Journal of Medical and oral biosciences
ISSN (Online): 3007-9551
ISSN (Print): 3007-9543

JMOB
Open Access DOAJ

Type: Research article
published: 30/ 08/2024

Knowledge and attitudes toward HIV/AIDS in a sample of Iraqi population

Ali Hafedh Abbas *[1], Fadhil Hussein Alwan [2], Dunya Fareed Salloom [3]

[1] Tropical-Biological Research Unit, College of Science, University of Baghdad. Email: ali_habbas@sc.uobaghdad.edu.iq. https://orcid.org/0000-0001-5314-3193
[2] MD Infectious Diseases, Baghdad Arusafa Directorate/ AIDS Control Center. Email: fadhilhussein960@gmail.com.
[3] Biology Department, College of Science, University of Baghdad Email: dunyascience@sc.uobaghdad.edu.iq, https://orcid.org/0000-0003-0379-1584

OPEN ACCESS

ARTICLE INFO
Received: 19/ 08/2024
Revised: 28/ 08/ 2024
Accepted: 28/ 08/2024
Publish online: 30/ 08/2024

* Corresponding Author: Ali Hafedh Abbas
Email address: ali_habbas@sc.uobaghdad.edu.iq
https://orcid.org/0000-0001-5314-3193

CITATION

Ali Hafedh Abbas, Fadhil Hussein Alwan, Dunya Fareed Salloom. (2024). Knowledge and attitudes toward HIV/AIDS in a sample of Iraqi population. JMOB. 1;(3): 01-15.

DOI: https://doi.org/ 10.58564/jmob.45

Abstract

***HIV continues to be a significant public health problem*, with** increasing incidence recently in the Middle East region. The cornerstones of fighting HIV are people's Knowledge and attitude. Consequently, this study is designed to evaluate the Knowledge and attitudes toward HIV/AIDS in a sample of the Iraqi population. The study comprised 621 well-educated participants from Baghdad University, who answered a questionnaire form regarding HIV/AIDS knowledge and altitude. The percentages of males and females were 33.82% and 66.18%, respectively. The percentages of participants according to level of education were 7.09%, 80.84%, 5.48%, and 6.60% for secondary education, bachelor's degree, master's degree, and a doctorate, respectively. Additionally, 96.14% having a scientific background and 3.86 having a humanitarian background. A 65.54% of participants answered that HIV enters via sexual relations; however, the Knowledge of the others is still primitive. At the same time, 48.31% considered HIV to be a fatal disease. While only 35.45 % of the respondents have a positive attitude for HIV patients to work, and 32.69% to marry. On the other hand, the succession of antiretroviral therapy to changing HIV from a fatal to a chronic disease with poor Knowledge has an impact on people living with HIV (PLHIV) because of stigma and discrimination. **In conclusion**, this study showed the negative attitudes toward PLHIV and also engaged in risky practices that might predispose them to HIV transmission. The authors recommend adopting an educational program for youths about HIV transmission and positive attitudes toward PLHIV.

Keywords: HIV, AIDS, virus, popular thoughts, discrimination, and stigma.

Introduction

Infection with the Human Immunodeficiency Virus (HIV) and the Acquired Immune Deficiency Syndrome (AIDS) continues to be a significant public health issue (1, 2). Even though the number of HIV cases in the Middle East and North Africa (MENA) region is low compared to other areas, recent research has revealed that HIV incidence is rising, particularly among high-risk populations (3). Because of social, cultural, and religious prohibitions, accurate data on HIV / AIDS prevalence and incidence has been slow in many Middle Eastern nations compared to other regions (4). Understanding people's Knowledge and attitudes about

HIV/AIDS is one of the cornerstones of fighting the disease. The most common problem people living with HIV/AIDS (PLWHA) is the general public's lack of Knowledge or miseducation about the disease (5); this, in turn, leads to / or causes discrimination against them, with disclosure, social isolation, access to antiretroviral therapy, and psychological support (6, 7). Furthermore, several factors are linked to HIV knowledge and play a significant impact in influencing the amount of HIV stigma. These determinants are primarily education and HIV attitudes. Increased HIV education and awareness are two excellent techniques for reducing stigma, among many others. As a result, as one's level of education rises, so does one's understanding of HIV, unfavorable views about PLWHA fall, and HIV stigma falls (8, 9). The theory of planned behavior can be utilized as a framework for creating and performing educational interventions to prevent HIV/AIDS among people with an addiction due to the intervention's substantial impact on its structural components (10). Moreover, in high school female students, educational interventions based on the Health Belief Model successfully promoted AIDS preventive beliefs by increasing Knowledge and perceived susceptibility (11). Several quasi-experimental studies that looked at the impact of educational and awareness interventions on HIV stigma back this up (12, 13). For example, a study in Canada found that raising participants' HIV awareness helped them become community influence champions, which reduced HIV stigma (13). Furthermore, a more sensitive cultural study found that the authors' educational and awareness interventions in a healthcare context reduced HIV stigma and prejudice in Egypt (14). Finally, the majority of the US Centres for Disease Control and Prevention (CDC) activities are centered on programs that combine public education and social marketing campaigns (15). Although the introduction of highly active antiretroviral medication has reduced mortality and improved quality of life, HIV remains a contentious topic and taboo in the MENA region (16). The region's data continues to reveal a low level of understanding, which is linked to a higher level of stigma (17,18). A study of university students in the United Arab Emirates, for example, found serious knowledge gaps and high levels of fear and intolerance toward PLWHA (18). The study surveyed medical students at Qassim University in Saudi Arabia showed modest Knowledge and negative attitudes toward people living with HIV (PLHIV) (19,20). HIV-related stigma, health-seeking behavior, and healthcare settings research has found that complications of HIV-related stigma on health-seeking behavior may result in individuals fearing to get tested, and for people living with HIV/AIDS (PLWHA), responses include delaying or adhering to treatment and potentially not adopting preventative behaviors. (8,20,21). Worldwide, there are several studies indicating the existence of HIV-related stigma in healthcare settings (22,29). Stigmatizing behaviors belonging to healthcare staff often stem from judgments associating HIV infection with immoral behaviors, fears related to contagion, or an insufficient awareness of what stigma looks like and what the consequences of stigma. (22,23). Women in Iraq appear to have limited Knowledge about the transmission of HIV and misperceptions about AIDS, independent of their level of education. This, combined with an overall negative attitude towards those with HIV/AIDS, poses a serious threat to stigmatization and risk of transmission (30). Also, a study showed existence of a shortage in the Knowledge and attitude of Iraqi medical and dental students toward HIV/AIDS, therefore emphasis should be placed on educating dental and medical students about HIV and other blood-borne infections (31). Review of literature showed a scarce publication regarding the Knowledge and attitudes toward HIV/AIDS among Iraqi population. Subsequently, this study designed to evaluate the Knowledge and attitudes toward HIV/AIDS in a sample of the Iraqi population.

Subjects

The present study included measuring the knowledge level among Iraqi students about stigma and discrimination against HIV patients. 621 completed answers were received to the questionnaire questions prepared by the research team in its three axes: the general axis, the axis of myths and beliefs and the axis of stigma and discrimination against patients with HIV. The questionnaire also included general information about the survey participants, such as sex, academic achievement, and scientific background. The first axis of the questionnaire included 11 general questions about HIV infection; the second axis included 7 questions about myths and popular beliefs, and the third axis included 17 questions about stigma and discrimination. So, the questionnaire consists of 35 questions ranging from general information, myths, popular beliefs about the disease, factors that lead to discrimination and stigma against patients, and patient rights. The answers were analyzed, and the option percentages for each question of the survey questionnaire were calculated, and those percentages were discussed and compared with other studies.

Materials & Methods

Subjects

The present study measured the knowledge level among Iraqi students about stigma and discrimination against HIV patients. A questionnaire form was sent to 621 participants. It includes three categories: the general, the myths and beliefs, and stigma and discrimination against patients with HIV. The questionnaire also included general information about the participants' demographic factors, such as sex, academic achievement, and scientific background. The first category of the questionnaire included 11 general questions about HIV infection; the second category included 7 questions about myths and popular beliefs, and the third category included 17 questions about stigma and discrimination. The questionnaire comprises 35 questions ranging from general information, myths, popular beliefs about the disease, factors leading to discrimination and stigma against patients, and patient rights. The answers were analysed, using IBM SPSS computer program version 27.0, the frequency and percentages for each question of the survey questionnaire were calculated.

Results

According to gender, the participants were comprised of 210 (33.82%) and 411 (66.18%) males and females, respectively. The percentages of participants according to level of education were 7.09%, 80.84%, 5.48%, and 6.60% for secondary education, bachelor's degree, master's degree, and doctorate, respectively (Figure 1).

The first category of this survey study included general information about HIV; 65.54% of the participants answered that the virus enters the human body through sexual transmission, while 13.21% of the participants believed that the virus might be transmitted through blood and its derivatives. In comparison, 14.49% of the participants believed that surgical instruments were contaminated with blood, and 6.76% of the participants thought that the patients' spray when sneezing and coughing might help the virus transmission (Figure 3).

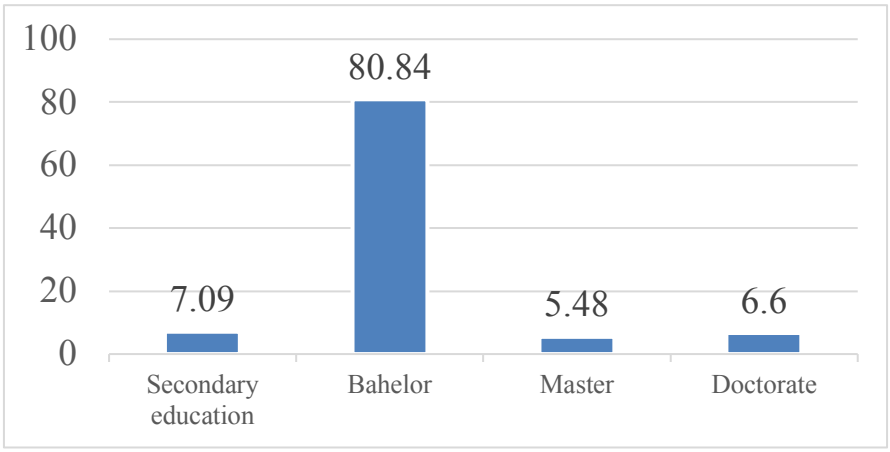

Figure. 1: Shows the educational level of the participants

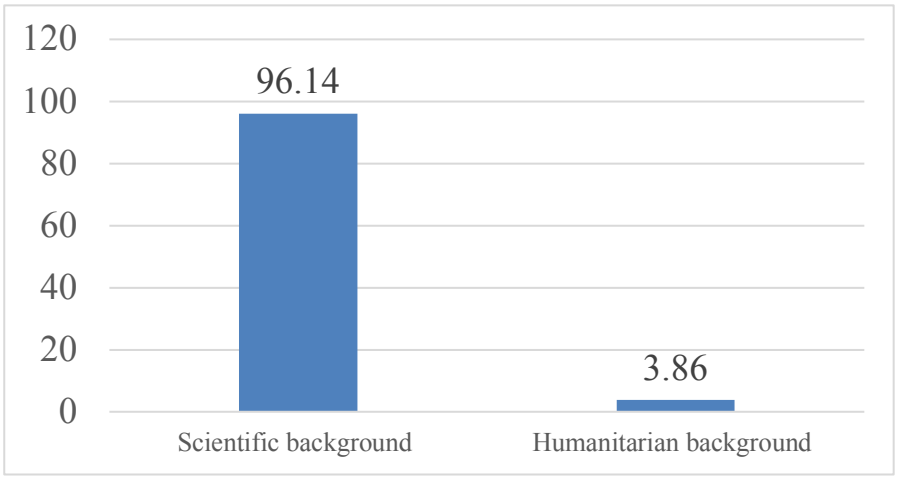

Figure.2: Shows the percentages of participant's educational backgrounds

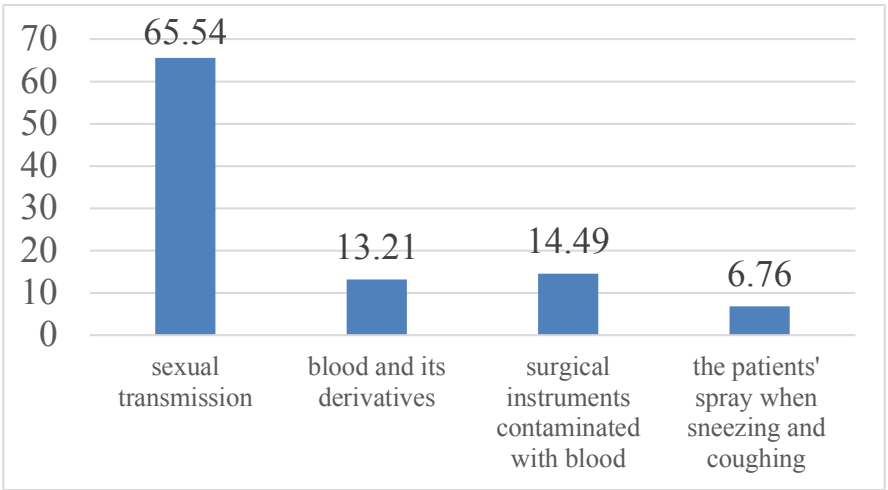

Figure.3: Shows the ways of HIV entrance to human body

This study's results showed a variation in participants' beliefs about the stages of HIV infection. The percentages for believing in one stage, two stages, and more than two stages were 35.75%, 63.61%, and 0.64% respectively (Figure 4).

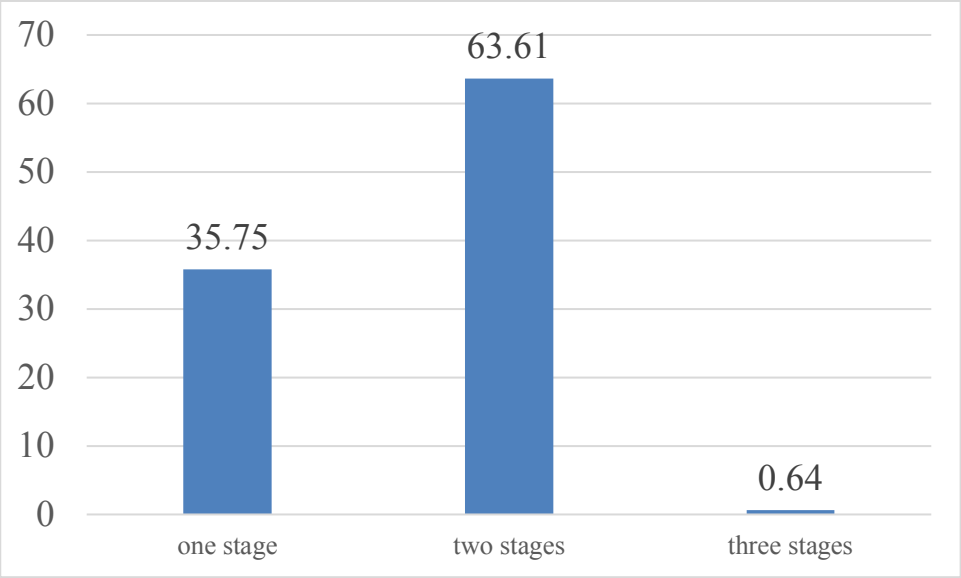

Figure.4: Shows participants' beliefs about the stages of HIV infection.

Likewise, the percentages of participants who believed regarding the transmission of HIV were 62.80%, 36.39%, and 0.81% for transmission from mother to child through pregnancy, during cesarean section, and through breastfeeding, respectively (Figure 5).

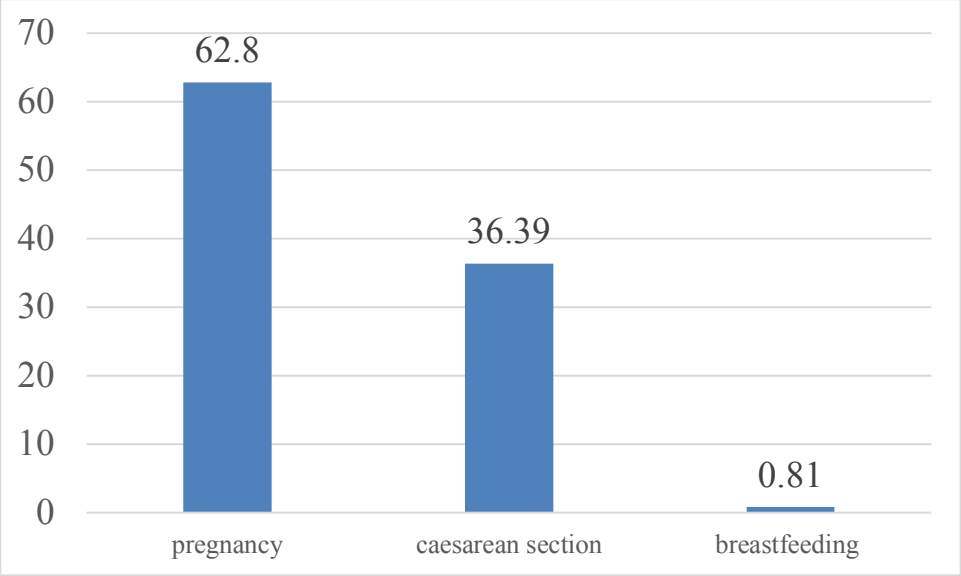

Figure.5: Shows participants' beliefs about the transmission mode of HIV infection.

Regarding the pathogenesis of human immunodeficiency disease, the study's results also showed that 57.97% of the participants believed in weakening the patient's immune system and encouraging opportunistic infections. However, 6.44% of the participants believed that the condition would lead to the formation of types of cancer. Meanwhile, 35.59% of the

participants believed that the disease might cause disorders of the patient's immune system (Figure 6).

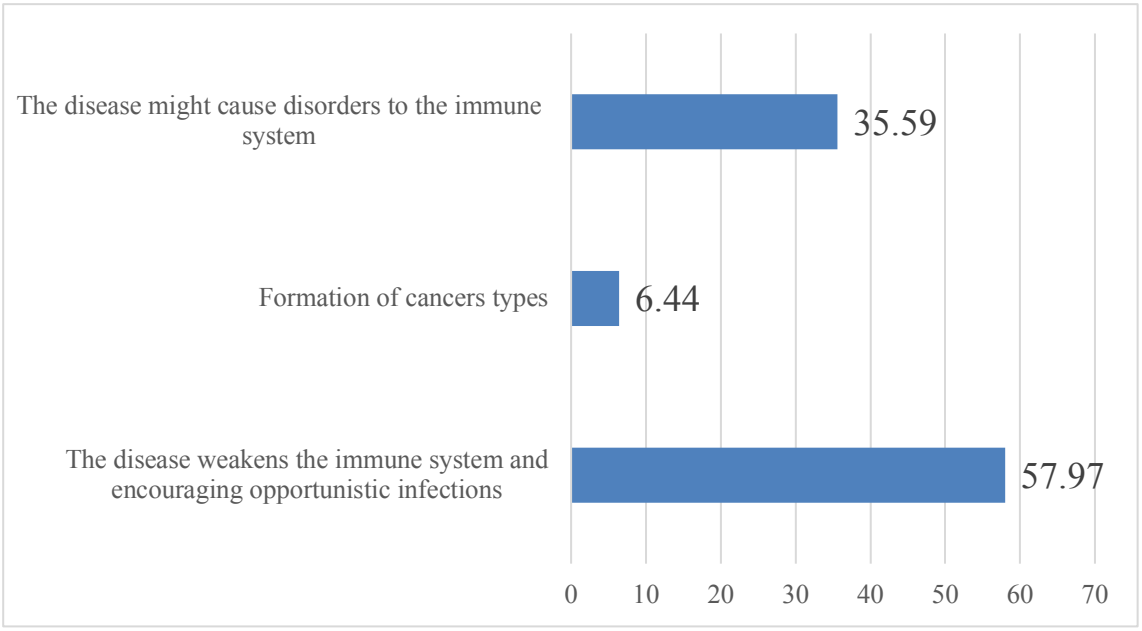

Figure.6: Shows the development of human immunodeficiency disease according to the participants' beliefs

The results also showed that 83.74% of the participants defined *sterilization* as getting rid of all microbes, 12.88% believed that disinfection could eliminate all microbes, and 3.88% thought cleaning was the only solution. Regarding the treatment of HIV disease, 45.09% of the participants indicated that the treatment period extends for patient life, while 51.53% thought it could be for one month, and 3.38% indicated that it could extend for six months. When the participants were asked about HIV prognosis, 45.09% answered that it is a chronic disease, while 48.31% answered that it is a fatal disease, and 6.60 answered that it is a temporary disease and is being cured (Figure 7).

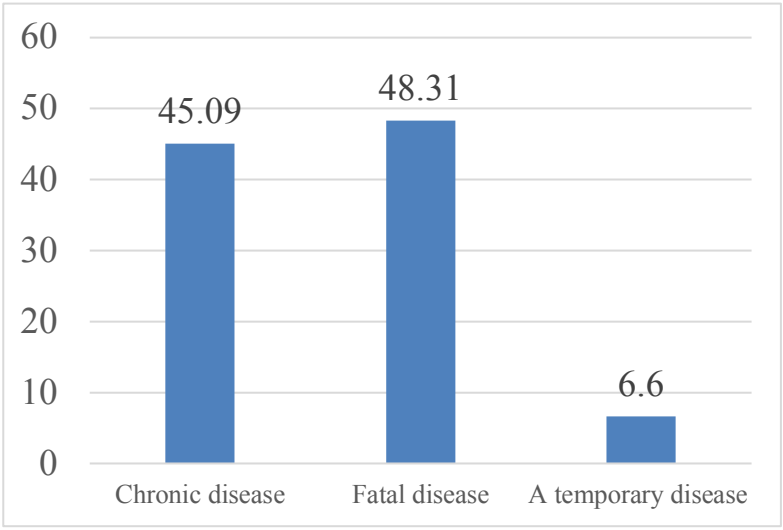

Figure.7: Shows the prognosis of HIV according to the participants' belief

Regarding other causes of HIV transmission, 53.14% of them answered that cupping in the wrong ways and tattoos transmit HIV. Meanwhile, 43.48% of them thought that they transmitted the Hepatitis virus, and 3.38% thought that they transmitted the coronavirus (Figure 8).

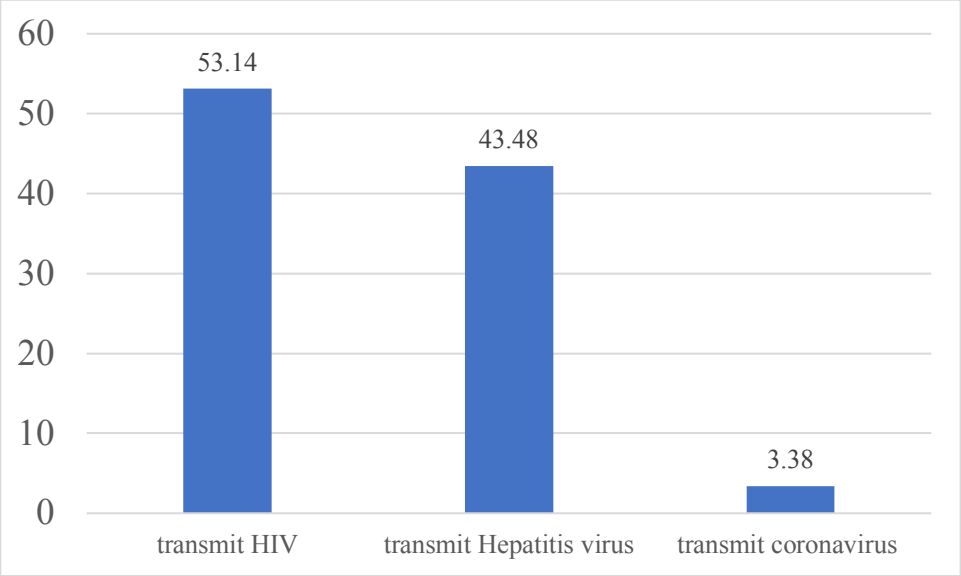

Figure.8: Shows other HIV transmission modes through cupping and tattoos according to the participants' belief

The results of this study also display the participants' views regarding preventing HIV infection. The percentages were 66.35%, 11.59%, and 22.06% for using a male condom, a female condom, and pre-exposure therapy for HIV infection (Figure 9).

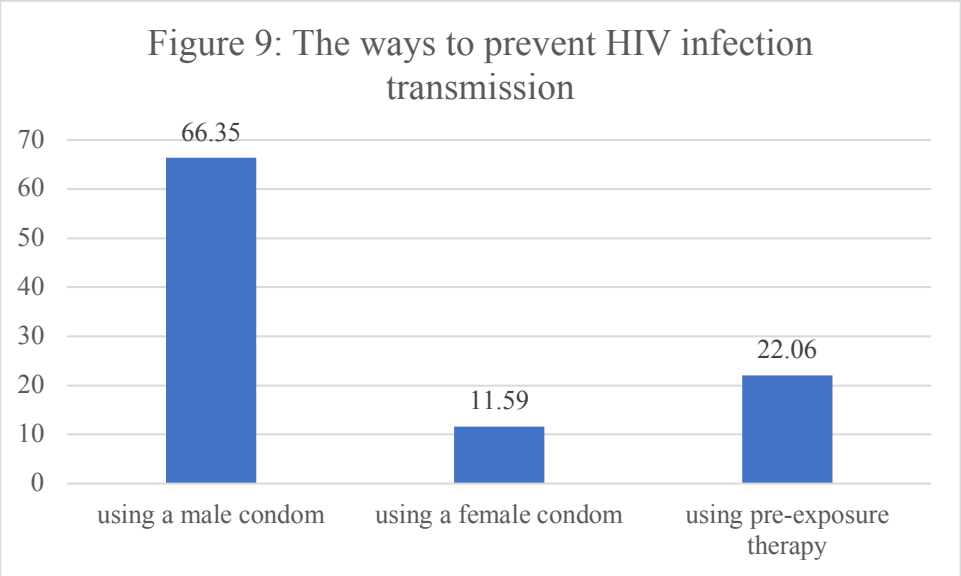

Figure.9: Shows the ways to prevent HIV infection transmission according to the participants' belief

Also, 88.57% of the participants answered that wearing medical gloves and using the correct hygienic methods when treating wounds for health and service workers in the health sector is one of the most important ways to prevent blood-borne diseases and their groups, including AIDS. However, 5.96% of participants had a neutral view, and 2.25% did not believe that this measure is essential to reducing HIV infection.

In addition, 62.96% of the respondents' opinions indicated that the disposal of medical waste contaminated with the blood of a person infected with HIV by incineration, while 19.97% of the views stated the possibility of transporting such medical waste to sanitary landfill sites for disposal. Meanwhile, 17.07% of the opinions stated the possibility of disposing of such medical waste with heavy water and throwing it into rivers after treatment (Figure 10).

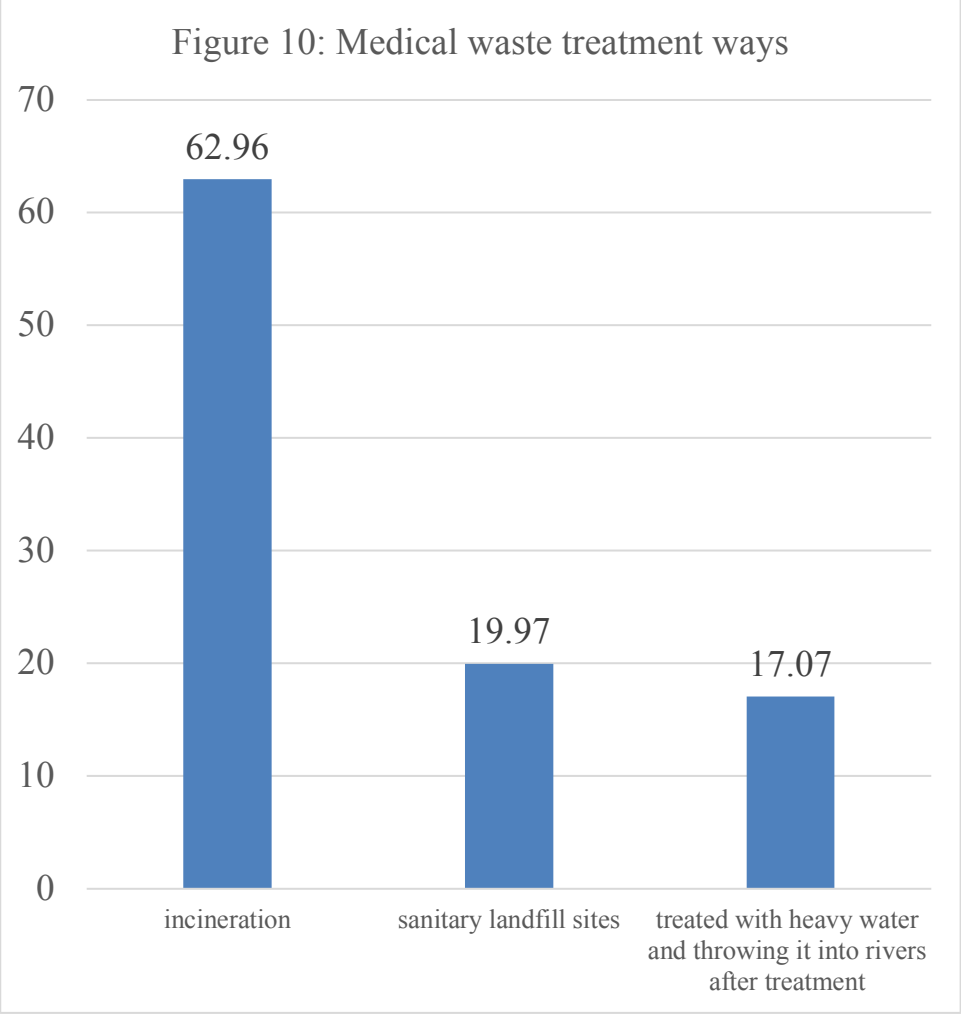

Figure.10: Shows the view of participant regarding the methods for treatment of medical waste of HIV patients

The second category of this study dealt with myths and beliefs accompanying the ways of transmission of HIV disease. When the participants were asked about their knowledge of the term bejel and whether it is one of the names of the endemic syphilis disease. The respondent's percentages were 3.38% for yes and know that bejel is a synonym for the epidemic syphilis disease. However, 96.65% of the participants did not know or have heard of this term. In

addition, 61.51% of participants believed that sexually transmitted diseases caused an increase in HIV infection rates, while 38.49% had a different opinion. Regarding myths and beliefs about the ways of HIV transmission, some questions were asked to the participants, including the belief that insects and mosquitoes are the sources of transmission of the disease; the answers were 78.90% yes and 21.10% no (Figure 11).

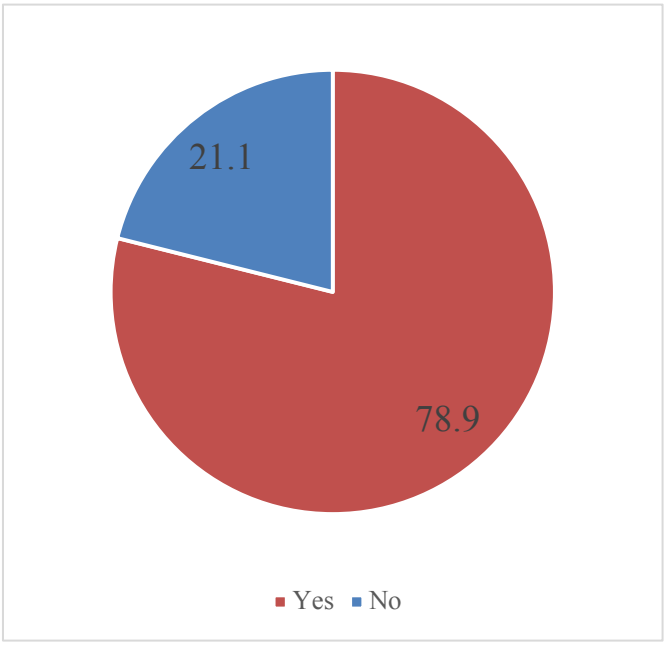

Figure.11: Shows the view of participant regarding the role of insects and mosquitoes in transmission of HIV

The results of this study also showed the view of the participants about the possibility of disease transmission when the patient shared his tools, such as toothbrushes, spoons, etc. The answers were 80.68% yes. In addition, 48.63% of the participants' opinions were positive regarding the role of the saliva and sweat of the patient in the transmission of the disease (Figure 12).

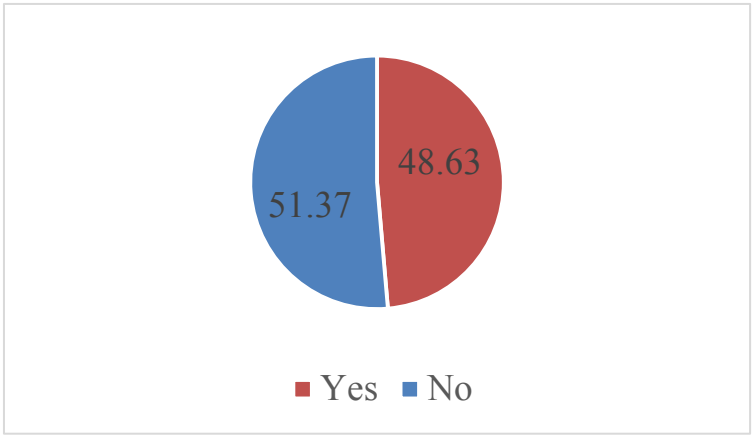

Figure 12: Shows the participants' opinions regarding the role of the saliva and sweat in the transmission of HIV

In contrast, 49.76% of the opinions were positive about the role of exposure to contaminated acupuncture used for the patient in the possibility of transmission of HIV (Figure 13).

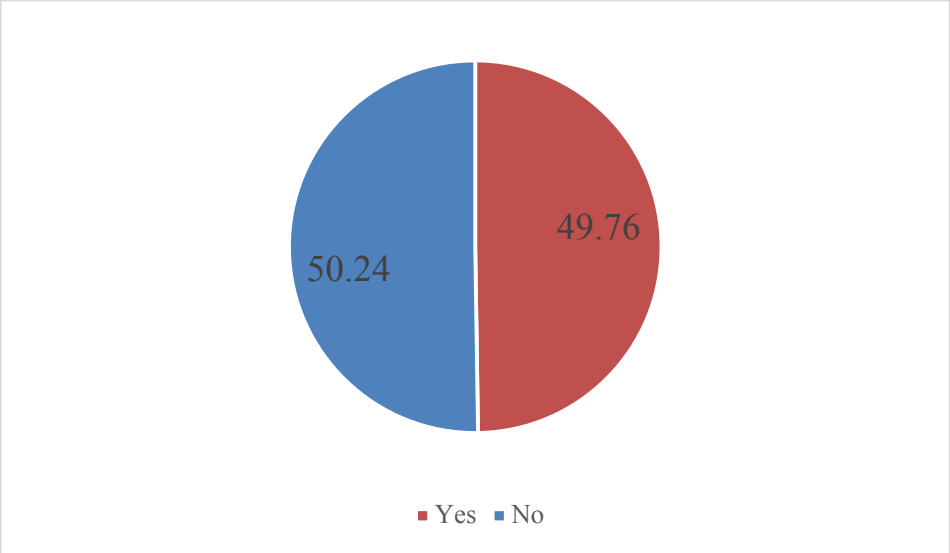

Figure 13: Shows the participants' opinions regarding the role of exposure to contaminated acupuncture in the transmission of HIV

Also, the participants were asked about the possibility of performing surgical operations for HIV patients when taking treatment with the patient with the adoption of necessary preventive measures. 95.0% of the opinions were positive (Figure 14).

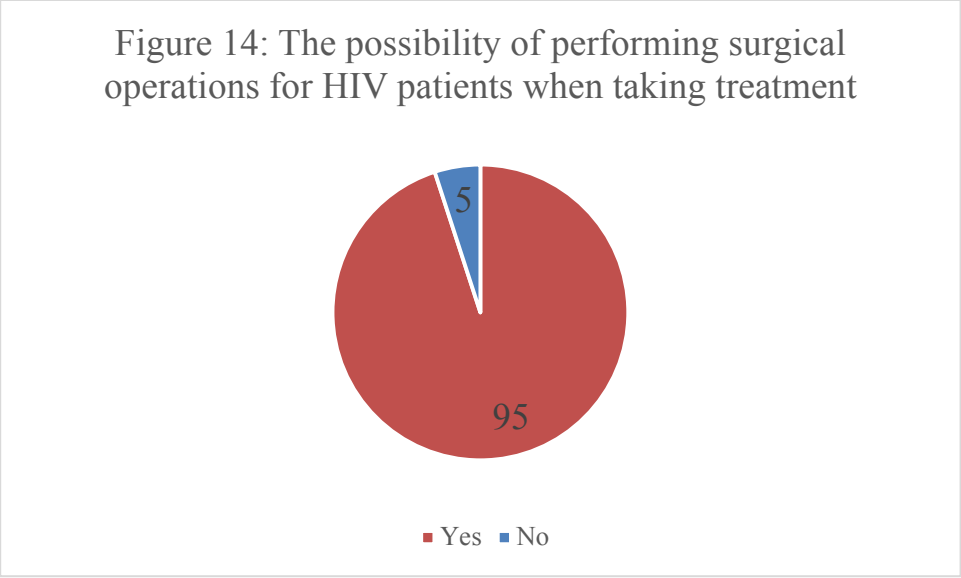

Figure 14: Shows the possibility of performing surgical operations for HIV patients when taking treatment

The third category of the current study dealt with the stigma and discrimination of the HIV patient. The percentage was 3.38% of the responses were positive for the definition of HIV-related discrimination and stigma as loss of the dignity of people infected with the virus and the unfair treatment of an infected individual. Also, 66.02% of participants' responses were positive about their opinion that stigma and discrimination are the main reason for people's reluctance to undergo voluntary HIV testing. However, 80.84% of the participants' opinions were positive for free voluntary testing, medical advice and confidentiality of the result without knowing the person's name and address if they wish not to disclose it. Due to the stigma and discrimination of the HIV patient, fear of breach of confidentiality, and exposure to negative attitudes from health care providers, 82.29% of the participants opinions were preferred the moving of patients outside the local communities to obtain health and preventive services and care. The results of the study also showed that 64.41% of the participants had a hopeful opinion on the question, which included counseling and voluntary testing to encourage a person to overcome fear and shame and increase the effectiveness of epidemiological monitoring. Also, the results of the survey showed that 62.80% of the participants had a hopeful opinion that a patient with tuberculosis develops the disease quickly when infected with HIV and that a person with HIV is more likely to develop tuberculosis. The results of this study also indicated that 48.31% of the participants supported that syphilis, sometimes associated with HIV disease, can lead to heart and nervous system problems if not treated. In addition, 96.46% of respondents believe that HIV is widespread on all continents of the globe. The third category also addressed the rights of the HIV-infected patient, including the right to marriage, childbearing, work, the availability of treatment, surgical intervention, and other rights. The results of the study showed that 98.39% of the participants supported that illegal marriage hinders the married person from knowing whether his partner is infected with HIV and other venereal diseases or not. Also, 66.02% of the opinions believe that a pregnant wife infected with HIV should get treatment as soon as she finds out about the infection. The results of the current study also showed that 32.69% of the survey participants had positive opinions about the right of the person with HIV to marry, 35.43% of the respondents' views were positive about the right of the infected with HIV to work, specifically in restaurants, and 93.40% of the opinions were positive about the right of the infected with HIV to undergo comprehensive treatment, as well as 96.62% of the opinions were positive about the right of the person with HIV to receive treatment and do the required medical analyses in specialized centers. Also, 78.90% of the opinions were positive about the patient's right to treatment and surgical intervention in public and private hospitals. In addition, 80.35% of the opinions were positive for the patient's right to provide psychological treatment, resulting from the stigma and discrimination associated with the disease.

Discussion

This study was primarily done among well-educated people with scientific backgrounds to evaluate their Knowledge and attitude toward HIV patients (PLHIV). Participants information believed that the most common mode of transmission of the virus is through sexual relationships, while the remaining believed that it is mainly transmitted through blood contact and considered as accepted Knowledge. This result agrees with studies done in KSA (24, 25). The current result indicated that only 57.97% of the respondents know that the disease weakens the immune system and encourages opportunistic infection. At the same time, the remaining have no idea or are unsure about the relation between the virus and the immune system, representing the most straightforward information about the disease. The success of antiretroviral therapy has turned HIV/AIDS from a fatal disease into a chronic illness. This

reality has had a positive impact on dealing with patients, a positive impact on HIV testing programs, and a positive effect on HIV treatment to prevent the disease progress and prevent infection in the community at least sexually, with decreased stigma and discrimination against PLHIV. The participants (48.31%) consider HIV a fatal disease and do not know that it can be controlled by treatment; therefore, more information is needed about the disease's fate. Regarding the way of transmission, like mosquitoes as a source of infections, toothbrush saliva, and sweat, the majority believe that the virus can transmitted in these ways; this thought increases stigma and discrimination against PLHIV. This result agrees with an early survey of Saudi Arabia (24), other countries in the region (27, 28), and other African countries (29) have reported a low level of understanding of HIV/AIDS. Inadequate understanding might lead to needless anxieties about interacting with HIV/AIDS patients, contributing to stigmatization; treatment initiation has been demonstrated to be hindered by social stigma (30). Stigma is a fundamental determinant of health that directly affects patient quality of life and disease treatment outcomes. Stigma is the main obstacle to seeking HIV-related services due to feeling shame and the fear of discrimination. Stigma exists in various forms and levels, such as in the family, community, and healthcare sectors. PLHIV usually experiences self-blaming, social isolation, physical or verbal abuse, mistreatment, and political discrimination, causes adverse health effects such as depression or anxiety, and impacts treatment adherence.

Conclusion

Getting information on HIV, how it spreads and, how to prevent it and stay healthy, how to deal with the patients must increase understanding of HIV prevention and transmission and develop a humanistic attitude. This is an excellent time for an education program to address self-esteem, healthy sexual attitudes, and being human and accepting others with love. Participants generally had inadequate Knowledge regarding HIV/AIDS, manifested negative attitudes toward PLHIV, and also engaged in risky practices that might predispose them to HIV transmission. The findings of the current study highlighted the need for culturally adopted and age-oriented basics for youths about HIV transmission and positive attitudes toward PLHIV.

DECLARATIONS:

Funding

There is no funding for this study

Competing interests' statement

No conflict of interest related with publishing of this article.

Ethics statement

All authors approved that this research follows the journal's ethical guidelines as appeared on the journal's author guidelines page.

Author contributions

Dr. Ali Hafedh Abbas provided the concepts, data analysis, and writing of the manuscript; All authors worked with data collection and analysis; Dr. Fadhil Hussein Alwan worked with data collection and analysis; All authors revised the manuscript and analyzed the data.

Acknowledgments

The authors would like to acknowledge Dr. Shaimaa Salman Kadhim for her assistance in the current study. In addition, the authors remember to express gratitude for reviewers' and editors' comments through the revision process.

References

1. Gallant JE. Human immunodeficiency virus medicine. J Infect Dis. 2017; 216:624–5. https://doi.org/10.1093/infdis/jix238.
2. UNAIDS. Global HIV & AIDS Statistics — 2024 Fact Sheet. UNAIDS, UNAIDS, 2024, www.unaids.org/en/resources/fact-sheet.
3. Gökengin D, Doroudi F, Tohme J, Collins B and Madani N. HIV/AIDS: trends in the Middle East and North Africa region. Int J Infect Dis. 2016;216(Supp5): S624–625. https://doi.org/10.1093/infdis/jix238.
4. Akala FA and Semini I. Characterizing the HIV/AIDS Epidemic in The Middle East and North Africa: Time For Strategic Action. Washington, DC: The World Bank Publication. 2010.
5. Alwafi HA, Meer AM, Shabkah A, Mehdawi FS, El-Haddad H, Bahabri N and Almoallim H. Knowledge and attitudes toward HIV/AIDS among the general population of Jeddah, Saudi Arabia. J Infect Public Health. 2018;11(1): 80–84. https://doi.org/10.1016/j.jiph.2017.04.005.
6. Herek GM, Capitanio JP and Widaman KF. HIV-related stigma and knowledge in the United States: prevalence and trends, 1991–1999. Am J Public Health. 2002;92(3): 371–377. https://doi.org/10.2105/AJPH.92.3.371.
7. Turan JM, Bukusi EA, Onono M, Holzemer WL, Miller S and Cohen CR. HIV/AIDS stigma and refusal of HIV testing among pregnant women in rural Kenya: results from the MAMAS Study. AIDS Behav. 2011;15(6): 1111–20. https://doi.org/10.1007/s10461-010-9798-5.
8. Zhang C, Li X, Liu Y, Qiao S, Zhang L, Zhou Y, Tang Z, Shen Z, Chen Z and Yuhua R. Stigma against people living with HIV/AIDS in China: does the route of infection matter? PLoS ONE. 2016;11(3): e0151078. https://doi.org/10.1371/journal.pone.0151078.
9. Farotimi AA, Nwozichi CU and Ojediran TD. Knowledge, attitude, and practice of HIV/AIDS-related stigma and discrimination reduction among nursing students in southwest Nigeria. Iran J Nurs Midwifery Res. 2015;20(6): 705-711. https://doi.org/10.4103/1735-9066.170011.
10. Sohn A and Park S. HIV/AIDS knowledge, stigmatizing attitudes, and related behaviors and factors that affect stigmatizing attitudes against HIV/AIDS among Korean adolescents. Osong Public Health Res Perspect. 2012;3(1): 24–30. https://doi.org/10.1016/j.phrp.2012.01.004.
11. Abbaspour A, Jalili Z and Shojaeizadeh D. Study the effect of education based on the theory of planned behavior in the prevention of AIDS among addicts. Iran J

Health Educ Health Promot. 2021;9(2): 201–211. https://doi.org/10.52547/ijhehp.9.2.201.

12. Rafiei N, Aghapoor S, Behnampour N, Heshmati H and Ghasemyani S. Promoting AIDS preventive beliefs in Turkmen students by using the health belief model in Aq-Qala. Iran J Health Educ Health Promot. 2019;7(4): 323–332. https://doi.org/10.29252/ijhehp.7.4.323.
13. Li AT-W, Fung KP-L, Maticka-Tyndale E and Wong JP-H. Effects of HIV stigma reduction interventions in diasporic communities: insights from the CHAMP study. AIDS Care. 2018;30(6): 739–745. https://doi.org/10.1080/09540121.2017.1391982.
14. Lohiniva A-L, Benkirane M, Numair T, Mahdy A, Saleh H, Zahran A, Okasha O, Talaat M and Kamal W. HIV stigma intervention in a low-HIV prevalence setting: a pilot study in an Egyptian healthcare facility. AIDS Care. 2016;28(5): 644–652. https://doi.org/10.1080/09540121.2015.1124974.
15. Beer L, McCree DH, Jeffries IV WL, Lemons A and Sionean C. Recent US centers for disease control and prevention activities to reduce HIV stigma. J Int Assoc Provid AIDS Care (JIAPAC). 2019; 18:2325958218823541. https://doi.org/10.1177/2325958218823541.
16. Abu-Raddad LJ, Hilmi N, Mumtaz G, Benkirane M, Akala FA, Riedner G, Tawil O, and Wilson D. Epidemiology of HIV infection in the Middle East and North Africa. AidS. 2010;24:S5–23. https://doi.org/10.1097/01.aids.0000386729.56683.33.
17. Badahdah AM. Stigmatization of persons with HIV/AIDS in Saudi Arabia. J Transcul Nurs. 2010;21(4):386–392. https://doi.org/10.1177/1043659609360873.
18. Gańczak M, Barss P, Alfaresi F, Almazrouei S, Muraddad A and Al-Maskari F. Break the silence: HIV/AIDS knowledge, attitudes, and educational needs among Arab university students in United Arab Emirates. J Adolesc Health. 2007;40(6): 572.el-572e8. https://doi.org/10.1016/j.jadohealth.2007.01.011.
19. Kahhaleh J, El Nakib M and Jurjus A. Knowledge, attitudes, beliefs and practices in Lebanon concerning HIV/AIDS, 1996-2004. East Mediterr Health J. 2009;15(4): 920–933. https://doi.org/10.26719/2009.15.4.920.
20. Alawad M, Alturki A, Aldoghayyim A, Alrobaee A and Alsoghair M. Knowledge, attitudes, and beliefs about HIV/AIDS and people living with HIV among medical students at Qassim University in Saudi Arabia. PubMed. 2019;13(5): 22 - 30.
21. WHO. National AIDS Programmes: A guide to indicators for monitoring and evaluating national HIV/AIDS prevention programmes for young people. World Health Organization. http://data.unaids.org/publications/irc-pub06/jc949-nap-youngpeople_en.pdf.
22. Bhalerao S and Kadam P. Sample size calculation. Int J Ayurveda Res. 2010;1(1): 55-57. https://doi.org/10.4103/0974-7788.59946.
23. Bloom BS, Engelhart MD, Furst E, Hill WH, and Krathwohl DR. Taxonomy of Educational Objectives The Classification of Educational Goals. Handbook I: Cognitive Domain. New York David McKay. – References – Scientific Research Publication. (n.d.) (1956). www.scrip.org.https://www.scrip.org/reference/referencespapers?

24. Al-Ghanim SA. Exploring public knowledge and attitudes towards HIV/AIDS in Saudi Arabia. A survey of primary health care users. Saudi Med J. 2005;26(5): 812–818.
25. Al-Mazrou YY, Abouzeid MS and Al-Jeffri MH. Knowledge and attitudes of paramedical students in Saudi Arabia toward HIV/AIDS. Saudi Med J. 2005;26(8): 1183–1189.
26. Al-Jabri AA and Al-Abri JH. Knowledge and attitudes of undergraduate medical and non-medical students in Sultan Qaboos University toward acquired immune deficiency syndrome. Saudi Med J. 2003;24(3): 273–277.
27. Tavoosi A, Zaferani A, Enzevaei A, Tajik P, Ahmadinezhad Z. Knowledge and attitude towards HIV/AIDS among Iranian students. BMC Public Health. 2004;4(1): 1–6. https://doi.org/10.1186/1471-2458-4-17.
28. Savaser S. Knowledge and attitudes of high school students about AIDS: A Turkish perspective. Public Health Nurs. 2003;20(1): 71–79. https://doi.org/10.1046/j.1525-1446.2003.20110.x.
29. Nubed CK and 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): 1–10. https://doi.org/10.1186/s12889-016-3516-9.
30. Al-Delaimy AK, Lea EC and Al-Rawi W. HIV/AIDS knowledge, attitudes and beliefs among Iraqi women. Al-Anbar medical journal. 2015;12(1): 33-41.
31. Hamid Al Albujeer AN, Shamshiri A and Taher A. HIV/AIDS awareness among Iraqi medical and dental studies. Journal of International Society of Preventive and Community Dentistry. 2015;5(5):372. https://doi.org/10.4103/2231-0762.164788.
32. Parker R and Aggleton P. HIV and AIDS-related stigma and discrimination: a conceptual framework and implications for action. Soc Sci Med. 2003;57(1):13–24. https://doi.org/doi:10.1016/S0277-9536(02)00304-0.