

Comparison of Knowledge and Practices among University Students of Allied Health Sciences and Engineering Departments in University of Lahore, Pakistan about Corona Virus Disease

IQRA FATIMA¹, SEEMA SHAFEEQ², JAWARIA SULTAN³, FATIMA ZUBAIR⁴, FATIMA ARSHAD⁵, AHMED MAJEED KHAN⁶

¹Senior Demonstrator Community Medicine, CMH Medical and Dental College, Lahore

²Registrar, University College of Medicine & Dentistry, Lahore

³Demonstrator, Institute of Public Health, Lahore

^{4,5}FCPS-II Trainee Community Medicine, CMH Medical and Dental College, Lahore

⁶Adjunct Faculty, Lahore University of Management Sciences, Lahore

Correspondence to: Iqra Fatima, Email: dr.iqraahmed29@gmail.com, Cell: 03326424838

ABSTRACT

Background: Corona Viruses is a group of viruses that cause diseases in both humans and mammals and are known to cause chronic respiratory diseases. The viruses among them include SARS, MERS and COVID-19. The most recent pandemic was a result of COVID-19. Older people and those with underlying medical problems are more likely to develop serious illness.

Objective: To compare the knowledge and practices of Allied Health and Engineering students of the University of Lahore about Corona Virus Disease.

Methodology: A cross-sectional questionnaire based survey was conducted on 326 students studying in Allied health Sciences and Engineering departments of UOL. The data was compiled in SPSS, version 24 for analysis.

Results: The students of Allied Health Sciences had a better understanding and were more aware of COVID-19, its percussions and the methods to prevent its spread than of the Engineering Students. More than half of the Engineering students have found to have less understanding about the causative agent of the COVID-19 and similar trend was found in other categories. Health sciences students showed higher tendency towards hands hygiene practices than engineering students.

Practical implication: Lessons learned from different outbreaks of infectious diseases suggested that knowledge and practices towards infectious diseases are associated with level of panic emotion among the population, which can further complicate attempts to prevent the spread of the disease. To facilitate outbreak management of COVID-19 in Lahore, Pakistan, there is an urgent need to understand the public's awareness of COVID-19. Keeping these considerations in mind this research was kicked-off to gauge the knowledge and practices of these medical and engineering students about Corona virus disease.

Conclusion: The study shows that educational background plays a vital role in disease control and it will help in successful uptake of control interventions for prevention of COVID-19.

Keywords: COVID-19, Engineering, Allied Health Sciences, knowledge, practices, comparative analysis

INTRODUCTION

A group of related viruses, known as Corona viruses, cause diseases in mammals and birds. Corona viruses cause respiratory tract infections in humans, which may range from mild to deadly¹. A newly recognized type of corona viruses has caused a recent outbreak of respiratory illness now called COVID-19². In December 2019, COVID-19 first emerged in Wuhan, China³. It is considered that virus mostly spread from person-to-person. It mainly transmits among those people who are in close contact with each other (within about 6 feet) and through respiratory droplets^{4,5}. It is most contagious during the first three days after the onset of symptoms. On 16 September 2020, COVID-19 has been confirmed in 2,97,33,221 individuals worldwide and has resulted in 9,39,268 deaths (WHO, 2020)⁶. As reported on Live Science, according to the Centers for Disease Control and Prevention (CDC), 454,000 illnesses and more than 20,550 deaths worldwide has been caused by this coronavirus⁷. For comparison, in the U.S. alone, it is estimated that 38 million illnesses, 390,000 hospitalizations, and 23,000 deaths have been caused by flu (influenza) in the year 2020. The death rate from seasonal flu is around 0.1% in the U.S⁸. For prevention and control, there are a few important step: The individuals should be kept quarantined. Washing hands with soap or use of an alcohol-based hand sanitizer which can kill the virus present on the hands. A distance of preferably 6 feet between oneself and the person who is coughing or sneezing should be maintained⁹. National Security Committee (NSC) of Pakistan didn't enforce extremely harsh measures needed to stop the virus from spreading. In an attempt to save the people from recession¹⁰. One of the most affected people of Pakistani society is the daily and self-employed workers, who lost their daily income in epidemic. Few other factors that didn't allow a complete lockdown of the country. For example, Pakistan has a strong social structure and traditions. This posed a major restriction on social and physical gatherings. There are occasions like funerals in which all acquaintances participate – for

social, cultural, and religious reasons. Similarly, although, very large gatherings like marriage ceremonies and celebrations were prohibited in the urban areas, people still organized events in villages and small towns^{11,12}. Lessons learned from different outbreaks of infectious diseases suggested that knowledge and practices towards infectious diseases are associated with level of panic emotion among the population, which can further complicate attempts to prevent the spread of the disease. To facilitate outbreak management of COVID-19 in Lahore, Pakistan, there is an urgent need to understand the public's awareness of COVID-19. Keeping these considerations in mind this research was kicked-off to gauge the knowledge and practices of these medical and engineering students about Corona virus disease.

MATERIALS AND METHODS

Method: It was an Analytical cross-sectional study conducted at University of Lahore, Defense Road Campus, Pakistan from February 2021 to October 2021.

Population: Two groups of Allied Health Sciences and Engineering departments of University of Lahore.

Sampling: It was non-probability purposive sampling.

Sample Size: The sample size was estimated using following formula:

$$n = Z^2 P(1-P)$$

$$d^2$$

Where,

n= is the minimum sample size; Z= Z statistic for a level of confidence, P = Expected prevalence or proportion and d = Precision (if the precision is 5%, then d = 0.05).

Assumptions: Precisions = 5.00 %; Prevalence (P) = 69.60 %; Population size = infinite; Z at confidence interval 5%= 1.96; d = 0.05

Sample size (n) = 326 students

These Students were Divided into Following Two Groups:

- Students of Allied Health Sciences Department = 163 students

- Students of Engineering Department = 163 students

Data Collection Procedure: Approval was obtained from the IRB of University of Lahore. Permission was obtained from the Dean's and Heads of Allied Health and Electrical Engineering departments of University. Student's name and contact details like E-mail and WhatsApp addresses were obtained from the administrative offices of these two departments. An online semi- structured questionnaire was developed by Google forms, with a consent form appended to it. The link of the questionnaire was sent through e-mails, WhatsApp to the contacts of the students.

Inclusion Criteria: It includes those students who were having an access to the internet and those who had not been diagnosed positive for COVID-19.

Exclusion Criteria: The students who did not give consent to participate and were suffering from Diabetes Mellitus, Cardio-Vascular Diseases, Renal disease were excluded.

Data Analysis Plan: The published literature was searched through free web search sources such as Pub Med, Google scholar was opted and relevant terms were used. Principal author studied all finalized publications in detail and extracted required information on semi structured form that included information like author, year of study, sample size, objectives and main findings. The form when filled was reviewed individually by all the authors for any discrepancy or duplication. Any raised concern was dealt with, via face to face meetings of all authors till final consensus was developed. The data collected was first transferred to SPSS spreadsheet. It was then processed and statistical analyzed using SPSS version 24.0 package. Demographic characteristics of the respondents/participants of the study was expressed in frequency and percentage. Mean \pm standard deviation was used due to Skew-ness of the information. Correlation was assessed between all independent variables and depended variables. Association of good knowledge and appropriate practices along with adherence to control measures were found out by using chi-square test. P value <0.05 was considered significant.

RESULTS

A total of 326 participants both male and female enrolled in health sciences (n=163) and engineering sciences (n=163) bachelor degree programs were included in this survey. Among both groups, health (64%) and engineering sciences (55%) students were older than 20 years of age while most of them (31%) were studying in 3rd year. In addition to that, majority of the respondents belonged to Muslim community (91%). 31% and 47% of health and engineering students became aware of COVID-19 in the month of January and March of the year 2020 respectively. Economically health sciences students were slightly better than engineering students with average family income more than 0.15 million PKR/month. (Table 1.1).

Table 2: Response of study participants about knowledge of COVID-19: In this survey 93% affirmed virus is the etiology of COVID-19 although some engineering students (14%) described bacteria as the causative agent. Considering the spread means of COVID-19, health sciences students appeared knowledgeable about the virus transmission through sneezing (100%), touching (87%) compared to the engineering students who (83%) described the virus do not have air borne. Similar kind of pattern was recorded about virus transmission through food and pets in both categories of participants. Striking contrast was observed related to COVID-19 symptoms awareness between the biology and engineering fellows as shown in table 2. All the respondents perceived the virus is highly contagious (100%) although engineering stated the virus infection is highly fatal too. To stem the spread of COVID-19, both group students strongly affirmed the isolation of infected individual and washing hands are quite helpful, however some engineering fellows (12%) were found to disagree. According to the response of both group participants, the risk of contracting infection in individuals with more than 65 years old, diabetes, asthma and those in crowded places is high (100%) and less commonly in smokers(51%).

Table 1: Socio-demographic characteristics of the participants of study

Socio-demographic Parameters/Characters	Health Students (n=163) n (%)	Engineering Students (n=163) n (%)	Total
Sex			
Male	85 (52.14)	102 (62.58)	187 (57.35)
Female	78 (47.85)	61 (37.42)	139 (42.34)
Age (years)			
Less than 20	59 (36.02)	74 (45.4)	133 (38.34)
More than 20	104 (63.81)	89 (54.61)	193 (59.20)
Family income per month (PKR)			
Less than 150,000	63 (38.66)	66 (40.50)	129 (39.57)
Above than 150,000	100 (61.34)	97 (59.51)	197 (60.42)
Religion			
Christianity	18 (11.04)	12 (7.36)	30 (9.2)
Islam	145 (88.95)	151 (92.63)	296 (90.79)
Year of study			
1 st	35 (21.47)	19 (11.65)	54 (16.46)
2 nd	33 (20.24)	40 (24.53)	73 (22.39)
3 rd	42 (25.77)	60 (36.80)	102 (31.28)
4 th	29 (17.79)	44 (26.99)	73 (22.39)
5 th	24 (14.72)	0.00 (0.00)	24 (7.36)
When a student first became aware of the Corona virus ? (month of the year 2020 since disease started)			
One month	112 (68.71)	8 (4.90)	120 (36.89)
Two month	19 (11.66)	20 (12.26)	39 (11.92)
Three month	32 (19.63)	120 (73.64)	152 (46.64)
Four month	0.00 (0.00)	15 (9.23)	15 (4.60)

Table 2: Information about spread of COVID-19

Knowledge	Health Students (n=73) n (%)	Engineering Students (n=73) n (%)	Total n (%)
Does Corona Virus spread through touching?			
Yes	145 (88.95)	138 (84.77)	283 (86.80)
No	18 (11.04)	25 (15.33)	43 (13.05)
Does Corona virus spread through sneezing?			
Yes	163 (100)	143 (87.73)	306 (93.86)
No	0 (0)	20 (12.26)	20 (6.13)
Does Corona virus spread through Air-borne?			
Yes	125 (76.69)	27 (16.56)	152 (46.62)
No	38 (23.31)	136 (83.44)	174 (53.37)
Does Corona virus spread through food?			
Yes	7 (4.29)	129 (79.15)	136 (41.71)
No	156 (95.71)	34 (20.85)	190 (58.28)
Can washing your hand frequently helps to stop the spread of Corona Virus?			
Yes	163 (100)	143 (87.73)	306 (93.86)
No	0.00 (0.00)	20 (12.26)	20 (6.13)
Are the pets at home able to transmit COVID-19 virus?			
Yes	0.00 (0.00)	94 (57.67)	94 (28.83)
No	163 (100)	69 (42.33)	232 (71.16)

There was no significant difference ($p>0.05$) of socio-demographic variables mean score vis-à-vis to knowledge and practices of COVID-19 except discipline of study as shown in Table 5.4. Over all, the engineering students displays lesser knowledge hence poor preventive practices in comparison to allied health sciences students. Significant difference was found in the knowledge of male and female students. The difference between practices of male and female students regarding corona virus was insignificant (p -value 0.27). In addition to this, no significant difference between knowledge and practices was found with reference to the age, socio-economic status and religion of the participants. A significant difference was found in the knowledge and practices of the two groups of participants (allied health sciences and engineering group) of the study regarding corona virus disease (Table 1.4).

Table 3: Response of study participants about perception of COVID-19

Practices	Health Students (n=73)	Engineering Students (n=66)	Total
	n(%)	n(%)	
I use soap to wash my hands			
Yes	163 (100)	133 (81.60)	296 (90.79)
No	0.00 (0.00)	30 (18.40)	30 (9.20)
If yes, for how long do you practice washing hands like?			
10 seconds	0.00 (0.00)	143 (87.73)	143 (7.87)
20 seconds	150 (92.02)	20 (12.26)	170 (52.45)
30 seconds	13 (8.08)	0.00 (0.00)	13 (3.98)
Do you wear a mask while going out for daily chores?			
Yes	163 (100)	111 (68.09)	274 (84.04)
No	0.00 (0.00)	52 (31.90)	52 (15.95)
When wearing a mask, do you test to ensure if it fits properly?			
Yes	163 (100)	94 (57.67)	257 (78.83)
No	0.00 (0.00)	69 (42.33)	69 (21.16)
Do you use hand sanitizer before entering house and university premises?			
Yes	156 (95.71)	39 (23.91)	195 (59.81)
No	7 (4.29)	124 (76.09)	131 (40.18)
Do you avoid hand shaking with people having cough or cold?			
Yes	150 (92.02)	138 (84.67)	288 (88.34)
No	13 (7.97)	25 (15.33)	38 (11.65)
Do you refrain from being close to those having cough or cold?			
Yes	163 (100)	163 (100)	326 (100)
No	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Do you abstain from making unnecessary visits to markets, restaurants and public places?			
Yes	163 (100)	104 (63.81)	267 (81.90)
No	0.00 (0.00)	59 (36.19)	59 (18.09)
Do you prefer to visit markets/grocery outlets out of peak hours?			
Yes	156 (95.70)	32 (19.63)	188 (57.66)
No	7 (4.30)	131 (80.37)	138 (42.3)
Do you avoid touching your eyes, nose and mouth with unwashed hands?			
Yes	163 (100)	101 (61.91)	264 (80.98)
No	0.00 (0.00)	62 (38.03)	62 (19.01)
Do you practice good respiratory etiquettes, including covering coughs and sneezes (or coughing/sneezing into your elbows/upper sleeves)?			
Yes	163 (100)	146 (89.60)	309 (94.78)
No	0.00 (0.00)	17 (10.40)	17 (5.21)

Table 4: Differences in the knowledge and practices scores with reference to socio-demographic practices

Variables	Subgroup	Mean score +SD	
		Knowledge	Practices
Sex	Male	9.92 ± 2.37	5.43 ± 1.43
	Female	10.13 ± 2.10	5.96 ± 1.12
	p-value	0.03	0.27
Age (years)	Less than 20	10.02 ± 2.09	5.80 ± 1.27
	More than 20	10.23 ± 2.22	5.76 ± 1.30
	p-value	0.59	0.27
Family income per month (PKR)	Less than 150,000	10.26 ± 2.08	5.47 ± 1.59
	Above than 150,000	10.45 ± 2.12	5.75 ± 1.26
	p-value	0.78	0.64
Religion	Christianity	10.21 ± 2.13	5.76 ± 1.29
	Islam	10.33 ± 2.46	5.84 ± 1.24
Discipline of study		0.65	0.61
	Allied health sciences	10.05 ± 2.31	5.79 ± 1.24
	Engineering	9.99 ± 2.17	5.43 ± 1.22
	p-value	0.01	0.04

DISCUSSION

The current study was designed with the aim to understand the knowledge and practices of two groups of students studying in Allied Health Sciences and Engineering departments of UOL. Findings of the study indicate that there is a significant difference between these two groups regarding knowledge of the disease as the respondents in Allied Health Sciences group were more aware about the causative agent, mode of transmission and prevention practices of the COVID-19 (Table 1.2). It indicates that the

educational background plays an important role in building perceptions about the disease. Similar finding have also been reported in previous studies conducted in Ghana, India and Karachi Pakistan, where the authors clearly admitted that the educational background has strong effect on the behaviors of people towards COVID-19 disease¹³. Effect of gender on final decision making abilities of individual has previously been assessed and was found that female gender was strongly associated with the uptake of control measures than male in countries with high socio-economic levels. Pakistan being considered as lower-middle income country this finding might contradict with previous literature however, as the study group was more composed of females and study was conducted in educational settings, which could have an impact on the findings. Family income, age and religion were found insignificant variables that effect knowledge and practices of the students. Age as an insignificant variable found in this study. This contradicts with previous findings where it was found that young people are more aware of the current trends in disease outbreaks and their reasoning rather old one¹⁴. This finding might occur due to less variation in the age group of the respondents of this study.

Since the pandemic of COVID -19 covered the globe, multiple strategies from time to time have come into place to contain the virus spread. These may include lockdowns, isolation of infected individuals, drug therapy and vaccines etc. Along with all these measures a plethora of information about knowledge, attitude and practices also circulated in the community through mass and social media¹⁵. This information travelled from one region to another irrespective of the nature of data either scientific based or misguided speculations. Hence the info-dynamics, overabundance of inaccurate information and fake facts prevailed in the society to fight off the virus. A number of studies have provided evidence about info-dynamics making it difficult to respond public health policies thus public health crisis to linger on. Similarly numerous studies are also available which evaluated the knowledge, attitude and practices of individuals in the different segments of society¹⁶. In this study efforts were made to evaluate and compare the perception of COVID-19 between allied health and engineering science students.

During public health crisis such as COVID-19 pandemic can be better dealt by public health initiative by establishing certain scientific behavioral pattern. In this regard knowledge is the first and key element that instills awareness in public thus preventive behavior development. Along with other studies this study has also showed association of knowledge with attitude and practices in KAP surveys of COVID 19. This study depicts that scientific based information can be potentially helpful in health intervention that results in higher public health awareness. Comparison between both Allied Health Sciences and Engineering students observes this phenomenon. Such inference is in accordance with a study by Tangcharoensathien et al. Greater misconception about the virus transmission through food (78%) and keeping pet at home (57%) was noted among engineering degree program students (Table 5.2.1). This implies that misguided and wrong information is rooted in the community. To break this chain of misinformation, understandable and logical data must be disseminated in public through available platforms like digital and mass media.

Attitude of community is strongly dependent upon efficacy beliefs. Efficacy beliefs are considered indicator of preventive behavior. After acquiring knowledge one must have confidence that certain practices would definitely remove the looming illness. For example in COVID-19, wearing mask can protect from acquiring infection. Thus efficacy beliefs are important and potential role toward adoption of preventive measures in public health crisis¹⁷. Source of information is a dynamic process and depends upon individual's cognitive and psychological condition. To devise public health policies, these factors must be addressed so that people actually believe on preventive measure. For example social distancing in COVID-19 is a significant factor to stem the spread of the virus¹⁸.

Preventive practices adopted by both group of students differ in many way as shown in table 3. Engineering students have less knowledge about COVID-19, thus attracted less towards preventive behavior. For example engineering students visit markets and parks more than usual in peak hours as compared to allied health students. Similar pattern was observed in hand sanitization practices (Table 5.3) This can be derived that poor knowledge result into lesser efficacy beliefs among the engineering respondents¹⁹. Consequently careless attitude and improper preventive behavior was observed by them in comparison with Allied Health Sciences respondents.(Table 5.3) Similar pattern has been reported by other KAP studies conducted in various countries²⁰.

Certain limitation should be considered while interpreting the results of this study. First of all the study was conducted in the academic setting of UOL which make group less homogenous on the basis of educational status, age and income of people. However, it was best considered to collect data from different years of study to address this issue. Moreover, both Engineering and Allied Health Sciences students have mathematical and biological sciences background making different in their approach to address a problem. In addition to this, mass media campaigns could have influenced their knowledge and practices which was not assessed in this project.

CONCLUSION

In this study 93% affirmed that virus is the etiology of COVID-19 although some engineering students (14%) described bacteria as the causative agent. Considering the spread means of COVID-19, health sciences students appeared knowledgeable about the virus transmission through sneezing (100%), touching (89%) compared to the engineering students who (83%) described that the virus do not have air borne. Striking contrast was observed related to COVID-19 symptoms awareness between the biology and engineering fellows as shown in table 1.2. To stem the spread of COVID-19, both group students strongly affirmed the isolation of infected individual and washing hands are quite helpful, however some engineering fellows (12%) disagree. According to the response of both group participants, the risk of contracting infection in individuals with more than 65 years old, diabetes, asthma and those in crowded places is high (100%) and less commonly in smokers (51%). Allied Health sciences students showed higher tendency towards hands hygiene practices than engineering students. This can be derived that poor knowledge result into lesser efficacy beliefs among the Engineering respondents. Improper preventive behavior was observed by them in comparison with Allied Health Sciences respondents. Thus, it was concluded that students related to Allied Health Sciences were more aware of disease spread than those related to Engineering department.

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