

# Knowledge, Attitude and Misconceptions regarding COVID-19 among medical students of Pakistan.

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## Abstract

**Objective:** To assess the understanding and knowledge of medical students regarding COVID-19 and to determine their ability in applying that knowledge as they could serve as potential workforce.

**Methods:** A quantitative approach was used to evaluate the knowledge of the medical students. The data was collected by an online cross-sectional survey conducted among students from 9 medical colleges across all provinces of Pakistan. The sample included 627 respondents. The survey was divided into two parts, the web-based information that a medical student acquires by self-motivation and information derived from social media that needs critical evaluation and further research to determine its authenticity. The second part included evaluation of knowledge about the pandemic in general with a focus on COVID-19 and its application.

**Results:** There were a total of 627 respondents from medical colleges across Pakistan. The majority 98.1% (n=615) were aware of pandemic and 87% (n=546) were actively following the emerging evidence of COVID-19. An important feature was that 82.8% (n=519) of the medical students were willing to check for the authenticity of information. More than two third of medical students had adequate knowledge regarding importance of testing, vulnerable population and protective measures required to prevent spread of COVID-19. Respondents responded to observing the preventive measures with 91% observing social distancing, 86% maintaining personal hygiene and 72% wearing masks.

**Conclusions:** Most of the medical students in Pakistan keep themselves abreast with developments in the pandemic. They are capable of understanding the scientific basis behind COVID-19 and have the ability to differentiate between scientific and nonscientific information.

**Keywords:** COVID 19, Medical students, Pandemic, Social media

## Introduction

COVID-19 is a contagious disease caused by an RNA virus. Majority of the people recover and report minor breathing problems requiring little treatment. People having co-morbidities like

hypertension, diabetes and those who are elderly are more vulnerable to severe form of the disease.<sup>1</sup> COVID-19 can spread by respiratory droplets when a person carrying the virus coughs, sneezes or even speaks. Sauer contested that these droplets can spread beyond six feet and the use of face mask and social distancing can help prevent transmission of this virus.<sup>2</sup> Corona virus disease, abbreviated as COVID-19 is caused by SARS-CoV-2 and the first case was reported in Wuhan city of China. The spread of this disease started in December 31, 2019 and in January 2020 it was recognized as an international health threat.<sup>3</sup>

Majority of patients remain asymptomatic or develop mild symptoms like cough, sore throat or low-grade fever which may pass unnoticed, while up to 15% may need hospitalization with more severe symptoms especially breathing problems, persistent fever and body aches.<sup>4</sup> Additionally, headache, lack of sense of taste or smell, dry throat, stuffy nose, nausea or diarrhea etc. are also reported. These symptoms show within 2 to 14 days after infection. SARS-CoV-2 is a novel virus<sup>5</sup> thus no specific treatment or vaccine exists as of yet.

With the outbreak of global pandemic, WHO has issued several precautionary measures to remain safe from virus like repeatedly washing hands with soap and to maintain social distancing.<sup>6</sup> Hashim et al<sup>7</sup> suggested to implement lockdown in areas where COVID-19 cases were being reported in large numbers. According to CDC SARS-CoV-2 spreads when people come close to each other and therefore a minimum distance of 6 feet should be observed.<sup>8</sup> Some COVID-19 patients do not show any signs and remain asymptomatic. There has not been any effective medicine to cure COVID-19.<sup>9,10</sup>

Awareness regarding the spread of the disease and preventive measures is important for the public as the impact of COVID-19 depends on the knowledge, attitude and practices of the people as highlighted by the KAP theory.<sup>11,12</sup> With an overwhelming amount of information that is being spread, it is necessary to assess and analyze the information.

Traditional medical studies include imparting knowledge by lectures, books and bed-side teaching. Access to web-based information and influence of social media in spreading information

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that may be true/false or a varying mixture of both, needs careful interpretation by the medical students. Any emerging evidence and evolving practice in the background of COVID-19 pandemic needs to be understood on a scientific basis and subjected to critical evaluation on the basis of existing authentic information.

Medical students are expected to keep updated with the current situation as they can act as possible sources of awareness to the general public. Therefore, the aim of our study was to assess the awareness, understanding and knowledge of medical students regarding COVID-19 and to assess their ability to apply that knowledge. It is important for any medical student to be able to apply knowledge in a clinical setting as well as use the same knowledge to help prevent spread of COVID-19. Secondary objective was to know the potential role of medical students of a community in prevention of COVID-19.

Methods

This survey was conducted among undergraduate medical students of 9 different medical colleges representing all four provinces of Pakistan, from 22 May 2020 to 26 July 2020. Since routine educational activities are restricted due to prevailing pandemic situation, the data was collected using an online questionnaire developed by means of Google form. The questionnaire was shared through social media platforms like WhatsApp, Facebook, Instagram and Twitter.

First student was invited through whatsapp and this first student further invited many other students. Rest of students joined the study through snow ball sampling. The non-probability convenient sampling technique was employed for the recruitment of study participants. The sample size was calculated on Raosoft sample size calculator. Sample size of 627 was calculated to achieve the confidence level of 99% with a margin of error of 5%, response distribution 52%, and the population size of 70,000 (total medical students enrolled in Pakistan) for the present survey. The goal was to approach as many students as possible to gather maximum possible data to enhance the study's validity and generalizability.<sup>13</sup> A quantitative approach was used to assess the defined survey questionnaire. A 32-item survey was developed after carefully reviewing the WHO myth-buster document on WHO website, already published literature and the emerging data regarding the SARS-CoV-2 and COVID-19. The questionnaire comprised of four parts; (1) demographics, which surveyed participants' socio-demographic information, including gender, age, academic year, marital status occupation, and parental income; (2) knowledge about COVID-19 (K1-10); (3) Awareness & attitudes toward COVID-19(A1-A5); and (4) practices relevant to COVID-19(P1-P7). The first draft questionnaire was reviewed by experts from Community Medicine and Medical Education Department. Initial draft was finalized after incorporation of changes suggested by expert panel. The pilot was conducted on 15 undergraduate medical students to ensure understandability.

Questions related to KAP had 5 options on 5-point likert scale ranging from lowest to highest score. There were six knowledge questions, and for each item, one score was given for highest values on Likert scale and zero for lowest value. Regarding scoring,

an individual score of 1-3 was taken as inadequate, while the score in the range of 4-6 was counted adequate. Ten questions were related to attitudes, and the scores were awarded +1 for highest value and -1 for lowest value, score of 1-5 was taken as inadequate, while the score in the range of 6-10 was counted adequate. The plus scores were taken as positive attitudes, while negative scoring indicated negative attitudes. For practice questions (P1-P7), 1 point were awarded highest value and zero for lowest value.

The study was carried out after obtaining ethical approval from the Institutional Review Board of Gujranwala Medical College (Reference No. 215/GMC). All the responses were voluntary and anonymous. Data was collected electronically after taking consent of volunteer participation. All students were subjected to give consent for volunteer participation before filling the proforma. First section of the survey proforma contains brief description about purpose of study and instruction on how to fill the survey. Consent was taken by giving option of "Yes" and "No". Only those students who opted for option of "Yes" were allowed to proceed and if students opted "No" they were not allowed to complete the survey. Students were given option to withdraw anytime if they are not willing to proceed. The data was analyzed using SPSS version 26.0. Frequency and percentages were calculated for qualitative variables.

Results

There were 627 respondents. Out of the total respondents around 51% were females and 47% were males while 2% didn't mention their gender. Half of them were studying in first year, 18% in fifth year, rest were between second to fourth years.

Table 1- Sociodemographic

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	292	46.6
	Female	326	52
	Prefer not to say	9	1.4
Year of study	First year	312	49.8
	Second year	79	12.6
	Third year	80	12.8
	Fourth year	44	7
	Fifth year	112	17.9

**Knowledge (K1-K6):** Six questions were related to knowledge.

While considering the most probable mode of spread, almost half (49%) responded that direct contact is the mode of transmission while 33.7% answered droplet is the mode (K1). As high as 60% of the respondents were of the opinion that self-isolation is very important in preventing the spread of the virus while 30% answered that it is not very important (K2),

While answering about herd immunity, more than half (52%) of the respondents stated that they had adequate knowledge about herd immunity while 16% had insufficient knowledge (K3). While answering about the type of immunity that is likely to be effective against SARS-CoV-2, 35.6% responded that natural active immunity will be effective to eradicate the virus, while 31.3% believed that artificial active immunity (vaccine) will be required(K4). While giving their forecast on how long it would take to develop a vaccine for COVID-19, 66.8% were

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of the opinion that it would be possible within one-year time, 24.6% said that it may be available after one year but before two years (K5).

While mentioning the source of information, almost 80% of the respondents replied news as a source (newspaper, news channel etc.) More than 75% replied that it was the social media, while 72% got the information from the internet and 35% from word of mouth (K6)

**Table 2 - Frequencies of Information Sources**

Aspects of COVID-19		Frequency	(%)
Sources of Knowledge	News (Newspaper, News Channels)	424	67.62
	Social Media	471	75.12
	Internet	454	72.41
	Community	218	34.77
	Other	79	18.63
Precautionary Measures	Social Distancing	572	91.23
	Maintaining Personal Hygiene	541	86.28
	Wearing Masks	455	72.57
	Not Touching Your Face	293	46.73
	Other	48	7.66
Comorbidities	Any Pre-Existing Respiratory Problem	577	92.03
	Diabetes	337	53.75
	Cancer	276	44.02
	Hypertension	242	38.60
	Obesity	149	23.76
	Other	47	7.50

**Attitude & Awareness:** Ten questions were related to attitude & awareness towards Corona Virus 97% of the respondents said that awareness regarding the pandemic is important (A1), 83% of the respondents said that they do check the authenticity of information (A2), 68% of the respondents agreed on the fact that misinformation is contributing to pandemic panic (A3), 97% of the respondents had opinion that in the spread is inevitable after the lockdown is lifted (A4), 68% of the respondents believed mask is effective in preventing the spread (A5). 87.7% of the respondents considered that hand washing is effective in preventing the spread of COVID-19 (A6), almost 80% responded that asymptomatic patients of COVID-19 should be isolated at home (A7), while 17.7% were of the opinion isolation should be in the hospital (A8), 60% of the respondents were worried about spread of COVID-19 (A9), 70% of the respondents said that disinformation was being circulated on social media. (A10).

**Misconception (M1-M7):** Seven questions were related to misconceptions

More than half (53%) of the respondents believed vitamin C can be an effective measure to fight corona virus (M1). As high as 59% of the respondents believed the 5G testing is not causing the COVID-19 symptoms and therefore the virus is not a hoax(M2). 80% of the respondents were of the opinion that they should be tested for COVID-19 at earliest or at least the moment they start developing symptoms (M3), around 77% of the respondents were of the opinion that people of sixty years of age or above are most vulnerable to the virus attack while 17.2% responded that the age group of forty to fifty-nine years are most vulnerable(M4), More than 74% of the respondents were concerned about the

spread of the new mutant strain of Corona virus(B.1.17 lineage) in Pakistan (M5). Almost 29% of the respondents believed the pandemic (COVID-19) has been created deliberately (M6). Half of the respondents disagreed that the seasonal change would impact the incidence of COVID-19(M7).

**Discussion**

This study aimed to evaluate the ability of the undergraduate medical students in Pakistan to understand, critically analyze and apply the evolving knowledge regarding the pandemic.. The role of health care workers is crucial in reducing the spread of this pandemic. In Pakistan the cases have exceeded 250,000 at the time of study reported and deaths were more than five thousand<sup>15</sup>. However, the death percentage among patients of COVID-19 admitted at hospital has remained around 2 percent since April, 2020<sup>14</sup>.

We also found that the students had sufficient knowledge regarding the spread of the virus and the preventive measures to avoid contracting the virus but this was low as compared to Uganda where at least 9 out of 10 medical students had sufficient knowledge<sup>21</sup> while in Iran 87% of the medical student’s demonstrated sufficient knowledge regarding COVID-19 pandemic<sup>22</sup>. Yet it was higher than Indian health care professionals and medical students (71%)<sup>23</sup>. Only 10.5% of students from a Bangladeshi university showed adequate knowledge regarding COVID-19<sup>24</sup>.

High number of students were aware of the precautionary measures and responded positively to observing these measures as well; 91% were observing social distancing, 86% were maintaining personal hygiene and 72% were wearing masks. Percentage of students wearing masks as a precautionary measure was a bit lower, probably because insufficient evidence was available in literature at the time of survey indicating the benefits of wearing masks. It could also be due to the misinformation being spread by social media against masks.

This study showed that majority of the students were motivated enough to keep updated about the pandemic, with 87% respondents actively following the pandemic.<sup>70%</sup> of the medical students responded that they had come across disinformation and as high as 83% responded that they do verify the authenticity of the information indicating the desire of the respondents to differentiate between incorrect and correct information.

Only 20% said that they agree that COVID-19 will decrease with the change of season. Different studies in literature indicate no such relation exists<sup>16, 17</sup>. Almost 29% of the respondents were of the opinion that the Corona virus has been created deliberately. This percentage is less than that demonstrated by the general Pakistani public in which 55.2% believed that the virus was man-made<sup>18</sup>. However, the scientific evidence till date suggests that it is unlikely that the virus was created in a laboratory<sup>19</sup>. As high as 59% of the respondents were of the opinion that the 5G testing is not causing the COVID-19 symptoms and therefore the virus is not a hoax. As per WHO “To date, and after much research performed, no adverse health effect has been linked with exposure to wireless technologies thus making this claim a myth”<sup>20</sup>. These results show that most of the students do not believe in the circulating myths. Although it does suggest that a

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fair proportion of students still believe in conspiracy theories. This might be due to the influence of social media, known to encourage and spread unproven and misleading content, as approximately 75% of the students responded that one of their sources of information is social media.

### Conclusions

The study shows that medical students were aware about the pandemic and motivated to seek knowledge regarding COVID-19. They are self-driven and possess the ability to independently judge scientific and nonscientific evidence.

### Limitations of Study

The limitations of the study included the uneven distribution of the medical students based on their year of study with about half of the respondents from first year.

### Recommendation

Medical students can be used to play an active role in a community setting to improve awareness, knowledge and encourage healthy practices. For this purpose, Medical Institutions should ensure that medical students are kept updated on evolving knowledge and research for any wide scale problem like COVID-19.

Further studies with larger sample size and more representation of students are recommended to evaluate whether medical students can be involved at some level of clinical setting in case healthcare system is overwhelmed with COVID-19 or a similar medical emergency in the future.

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