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Knowledge of HIV pre-exposure prophylaxis

(PrEP) among students – A narrative review

Wiedza studentów na temat profilaktyki przedekspozycyjnej HIV (PrEP) – Przegląd narracyjny

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Abstract

Acquired Immunodeficiency Syndrome (AIDS) has been a global epidemic since the 1980s, with the Joint United Nations Programme on HIV and AIDS (UNAIDS) aiming to eliminate it as a public health threat by 2030. As of 2017, 36.9 million individuals were living with HIV worldwide, making HIV infection a leading cause of death globally. Pre-exposure prophylaxis (PrEP) is a highly effective biomedical prevention method that can reduce the risk of HIV transmission by over 90% when taken consistently. This review examines the awareness and knowledge of PrEP among students, focusing on variations across gender, race, sexual orientation, study type, university type, and country of residence. A literature search conducted in the MEDLINE database between February and March 2024 identified 26 relevant studies published in the last ten years. Findings reveal significant disparities in PrEP awareness and knowledge, influenced by factors such as field of study and geographic location. While healthcare students generally show higher awareness levels, gaps remain, particularly among non-healthcare students and in different regions. Targeted educational initiatives are crucial to enhance PrEP acceptance and utilization. Addressing these gaps is essential for improving HIV prevention efforts and ultimately achieving UNAIDS' 2030 objective.

Keywords: pre-exposure prophylaxis, PrEP, HIV, students, knowledge

Streszczenie

Epidemia zespołu nabytego niedoboru odporności (AIDS) trwa od lat 80. XX wieku, a Wspólny Program Narodów Zjednoczonych ds. HIV i AIDS (UNAIDS) dąży do wyeliminowania go jako zagrożenia dla zdrowia publicznego do roku 2030. Na koniec 2017 roku 36,9 miliona osób na całym świecie żyło z wirusem HIV, co czyni zakażenie HIV jedną z głównych przyczyn śmierci na świecie. Profilaktyka przedekspozycyjna (PrEP) jest wysoce skuteczną metodą zapobiegania zakażeniom HIV, która może zmniejszyć ryzyko przeniesienia wirusa o ponad 90% przy konsekwentnym stosowaniu. Niniejszy przegląd bada świadomość i wiedzę na temat PrEP wśród studentów, koncentrując się na różnicach ze względu na płeć, rasę, orientację seksualną, typ studiów, rodzaj uczelni i kraj zamieszkania. Przeprowadzone wyszukiwanie w bazie danych MEDLINE między lutym a marcem 2024 roku zidentyfikowało 26 odpowiednich badań opublikowanych w ciągu ostatnich dziesięciu lat. Wyniki ujawniają znaczące różnice w świadomości i wiedzy na temat PrEP, zależne od takich czynników jak kierunek studiów czy lokalizacja geograficzna. Chociaż studenci kierunków medycznych zazwyczaj wykazują wyższy poziom świadomości, luki pozostają, zwłaszcza wśród studentów kierunków niemedycznych i w różnych regionach. Ukierunkowane inicjatywy edukacyjne są kluczowe dla zwiększenia akceptacji i wykorzystania PrEP. Jest to niezbędne do poprawy działań zapobiegających HIV oraz osiągnięcia celu UNAIDS na rok 2030.

Słowa kluczowe: profilaktyka przedekspozycyjna, PrEP, HIV, studenci, wiedza

Introduction

Acquired Immunodeficiency Syndrome (AIDS) has been a global epidemic since the 1980s. The Joint United Nations Programme on HIV and AIDS (UNAIDS) has set forth a global objective: to eliminate AIDS as a public health threat by 2030 [1]. AIDS poses a significant challenge to global public health. As of the conclusion of 2017, there were 36.9 million

individuals worldwide living with the human immunodeficiency virus (HIV) [2] . HIV infection stands as a leading contributor to death on a global scale. Among the strategies aimed at curbing the spread of this disease is pre-exposure prophylaxis (PrEP), whose effectiveness hinges on adherence to medication [3]. PrEP is a biomedical prevention method proven to be over 90% effective in preventing HIV transmission [4–9] . It entails giving antiretroviral medication to individuals who are not currently infected with HIV before they may be exposed to the virus, to lower the risk of contracting the infection [10] . It is administered as a once-daily combination tablet of emtricitabine/tenofovir disoproxil fumarate (FTC/TDF) or as a combination tablet of emtricitabine/tenofovir alafenamide (FTC/TAF) [5,7,8,11] . International organizations like the Centers for Disease Control and Prevention (CDC) advocate for its use among men who have sex with men (MSM), heterosexual individuals at high risk of HIV transmission, injection drug users, and serodiscordant couples [3] . Although clinical guidelines have affirmed its safety and effectiveness, and healthcare providers have become more knowledgeable about PrEP since its approval by the Food and Drug Administration (FDA) in 2012, the utilization of PrEP has not matched expectations [2,6–8]. Recent findings indicate that fewer than 10% of individuals who are at risk for HIV are being prescribed PrEP [4]. While PrEP has the potential to greatly reduce the rate of new HIV diagnoses among young adults, research on individuals' understanding of PrEP has primarily focused on MSM, people living with HIV, and primary care providers [11]. For PrEP to effectively impact HIV transmission rates on a population-wide scale, it's essential to enhance awareness, acceptance, and utilization. Young adults should be informed about these preventive measures well before they may require them [10].

Aim of the work

The study aims to review the available literature concerning awareness and knowledge about PrEP among students from different countries.

Methods

For the purpose of the present review, the literature search was performed between February and March 2024 using the database MEDLINE. Keywords used to retrieve relevant documents included “pre-exposure prophylaxis”, “PrEP”, “HIV”, “students” and

“knowledge”. From 49 records identified, only 29 were eligible for quality assessment and finally, 26 of them were included in the study. Exclusion criteria were non-English language and those unrelated to the topic of the review. All considered articles were published in the last 10 years.

Literature review results

Recent research reviews have revealed that awareness of PrEP among young adults, who are often at risk of HIV contraction, varies widely, ranging from as low as 14,77% to as high as 99.2% [10,12,13]. It may depend on many different factors, including gender, race, sexual orientation, type of study, type of university, country of residence, and many others. Studies indicate that young adults are generally open to using PrEP; however, the lack of public education regarding its availability acts as a barrier to accessing these medications [10].

Disparities in education within the healthcare field

Healthcare students are believed to be better educated about STDs compared to students from other fields of study [7].

Although PrEP is a highly effective and safe pharmacologic method of HIV prevention, its prescription remains low in people at high risk of HIV. Crucial for this may be the lack of inclusion of PrEP and HIV prevention education within the curricula of health professions studies [7]. Overall, the awareness of PrEP among future healthcare providers varies significantly depending on the specific field of medicine studies, year in training, and university location (country) [7,13]. According to research conducted so far, the lowest score obtained by López-Díaz G. et al. in their study is 14,77% and the highest obtained by Grant W. et al. in their research is 99,2%, which is a surprisingly large disparity [12,13]. First of all, the type of medical specialization represents the most significant association concerning knowledge of PrEP. Current studies show that pharmacy students have the greatest knowledge about PrEP because the substantial majority of all future pharmacists participating in each different research have heard about PrEP before and their number ranged between 81.4% and 92.2% [4,7,8,14,15]. The awareness of PrEP among medical students is a little bit lower and

on average, it accounts for 64.6%-88,6% [4,7,16] . An exception is medical students who participated in Grant W.'s study, among whom a staggering 99.2% have heard of PrEP [13]. However, this is likely since all surveyed students were studying at one university, which ranks among the top medical universities and maintains a high standard of education [13]. The lowest awareness of PrEP concerns nursery students and it varies between 14,77% and 67.9% [4,12]. Bunting SR et al. show in their research that the year of training has a big impact on the knowledge about PrEP [4]. Among first-year students, 73.9% of them were aware of PrEP, increasing to 85.9 % among fourth-year students [4] . Duarte F. et al. also obtained similar results in their study – only 32.99% of first-year students have heard of PrEP, while 86.96% of final-year medical students possessed knowledge about PrEP [16] . Another significant aspect regarding the dissemination of knowledge about PrEP is the quality of education at individual universities. Significantly higher levels are demonstrated by students from medical universities in the United States compared to students from European countries such as Spain or Portugal. Unfortunately, there is a lack of more extensive data on universities from other parts of Europe, making it difficult to draw further conclusions based on this information [12,13,16]. Reviewed studies so far indicate that while the knowledge of medical students is not negligible, it still leaves much to be desired. Due to the still limited amount of data on this subject, it is difficult to conclusively determine the actual level of knowledge among future healthcare providers. However, based solely on the currently available information, it can be stated that the issue of lack of knowledge regarding HIV prevention within the medical community is also present [7].

Disparities across orientation

PrEP among MSM students

MSM participants typically demonstrate higher levels of knowledge compared to other demographics [11]. They constitute the predominant demographic, reflecting the historically high HIV incidence and targeted PrEP marketing in various countries [4,12,17]. There are significant disparities in knowledge on this topic among students worldwide. Approximately 84.5% of MSM students in the United States of America were tested for HIV, had greater awareness of PrEP, and had higher perceived knowledge of HIV than heterosexual partnerships [11]. A similar trend is observed in Australia, where MSM have been prioritized in HIV prevention activities and campaigns [18]. On the other hand, despite the availability of free PrEP in France, accessibility remains an issue, especially among MSM groups. Well-educated and informed student populations were less likely to seek care and were significantly

associated with non-uptake of PrEP [19]. The study conducted by Lai J. et al. demonstrated that in China the proportion of MSM who answered AIDS-related questions completely correctly was significantly lower than that of non-MSM students [1]. Moreover, students in China and Thailand were more inclined to use cigarettes, alcohol, and drugs, and were less likely to consistently use condoms, particularly while on PrEP [1,20].

Disparities across continents and nations

The degree of HIV and PrEP awareness among students fluctuates significantly based on their geographic location or nationality. Numerous factors play a crucial role in shaping awareness levels among young adults globally, indicating that the issue persists worldwide.

North America

HIV infections continue to pose significant public health challenges in the United States, particularly among young adults aged 13-24 and 25-34 [11]. Various factors influence this, including place of residence, access to education, gender, sexual orientation, and ethnicity [21].

In the study conducted by Stutts et al., a correlation was found between perceived HIV knowledge and the type of institution attended in a southeastern city in the United States. Specifically, the researchers examined four types of institutions: a large public community college, a large public state university, a private small college, and a private historically black university [11]. Results of the study showed that generally, students from private schools had higher HIV knowledge scores and were more likely to use condoms at all times than students from public schools. However, students from public schools were more likely to get tested for HIV than students from private schools. Nevertheless, only 24.6% of sexually active students reported always using a condom [11].

Additionally, across various regions of the United States, education regarding HIV risk and PrEP showed notable disparities. The Southern region exhibited the highest proportion (87.4%) of students receiving instruction on HIV risk, with more comprehensive training observed in the Southern and Northeastern regions compared to the Midwest [4]. New York City (NYC) holds the fourth position nationwide in terms of HIV incidence, prompting initiatives aimed at broadening PrEP coverage [15]. In Przybyla et al.'s study, it was revealed that possessing a deeper comprehension of HIV prevention, maintaining positive attitudes

towards it, and being familiar with prescribing guidelines were closely linked to confidence in delivering counselling for PrEP, with awareness levels reaching 91% [6]. Furthermore, in Washington, a longstanding program centred on PrEP has led to a significant enhancement in understanding HIV risk factors and the efficacy of this prevention strategy [21].

The impact of gender, sexual orientation, and race on HIV and PrEP awareness among students holds considerable significance. As outlined by Stutts et al., females demonstrated notably higher HIV knowledge scores compared to males [11]. Moreover, individuals identifying as gay or lesbian exhibited a deeper understanding of HIV compared to their heterosexual counterparts. Additionally, disparities in PrEP and HIV awareness were evident among participants from various racial backgrounds. White respondents showed the highest familiarity with PrEP, compared to Asian participants, while Black respondents reported the lowest awareness levels [8]. The rising incidence of HIV infections among African American students in Historically Black Colleges and Universities (HBCUs) has been linked to risky behaviour, necessitating intervention. Marshall et al.'s research revealed that even 86.2% of participants, despite being unaware of PrEP, engaged in multiple sexual partnerships and inconsistent condom usage [22]. Despite a generally low perception of HIV risk, Okeke et al.'s study demonstrated that African Americans at HBCUs are not only aware of PrEP but also find it acceptable and worth considering [5,15].

Europe

Knowledge about HIV and PrEP is different between countries in Europe. France was the first country in Europe where the health insurance system fully reimburses this prevention. Uptake of PrEP is slower than expected, especially in MSM. Non-PrEP users were mainly associated with being students or living in a small city or village. Students are both well-educated and informed on risk prevention, but less likely to seek care [19]. On the other hand, in Spain, a significant increase rate of new HIV diagnoses is higher than the average country in the European Union. The results of one study revealed a high knowledge deficit, as well as a great indifference towards PrEP among students from various fields [12,16]. Additionally, only 14.77% of students in the López-Díaz, G. et al. study had ever heard of PrEP [12]. A good example is Portugal, where over the years, the probability of being aware of PrEP, having at least one class about it and correctly identifying the eligible groups increased [16].

Africa

South African adolescent females face a heightened vulnerability to HIV infection and exhibit distinct risk factors compared to adults. Ayton, S. G. et al.'s research indicates that underlying risks include sexual behaviour factors such as contraception, pregnancy, and perceived HIV risk, as well as socioeconomic factors like HIV knowledge, prior testing, financial dependence, and alcohol use [23]. Accessing condoms, lubricants, dental dams, and PrEP continues to pose a challenge [24,25]. Furthermore, the absence of sexual health education programs in schools and the suppression of sexual health issues among Lesbian, Gay, Bisexual, and Transgender (LGBT) students exacerbate the situation [24,25]. Despite efforts, Health Science students do not possess superior knowledge compared to students from other faculties [24]. A low level of knowledge about HIV and usage of PrEP estimated at 18.9% among university students, also appears in Nigeria. Factors such as prior HIV testing and awareness of the partner's HIV status significantly influenced the knowledge of PrEP [10]. Similar problems were present in Uganda where the prevalence of HIV/AIDS remains high. The major source of information there about HIV and PrEP is school education. Despite approximately 87,73% of students being aware of HIV/AIDS and its treatment, their understanding of factors such as its causes and modern prevention methods, including PrEP and prevention of mother-to-child transmission, is comparatively limited [3].

Asia

The situation about HIV incidents in Asia is different among the countries. In Thailand, despite campaigns and efforts to reduce HIV transmission, the incidence of HIV infections has remained stable. One possible contributing factor is a false belief in low HIV risk despite engaging in high-risk behaviours. Although students demonstrate high levels of knowledge about HIV transmission risks, rates of consistent condom use during vaginal, oral, and anal sex, remain low and nearly 33% of them showed disinterest in PrEP. Independent factors associated with this false perception include male gender, homosexual orientation, and enrollment in non-medical faculties [20].

In China over the last few years, there has been an approximate 50% annual increase in the number of newly diagnosed HIV cases among college students. A study indicated a notably higher prevalence of the HIV epidemic among high school and college students, particularly

among MSM students. Lai J. et al. revealed in their study that only 67.30% of students provided correct answers regarding HIV knowledge and behaviours, with just 19.4% reporting consistent condom use in the past six months. PrEP has not yet gained widespread popularity in China, with most studies focusing on assessing willingness to use it [1].

Australia

In Australia, one-quarter of new HIV notifications in 2021 were among young people, with MSM contacts predominantly found among individuals born in Southeast Asia. Australian universities enrol large numbers of international students, potentially influencing patterns of sexual behaviour. To emphasize the significance of this data, it is crucial to differentiate domestic students into two groups: Australian-born and overseas-born. In cohort studies about HIV knowledge, approximately 90% of participants answered questions correctly. Mean HIV risk scores were higher for MSM, particularly among international students and overseas-born domestic students, whereas Australian-born domestic students were at lower risk of HIV infection. Being an international student was significantly associated with lower odds of awareness regarding PrEP [18]

Conclusions

The prevalence of risky behaviours among college students highlights the immediate necessity for greater public awareness and more impactful health education initiatives [1]. The primary method for managing and preventing HIV/AIDS continues to be through prevention efforts focused on enhancing knowledge and awareness, as there is currently no available cure or vaccine [3]. Enhancing the sexual well-being of university students should involve implementing preventive measures aimed at improving the sexual health of each student and fostering healthier social environments [26]. Specifically, there's an urgent requirement for educational resources or supplemental information regarding PrEP to alleviate concerns about potential side effects, which could hinder its acceptance [1]. Increasing PrEP prescription is a key part of the plan to stop the HIV epidemic [4]. To ensure that PrEP is accessible to all patient demographics at risk of HIV, health professionals' education must equip future clinicians with the necessary skills to integrate this preventive measure against HIV into their clinical practice [8]. Expanding PrEP coverage requires involvement from healthcare

providers in various fields. As a result, academic educational initiatives should create more opportunities for interdisciplinary training [15]. Government and health departments ought to enhance AIDS education within schools, with a specific focus on improving the public's and key populations' understanding of AIDS and encouraging condom usage. By raising awareness, reducing medication expenses, and emphasizing risk assessment, we can enhance adherence to PrEP [2]. To guarantee that everyone is included in the objective of eliminating new HIV infections, it's essential to conduct awareness campaigns, provide public education, and engage the community to broaden access to these preventive measures within academic environments [10].

Author's contribution

Conceptualization: JM, AS and JG; methodology: JM, AS and JG; check: JM, AS and JG; formal analysis: JM, AS and JG; investigation: JM, AS and JG; resources: JM, JG, AS, PG, and MD; data curation: JM, AS and JG; writing-rough preparation: JM, JG, AS, PG, MD, PW, NK, OD and DM; writing-review and editing: JM, JG, AS, PG, MD, PW, NK, OD and DM; visualization: JM, AS, JG; supervision: JM, AS and JG.

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The authors declare no conflict of interest.

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