

Knowledge, attitude and practice of medical students towards HIV patients in their pre-clinical and post-clinical years in Karachi, Pakistan: a dual-center cross-sectional study

Simran Batra¹, Zahid Ali Memon², Rohan Kumar Ochani¹, Sana Awan¹, Simran Bhimani¹, Yumna Siddiqui³, Ashar Mohiuddin⁴, Hamza Ahmed Farooqi⁵

¹Department of Internal Medicine, Dow University of Health Sciences, Karachi, Pakistan;

²Department of Surgery, Dr. Ruth K. M. Pfau Civil Hospital Karachi, Karachi, Pakistan;

³Department of Internal Medicine, Bahria University Medical & Dental College, Karachi, Pakistan;

⁴Department of Internal Medicine, Dow International Medical College, Karachi, Pakistan;

⁵Department of Internal Medicine, Ziauddin Medical University, Karachi, Pakistan

SUMMARY

The human immunodeficiency virus (HIV) is currently a global threat with an estimated 38.6 million people affected with HIV worldwide. According to the Joint United Nations Program on HIV/AIDS (UNAIDS), since 2004 the total number of cases of HIV in Pakistan has risen from 2700 to 130,000. In light of the rising burden of HIV/AIDS across the country, it is essential that medical students possess appropriate knowledge regarding the subject. Therefore, we aimed to assess the knowledge, attitude and practice of medical students towards HIV patients in their pre-clinical and post-clinical years in Karachi, Pakistan. A cross-sectional study was conducted among 518 pre-clinical (year 1 and 2) and post-clinical (year 3, 4, and 5) medical students from two medical schools in Karachi during the months of October - December 2019. Similar numbers of participants were taken from each year. Data were analyzed using SPSS. Descriptive statistics were used to report frequencies and proportions for categorical responses. Chi-square and Kruskal-Wallis tests were used as the primary statistical tests. About 55% of participants were female, and most belonged to the Islamic faith. More than half of the participants learned about HIV from books (315/518), followed by medical personnel (287/518). A quarter (134/518) of the participants believed HIV could be transmitted by sharing saliva, more than half of whom consisted of pre-clinical year students. Over half the participants (60.4%)

knew that there was a difference between HIV and AIDs, most of whom belonged to the 5th year group. When detecting HIV, only about 30% of participants knew about indirect fluorescent antibody. Regarding attitudes, one-third would not be friends with a person diagnosed with HIV/AIDS. As a medical officer, a large majority (76.6%; n=397/518) of the participants would be anxious or somewhat anxious. Two-thirds believed that treating an HIV patient can make them contract HIV, and a majority of participants (333/518) did not feel adequately prepared to deal with the psycho-social problems of an HIV/AIDS patient. Finally, regarding practice, only one-third of the participants were willing to treat an HIV/AIDS patient, most of whom belonged to the pre-clinical 2nd year group and fewer to the post-clinical 3rd year group. Knowledge amongst medical students regarding HIV/AIDS was generally high, although there are some knowledge inadequacies which require more emphasis in the medical school curriculum. However, contrasting with the level of knowledge, in terms of attitude the majority were anxious or somewhat anxious when treating an HIV patient, and only one-third were willing to treat a patient with HIV.

Keywords: Human immunodeficiency virus, acquired immunodeficiency syndrome, HIV/AIDS, infectious diseases, medical students.

Corresponding author

Rohan Kumar Ochani

E-mail: rohanochani@gmail.com

■ INTRODUCTION

The human immunodeficiency virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) is an extremely pressing and complex public health issue in our current medical landscape across the world. There have been multiple epidemics in the past which have caused devastation and fear among communities throughout the world, since it was first recognized as a disease in 1981 [1].

The worldwide impact of HIV is statistically massive. To date, 75 million people have been recorded to be infected with HIV and about 32 million have died from the disease. Globally, approximately 37.9 million people were living with HIV at the end of 2018. Around 0.8% of adults aged between 15 to 49 years old worldwide are living with HIV, but the distribution varies considerably between countries and regions [2].

Our country, Pakistan, has faced a recent epidemic in Larkana District in Sindh. Through April and June 2019, 30,192 people were screened for HIV. There were 876 new cases, of which 82% were under the age of 15. The risk factors identified included unsafe intravenous injections during medical procedures, unsafe practices at blood banks, and poorly implemented infection control programs [3].

Other than that, according to a recent survey done in Pakistan, from 4500 HIV patients in Pakistan in 2013, the number has increased to 24,331 registered with National AIDS Control Program (NACP) as of June 2019 [4].

Another startling finding is that the prevalence of HIV is due to mismanagement from the medical community and authorities, which could be due to lack of knowledge, awareness and the stigma associated with the disease that may lead to discrimination and therefore, insufficient care. The first line of defense for this massive increase could be an increased awareness among the upcoming doctors regarding HIV, their attitude and willingness to care for HIV patients. These doctors are the ones who will diagnose these patients in the near future and will be in the position to appropriately counsel and care for them. Therefore, we are conducting a study to assess the knowledge and willingness of medical students to care for HIV patients.

■ MATERIALS AND METHODS

A cross sectional study was conducted among medical students of Karachi, Pakistan in order to assess their knowledge and willingness to care for HIV patients. First till final year MBBS students from Dow Medical College (DMC) and Bahria University Medical and Dental College (BUMDC) participated in the study. The time period for data collection was from October 2019 to December 2019.

All students from 1st till 5th year who were selected by convenient sampling and were willing to participate were interviewed to fill out the questionnaire. We took over 500 participants to equally divide them, creating a total of approximately 50 students from each year of each school. All postgraduate and dental students were excluded from the study. Similarly, those who were uncomfortable talking about the topic were excluded and incomplete entries were discarded.

A structured, standardized questionnaire was designed. It had 22 questions and was divided into 4 sections: 4 questions on demographic information; 7 on student's knowledge about HIV transmission, prevention and cure; 8 on their attitude towards HIV patients; and the last 3 assessed the practice outlook to care for HIV patients. The questionnaire was distributed among the students and filled manually to reduce any bias that may have arose if the forms were filled online. Written consent was obtained from all individuals willing to fill the questionnaire. However, ethical approval was not required since no intervention was employed.

A sample size of 425 was calculated using OpenEpi with a confidence interval set at 99% and a statistical power of 80%. We ensured complete anonymity and out of the 550 forms that were distributed, 10 participants refused to provide written consent as they were uncomfortable talking about the topic, while 22 forms were incompletely filled, hence they were discarded. Therefore, the cooperation rate came out to 94.2%. No imputation methods were used to maintain an accurate representation of the views of the sample population. The two interviewers collected the data using a standard protocol with all subjects. They were ordered to wear identical lab coats, offer prepared explanations for questions, not to engage in mundane conversations and offer the same amount of time to each person.

Disparity between categorical variables was checked using Chi-square test whereas descriptive statistics were used to report frequencies and proportions for categorical responses. Normality was established by Shapiro Wilk test and in the case of ordinal data; the Kruskal-Wallis test was used. The data analysis was performed using Statistical Package for Social Science (SPSS) version 25.0. A p-value of less than 0.05 was considered statistically significant in all cases.

Table 1 - Socio-demographic variables of all the participants.

Basic characteristics	n		Frequency (n)	Percentage (%)
1. Gender	518	Male	236	45.6
		Female	282	54.4
2. Institute	518	BUMDC*	258	49.8
		DMC*	260	50.2
3. Year of study†	518	1st	96	18.5
		2nd	107	20.7
		3rd	104	20.1
		4th	99	19.1
		5th	112	21.6
4. Religion	518	Islam	448	86.5
		Hinduism	49	9.5
		Christianity	9	1.7
		Sikhism	3	0.6
		Others	9	1.7

*BUMDC, Bahria University Medical & Dental College; DMC, Dow Medical College.

■ RESULTS

Basic characteristics

Our study consisted of 518 participants, of which 54.4% (n=282) were females, and a majority (86.5%; n=448/518) belonged to the Islam religion. A similar number of participants was selected from each university, 258 participants being from BUMDC, and 260 participants from DMC. Each year of study had a similar number of participants. Similarly, each year comprised of an equivalent number of participants. The participants were then divided into a pre-clinical group, comprising of first and second year of medical school, and into a post-clinical group which comprised of third, fourth and fifth year of medical school. 203 participants belonged to the pre-clinical group, while 315 belonged to the post clinical group. The basic characteristics of our study are displayed in Table 1.

Knowledge of medical students regarding HIV/AIDS

Table 2 displays knowledge regarding HIV. A majority number of participants learned about HIV through books (60.8%; n=315/518), followed by medical personnel (55.4%; n=287/518) and through television (27.8%; n=144/518). A significant association was found between learning about HIV through medical personnel (p=0.020). When asked regarding the transmission of HIV, almost everyone (94.8%) knew about its spread through body fluid, followed by unprotected intercourse (357/518) and tattoo's and piercings' (272/518).

Table 2 - Knowledge regarding HIV and its relationship with year of study.

Items	No. of responses (n)	Percentage (%)	Most popular response (%)	p-value
5. Where did you learn about HIV from?	518	100	Books (60.8)	0.220
6. How do you think HIV could be transmitted?	518	100	Body fluids (Semen/Rectal fluids/Vaginal fluids/Breast milk) transmission from a person infected with HIV (94.8)	0.102
7. The median latent period between HIV and AIDS is?	518	100	5-8 years (42.6)	0.296
8. Is there any difference between HIV and AIDS?	518	100	Yes (60.4)	0.625
9. Tests for detecting HIV/AIDS?	518	100	ELISA (82.2)	0.057
10. HIV can be prevented by?	518	100	Avoiding multiple sex partners (61.6)	0.375
11. Is AIDS a curable disease?	518	100	No (73.9)	0.108

A significant result was found between the transmission and unprotected intercourse and tattoos and piercings. Furthermore, surprisingly, a significant finding was found between the transmission of HIV with kissing, touching someone and sneezing, with p-values of 0.003, 0.021, and 0.001, respectively. This finding was more prevalent in students of pre-clinical years than post-clinical years. The highest number of participants who believed HIV is transmitted through kissing (29.1%; n=39/134) and touching (41.7%; n=10/24) belonged to 2nd year, while one-third of the population who believed its spread by sneezing coughing belonged to the first year (31.5%; n=29/92).

Additionally, more pre-clinical year students (124/222) believed the latent period to be anywhere from 5 to 8 years, however post-clinical year (127/182) students believed it was lesser than five years (p=0.001). Moreover, more than half of the participants knew there was a difference between HIV and AIDS, equally represented by both groups (p=0.903). Furthermore, when asked about tests to detect HIV, a majority (82.2%; n=426/518) knew about Enzyme-linked Immune Sorbent Assay (ELISA), and approximately half (47.9%; n=248/518) knew regarding Western Blot. Only the indirect fluorescence antibody test showed a significant relationship with HIV test-

ing, where the greatest number of participants belonged to 4th year of medical school (26.5%; 41/155, p=0.025).

Attitude of medical students towards HIV/AIDS patients

Table 3 shows the attitudes of participants to care for an HIV / AIDS individual. Approximately one-third (35.5%; n=184/518) of the participants stated that they would not continue their friendship if their friend were diagnosed as HIV positive. Of these, one-quarter (25%; n=46/184) belonged to their 3rd year of medical education (p=0.045). Almost one-fourth of the respondents believed that an HIV positive student should not be allowed to continue studying in school, which relatively included a greater number of post-clinical students (82/315) when compared with pre-clinical students (43/203).

Additionally, a similar majority said yes when asked if one of their family members were to be HIV positive, they would quarantine them (129/518). When respondents were asked regarding their feelings towards an HIV positive individual, 38 stated they would see them with hatred. This was much more common in pre-clinical years (25/38) when compared with post-clinical years (13/38). A majority remained indifferent towards HIV positive individuals (57.7%; n=299/518).

Table 3 - Attitude towards HIV patients and its relationship with year of study.

Items	No. of responses (n)	Percentage (%)	Most popular response (%)	P-value
12. If your friend is HIV positive, would you continue your friendship with him/her?	518	100	Yes (64.5)	0.045
13. If a student is HIV positive, she/he should be allowed to continue his/her studying in school?	518	100	Yes (75.9)	0.559
14. If one of your family members is HIV positive, would you quarantine him/her?	518	100	No (58.9)	0.701
15. What are your feelings towards a HIV positive person?	518	100	Indifferent (57.7)	<0.001
16. If as a medical officer, you had to care for a HIV patient, would you feel	518	100	Somewhat anxious (59.3)	0.088
17. Do you think treating a HIV patient can infect you with AIDS?	518	100	No (66.8)	0.580
18. Do you feel adequately prepared to deal with the psycho-social problems of HIV / AIDS patient?	518	100	No (64.3)	0.070
19. Do you think people with AIDS should be quarantined?	518	100	No (80.0)	0.053

Table 4 - Practice regarding HIV and its relationship with year of study.

Items	No. of responses (n)	Percentage (%)	Most popular response (%)	P-value
20. It is best to train a few specialists who would be responsible for the treatment of HIV+/AIDS patients?	518	100	Yes (62.0)	0.295
21. Would you feel resentful if HIV+ /AIDS patients accounts for a significant part of your caseload?	518	100	No (65.8)	0.624
22. Would you be willing to treat an HIV infected individual?	518	100	Maybe (47.3)	0.344

The majority of the participants (76.6%; n=397/518) stated that they would be either very anxious or somewhat anxious if they were to care for an HIV patient. Of which, 80% (n=256/315) of the participants belonging to the post-clinical group felt this way, and about two-thirds of pre-clinical participants felt this way (69.5%; n=141/203). 64.3% (n=333/518) participants mentioned that they do not feel confident enough to adequately respond to psycho-social problems of patients with HIV/AIDS. Surprisingly, this was more prevalent in students of post-clinical years (68.6%; n=216/315) than pre-clinical years (57.6%; n=117/203). Lastly, one-third (33.2%; n=172/518) thought treating an HIV patient may infect them with HIV as well.

Practices of medical students regarding HIV/AIDS patients

About 40% (197/518) of the participants believed it would not be essential to train a few specialists who would be responsible for the treatment of HIV/AIDS, while one-third of the respondents will feel resentful if HIV/AIDS patients accounted for a considerable part of their caseload. Finally, only 180 out of 518 participants were willing to treat an HIV individual, with similar percentages from both pre-clinical and post-clinical years. Table 4 shows the frequency of practices regarding HIV.

DISCUSSION

Primarily, there are various sources through which awareness of HIV could be sought; however, a huge number of students gained knowledge regarding HIV from medical personnel during their post-clinical years, with a majority being in their final year. This finding is consistent with a previous study conducted among clinical-year recruited medical students from 4th to 6th year,

where most (73.7%) students gained information regarding HIV through their ward rotations, and the rest learnt through training on post-exposure prophylaxis for HIV [5]. Thus, this illustrates that preponderance of students with clinical rotations had a higher knowledge of HIV/AIDS by medical personnel compared to students who did not have clinical exposure. A survey was done which showed that education had a direct relation to the knowledge, attitude and awareness level among the respondents [6].

Furthermore, majority of the medical students knew that the mode of transmission of HIV/AIDS is via unprotected sex. Moreover, a significant number of students believed that oral route could be one of the ways of its spread. A study was conducted amongst college students in Delhi and Pune and students of Qassim University in KSA, who all shared a similar conception concerning the spread via oral route. Another study conducted among first year medical students showed that 58% of students believed that HIV is transmitted via oral route [7]. Another misconception that 1st year students in the survey had was, that they believed the transmission of the virus is via insect bite and non-intimate touch. This was congruent to the results of our study, validating importance of conducting such studies to induce awareness. A disturbing finding in our study was that several students, majority being in their first year, thought HIV/AIDS can be spread by coughing and sneezing. A similar finding was seen in a study conducted by Mehra et al., in which several participants had misperception regarding spread of HIV through coughing/sneezing, mosquito bites, touching an HIV infected person or sharing towels and clothes with them [6-9].

Moreover, our study showed a significant number of 2nd year students followed by 4th year students having a false perception of HIV being

transmitted by kissing. A similar study conducted in Democratic Republic of the Congo (DRC) reported that one of most common misconception amongst students was regarding transmission of HIV through kissing on mouth [8]. This could be because HIV as a topic is taught in 2nd year and beyond in the academic coursework. Perhaps, this lack of knowledge and darkness regarding the awareness of HIV in the youth of our country could be due to lacking sex education, and since Pakistan consists of primarily a Muslim population; dialogue regarding sexual practices is considered taboo and unsought. An editorial on need of sexuality education in Pakistan also highlighted this misconception regarding sexual practices, the lack of public dialogues; largely due to the strong religious influence and traditional practices as well as the open platform for criticism it brings along [10].

Additionally, awareness regarding various methods of detecting HIV among the medical students, the indirect fluorescent antibody test was highly known by the 4th year medical students, followed by ELISA, which was well known by the most participants, majority being the final year students. Moreover, approximately half were familiar with the Western Blot test. A similar study was conducted among the 4th and 5th year students of Sindh Medical College, Karachi where approximately three-fourths were aware regarding the use of HIV antibody test for diagnosis. They also knew that ELISA, Western Blot, rapid HIV test can be used in testing HIV.

Moving on, a majority in our study knew about condoms as a method to prevent spread of HIV. This result is supported by a study conducted in Ghana amongst senior high school students, where 26.2% of respondents had a history of sexual intercourse. Of those, 51.9% used condoms for coitarche and 41.5% used it regularly. Many different studies were conducted with different percentile of respondents using condoms [8-12]. The popularity condoms have gained among students and its efficacy in preventing HIV transmission is yet controversial, irrespective of religious convictions or without. Moreover, condoms do not provide absolute protection due to its improper use, reuse, inconsistent use, use while intoxicated and manufacturing defects that may lead to its breakage. Hence, condoms should not be considered as a part of protection against HIV transmission.

Also, one of the methods of prevention chosen by the majority students was avoiding multiple sexual partners. According to a study, multi-partner sexual activity is considered one of the highest risk factors for contracting HIV [13]. Thus, counterpart to the reasoning where condoms do not provide absolute protection, use of condoms is actively encouraged since having one sexual partner is not always possible.

Surprisingly, few students from first and second year chose the way of prevention by not talking to HIV positive individuals, which adds to scientific evidence that lack of clinical knowledge and awareness is the root cause among the pre-clinical medical students. This further demonstrates that lack of proper medical education in our society portrays an HIV individual in a derogatory manner that even speaking to them may cause spread of HIV. However, post-clinical students knew that HIV is not transmissible by talking to an HIV positive individual. This is likely due to the clinical knowledge and awareness gained during these years, unlike how the society puts it through. Similarly, some pre-clinical students chose that not sharing space with an HIV positive individual is one of the preventions; this again is due to the lack of knowledge in their pre-clinical years.

More than half believed that AIDS is not curable, and whereas a few believed that it is curable. This, however, depends on how early AIDS has been diagnosed and how consistent an AIDS patient is towards their post exposure prophylaxis. A study was conducted among pre-clinical medical students in a Nigerian university which showed that 95% agreed to the fact that there is no cure for the disease [14]. Regarding the attitudes of medical students towards HIV positive individuals; two-third mentioned that they would continue being friends with an HIV positive individual. This finding is congruent to a study conducted in Ghana, where around 79% of respondents had a positive attitude when asked if they were willing to be around and care for HIV individuals. However, a few had a negative attitude and were not willing to share a cup with HIV positive individual. This attitude was parallel to the findings of Nubed et al. and Akoachere et al. [8, 15].

Furthermore, in our survey, majority of the medical students agreed that an HIV positive student should be allowed to continue his/her studies in school. However, a few participants surprisingly

disagreed to this. This again is due to unfamiliarity to HIV, as according to the U.S. Department of Education, children with AIDS can pursue their education in a regular classroom without any restrictions. There is no evidence of spread of HIV in a school setting [16].

Also, one-fourth of the participants wanted to quarantine their family members, if one of their family members was an HIV positive individual. This is congruent to a study conducted by Fom L, et al. where 23.4% believed that HIV positive individual should be quarantined. This however is not necessary as spread of HIV is not contagious and is instead due to body fluids such as semen and blood [17]. Additionally, when asked about the participants' feelings towards an HIV positive individual, a huge ratio was distributed between compassion and indifferent solicitude, and a few participants surprisingly had hatred towards such an individual. This manifests how orthodox our society and its thought process are, therefore, potentiating existence of such studies. Like any study, our study also had some limitations. First, the fact that only two medical colleges from Karachi were taken in our study, the results cannot be generalized to a broader population. Second, a dialogue regarding controversial topics such as HIV is considered taboo in our society; participants may have chosen a more socially accepted response than the actual intended response. Last, convenience sampling was done to collect data; hence therefore, this may lead to a degree of bias.

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Conflict of interest

None.

REFERENCES

- [1] Sadob AE, Fawole AO, Sadoh WE, et al. Attitude of Health-Care Workers to HIV / AIDS. *Afr J Reprod Health*. 2006; 10 (1), 39-46.
- [2] World Health Organization. HIV/AIDS. 2018. Retrieved from: <https://www.who.int/gho/hiv/en/>. Last accessed February 07, 2020.
- [3] World Health Organization. HIV cases–Pakistan. 2019. Retrieved from: <https://www.who.int/csr/don/03-july-2019-hiv-cases-pakistan/en/>. Last accessed February 07, 2020.
- [4] Ahmed A, Hashmi FK, Khan GM. HIV outbreaks in Pakistan. *Lancet HIV*. 2019; 6 (7), e418.
- [5] Aminde LN, Takah NF, Noubiap JN, et al. Awareness and low uptake of post exposure prophylaxis for HIV among clinical medical students in a high endemicity setting. *BMC Public Health*. 2015; 15, 1104.
- [6] Mehra B, Bhattar S, Bhalla P, et al. HIV/AIDS awareness among VCT clients: a cross-sectional study from Delhi, India. *Biomed Res Int*. 2014; 269404.
- [7] Kuruvila M, Venugopalan PP, Sridhar KS, Kumar P, Rao GS, Kotian S. KAP study on HIV/AIDS among first year MBBS students. *Indian J Dermatol Venereol Leprol*. 1997; 63, 225-8.
- [8] Dzah SM, Tarkang EE, Lutala PM. Knowledge, attitudes and practices regarding HIV/AIDS among senior high school students in Sekondi-Takoradi metropolis, Ghana. *Afr J Prim Health Care Fam Med*. 2019; 11(1), e1-e11.
- [9] Tavooosi A, Zaferani A, Enzevaei A, Tajik P, Ahmadinezhad Z. Knowledge and attitude towards HIV/AIDS among Iranian students. *BMC Public Health*. 2004; 4, 17.
- [10] Shaikh A, Ochani RK. The Need for Sexuality Education in Pakistan. *Cureus*. 2018; 10 (5), e2693.
- [11] Christane NA, Zamba MR, Masika J, Zhang Y, Zhang L. HIV/AIDS prevalence, knowledge, attitudes and related behaviors among young people in Libreville, Gabon. *IOSR J Humanit Soc Sci*. 2014; 19 (1), 59-65.
- [12] Hanavanh B, Harun-Or-Rashid M, Kasuya H, Sakamoto J. Knowledge, attitudes and practices regarding HIV/AIDS among male high school students in Lao People's Democratic Republic. *J Int AIDS Soc*. 2013; 16, 17387.
- [13] Appiah-Agyekum NN, Suapim RH. Knowledge and awareness of HIV/AIDS among high school girls in Ghana. *HIV AIDS. (Auckl)*. 2013; 5, 137-44.
- [14] Unadike BC, Ekrikpo UE, Basse EA. Awareness, knowledge and perception of HIV/AIDS and sexual behaviour amongst pre-clinical, medical students in a Nigerian university. *Niger J Med*. 2012; 21 (3), 272-6.
- [15] Nubed CK, Akoachere J-FTK. Knowledge, attitudes and practices regarding HIV/AIDS among senior secondary school students in Fako Division, South West Region, Cameroon. *BMC Public Health*. 2016; 16 (1), 847.
- [16] U.S. Department of Education Office for Civil Rights. 1991. Retrieved from: <https://www2.ed.gov/about/offices/list/ocr/docs/hq53e9.html>. Last accessed February 07, 2020.
- [17] Ali G, Khanani R, Shaikh MA, Memon AR, Naqvi HN. Knowledge and attitudes of medical students to people with HIV and AIDS. *J Coll Physicians Surg Pak*. 1996; 6 (1), 58-61.