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# Human immunodeficiency virus/ acquired immune deficiency syndrome: A survey on the knowledge, attitude, and practice among medical professionals at a tertiary health-care institution in Uttarakhand, India

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## Abstract:

**INTRODUCTION:** Health-care professionals are trained health-care providers who occupy a potential vanguard position in human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS) prevention programs and the management of AIDS patients. This study was performed to assess HIV/AIDS-related knowledge, attitude, and practice (KAP) and perceptions among health-care professionals at a tertiary health-care institution in Uttarakhand, India, and to identify the target group where more education on HIV is needed.

**MATERIALS AND METHODS:** A cross-sectional KAP survey was conducted among five groups comprising consultants, residents, medical students, laboratory technicians, and nurses. Probability proportional to size sampling was used for generating random samples. Data analysis was performed using charts and tables in Microsoft Excel 2016, and statistical analysis was performed using the Statistical Package for the Social Science software version 20.0.

**RESULTS:** Most participants had incomplete knowledge regarding the various aspects of HIV/AIDS. Attitude in all the study groups was receptive toward people living with HIV/AIDS. Practical application of knowledge was best observed in the clinicians as well as medical students. Poor performance by technicians and nurses was observed in prevention and prophylaxis. All groups were well informed about the National AIDS Control Policy except technicians.

**CONCLUSION:** Poor knowledge about HIV infection, particularly among the young medical students and paramedics, is evidence of the lacunae in the teaching system, which must be kept in mind while formulating teaching programs. As suggested by the respondents, Information Education Communication activities should be improvised making use of print, electronic, and social media along with interactive awareness sessions, regular continuing medical educations, and seminars to ensure good quality of safe modern medical care.

## Keywords:

Acquired immune deficiency syndrome, health-care professionals, human immunodeficiency virus, immunohematology, knowledge, attitude, practice study

## Introduction

Health-care professionals occupy a potential vanguard position in human

immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS) prevention programs and the management of AIDS patients. An important factor

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fuelling the spread of HIV/AIDS in developing countries is believed to be poor knowledge perception, attitude, and practice about how the disease is spread and how it can be prevented. It is a known fact that there is no cure as such for HIV/AIDS and an effective vaccine is still under research phase and clinical trials.

Globally, an estimated 35.3 (32.2–38.8) million people were living with HIV in 2012, an increase from previous years as more people are receiving the life-saving antiretroviral therapy. There were 2.3 million new HIV infections, globally, showing a 33% decline in the number of new infections from 3.4 million in 2001. At the same time, the number of AIDS deaths is also declining with 1.6 million AIDS deaths in 2012, down from 2.3 million in 2005.<sup>[1]</sup>

Although people of any age and gender are susceptible to HIV, young people aged 15–25 years are more at risk of contracting it. According to the World Health Organization (WHO) and the Joint United Nations Program on HIV/AIDS, the youth are much more prone to HIV infection as a result of a lack of correct health information, indulgence in risky behaviors, and lack of access to adequate reproductive health services.<sup>[2]</sup>

An insight into the knowledge, attitude, and practices (KAP) about HIV/AIDS and people living with HIV/AIDS (PLHA) among caregivers including paramedical and medical staff will be of help in formulating a strategy for prevention, control, and improving compliance to treatment.<sup>[3]</sup>

This study was performed to assess the HIV/AIDS-related KAP and perceptions among health-care professionals at a tertiary health-care center in Uttarakhand and identify the target group where more education on HIV is needed.

## Materials and Methods

### Study design, sampling, and procedure

A cross-sectional survey was conducted at a tertiary health-care institution in Uttarakhand (India), among five groups comprising consultants, postgraduate residents, undergraduate medical students (third and final year), laboratory technicians, and nursing staff. Anonymity was maintained within the study groups. Probability proportional to size sampling (Cochran's formula) was used for generating random sample from the total approximate population [Table 1].

The study protocol was approved by the Research Committee and Ethical Clearance was obtained from the Ethics Committee, Himalayan Institute of Medical Sciences.

**Table 1: Sample selection**

	Total approximate population	Selected sample
MBBS	550	171
PG	210	66
Consultants	115	36
Staff nurse	300	96
Laboratory technicians	50	16
Total	1225	385

### Calculation of sample size (Cochran's formula)

$$n = \frac{Z_{\alpha/2}^2 p \cdot q}{d^2} = \frac{(1.96)^2 (0.5)(0.5)}{(0.05)^2} = \sim 384$$

Where Z = abscissa of normal distribution curve that cuts off an area  $\alpha$  at tails

= 1.96 with 95% confidence interval ( $\alpha$  = alpha level of tails = 5%)

$p$  = Estimated proportion of population = 50%

$q$  = 100 –  $P$  = 50%

$d$  = Acceptable margin of error = 0.05.

Before data collection, the respondents were briefed about the technical terminologies used in the questionnaire and were given guidance on how to fill out the form. To evaluate knowledge and attitude of the respondents, they were asked to answer "yes," "no," or "not sure" to every KAP-related question. Open-ended suggestion and opinion-based questions were also included in the study.

The respondents were informed about the purpose of the study and were assured that their responses would be treated confidentially. Respondents were also informed that their participation was entirely voluntary and that they were free to decline to answer any question that made them feel uncomfortable. Written informed consent was obtained from all of the participants.

### Questionnaire

The aim of the questionnaire was to obtain information on the level of HIV/AIDS-related KAPs of the respondents, in which awareness and knowledge of HIV infection manifestation and health-care practices were included in the study. The questionnaire was developed in English based on the WHO Family Health International 2000, HIV/AIDS/sexually transmitted disease (STD), Behavioral Surveillance Survey (BSS 2000) for adults,<sup>[4]</sup> National AIDS Control Organization, and National BSS 2006.<sup>[5]</sup> The questionnaire was pretested and validated in each group and customized as required.

The final questionnaire included 30 questions of which 16 were knowledge-related questions such as mode of transmission, parent-to-child transmission, prevention, and control of HIV/AIDS. Three questions on attitudes toward people living with HIV and HIV stigma were asked, which again included both positively and negatively framed questions. Eight questions on practices related to HIV/AIDS included sample handling, HIV testing, use of condom, and pre- and post-exposure prophylaxis. There were three open-ended questions on National AIDS Control Policy and suggestions for improvement in the current Information Education Communication (IEC) practices for both medical professionals and the general public.

The questions were arranged in no specific order and included both positively and negatively framed questions to assess the knowledge, as well as their misperceptions, about HIV/AIDS.

### Statistical analysis

Data analysis was performed using charts and tables in Microsoft Excel 2016 and exported to Statistical Package for the Social Science® (SPSS) for Mac version 20.0 software (SPSS Inc., Illinois, USA) for further analysis. Numbers and percentages were used to present categorical data. Mean ( $\pm$  standard deviation, [SD])

was used for normally distributed continuous data, and median (interquartile range) for nonnormal continuous data was calculated.

## Results

- Participants included consultants ( $n = 36$ ), postgraduate residents ( $n=66$ ), undergraduate medical students ( $n = 171$ ), laboratory technicians ( $n = 16$ ), and nursing staff ( $n = 96$ ). The response was 100% ( $n = 385$ )
- Out of the 36 consultants, 22 were from clinical departments and 14 from nonclinical departments which included pathology, microbiology, and biochemistry
- Out of the 66 residents, 32 were from clinical departments and 34 from nonclinical departments which included pathology, microbiology, and biochemistry
- MBBS undergraduate students included 54.4% female and 45.6% male
- Percentage of correct responses for questions on KAP is shown in Tables 2-4
- The mean for KAP was 73.10 (SD = 23.40), 79 (SD = 14.87), and 61.76 (SD = 28.76) with a median of 80, 82, and 70, respectively
- As far as knowledge was concerned all the study groups

**Table 2: Questions based on knowledge (percentage of correct responses)**

Questions	Technicians	Nurses	MBBS	PG	Consultants
1. HIV is killed by bleach	82	88	50	82	94
2. Spread by mosquitoes	18	16	8	80	96
3. Infection on getting a tattoo/piercing	84	60	90	88	94
4. All pregnant women infected with HIV will have babies born with AIDS	18	70	4	56	92
5. HIV patient can look and feel healthy	82	82	67	78	94
6. A person can be infected with HIV for 5 years or more without getting AIDS	60	80	62	82	88
7. Availability of HIV Vaccine	80	90	64	66	70
8. Transmission by kissing	56	68	22	64	70
9. Transmission by donating blood	58	60	80	50	66
10. Promiscuity	94	96	98	86	100
11. Transmission of HIV through breastfeeding	72	80	86	72	88
12. Transmission through blood transfusion of unscreened blood and blood products	96	76	98	84	94
13. Transmission through infected needles	80	98	90	88	100
14. Confidentiality of HIV testing	86	76	88	86	94
15. ICTC services	96	92	84	76	100
16. PPTCT	38	60	86	65	78

ICTC = Integrated Counseling and Testing Center, PPTCT = Prevention of Parent-to-Child Transmission, HIV = Human immunodeficiency virus

**Table 3: Questions based on attitude (percentage of positive responses)**

Questions	Technicians	Nurses	MBBS	PG	Consultants
1. If a worker has HIV but is not sick, should he or she be allowed to continue working?	64	78	50	82	94
2. If you knew a shopkeeper or food seller had HIV, would you buy food from them?	80	86	92	58	94
3. Would you be willing to share a meal with a person you knew had HIV or AIDS?	96	92	64	67	88

HIV = Human immunodeficiency virus

differed significantly as shown in Figure 1a along with  $F(4,75) = 3.23061, P < 0.05$

- Figure 1b shows that the consultants (mean = 92) and nurses (mean = 85.33) had more positive attitudes than the other groups; however, the attitude of all the study groups was altogether receptive toward PLHA with  $F(4,10) = 1.6962, P < 0.05$
- As shown in Figure 1c, practice was best seen among the postgraduate residents (mean = 72.67) and consultants (mean = 72.22) and was nearly satisfactory in the remaining groups  $F(4,75) = 1.06857, P < 0.05$ .

### Discussion

All the participants had incomplete knowledge regarding the various aspects on HIV/AIDS though the clinicians possessed relatively better knowledge in comparison to the other groups. In context to the social stigma, the attitude of all the study groups was receptive toward PLHA. Practical application of knowledge was best observed in the budding postgraduate residents and clinicians. The technicians and nursing staff performed poorly as far as prevention and prophylaxis were concerned; however, the undergraduate and postgraduate medical students were better informed in contrast to the consultants. Almost all the groups were aware of the location of Integrated Counseling and Testing Centers and services offered at our facility. The technicians had poor knowledge about the National AIDS Control Program versus undergraduate and postgraduate medical students and clinicians.

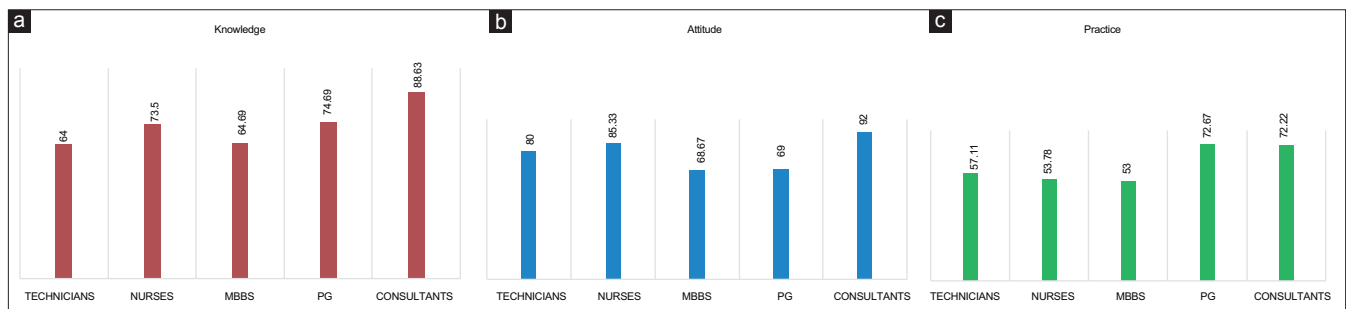
A study evaluating the existing level of knowledge about AIDS among 171 females and males joining medical college revealed that the average knowledge regarding AIDS transmission was found to be significantly higher in males ( $z = 2.247, P < 0.05$ ). Knowledge regarding prevention was also significantly higher in males ( $z = 4.2115, P < 0.001$ ). Students had misconceptions regarding mode of transmission, prognosis, and prevention. Hence, they concluded that awareness programs should be initiated among MBBS students in the 1<sup>st</sup> year itself to rectify lacunae in the education system.<sup>[3]</sup>

A questionnaire survey conducted by Adelekan *et al.*, in 1993, among 111 doctors, 92 nurses, and 53 nonhealth workers at the University of Ilorin Teaching Hospital, Ilorin, Nigeria, to assess the knowledge of AIDS of all groups and the attitude of only health workers toward the care of patients with AIDS. Concordant with our results, important gaps in knowledge were found in all groups, doctors performed significantly better than nurses and nonhealth workers. About one in three nurses would hesitate to nurse a PLHA while half would not participate in birth delivery. Furthermore, about one-quarter of doctors would hesitate to treat a PLHA while one in three would not carry out surgery despite adequate precautions. The findings compare favorably with those reported from other countries. They expressed the need for a comprehensive AIDS education package to improve the knowledge base and allay fears for all groups and to prepare health workers for the important task of caring for PLHA.<sup>[6]</sup>

**Table 4: Questions based on practice (percentage of correct responses)**

Questions	Technicians	Nurses	MBBS	PG	Consultants
1. Use of latex condom	70	42	90	86	96
2. HIV testing	56	36	18	36	10
3. Sample handling	94	84	42	82	94
4. Consent for HIV testing	98	90	90	90	94
5. Administration of PEP	18	14	20	56	32
6. Duration of antiretroviral therapy in PEP	32	30	16	56	82
7. Effectiveness of PEP	24	44	41	74	94
8. Pre-exposure prophylaxis	36	68	72	88	54

HIV = Human immunodeficiency virus, PEP = Postexposure prophylaxis



**Figure 1: (a-c) Percentages of correct responses to Knowledge, Attitude and Practice based questions**



Pita-Fernández *et al.* conducted a survey to determine the attitudes of health personnel staff concerning HIV/AIDS in a Spanish hospital. Participants included 315 nurses and 115 auxiliary staff. The response was 74.9% ( $n = 430$ ). The mean for the attitudes' questionnaire was 79.7 (SD = 10.9), with a median of 80. The nurses had more positive attitudes than the auxiliary workers (80.9 vs. 76.5;  $t = 3.712$ ;  $P < 001$ ). Twenty percent ( $n = 63$ ) of the nurses and 37.4% ( $n = 43$ ) of the auxiliary workers ( $P < 0.001$ ) reported a negative attitude. After a logistic regression analysis adjusting for age, sex, and occupations, the authors found that age and occupation were the variables with an independent effect on attitudes toward HIV.<sup>[7]</sup>

Meena *et al.* studied the KAP about HIV in 102 HIV patients, sixty caregivers of HIV/AIDS patients and non-HIV patients, and forty controls from the general population in Northeastern India. Their findings showed that electronic media and print media were major sources of information to all the study groups, concordant with our study. Nearly 35.3% patients, 22.9% caregivers, and 47.5% general population group thought that with medication, HIV is curable and use of condom was the most important preventive measure. They concluded that understanding the KAP about HIV/AIDS of patients, caregivers, and in general populations will be helpful in formulating a strategy for prevention and treatment.<sup>[8]</sup>

The results of various studies conducted in India among medical undergraduates showed correct knowledge about the causative agent and modes of disease transmission. They had a good knowledge about availability of diagnostic tests. Misconceptions about transmission were also prevailing in the students. Most studies recommended the need for development and organization of HIV/AIDS training sessions at regular intervals from high school level to inception of medical curriculum.<sup>[9-11]</sup> Similar results were observed in studies conducted abroad.<sup>[12-14]</sup>

In a study conducted by Brijmohan and Vashist among nursing students in India, they found that 10% of nursing students reported vaccine availability to prevent HIV. Similar responses were also observed in nursing students in Southwestern Nigeria.<sup>[15,16]</sup>

Misconceptions about transmission of HIV/AIDS were also prevalent in our study such as mosquitoes as vectors, sharing utensils, and by kissing. This was seen in other studies and needs to be addressed during medical trainings.<sup>[17,18]</sup> Most nursing students and technicians in our study had awareness related to the different preventive approaches and mode of transmission.

A recent study conducted by Biradar *et al.*, in 2016, among MBBS students emphasized on the role of media and IEC activities to spread awareness among general population. They also concluded that these measures will help reduce the misconceptions and indifferent attitude toward the HIV-infected patients.<sup>[10]</sup>

## Conclusion

The present study is the first of its kind analyzing five groups of medical professionals. Hence, it was possible to identify exactly where the lacunae in the education system lie. This was evident through incomplete knowledge about HIV infection, particularly among the young medical students. These deficiencies influence their behavior later, thus exposing them to the risk of transmission while working in health care settings.

In a nutshell, better-structured education targeted to all health-care professionals working in both rural and urban hospital settings apart from classroom teaching, in the form of health talks/seminars, in-service training, continuing medical education, quiz, and debates would not only improve the HIV/AIDS knowledge for health-care providers most efficiently and effectively but also end the HIV/AIDS epidemic.

For the general public, exploitation of print and electronic media was suggested along with street plays and grass-root level health education drives. It was also suggested by the participants that the social stigma and discrimination for STD be dissolved so as to propagate open-mindedness, positivity, healthy discussion, and application of knowledge pertaining to them.

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## Conflicts of interest

There are no conflicts of interest.

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