease control center	179 (70.1%)	38 (14.9%)	38 (14.9%)
A complete list should be provided of all people who have been in contact with the confirmed patient with CoV infection	183 (71.7%)	39 (15.2%)	33 (12.9%)
The use of N95 masks is necessary when sampling of induced sputum from patients suspected of CoV infection	181 (70.9%)	43 (16.8%)	31 (12.1%)
Visitors to patients with suspected, probable and confirmed cases of CoV infection should be limited both in hospital and at home	172 (67.4%)	68 (25.6)	15 (5.8%)
The number of caregiving personnel for suspected, probable and confirmed cases of CoV infection, including physicians and nurses, should be limited and certain.	148 (58.0%)	76 (29.8%)	33 (12.1%)
If no isolation room is available, patients with a diagnosis of CoV infection can be put in the same room with beds 1 m apart	169 (66.2%)	59 (23.1%)	27 (10.5%)
After confirming the diagnosis of CoV infection, patient's contacts in the past 14 days must be checked and controlled	179 (70.1%)	68 (25.6)	8 (3.1%)
After diagnosis of CoV infection, it is necessary to find possible patients among those who have been in contact with the patient	177 (69.4%)	57 (22.3%)	21 (8.2%)
The N95 mask is required to be put on when entering the room of a patient with CoV infection and caring at a distance of 2 m from the patient	158 (61.9%)	75 (29.4%)	22 (8.6%)
A person with mild symptoms of CoV must remain at home until resolution of clinical symptoms and negative results of the PCR test	178 (69.8%)	48 (18.8%)	29 (11.3%)
Patients with CoV infection admitted to an isolation room should use a surgical mask when moving and leaving the room for diagnostic and therapeutic procedure	159 (62.3%)	76 (29.8%)	20 (7.8%)
Dimension 4: Precautionary Measures by Health Care Providers			
Droplet precautions should be followed by health care providers in dealing with suspected, probable and confirmed cases of CoV infection	197 (77.2%)	51 (20.0%)	7 (2.7%)
Contact precautions should be followed by health care providers in dealing with suspected, probable and confirmed cases of CoV infection	193 (75.6%)	28 (10.9%)	34 (13.3%)

Standard precautions should be followed by health care providers in dealing with suspected, probable and confirmed cases of CoV infection	187 (73.3%)	38 (14.9%)	30 (11.7%)
Airborne precautions should be followed by health care providers in dealing with suspected, probable and confirmed cases of CoV infection	224 (87.8%)	18 (7.00%)	13 (5.0%)
Dimension 5: Treatment of the Disease			
Oxygen therapy should be given to all cases of severe CoV with acute respiratory infection	161 (63.1%)	72 (28.2%)	22 (8.6%)
Antibiotic therapy is required for the treatment until of pneumonia of suspected cases of CoV infection	136 (53.3%)	105 (41.7%)	14 (5.4%)
Ventilation with an endotracheal tube must be carried out in patients with confirmed or suspected CoV with clinical manifestations of acute respiratory distress syndrome	137 (53.7%)	91 (35.6%)	27 (10.5%)
High doses of systemic corticosteroids should be avoided in patients with confirmed or suspected CoV infection and clinical manifestations of viral pneumonia	82 (32.1%)	142 (55.6%)	31 (12.1%)

Table 4: Participant's Attitude about Coronavirus Infection.

Attitude Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I am afraid of working in places where patients suspected of CoV infection are admitted/cared for are admitted/cared for	31 (12.1%)	38 (14.9%)	82 (32.1%)	66 (25.8%)	38 (14.9%)
I am afraid of caring for a patient with CoV infection	40 (15.6%)	43 (16.8%)	67 (26.2%)	65 (25.4%)	40 (15.6%)
Despite the use of personal protective equipment and observing infection transmission the risk of CoV infection is high among health care staff	88 (34.5%)	52 (20.3%)	46 (18.0%)	28 (10.9%)	41 (16.0%)
I think that the equipment and facilities required to protect health care workers from CoV have not been sufficiently provided in the care settings	30 (11.7%)	35 (13.7%)	75 (29.4%)	64 (25.0%)	51 (20%)
Higher pay should be received when caring for patients with CoV infection	76 (29.8%)	44 (17.2%)	52 (20.3%)	43 (16.8%)	40 (15.6%)
I am afraid that a family member of mine may be affected by CoV infection	88 (34.5%)	27 (10.5%)	58 (22.7%)	46 (18.0%)	36 (14.1%)
In case of CoV outbreak, schools and workplaces should be closed	157 (61.7%)	32 (12.5%)	38 (14.9%)	20 (7.8%)	8 (3.1%)
Corona Virus is highly transmissible in hospital	78 (30.5%)	57 (22.3%)	62 (24.3%)	34 (13.3%)	24 (9.4%)
Health education has no effect on the prevention of CoV infection	10 (3.9%)	15 (5.8%)	63 (25.3%)	59 (23.1%)	108 (42.3%)
I think that training on CoV is effective in protecting me from the disease in case of likely exposure	71 (27.8%)	47 (18.7%)	54 (21.7%)	39 (15.2%)	44 (17.2%)
Caring for patients with CoV infection may be a threat to health care personnel	63 (24.7%)	61 (23.9%)	65 (25.7%)	38 (14.9%)	28 (11.3%)

Table 5: Participant's Practice about Coronavirus Infection.

Practice Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Public health agencies can control Outbreak of CoV	31(12.1%)	57 (22.3%)	84 (32.9%)	37 (13.6%)	46 (18.0%)
Corona Virus can have a negative effect on the economies of the countries involved	89 (34.9%)	51 (20.0%)	34 (13.3%)	35 (13.8%)	31 (12.2%)
It is important to report suspected cases to health authorities	102 (40.0%)	41 (16.0%)	53 (20.8%)	34 (13.3%)	21 (8.2%)
Corona Virus is preventable	59 (23.1%)	55 (22.1%)	86 (33.7%)	38 (14.9%)	28 (10.9%)
It is imperative to use a surgical mask when working with the patient with Co V	88 (34.5%)	27 (10.5%)	55 (22.1%)	35 (13.7%)	46 (18.0%)

answers of study participants regarding the knowledge dimensions. As it can be note that the highest percent of correct answers were noted in nature of disease and precautionary measures by health care providers dimensions. Additionally, the study participants responses revealed that they had moderate level of knowledge regarding the Actions in Dealing with Suspected, Probable and Confirmed Cases. However, the lowest percentages were observed in transmission and treatment of disease.

The results of study participants regarding attitudes towards COVID-19 revealed that they had negative attitudes. For instance, only 27% of study participants agreed to work in a place where it has patients confirmed with COVID-19 diagnosis. In addition, the majority of students (67.2%) expressed that they are hesitant to care for such patients. Around 50% of participants believed disease transmission can be controlled by using protective measures. More than half of study participants (52.8%) were in the agreement of COVID-19 is highly transmissible disease. Moreover, 50% of participants agreed that COVID-19 would successfully be controlled by locking down crowding places such as schools. Even so, 50% of participants were unsure whether the virus would be controlled by

lockdown measures. Only 9.7% of participants believed that health education is an effective measure to prevent the occurrence of COVID -19 and 47% were convinced that COVID-19 is dangerous disease, as presented in Table 4.

There was a total of 4 questions to access practice among the participants Also, most of them express unfavourable practice when they were asked about the efforts of different authorities for disease prevention and control, where 33.4% agreed that responsible authorities take the necessary measures for disease control, 55.9% greed that corona virus has deleterious impact on economical status of the affected country. Among participants, 55.2% believed that COVID-19 is preventable disease. Meanwhile, 45% of participants performed practices like wearing a mask as a correct way to control the disease transmission. More than half of the participants reported that reported case discovered to health authority is a successful method to restrict disease spread, as reported in Table 5,6 and 7.

Discussion

To the best of our knowledge, there are no previous studies examined KAP among undergraduate medical university students

Table 6: Student's total knowledge scores about coronavirus according to their personal characters.

Characteristics	Dimension 1: Nature of Disease	Dimension 2: Transmission of Disease	Dimension 3: Actions in Dealing with Suspected, Probable and Confirmed Cases	Dimension 4: Precautionary Measures by Health Care Providers	Dimension 5: Treatment of the Disease
Age					
18-21	3.86	3.08	7.68	4.08	3.75
22-26	4.57*	4.28	9.58*	4.68	4.41*
>26	4.2	4.35*	9.25	4.81*	4.08
Education Level					
Second Year	3.94	3.89	8.67	3.58	3.26
Third Year	4.76	4.65*	9.91*	4.67*	4.76*
Fourth Year	4.82*	4.24	9.74	4.52	4.52
Living with					
Family	4.67	4.65	10.23	4.75	4.35
Alone	4.62	3.58	9.58	4.25	4.26
Place of Living					
Rural	4.61*	4.51*	9.90*	4.37	4.67
Urban	3.57	3.59	8.78	4.21	4.54

Table 7: Correlation between Total Knowledge, Total Attitude about Corona and Personal Characteristics of Studied Sample.

Characteristics	Total knowledge Score	Total Attitude Score	Total Practice Score
Age	0.652*	0.588*	0.742*
Education Level	0.684*	0.751*	0.650*
Living with	0.178	0.742*	0.619*
Place of Living	0.252	0.654*	0.589*

toward COVID-19. However, there are limited studied examined general community perception towards the pandemic crises.

It has been reported that the KAP for an infectious disease is relied on several factors such as the prevalence and incidence of cases as well as mortality rate of affected people. Ever since the announcement of COVID-19 as a pandemic by the WHO, the knowledge, attitude and practices toward COVID-19 has been growing day by day [13,14]. The fact that COVID-19 is highly contagious disease which makes the control of its spread challenge. Therefore, the effective strategy to control infectious disease spread by adopting strict sanitation measures as well as proper measures of handwashing. The Ministry of health in Saudi Arabia implemented strict safety measures. For instance, wearing facemasks and gloves, and frequent handwashing.

The results of the study indicated that medical students had moderate level of knowledge towards COVID-19 (average 20.54 ± 4.67). Looking at the table results reflected that some knowledge items towards COVID-19 is received high percentage compared to other item received low percentage. This suggests that numbers of participants had high knowledge and other part had low knowledge towards the phenomenon. The finding of a high correct rate of COVID-19 knowledge found among study participants can be related to the nature of their discipline even though the study was conducted at earlier stage of pandemic crises. Also, the largest proportion of study sample were at advanced education level, those students were more likely to actively learn information about the virus from variety of authentic sources.

Regarding the nature of disease dimension, students appeared had sufficient knowledge about the disease as most of students provided correct answer to questions related to symptoms, diagnostic criteria and techniques as well as virus incubation period. In this study, the findings regarding the knowledge about COVID-19 among the students reflect a good relationship between their deep

understanding and the information available about COVID-19 in the literature and media [13,15]. For example, most of study participants defined frequent clinical manifestation of disease (i.e. fever, dry cough and dyspnea) and lack of effective approved treatment against COVID-19. This could be attributed to the factor that the seriousness of COVID-19 disease and the number of new cases as well as mortality rate as announced daily by world health organization. This result is consistent with those reported elsewhere that students had adequate knowledge towards symptoms and preventive measures [16,17]. This could be explained by the fact that Ministry of Health in Saudi Arabia has conducted an official talk daily by health minister and MoH specified education channels to inform public about the COVID-19. Moreover, several reports are made available from the World Health organization and Communicable Disease Centre.

With regard to the mode of transmission, the study participants demonstrated poor knowledge towards the transmission of recent corona virus, this was evident from the average (2.14 ± 1.01). The percentage of correct answers were least compared to non-correct answers. This could be explained by the novelty of virus and several inconsistent information about method of transmission by close contact (65%), air droplet (20%), or through haemodialysis (18%). Comparison of the findings with those of other studies confirms that students showed limited knowledge about COVID-19 mode of transmission [12,18]. It could be attributed to the spread of myths and misinformation driven by fear, blame and stigma. This may be a reflection of need to have more emphasis on the modes of transmission in the future educational campaign.

In terms of actions in dealing with suspected, probable and confirmed cases, the results of survey appeared that participants reported the importance of social distance, and the importance of using surgical mask in prevention of disease spread. Similarly, the result of Al-Hanawi, Angawi [18] that students of KAU showed a good knowledge towards the importance of frequent handwashing,

mask and social distance in controlling the COVID-19 spread. The current study confirmed the fact that students of health colleges are more knowledgeable compared to other specialties and this result is in accordance with [19]. In relation to public knowledge, general population stresses the importance of mask in prevention the disease spread [20,21]. Several studies conducted in other Asian countries have indicated high levels of COVID-19 knowledge among the general population [17] and healthcare workers [22]. Differences in measurement and scoring systems do not make it possible for accurate comparisons of knowledge levels across these studies.

Also, study participants had moderate knowledge about the appropriate treatment approach for COVID-19. The participants indicated oxygen, antibiotic, antiviral or vaccination as management action. This could be attributed to the fact that there is no approved drugs or vaccines against COVID-19 [14]. This also accords with our earlier observations, which showed that participants expressed wide range of views towards COVID-19 management by drugs, traditional treatment or vaccination [15,16,18].

In terms of attitude of students toward coronavirus, the study showed that participants had optimistic attitudes towards pandemic crises. Around 27% of study participants stated they are hesitant to provide care for patient diagnosed with COVID-19. Furthermore, 54% of students reported even they use face mask, the risk of COVID-19 is still high. The results showed that the most of students applied precautions measure in order to control COVID-19 spread. These measures included avoided crowded places or wearing medical masks. These were consistent with strict measures were implemented by the government. Approximately 75% concur that gathering places should be locked down to successfully control COVID-19 spread. This finding is consistent with a recent study conducted in China, where the majority of participants were convinced that the disease is curable and that their country will combat the disease [17]. However, these results contrast with other findings that suggest people tend to express negative emotions, such as anxiety and panic, during a pandemic that could affect their attitude. In terms of practice, study participants showed good practice towards COVID-19. This is evident from their agreed responses. This result is supported by earlier studies which indicated that participants who had good knowledge towards COVID-19, they transferred the knowledge into practice.

It is of worth noting that there was a significant difference in the mean of knowledge, attitudes and practice scores according to study participants characteristics. For instance, students added 22 years or older showed more knowledge, optimistic attitudes and positive practice. In addition, education level demonstrated significant difference in all dimensions of knowledge, attitudes and practice. This could be related to the advanced students received more specialized medical courses alongside epidemiology course. This positive result is also echoed in students who lived in rural areas. This might be related to availability of information, strictness in application of governmental preventive measures. These results corroborate the findings of a great deal of the previous work in Alzoubi, Alnawaiseh [23] and Hassan [12] who stated aged, education level influenced participants knowledge, attitudes and practices towards COVID-19.

Despite its exploratory nature, this study offers some insight into assessing undergraduate medical students' attitudes KAP towards COVID-19. However, the study has threats such as study participants were recruited from one governmental university which limits the generalizability of the study findings. Moreover, almost all of the study participants were female.

Conclusion

Our findings suggest that undergraduate medical students had good knowledge, positive attitudes, and good practices toward COVID-19. The results of the study should help stakeholders to pay more emphasis on infectious disease and the medical role in controlling its spread.

Author Contribution

Study conception and design: NA, AH

Data collection: NA, AH

Data analysis and interpretation: AH

Drafting of the article: AH

Critical revision of the article: NA, AH

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