

ABSTRACT

Introduction: Biomedical HIV prevention methods are crucial in reducing new infections and achieving the goal of ending AIDS by 2030. Medical students, as future healthcare providers, play an important role in implementing these preventive measures. Biomedical HIV prevention technologies include antiretroviral Treatment as Prevention, Pre-Exposure Prophylaxis (PrEP) and Post Exposure Prophylaxis (PEP) as medical treatment, male and female condoms as barrier methods and medical male circumcision as procedures.

Objectives: The study aimed to describe knowledge, attitudes and perceptions regarding biomedical HIV prevention techniques among final year medical students at government universities in Colombo districts

Methods: A descriptive cross-sectional study was conducted among 202 final-year medical students from the Faculties of Medicine, University of Colombo and University of Sri Jayewardenepura. Participants were selected through random sampling, and data were collected using a validated, structured, self-administered questionnaire. Data was analyzed using SPSS version 22. Descriptive statistics summarized key variables, while Chi-square and t-tests assessed associations between demographic factors and knowledge/attitudes. A significance level of $p < 0.05$ was used.

Results: The response rate for the study was 100%. Most study participants were female. A total of 202 final-year medical students participated. Of these, 54.5% demonstrated good knowledge regarding biomedical HIV prevention techniques, while 45.5% exhibited poor knowledge. Participants were most knowledgeable about post-exposure prophylaxis (PEP), with 92.6% correctly identifying it as a prevention method after

occupational, sexual, or non-occupational exposures. Awareness of condom use as a barrier method for HIV prevention was also high (81.2%). However, knowledge of pre-exposure prophylaxis (PrEP) was comparatively low, with only 53.5% understanding that it can be taken daily or event-driven before potential risk exposure.

In terms of attitudes, 52.5% of participants had favorable attitudes toward biomedical HIV prevention techniques, while 47.5% exhibited unfavorable attitudes. Positive attitudes were most apparent regarding condom use, where 95.5% agreed that consistent and correct use can prevent HIV transmission, but less so for treatment as prevention (mean score: 69.60%). Barriers to promoting HIV prevention techniques included lack of education (97.5%), social stigma (92.6%), and misconceptions regarding condom use (78.2%).

Gender was significantly associated with knowledge levels, with male students demonstrating better knowledge than female students (72.0% vs. 39.4%, $p < 0.0001$). Ethnicity also played a role, as non-Sinhala students were more likely to have good knowledge compared to Sinhala students (68.3% vs. 50.9%, $p = 0.046$). Additionally, students residing in Colombo showed significantly higher knowledge levels (70.5%) compared to those from outside Colombo (40.2%, $p < 0.0001$). Awareness of PrEP was another strong determinant of knowledge; 62.4% of participants who had heard of PrEP exhibited good knowledge, compared to only 6.9% among those unaware ($p < 0.0001$). Attitudes were significantly associated with the university attended and the age of participants. Students from the University of Colombo displayed more favorable attitudes (59.1%) compared to those from the University of Sri Jayewardenepura (43.7%, $p = 0.029$). Students older than 25 years demonstrated significantly better attitudes (62.1%) compared to their younger students. (45.2%, $p = 0.018$).

Conclusion and recommendation: Despite being future frontline healthcare providers, many final-year medical students demonstrated inadequate knowledge and mixed attitudes toward biomedical HIV prevention. Strengthening the undergraduate curriculum by integrating comprehensive, practical HIV prevention training particularly on PrEP, TasP, and stigma reduction, is recommended to better prepare medical graduates for effective HIV prevention service delivery.

Key words: HIV, biomedical prevention method, medical students, Pre-exposure prophylaxis, post-exposure prophylaxis