Knowledge and Practices of Students Regarding the Use of Face Masks to Limit the Spread of Coronavirus Disease (COVID-19)

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ABSTRACT

Background and Objectives: Many countries are implementing face masks as part of their pandemic prevention strategies. Because the virus is so widespread, incorrect usage and disposal of masks can increase the transmission rate. The purpose of this study was to assess knowledge and practices of students in wearing facemask to prevent the spread of the new coronavirus (COVID-19).

Methods: A cross-sectional descriptive study of 365 undergraduate students at Hawler Medical University was conducted from June 15th to October 15th, 2021. The data was gathered through direct interviews using a questionnaire that had been modified include demographic information, ten questions about knowledge, and 17 questions about practices for using surgical face masks to reduce COVID-19 exposure.

Result: The result revealed that highest percentage of students were 18 to 20 years old (66.6%). Most of the participants in this study were female (59.5%). Participants demonstrated fair knowledge (N=218, 59.7%). Concerning the using surgical facemask to prevent the spread of COVID-19 and good practical knowledge (N=273, 74.8%). The highest levels of practical knowledge were related to wearing face masks in hospital premises to protect against COVID-19 (91.8%) and wearing masks in public spaces to protect against COVID-19 (87.1%).

Conclusion: The studied students had a poor understanding of how to utilize face masks. Enhancing one's knowledge and appropriate use of face masks takes time and effort. It is necessary to implement massive education campaigns at the level of Hawler Medical University to increase the proportion of knowledge about COVID-19 and stop its spread.

Keywords: Knowledge; Practice; Students; Face mask; Coronavirus.

INTRODUCTION

Coronavirus disease is a respiratory infection caused by coronavirus 2 (SARS-CoV-2) that causes severe acute respiratory syndrome [1]. It first occurred in China in December 2019 and has since spread to almost every country globally, resulting in the coronavirus pandemic of 2019-2020 [2,3]. The virus spreads primarily by

respiratory droplets, which are released when an infected person coughs or sneezes, or by touching contaminated surfaces or objects and then touching their mouth, nose, or possibly their eyes [4, 5]. Students are obliged to adopt standard infection control techniques to reduce the risk of infection. The routine usage of a face mask is one of the infection control methods. A face mask is a single-use, loose-fitting mask covering the nose, mouth, and chin. It is a simple, cost-efficient non-pharmaceutical individual intervention for safeguarding oneself and preventing respiratory infections from spreading [6].Incorrect use of face masks may have the opposite effect of reducing the spread of respiratory illnesses. Correct knowledge and practice are required for the appropriate use of face masks. Evaluating these two components can provide helpful information for building health promotion programs to increase face mask efficacy [7]. Students are strongly advised to wear a face mask as a standard for transmission-based precaution by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC). Furthermore, the correct use of these face masks is critical, especially now that their use is becoming more prevalent [8]. With large student populations, higher education institutions can become outbreak hotspots that may negatively impact the community [9].Maintaining proper personal hygiene habits and instilling a positive attitude toward wearing a face mask during illness is critical to controlling and limiting the spread of coronavirus. The study's main objective was to assess the knowledge and practices of Hawler Medical University students about using surgical face masks to prevent the spread of COVID-19.

METHODS

A cross-sectional study was carried out from June 15th, 2021, to October 15th, 2021. The sample size of the study was estimated according to the total number of registered students at Hawler Medical University (3862) using Power analysis with a 95% confidence interval (CI) and a 5% margin of error [14]. The estimated sample size was 365. All male and female undergraduate students in colleges of Nursing, Medicine, Dentistry, Pharmacy, and Health Sciences were included in the study. The exclusion criteria included those who refused to be interviewed or could not participate in the study. Informed consent was obtained after confirmation of confidentiality. Ethical approval was obtained from the research ethics committee at the College of Nursing (No. 8, dated July 23, 2021). A questionnaire consisting of three parts was developed to collect data. The first part of the questionnaire included sociodemographic characteristics such as age, stage, gender, marital status, and religion. The second part of the questionnaire collected data on the overall knowledge of students regarding the use of surgical face masks using ten items and was divided into three categories: "poor", "fair", and "good". The scores for overall knowledge ranged from 0-10, poor knowledge ranged from 0–3, fair knowledge ranged from 4–7, and good knowledge ranged from 8–10. The third part of the questionnaire included 17 questions about practices related to face mask use and was divided into three categories: "poor", "fair", and "good". The overall practical knowledge was ranged from 0-17, poor practical knowledge ranged from 0–5, fair practical knowledge ranged from 6–11, and good practical knowledge ranged from 12–17. Questions were adapted from previously published

COVID-19 questionnaires and were filled out by the students using direct interview technique. The data were analyzed using the Statistical Package for Social Sciences (SPSS, Version 23). The association between all sociodemographic variables with students' overall knowledge and practical knowledge was assessed using inferential statistics and the Chi-Square test. A p-value of ≤ 0.05 was considered statistically significant.

RESULTS

Table 1 presents participants' socio-demographic information. According to the results, the college students in the field of medicine constituted the highest frequency (N=83) and percentage (22.7%). Inc comparison, the students in health science constituted the lowest responses (N=64, 17.5%). The students in their first stage of studies constituted the highest (N=157, 43%) response, while those in their fifth year of study constituted the lowest response (N=27, 7.4%). Moreover, the highest responses (66.6%) of students were among the age group 18-20 years old, whereas the 24-26 years old age group had the lowest responses with eight frequencies (2.2%). With respect to gender, female students constituted the maximum number of participants in this study (N=217, 59.5%) and were subsequently followed by their male counterparts (N=148, 40.5%). Those students who were single made up most of the participants (N=346, 94.8%), followed by those who were married (N=19, 5.2%). The majority of the participants (N=358, 98.1%) identified as Muslims, followed by others (N=4, 1.1%), and then Christians (N=3, 0.8%).

Table 1: Socio-demographic data of study participants

Variables		n =365	
College	Nursing	71	(19.5)
	Medicine	83	(22.7)
	Dentistry	76	(20.8)
	Pharmacy	71	(19.5)
	Health science	64	(17.5)
Stage	First	157	(43)
	Second	76	(20.8)
	Third	73	(20)
	Forth	32	(8.8)
	Fifth	27	(7.4)
Age group	18-20	243	(66.6)
	21-23	114	(31.2)
	24-26	8	(2.2)
Gender	Male	148	(40.5)
	Female	217	(59.5)
Marital	Single	346	(94.8)
Status	Married	19	(5.2)
Religion	Christian	3	(0.8)
	Muslim	358	(98.1)
	Others	4	(1.1)
Total		365	(100)

Table 2 illustrates the results of students' knowledge regarding the correct usage of face masks. Most participants (N=158, 43.3%) incorrectly identified the first person answered to recommend wearing a mouth mask as Joseph Lister. Johan Mikulicz is the first person who recommended wearing a mouth mask (N=69, 18.9%). Most students correctly answered the questions "Can wearing a surgical face-mask protect you from COVID-19?" (N=311, 85.2%), "Which is the correct way of using surgical face masks to protect against COVID-19?" (N=277, 75.9%), "How many layers does a surgical mask

have?" (N=237, 64.9%), and "Which layer acts as a filter media barrier?" (N=246, 67.4%). A majority of students incorrectly responded to the "Which type of masks actually protect against COVID-19?" (N=116, 31.8%) choosing 99% BFE & PFE. The correct answer for this question is 95% BFE & PFE (N=87, 23.8%). A significant number of participants (N=98, 26.8%) indicated eight hours as a correct answer to the question "How long can you wear a surgical mask?". The majority (N=267, 73.1%) correctly answered the question "For proper wearing, to what extent should the surgical mask cover the face?", with Nose, Mouth, and Chin being the correct answer. Many of the participants (N=256, 70.1%) correctly answered "yes" to the statement "Wearing a mask for an extended period time can lower O2 levels and raise CO2 levels in the body". When asked if the cloth facial mask was as effective as a standard surgical facial mask, many participants (N=237, 64.9 percent) correctly answered "no". Table 3 shows the practical knowledge of students regarding the correct usage of face masks. According to the results, a significant number of the student (N=271, 74.2%) correctly answered the question "During clinics, if there is a need to talk to the patient, will you remove your mask?". However, a substantial number of the students (N=200, 54.8%) incorrectly indicated "yes" to the question "If you are not sick, do you store the used surgical mask in a bag for later use?". Most of the participants correctly responded to the questions such as "Do you wear a mask in public places to protect yourself against COVID-19?" (N=318, 87.1%), "Do you wear a mask on hospital premises to protect yourself against COVID-19?" (N=335, 91.8%), and "Is it necessary to clean hands before wearing a mask?" (F=303, 83%). Participants correctly responded to the statements "identify the inside and outside

of a mask before wearing it on" (N=275, 75.3%), "It's important to confirm the metal nose band on the top (N=283, 77.5%), "You should place the loop around on the ear" (N=290, 79.5%), "Extending the folds by pulling the top and bottom of the mask" (N = 293, 80.3%), "It is necessary to press the nose band (N=285, 78.1%)", "you should not touch mask (N=283, 77.5%), "Whilewearing the mask, avoid eating, drinking, and smoking (N=224, 61.4%). Participants also correctly responded to the statements "Remove the mask from your face, only touching the bands" (N=277, 75.9%), and "Avoid pulling the mask over the forehead or down over the chin" (N=269, 73.7%). Participants correctly responded to the statements "You should dispose of the mask when soiled or wet" (N=308, 84.6%), "You should clean your hands after taking off" (N=307, 84.1%), and "You should not reuse a single-use mask" (N=284, 77.8%). The overall results for knowledge and practical knowledge of the students are displayed in table 4. Based on total score the overall knowledge is scored as fair (N=218, 59.7%), while overall practical knowledge is scored as good (N=273, 74.8%). Table 5 explores the association between socio-demographic data and overall knowledge of the participants. There was a significant association between good knowledge of the students and the two groups of socio-demographic variables: college group of students (50.7% for pharmacy students, 31.6% for dentistry students, 29.7% for health sciences students, 27.7% for medicine students, and 19.7% for nursing students, P = 0.010) and stage of students (53.1% for forth stage, 51.9 % for fifth stage, 28.8% for third stage, 27.6% for second stage, and 27.4 % for first stage, P = 0.015). There was no significant difference between good knowledge of the students with the other variables of

Socio demographic; age group (P = 0.097), gender (P = 0.756), marital status (P = 0.584) and religion (P = 0.792).Table 6 exhibits the association between sociodemographic data and overall practical knowledge. A significant association between good practical knowledge and college group of students (85.9% for pharmacy students, 31.6% for dentistry students, 75% for health sciences students, 68.7% for medicine students, and 67.6% for nursing students, P= 0.042), age group (84.2% for 21-23 years old, 71.6% for 18-20 years old, and 37.5% for 24-26 years old, P= 0.010) and gender(79.3% for females vs. 68.2% for males, P = 0.021). There was no significant association between practical knowledge with the stage of students (P= 0.766), marital status (P = 0.935) and religion (P = 0.828).

Table 2: Knowledge of students about correct usage of face masks

Items		N	(%)
In 1897, he was the first person to recommend wearing a mouth mask.	Johan Mikulicz (correct)	69	(18.9)
	Carl Flugge	54	(14.8)
	Joseph Lister	158	(43.3)
	Louis Pasteur	84	(23)
Can wearing a surgical mask protect you from COVID-19?	Yes (correct)	311	(85.2)
	No	54	(14.8)
Which way should a surgical face mask be used to protect against COVID-19?	Whiteside facing in (correct)	277	(75.9)
	Whiteside facing out	88	(24.1)
A surgical mask consists of how many layers?	Two	117	(32.1)
	Three (correct)	237	(64.9)
	Four	11	(3)
Which layer serves as a filter media barrier?	First	96	(26.3)
	Middle (correct)	246	(67.4)
	Last layer	23	(6.3)
What types of facemasks are effective against COVID-19?	95% BFE & PFE (correct)	87	(23.8)
	97% BFE & PFE	97	(26.6)
	91% BFE & PFE	65	(17.8)
	99% BFE & PFE	116	(31.8)
How long may a surgical mask be worn?	2 Hours	98	(26.8)
	4 Hours	169	(46.4)
	8 Hours (correct)	98	(26.8)
To what extent should the surgical mask cover the face?	Mouth only	27	(7.4)
	Mouth and Nose	71	(19.5)
	Nose, Mouth, and Chin	267	(73.1)
Wearing a facemask for an extended period of time leads to the body's O2 level dropping and CO_2 level rising?	Yes (correct)	256	(70.1)
	No	109	(29.9)
Is a cloth facial mask as effective as a standard surgical mask?	Yes	128	(35.1)
	No (correct)	237	(64.9)
Total		365	(100)

Table 3: Practical knowledge of students regarding correct usage of face mask

Items	Correct		Incorrect	
Will you remove your mask during clinics if you need to talk with a patient?	271	(74.2)	94	(25.8)
If you are not sick, do you store the used surgical mask in a bag for later use?	165	(45.2)	200	(54.8)
Do you protect yourself from COVID-19 by wearing a mask in public places?	318	(87.1)	47	(12.9)
Do you wear a mask in hospital premises to protect yourself against COVID-19?	335	(91.8)	30	(8.2)
Is it necessary to clean hands before wearing a mask?	303	(83)	62	(17)
Identify the inside and outside of a mask before wearing it on.	275	(75.3)	90	(24.7)
It's important to confirm the metal noseband on the top.	283	(77.5)	82	(22.5)
You should place the loop around on the ear.	290	(79.5)	75	(20.5)
Extending the folds by pulling the top and bottom of the mask.	293	(80.3)	72	(19.7)
It is necessary to press the nose band.	285	(78.1)	80	(21.9)
You should not touch the mask.	283	(77.5)	82	(22.5)
While wearing the mask, avoid eating, drinking, and smoking.	224	(61.4)	141	(38.6)
Remove the mask from your face, only touching the bands.	277	(75.9)	88	(24.1)
Avoid pulling the mask over the forehead or down over the chin.	269	(73.7)	96	(26.3)
You should dispose of the mask when soiled or wet.	308	(84.6)	56	(15.4)
You should clean your hands after taking off.	307	(84.1)	58	(15.9)
You should not reuse a single-use mask.	284	(77.8)	81	(22.2)

Table 4: Overall Knowledge and Practical Knowledge of the students

Overall		N	(%)
	Poor	31	(8.5)
Knowledge	Fair	218	(59.7)
	Good	116	(31.8)
	Poor	2	(0.5)
Practical Knowledge	Fair	90	(24.7)
	Good	273	(74.8)
Total		**365**	**(100)**

Table 5: Association between Socio demographic data with Overall Knowledge

| Variables | | Overall Knowledge | | | | | | P Value |
| | | Poor | | Fair | | Good | | |
		N	(%)	N	(%)	N	(%)	
College	Nursing	8	(11.3)	49	(69)	14	(19.7)	
	Medicine	10	(12)	50	(60.2)	23	(27.7)	
	Dentistry	7	(9.2)	45	(59.2)	24	(31.6)	0.010
	Pharmacy	2	(2.8)	33	(46.5)	36	(50.7)	
	Health science	4	(6.3)	41	(64.1)	19	(29.7)	
Stage	First	17	(10.8)	97	(61.8)	43	(27.4)	
	Second	8	(10.5)	47	(61.8)	21	(27.6)	
	Third	3	(4.1)	49	(67.1)	21	(28.8)	0.015
	Forth	3	(9.4)	12	(37.5)	17	(53.1)	
	Fifth	0	(0)	13	(48.1)	14	(51.9)	
Age group	18-20	25	(10.3)	151	(62.1)	67	(27.6)	
	21-23	6	(5.3)	62	(54.4)	46	(40.4)	0.097
	24-26	0	(0)	5	(62.5)	3	(37.5)	
Gender	Male	13	(8.8)	85	(57.4)	50	(33.8)	0.756
	Female	18	(8.3)	133	(61.3)	66	(30.4)	
Marital Status	Single	29	(8.4)	205	(59.2)	112	(32.4)	0.584
	Married	2	(10.5)	13	(68.4)	4	(21.1)	
Religion	Christian	0	(0)	2	(66.7)	1	(33.3)	
	Muslim	30	(8.4)	214	(59.8)	114	(31.8)	0.792
	Others	1	(25)	2	(50)	1	(25)	

Table 6: Association between Socio demographic data with Overall Practical Knowledge

Variables		Overall Practical Knowledge						P-Value
		Poor		Fair		Good		
		N	(%)	N	(%)	N	(%)	
College	Nursing	2	(2.8)	21	(29.6)	48	(67.6)	
	Medicine	0	(0)	26	(31.3)	57	(68.7)	0.042
	Dentistry	0	(0)	17	(22.4)	59	(77.6)	
	Pharmacy	0	(0)	10	(14.1)	61	(85.9)	
	Health science	0	(0)	16	(25)	48	(75)	
Stage	First	2	(100)	42	(46.7)	113	(41.4)	
	Second	0	(0)	21	(27.6)	55	(72.4)	0.766
	Third	0	(0)	14	(19.2)	59	(80.8)	
	Forth	0	(0)	7	(21.9)	25	(78.1)	
	Fifth	0	(0)	6	(22.2)	21	(77.8)	
Age group	18-20	2	(0.8)	67	(27.6)	174	(71.6)	
	21-23	0	(0)	18	(15.8)	96	(84.2)	0.010
	24-26	0	(0)	5	(62.5)	3	(37.5)	
Gender	Male	2	(1.4)	45	(30.4)	101	(68.2)	0.021
	Female	0	(0)	45	(20.7)	172	(79.3)	
Marital Status	Single	2	(0.6)	85	(24.6)	259	(74.9)	0.935
	Married	0	(0)	5	(26.3)	14	(73.7)	
Religion	Christian	0	(0)	1	(33.3)	2	(66.7)	
	Muslim	2	(0.6)	89	(24.9)	267	(74.6)	0.828
	Others	0	(0)	0	(0)	4	(100)	

DISCUSSION

The highest percentage of the study sample were from Medicine College in the first stage and ranged from 18- 20 years old. This result is similar to the results of a descriptive study done on 592 students who found that most students were in medicine but in the second stage [10]. The findings are consistent with those of a cross-sectional study of 104 students, which found that most students were between the ages of 18 and 25 [11]. More than half of the study sample were females, and the remainder were males. This study agrees with the study done by Hamed Alzoubi, in 2020, which reported more than half of the sample were female [10]. The current study found that the highest percentage of the students were single and Muslims. Concerning the knowledge of students about the correct usage of face masks, most questions were answered correctly. The present study revealed that majority of students answered all questions correctly except one question ("If you are not sick, do you store the used surgical mask in a bag for later use?"). The result of the present study agrees with the findings of the study by Hamed Alzoubi et al. which reported a positive practical attitude toward COVID-19 [10]. Joshi et al. conducted a cross sectional study on 407 students which revealed that around 95.58% were knowledgeable about face mask usage while going out duringthe pandemic [12]. The current study showed that the more than half of the sample were at a fair level of overall knowledge and most of the sample were at a good level of practical knowledge. In terms of the relationship between socio-demographic data and overall knowledge, the study found that there was a significant relationship between the college, stage, and age of the students, but there was no significant relationship between gender, marital status, and religion and overall knowledge of the use of face masks. This result is like the findings of a descriptive study conducted by Imtaz Ahmed et al. on 60 students at the University of Raiwind Road, Lahore [6]. There was a significant relationship between college, age, and gender of the students with overall practice knowledge regarding the usage of face masks in the resent study. There was no significant relationship between the stage, marital status, and religion of the students with the overall practice of using face masks.

CONCLUSION

Face masks are necessary to implement for prevention in mass gatherings due to the rising number of cases of COVID-19 and the threat of respiratory infection. The study concluded that the knowledge and practice of students regarding the use of surgical face masks were found to be inadequate. According to the findings of the study, during this pandemic crisis, there is an urgent need to implement periodic educational interventions and training programs on infection control techniques and the use of protective equipment among Hawler Medical University students. Regular instructional webinars with guidelines and content to enhance student awareness are necessary for them to be healthy and safeguard our society from diseases like COVID-19.

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CONFLICT OF INTEREST

The author reports no conflict of interest.

REFERENCES

[1]   Anikwe C, Ogah C, Anikwe I, Okorochukwu B, Ikeoha C. Coronavirus disease 2019: Knowledge, attitude, and practice of pregnant women in a tertiary hospital in Abakaliki, southeast Nigeria. International Journal of Gynecology & Obstetrics. 2020;151(2):197-202.

[2]   Radonovich L, Simberkoff M, Bessesen M, Brown A, Cummings D, Gaydos C et al. N95 Respirators vs Medical Masks for Preventing Influenza Among Health Care Personnel. JAMA. 2019;322(9):824.

[3]   Azlan A, Hamzah M, Sern T, Ayub S, Mohamad E. Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. PLOS ONE. 2020;15(5):e0233668.

[4]   Sohrabi C, Alsafi Z, O'Neill N, Khan M, Kerwan A, Al-Jabir A et al. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). International Journal of Surgery. 2020;76:71-76.

[5]   Olum R, Chekwech G, Wekha G, Nassozi D, Bongomin F. Coronavirus Disease-2019: Knowledge, Attitude, and Practices of Health Care Workers at Makerere University Teaching Hospitals, Uganda. Frontiers in Public Health. 2020;8.

[6]   AHMAD, Imtiaz; ALTAF, Sehar; AHMAD, Hafiz M. Assessment of knowledge, practice and barrier in use of facemasks among university students. Pakistan Journal of Medical & Health Sciences, 2017, 11.4: 1657-58.

[7]   Lee L, Lam E, Chan C, Chan S, Chiu M, Chong W et al. Practice and technique of using face mask amongst adults in the community: a cross-sectional descriptive study. BMC Public Health. 2020;20(1).

[8]   Wada K, Oka-Ezoe K, Smith D. Wearing face masks in public during the influenza season may reflect other positive hygiene practices in Japan. BMC Public Health. 2012;12(1).

[9]   Akan H, Gurol Y, Izbirak G, Ozdatlı S, Yilmaz G, Vitrinel A et al. Knowledge and attitudes of university students toward pandemic influenza: a cross-sectional study from Turkey. BMC Public Health. 2010;10(1).

[10]   Alzoubi H, Alnawaiseh N, Al-Mnayyis A, Abu-Lubad M, Aqel A, Al-Shagahin H. COVID-19 - Knowledge, Attitude and Practice among Medical and Non-Medical University Students in Jordan. Journal of Pure and Applied Microbiology. 2020;14(1):17-24.

[11]   Olum R, Chekwech G, Wekha G, Nassozi D, Bongomin F. Coronavirus Disease-2019: Knowledge, Attitude, and Practices of Health Care Workers at Makerere University Teaching Hospitals, Uganda. Frontiers in Public Health. 2020;8.

[12]   Joshi K, Madhura L, Jamadar D. Knowledge and awareness among nursing students regarding the COVID-19: a cross sectional study. International Journal Of Community Medicine And Public Health. 2020;7(7):2518. DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20202536.

[13]   AHMAD, Imtiaz; ALTAF, Sehar; AHMAD, Hafiz M. Assessment of knowledge, practice and barrier in use of facemask among university students. *Pakistan Journal of Medical & Health Sciences,* 2017, 11.4: 1657-58. doi:10.11622/smedj.2014037.

[14]   Ho HS. Use of face masks in a primary care outpatient setting in Hong Kong: knowledge, attitudes and practices. Public health. 2012 Dec 1;126(12):1001-6.