

Sustainability Awareness and Preparedness of COVID-19 Pandemic among University Students

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Abstract

Awareness level and compliance of students can be vital in timely prevention and control of COVID-19 crisis. Negative attitudes and practices towards novel infectious diseases can intensify epidemics which may ultimately consequence in pandemics. **Aim of the study:** To assess the sustainability awareness and preparedness of COVID-19 pandemic among university students. **Research design:** Descriptive exploratory survey research design was used to carry out this study. **Setting:** Five faculties from the medical sector including; "Faculty of Nursing, Medicine, Pharmacy, Dentistry, and Faculty of Science", and four faculties from non-medical sector including; "Faculty of Law, Education, Arts, and Faculty of commerce" are affiliated to Alexandria University. **Subjects:** Convenience sample of 850 university students from the previously mentioned settings. **Tool:** COVID-19 awareness & preparedness questionnaire was used. **Results:** The results of this study showed that most of the students had high level of awareness and preparedness level toward COVID19, additionally, the highest percent of them had good knowledge, satisfactory practice as well as positive attitude, and there was highly statistically significant relation between students 'total awareness and preparedness level and their gender, religious, residence, specialty and acquiring COVID-19 infection as $P=<0.001^*$. **Conclusion:** The highest percent of the students under the study had good knowledge, satisfactory practice and positive attitude toward COVID-19. There was also a strong positive, statistically significant correlation between students' knowledge, practice of preventive measures and their total awareness and preparedness level toward COVID 19. **Recommendations:** Focusing on supplying scientific information through academic courses and other workshops, presentations, and modeling learning are all key tools for transferring information into real-world applications.

Keywords: Sustainability Awareness- Preparedness - COVID-19 Pandemic- University Students.

Introduction

The COVID-19 outbreak is an unprecedented event, and much about the virus remains unknown, due to the obscurity of this virus make a lot of disinformation and panic attacks (Pratiwi1 & Sri ., 2021). On 11th March 2020, the current outbreak COVID-19 has been declared a pandemic by WHO, as more than 170 countries around the world have reported the presence of infections, with more than 4,500,000 confirmed cases and more than 300,000 confirmed deaths (WHO,2020).

COVID-19 seems to be rapidly spreading and more contagious than severe acute respiratory syndrome (Meng Let al., 2020). The World health organization declared that COVID-19 spreads primarily from person to person in several different ways including small liquid particles. These particles range

from larger respiratory droplets to smaller aerosols released when an infected person coughs, sneezes, speaks, sings or breathes. It can also spread mainly between people who are in close contact with each other, typically within 1 meter, poorly ventilated and/or crowded indoor settings; where aerosols remain suspended in the air or travel farther than 1 meter and person touches surfaces that have been contaminated by the virus (WHO, 2020).

Despite the availability of disease prevention guidelines and recommendations, many people's activities do not meet the minimum standards for infection control, which is due to a lack of interest in taking the necessary precautions. The enormous number of patients treated at clinics could explain this lack of desire in making an extra, but necessary, effort. To improve their prevention, it is critical to deploy sound prevention

strategies in all contexts and to raise public awareness (**Khader et al., 2020**).

Globally, extraordinary measures are being adopted to combat the formidable spread of the ongoing outbreak. Under this condition, adherence of people to preventive measures is greatly affected by their awareness of the disease. People's knowledge, attitudes and preparedness toward infectious diseases are often associated with the level of panic among them. As "natural hazards are inevitable; the disaster is not," to facilitate the management of the COVID-19 outbreak, there is an urgent need to understand the public's awareness and preparedness during this challenging time (**Tripathi et al., 2020**).

The global health crisis caused by COVID-19 has caught the attention of the media all over the world. The majority of public health messages have focused on reducing transmission risk. Many of these messages are about maintaining social distance, hand hygiene frequently and properly, staying at home, and avoiding crowded locations. However, the worldwide information pandemic has resulted in a significant deal of anxiety, dread, excessive worry, and bewilderment. Furthermore, the disease's fast expanding and changing understanding has resulted in a cloud of disinformation and confusion among people in various areas (**WHO,2020**).

A knowledge gap concerning the spreading disease might produce confusion and panic among the community at some point during epidemics and pandemics. The dissemination of accurate information can not only guide society through such situations, but it can also help increase pandemic preparedness in the future (**Lau et al., 2020**). Additionally, attitudes often reflect stereotypes about persons; they are a reflection of the person who has a certain attitude and they also have an impact on the perception of the individual who is part of the group (**Hinton., 2017**).

Negative attitudes and practices towards novel infectious diseases can intensify epidemics which may ultimately consequence in pandemics. Awareness level and compliance of students can be vital in timely prevention and control of this public health crisis (**Storr et al., 2017**). As a result, the National Action Plan

for COVID-19 has been proposed by the Ministry of Health Services, regulation, coordination and a media campaign for generating awareness has been initiate. (**Hussain et al.,2021**).

There are number of published studies that assessed the epidemiology, pathogenesis, virology, and treatment of COVID-19. However, there are limited studies assessing the COVID-19 awareness and preparedness in the academic community (**Alali et al., 2020**). However, the academic community is an important segment of the society, which represents students and staff in higher education institutions. Students in either health science or theoretical fields (e.g., Medicine, Dentistry, Pharmacy, Law, Art and public health) will be the next generation of health leaders. Hence Peoples' awareness toward the pandemic has an integral function in revealing the society's preparedness to receive behavioral change measures from the health ministry. this study aimed to assess the sustainability awareness and preparedness of COVID-19 pandemic among university students. Hopefully the study results could help policymakers devise a sound policy to control this and future health crises.

Significance of the study:

Significance of the study from the researcher's experience, the findings of this study are expected to help in many aspects such as, better planning for mindfulness campaigns, guide different health authorities accordingly to modulate their policies as needed and to correct some inconvenient behaviors in order to break the spread of the virus which may result in rapid control and suppression of the current pandemic

Aim of the study

This study aimed to:

- To assess the sustainability awareness and preparedness of COVID-19 pandemic among university students.
- To assess knowledge regarding COVID-19 pandemic among university students.
- To assess attitude toward COVID-19 pandemic among university students.

- To assess practice of preventive measures regarding COVID-19 pandemic among university students.

Operational definition:

Awareness regarding COVID-19 Pandemic: in this study means students' knowledge and attitude toward COVID-19 pandemic. While, **preparedness**; refers to their practice of preventive measures to protect themselves against COVID-19.

Research questions:

- What are the levels of COVID-19 pandemic awareness and preparedness among university students?
- What are the levels of knowledge, attitude, and preparedness toward COVID-19 pandemic among university students?
- What is the relation between COVID-19 awareness and preparedness of preventive measures among university students?

Materials and Method

Materials

Research Design:

Descriptive exploratory survey research design was used to carry out this study.

Setting:

The study settings were selected using a multistage random sampling technique. Accordingly, the study was carried out in Alexandria University, a governmental University. Nine Faculties out of the (21) Faculties of the Alexandria University were selected randomly to be included in the study. Five faculties from the medical sector including; "Faculty of Nursing, Medicine, Pharmacy, Dentistry, and faculty of Science"; and four faculties from non-medical sector including " Faculty of Law, Education, Arts, and Faculty of commerce" were included.

Subjects:

- Convenience 850 university students from the previously mentioned settings were selected.
- Egyptian young students of both genders were allocated through online advertisements on above mentioned faculties' official groups.

- Inclusion criteria were; University students, both genders, living in Alexandria, had a Facebook account.

- Exclusion criteria were; outside the study period, and out of Alexandria university.

- The sample size was calculated using EPI-Info 7 software. The calculations were assumed that the probability of participants' knowledge, attitude and precautionary measures were 50.0% at 95% confidence interval, precision of 5%, with a design effect of 1, and then the calculated sample size was 850 participants at least., Accordingly, the survey was closed, and stopped at the end of the day when the number of participants exceeded the sample size.

Tools: One tool was used to collect the required data:

COVID-19 Awareness & Preparedness Questionnaire:

This tool was developed by the researchers based on a review of related literature (Gao et al., 2020 & Khasawneh et al., 2020 & Sohaira et al., 2020). It included four parts:

Part I: Student's demographic characteristics: it was covered the following data: age, gender, academic grade, religion, specialty, residence, acquiring COVID-19 infection, and source of information about COVID-19.

Part II: Student's knowledge regarding COVID-19, which included data about COVID-19 symptoms, mode of transmission, prognosis, possibility of COVID-19 reinfection, treatment, vaccine or specific antiviral treatment, in addition to their knowledge source about COVID-19.

- The scoring system was varied between (Zero), that was given for students' incorrect answer (no) and score of (One) that was given for student's correct answer (yes).
- The total score ranged from 0 to 27. The total scores of student's answers were summed up, then converted into percent scores as follows; 75% -100% scores were considered "good knowledge", from 60% < 75 % scores were considered "fair

knowledge" and less than 60% were considered "poor knowledge".

Part III: Students Attitude toward COVID-19; which included questions reflected student's attitude toward preventive measures, following regular updates about COVID-19, visiting hospitals if symptoms developed or hiding that, being infected was a stigma, if his/her immunity or religious beliefs would completely protect him/her from acquiring the infection.

- The scoring system was varied between (zero), that was given for (No) negative response, (one) that was given for (Not sure) and the score of (two) was given for (Yes) positive response.
- The total score ranged from 0 to 26. The total scores of student's answers were summed up, then converted into percent scores as follows; 75% -100% scores were considered "Positive attitude", from 60% < 75 % scores were considered "Neutral attitude", and less than 60% were considered "Negative attitude".

Part IV: Students' preparedness regarding COVID-19; which included measures that the student followed to prevent acquiring the infection such as;" hand hygiene, covering nose and mouth with a tissue while sneezing or coughing, avoidance of hand shaking, and eating or drinking herbal; etc".

- The scoring system was varied between (zero) that was given for (Never) answer, (one) that was given for (Sometimes) answer, and the score of (two) was given for (Always) answer. The total score ranged from 0 to 40.
- The total scores of student's answers were summed up, and then converted into percent scores as follows; less than 85% were considered UN-Satisfactory preventive measures, 85% score or more were considered satisfactory preventive measures.
- The total scores of students' awareness and preparedness was summed up using the total knowledge, attitude and practice scores. Then converted into percent scores as follows: 75% -100% scores were considered "High awareness & Preparedness", from

60% < 75 % scores were considered "Moderate awareness and preparedness" and less than 60% were considered "Low awareness and Preparedness".

- In addition to questions about the students' personal and socio-demographic data such students' age, gender, religion residence, specialty, academic grade, and acquiring COVID-19 infection or not.

Method

- Approval from the Research Ethics Committee of the Faculty of Nursing, Alexandria University was obtained.
- The study tool was developed by the researchers after reviewing of the recent literature.
- The questionnaire was initially structured in English, thereafter content was validated by public health experts. The questionnaire was then translated into Arabic before distribution, the Arabic version was further reviewed by medical experts
- The content validity of the study tool was tested by a group of (5) experts professors at the field of Medical-Surgical Nursing and Community Nursing, faculty of Nursing, Alexandria university were asked to review the tool regarding its relevancy and content validity related to aim of the study.
- Reliability of the tool was asserted by using Cronbach's Alpha coefficient test. The internal consistency reliability result was (0.951).
- The survey was included a cover page to clarify the purpose of the study in order to gain the cooperation of the study participants during data collection (filling the survey).
- A pilot study was carried out on 10% percent (85) of students, (9 students from the previously mentioned faculties except the faculty of Art, 10 students were involved) to test the clarity, feasibility and applicability of the tool. Accordingly, the necessary modifications were done. These subjects were excluded from the total study subjects.

Data collection:

- The questionnaire link was posted among the above-mentioned faculties official 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 was directed to click the submit option and finally the online questionnaire was sent to the drive.
- Data were collected from April 2021 till December 2021.

Ethical Considerations:

- Written online consent after complete description of the research purpose was included at the start-up statement at the beginning of the online form.
- Anonymity of individual's response was ensured by using the online questionnaire without participant's names.
- Confidentiality of the collected data was assured.
- The study subjects had the right to withdrawal at any time of the research.

Statistical analysis:

- After data were collected, they were coded and transferred into specially designed formats to be suitable for computer feeding. Following data entry, checking and verification processes were carried out to avoid any errors during data entry, frequency analysis, cross tabulation and manual revision were all used to detect any errors. The statistical package for social sciences (SPSS version 25) was utilized for both data presentation and statistical analysis of the results. The level of significance selected for this study was P equal to or less than 0.05.

The used tests were.

- 1- **Chi-square test:** Was used for categorical variables, to compare between different groups.

- 2- **Fisher's Exact or Monte Carlo correction:** Was used for correction for chi-square when more than 20% of the cells have expected count less than 5.
- 3- **R correlation coefficient (r):** Was used to measure of the closeness of association of the points in a scatter plot to a linear regression line based on those points.

Results:

Table (1), shows distribution of students according to their demographic characteristics. It was noticed that, the age of the students ranged from 18 to 23 years with a mean of (20.97±7.345). Furthermore, around three quarters 76.2% of the students were females, while the rest 23.8% were males. The majority 98.1% of them were Muslims. In addition, more than half 55.1% of the students were enrolled in non-medical faculties, and more than two fifths 44.9% of them were enrolled in medical faculties. One quarter 20.0% of the students were enrolled in the first academic year, while 32.4% of them were in the fourth academic year. Furthermore, the majority 86.8% of them were urban dwellers. The same table also reveals that, the most 80.3% of the students stated that they hadn't acquired COVID 19 infection.

Figure (1), portrays distribution of students regarding to their source of knowledge about COVID-19. It was evident that the majority 92 % of them mentioned that they obtained their information from social media followed by TV 54%, health care workers 22%, and academic courses as mentioned by less than one fifth 18% of them, and the least was from Google and official sites (10% & 5% respectively).

Table (2), conveys distribution of students according to their knowledge about COVID -19 symptoms & mode of transmission. The table reveals that out of the 850 respondents, the highest percent (93.4%, 91.8%, 90.5%, 89.9%, 89.9%, 89.2% & 87.5% respectively) were able to identify that; headache, muscle pain, fever, coughing, affected oxygen saturation, dyspnea, fatigue and diarrhea considered as symptoms of COVID -19 while, more than half 58% of them recognized that vomiting was one symptom.

Furthermore, the highest percent (90.1% & 82.3% respectively) of the respondents recognized that COVID -19 had no vaccine and no specific treatment. The highest percent of participants were able to identify kissing, touching eyes, nose and mouth, public transportation, air, animals, touching contaminated surfaces and sneezing, public transportation and handshaking as a COVID-19 transmission route. The same picture was portrayed in their mean score, where, all students had a higher mean score (**26.84±3.532**)

Table (3), illustrates distribution of students regarding to their attitude toward COVID -19. It was noted that, the highest percent had positive attitude toward COVID -19. Interestingly, nearly equal distribution (87.3%, 87.3% & 81% respectively) mentioned that virus was not known as a stigma. Furthermore, antibiotic and smoking were not preventing COVID-19 infection. Finally, the table shows that the mean total score of students' attitudes was (21.85±3.649).

Table (4), presents the distribution of the students according to their correct practice of COVID -19 precautionary preventive measures. The results denoted that keep in the face mask covered nose & mouth appeared to be the most common preventive practice reported by 99.5% of respondents in response to COVID-19, followed by change the face mask every 4 hours 90.8% if spent long time outside their home, wearing face mask and coughing and sneezing in a tissue paper and throwing it in waste bin constituted (90.6% & 89.4% respectively). While the least percent (45.4%, 45.4% & 48.5%, 48.5% & 48.5% consecutively) of the studied participants reported that they avoided eating outside, closely monitored personal physical health, eat foods that strength my immunity, spent less

time outside and got enough sleep as a potential preventive measure against COVID-19 with total practice mean score (24.61±9.351).

Table (5), conveys distribution of students regarding to their total awareness & preparedness level regarding COVID -19 precautionary preventive measures. The table shows that, awareness of participants towards the COVID-19 was high 80.5% with total mean score of (89.24± 23.245). Additionally, the highest percent (73.9%, 77.2 & 62.7% respectively) of them had good knowledge, satisfactory performance and positive attitude.

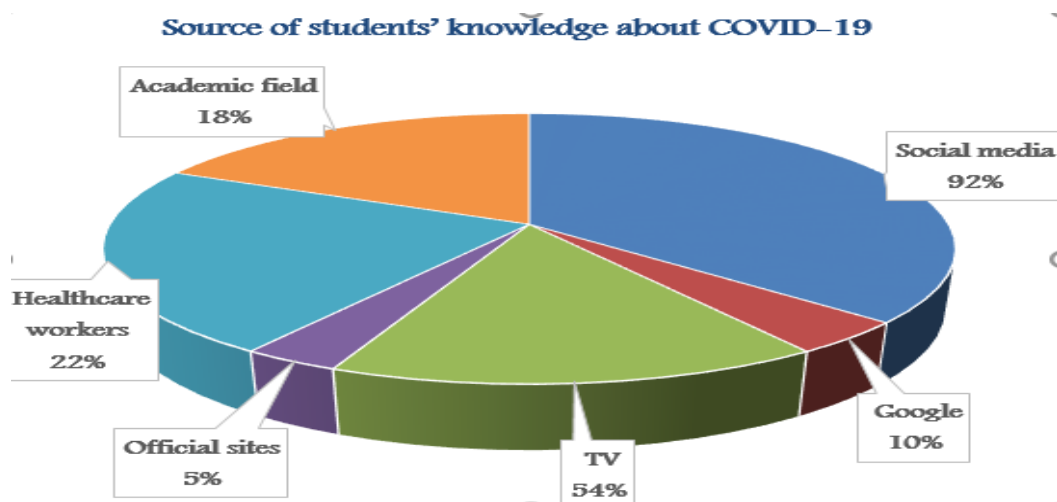
Table (6), denotes relation between students' total awareness, practice & preparedness levels towards the COVID-19 and their demographic characteristics. This table reveals highly statistically significant relation between students' total awareness & preparedness level and their gender, religious, residence, specialty and acquiring COVID-19 infection; where p value was $P < 0.001$. While there was no statistically significant relation between total students' awareness & preparedness level and their academic grade as $P \leq 0.05$.

Table (7), portrays correlation matrix between COVID 19' awareness (knowledge and attitude) and preparedness to COVID 19 preventive measures. Highly statistically significant relations were found between students' total awareness level about COVID 19 (knowledge)& preparedness(practice) of COVID 19 preventive measures where $p < 0.001$. Furthermore, a statistically significant relation was found between total students' awareness level (attitude) and practice of COVID 19 preventive measures $p = 0.049$.

Table (1): Frequency & percentage distribution of students according to their demographic characteristics. (n=850)

Students' Bio-sociodemographic characteristics n=850		
Age (X ± SD)	20.97± 7.345	
	No	%
Gender		
Males	202	23.8
Females	648	76.2
Specialty		
Medical faculties	382	44.9
Faculty of Nursing	90	23.6
Faculty of Pharmacy	72	18.9
Faculty of Medicine	80	20.9
Faculty of Dentistry	81	21.2
Faculty of science	59	15.4
Non -Medical faculties	468	55.1
Faculty of Art	94	20.1
Faculty of Commerce	101	21.6
Faculty of Education	172	36.7
Faculty of Law	101	21.6
Academic Grade		
First grade	173	20.3
Second grade	190	22.3
Third grade	212	25.0
Fourth grade	275	32.4
Religious		
Muslims	834	98.1
Christians	16	1.9
Residence		
Urban	738	86.8
Rural	112	13.2
Acquiring COVID-19 infection		
No	683	80.3
Yes	167	19.7

X ± SD = Mean and standard deviation



N.B:** More than one answer was allowed

Figure (1): Percentage distribution of students regarding to their Source of knowledge about COVID-19.

Table (2): Frequency & percentage distribution of students according to their correct knowledge about COVID -19 symptoms & mode of transmission. (n=850)

COVID -19 Knowledge items	n =850			
	Yes		No	
	No	%	No	%
Symptoms of COVID -19				
Fever.	769	90.5	81	9.5
Cough.	764	89.9	86	10.1
Dyspnea.	758	89.2	92	10.8
Headache.	794	93.4	56	6.6
Vomiting.	464	58.6	386	45.4
Diarrhea.	686	80.7	164	19.3
Muscle pain.	780	91.8	70	8.2
Fatigue.	744	87.5	106	12.5
COVID -19 affect person's oxygen saturation.	764	89.9	86	10.1
COVID -19 is symptomless.	750	88.2	100	11.8
COVID-19 treatment & prognosis				
COVID-19 has no specific treatment.	700	82.3	150	17.7
COVID-19 has no vaccine.	766	90.1	84	9.9
COVID-19 has specific and applied vaccine.	666	78.4	184	21.6
The currently COVID treatment regimen does not cure the COVID but relieve symptoms only.	752	88.5	98	11.5
COVID-19 can cause death.	850	100.0	0	0.0
If a person gets infected with COVID he/she gain immunity against COVID.	780	91.8	70	8.2
If a person gets infected with COVID he/she can be re-infected with COVID.	780	91.8	70	8.2
COVID-19 Modes of transmission				
COVID-19 can be transmitted by coughing and sneezing.	758	89.2	92	10.8
COVID-19 can be transmitted by handshaking.	742	87.3	108	12.7
COVID-19 can be transmitted by taking public transportation.	744	93.0	106	12.5
COVID-19 can be transmitted by Touching elevator or ATM machine buttons.	744	87.5	106	12.5
COVID-19 can be transmitted by Touching eyes, nose and mouth.	805	94.7	45	5.3
COVID-19 can be transmitted by air.	790	93.0	60	7.0
COVID-19 can be transmitted by animals.	766	90.1	84	9.9
COVID-19 can be transmitted by kissing.	762	89.6	88	10.4
COVID-19 can be transmitted by touching contaminated surfaces.	766	90.1	84	9.9
COVID-19 can be transmitted from mother to fetus.	850	100.0	0	0.0
COVID-19 can be transmitted through blood transfusion.	850	100.0	0	0.0
X ± SD	26.84±3.532			

X ± SD = Mean and standard deviation.

Table (3): Frequency & percentage distribution of students regarding to their positive attitude toward COVID -19. (n=850)

Attitude items	N =850	
	No	%
Hand hygiene is necessary for prevention of COVID infection		
No	0	0.0
Not sure	47	5.5
Yes	803	94.5
Face mask can prevent COVID transmission		
No	0	0.0
Not sure	130	15.3
Yes	720	84.7
Smoking will not prevent COVID infection		
No	2	0.2
Not sure	160	18.8
Yes	688	81.0
Antibiotic will not prevent COVID infection		
No	8	0.9
Not sure	100	11.8
Yes	742	87.3
Virus is not a stigma.		
No	8	0.9
Not sure	100	11.8
Yes	742	87.3
If getting infected I will go to hospital as advised.		
No	20	2.3
Not sure	50	5.9
Yes	780	91.8
I can get infected if I contacted an infected patient despite my good immunity.		
No	0	0.0
Not sure	138	16.2
Yes	712	83.8
Find a credible source to Learn more about COVID-19.		
No	10	1.2
Not sure	60	7.0
Yes	780	91.8
I Fear and worry about my own health and the health of my loved ones.		
No	0	0.0
Not sure	92	10.8
Yes	758	89.2
Stay at home & avoid going to college and visiting family &friends.		
No	0	0.0
Not sure	108	12.7
Yes	742	87.3

Cont...Table (3): Frequency & percentage distribution of students regarding to their positive attitude toward COVID -19. (n=850)

Attitude items	N =850	
	No	%
If I got infected, I would do anything to avoid isolation.		
No	56	6.6
Not sure	50	5.9
Yes	744	87.5
If I get infected, I will not report to my faculty members to complete courses and exams		
No	744	87.5
Not sure	50	5.9
Yes	50	5.9
I think about death from COVID		
No	805	94.7
Not sure	40	4.7
Yes	5	0.6
X ± SD	21.85±3.649	

X ± SD = Mean and standard deviation

Table (4): Frequency & percentage distribution of students regarding to their correct practice of COVID -19 Preventive measures. (n=850)

Practice of COVID -19 Preventive measures	N =850	
	No	%
Cough and sneeze in a tissue paper and throw it in waste bin.		
Never	0	0.0
Sometimes	90	10.6
Always	760	89.4
Wear face mask		
Never	10	1.2
Sometimes	70	8.2
Always	770	90.6
Keep the face mask cover nose & mouth.		
Never	2	0.2
Sometimes	2	0.2
Always	846	99.6
Change the face mask each 4 hours, if spend long time long time outside my house.		
Never	70	8.2
Sometimes	8	1
Always	772	90.8
Avoid hand shaking		
Never	66	7.7
Sometimes	100	11.8
Always	684	80.5
Avoid contact with infected people.		
Never	0	0.0
Sometimes	158	18.6
Always	692	81.4
Wash hands with water and soap regularly		
Never	0	0.0
Sometimes	162	19.0
Always	688	81.0
Use alcoholic hand rub regularly.		
Never	0	0.0
Sometimes	162	19.0
Always	688	81.0
keep the environment clean and well ventilated.		
Never	0	0.0
Sometimes	242	28.5
Always	608	71.5
Use chlorine on cleaning my sounding environment		
Never	0	0.0
Sometimes	126	14.8
Always	724	85.2
Drink warm fluids regularly		
Never	58	6.8
Sometimes	300	35.3
Always	492	57.9
Eat foods that strength my immunity		
Never	38	4.5
Sometimes	400	47.0
Always	412	48.5
Avoid eating outside		
Never	64	7.5
Sometimes	400	47.0
Always	386	45.4
Maintain social distance with others		
Never	0	0.0
Sometimes	158	18.6
Always	692	81.4
Spend less time outside		
Never	38	4.5
Sometimes	400	47.0
Always	412	48.5

Practice of COVID -19 Preventive measures	N =850	
	No	%
Get enough sleep		
Never	38	4.5
Sometimes	400	47.0
Always	412	48.5
Closely monitor personal physical health		
Never	400	47.0
Sometimes	64	7.6
Always	386	45.4
Pay more attention to personal hygiene		
Never	0	0.0
Sometimes	100	11.7
Always	700	82.3
Clean /disinfect my phone screen regularly		
Never	24	2.8
Sometimes	250	29.4
Always	576	67.8
X ± SD	24.61±9.351	

X ± SD = Mean and standard deviation

Table (5): Frequency & percentage distribution of students regarding to total awareness &preparedness level regarding COVID -19 Precautionary Preventive measures. (n=850)

Total awareness &preparedness regarding COVID -19	N =850	
	No	%
Total knowledge about COVID-19		
Good knowledge	628	73.9
Fair knowledge	182	21.4
Poor knowledge	40	4.7
X ± SD	82.97±8.440	
Total Attitude regarding COVID -19.		
Positive attitude	534	62.7
Natural attitude.	226	26.6
Negative attitude	90	10.7
X ± SD	76.34±10.150	
Total Preparedness (Practice) regarding COVID-19		
Satisfactory performance	656	77.2
UN- Satisfactory performance.	194	22.8
X ± SD	84.51±12.354	
Total Awareness &preparedness level towards the COVID-19.		
High	684	80.5
Moderate	150	17.6
Low	16	1.9
X ± SD	89.24± 23.245	

X ± SD = Mean and standard deviation

Table (6): Relation between students' total Awareness & preparedness level towards the COVID-19 and their demographic characteristics. (n=850)

Students' Bio-sociodemographic characteristics	Total Awareness & preparedness level towards the COVID-19						Test of significance
	Low n=16		Moderate n=150		High n=684		
	No	%	No	%	No	%	
Gender							
Males	2	12.5	56	37.3	144	21.0	FET=16.363 P=<0.001*
Female	14	87.5	94	62.7	540	79.0	
Religious							
Muslims	16	100	145	96.7	673	98.4	FET=2.016 P=<0.001*
Christians	0	0.0	5	3.3	11	1.6	
Residence							
Urban	11	68.8	143	95.3	584	85.4	FET=14.063 P=<0.001*
Rural	5	31.2	7	4.7	100	14.6	
Specialty							
Medical faculties							$\chi^2=99.607$ P=<0.001*
Faculty of Nursing	1	6.3	23	15.3	66	9.6	
Faculty of Pharmacy	1	6.2	15	10.0	56	8.2	
Faculty of Medicine	1	6.2	4	2.7	75	11.0	
Faculty of Dentistry	1	6.3	5	3.3	75	11.0	
Faculty of Science	2	12.5	4	2.7	53	7.7	
Non -Medical faculties							
Faculty of Art	2	12.5	24	16.0	68	10.0	
Faculty of Commerce	2	12.5	15	10.0	84	12.3	
Faculty of Education	2	12.5	15	10.0	155	22.7	
Faculty of Law	4	25.0	45	30.0	51	7.5	
Academic Grade							$\chi^2=9.698$ 0.137
First grade	7	43.7	36	24.0	130	19.0	
Second grade	3	18.8	27	18.0	160	23.4	
Third grade	2	12.5	44	29.3	166	24.3	
Fourth grade	4	25.0	43	28.7	228	33.3	
Acquiring COVID-19 infection							
No	15	93.8	108	72.0	560	81.9	FET=8.448 P*
Yes	1	6.2	42	28.0	124	18.1	

Chi-Square (χ^2) and Fisher's exact (FET) *in Significant difference at P level > 0.05.

** Highly significant difference at P level =<0.001

Table (7): Correlation matrix between COVID 19 Awareness (Knowledge, Attitude) and preparedness (practice) of Precautionary preventive measures.

Items		Awareness	Knowledge	Attitude	preparedness (practice) of preventive measures.
Awareness	r				
	p				
Knowledge	r	0.864			
	p	<0.001*			
Attitude	r	0.006	0.005		
	p	0.900	0.914		
preparedness practice of preventive measures.	r	0.320	0.280	0.086	
	p	<0.001*	<0.001*	0.049*	

r = Correlation coefficient

* Significant at p ≤0.05

Discussion

COVID 19 is one of the preventable diseases that drain a lot of resources and put a strain on not just health-care practitioners, but also the health-care system around the world. As a result, the only way to save all human and

non-human resources is to prevent this terrible sickness. Until now, this infectious virus has a large number of strains, each of which is characterized by a high level of mutation and variety in genotypes. As a result, improving community knowledge and preparedness to deal with this devastating virus is seen as a

critical element in the prevention and control of COVID 19 **WHO.,(2020)**. This knowledge and its sources may play a dual role in influencing people's attitudes about taking preventative steps, either positively or adversely.

Public health education is an effective measure to prepare the population to face COVID-19 disastrous health emergency and take preventive measures to reduce this lethal disease. So, awareness and preparedness studies aid in reducing public anxiety, encouraging good attitudes and also adoption of desirable healthy behaviors (**Peng et al., 2020**).

In relation to students' knowledge regarding COVID-19; the present study revealed that, the majority of the students were able to identify that headache, muscle pain, fever, coughing, affected oxygen saturation, dyspnea, fatigue and diarrhea as symptoms of COVID 19, while more than half of them recognized that vomiting was among COVID-19 symptoms. Furthermore, there was a highly statistically significant relation between total students' awareness & preparedness level and their gender, religious, residence, specialty and acquiring COVID-19 infection.

These findings could be attributed to the effect of health education that delivered through mass public education by social media and TV to raise public awareness about the emerging of this health problem. In this context, the present study also confirmed that the majority of them mentioned that they obtained their information from social media followed by TV, health care workers and academic courses as mentioned by less than one fifth of them and the least was from Google and official sites. Furthermore, the students in this study ranged in their age from 18 to 23, and this young age has mobile devices with internet connection practically all of the time, facilitating simple access to COVID 19 information. This finding was backed up by the findings of a Pakistani study conducted by **Hussain et al.,(2021)**, who found that the majority of students were aware of the common COVID-19 indications and symptoms, as well as the channels of transmission. In a similar vein **Shaheen et al., (2021)** claimed that the majority of pupils had a

strong understanding of COVID 19. Further evidence comes from **Ewees et al., (2020)**, who found that the majority of their participants had a good level of knowledge about COVID-19. However, **Ghaderi, et.al (2021)** in a study about knowledge, attitudes, practices and fear of COVID- 19 among Iranians, found that less than fifty percent of their sample had unsatisfactory knowledge

Regarding students' attitude toward COVID -19, the present results denoted that the highest percent of the students had positive attitude toward COVID- 19. Interestingly, the vast majority of them mentioned that virus was not known as a stigma, antibiotic and smoking were not preventing COVID infection, isolation while having symptoms hand washing was necessary for prevention of COVID -19 infection and the highest percent of them mentioned that face mask can prevent COVID -19 transmission. This positive attitude regarding COVID-19 may be due to student's belief that pandemic state was dangerous, but would be successfully controlled and had a confidence of the government in winning the battle against COVID-19, furthermore good knowledge demonstrated by them regarding COVID -19 consequently affect the student's attitude. This finding was comparable to **Hatami et al., (2021)**, who reported that the majority of the participants in their study had positive attitude toward COVID-19. They believed that people should keep a safe physical distance from each other, that everyone should isolate themselves upon symptoms onset, and that cities need to go under lockdowns if needed.

Concerning the students' practice regarding COVID -19, the majority of the students in the present study had satisfactory **practice** regarding COVID -19 precautionary preventive measures. These findings may be explained by many factors including; academic level, positive students' attitude and area of residence. The participants of this study about one quarter of them enrolled in the third academic year and more than one quarter of them enrolled in the fourth academic year, so that have background about importance of adopting the preventive measures for protecting themselves and preventing transmission to other people and their perceived feeling of

responsibility toward their own health and feeling that COVID-19 can be a fatal disease. It can be interpreted by that as someone has felt positive towards prevention of the disease, the more likely he/she applies COVID-19 preventive measures, in this context, this study showed a statistically significant relation between students' attitude and their practice of COVID-19 preventive measures. Likewise, area of residence, the majority of the students in this study came from urban area, and the urban area has adequately net resources that the students used as a source of their information and provide a lot of educationally posters about COVID-19 precautionary preventive measures.

This finding was similar to the study conducted by **Rehman et al., (2021)** who revealed that the overall Pakistani population had good practices and positive attitudes toward COVID-19 preventive measures. In agreement with, **Khader et al., (2020)** who also reported that the majority of Jordanian dentists were aware of COVID-19 symptoms, mechanism of transmission and infection control measures.

In relation to students' total awareness and preparedness level regarding COVID -19, the present study showed that, there was also a strong positive, statistically significant correlation between students' knowledge, practice of preventive measures and their total awareness and preparedness level toward COVID 19. These findings were in accordance with, **Hussain et al., (2021)** who indicated a high level of right awareness among students, in their study to general awareness among Pakistani students regarding COVID-19 outbreak. As well as; **Jangra et al., (2021)** they reported that the overall awareness for all the participants was adequate. Furthermore, **Hasab et al., (2021)** also found that a strong positive statistically significant correlation between knowledge, attitudes and practices among their studied sample.

Conclusion:

This study concluded that, the highest percent of the students under study had good knowledge, satisfactory practice and positive attitude toward COVID-19. There was also a, statistically significant strong positive correlation between students' total awareness

about COVID-19 and their total preparedness level (practice) of preventive measures.

Recommendation

- Developing a program for university students to rectify misinformation in the current study, such as; (COVID-19 has no vaccination, no specific therapy, don't report or notify the presence of COVID-19 infection, and avoid isolation when get infection). Additionally, the approach should address widespread illiteracy as well as sociocultural behaviors.
- Focusing on supplying scientific information through academic courses and other workshops, presentations, and modeling learning are all key tools for transferring information into real-world applications.
- Further studies to compare between medical and non-medical faculties students regarding their awareness toward COVID-19 between.

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