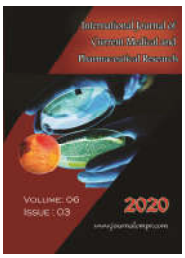
INTERNATIONAL JOURNAL OF CURRENT MEDICAL AND PHARMACEUTICAL RESEARCH
ISSN: 2395-6429, Impact Factor: 4.656
Available Online at www.journalcmpr.com
Volume 6; Issue 03(A); March 2020; Page No. 5055-5062
DOI: http://dx.doi.org/10.24327/23956429.ijcmpr202003863



Research Article

CONCERNS OF UNDERGRADUATE MEDICAL STUDENTS TOWARDS AN OUTBREAK OF COVID-19

Naseem Ahmed[1]*, Aneeqa Khan[2], Naveed[2], Hafiz Abdullah[2]
Syed Muhammad Moizuddin[2] and Javeria Khan[2]

[1]Department of Pathology, Dow Medical College, Dow University of Health Sciences, Karachi, Pakistan
[2]Dow Medical College, Dow University of Health Sciences, Karachi, Pakistan

ARTICLE INFO

Article History:
Received 6th December, 2019
Received in revised form 15th January, 2020
Accepted 12th February, 2020
Published online 28th March, 2020

Key words:
Corona virus, Medical Undergraduates, COVID-19, Pandemic, Concerns

ABSTRACT

Introduction: The Novel coronavirus has now been declared as a global pandemic emergency. It is closely associated to SARS-CoV virus. 1022 confirmed cases of COVID-19 and 8 deaths have been cited (till 25/03/2020 07:00 pm) in accordance with Pakistani media as well as by National Institute of Health, Pakistan. With the deteriorating situation, health care workers and medical students, posted in wards are supposed to be at a higher risk for acquiring and transmitting infection.

Methods: This cross-sectional survey was conducted at 3 different medical institutes of Karachi including Dow University of Health and Sciences, Jinnah Sindh Medical University and Karachi Medical and Dental College, in the duration from January 2020 to February 2020. 322 medical undergraduates, who consented to participate and had clinical exposure were recruited randomly hence, our sample population involved 3rd, 4th and 5th year MBBS students; 3rd and 4th year BDS students. A Self-designed questionnaire was utilized which focused on general perception, possibility of outbreak in local settings and institutional efficiency in fighting outbreak conditions, anxiety and mental strategy of participants. Data was analyzed using SPSS version 24.

Results: A total of 322 medical undergraduates (73.9% females and 26.1% males) aged between 18-28 years participated in the survey, where the partakers from DUHS, JSMU and KMDC proportioned out to be 55.6%, 20.5% and 23.9% in order. Majority participants considered coronavirus infection as life threatening illness and categorized novel coronavirus as the deadliest of its entire species. 75.8% participants were found worrisome regarding probability of getting infected during medical rotations. Around 80% individuals dreaded insufficient care and inappropriate treatment, in case they acquire infection. Majority of the students thought that their institute associated hospital won't be able to handle the situation in case of an uncontrolled outbreak. When asked about their strategies, 78.6% thought-about themselves being obliged to take care of patient. 71.1% denied skipping ward rotations even during outbreak conditions. Use of face masks and isolation of infected individuals were popular opinions.

Conclusion: The situation in this thickly populated city, Karachi is still ambiguous. Moreover, whether the fragile health care system of Pakistan will be able to handle the situation still remains an unanswered question.

INTRODUCTION

Coronaviruses are large, positive single-stranded, enveloped RNA viruses that pass on a disease to humans, but also an extensive range of animals. In 1966, Tyrell and Bynoe were the first to depict Coronaviruses, after cultivating them from patients affected with common colds [1]. They are categorized under 4 sub families namely; alpha-, beta-, gamma- and delta-coronaviruses. The beta-coronaviruses may cause serious disease and fatalities, whereas alpha-coronaviruses cause mildly symptomatic or even asymptomatic infections [2]. The recent outbreak at Wuhan, China occurred due to Novel Corona Virus, which fits in the B lineage of the beta-coronaviruses and is closely related to the SARS-CoV virus [3, 4].This has followed the emergence of severe acute respiratory syndrome coronavirus (SARS-CoV) in Guangdong, China, during 2002, which troubled 8098 people in 37 countries[5] and Middle east respiratory syndrome coronavirus (MERS-CoV), about which World Health Organization (WHO) testified 1864 laboratory-confirmed MERS-CoV cases with 659 deaths in 27 countries since September 2012 [6].Reported cases at Wuhan, China presented with fever, cough, fatigue and myalgia as conventional symptoms whereas, sputum production, headache, hemoptysis and diarrhea were some minor presentations. In one study 55% developed dyspnea, 63% had lymphopenia and every patienthad pneumonia with chest CT scan showing worrisome and anomalous findings. Complications encompassed RNAaemia[15%], acute respiratory distress syndrome [29%],

*Corresponding author: **Naseem Ahmed**
Department of Pathology, Dow Medical College, Dow University of Health Sciences, Karachi, Pakistan

secondary infection [10%] and acute cardiac injury [12%] [7]. The current approximation of the mean incubation period for COVID-19 is 6.4 days, ranging from 2.1 days to 11.1 days [8], with potential asymptomatic transmission. Although early studies narrated a link between a single local fish and wild animal market and most cases of infection, representing thinkable animal-to-human transmission but recent studies have progressively demonstrated human-to-human transmission of SARS-CoV-2 through droplets or direct contact [9].

Novel coronavirus cases are now being reported from different countries across the world. According to National institute of health, 1022 confirmed cases of COVID-19 and 8 deaths (till 25/03/2020 07:00 pm) have been reported along with many suspected cases in Islamic Republic of Pakistan. Although the condition is still changing and further updated data is required to confirm these preliminary guesses, there is prodigious capacity for an uncontrolled and hysterical outbreak of COVID-19 soon. Health care workers and medical students, posted in wards are supposed to be at a higher risk for acquiring and transmitting infection. Therefore, this research was carried out in order to evaluate the concerns of medical students towards a possible panic-stricken outbreak in Karachi.

MATERIALS AND METHODS

This cross-sectional survey was conducted at 3 different medical institutes of Karachi including Dow University of Health and Sciences (DUHS), Jinnah Sindh Medical University (JSMU) and Karachi Medical and Dental College (KMDC) in the duration from January 2020 to February 2020. Sample size of 322 was calculated using www.openepi.com keeping anticipated frequency of 70.4%, in view of a study done in Saudi Arabia which estimated that 70.4% of participants felt at risk of contracting the MERS-CoV infection at work. Confidence interval of 95% and absolute precision of 5% was taken under consideration.

Undergraduate students from all 3 aforementioned universities were enrolled in the study after taking written and informed consent. Only those medical undergraduates who had clinical exposure were recruited randomly hence, our sample population involved 3rd, 4th and 5th year MBBS students; 3rd and 4th year BDS students. Undergraduates of 1st and 2nd year from both departments were withheld from this survey. Graduates and students from other medical departments including DPT, Nursing and Radiology department were also exempted from the study. Participants were not divided equally in numbers neither with respect to institute nor Department. The participants were enrolled on the basis of convenient sampling. Voluntary participation was appreciated and those unwilling to take part were excluded from the study. Moreover, in order to ensure participant's privacy data was collected anomalously. A Self-designed questionnaire was utilized in which questions were classified into different sections including demographics, general perception, possibility of outbreak in local settings and institutional efficiency in fighting outbreak conditions. Anxiety related to acquiring infection during clinical rotations was also inquired. Further mental strategy of students towards their patients and their routine activities was assessed via a set of questions and finally their view point on government's and institute's role was queried.

Statistical Analysis

Data was entered through MS Excel. All the collected information was assessed and analyzed via software Statistical Package for Social Sciences version 24. Frequencies and percentages for each answer was tabulated and reported with respect to department and institutions. Related pie charts and bar graphs were generated as well.

RESULTS

A total of 322 medical undergraduates aged between 18-28 years with median of age 22(21-23), with 73.9% females and 26.1% males participated in this study, where the partakers from DUHS, JSMU and KMDC proportioned out to be 55.6%, 20.5% and 23.9% in order. Majority (71.4%) of the students were enrolled in MBBS course while the remaining were BDS students. On the basis of clinical exposure, our sample population comprised of students from 3rd (27.3%), 4th (45.3%) and 5th (27.3%) years. Student's perception about Novel coronavirus was queried, which revealed that 72.4 % participants considered coronavirus infection as life threatening illness and 57.1% individuals categorized novel coronavirus as the deadliest of its entire species. Over 88% students replied in affirmative when asked whether they regard COVID-19 infected person as a serious threat to society. The detailed frequency and respective percentage of participant's responses are provided in Table 1. Upon probing, 75.8% participants were found worrisome regarding probability of getting infected during medical rotations (Fig 1). Questions regarding possible approach by government and institution in outbreak conditions were also asked and are reported in Table 1 as well

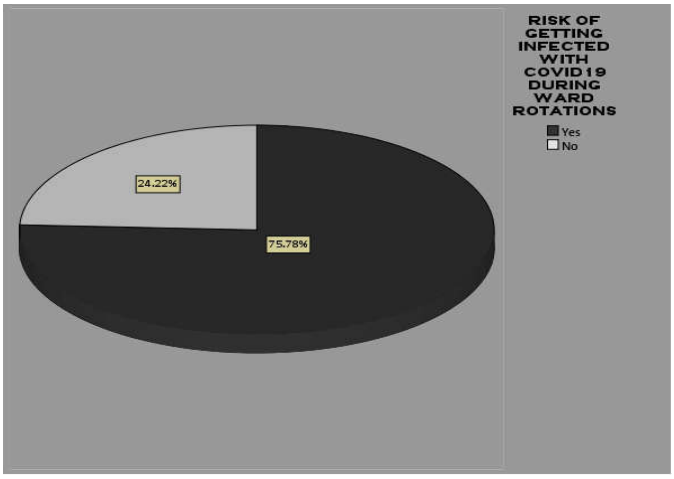


Fig 1 Risk of getting infected with COVID-19 during ward rotations.

Participants were asked about susceptible individuals and more than seventy percent participants reported that recent travelers from affected countries are more prone towards acquiring infection. (Fig 2) Around 80% individuals dreaded insufficient care and inappropriate treatment, in case they acquire infection. The participants were also questioned about proficiency of their respective institute associated hospital in facing a possible outbreak, to which 73.9% answered that their institute won't be able to handle the situation. Mental strategy of participants towards an outbreak was also inquired; 254(78.6%) thought-about themselves being obliged to take care of patient and 239(74.2%) participants were ready to serve the cause despite themselves being exposed to danger. 229(71.1%) denied skipping ward rotations even during outbreak conditions. 313(97.2%) showed positive response

toward use of masks and around half of all participants were in favor of taking prophylactic medication while working in infected environment. With the exception of 5-10 participants, all agreed with the idea that isolation of the infected individual from other patients would be a better choice. Mental strategies of students along with effect of outbreak on routine activities are reported in Table 2.

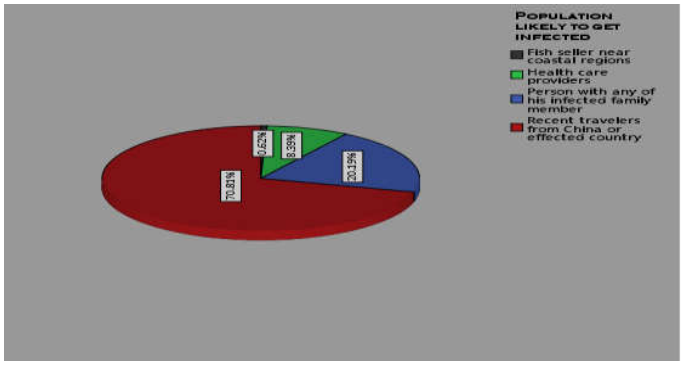


Fig 2 Response of students when asked about the population likely to get infected.

Likely cause of this global emergency was also investigated; around seventy percent participants believed that air-borne droplets are the leading cause of global outbreak while 14% thought that being immune compromised is a causative factor. Participants were asked about their current clinical postings in order to find probable lack of exposure that might occur in case of outbreak. Majority of KMDC students were free from postings due to preparation leave and most of the participants from other institutes were posted in General Medicine and Surgery wards. Vast exposure to clinical settings is reported in figure 3. Finally participants gave their views regarding research topics that should be considered on this aspect, for which majority commented that early diagnosis and management plans need extensive research in near future.

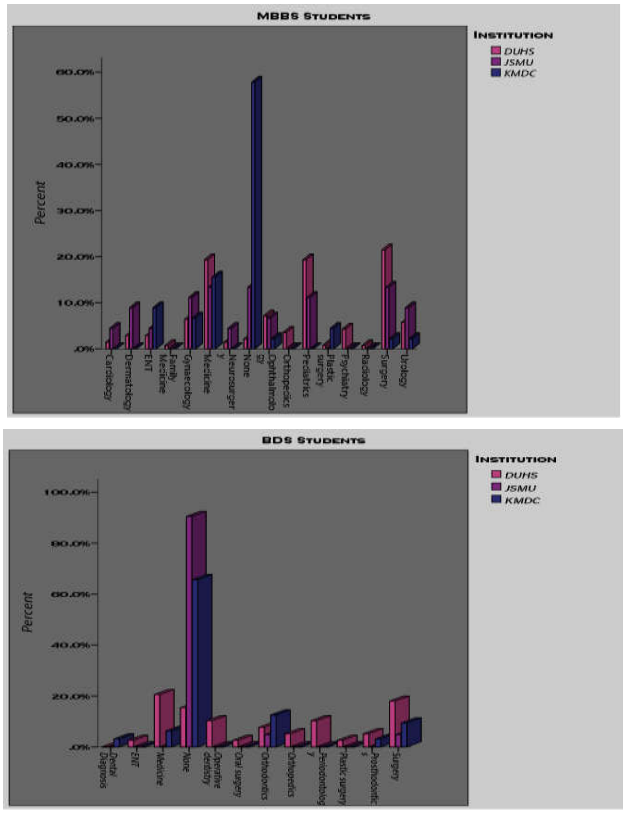


Fig 3 Comparison of clinical postings

DISCUSSION

During a pandemic, health-care institutions are supposed to play a chief role [10] when, health professionals are at an extreme danger of exposure and acquisition of infection [11]. During the outbreak of SARS, they underwent a lot of anxiety and hassle, may be due to an overstrained and fragile health-care system [12, 13]. Also during the MERS-CoV outbreak at Saudi Arabia, a research carried out by Abolfotouh MA et al. revealed that 70.4% of HCWs (health care workers)sensed the threat of catching the MERS-CoV infection at work and 7.1% felt that changing job would be an appropriate option during MERS crisis [14]. Our findings are also consistent with this survey since 75.78% of medical students considered they are at risk of acquiring the infection while attending clinical postings, in case of an uncontrolled, widespread outbreak, illustrated in Figure 1. Once diseased, majority of them feared that they may not get appropriate attention and care. A chaotic and dreadful scenario is expected should a widespread, hysterical and uncontrolled novel Coronavirus outbreak occur in a developing country like Pakistan. The infection has already grown throughout China and influenced numerous other countries, thus initiating a global concern [15]. This research was therefore carried out to investigate the level of concern and mental strategies of medical students attending their clinical postings at government teaching hospitals.

Awareness and Knowledge About COVID-19

Majority of the students in this survey considered COVID-19 as a life threatening condition while 57.1% characterized it as the deadliest of all coronaviruses, although the reported fatality rate of this virus is less than MERS and SARS. According to WHO, above 80% of patients with covid-19 have a “mild disease and will recuperate since, its reported fatality is 2%. In contradistinction to this, outbreak of SARS had a casualty rate of approximately 10%, while MERS killed 34% of the affected people between 2012 and 2019.However, despite the decreased case fatality rate, COVID-19 has surprisingly caused more number of deaths (1871) than those caused by SARS and MERS combined (1632) [16]. This may be credited to the basic reproduction number of COVID-19 which was discovered to be 3.28, which exceeds WHO estimates from 1.4 to 2.5 [17]. In this survey, 89.9% participants from DUHS, 95.5% from JSMU and 85.7% from KMDC feared that an outbreak similar at Wuhan, China can occur in Karachi. Their fears have indeed proven to be true and outbreak has occurred, however local transmission is still under control. Bulk of them was terrified that any individual with fever and respiratory symptoms these days might have COVID-19. Moreover, majority of the students from both MBBS and BDS from all three institutes categorized COVID-19 infected individual as a grave danger to society. Upon asking the probable cause of acquiring the infection, air borne droplets and immune compromised state were the two most popular opinions. A publication by Cascella M et al. states the same facts that this virus is transmissible from human-to-human, and symptomatic people are the commonest source of COVID-19 spread [18]. Another study by Riou J et al. also highlighted that basic reproduction numbers of SARS-CoV2 also reckoned human-to-human transmission [19]. Another publication states the same that transmission is chiefly by respiratory droplets and possibly by fomite. Virus is found in saliva as well as in respiratory secretions.

Table 1 Students perception, approaches by Government and institution toward possible outbreak.

Questions		DUHS N (%)		JSMU N (%)		KMDC N (%)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree
➢Novel coronavirus is a life-threatening condition	MBBS	102(57.0)	38(21.2)	32(48.5)	13(19.7)	34(44.2)	11(14.3)
	BDS	37(20.7)	2(1.1)	10(15.2)	11(16.7)	18(23.4)	14(18.2)
	Total	139(77.7)	40(22.3)	42(63.6)	24(36.4)	52(67.5)	25(32.5)
➢Novel coronavirus is deadliest of all coronavirus infection	MBBS	89(49.7)	51(28.5)	21(31.8)	24(36.4)	25(32.5)	20(26.0)
	BDS	31(17.3)	8(4.5)	8(12.1)	13(19.7)	10(13.0)	22(28.6)
	Total	129(67.0)	59(33.0)	29(43.9)	37(56.1)	35(45.5)	42(54.5)
➢Novel coronavirus outbreak can occur in Karachi	MBBS	129(72.1)	11(6.1)	42(63.6)	3(4.5)	40(51.9)	5(6.5)
	BDS	32(17.9)	7(3.9)	21(31.8)	0(0.0)	26(33.8)	6(7.8)
	Total	161(89.9)	18(10.1)	63(95.5)	3(4.5)	66(85.7)	11(14.3)
➢Any person with fever and respiratory symptoms these days might have novel coronavirus infection	MBBS	91(50.8)	49(27.4)	28(42.4)	17(25.8)	18(23.4)	27(35.1)
	BDS	15(8.4)	24(13.4)	10(15.2)	11(16.7)	20(26.0)	12(15.6)
	Total	106(59.2)	73(40.8)	38(57.6)	28(42.4)	38(49.4)	39(50.6)
➢COVID19 infected person is a serious threat to society	MBBS	126(70.4)	14(7.8)	41(62.1)	4(6.1)	38(49.4)	7(9.1)
	BDS	36(20.1)	3(1.7)	19(28.8)	2(3.0)	26(33.8)	6(7.8)
	Total	162(90.5)	17(9.5)	60(90.9)	6(9.1)	64(83.1)	13(16.9)
Institutional approach towards outbreak							
➢University should arrange awareness sessions about preventive measures.	MBBS	138(77.1)	2(1.1)	45(68.2)	0(0.0)	44(57.1)	1(1.3)
	BDS	39(21.8)	0(0.0)	21(31.8)	0(0.0)	32(41.6)	0(0.0)
	Total	177(98.9)	1(1.1)	66(100.0)	0(0.0)	76(98.7)	1(1.3)
➢University should provide training about infection control measures, in case of a possible outbreak	MBBS	135(75.4)	5(2.8)	45(68.2)	0(0.0)	44(57.1)	1(1.3)
	BDS	39(21.8)	0(0.0)	21(31.8)	0(0.0)	32(41.6)	0(0.0)
	Total	174(97.2)	5(2.8)	66(100.0)	0(0.0)	76(98.7)	1(1.3)
➢University should consider keeping the wards off, ➢ till the outspread settles.	MBBS	115(64.2)	25(14.0)	34(51.5)	11(16.7)	31(40.3)	14(18.2)
	BDS	26(14.5)	13(7.3)	16(24.2)	5(7.6)	21(27.3)	11(14.3)
	Total	141(78.8)	38(21.2)	50(75.8)	16(24.2)	52(67.5)	25(32.5)
Government Approach to outbreak							
➢Government should arrange prevention awareness programs	MBBS	137(76.5)	3(1.7)	45(68.2)	0(0.0)	45(58.4)	0(0.0)
	BDS	39(21.8)	0(0.0)	21(31.8)	0(0.0)	32(41.6)	0(0.0)
	Total	176(98.3)	3(1.7)	66(100.0)	0(0.0)	77(100.0)	0(0.0)
➢Government should provide free medication and ➢ prompt treatment to affected individuals	MBBS	136(76.0)	4(2.2)	44(66.7)	1(2.2)	44(57.1)	1(1.3)
	BDS	39(21.8)	0(0.0)	20(30.3)	1(1.5)	32(41.6)	0(0.0)
	Total	175(97.8)	4(2.2)	64(97.0)	2(3.0)	76(98.7)	1(1.3)
➢Government should provide preventive precautions ➢for health care providers	MBBS	136(76.0)	4(2.2)	45(68.2)	0(0.0)	45(58.4)	0(0.0)
	BDS	37(20.7)	2(1.1)	21(31.8)	0(0.0)	32(41.6)	0(0.0)
	Total	173(96.6)	6(3.4)	66(100.0)	0(0.0)	77(100.0)	0(0.0)

Table 2 Mental strategy of students and effect on daily activities

Questions		DUHS N (%)		JSMU N (%)		KMDC N (%)	
		Yes	No	Yes	No	Yes	No
Considering yourself as obliged to take care of infected patients	MBBS	103(57.5)	37(20.7)	33(50.0)	12(18.2)	42(54.7)	3(3.9)
	BDS	35(19.6)	4(2.2)	15(22.7)	6(9.1)	25(32.5)	7(9.1)
	Total	138(77.1)	41(22.9)	48(72.7)	18(27.3)	67(87.0)	10(13.0)
Provide your best possible despite the threat of being infected	MBBS	103(57.3)	37(20.7)	30(45.5)	15(22.7)	38(49.4)	4(9.1)
	BDS	33(18.4)	6(3.4)	7(10.6)	14(21.2)	28(36.4)	4(5.2)
	Total	136(76.0)	43(24.0)	37(56.1)	29(43.9)	66(85.7)	11(14.3)
You would maintain distance from the infected patients	MBBS	122(68.2)	18(10.1)	42(63.6)	3(4.5)	33(42.9)	12(15.6)
	BDS	32(17.9)	7(3.9)	20(30.3)	1(1.5)	25(32.5)	7(9.1)
	Total	154(86.0)	25(14.0)	62(93.9)	4(6.1)	58(75.3)	19(24.7)
You would remain more conscious while interacting with any febrile patient	MBBS	136(76.0)	4(2.2)	45(68.2)	0(0.0)	42(54.5)	3(3.9)
	BDS	37(20.7)	2(1.1)	20(30.3)	1(1.5)	32(41.6)	0(0.0)
	Total	173(96.6)	6(3.4)	65(98.5)	1(1.5)	74(69.1)	3(3.9)
Skip/ avoid ward rotations to avoid danger of getting infected	MBBS	43(24.0)	97(54.2)	15(22.7)	30(45.5)	9(11.7)	36(46.8)
	BDS	10(5.6)	29(16.2)	7(10.6)	14(21.2)	9(11.7)	23(19.9)
	Total	53(29.6)	126(70.4)	22(33.3)	44(66.7)	18(23.4)	59(76.6)
➢ Would use mask while working in hospital setting	MBBS	131(73.2)	9(5.0)	45(68.2)	0(0.0)	45(58.4)	0(0.0)
	BDS	39(21.8)	0(0.0)	21(31.8)	0(0.0)	32(41.6)	0(0.0)
	Total	170(95.0)	9(5.0)	66(100.0)	0(0.0)	77(100.0)	0(0.0)
Would take medications prophylactically before going for Rotations	MBBS	68(38.0)	72(40.2)	14(21.2)	31(47.0)	35(45.5)	10(13.0)
	BDS	27(15.1)	12(6.7)	3(4.5)	18(27.3)	19(24.7)	13(16.9)
	Total	95(53.1)	84(46.9)	17(25.8)	49(74.2)	54(70.1)	23(29.9)
➢ Distribute free masks in the respective ward	MBBS	104(58.1)	36(20.1)	35(53.0)	10(15.2)	41(53.2)	4(5.2)
	BDS	30(16.8)	9(5.0)	19(28.8)	2(3.0)	29(37.7)	3(3.9)
	Total	134(74.9)	45(25.1)	54(81.8)	12(18.2)	70(90.9)	7(9.1)
➢ You would isolate the infected patient to save others	MBBS	138(77.1)	2(1.1)	44(66.7)	1(1.5)	44(57.1)	1(1.3)
	BDS	39(21.8)	0(0.0)	21(31.8)	0(0.0)	32(41.6)	0(0.0)
	Total	177(98.9)	2(1.1)	65(98.5)	1(1.5)	76(98.7)	1(1.3)
Effect on routine activities							
➢ Use of public transport	MBBS	106(59.2)	34(19.0)	32(48.5)	13(19.7)	31(40.3)	14(18.2)
	BDS	28(15.6)	11(6.1)	17(25.8)	4(6.1)	22(28.6)	10(13.0)
	Total	134(74.9)	45(25.1)	49(74.2)	17(25.8)	53(68.8)	24(31.2)
➢ Visit to shopping centers	MBBS	102(57.0)	38(21.2)	27(40.9)	18(27.3)	32(41.6)	13(16.9)
	BDS	27(15.1)	12(6.7)	15(22.7)	6(9.1)	19(24.7)	13(16.9)
	Total	129(72.1)	50(27.9)	42(63.6)	24(36.4)	51(66.2)	26(33.8)
Interaction and relation with infected family members/friends	MBBS	112(62.6)	28(15.6)	33(50.0)	12(18.2)	34(44.2)	11(14.3)
	BDS	28(15.6)	11(6.1)	17(25.8)	4(6.1)	24(31.2)	8(10.4)
	Total	140(78.2)	39(21.8)	50(75.8)	16(24.2)	58(75.3)	19(24.7)
➢ Attending parties till the outspread settles	MBBS	107(59.8)	33(18.4)	28(42.4)	17(25.8)	25(32.5)	20(26.0)
	BDS	23(12.8)	16(8.9)	17(25.8)	4(6.1)	22(28.6)	10(13.0)
	Total	130(72.6)	49(27.4)	45(68.2)	21(31.8)	47(61.0)	30(39.0)

N=Frequency, %=Percentage

Some researchers have described stool shedding as a possible way of transmission but its role is still uncertain. The same study underscored that maximum deaths in patients occurred with comorbid conditions and often in elderly population hence, > 60 years of age can be considered a risk factor [20]. Thus, weak immune system may be envisioned as a significant aggravating factor. A report from US reported that out of 53 diagnosed cases, 12 had a travel history of China; 2 acquired the infection through person-to-person transmission to close family members of a person with diagnosed COVID-19 and a further 39 cases were testified among repatriated individuals [21]. The response given by medical students in this survey is in consistency with the above mentioned report. Fig 2 shows that a wide majority of participants considered recent travellers from affected countries as the most susceptible population followed by people with an infected family member. Moreover, 8.39% individuals also stated that health care workers are more prone towards acquiring COVID-19. One such case was observed in Thailand, where a nurse attendant became infected during her usual medical work. She had an interaction with a patient diagnosed with dengue and hence, no respiratory infection control techniques were in place. Later the patient obtained an added identification of COVID-19 [22]. There are reports of many Chinese young doctors struggling between life and death and in fact dying because of COVID-19 too [23]. One such case has been observed in our country too, where a young doctor died after acquiring COVID-19, while treating the patients. Hence, it's not wrong to say that medical personals are at risk.

Concernes of Medical Undergraduates

During SARS epidemic, Chinese established fever clinics for triaging patients. Keeping this in mind, they launched certain clinical schemes in adult fever clinics. However, the inundation of patients substantively outweighed the number of physicians [24]. A similar scenario is being observed in Karachi, since it's a densely populated city with a friable health care system. This has been highlighted by our participants as well since most of them considered their institute associated hospital quite incompetent in limiting this pandemic. It's not wrong to imagine that if such an extensive outbreak with widespread local transmission occurred in Karachi, the health care system might crumple altogether. Our study also reveals that many medical students were worried about the effect this outbreak can have on their routine activities. In case of this unfortunate situation, student's use of public transport, visit to shopping centers, social gatherings and their relation with infected friends and family is expected to be affected inimically. At the time of data collection, the wards being attended by students are shown in Figure 3. However, since confirmed cases of COVID-19 got reported in Pakistan, the government has closed all private and public sector institutes, which has surely disrupted student's studies and have badly affected their clinical exposure. However, this is supposed to be a necessary step towards preventing local transmission.

Mental Strategies of Medical Undergraduates

This research also attempted to explore the mental strategies of medical students towards an outbreak. A wide majority of students from all 3 institutes from both MBBS and BDS considered themselves obliged to take care of a COVID-19 infected person, if given a chance. However, a total of 69 individuals replied in negative as well, reflecting their fear of getting infected. Table 2 also shows that more than 80% of the partakers replied in affirmative when asked whether they would consider maintaining a distance with the patient in case of an outspread in their teaching hospital and almost all except a few stated that they would remain more conscious while interacting with any febrile patient. However, despite the threat of being infected 70.4% students from DUHS, 66.7% from JSMU, and 76.6% from KMDC denied skipping clinical postings. This reflects the eagerness of medical students towards serving the affected population as well their sincerity towards their studies. However, as per the government's instructions the clinical posting have been suspended to ensure student's safety. Several studies have underscored the use of mask in routine practice by HCWs. One such study quotes that although the protocols for best use of personal protective equipment and other precautions for preventing transmission subsist in almost all healthcare facilities however, health professional's amenability to consume them is typically inadequate, particularly in non-outbreak situations or in the early stages before an outbreak is established [25, 26]. This is classically comparable with the current situation of Karachi. Specifically, the use of respirators or protective masks while treating people with respiratory infections is an eminent and frequently acknowledged infection prevention and control technique [27]. Yet, the use of defensive masks and equipment in general, during routine care is often inadequate and can ensue nosocomial acquisition of infection [28].However, the findings of this survey showed that almost all the medical students from MBBS or BDS, from all three institutes approved the use of mask as a precautionary step in case of an outbreak and almost half (51.5%) also agreed with the suggestion of taking prophylactic medication for their own safety as well. A wide majority of students from all three institutes also agreed with the idea of distributing free masks among the visiting patients in their respective wards, reflecting their high spirits of volunteerism. Finally all the students matched in opinion that isolating the affected patients would be a good step towards managing the outbreak. This has also been verified by a research which enumerated the potential effectiveness of contact tracing and isolation in controlling COVID-19 outbreak. According to the results, highly effective contact tracing and case isolation is sufficient enough to control outbreak of COVID-19 within duration of 3 months. Also, the likelihood of control falls with long postponements from onset of symptoms to isolation [29].

Institutional and Governmental Approaches Suggested by Students

In addition to this, table 1 shows the responses of medical undergraduates towards institution's and government's approach in tackling the situation. 98.9% students from DUHS, 100% students from JSMU and 98.7% students from KMDC agreed with the idea that universities should arrange awareness sessions about preventive measures. Almost similar percentages of participants, answering in affirmative were seen when they were asked whether institutions should provide training about infection control measures. Moreover, percentages of participants from DUHS, JSMU, and KMDC agreeing with the idea of keeping the wards suspended until the outbreak settles proportioned out to be 78.8%, 75.8% and 67.5% respectively. This has already been implemented in order to avoid the worsening of situation. Almost all individuals felt the need that government should provide

precautionary equipment to health care professionals and free medication and prompt treatment to affected individuals.

Treatment Options

By far, the recommended treatment is supportive management, isolation and oxygen supplementation, if needed. However, several researchers across the world are busy in finding treatments and ways to control this COVID-19 pandemic. A study by Victor M. Corman et al. has focused on detection of 2019-nCoV by real time RT-PCR [30]. Another study states that mixing anti-viral and anti-inflammatory drugs can be an effectual therapy for COVID-19. It suggests that combinations of Baricitinib with direct-acting antivirals could diminish viral replication, viral infectivity and an anomalous host inflammatory reaction [31]. Another study by Wang M et al. has highlighted that Chloroquine and Remdesivir are highly applicable in management of 2019-nCoV infection. Since these compounds have a harmless track record in human patients and are applicable against various illnesses hence, they should be assessed in human patients suffering from the novel coronavirus disease as well [32]. Another research publication mentions convalescent plasma from patients who have recovered from viral infections as an efficacious treatment without the manifestation of severe unfavorable events. One possible explanation is that the antibodies from convalescent plasma might repress viraemia successfully. Therefore, safety and efficacy of convalescent plasma transfusion in SARS-CoV-2-infected patients should be considered and tested [33]. Few researches have shown that individuals who have faced public health emergencies suffer from varying degrees of stress disorders, even after the incident is ended, or they have been treated and cleared from hospital, indicating these people should not be overlooked [34, 35]. Hence, apart from medical interventions, psychological interventions are also required. According to a research by Duan L and Zhu G severity of clinical symptoms, course of disease and treatment location (e.g. ordinary isolation ward, isolated at home, intensive care unit), and other factors should be measured in order to identify persons who need psychological intervention and to design particular methods aimed at improving the success of these interventions [36]. Another research has focused on an adverse outcome of staying at home, though a crucial precautionary measure, can lead to sedentary life styles and worsening of chronic health conditions. Hence, it suggests exercising at home which may include strengthening exercises, stretching exercises, activities for balance and control [37]. In addition, yoga should also be counted since it requires no special tools, minimum space, and can be practiced at any time [38]. Finally many efforts are being made to create a vaccine for COVID-19 and there are reports of many trials being carried out across the world. Infact one study by Ahmed SF et al. has provided a screened set of epitopes that can direct investigational attempts towards the development of vaccines against SARS-CoV-2 [39].

Limitations and Future Recommendations

This pivotal strength of this study lies in revealing apprehensive behavior of medical undergraduates towards the risk of acquiring the infection during their clinical postings yet, majority denied skipping ward rotations as well, which shows their eagerness to serve despite the threat of being infected. However, the study included only students from government medical institutions and not the private ones, which may be considered as a limitation to the study. Future researchers should consider recruiting equal number of students from both government and private institutions for better understanding of their concerns and mental strategies.We also queried the potential research topics from students, for which majority stated that management and treatment of COVID-19 needs extensive research. Several researches have highlighted the lessons learned from COVID-19 epidemic. One such study at China emphasizes the establishment of a barrier between the source of infection and healthy uninfected people, in order to block the transmission of the new coronavirus [40]. The authors recommend that significance of social distancing and screening, predominantly at airports should never be neglected to prevent further international spread of 2019-nCoV. The authors also recommend that government needs to establish an organization, aimed at taking emergent decisions to prevent further worsening of the situation. The government also needs to disclose the actual facts and figures to the general public regularly. In short, collective effort of government, health care providers and cooperation by public is a mandatory requisite for controlling this condition.

CONCLUSION

The scenario in this densely populated city, Karachi is still ambiguous. As per the government's announcements, public gatherings are being avoided, affected patients are being quarantined, educational institutions have been shut down and online teaching is being encouraged to make up for the loss. However, medical students, though agreeing with this as a necessary precautionary step are still having uncertainties about the loss of clinical exposure affecting their knowledge. Moreover, there is deep resentment among the masses and the health care professionals with regards to shortage of face masks and other precautionary equipment. Authors therefore request the concerned authorities to look into the matter. In case of a widespread local transmission of COVID-19, whether the fragile health care system of Pakistan will be able to handle the situation still remains an unanswered question. However, as per the statement issued by government, the situation to date is still under control and required measures are being taken to prevent deterioration.

Conflict of Interest

The authors declare that there is no conflict of interest.

Acknowledgment

The authors would like to acknowledge the participants from Dow University of health and sciences, Jinnah Sindh medical University and Karachi medical and dental college for giving their precious time to this study.

Funding

The research did not receive any special grant from funding agencies in public, commercial, or not-for-profit-sectors.

References

1. Tyrrell DA, Bynoe ML. Cultivation of viruses from a high proportion of patients with colds. Lancet. 1966:76-.7 **Record Number :** 19662702548, available at https://www.cabdirect.org/cabdirect/abstract/19662702548
2. Tung Phan, Genetic diversity and evolution of SARS-CoV-2, *Infection, Genetics and Evolution*, 10.1016/j.meegid.2020.104260, 81, (10426), (2020).https://doi.org/10.1111/tmi.13383

3. GISAID Global Initiative on Sharing All Influenza Data. Phylogeny of SARS-like betacoronaviruses including novel coronavirus (nCoV). (Available from: https://nextstrain.org/groups/blab/sars-like-cov)
4. Zhou P, Yang XL, Wang XG et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature* 2020. https://doi.org/10.1038/s41586-020-2012-7
5. N.S. Zhong, B.J. Zheng, Y.M. Li, Poon, Z.H. Xie, K.H. Chan, *et al.*Epidemiology and cause of severe acute respiratory syndrome (SARS) in Guangdong, People's Republic of China, in February, 2003 Lancet, 362 (2003), p. 1353 https://doi.org/10.1016/S0140-6736(03)14630-2]
6. A. Bawazir, E. Al-azroo, H. Jradi, A. Ahmed, M. Badri. MERS-CoV infection: mind the public knowledge gap J Infect Public Health, 11 (2018), pp. 89-93 https://doi.org/10.1016/j.jiph.2017.05.003
7. C Huang, Y Wang, X Li, *et al*. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China**.** Lancet (2020) published online Jan 24https://doi.org/10.1016/S0140–6736(20)30183–5
8. Backer JA, Klinkenberg D, Wallinga J. Incubation period of 2019 novel coronavirus (2019-nCoV) infections among travelers from Wuhan, China, 20– 28 January 2020. Euro Surveill 2020;25. doi:10.2807/1560-7917.ES.2020.25.5. 2000062.
9. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. N Engl J Med 2020 Jan 29 [Epub ahead of print]. doi:10.1056/NEJMoa2001316
10. Ministry of Health, Singapore. Influenza Pandemic Readiness and Response Plan. Available at: https://www.moh.gov.sg/content/dam/moh_web/PressRoom/Current_Issues/2009/Main%20Document%20Public%20_Jan09.pdf. Accessed 11 Dec 2016.
11. Wilson N, Baker M, Crampton P, Mansoor O. The potential impact of the next influenza pandemic on a national primary care medical workforce. Hum. Resour. Health. 2005;3(1):7. doi: 10.1186/1478-4491-3-7.
12. Tam CW, Pang EP, Lam LC, Chiu HF. Severe acute respiratory syndrome (SARS) in Hong Kong in 2003: stress and psychological impact among frontline healthcare workers. Psychol Med. 2004;34(7):1197–204. doi: 10.1017/S0033291704002247.
13. Koh D, Lim MK, Chia SE. SARS: health care work can be hazardous to health. Occup Med. 2003;53(4):241–3. doi: 10.1093/occmed/kqg090.
14. Abolfotouh MA, AlQarni AA, Al-Ghamdi SM, Salam M, Al-Assiri MH, Balkhy HH. An assessment of the level of concern among hospital-based health-care workers regarding MERS outbreaks in Saudi Arabia. BMC Infect Dis. 2017;17(1):4. Published 2017 Jan 3. doi:10.1186/s12879-016-2096-8
15. Khan S, Ali A, Siddique R, Nabi G. Novel coronavirus is putting the whole world on alert. J Hosp Infect. 2020 Mar;104(3):252-253. doi: 10.1016/j.jhin.2020.01.019. Epub 2020 Feb 4
16. Mahase E. Coronavirus: covid-19 has killed more people than SARS and MERS combined, despite lower case fatality rate. BMJ 2020; 368 :m641 doi: https://doi.org/10.1136/bmj.m641
17. Ying Liu, Albert A Gayle, Annelies Wilder-Smith, JoacimRocklöv, The reproductive number of COVID-19 is higher compared to SARS coronavirus, *Journal of Travel Medicine*, , taaa021, https://doi.org/10.1093/jtm/taaa021
18. Cascella M, Rajnik M, Cuomo A, et al. Features, Evaluation and Treatment Coronavirus (COVID-19) [Updated 2020 Mar 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK554776/
19. Riou Julien, Althaus Christian L.. Pattern of early human-to-human transmission of Wuhan 2019 novel coronavirus (2019-nCoV), December 2019 to January 2020. Euro Surveill. 2020;25(4):pii=2000058. https://doi.org/10.2807/1560-7917.ES.2020.25.4.2000058
20. Auwaerter PG. Coronavirus COVID-19 (SARS-CoV-2) [Internet]. In: Johns Hopkins ABX Guide. The Johns Hopkins University; 2020. [cited 2020 March 11]. Available from: https://www.hopkinsguides.com/hopkins/view/Johns_Hopkins_ABX_Guide/540747/all/Coronavirus_COVID_19__SARS_CoV_2_.
21. Jernigan DB. Update: Public Health Response to the Coronavirus Disease 2019 Outbreak—United States, February 24, 2020. MMWR.Morbidity and Mortality Weekly Report. 2020;69.216-219 DOI: http://dx.doi.org/10.15585/mmwr.mm6908e1external icon
22. Joob, Beuy et al. COVID-19 in medical personnel: observation from Thailand. Journal of Hospital Infection 2020.https://doi.org/10.1016/j.jhin.2020.02.016
23. Several young doctors in China have died of the coronavirus. Medical workers are far more vulnerable to infection than the general population, https://www.businessinsider.com/why-coronavirus-killed-young-chinese-doctors-2020-2 ; 2020 [accessed 3 March 2020]
24. Zhang J, Zhou L, Yang Y, Peng W, Wang W, Chen X. Therapeutic and triage strategies for 2019 novel coronavirus disease in fever clinics. The Lancet Respiratory Medicine.2020 Feb 13. DOI: https://doi.org/10.1016/S2213-2600(20)30071-0
25. Bouchoucha S, Moore K. Standard precautions but no standard adherence. Australian Nursing and Midwifery Journal. 2017 Mar;24(8):38. Availability: <https://search.informit.com.au/documentSummary;dn=658934839800582;res=IELHEA> ISSN: 2202-7114.
26. Gralton J, Rawlinson WD, McLaws ML. Health care workers' perceptions predicts uptake of personal protective equipment. American journal of infection control. 2013 Jan 1;41(1):27.https://doi.org/10.1016/j.ajic.2012.01.019
27. National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare-Executive Summary. National Health and Medical Research Council; 2010. Available from: https://www.nhmrc.gov.au/guidelines-publications/cd33
28. Alfaraj SH, Al-Tawfiq JA, Altuwaijri TA, Alanazi M, Alzahrani N, Memish ZA. Middle East respiratory

syndrome coronavirus transmission among health care workers: implication for infection control. American journal of infection control. 2018 Feb 1;46 (2):165-8.https://doi.org/10.1016/j.ajic.2017.08.010

29. Hellewell J, Abbott S, Gimma A, Bosse NI, Jarvis CI, Russell TW, Munday JD, Kucharski AJ, Edmunds WJ, Sun F, Flasche S. Feasibility of controlling COVID-19 outbreaks by isolation of cases and contacts. The Lancet Global Health.2020 Feb 28. DOI: https://doi.org/10.1016/S2214-109X(20)30074-7
30. Corman VM, Landt O, Kaiser M, Molenkamp R, Meijer A, Chu DK, Bleicker T, Brünink S, Schneider J, Schmidt ML, Mulders DG. Detection of 2019 novel coronavirus (2019-nCoV) by real-time RT-PCR.Eurosurveillance. 2020 Jan 23;25(3).https://doi.org/10.2807/1560-7917.ES.2020.25.3.2000045
31. Stebbing J, Phelan A, Griffin I, Tucker C, Oechsle O, Smith D, Richardson P. COVID-19: combining antiviral and anti-inflammatory treatments. The Lancet Infectious Diseases.2020 Feb 27. DOI: https://doi.org/10.1016/S1473-3099(20)30132-8
32. Wang M, Cao R, Zhang L, Yang X, Liu J, Xu M, Shi Z, Hu Z, Zhong W, Xiao G. Remdesivir and chloroquine effectively inhibit the recently emerged novel coronavirus (2019-nCoV) in vitro. Cell research. 2020 Mar;30(3):269-71.DOIhttps://doi.org/10.1038/s41422-020-0282-0
33. Chen L, Xiong J, Bao L, Shi Y. Convalescent plasma as a potential therapy for COVID-19. The Lancet Infectious Diseases.2020 Feb 27. DOI: https://doi.org/10.1016/S1473-3099(20)30141-9
34. Fan F, Long K, Zhou Y, Zheng Y, Liu X. Longitudinal trajectories of post-traumatic stress disorder symptoms among adolescents after the Wenchuan earthquake in China. Psychological medicine. 2015 Oct;45(13):2885-96. DOI: https://doi.org/10.1017/S0033291715000884
35. Cheng SK, Wong CW, Tsang J, Wong KC. Psychological distress and negative appraisals in survivors of severe acute respiratory syndrome (SARS). Psychological Medicine. 2004 Oct;34(7):1187-95. DOI: https://doi.org/10.1017/S0033291704002272
36. Duan L, Zhu G. Psychological interventions for people affected by the COVID-19 epidemic. The Lancet Psychiatry.2020 Feb 19. DOI: https://doi.org/10.1016/S2215-0366(20)30073-0
37. Chen P, Mao L, Nassis GP, Harmer P, Ainsworth BE, Li F. Wuhan coronavirus (2019-nCoV): The need to maintain regular physical activity while taking precautions. Journal of Sport and Health Science. 2020 Mar;9(2):103.https://doi.org/10.1016/j.jshs.2020.02.001
38. National Center for Complementary and Integrative Health. Yoga: what you need to know. Available at: https://nccih.nih.gov/health/yoga/introduction.htm
39. Ahmed SF, Quadeer AA, McKay MR. Preliminary identification of potential vaccine targets for the COVID-19 coronavirus (SARS-CoV-2) based on SARS-CoV immunological studies. Viruses. 2020 Mar;12 (3):254. https://doi.org/10.3390/v12030254
40. Pan X, Ojcius DM, Gao T, Li Z, Pan C, Pan C. Lessons learned from the 2019-nCoV epidemic on prevention of future infectious diseases. Microbes and Infection.2020 Feb 20.https://doi.org/10.1016/j.micinf.2020.02.004

How to cite this article:

Tirthankar Deb, Manmeet Kaur* and Jayant Kumar Kairi (2020) 'The Role of Sensitisation on Clinicians And Nursing Staff In Adverse Drug Reaction Reporting In A Newly Established Medical College', *International Journal of Current Medical and Pharmaceutical Research,* 06(02), pp 5055-5062.

****