

ORIGINAL ARTICLES

KNOWLEDGE ABOUT HIV PREVENTION AND ATTITUDE TOWARDS PEOPLE LIVING WITH HIV/AIDS OF FOREIGN STUDENTS FROM THE MEDICAL UNIVERSITY OF VARNA, BULGARIA

Miglena Kolarova-Dimitrova¹, Hikaru Iwata¹, Militsa Dimitrova²

¹*Department of Hygiene and Epidemiology, Faculty of Public Health,
Medical University of Varna, Bulgaria*

²*Student, Faculty of Medicine, Medical University of Varna, Bulgaria*

ABSTRACT

INTRODUCTION: Medical students, future physicians of people living with HIV/AIDS (PLHIV), are a key group to whom targeted knowledge and adequate training should be directed in order to provide patient care without prejudice.

AIM: The aim of this article is to evaluate the knowledge about prevention, diagnosis, treatment of HIV and the attitude towards sexually transmitted diseases (STDs) among medical students at the Medical University of Varna, Bulgaria.

MATERIALS AND METHODS: A total of 100 students were surveyed using anonymous questionnaire. The data were entered in Microsoft Excel and processed for the needs of the study with a documentary, statistical, and graphical method.

RESULTS: The analysis shows that according to the survey >90% of students believe the early diagnosis/treatment increases the life expectancy of PLHIV, 78% chose Treatment can reduce the chance of HIV transmission, 94% can work/study with an HIV infected individual, 74% would not cut off their contacts with PLHIV, and 78% are not afraid to serve HIV-seropositive patients. However, 15% are not sure and 9% would do so only after a negative HIV test. These doubts are also confirmed in the opinion about the need to test for HIV all who seek medical care according to 67%, and only those subject to hospitalization according to 31%.

CONCLUSION: According to the survey, students have correct knowledge about HIV prevention and a positive attitude towards PLHIV, but there are also some negative attitudes. Increasing HIV knowledge is an effective behavioral intervention in a variety of contexts. Universities are of utmost importance in achieving this goal.

Keywords: HIV, medical students, knowledge, attitude, prevention

Address for correspondence:

Miglena Kolarova-Dimitrova
Faculty of Public Health
Medical University of Varna
55 Marin Drinov St
9002 Varna, Bulgaria
e-mail: megank@abv.bg

Received: November 3, 2024

Accepted: December 19, 2024

INTRODUCTION

We are entering the 5th decade of the HIV epidemic, and although there is no cure, critical advances in treatment, prevention, and diagnosis have been made, transforming the human immunodeficiency virus (HIV) into a chronic, manageable disease (1).

HIV is different from many other diseases. Finding out that one has HIV presents complex phys-

ical, emotional, social, and legal concerns that do not arise when one is tested for other conditions, including other communicable diseases.

Patients with HIV are subject to long-term management and a complex care process. They are clinically, socially, and emotionally vulnerable and face many challenges (2).

The stigmatizing attitude towards people living with HIV/AIDS (PLWHA) can be a major barrier to effective patient care. As future physicians, medical students represent a core group that should be targeted with focused knowledge and adequate training to provide patient care without prejudice (3). In this regard, the knowledge and attitudes of medical students related to the comprehensive care of people living with HIV/AIDS (PLHIV) is an important component in the overall strategy for prevention and control of the disease.

Advances in treatment have dramatically changed the lives of many people living with HIV, but societal understanding and acceptance have not improved at the same rate. HIV stigma and discrimination continue to exist, both in health care settings and in society, and are a major obstacle to an effective global HIV response (3).

Medical students play an important role in national HIV/AIDS prevention strategies. As future physicians, people living with HIV/AIDS (PLHIV) are a key group to which targeted knowledge and adequate training must be directed in order to provide patient care without prejudice (3).

MATERIALS AND METHODS

A documentary method was used for analyzing the content of scientific articles from periodic medical publications and specialized editions. Sociological and statistical methods were employed during the research process.

This descriptive-analytical study was conducted among students from the English language program at the Medical University of Varna. Knowledge and attitudes toward HIV were assessed using a self-developed questionnaire. The questionnaire was designed through a literature review on HIV/AIDS using keywords such as HIV, medical students, knowledge, attitudes, and prevention. The target group comprised fifth- and sixth-year students at the Medical University of Varna. A total of 100 students

(n=100), or 30% of the students from the fifth and sixth years, were surveyed on a voluntary basis. The survey was conducted online via Google Forms and was distributed by email. The questionnaire consisted of three parts. The first part included demographic characteristics such as age and gender. The second part consisted of 10 questions about HIV prevention, diagnosis, and treatment. The third part contained 12 questions regarding attitudes toward people living with HIV/AIDS. Participants were divided into three age groups. The survey results were analyzed using Microsoft Excel. The percentage of positive responses for each question was calculated, and the results were presented in tables. Descriptive analyses were conducted for the participants' demographic characteristics.

RESULTS

The survey was conducted from May to June 2024. Among the respondents, women predominated at a ratio of 2:1. The largest proportion of respondents was in the 19–24 age group (53%), which aligns with the demographic characteristic of the most affected age group among young people (Table 1). Globally, students fall within the age group with the highest percentage of new HIV infections (5,6). Foreign students represented a heterogeneous population from various countries (Cyprus, Germany, Ukraine, Spain, North Macedonia, India, Jordan, Afghanistan, Iran, Turkey, England), religions, and diverse epidemiological, health, and behavioral characteristics. Differences exist regarding national characteristics, health culture, habits, and behavior. The epidemiological situation for HIV varies and remains unstable in different countries. In the study, the majority of participants were from Europe (87%), while 13% were from Asia.

Although most participants (60–90%) provided definitive answers regarding well-known preventive measures, a small percentage hesitated in their responses. Most participants knew that PLHIV could not be identified by their appearance (89%) and that HIV testing is the only diagnostic measure (61%). Ninety-two percent of respondents were certain that using condoms reduces the chance of HIV transmission. Most participants were aware that having multiple sexual partners and sexually transmitted infections (STIs) could increase the risk of a HIV infec-

Table 1. Sociodemographic characteristics of the respondents.

Number of Respondents/ Relative %	Sociodemographic Indicators n (%)
n (%)	Gender
62	females
38	male
n (%)	Age
53	19–24
45	25–29
2	> 30

tion (64%). Participants' knowledge about HIV prevention was heterogeneous: 8% believed that a vaccine against HIV exists, and 7% thought AIDS is a curable condition. More than two-thirds (78%) of participants knew that antiretroviral therapy could reduce the chance of HIV transmission. Ninety percent were aware that early diagnosis and treatment increase the life expectancy of PLHIV.

We also tried to analyze attitudes towards PLHIV/AIDS (Table 3).

Overall, respondents' attitudes toward PLHIV were positive. This high level of positive attitude is attributed to a better understanding of HIV. However, some uncertainties in responses still require greater

Table 2. Knowledge of HIV prevention, diagnosis, and treatment.

Knowledge of HIV Prevention, Diagnosis, and Treatment	n (%)
1. One can identify PLHIV by their appearance	11
2. Treatment can reduce the chance of transmitting HIV	78
3. Early diagnosis/treatment increases the life expectancy of PLHIV	90
4. A blood test is the only sure diagnosis of HIV infection	61
5. There is a cure for AIDS	7
6. Condom use reduces the likelihood of HIV transmission	92
7. PLHIV can lead normal lives by following a healthy diet and lifestyle and accepting their treatments	69
8. There is a vaccine that prevents AIDS	8
9. Having multiple sexual partners increases the chance of contracting HIV	92
10. The presence of sexually transmitted diseases (e.g., genital ulcers) increases the likelihood of HIV infection	64

Table 3. Attitudes toward PLHIV.

Attitude Towards PLHIV	n (%)
1. I can work/study with an HIV-infected colleague/classmate	94
2. HIV is not a punishment for past sins and immorality	81
3. Quarantine of PLHIV is not the best way to prevent HIV	72
4. We should not avoid/stay away from family with HIV-infected member	91
5. PLHIV should be supported and treated	90
6. PLHIV do not like to infect others	62
7. Kissing or hugging people living with HIV is not a problem	71
8. I prefer not to interrupt my contacts with HIV	74
9. PLHIV do not bring disgrace and shame to their family	80
10. I can start a family with HIV	33
11. AIDS is not only a problem of people who inject drugs and people with unbridled sexual practices (e.g., women working in prostitution)	81
12. If I contract HIV, my life is not over	72

emphasis in the curriculum. This is also highlighted in many other studies (7,8,9,10).

More than half of the participants rejected misconceptions such as considering HIV as just punishment for past sins (81.0%) or isolating PLHIV as the best preventive measure against HIV (72.0%). Ninety percent of participants believed that PLHIV should be supported and receive treatment, and 71.0% dismissed feelings of disgust when thinking about kissing or hugging PLHIV. However, only 33% agreed to live with PLHIV. About two-thirds (81.0%) of participants declared that AIDS is not limited to high-risk groups—drug users, homosexuals, or sex workers—and 74.0% stated they would not cut ties with PLHIV. Seventy-two percent rejected feelings of despair in the event of a positive HIV test. These results are supported by similar studies among students in Iran in 2013 (11).

Contrary to the declared positive attitude toward PLHIV, there was some concern about treating an HIV-positive patient. Two-thirds were willing to treat an HIV-positive patient (78%), 15% were hesitant, and 9% agreed only if an HIV test had been conducted beforehand. This coincides with the study by Ahmad Z, 2017 (12), revealing nuances of stigma expressed as fear that HIV-positive patients pose a threat to their health.

Out of all participating students from the English language programs, 67% believed HIV testing should be mandatory for anyone seeking medical assistance, and 33% believed it should be mandatory for anyone admitted to a hospital. These results align with another study among students in the Bulgarian language program, where 80% supported mandatory HIV testing for all hospital patients. Insufficient knowledge, negative attitudes toward PLHIV, and risky practices are associated with the spread of HIV infection (13). This is also reflected in our students' responses to the question, "Would you work with HIV-positive patients?". Seventy-eight percent responded with "Yes, 15% expressed uncertainty (9 women and 6 men), and 1 male respondent answered "No". Additionally, 7 women and 2 men considered it an option only after presenting an HIV test result.

DISCUSSION

Most similar studies are heterogeneous. Our results differ from others, such as Al-Rabeei NA, Dal-

lak AM, Al-Awadi FG, which reveal positive attitudes toward PLHIV (68.7%), but also misconceptions and prejudices with significant stigmatization (31.3%), reluctance to share a room with someone infected with HIV (27.7%), and unwillingness to work with PLHIV (23.8%). Similar attitude issues were found among youth from other developing countries in the Islamic Republic of Iran, India, and China. These findings are consistent with a study conducted in Tunisia (14).

There is a contradiction between the need for HIV testing and the reliability of the obtained results (15). In 2006, the U.S. Centers for Disease Control and Prevention issued recommendations supporting routine HIV testing in healthcare facilities for all individuals aged 13 to 64 years (16). In April 2013, the U.S. Preventive Services Task Force (USPSTF) published a recommendation for routine testing of all adolescents and adults aged 15 to 65 years. Despite these recommendations, physicians do not routinely offer HIV testing (17, 18). In Bulgaria, routine HIV screening has not been widely adopted, and specific informed consent is required for HIV testing. Requirements for informed consent have been identified as a significant barrier to adopting routine HIV screening (19).

No correlation with gender was established due to the disproportionate distribution of participants, with women being the leading group. Early HIV diagnosis enables infected individuals to start life-saving antiretroviral therapy, preventing HIV-related morbidity and mortality. Early diagnosis and treatment can also reduce the risk of transmission by 96% by lowering the viral load of the infected individual. However, patients might prefer uncertainty over confronting the psychosocial consequences of an HIV-positive diagnosis, particularly given the potential stigma associated with such a diagnosis, fear of immoral behavior by healthcare workers, and other barriers to accessing prevention, care, and treatment services (20).

According to a 2014 study among primary care physicians in Houston, 35.4% believed their patients would refuse an HIV test, and 16.6% thought patients would feel offended if offered an HIV test (21). Additionally, a 2008 study among Indian Health Service doctors and nurses found that 29.3% believed an HIV-positive result would lead to rejection by the lo-

cal community, while 43.0% believed maintaining confidentiality related to HIV would be challenging. The study also found that pre-test counseling would take “valuable minutes from primary care” and require financial resources to support staff conducting routine tests (22).

The likelihood of inaccurate HIV test results is considered very low. Inaccuracies are possible when potential exposure to HIV occurred recently, and the window period (the time from infection to positive results) was not adhered to or was overlooked by medical professionals. Therefore, the test should be repeated after specific intervals, such as the 1st, 3rd, and 6th months. Regardless of the result, every patient should be considered a potential carrier of bloodborne pathogens (23).

Young people aged 18–24 are a key demographic target for eliminating HIV transmission globally. Final-year medical students were chosen because they are nearing the completion of their medical program, providing a good indication of knowledge about HIV and attitudes toward PLHIV.

The HIV pandemic is an ongoing reality. The study is limited in scope and does not claim to provide comprehensive, reliable, or representative results. However, the findings can be used for health promotion and developing programs to address existing hesitations among students.

CONCLUSION

Our study re-emphasizes findings on the importance of education as a social vaccine to address the HIV epidemic. According to the survey, students mostly have correct knowledge about HIV prevention and a positive attitude towards HIV/AIDS, but there are also negative attitudes. Behavioral changes and appropriate education provide a strong foundation for prevention in a variety of contexts. Raising HIV awareness can be vital to achieving HIV elimination by 2030, a target set by UNAIDS (24). Increasing knowledge about HIV is an effective behavioral intervention for prevention and thus contributes to addressing the stigma. Universities are of utmost importance in achieving this goal.

REFERENCE

1. Balogun K, Slev PR. Towards achieving the end of the HIV epidemic: Advances, challenges and scaling-up strategies. *Clin Biochem*. 2023 Jul;117:53–59. doi: 10.1016/j.clinbiochem.2022.05.006.
2. Bouabida K, Chaves BG, Anane E. Challenges and barriers to HIV care engagement and care cascade: viewpoint. *Front Reprod Health*. 2023 Jul 20;5:1201087. doi: 10.3389/frph.2023.1201087.
3. Sallam M, Alabbadi AM, Abdel-Razeq S, Battah K, Malkawi L, Al-Abbadi MA, et al. HIV Knowledge and Stigmatizing Attitude towards People Living with HIV/AIDS among Medical Students in Jordan. *Int J Environ Res Public Health*. 2022 Jan 10;19(2):745. doi: 10.3390/ijerph19020745.
4. Rathbone A, Cartwright N, Cummings L, et al Exploring young people’s attitudes to HIV prevention medication (PrEP) in England: a qualitative study. *BMJ Open*. 2024;14:e077733. doi: 10.1136/bmjopen-2023-077733.
5. Shankar PR, Subish P, Paudel R, Alam K. Perception and knowledge about HIV/AIDS among students in a medical college in western Nepal. *SAARC J Tuber Lung Dis HIV/AIDS*. 2009;6(2):11–6. doi: 10.3126/saarctb.v6i2.3052.
6. Lewis JE, Malow RM, Ireland SJ. HIV/AIDS Risk in heterosexual college students - a review of a decade of literature. *J Am Coll Health*. 1997;45(4):147–58. doi: 10.1080/07448481.1997.9936875.
7. Pickles D, King L, Belan I. Attitudes of nursing students towards caring for people with HIV/AIDS: thematic literature review. *J Adv Nurs*. 2009 Nov;65(11):2262–73. doi: 10.1111/j.1365-2648.2009.05128.x.
8. Álvarez-Serrano MA, Martínez-García E, Martín-Salvador A, Gázquez-López M, Pozo-Cano MD, Caparrós-González RA, et al. Spanish Nursing Students’ Attitudes toward People Living with HIV/AIDS: A Cross-Sectional Survey. *Int J Environ Res Public Health*. 2020 Nov 22;17(22):8672. doi: 10.3390/ijerph17228672.
9. Li H, Wu Q, Gao E, Zhang Y, Yin D. HIV/AIDS-related knowledge and attitudes toward people living with HIV among college students in Xuzhou, Jiangsu Province, China: a cross-sectional survey. *Front Public Health*. 2024 Oct 10;12:1398980. doi: 10.3389/fpubh.2024.1398980.
10. Qin S, Qin J, Su Q, Huang T, Zhan J, Yang X, et al. HIV knowledge, sexual attitudes, and PrEP-Eligible behaviors among college students in Southwest China: a cross-sectional study. *BMC In-*

- fect Dis. 2024 Aug 14;24(1):827. doi: 10.1186/s12879-024-09657-7.
11. Shokoohi M, Karamouzian M, Mirzazadeh A, Haghdoost A, Rafierad AA, Sedaghat A, et al. HIV Knowledge, Attitudes, and Practices of Young People in Iran: Findings of a National Population-Based Survey in 2013. *PLoS One*. 2016 Sep 14;11(9):e0161849. doi: 10.1371/journal.pone.0161849.
12. Ahmad Z, Sadiq S, Asghar M, Khan AR, Arif O, Shah SH, et al. Comparison of Knowledge, Attitudes, and Practices of Educated and Uneducated Adults Regarding Human Immunodeficiency Virus in Karachi, Pakistan. *Cureus*. 2017 Jun 12;9(6):e1338. doi: 10.7759/cureus.1338.
13. Mereu A, Liori A, Fadda L, Puddu M, Chessa L, Contu P, et al. What do young people know about HIV? Results of a cross sectional study on 18-24-year-old students. *J Prev Med Hyg*. 2022 Dec 31;63(4):E541-8. doi: 10.15167/2421-4248/jpmh2022.63.4.2555.
14. Al-Rabeei NA, Dallak AM, Al-Awadi FG. Knowledge, attitude and beliefs towards HIV/AIDS among students of health institutes in Sana'a city. *East Mediterr. Health J*. 2012;18(3):212-26. doi: 10.26719/2012.18.3.221.
15. Govender K, Durevall D, Cowden RG, et al. Depression symptoms, HIV testing, linkage to ART, and viral suppression among women in a high HIV burden district in KwaZulu-Natal, South Africa: A cross-sectional household study. *J Health Psychol*. 2022 Mar;27(4):936-45. doi: 10.1177/1359105320982042.
16. Moyer VA; U.S. Preventive Services Task Force*. Screening for HIV: U.S. Preventive Services Task Force Recommendation Statement. *Ann Intern Med*. 2013 Jul 2;159(1):51-60. doi: 10.7326/0003-4819-159-1-201307020-00645.
17. Zheng MY, Suneja A, Chou AL, Arya M. Physician barriers to successful implementation of US Preventive Services Task Force routine HIV testing recommendations. *J Int Assoc Provid AIDS Care*. 2014 May-Jun;13(3):200-5. doi: 10.1177/2325957413514276.
18. National Program for Prevention and Control of HIV and Sexually Transmitted Infections in the Republic of Bulgaria, 2021–2025. (in Bulgarian).
19. Burke RC, Sepkowitz KA, Bernstein KT, Karpatti AM, Myers JE, Tsoi BW, et al. Why don't physicians test for HIV? A review of the US literature. *AIDS*. 2007 Jul 31;21(12):1617-24. doi: 10.1097/QAD.0b013e32823f91ff.
20. Baumann KE, Hemmige V, Kallen MA, Street RL, Giordano TP, Arya M. Whether Patients Want It or Not, Physician Recommendations Will Convince Them to Accept HIV Testing. *J Int Assoc Provid AIDS Care*. 2018 Jan-Dec;17:2325957417752258. doi: 10.1177/2325957417752258.
21. Privette AR, Ferguson PL, Olsen J, Gay S, Richey LE. "That Can't Be!": Perceptions of HIV and Hepatitis C Screening during Admission to an Acute Care Surgery Service. *J Emerg Trauma Shock*. 2019 Jul-Sep;12(3):185-191. doi: 10.4103/JETS.JETS_103_18.
22. Kermode M, Holmes W, Langkham B, Thomas MS, Gifford S. HIV-related knowledge, attitudes and risk perception amongst nurses, doctors and other healthcare workers in rural India. *Indian J Med Res*. 2005 Sep;122(3):258-64. PMID: 16251785.
23. Korthuis PT, Berkenblit GV, Sullivan LE, Cofrancesco J Jr, Cook RL, Bass M, et al. General internists' beliefs, behaviors, and perceived barriers to routine HIV screening in primary care. *AIDS Educ Prev*. 2011 Jun;23(3 Suppl):70-83. doi: 10.1521/aeap.2011.23.3_suppl.70.
24. UNAIDS. New report from UNAIDS shows that AIDS can be ended by 2030 and outlines the path to get there [Internet]. www.unaids.org. 2023. Available from: <https://www.unaids.org/en/resources/presscentre/press-releaseandstatementarchive/2023/july/unaids-global-aids-update>