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ARE PAKISTANI MEDICAL STUDENTS READY AND TO WHAT EXTENT?:KNOWLEDGE, ATTITUDE AND PRACTICE DURING THE COVID-19 PANDEMIC: A CROSS-SECTIONAL STUDY ON MEDICAL STUDENTS OF PUNJAB, PAKISTAN

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Abstract:

Background: *COVID-19 is one of the most severe and lethal pandemics ever seen by the world. Whole world generally while education sector specifically are badly affected by this. Medical students also felt the Wrath of this pandemic.*

Objective: *"To assess the knowledge, attitude and practice of medical students in Punjab, Pakistan."*

Study Design: *A cross-sectional, descriptive, observational study design.*

Duration: *Study was conducted from March 2020 to May 2020.*

Study Place: *Medical Education Department, Quaid-e-Azam Medical College, Bahawalpur.*

Material and Methods: *Sample size during the study period consisted of total 591 undergraduate medical students from different medical colleges of Punjab, Pakistan.*

Ethical issue: *Ehtical approval was taken from ethical approval committee of Quaid-e-Azam Medical College, Bahawalpur.*

Sampling technique: *It was non-probability "convenient sampling method."*

Data analysis: *Data was analyzed through SPSS- version 20 and different frequencies were calculated.*

Results: *A total of 591 medical students of Punjab, Pakistan participated in the study; out of which 436(73.77%) were females and 154(26.05%) were males. The knowledge of medical students was scored on a scale of 0-21. A large proportion of students (79.53%) had good knowledge, 20.30% had average knowledge while 0.002% belonged to poor knowledge category. Final year students had higher score (83.42% belonged to good knowledge category) than their juniors. The attitude of the participants was scored on a scale of 0-6 with 78.34% of the participants having positive attitude. Overall, more males (81.8%) had positive attitude than females (77%). The practice of medical students regarding COVID-19 was scored on a scale of 0-7. The majority of the students (81.22%) had good practice while 15.57% and 3.21% of the students belonged to average and poor practice category respectively.*

Conclusion: *Our study showed that overall, medical students demonstrated moderate level of knowledge about COVID-19 (levels were lower in juniors) which surely affected their attitude and practice towards COVID-19 pandemic. However, in some aspects, participants had decreased knowledge, attitude and practice levels which highlights the need of targeted awareness and education programs.*

Keywords: *Knowledge, Attitude Practice; Undergraduate students; COVID-19.*

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INTRODUCTION:

Novel Corona virus (COVID-19) or SARS-COV 2, a respiratory RNA virus, has taken the world by storm since its emergence as a pandemic, affecting the health and socio-economic conditions of people in over 197 countries including Pakistan[1]. The first case of COVID-19 was reported in December 2019 in Wuhan, the capital city of Hubei Province of China, as pneumonia of unknown cause. Later, Wuhan became the first epicenter of spread of Corona virus. Due to its human to human transmission, COVID-19 also started spreading outside China, not respecting any international borders. On 30th January 2020 WHO declared COVID-19 outbreak as a Public Health Emergency of International concern (PHEIC)[2].

The first confirmed case of COVID-19 in Pakistan was reported on February 26, 2020 in a pilgrim returning from Iran[3]. The most common symptoms include fever, body aches, dry cough and shortness of breath. Some patients may also present with diarrhea and renal failure. Approximately 30%patients are asymptomatic carriers. People with co-morbid conditions like Diabetes Mellitus, Hypertension and chronic renal and lung diseases are at higher risk of acquiring severe infection than others [4]. The most reliable diagnostic test is Real-Time PCR (RT-PCR) of nasopharyngeal secretions. No vaccine is available for COVID-19 till date and the only treatment option available is supportive treatment. So, precautionary measures like social distancing, lockdown practices, meticulous hand washing and wearing gloves and masks are the key to control the spread of COVID-19[5].

Considering that COVID-19 is a new virus and there are not much Knowledge Attitude Practices studies available on medical students regarding COVID-19, this study aimed to survey the understanding of COVID-19 pandemic in their clinical years considering their role in bringing familiarity with COVID-19 to the community and to recognize any slums in their insight regarding such crisis situations for their well-being in practical life as well.

MATERIAL AND METHODS:

591 Medical students from various medical schools of Punjab, Pakistan took part in a web-based, convenient sampling, cross-sectional KAP survey about the COVID-19 pandemic. Briefly, there are a total of 32 Public and Private sector medical colleges in Punjab, Pakistan affiliated with UHS with above 30,000 medical students currently studying. This affirms that the extent of clinical studies is not low and besides these students are viewed as a frontline in COVID-19 mindfulness battle. Subsequently these medical institutions are a key priority to explore KAP level in Punjab, Pakistan.

This KAP study was directed when an influx of COVID-19 wasnemitted all over Pakistan. A 39-item questionnaire was created utilizing a web survey tool called google forms; an expert online study assessment platform, and sent randomly via a third party WhatsApp and Instagram accounts to students on 30th March and 1st April 2020; 1 week immediately after lockdown in Punjab. A total of 591 responses were collected (Year and gender wise distribution: Table)

The structured questionnaire of this student-based study constituted close ended questions of types like MCQs, 4-point Likert scale questions, and yes/no statements. Moreover, statements meant to collect data on respondent's gender and year of study were also added. Most of the questions were received from another study however, new items were added to measure student's perception regarding pandemic.

The designed questionnaire covered three domains: knowledge about corona virus (COVID-19) [21 items], respondent's attitudes towards current situation [6 items], and their precautionary practices during the pandemic [7 items]. Knowledge of students was graded as good (17-21 score), average (10-16) and poor (below 10). Similarly, a score of 5 and greater than 5 out of 6 showed positive attitude. Good practice was considered of those scoring greater than and equal to 6, with a score of 4-5 considered as average as and less than 4 as poor. Sub-sections of the knowledge domain constituted queries concerning virology and vaccination (2 items), virus source and spread (4 items), knowledge about

symptomatology (2 items), precautions and risk prevention (6 items), treatment options and virus fatality (5 items). 1 MCQ inquired about incubation period for COVID-19. Also, students were asked whether COVID-19 is same as SARS virus using a Yes/No statement (Table 2). Students were asked to appraise the probability of final eradication of this virus and control of pandemic (2 Yes/No statements), what are their thoughts about seriousness of this pandemic (1 item: measured on a 4-point Likert scale) and their views on importance of undergraduate student's training, HCWs active participation and adequate supply of PPEs to frontline workers (3 items: 3- point Likert scale). Finally, students were asked to report their eagerness to care for COVID-19 infected patients (1 item).

Assessment of respondent's practices was based on behaviors such as going to crowded places (1 item), wearing a mask while going out and covering their mouths while coughing (2 items). Questions about practices like hand washing, intake of immunity boosters and social distancing were also the part of questionnaire (3 items) (Table 3). Participants were asked to choose among college lectures, television, friends and social media in order to find out their knowledge source about COVID-19.

Students from all five years and of both genders were included in the study. Students reluctant to participate in study and those whom we could not contact at the time of data collection were excluded. The research was conducted following all the ethical principles concerned and in accordance with generally acknowledged moral principles. Confidentiality a of study members was kept up all through the research by making member's data unknown. Informed consent was acquired for every member by means of a text message. Study protocol was affirmed by DME, QAMC Bahawalpur. Members had adequate time to peruse, comprehend, and respond to the questions and they were free to leave out if they did not wish to answer.

RESULTS:

1. Bio data of participants:

A total of 591 medical students of Punjab, Pakistan participated in the study; out of which 436(73.77%) were females and 154(26.05%) were males. (Table 1)

Table 1: Bio data details of study participants (n=591)

Details		Participants
Sex	Male	154
	Female	436
Final Year*	Male	62
	Female	193
4th Year	Male	40
	Female	119
3rd Year	Male	21
	Female	30
2nd Year	Male	18
	Female	56
1st Year	Male	13
	Female	38

***1 Final Year student didn't mention the gender**

2-Knowledge:

The knowledge of medical students was scored on a scale of 0-21. A large proportion of students (79.53%) had good knowledge, 20.30% had average knowledge while 0.002% belonged to poor knowledge category. The main source of information about COVID-19 pandemic was different for the participants with social media (78.51%) being the highest followed by television (15.90%), college lectures (4.91%) and friends (0.68%). The 99.66% of participants knew that COVID-19 is a viral disease. Most of the students had knowledge that the source of COVID-19 infection is bats (75.46%). Among all the students, 44.16% students believed that COVID-19 is same as SARS virus,30.63% believed the opposite while 25.21% had no idea about it.

2.1-Knowledge of mode of transmission and symptoms: Regarding the transmission, high majority (97.12%) believed that mode of transmission is respiratory droplets while rest believed it to be contact with animals (1.35%) and fecal-oral transmission (1.52%). Among the participants, 588(99.49%) had knowledge about symptoms of COVID-19 infection which are shortness of breath, dry cough, fever and body aches. In addition,99.5% of the students considered

immunodeficient persons being the high-risk group.

2.2-Knowledge about treatment:
A large proportion of students (93.40%) considered that travel history is important in making diagnosis of COVID-19 infection. Also, 87.82% of students were aware of the fact that the only treatment available at present is supportive treatment. 80.20% of students successfully knew about the mortality rate in COVID-19 patients that is 2-4%. (Table 2)
2.3-Knowledge of COVID-19 according to gender and year of medical school of the participants:
Final year students had higher score (83.42% belonged to good knowledge category) than their juniors.
The scores of 1st,2nd and final year males were higher than females of the same year. While 3rd year females scored better than males of the same year. Overall, more males (81.8%) belonged to good knowledge category than females (78.67%).
3-Attitude: The attitude of the participants was scored on a scale of 0-6 with 78.34% of the participants having positive attitude. While analyzing the attitudes of students regarding COVID-19 as a serious public health issue, majority (95.10%) of students strongly agreed.

78.34% students were of the view that medical students should be adequately trained to deal with crisis situation while 16.41% considered it a debatable issue. Interestingly, 15.23% of students said that they will not do clinical rotation in a hospital where COVID-19 patients are treated. In contrast, 47.04% of students had positive attitude while 37.05% students weren't sure of their decision.

Table 2: Knowledge about Novel Corona Virus among Medical Students of Punjab, Pakistan during the COVID-19 Pandemic (n=591)

Statements	Correct	Incorrect	Didn't Respond
COVID-19 belongs to the category of virus	589 (99.66%)	2 (0.33%)	----
COVID-19 spreads from one person to another	581 (98.31%)	9 (1.5%)	1 (0.16%)
There is currently no vaccine for COVID-19	569 (96.28%)	22 (3.8%)	----
COVID-19 can prove fatal	234 (39.60%)	357 (60.41%)	----
Antibiotics have no role in the treatment of COVID-19 infection	438 (74.11%)	153 (25.90%)	----
Shortness of breath, fever, body aches and dry cough are the main symptoms of COVID19 infection	588 (99.49%)	3 (0.5%)	----
COVID-19 infection can be prevented by taking measures such as maintaining good hygiene, avoiding close contact with infected people and using face masks while going outside	583 (98.65%)	7 (1.18%)	----
People with immune system deficiency are at higher risk for acquiring COVID-19 infection	588 (99.50%)	2 (0.33%)	1 (0.17%)
Incubation period for CoVID-19 is 2 - 14 days	576 (97.46%)	12 (2%)	3 (0.50%)
Source of COVID-19 are bats	446 (75.47%)	145 (24.50%)	----
COVID-19 transmits through respiratory droplets of infected people	574 (97.12%)	17 (2.9%)	----
COVID-19 is same as SARS virus	181 (30.63%)	410 (69.30%)	----
The only treatment option for COVID-19 is supportive treatment	519 (87.82%)	71 (12%)	1 (0.17%)
Approximate mortality rate in average risk COVID-19 patients is 2 to 4 %	474 (80.20%)	116 (19.60%)	1 (0.17%)
COVID-19 patients might not show any symptom	545 (92.20%)	44 (7.40%)	2 (0.33%)
Travel history is an important factor in making diagnosis of COVID-19 infection	552 (93.40%)	38 (6.40%)	1 (0.17%)
People with co-morbid conditions are more likely to get COVID-19 infection	561 (94.92%)	26 (4.40%)	4 (0.68%)
Children and young adults also must take preventive measures	584 (98.81%)	4 (0.68%)	3 (0.51%)
Asymptomatic carriers can also transmit virus to other people	554 (93.74%)	34 (5.80%)	3 (0.51%)
COVID-19 infected patients should be kept in isolation	575 (97.29%)	12 (2.00%)	4 (0.68%)
Symptoms of COVID-19 patients often resolve with time and do not require special treatment	177 (29.95%)	411 (69.50%)	3 (0.51%)

Majority of students (97.29%) had positive attitude towards isolation of infected patients and that prevalence of this infection can be reduced by active participation of health care workers (80.20%) in infection control programme.79.36% students believed that pandemic will finally be controlled. In addition,79.19% of students also had confidence that Pakistan can win this battle against COVID-19 (fig. 1)

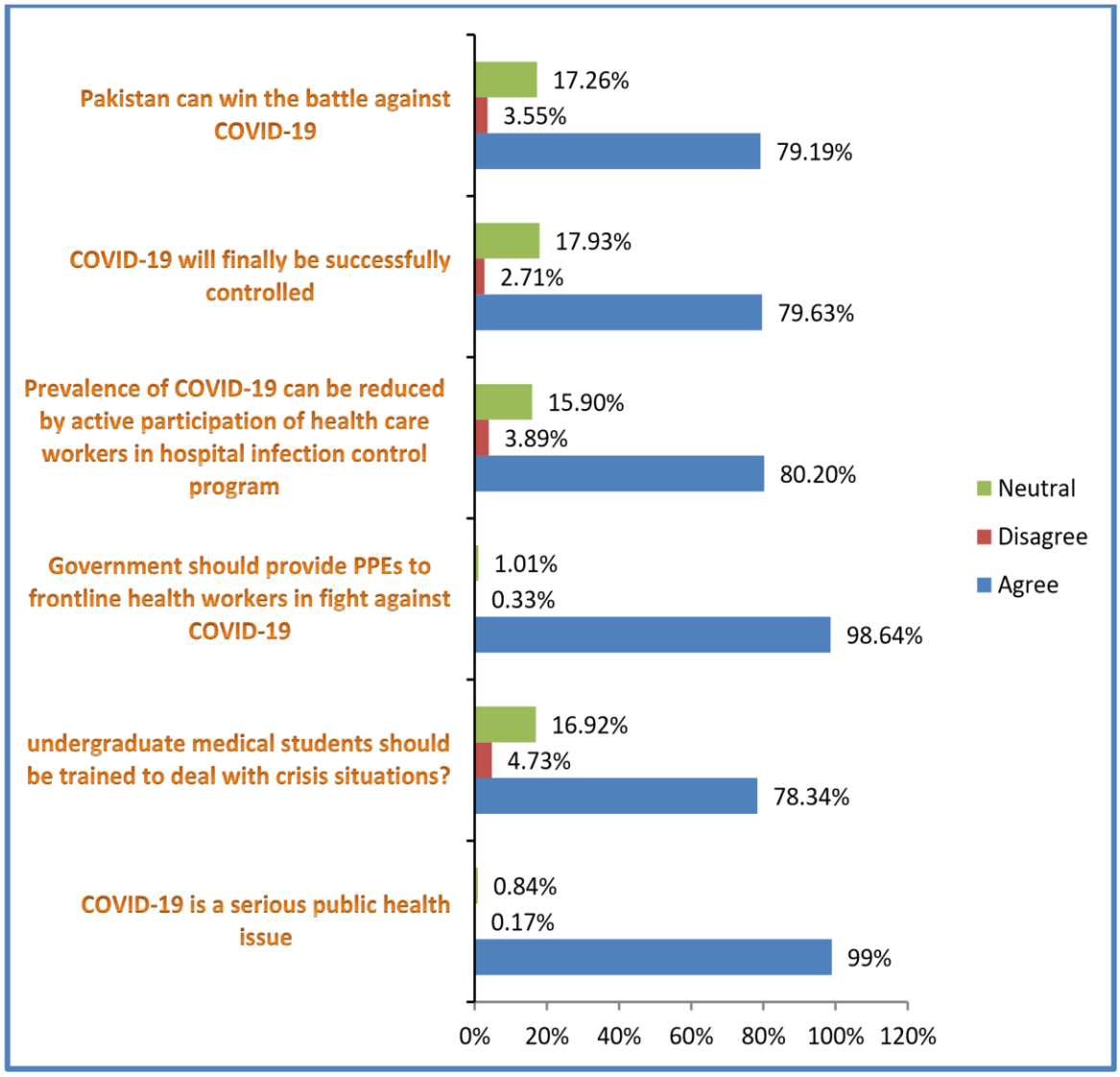

Fig. 1 Attitude of medical students of Punjab, Pakistan

3.1-Attitude of participants according to their gender and year of medical school: 100% of the first-year males had positive attitude, much higher than 1st year females. Overall, more males (81.8%) had positive attitude than females (77%).

4-Practice: The practice of medical students regarding COVID-19 was scored on a scale of 0-7. The highest scored obtained by the participants was 7 and 0 being the lowest. The majority of the students (81.22%) had good practice while 15.57% and 3.21% of the students belonged to average and poor practice category respectively.

Large proportion of respondents were practicing preventive measures against COVID-19 infection like wearing face masks (81.39%), washing of hands (88.66%) and covering mouth while coughing or sneezing (92.38%). Students were also practicing social distancing (91.03%).

Medical students were also taking healthy foods to boost their immunity (86.46%). It was hopeful to find that students played their part by creating awareness among masses (88.49%) [see Table 3].

Table 3: Practice of Medical students during COVID-19 pandemic

Statements	Responses
Students who have not visited any crowded place in recent times	546(92.38%)
Students who wear face mask while going outside	481(81.39%)
Students who wash their hands before and after any activity	524(88.66%)
Students who cover their mouth while coughing and sneezing	546(92.38%)
Students who are taking health foods to boost their immunity	511(86.46%)
Students practicing social distancing in daily life	538(91.03%)

4.1-Practice of participants according to their gender and year of medical school:
More 2nd year female students (89.29%) belonged to good practice category than their batch fellow males (83.3%) and also than their seniors (86.66% 3rd year females, 78.15% 4th year females and 83.26% final year females belonged to good practice category). Overall, also more females (83.26%) fell into good practice category than males (75.3%).

DISCUSSION:

Various KAP studies on MERS and COVID-19 pandemic have been completed worldwide on groups like nurses[6], health care workers[7] and doctors[8] yet few have included students especially undergraduate medical students9. Health oriented representation of both general public and medical personnel cannot be better done by anyone but medical students. Supposedly, this survey is first of its kind to be conducted among medical students in Pakistan. This study not only depicts respondent's actual response but also enlarges their comprehension towards this pandemic. Correct attitude and practice towards the pandemic make these students less vulnerable and eventually it decides well-being of a community as in previous done[9,10].

According the results, found that a moderate number of medical students have good knowledge (79.5% N=591), a positive attitude (78.34%), and good practice (81.22%) towards COVID-19. Although varying perception was appreciated among students from different years and of different gender. Final year medical students; males to be precise, appeared to be more knowledgeable than their subordinates due to obvious reasons like better orientation to curriculum and clinical rotations. Knowledge scores of 1st year and 2nd year medical students were surprisingly low (Table 4).

Table 4: DIFFERENCE IN KNOWLEDGE STATUS BY GENDER AND YEAR OF STUDY

Characteristics		Knowledge		
		Good*	Average**	Poor***
Total [n (%)]		4701 (79.53)	120 (20.30)	1 (0.002)
Gender				
	Female	343 (78.67)	93 (21.33)	_
	Male	126 (81.8)	27 (17.5)	1 (0.64)
Year of study				
	1st year	33 (64.7)	18 (35.29)	_
	2nd year	50 (67.5)	24 (32.4)	_
	3rd year	39 (76.4)	12 (23.52)	_
	4th year	128 (80.5)	30 (18.86)	1 (0.6)
	5th year	220 (85.9)	36 (14)	_

*Good: 17-21 score
**Average: 10-16 score
***Poor: below 10 score
[1]Gender of one of the respondents was unknown.

A remarkably high level of awareness was found when asked about contagious nature of virus and its transmission, vaccine availability, symptomatology and preventive measures. And these results were very much consistent with those of other KAP researches on and COVID-19 carried out on Saudi medical students and pharmacists in Pakistan. Since medical students enjoy the status of health advocates, which makes them more informed and prepared in their communities, their knowledge regarding incubation period, symptomatology and disease transmission was much better than general public of Pakistan. Still approximately only 40% of both public and students was aware of the actual fatal nature of this disease. Another recent study on HCWs in Pakistan revealed a pretty good

proportion having good knowledge as compared to our study participant's clinical understudies.

Students had moderate awareness respecting source of COVID-19 (75%) and approximate mortality rate in this disease (80%). A cause of concern showing serious lack of knowledge was highlighted by the fact that 60% respondents believed that COVID-19 infection always leads to death. This was probably because of surge in COVID-19 cases and a massive number of deaths reported in USA, Italy and other gravely affected countries. A few findings recommend significant knowledge gaps between the amount of information available and the profundity of information about COVID among students. For instance, 70% of students were unaware that COVID-19 is different from SARS which shows relatively lower apprehension of basic science and virology. Lack of accentuation on this aspect in a student's study years could be a promise explanation. Unfortunately, 70% participants did not know that mostly symptoms resolve with time and do not require special treatment. This highlighted student's concern about pandemic.

The knowledge about students and their practices is a key factor to receive the transparent information about the pandemic. A finding of extensive concern was that a vast majority of students (78.5%) came to know about COVID-19 via social media. These days no doubt social media holds a position of mainstream medium of obtaining information in this era of technology but at the same time, a tremendous amount of unverified deleterious information is available through internet and it can spread rapidly misguiding individuals. In this manner, students should utilize logical and valid substance of data sources. In this respect official websites of WHO, NHSRC and NIH can prove to be very useful.

As it was observed that important gaps in knowledge were found in all years studied; overall knowledge apparently did influence attitudes of students with only 78% of study population (77% in females, 81% in males) showing positive attitude towards the pandemic.

Independent factors that contribute towards decreased will to care for COVID-19 patients in approximately 53% of study population might include lack of motivation, student's feeling of being unprotected and ill-equipped due to frequent shortage of PPEs; in simple words feeling oneself at risk. A significant number (approx. 20%) was ill-confident that this pandemic would eventually be controlled and Pakistan can win battle against COVID-19. To our despair, this proportion was 10 to 20 times greater than Chinese non-medical students from another study.[11] Better knowledge would probably have a better influence in such instances.

Questionnaire had detailed possible precautions that were in accordance with official WHO recommendations and 81% participants scored good. Females from all years scored significantly higher than males since they are known to be more health and hygiene conscious (fig 2). Still the practice of wearing face mask while going out was comparatively less in our study participants (81%) as compared to students from another study in China (96%)[11]. Close results were found among general public and students regarding use of face mask and avoiding crowded places but the practice of hand washing was more common in general public (94%).[12-17] Proportion of students showing good practice score was also approx. 10% less than nurses and doctors.

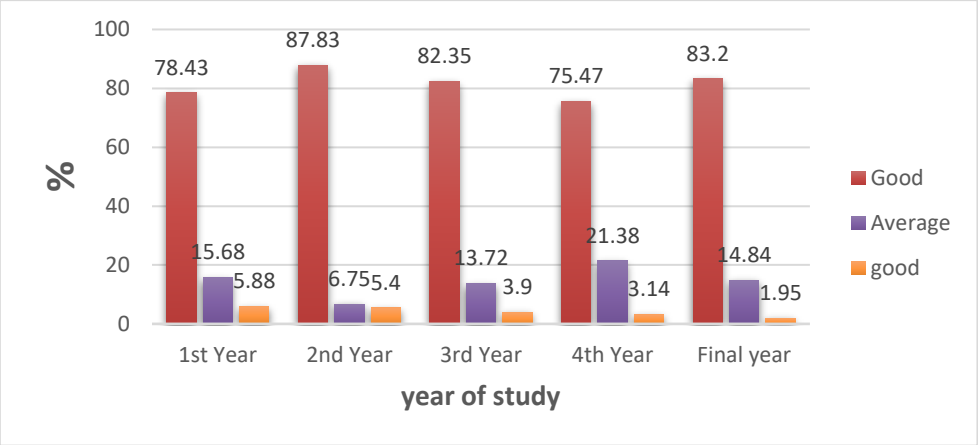

Fig. 2 Practice score according to year of study

There were multiple reasons for conducting this research during an outbreak. COVID was a hot topic in media and community and since medical students are supposed to raise awareness among masses therefore, it was crucial to assess whether medical students were well informed and prepared to play their part. Also, this study showed how emerging infections trigger curiosity in students and their urge to read and react to surrounding happenings.[18]

Our study had several limitations. There is no comparable study involving medical students from Punjab, Pakistan. Also, our sample size might not be ideal to represent KAP level of all medical students. It might be appropriate to address these points in future studies with a larger sample size, in order to obtain a full understanding.[19]

CONCLUSION:

Overall, medical students demonstrated moderate level of knowledge about COVID-19 (levels were lower in juniors) which surely affected their attitude and practice towards COVID-19 pandemic. However, in some aspects, participants had decreased KAP levels which highlights the need of targeted awareness and education programs. Knowledge, attitude and practice are the pillars of public health system as it directly influences the health education programs. So, considering their important role in community, government should provide motivational and up-to-date education methods to educate medical students to deal with such situations in future.

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