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COVID-19 - Knowledge, Attitude and Practice among Medical and Non-Medical University Students in Jordan

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Abstract

The World Health Organization declared COVID-19 as a pandemic on the 11th of March 2020. Since then, many efforts are being carried out to contain the virus. Knowledge and attitude of people should be directed towards strict preventive practices in order to halt the spread of the virus. The aim of the current cross-sectional study is to assess the knowledge, practice and attitude of university students from medical and non-medical colleges in Jordan using a structured questionnaire involving a total number of 592 students. A positive response regarding the overall knowledge about the symptoms of COVID-19 was observed in more than 90% of the students. In response to the attitude and practice, a good number of students nearly 99.7% agreed that hand washing is necessary for prevention of infection whereas 68.4% believed that mask wearing would prevent the infection. Around 6-7% students considered the virus as a stigma hence would not visit hospital. Also, around 10% students believed that their religious beliefs and body immunity might protect them from infection. More dangerously, 20.6% and 19.2% students believed antibiotics and smoking to be a protective measure against the infection respectively. Also, 96.8% do avoid hand shaking, 98.8% wash their hands and 93.3% use alcoholic rub, 95.8% cough or sneeze in a tissue and dispose it in waste bin, 51% will drink ginger with honey and 42.7% eat garlic for infection prevention. The main sources of knowledge were social media, internet and television. No significant difference was noticed between medical and non medical colleges. Thus, there is a need for more detailed and directed measures and awareness campaigns to improve the knowledge, attitude and practice in some critical aspects to contain the virus.

Keywords: COVID-19, Knowledge, practice, attitude, university, students, Jordan

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INTRODUCTION

In late December 2019, a novel coronavirus disease was identified and responsible for the new cases of pneumonia in Wuhan, China. The virus was initially named as 2019 novel coronavirus (2019-nCOV) by the WHO, then was later on updated as SARS-CoV-2 and the name of the disease as coronavirus disease 2019 (COVID-19)[1,2]. On the 11th of March 2020, the WHO has declared COVID-19 as a global pandemic and most of the countries worldwide have registered COVID-19 cases, including Jordan. The SARS-CoV-2 is an enveloped non-segmented positive sense RNA virus[3]. Around six coronaviruses have been identified to infect humans namely the α-CoVs HCoV-229E, HCoV-NL63, β-CoVs HCoV-HKU1 and HCoV-OC43 responsible to cause mild respiratory symptoms similar to that associated with the common cold, while SARS-CoV-2, SARS-CoV, and MERS-CoV are implicated to cause lethal respiratory infections[4]. The origin of COVID-19 stick to a food market in Wuhan, China[5,6] where bats were proposed to be implicated to be the source of SARS-CoV-2 based on its 96.2% genomic similarity with the bat coronavirus COV RaTG13[7]. SARS-CoV-2 invades lower respiratory tract cells using the angiotensin-converting enzyme 2 (ACE2) receptor[8].

The site of infection determines the route of transmitting the virus among people directly via the respiratory droplets and secretion and indirectly through contaminated inanimate surfaces[9]. Based on the epidemiological investigations, the incubation period of the SARS-CoV-2 is between 1-14 days and the virus has been found to be contagious in the asymptomatic patients[10]. The COVID-19 infection is more prominent in the elderly people with underlying diseases[11,12], and the clinical presentations include fever, cough, malaise and acute respiratory distress syndrome in few patients which may eventually leads to death. However, in adults and children the disease is usually presented with mild flu-like illness[13]. Rapid respiratory transmission of the disease necessitates the practice of strict respiratory precautions for its prevention. Therefore, the current study aims to assess the knowledge, attitude and practice regarding COVID-19 among medical and non-medical students and to evaluate the general satisfaction towards the governmental policies for the disease confrontation. The findings of this study are expected to help in many aspects such as, better planning for awareness campaigns, guide different health authorities accordingly to modulate their policies as needed and to correct some untoward behaviors in order to stop the spread of the virus which may result in rapid control and containment of the ongoing pandemic.

METHODOLOGY

Study design

This cross-sectional study was conducted in March 2020, in Mutah University, a governmental university in Jordan with a total number of about 16,000 undergraduate students[14]. The study was conducted using online self-administered questionnaire distributed to specific Facebook groups of students from health and other colleges. These groups were used by different faculty members to deliver notes and announcements to their students. And recently, due to COVID-19 pandemic, lectures were imparted to students via these Facebook groups as a part of distance learning.

Inclusion criteria

University students
Any gender
Any nationality
Living in Jordan
Able to read and write
Had a Facebook account
Member of Facebook groups that were selected for the study

Exclusion criteria

Illiterate
Outside the study period
Did not live in Jordan

Questionnaire

The survey questionnaire composed of an interface and five main parts with a total number of 30 questions. The interface of the questionnaire explains the aim of the study additionally assuring the participant on confidentiality ground.

The five main parts of the questionnaire included the following aspects

Socio-demographic data such as sex, college, year of study and complaining any health related problems.

Knowledge part which includes data on most

important symptoms of COVID-19, if the participant is aware of diagnosing the cases in his/her country and the source of his knowledge about that, and if the COVID-19 has any vaccine or specific antiviral treatment.

Practice part which includes measures that the participant follows to prevent acquiring the infection such as hand washing, using alcohol rub, covering nose and mouth with a tissue while sneezing or coughing, avoidance of hand shaking and eating or drinking herbal.

Attitude part which includes questions reflecting his/her attitude toward preventive measures, following regular updates about COVID-19, visiting hospitals if symptoms develops or hiding that, being infected is a stigma, if his/her immunity or religious beliefs will completely protect him/her from acquiring the infection.

Satisfaction about the role of health authorities in the management of the COVID-19 pandemic and sufficiency of necessary awareness campaigns in the country.

The questionnaire was initially structured in English, thereafter content was validated by microbiology and public health experts. The questionnaire was then translated into Arabic and back translated into English to validate language proficiency. Before distribution, the Arabic version was further reviewed by experts.

After being validated, the questionnaire was formatted into the Google forms, internet-based software, commonly used for data collection via personalized survey. It was preferred for its convenience, efficiency and high popularity especially in the current scenario where all educational institutions of the country were closed by the government to combat COVID-19 following detecting a number of cases starting from the 2nd of March 2020 till the moment of writing this article. After adding the questionnaire into the Google forms, a link for the same was generated and randomly distributed to Facebook groups among students from health and other colleges.

In order to troubleshoot the questionnaire on the ground of quality, possible difficulties detected during filling and estimated time required for its completion, it was piloted on a total number of 30 participants sampled from the target population and subsequently excluded from the data analysis.

The study was approved by the Scientific and the Ethics Committees of the Faculty of Medicine at Mutah University.

Data collection

The questionnaire link was posted among specific Facebook groups, thereafter the members who clicked the link were directed to the Google forms. To minimize the missing data, the participants were requested to fill all the items in the online questionnaire or else could not proceed to the next page; a notification box indicating a warning note that one or more items were not answered. On completion of the questionnaire, the participant were directed to clicks the submit option and finally the online questionnaire was sent to the drive.

Sample size calculation and Statistical analysis:

The sample size (n) was calculated by using OpenEpi, Version using Kish formula[15] for sample size estimation at a 95% significance level and a 5% error margin, the representative sample size is 384. Considering the non-response rate, 10% of sample size was added.384*10% = 38.4. So, the total sample size becomes 384+38.4=422.

Therefore, a minimum sample size of 422 students was required for the overall study and a total number of 592 students were recruited in the present study. Data retrieved from the online survey were entered into Microsoft Excel and then imported into the Statistical Package for Social Sciences (SPSS) version 25. Output measures were portrayed as simple frequency (n) and percentage (%), level of outcome measures expressed as mean and standard deviation (SD). To detect the significant difference between the different mean level of Knowledge, Attitude, Practice and Satisfaction parameters among medical and non- medical colleges, independent sample t test was used; P-value of 0.05 or less was considered statistically significant.

RESULTS

The questionnaire was collected and responses were analyzed to evaluate demographic data, knowledge, attitude and practice of all 592 participants. The correlation of knowledge, attitude and practice among the students of medical and non medical colleges were also assessed.

The demographic data is shown in Table 1. About

204 (34.5%) number of participants were males, and 388 (65.5%) were females. In the present study, a total number of 323 (55.6%) and 269 (45.4%) students participated from medical and non-medical colleges respectively. Among them, a total of 148 (25%), 198 (33.5%), 163 (27.5%) and 83 (14%) students were from first, second, third and fourth year respectively. Around 562 (95%) number of participants were healthy whereas, 30 (5%) number of participants were reported with some health conditions namely allergic rhinitis, diabetes mellitus, psoriasis and epilepsy.

Table 1. Demographic characteristics (n = 592)

Number (%)	Variables
Sex	
Male	204 (34.5)
Female	388 (65.5)
College	
Medical	323 (55.6)
Non medical	269 (45.4)
Year of study	
First	148 (25)
Second	198 (33.5)
Third	163 (27.5)
Fourth	83 (14)
Health status	
Healthy	562 (95)
Non healthy	30 (5)

The prevalence of knowledge among the participants is shown in Table 2. The result indicates that the overall understanding about the virus was good, knowledge about the major symptoms namely fever, cough and difficulty in breathing was appreciated by 94.5% (*n* = 559), 90.5% *(n* = 535), 91.9% *(n* = 544) of the participants respectively. Moreover, 97.5% *(n* = 577) of the participants were aware about diagnosis of COVID-19 in the country, and majority of them were cognizant of unusual symptoms such as vomiting and diarrhea which are usually considered as a part of the clinical presentation and also about the unavailability of specific vaccine or treatment.

Fig. 1 showed the various sources of knowledge about COVID-19 among the participants. Social media was the commonest source (34%) followed by the WHO (19.9%), TV (17.6%), internet (13%), Ministry of Health (10.1%) and friends (5.4%).

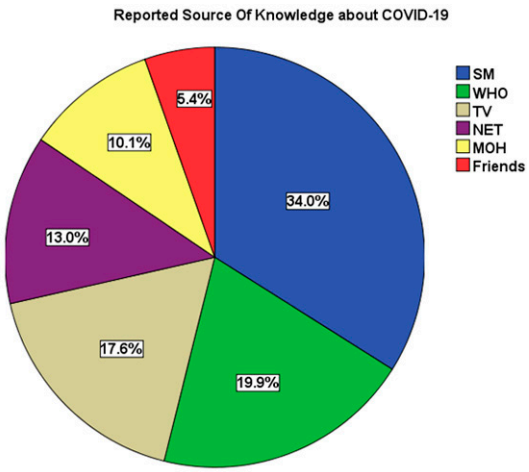

Fig. 1. Reported source of knowledge about COVID-19 SM: Social media, WHO: World Health Organisation, MOH: Ministry of Health

Table 2. Prevalence of knowledge among the participants (those who answered correctly by choosing ''yes'')

	Total respondents (n = 592)	**Number (%)**
1.	Has COVID-19 been detected in your country?	577 (97.5)
2.	Is fever a symptom of COVID-19?	559 (94.5)
3.	Is cough a symptom of COVID-19?	535 (90.5)
4.	Is difficulty in breathing a symptom of COVID-19?	544 (91.9)
5.	Is headache a symptom of COVID-19?	444 (75)
6.	Vomiting is not a common symptom of COVID-19	431 (72.8)
7.	Diarrhea is not a common symptom of COVID-19	361 (61)
8.	COVID-19 has no vaccine	527 (89)
9.	COVID-19 has no specific treatment	467 (78.9)
10.	Can COVID-19 cause death?	420 (70.9)
	Knowledge score (mean ± SD) = 0.81 ± 0.15	

Prevalence of attitude, practice and satisfaction parameters among the participants are shown in Table 3. The study resulted that almost all participants (99.7%) were in the agreement of hand washing as a necessary personal hygiene for prevention of infection, about 68.4% of the participants believed that mask wearing might prevent infection. Moreover, 81.8% and 79.4% of the participants agreed that smoking and antibiotics will not prevent infection respectively. Nearly 94.6% of the participants agreed that infection is not a stigma and they will not hide their infection and 93.6% agreed to visit the hospital if infected. Around 90% of the participants agreed that despite their strong immunity and beliefs, they can contract infection from COVID-19 patients. About 36.7% of the participants bought masks and 86.5% follow regular updates on COVID-19.

Table 3. Prevalence of attitude, practice and satisfaction among the participants (answered agree or yes), n = 592

Number (%)		Attitude
1.	Hand washing is necessary for prevention of infection	590 (99.7)
2.	Face mask can prevent viral transmission	405 (68.4)
3.	Smoking will not prevent infection	480 (81.8)
4.	Antibiotic will not prevent infection	470 (79.4)
5.	Virus is not a stigma and I should not hide my infection	560 (94.6)
6.	If getting infected I will go to hospital as advised	554 (93.6)
7.	I can get infected If I contacted an infected patient despite of my strong beliefs	532 (90)
8.	I can get infected If I contacted an infected patient despite my good immunity	526 (89.9)
9.	Have you bought face masks	217 (36.7)
10.	I follow regular updates on virus, mention the source	512 (86.5)
	Attitude score (mean ± SD) = 0.82 ± 0.07	
	Practice	
1.	I avoid hand shaking	573 (96.8)
2.	I wash my hands with water and soap regularly	585 (98.9)
3.	I use alcoholic hand rub	555 (93.8)
4.	I cough and sneeze in a tissue and throw it in waste bin	567 (95.8)
5.	I wear a face mask	383 (64.7)
6.	I drink ginger with honey	302 (51)
7.	I eat garlic	253 (42.7)
	Practice score (mean ± SD) = 0.78 ± 0.2	
	Satisfaction	
1.	Satisfied with the steps of ministry of health to contain COVID-19	410 (69.3)

In order to assess the practices followed by the participants to preventCOVID-19 infection, a total number of 96.8% of the participants shared their agreement on avoiding hand shaking, 98.8% of the participants supports washing hands regularly, 93.3% participants favors the use of alcoholic rub, 95.8% participants give their consent on using tissues during coughing or sneezing and disposing it in waste bin, 64.7% participants accept masks wearing, 51% participants choose to drink ginger with honey and 42.7% participants agreed eating garlic as an effective measure against

Table 4. Independent Samples Test, regarding the mean difference of Knowledge, Attitude, Practice and Satisfaction Level between medical and non-medical colleges

	t	df	Sig. (2-tailed)	Mean Difference
Knowledge	-0.646-	590	0.519	-0.008
Attitude	0.554	590	0.580	0.003
Practice	-0.642-	590	0.521	-0.007
Satisfaction Level	-0.905-	590	0.366	-0.020

COVID-19

Finally yet importantly, the overall response of the participants regarding the general satisfaction about the steps led by ministry of health to contain COVID-19 was 69.3%.

Mean difference of Knowledge, Attitude, Practice and Satisfaction Level between participants of medical and non-medical colleges are shown in Table 4. The p value of satisfaction, Knowledge, Attitude and Practice was 0.366, 0.519, 0.580 and 0.521 respectively. The result concluded with no significant difference in Satisfaction Knowledge, Attitude and Practice level.

DISCUSSION

The Knowledge, Attitude and Practices for a particular infectious illness can be influenced by various factors namely, the gravity of the illness, severity of its spread and the fatality rate. Ever since the announcement of COVID-19 as a pandemic by the WHO[16], the knowledge, attitude and practices toward COVID-19 has been growing day by day.

The complete clinical picture of COVID-19 is yet to be understood, however, fever, cough, dyspnea and pneumonia are the most commonly associated symptom of COVID-19 [17]. Till date no specific antiviral drug or vaccine for the virus has been reported[13, 18].

In this cross sectional study, we provided an insight to the knowledge, preventive measures and attitude of the students of Mutah university towards COVID-19. And to the best of our knowledge, this is the first study carried out in Jordan.

The study resulted that the overall knowledge about the symptoms and unavailability of vaccine or specific antiviral treatments against COVID-19 was good, where 90% participants have knowledge about the symptoms and above 80% participants knew about the unavailability of vaccine and treatment. This could be an important finding explained on various factors such as the seriousness of the disease as circulated by different media and health authorities especially after being declared as a pandemic by the WHO[16] and the effectiveness of different awareness campaigns conducted within the country. This is supported by the fact that, almost all participants were aware about the common symptoms of COVID-19 and its presence in the country despite of only one case diagnosed in Jordan at the time of conducting the study[19]. 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. For example, majority of students knew that fever, cough and dyspnea can be the common clinical manifestation of COVID-19 and have knowledge about the unavailability of specific treatment and vaccines as described previously [13,20].

The study also resulted in an overall high level of attitude and good practice towards the disease preventive measures and their responses if contracted infection. The attitude of the participants on practices reflects the right way to prevent the infection by various means namely hand washing, using alcohol rub, avoidance of hand shaking and follow preventive etiquettes during coughing and sneezing. These measures are well known to prevent many infectious diseases particularly respiratory transmitted infections such as COVID-19. However, around 2/3 of the participants, supports the attitude of wearing mask and its practice as a preventive measure against the infection. This contradicts the advice shared by the WHO that does not recommend the use of face masks in public in those individuals without respiratory symptoms [21]. Regarding the behavior and practice of wearing face masks, it might be a reflection of the large amount of information circulated in the community and perceived by them, which necessitate for further awareness campaigns in order to minimize the panic aroused among the population. Surprisingly, 20% of study sample wrongly believed that taking antibiotics will protect them from being infected with COVID-19. Such response indicates the unawareness about the specific drugs use in the treatment of COVID-19, so it is utmost necessary to remain informative which may turn effective in curbing the misuse of antibiotics thereby, halting the emergence of multidrug resistant organisms as a global worry [22]. Interesting, 94.6% of the participants neither consider the COVID-19 infection as a stigma nor they will hide it from health authorities moreover, 93.6% of the participants choose to visit hospital or subject to quarantine if necessary which is believed to be an important

attitude towards containment of ongoing infection transmitted via respiratory routes as per reports and available data[23,24]. About one third of the participants were not generally satisfied with the efforts contributed by the ministry of health to contain the virus. This is supported by our findings which suggest that only 10% of the participants visit the official site of the ministry of health for upcoming advisories to combat the disease. Till the time of writing this manuscript, the Jordanian ministry of health has carried out early significant steps to fight the diseases such as early closure of the airports, specific quarantine and isolation wards in hospitals, closing all educational institutes and more recently enforcing emergency law and curfew in the country[18]. As a result, the health authorities should timely aware the public about the efforts and necessary advices enacted by them in containing the spread of the virus.

It is of worth noting that there was no significant difference between the mean of Knowledge, Attitude and the Practice level among the medical and non medical students. This is expected due to the wide coverage on the COVID-19 in media and the strict measures imposed by different governments immediately after its announcement as pandemic by the WHO[16].

As per the findings, it is necessary for the government to come up with good efforts in delivering knowledge, attitude and practices about COVID-19 to the community particularly on specific control measures such as wearing masks, role of a few herbs in preventing infection and aware the ineffectiveness of antibiotics in COVID-19 treatment. The later is important as it will surely help in fighting the bacterial resistance, a major health problem globally [22] and providing proper advice regarding using of herbs. We believed that the Ministry of health and general practitioners should pay enormous efforts in educating the people about COVID-19 on social media and television which represent the core source to get information by more than half of the study population. Providing awareness about the disease in large population may help in rectifying some incorrect information perceived by the people regarding the knowledge or attitudes towards the disease as noticed in this study where a few participants believed that smoking or use of antibiotics will prevent the infection and some considered COVID-19 infection and their quarantine as a stigma therefore, will hide their infection. They may serve as a source of infection and probably results in death.

CONCLUSION

To conclude, the present study revealed a good knowledge, practice and a high attitude among the study population towards COVID-19. Such response reflects the effect of its announcement as pandemic declared by the WHO and efforts made by the local health authorities to sensitize a wide spectrum of the public about the COVID-19. Nevertheless, a minority of participants in the study sample showed unsatisfactory response on the knowledge and attitudes about COVID-19 thereby, require an urgent need of awareness campaigns. The findings of this study might prove as the baseline for planning awareness campaigns between university students and publics and helpful in directing the efforts and plans of the health authorities of the country for better containment of COVID-19 and its further spread. The study might be fruitful in conducting further research of its kind. .

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CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORS' CONTRIBUTION

All authors contributed to questionnaire which is design by HA, NA has analyzed the results. HA, AAM, MM and AA has wrote the manuscript. All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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None.

DATA AVAILABILITY

All datasets generated or analyzed during the study are included in the manuscript.

ETHICS STATEMENT

This study was approved by the Scientific and the Ethics Committees of the Faculty of Medicine at Mutah University, Approval number 202017.

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