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Awareness of University Students about Corona Virus-19 Pandemic and its Precaution Measures

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Abstract: Background: The outbreak of coronavirus disease-19 (COVID-19) is a worldwide public health issue. **Purpose**: This study was conducted to assess knowledge of university students' about corona virus-19 pandemic and its precaution measures. **Design**: A descriptive research design was used to achieve the purpose of study. **Setting**: This study was conducted at Faculty of Commerce and Faculty of Law in Shebin Elkom city, Menoufia University. **Sample**: A convenience sample of 280 university students, aged between 18- 22, from non-medical faculties were gathered via an online Google Form. **Instruments**: Self-administered structured questionnaire included socio-demographic characteristics, and knowledge of undergraduate students' about COVID-19 pandemic. **Results**: More than three fourths of university students (82.2%) had poor knowledge about COVID 19, 16.4% had fair knowledge and 1.4% good knowledge. Moreover, majority of studied students were not knowledgeable about each item of protective measures against COVID-19 such as washing hands with soap and water (61.8%), covering the mouth and nose with elbow or a tissue when coughing or sneezing (66.1%), wearing a mask in crowded places (67.1%), and maintaining a distance of at least one meter between you and any person (66.3%). **Conclusion**: majority of students in the study had lack of knowledge about COVID -19 pandemic and its preventive measures. **Recommendations**: Enhancement students' awareness about COVID-19 and its protective measures are required.

Keywords*: COVID-19, Awareness, University students, precaution measures,*

Introduction

Coronavirus is a new microorganism that causes respiratory disease in humans. Several coronaviruses in humans have been linked to respiratory infections. They ranged from the common cold to more diseases that are serious like the Middle East respiratory syndrome, severe acute respiratory syndrome as well as coronavirus disease 2019 (COVID 19) (WHO, 2020a]. COVID 19 is a major public health issue that affects people all over the world (Iboi et al. 2021). It has quickly spread globally, prompting the

World Health Organization (WHO) to declare it a pandemic on 12 March 2020 (WHO, 2020a). Globally, 259 502 031 cases of COVID-19, 5 183 003 established deaths, in the Eastern Mediterranean region, there are 87696 cases infected of COVID 19 and 29652 cases In Egypt (WHO, 2021a). .

The COVID-19 is most contagious immediately after the onset of symptoms, although the spread through asymptomatic cases has been reported (Bi et al., 2020). The incubation period is around 5 days (range, 2–14 days) and common symptoms include fever, cough and shortness of breath (Chen et al., 2020; CDC, 2021) The COVID-19 is most commonly transmitted from person to person is by saliva droplets or discharge from the nose when an infected individual sneezes or coughs. It can also be transferred by direct or indirect contact with someone who is infected. Inhalation of respiratory droplets or aerosols through the nose or mouth can enter the lungs. The transmission of the COVID-19 virus can occur by also via indirect contact with surfaces in the immediate environment or with objects used on the infected person (e.g. stethoscope or thermometer). Hand washing, keeping physical distance, avoiding contacting faces with the hand, and wearing a face mask to protect the mouth and nose can all help to stop the spread of the organism (WHO, 2020b).

Most people infected with COVID-19 may experience mild to moderate respiratory illness and recover without requiring special treatment. However, some people may become seriously ill and require medical attention. According the CDC, individuals at higher risk for severe illness due to COVID-19 infections are people 65 and older ; people existing in nursing homes or long-term care centers ; people with underlying medical conditions including diabetes , heart disease or serious heart condition , moderate to severe asthma , HIV, chronic kidney disease (undergoing dialysis), liver disease, immune deficiencies, etc. People with disabilities alone maynot increase your risk for getting COVID-19 or having severe illness. However, adults with disabilities are three times more likely than adults without disabilities to have underlying medical conditions (CDC, 2021).

Coronaviruses are modified viruses, thus taking precautions is essential to avoid contracting them. Individual behaviors such as continuous hand washing, wearing masks inside and

outside in crowded places, covering mouth and nose with elbow or tissue when coughing and sneezing, avoiding face touching, social distance, isolation at reducing contacts with other people, and preventing travels and conferences are examples of protective measures. These safeguards are critical in preventing the spread of illness (Akalu et al., 2020).

Community health nurses have key roles and duties during the COVID-19 epidemic. They remain on the front lines of patient care in hospitals and are actively involved in community assessment and monitoring. They also plan for expected COVID-19 outbreaks, which raises the need for nursing and healthcare resources, potentially overloading the system. Furthermore, provide virus screening information to prevent the transmission of viruses. A worldwide pandemic necessitates active nursing staff participation in clinical management, public awareness and knowledge exchange, and public safety (Fawaz, 2020). Much information about students' behaviors and attitudes may be obtained through assessing their knowledge about coronaviruses, which assists in identifying factors that impact students' adoption of healthy habits (Geldsetzer, 2020). As a result the purpose of this study is to assess knowledge of university students about corona virus-19 pandemic and its precaution measures.

Significance of the study

The COVID-19 pandemic has become a significant public health threat that is causing widespread worry in individuals around the world, results in disastrous education, societal, and economic difficulties (WHO, 2020c) .The status of society, behaviors, understanding, and habits has a major impact on willingness to consider behavioral modification and compliance to precautionary interventions (Zhu et al., 2020). Greater awareness of transmission mode, comprehension of preventive methods, addressing myths and misconceptions, and development of preventive approaches can all help to ensure that preventive strategies are implemented successfully (Ajilore et al.2017; Zhu et al., 2020).

University students represent a special subset of the student population that has more autonomy and live independently but lack life experience. Their knowledge and behaviors could have a vast impact on the spread of a pandemic. As a result, students'

knowledge of COVID-19 and viable preventative techniques is critical in limiting the disease's spread (Keene Woods et al., 2021). So, the purpose of this study is to assess knowledge of university students' about corona virus-19 pandemic and its precaution measures.

Purpose of the study

The study purpose was to assess knowledge of university students' about corona virus-19 pandemic and its precaution measures.

Research Questions:

- What is the level of knowledge of students about COVID-19 pandemic and its preventive measures?

Methods

Research design

A descriptive research design was used to achieve the purpose of study.

Research setting

This study conducted in two non-Medical faculties (Faculty of Commerce, and Faculty of Law) in Menoufia University at Shebin Elkom City.

Sample

A convenience sample was gathered through Google form, composed of 280 university students according to the following criteria:

- Age: 18 to 22 years
- Non-medical faculties.

Sample size: We used Epi website (Open Source Statistics for Public Health), with the following sample size equation: N = [DEFF*Np (1-p)]/ [(d2/Z21-α/2*(N-1) +p*(1-p)]. Our assumptions were we used 95% confidence intervals, with a sample size of 280 university students who agreed to participate in the study (Sullivan et al. 2009)

Instruments of the study: -

The instruments used for data collection from students encompassed:

Self-Administered structured questionnaire: -

it was developed by the researchers after reviewing the related literature and including the following two parts:

a) Socio-demographic Characteristics: - it involved student's name, age, sex, type of faculty, educational year and residence.

b) Knowledge of University Students' about COVID-19: -

It was used to assess knowledge of undergraduate students' about COVID-19 and its protective measures.

It included Forty-four items: nature of COVID-19 (8 items), mode of transmission (6 items), signs and symptoms (7 items), vulnerable group (7 items) to infection, complications of COVID-19 (4 items) and protective measures of COVID-19 (12 items). The responses of each item in the form of yes/ no, don't know. Students who know the correct answer had two scores. while, students who had don't know and incorrect answer had zero score. The total score of knowledge was 88 points. The scoring system was categorized into "good knowledge" when the student achieved > 75% of the total score, "fair knowledge" when the student achieved 50-75 % and "poor knowledge" was considered when the student achieved < 50 % of the total score. Reliability of the instrument was estimated by test retest method and correlation coefficient was 0.89 that indicates the tool is reliable. Additionally, question about source of knowledge about corona virus such as social media, television, family and friends and others and the response in the form of yes and no.

Validity: -

The validity of the instruments was determined by three panels of specialists in the fields of community health nursing, professor in family and community health nursing department community medicine, and medical and surgical nursing and changes were made in response to concerns from the panel about the veracity of the statements and the relevancy of the contents.

Ethical considerations: -

- The study was approved by the Ethical and Scientific Research Committee in the Faculty of Nursing's Menoufia University.
- The informed consent was obtained from participants through WhatsApp after they were notified about the purpose of the study. Participants who want to take part in the research must sign a permission form.
- Students were notified that involvement in the study was voluntary and withdrawal was voluntary at any time. Additionally, confidentiality of student's data was respected.

Pilot study

A pilot study conducted on 10% (n/ 280) of selected undergraduate

university students to determine the feasibility, clarity and objectivity of the study tool. The needed modifications were considered. The subjects of the pilot study were excluded from the actual study sample.

Procedure: -

- A letter was submitted from the Dean of the |Faculty of Nursing to the Deans of Faculty of Commerce and Faculty of Law.
- The data for this research were gathered during the begining of the epidemic from March 2020 and ended by September 2020.
- The researchers submitted a formal letter to the director of student's affairs in order to get the social networking site of students' academic years at selected faculties.
- Because the faculties were closed at the time of data collecting, internet sites such as Google form, WhatsApp and Messenger were used to choose participants via a delivered a link to undergraduate students and shared through WhatsApp groups of selected faculties.
- Instruments of data collection were developed and deployed by online questionnaire and the generated link was sent to students WhatsApp groups.
- Researchers sent the questionnaire through social networking site of selected faculties, through the generated link. The study included students who completed the questionnaire and met the inclusion criteria and submit it to the researchers.

Statistical analysis:

Data was coded and transformed into specially designed form to be suitable for computer entry process. Data was entered and analyzed by using SPSS (Statistical Package for Social Science) statistical package version 22. Graphics were done using Excel program. Quantitative data were presented by mean (X) and standard deviation (SD). Qualitative data were presented in the form of frequency distribution tables, number and percentage. Descriptive statistical techniques were utilized to summarize data on socio-demographic characteristics and responses to questions related knowledge regarding COVID-19. Data were summarized in the form of frequencies (n) and percentages for categorical variables

Results

Figure 1, 2, and 3: shows that forty point seven percent of the students ages 18 to 24 years with average age of 20.9 ± 1.7 years. Meanwhile 28.6% of them are in first year, 21.4% in fourth year, 50% are female. More than half of them were from the Faculty of Law (51.4%) and 48.6% from the faculty of Commerce. As regards residence, 62.9% live in rural area, while 37.1% in urban area.

Table 1: reveals that majority of the studied university students don't know that the virus infects animals and is transmitted to humans (79.6%) and the virus is reproducing faster than other viruses (70.7%) as well as the virus is transmitted from person to person (66.4%). Also, about two thirds (64.3%) of university students do not know that the incubation period of corona ranges from 14-21 days. However, more than one half (62.5%) of them know that the virus is very dangerous and 64.3% know that the virus is highly infectious.

Table 2: Concerning COVID-19 modes of transmission, more than two thirds of them (71.1%) don't know that the virus is transmitted in crowded places with people, 66.8% of university students don't know that virus is transmitted through inhalation of droplets from coughing or sneezing of an infected persons. In addition, 69.3% deny that virus is transmitted via sharing the items with an infected person.

Table 3: illustrates that the majority of university students were not aware of vulnerable groups to COVID-19. More than three fourths (80.4%) of university students don't know that health care workers are one of the vulnerable group. Also, students don't know that children up to 18 years, elderly people, pregnant women and people with chronic diseases are vulnerable to corona virus infection (77.1 %, 62.3%, 64.4%, and 67.1% respectively). The mean total score of knowledge about vulnerable groups of corona virus was 4.71 ± 4.52.

Table 4: illustrates that the majority of university students don't know COVID-19 symptoms. More than three quarters (78.6%) of university students don't know that muscular pain is a symptom of COVID-19 and more than two thirds of them (67.9%) don't know the symptom of COVID-19 (e.g. severe headache). Mean of the level of knowledge about signs and symptoms of COVID-19 was 4.76± 3.51. Moreover, about one fourth of university student's know that corona virus can cause heart failure (22.9%) and kidney failure (23.6%). mean of the level of students' knowledge about complications was 2.46 ± 2.4.

Table 5: highlights that majority of studied students are not knowledgeable about protective measures against COVID-19 such as washing hands with soap and water (61.8%), disinfecting surfaces with alcohol and chlorine (71.1%), covering the mouth and nose with elbow or a tissue when coughing or sneezing (66.1%), wearing a mask in crowded places (67.1%), avoiding touching the eyes, nose and mouth after touching contaminated surfaces (62.3%), maintaining a distance of at least one meter between you and any person (66.3%), avoiding shaking hands and kissing with mouth (63.9%) and wearing gloves while handling contaminated surfaces (68.2). The mean total score of studied students' knowledge about protective measures against COVID-19 was 8.02 ± 2.5.

Table 6: represents knowledge level of students about COVID 19 and shows that more than three fourths (82.2%) of students have poor knowledge about COVID 19, 16.4% fair knowledge and 1.4% have good knowledge

Table 7: illustrates that 63.9% of students reported that social media is the first source of knowledge, then television (59.6%), newspapers & magazines (56.8%), and the least source was friends and family conversation (45%).

Fig.1: Age groups distribution of studied university students (N=280)

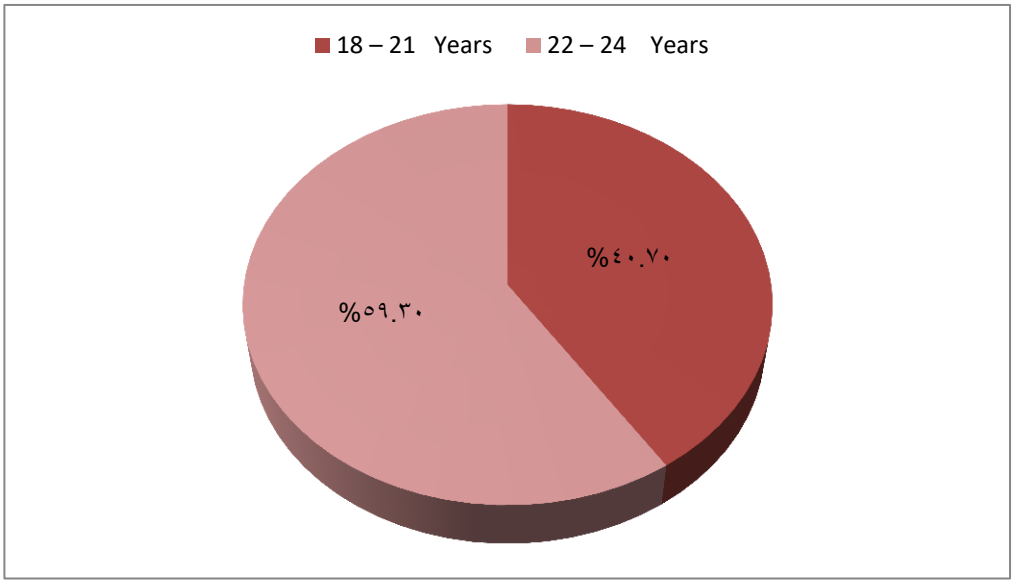

Fig.2: Distribution of the studied university students according to gender, faculty name and residence (N = 280)

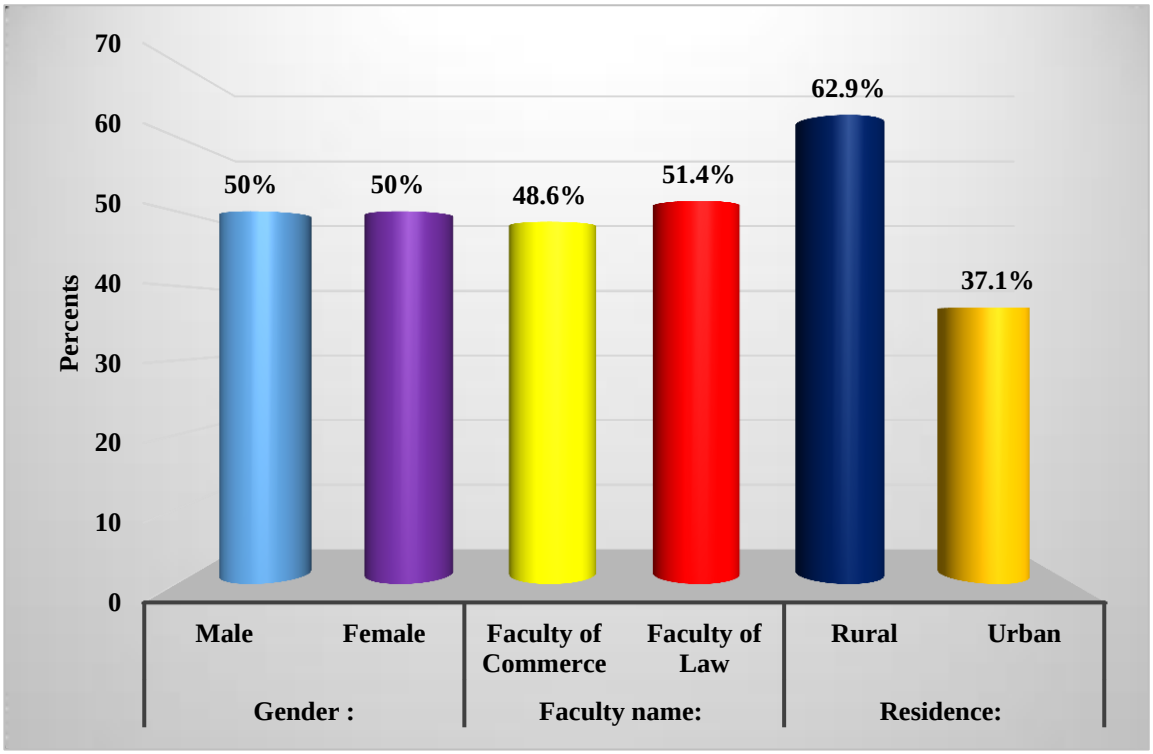

Fig.3: Academic year of studied university students (N=280)

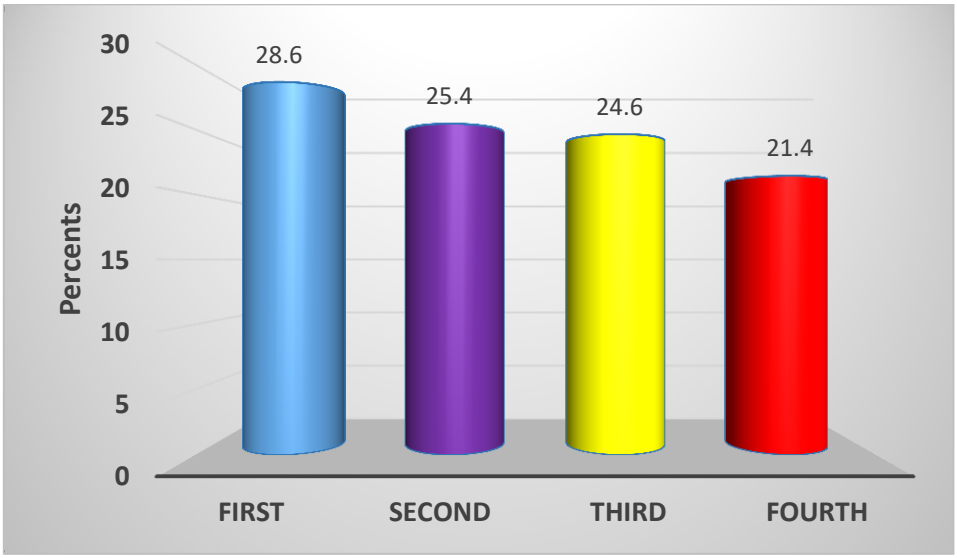

Table 1: Distribution of the university students' knowledge about COVID-19 nature, and mode of transmissions (N = 280)

Students' knowledge about COVID-19 nature, and modes of transmissions	Know		Don't know	
	No.	%	No.	%
Nature of COVID-19:				
It is very dangerous	175	62.5	105	37.5
It is an infectious disease	180	62.5	100	37.5
It is an infection that infects animals and is transmitted to humans	57	20.4	223	79.6
It is reproducing faster than other viruses	82	29.3	198	70.7
It is transmitted from person to person	94	33.6	186	66.4
It is a microorganism can't be seen by necked eye	101	36.1	179	63.9
It is living as an intruder inside the cell to ensure reproduction cause varying severity of diseases	64	22.9	216	77.1
Incubation period of COVID-19 is from 14-21 days	100	35.7	180	64.3

Table 2: Distribution of university students' according to knowledge about COVID-19 mode of transmissions (N = 280)

Students' knowledge about COVID-19 modes of transmissions	Know		Don't know	
	No.	%	No.	%
Modes of transmission through				
Inhalation of droplets from coughing or sneezing of an infected person's	93	33.2	187	66.8
Shaking hands or touching hands of an infected person	91	32.5	189	67.5
Sharing the items with an infected person	86	30.7	194	69.3
Crowding places with people	81	28.9	199	71.1
Touching surfaces contaminated with the virus and touching eyes nose mouth with hands	183	34.6	97	65.4
Transmitting through the air	71	25.9	209	74.6

Table 3: Distribution of university students' according to knowledge about Vulnerable groups to COVID-19 (N = 280)

Students' knowledge about Vulnerable groups to COVID-19	Know		Don't know	
	No.	%	No.	%
Vulnerable groups:				
Children up to 18 years old	64	22.9	216	77.1
Pregnant women	105	35.6	175	64.4
Elderly people	107	37.7	107	62.3
People who affected with low immune deficiency diseases	108	38.6	172	61.4
People who are in contact with infected people	109	39.6	171	60.4
People who have chronic diseases such as diabetes, hypertension, and cardiovascular diseases.	102	32.9	178	67.1
Health care workers	55	19.6	225	80.4

Table 4: Distribution of university students' according to knowledge about COVID-19 symptoms, and complications (N=280)

Students' knowledge about COVID-19 symptoms, and complication	Know		Don't know	
	No.	%	No.	%
COVID-19 symptoms:				
Nasal congestion and dry cough without expectoration	90	32.1	190	67.9
Difficulty breathing	117	41.8	163	58.2
Severe headache	90	32.1	190	67.9
Muscular pains	60	21.4	220	78.6
Fatigue and exhaustion in the body	102	36.4	178	63.6
High temperature and fever	99	35.4	181	646.
Severe diarrhea	108	38.6	172	61.4
Mean total score of COVID-19 symptoms	4.76 ± 3.51			
Complication of COVID-19 :				
Acute pneumonia	94	33.6	186	66.4
Kidney failure	66	23.6	214	76.4
Heart failure	64	22.9	216	77.1
Death	121	43.2	159	56.8

Table 5: Distribution of university students' according to knowledge about protective measures against COVID-19 (N = 280)

Students' knowledge about protective measures against COVID-19	Know		Don't know	
	No.	%	No.	%
Knowledge about protective measures:				
Washing hands with soap and water	107	38.2	173	61.8
Wearing a mask in crowded places	92	32.9	188	61.8
Avoiding touching the eyes, nose and mouth after touching contaminated surfaces	102	37.7	178	62.3
Maintaining a distance of at least one meter between you and any person	100	33.7	180	62.3
Disinfecting surfaces with alcohol and chlorine	81	28.9	199	71.1
Avoiding shaking hands and kissing with the mouth	101	36.1	179	63.9
Wearing gloves while handling contaminated surfaces	89	31.8	191	68.2
Covering the mouth and nose with elbow or a tissue when coughing or sneezing	95	33.9	185	66.1
Going to a medical center if you suffer from cough or fever	93	33.2	187	66.8
Avoiding eating raw or undercooked animal product	90	33.4	190	66.6
Eating foods rich in vitamin C	96	34.3	184	65.7
Eating onions and garlic strengthens the immune system	88	31.4	192	65.7

Table 6: Distribution of students according to level of knowledge about COVID-19 infection among study students (N = 280)

Knowledge level about COVID-19 infection	No.	%
Poor knowledge	230	82.20
Fair knowledge	46	16.4
Good knowledge	4	1.4
Mean total score of knowledge	29.73 ± 15.89	

Table 7: Distribution of students' according to sources of knowledge about COVID-19 infection (N = 280)

Sources of students' knowledge about COVID-19 infection	No.	%
Sources of students' knowledge		
Social media	179	63.90
Newspaper and magazine	159	56.80
Friends and family conversation	126	45.0
Television	167	59.60

Discussion

The World Health Organization has declared Coronavirus Disease 2019 (COVID-19) a pandemic. Global efforts have been made to prevent the illness from spreading by governmental decisions and personal habits, both of which are dependent on public knowledge (WHO, 2020a). So, the study purpose was to assess knowledge of university students' about corona virus-19 pandemic and its precaution measures.

Concerning the students' knowledge about the nature of COVID-19, the current findings revealed that more than three quarters of students don't know that the virus infects animals and is transmitted to humans as well as more than two thirds don't know the virus is reproducing faster than other viruses. These findings were in agreement with the findings of a study performed at King Khalid University, Abha, and Kingdom of Saudi Arabia to asses "knowledge, attitude, and practice concerning COVID-19 among undergraduate students of faculty of Applied Medical Sciences. They reported that most of students were not aware about the virus is reproducing faster than other viruses and more than two thirds reported wrong answers that the virus is transmitted from person to person (Adam et al., 2021).

On the other hand, this finding was inconsistent with findings of the study conducted by Ikhlaq et al., (2022). who assessed" awareness and attitude of undergraduate medical students towards COVID-19 in Combined Military hospital, Lahore". They revealed that most of students demonstrated correct answer about coronavirus is transmitted by close contact with infected person or animal. This difference could be attributed to the application of their study on medical students.

The findings of the present study showed that more than half of students know that virus was very dangerous and about two thirds know that the virus is an infectious disease. These results were in agreement with the findings of a study conducted by Angelo et al., (2021) who assessed knowledge, attitudes, and practices toward COVID-19 and associated factors among university students in Mizan Tepi University". They showed that more than three fourths of students declared that COVID-19 is a dangerous infectious disease. In contrast, another study conducted among school children aged between 6

and 18 years in Egypt. They illustrated that most of the students had correct answers about the cause of the virus (Shehata et al., 2021). This finding was based on a number of variables, including the severity of the disease as reported by the media and health officials, particularly after the WHO proclaimed it a pandemic, and the efficiency of numerous awareness programs launched around the country.

Concerning students' knowledge about COVID-19 modes of transmission, the current results showed that more than two thirds of students don't know that the virus is transmitted in crowded places through inhalation of droplets from coughing or sneezing of an infected persons, beside sharing the items with an infected person. These results were in agreement with the findings of a study performed by Hasan et al., (2021) who assessed "knowledge, attitudes, and practices toward COVID-19 in the United Arab Emirates among medical and nonmedical university students". They showed that the nonmedical students were having low knowledge about mode of transmission than medical students.

On the contrary, a study was conducted by Shehata et al., (2021) illustrated that the majority of students demonstrated correct answers about transmission of disease by cough or sneezing, transmission via droplets during speaking and transmission through contaminated surfaces. Additionally, Salameh et al., (2021) revealed that most of the Palestinian university students knew that COVID-19 is transmissible via droplets through coughing, sneezing, or close contact. Moreover, Angelo et al., (2021) noted that about three fourths of medical students stated that methods of transmission of COVID-19 are respiratory droplest and close contact. This difference between the present study and the other studies may be explained as some studies were applied on medical students. In addition, mass media and television that plays an important role in increasing awareness of students about COVID-19.

Regarding to the students' knowledge about COVID-19 signs and symptoms, the present study findings revealed that the majority of the university students don't know symptoms of the corona virus infection. More than three quarters of university students don't know that muscular pain is a symptom of corona virus, and more than two thirds of them don't know that severe headache is a sign of corona virus. This result was in line with the

findings of the cross- sectional study that was conducted among Palestinian university students. It was discovered that the majority of participants incorrectly identified fever, shortness of breath, cough, fatigue and headache as COVID 19 symptoms (Salameh et al., 2021). On the contrary, Alzoubi et al., (2020) showed that the overall students have good knowledge about the major symptoms namely fever, cough and difficulty in breathing. Additionally, Ikhlaq et al., (2020) revealed that most of medical students in Pakistan had correct answers about symptoms of coronavirus. This disparity in findings of the present study and other studies might be attributed to differences in the research sample's characteristics as well as time of conducting study.

Concerning to the students' knowledge about vulnerable group to COVID-19, the present study results reported that the majority of university students were unaware of vulnerable group to COVID 19. More than three-fourths students were unaware that health care workers and children up to 18 years are vulnerable groups. Furthermore, about two thirds of students don't know that pregnant women and chronic disease persons are the vulnerable to COVID 19. This result was in line with the findings of the cross- sectional study conducted by Hasan et al., (2021) in the United Arab Emirates among medical and nonmedical university students. They illustrated that the nonmedical students were not aware that health care workers, children up to 18 years pregnant women and people chronic disease are the vulnerable group to COVID 19 than medical students. Additionally, Abdelhafiz et al., (2020) who assess "knowledge, perceptions, and attitude of Egyptians aged 18-30 years towards COVID-19 in Egypt". They showed that most of the participants were not aware that the virus might be more dangerous for the elderly and patients with chronic diseases.

Regarding to the students' knowledge about incubation period of COVID-19, the present study findings represented that about two thirds of university students don't know that the incubation period of corona range from 14-21 days. The results were inconsistent with Hussein et al., (2021) who studied "COVID-19 knowledge, risk perception, and precautionary behavior among medical students in Egypt". They demonstrated that most of students had correct knowledge that

COVID-19 incubation period is up to 14 days, with an average of 5 days.

Concerning to the students' knowledge about protective measures of COVID-19, the present study findings represented that majority of the students were not knowledgeable about each item of protective measures against COVID 19 such as washing hands with soap and water, disinfecting surfaces with alcohol and chlorine, covering the mouth and nose with elbow or a tissue when coughing or sneezing, wearing a mask in crowded places, avoiding touching the eyes, nose and mouth after touching contaminated surfaces. This result was in line with the findings by Hasan et al., (2021) reported that the non-medical students had low knowledge about protective measures of COVID-19 than medical students. In addition, this study was supported by Hamza et al., (2020) in Egypt; they showed that most of pharmacy students had low knowledge regarding some of the COVID-19 preventive measures.

On the other hand, the current study finding was inconsistent with Hussein et al., (2021) revealed that most of medical students in Egypt had high knowledge level about protective measures of COVID-19. Additionally, Kuchma et al., (2021) they evaluated medical students' awareness of covid-19 against the background of remote learning". They showed that most of students correctly indicated preventive measures to prevent the outbreak: social distancing 20-second hand washing as an appropriate measure to prevent the virus spread. This difference might be explained by a number of factors, including the severity of illness as reported by the media and health officials, particularly after the WHO classified it a pandemic, and the effectiveness of several awareness efforts undertaken around the country.

Concerning to sources of students' knowledge about COVID-19, the present findings shows that the first source of knowledge was social media followed by television then newspapers & magazines, and the least source was friends and family conversation. This result was consistent with other studies that found the internet and social media are the most common sources of current COVID-19 information (Kenee et al., 202; Kuchma et al., 2021; Mohamed et al., 2021 & Hamaza et al., 2020).

Regarding to the knowledge level of students' about COVID-19, the present

findings illustrated that most of students (82.2%) were poor knowledge about COVID 19, 16.4% were fair knowledge while only 1.4% had good knowledge. This result similar to the study conducted by Prasad Singh et al., (2021) they "assessed the knowledge, attitude and practices of students regarding the COVID-19 pandemic in India". They showed that more than three fourths (78%) of students had poor knowledge of COVID-19 symptoms, mode of transmission and preventive measures. Additionally, the study conducted by Khasawneh et al., (2020) who evaluated" medical students and COVID-19: knowledge, attitudes, and precautionary measures in Jordan". They revealed that more than three quarters (80%) of medical students had poor level of knowledge about the COVID-19 virus and implemented proper strategies to prevent its spread.

Conclusions and recommendations:

Based on the findings of this study, more than three fourths of students (82.2%) had poor knowledge about COVID 19, 16.4% had fair knowledge while only 1.4% had good knowledge. Moreover, the majority of studied students were not knowledgeable about protective measures against COVID-19 such as washing hands with soap and water (61.8%), covering the mouth and nose with elbow or a tissue when coughing or sneezing (66.1%), wearing a mask in crowded places (67.1%), and maintaining a distance of at least one meter between you and any person (66.3%). Furthermore, the majority of students reported that social media was the first source of knowledge about COVID-19.

Recommendations:

Based on the result of this study we recommended that:

- Students' knowledge about COVID-19 and its protective measures must be enhanced.
- Ongoing enhancement the students' awareness about the importance of adopting preventive measures against COVID-19 is required.
- Further studies are needed to raise students awareness about COVID-19 and its precaution measures through telehealth .

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