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Facilitators and barriers of HIV pre-exposure prophylaxis use among four key populations in Iran

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Abstract

Background Pre-exposure prophylaxis (PrEP) significantly reduces HIV transmission, but it is not commonly prescribed in Iran. Therefore, this study aimed to identify facilitators and barriers to PrEP use among four key populations (KPs) in Iran.

Methods We conducted in-depth qualitative interviews with female sex workers (FSW), men who have sex with men (MSM), people who inject drugs (PWID), and sexual partners of people living with HIV (PLHIV) to obtain deep insights into the participants' experiences, beliefs, and viewpoints. We included HIV experts, including staff from the HIV control department, healthcare providers with HIV experience, health policymakers, infectious disease specialists, and university professors. We performed a content analysis to identify facilitators and barriers to PrEP implementation among KPs.

Results We interviewed seven FSW, seven MSM, four PWID, four sexual partners of PLHIV, and 18 HIV experts. The facilitator's theme emerged in four main categories, including eight different factors: 1) Individual and interpersonal factors (motivations, fear of testing positive for HIV, and safety nets and financial support), 2) Age and sex differences, 3) Organizational factors (appropriate PrEP distribution, information sharing, and receipt of high-quality services, 4) Efficacy of PrEP. The barrier's theme emerged in three main categories, including four factors: 1) Individual factors (insufficient knowledge and awareness, and fragile trust), 2) Cultural barriers, and 3) Organizational factors (inadequate infrastructure and organizational barriers).

Conclusions We identified key facilitators and barriers to successful PrEP implementation among KPs in Iran. By addressing these barriers, Iran has an opportunity to include PrEP programs in its HIV prevention efforts for KPs.

Keywords HIV, Pre-exposure prophylaxis, Facilitators, Barriers, Key populations, Iran

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Introduction

Despite global advances in HIV prevention and treatment, HIV continues to be a global public health challenge, resulting in significant mortality and morbidity. Few countries are estimated to meet the UNAIDS 2030 mortality and incidence targets [1]. Reports showed that 39 million people were living with HIV, and 1.3 million people were newly infected with HIV globally in 2022 [2]. In Iran, at the end of October 2022, over 46,000 people were living with HIV, over 2,900 new cases were reported in 2022, and around 43% of the adults who are living with HIV received Antiretroviral Therapy (ART) [3]. Although many strategies, including educational initiatives regarding high-risk sexual behaviors, the provision of free condoms and syringes, and the availability of free HIV testing among key populations (KPs) (such as gay men and other men who have sex with men (MSM), (female sex workers (FSW), transgender people (TG), and people who inject drugs (PWID)), have had a positive impact on reducing new HIV infection, the HIV epidemic among KPs has not adequately controlled [4, 5]. A more effective prevention strategy, including biomedical interventions, is needed to stop HIV transmission in Iran [6, 7].

Pre-exposure prophylaxis (PrEP), a novel biomedical approach for HIV prevention using antiretroviral drugs among KPs, is increasingly recognized as a highly effective HIV prevention strategy [8]. Since 2012, the World Health Organization has recommended this prevention method, which has emphasized the use of antiretrovirals in HIV seronegative KPs [6]. Numerous trials have indicated that daily oral HIV PrEP is safe, well-tolerated, and effective in preventing HIV [9, 10]. Some countries, such as the United States, France, Brazil, and South Africa, have approved using PrEP among KPs [11–14]. However, PrEP is not yet used as part of the HIV national prevention strategy in Iran.

Although many countries have approved the use of PrEP among KPs [11–14], not only is PrEP not part of the HIV national prevention strategy, but it is also not available to individuals in Iran (during the time of this study). Several barriers may make it challenging to provide and access PrEP in Iran. Barriers and facilitators to PrEP arise from multiple social and biological factors. Several of these barriers include stigma and discrimination, restricted access to healthcare, cultural factors, perceived risk of HIV, peer pressure, adverse side effects, and health-related concerns [12, 15, 16]. In addition, due to the sociodemographic, cultural, economic, and structural factors that are likely to affect the implementation of PrEP among KPs [3, 17, 18], it is important to understand how to implement PrEP according to local settings [17–19]. It is noteworthy that PrEP implementation may vary across countries, limiting the generalizability of existing research [19]. Qualitative studies provide appropriate conditions for a deep understanding of facilitators and barriers due to their approach to extensive and in-depth examination of issues requiring more clarity [20]. Therefore, this study aimed to identify the facilitators and barriers to PrEP implementation among four KPs FSW, PWID, MSM, and sexual partners of people living with HIV (PLHIV)) in Iran using qualitative methods by conducting in-depth interviews with members of those KPs and HIV experts.

Method and material

Content analysis was used for data analysis [21] to identify and understand the facilitators and barriers to PrEP implementation among four KPs in Iran. Content analysis is analyzing, interpreting, and conceptualizing the underlying meanings of qualitative data by systematically coding and classifying [22]. Staff from the HIV control department, healthcare providers with HIV experience, health policymakers, infectious disease specialists, and university professors were invited to participate in this study. Also, KPs such as FSW, PWID, MSM, and sexual partners of PLHIV participated in the study. At first, participants were asked whether they were familiar with PrEP. For those without the necessary information, the researcher described the characteristics of PrEP, including its efficacy, administration methods, dosage, and the various forms available (oral and injectable). Additionally, essential information regarding potential side effects was also provided. Furthermore, the researcher provided all participants with phone numbers and email addresses to facilitate any inquiries following the interview. The methodology, participant selection, data collection, analysis, and findings were conducted following the Standards for Reporting Qualitative Research tool to enhance the study's clarity and reproducibility, facilitating readers' comprehension of the research context, processes, and concepts.

Sampling

Participants were selected using purposive sampling based on eligibility criteria: age $\geq$ 18 years old, HIV negative by self-report, Iranian citizen, and being a member of a KPs. KPs were defined as women exchanging sex for money or any other service in the last 12 months (FSW), reported using at least one non-prescribed injection drug in the previous 12 months (PWID), men who had sex with other men during the past 12 months (MSM), or sexual partners of PLHIV. There was no gender restriction for participating in this study, especially for sexual partners of PLHIV. In addition, eligibility criteria for managers and health policymakers, health professionals and personnel, professors, and infectious disease

specialists included HIV-related jobs or at least one year of work experience in the field of HIV. Participants from eight provinces, including Esfahan, Fars, Kerman, Khuzestan, Kurdistan, Mazandaran, Razavi Khorasan, and Tehran out of the 31 provinces (25.8%) were included to enhance the generalizability.

Data collection

Data were collected through in-depth interviews using a semi-structured questionnaire. The questions were formulated following a thorough literature review and consultation with subject matter experts in the field [23, 24]. A team of experts, including a nurse familiar with qualitative studies, a person with experience working in the field of PrEP, and two epidemiologists, participated in the development of the questions. A standardized guide was employed to conduct all the interviews (Supplementary 1). Participants of the KP were interviewed in a private room by a gender-matched interviewer in Voluntary Counseling and Testing (VCT) centers and drop-in centers. Previous studies have shown that using gender-matched interviewers in qualitative research with KP, especially in a conservative situation like Iran, leads to increased comfort and honesty from respondents, reduced social distance, reduced social desirability bias, and sensitivity to gender dynamics, which ensures improved data quality [25, 26]. In-depth face-to-face or remote meetings (mobile phone, Skype, etc.) were used to interview managers, health policymakers, and staff of the HIV control department. The average time per interview was 40 min (range 30–70 min). The interviews continued until the findings reached theoretical saturation (i.e., new interviews did not add new information to previous findings [27].

Ethical considerations

The Ethics committee of Kerman University of Medical Sciences approved the study protocol (Ethics code: IR.KMU.REC.1401.443). Before the semi-structured interviews, participants were informed about the study's aims and the confidentiality of their information. Before commencing the interviews and recording them, participants provided verbal informed consent. Participants were free to participate or discontinue their study participation at any time. After completing the interviews, the researchers allowed participants to call or e-mail regarding any questions or information.

Data analysis

We performed the data analysis process according to the steps suggested by Lundman and Graneheim [21]. Due to the combination of a rigorous framework, emphasis on trustworthiness, flexibility, and focus on contextual understanding, Lundman and Granheim's analysis method was chosen. First, the interviews were transcribed verbatim. Next, the text of the interviews was broken into compact semantic units so that words and phrases with related elements were summarized in each unit of meaning. In the third step, the summarized meaning units were coded. Next, codes were broken into categories based on similarities and differences. A category class at the manifest level consists of related code. After finding the underlying meaning and content of the data, themes were created to express the underlying meaning of the text [21]. A sample of the process of analysis is shown in Table 1. Any suggestion the participants gave to the researcher during the interview or analysis was recorded in a note and used in subsequent interviews. Graneheim and Lundman's criteria assessed the study's trustworthiness [21]. Double-checking the codes with the participants (member check) was conducted to ensure credibility. To member check, study findings and conclusions were sent to four participants to compare the degree of homogeneity of the concepts extracted by the researcher with the main opinions of the participants. We contacted them if they had any more comments. In addition, data were analysed manually using Microsoft Word. At first, we designed a table in Microsoft Word that included four sections (Meaning unit, Open code, Subcategory, and Category). With each interview, the initial codes were placed in the meaning unit section, and in subsequent interviews, similar codes were placed next to each other. In the next step, an open code was formed by combining some initial codes. The rest of the steps were done in Word in the same way as the table was designed. Then, the final categories were created.

Results

The analysis included 39 participants who were members of a KPs or HIV experts. Of 21 people in a KPs, the majority were men ($n=12$), married ($n=12$), and had less than a high school education ($n=10$). The age range of the KPs participants was 25 to 49 years (Mean = 38.4, SD = 8). Of 18 people in the HIV expert group, the majority were female ($N=10$) and had more than ten years of experience in the HIV field ($n=14$). The age range in the expert group was 33 to 68 years (Mean = 51.4, SD = 8) (Supplementary 1).

Qualitative themes

We identified two overarching themes related to factors facilitating and hindering PrEP uptake in KPs (Table 2).

Facilitators of PrEP implementation

The facilitator's theme emerged in six main categories:

Table 1 Example of qualitative content analysis process

Category	Subcategories	Open code	Meaning units
Helpful fears	Fear of infection (HIV)	Having multiple sexual partners is the reason they want PrEP	People with more relationships are more likely to use PrEP. They have, after all, relationships with more individuals (**P_5**)
		Fear of condom failure is why they want PrEP	I always have a concern that the condom would fail. If my partner has HIV, it is extremely risky (**P_1**).
		Fear of acquiring HIV infection is the reason they want PrEP	You know, I use it personally. One does not become ill. I will no longer be afraid of contracting AIDS (**P_{15}**).
	Avoid the risk when you notice many of your friends are infected with HIV	Learn from the fact that many friends are infected with HIV, and so use PrEP to avoid the risk	When a person sees that his friends are infected with HIV, he is scared that he may contract the infection as well (**P_6**).
		Observing friends' problems as a result of HIV infection, an effective factor for receiving PrEP	When you observe your friends have HIV and what problems they have in life and health as a result, you become very sad and afraid of it (**P_4**).
		Friends' tendency to use drugs as a result of HIV infection, an effective factor for receiving PrEP	One of my friends tested positive two years ago, and he went and took his pills, but now I think he uses drugs to reduce her pain (**P_2**).

Table 2 The category and subcategory related to importance, facilitators, barriers and strategies to overcome barriers of HIV PrEP among at-risk populations in Iran

Theme	Category	Subcategory
Facilitators of PrEP implementation	Motivations	Hope and motivation from others
		Maintaining personal health
		Maintaining a source of income
		Forced suggestions such as requesting a sexual partner
	Fear of testing positive for HIV	Fear of infection (HIV)
		Lessons learned from the neglect of HIV-positive friends
	Age and sex differences	Better acceptance in women
		Young people's different perspectives and information
	Appropriate PrEP distribution	Appropriate drug distribution management
		Easy access to the PrEP
	Efficacy of PrEP	Variety in drug forms
		Trust in the drug's effect
	Information sharing	Effective training
		The existence of communication networks
	Receipt of high-quality services	the presence of knowledgeable and dedicated personnel
		The existence of Health centers
	Safety nets and financial support	Financial support
		The support of policymakers
		The private sector collaboration
Barriers to PrEP implementation	Insufficient knowledge and awareness	lack of knowledge among key populations
		lack of knowledge among healthcare workers
		lack of comprehension of disease risk in at-risk individuals
	Inadequate infrastructure	Inadequate health services
		Weakness in providing the desired services
		Inaccurate service distribution management
	Cultural barriers	Unprofessional behavior of healthcare workers
		Peer group negative thoughts
		Fear of stigma
		Concealment
	Organizational barriers	Economic challenges
		Decision-making challenges in policy-makers
		Policymakers' concealment
		Internal inconsistencies in the organization
		Incapability to identify the target groups
	Fragile trust	Lack of trust in drug
		Preferring other harm reduction methods
		Insufficient trust in the health system

1) Motivations
2) Fear of testing positive for HIV
3) Safety nets and financial support
4) Age and sex differences
5) Organizational factors (appropriate PrEP distribution, information sharing, and receipt of high-quality services)
6) Efficacy of PrEP

Motivations

Motivations, including intrapersonal or extrapersonal, were considered facilitators of PrEP implementation. Intrapersonal motivations included maintaining wellness and maintaining a source of income. Extrapersonal motivations included support motivation and forced suggestions such as requesting a sexual partner. Due to the importance of maintaining health in sexual relations, this

facilitator was mentioned more by the FSW and health providers. A university faculty member with 12 years of experience working with the HIV Department said: *"Sex workers are persons whose job is to have sex. Because their source of income is dependent on their health and if they are not healthy (referring to getting HIV infection), they will lose their jobs; so, they are motivated to receive PrEP."* In addition, A 25-year-old MSM said: *"If the drug (PrEP) is available, I will take it because I highly value my health. I want to lead a long life, and I don't want to get disease (HIV)."*

Fear of testing positive for HIV

One of the most important factors reported by more than half of the participants as a facilitator was the fear of testing positive for HIV. This fear resulted in an increased likelihood of PrEP uptake. Some of these fears resulted from sexual situations and relationships, while other fears were associated with observing the condition of friends who had contracted HIV. A 37-year-old FSW said: *"I always have a fear that the condom would break. Other than that, if my partner has HIV, it is extremely risky."*

Safety nets and financial support

Nearly all study participants mentioned the need for safety nets and financial support for KPs as a facilitating factor. Safety nets, such as peer groups among KPs, were identified as a facilitating factor. A university faculty member with 15 years of experience in the HIV field said: *"Utilizing networks of individuals and peer groups to transfer information to KPs is an effective approach. In this situation, you tell these people, I will give you a solution so that you don't get that disease; this may be a strong point.* Additionally, health policymakers have introduced financial support as a key facilitating factor. A 31-year-old FSW said: *"The drug (PrEP) provision should be at no cost to the customers. If adverse effects occur from its use, medical consultations should also be offered without charge to address any related issues".*

Age and sex differences

Women were more likely to be concerned about maintaining their wellness and remaining HIV-negative. Additionally, younger participants noted having more information and awareness about the efficacy of PrEP, which resulted in their acceptance of PrEP compared to older participants. A 36-year-old female PWID said: *"Younger people are accepting of the medication [PrEP] because they care more about their health and have more information and awareness. Well, you know. Women, on the other hand, care more about their health and appearance. Thus, they accept the use of this medication [PrEP] more than men."*

Appropriate PrEP distribution

Appropriate PrEP distribution was recognized as a facilitator based on two perspectives. First, it was noted that proper medication distribution works as a facilitator of PrEP implementation because it can make it more convenient and accessible for KPs to access. Second, appropriate medication distribution can help increase the demand to receive PrEP. Participants preferred to receive free PrEP at accessible locations. However, due to the less stigma in private centers, they prefer these centers to receive PrEP. Given that the majority of MSM engage with the private sector, collaboration with this sector will facilitate the acceptance and receipt of PrEP in this group. A university faculty member with 15 years of experience working in the HIV field said: *"It seems that just delivering PrEP at a single place is insufficient. Different locations should be considered for the access of different groups. Counseling centers for vulnerable women are good for FSWs because they provide services, and more FSWs visit them. But we don't have a center for MSM; maybe a pharmacy would be better for them."*

Information sharing

More than half of the participants (14 KPs and six healthcare providers) recognized information sharing as an important facilitator, primarily when PrEP information is delivered by people such as health workers or peer groups trusted by KPs. The need to receive information about PrEP and HIV was expressed more by FSW and PWID. Due to the lack of information and awareness among these groups, increasing the knowledge of HIV and PrEP for this group seems crucial. PWID and MSM showed a greater preference for peer groups, while FSW preferred interactions with healthcare professionals. Additionally, sexual partners of PLHIV showed a preference for television as a source of information. A university faculty member with 15 years of experience working in the HIV field said: *"Transferring accurate information to people through social media and peer groups can help a lot. Increasing public awareness about HIV can also be helpful."*

Receipt of high-quality services

One of the factors that facilitates receiving PrEP services is the provision of satisfactory services by healthcare providers. The provision of services by knowledgeable and committed individuals affects how KPs buy into and use such services. Furthermore, the availability of private and government centers that provide the services required by the KPs was mentioned as a positive and beneficial factor in receiving PrEP. A policy-maker with seven years of experience working with the HIV Department said: *"Our country is unique in that it has such a unique health*

system that serves a large number of residents, and the services it provides are of relatively high quality."

Efficacy of PrEP

The efficacy of PrEP (oral or injectable) was identified as an important factor for PrEP uptake. A participant from a VCT center with 20 years of experience said: *"Based on my experience, I believe people will be convinced to use PrEP if it is effective. Of course, these findings must be evidence-based and scientific."*

Barriers to PrEP implementation

The barrier's theme emerged in three main categories, including five factors:

A) *KPs' perspectives*:

1. Cultural barriers (stigma)
2. Organizational barriers (financial challenges)

B) *Health provider's perspectives*:

1) Insufficient knowledge and awareness
2) Fragile trust
3) Cultural barriers
4) Inadequate infrastructure
5) Organizational barriers

Insufficient knowledge and awareness

Participants reported a lack of knowledge and awareness about PrEP and other HIV prevention methods among KPs and healthcare providers. Due to insufficient information, PKs were unable to assess the level of knowledge of health workers. Therefore, health providers only mentioned this theme. Given that a lack of knowledge may result in a low perceived HIV risk, it was introduced as an important barrier to receiving PrEP. An infectious disease specialist with 20 years of medical experience said: *"The staff cannot persuade people to start PrEP due to a lack of awareness. I assure you that more than 80% of our staff do not know what PrEP is. These people sometimes state, 'We don't believe in these methods, such as vaccines.' This is due to a lack of knowledge."*

Fragile trust

Participants reported distrust in the government healthcare system and medications as an important barrier. From the health provider perspective, key populations need more trust in health systems, primarily due to concerns regarding the potential disclosure of their personal information. A president of the VCT Center with 20 years of experience said: *"In 2012, I had a patient. We had an excellent relationship. He had been receiving medications from us for six months. However, after lab testing, we discovered no improvement in his health. I talked to him, and he said, "Doctor, honestly, my friends told me that these medications are used to accelerate our deaths."*

Cultural barriers

Many interviewees noted cultural barriers related to the society at large, the KP's culture, and the culture of healthcare providers as important barriers. These barriers lead to the KP's fear of stigmatization and result in the concealment of their activities, which is a barrier to receiving PrEP. In Iranian society, prevailing misconceptions regarding KPs contribute to a significant stigma about these groups, often leading to their unjust perception of guilt. A 36-year-old female with HIV seropositive sexual partners said: *"When people hear the terms AIDS and HIV, they look at us differently. My husband had a close friend. We had regular family visits. My husband attended a seminar and presented a speech about addiction. His friend's sister found out about my husband's HIV status. They were upset because they were friends with us. This type of behavior occurs frequently."*

Inadequate infrastructure

Among the barriers mentioned by participants were a need for sufficient infrastructure to provide PrEP services to KPs and a weakness in delivering the desired services in health service centers. Therefore, insufficient service distribution management was a key barrier. This category was mentioned only by healthcare providers. A technical officer from the national HIV program with 15 years of experience working said: *"We do not have a VCT in many cities. We are lacking in both staff and transportation. We have the current services' infrastructure, but adding another service will be difficult."*

Organizational barriers

Organizational barriers caused by internal and external challenges included financial challenges, health policymakers' attitudes toward HIV, and a lack of consistency within the organization. Furthermore, KPs reported the distribution of PrEP in locations with limited accessibility as a significant challenge. Participants additionally mentioned the inability of healthcare providers to identify KPs who may be eligible for PrEP as a barrier. These barriers were mentioned only by health providers. A president of the VCT center with seven years of experience said: *"In my opinion, we have no barriers from consumers because they want to use it, but the cost required to do so can be an obstacle. But we need to know if the country's health system can do this for free. If it cannot, it*

will undoubtedly be an important barrier to PrEP in the country."

Discussion

We identified key facilitators and barriers to successful PrEP implementation among KPs in Iran. Facilitators for a successful PrEP program included eight factors at the individual, interpersonal, organizational, and medication efficacy levels. Furthermore, barriers to PrEP implementation included four individual, community, and organizational aspects.

Similar to our findings, previous studies have reported several individual and structural facilitators for using PrEP [28–33]. Previous studies have noted that the main reasons for initiating PrEP were to protect against HIV, as well as concerns about partners' sexual risk behaviors [29, 33]. In a study in Switzerland, women emphasized the importance of having control over their sexual health after receiving PrEP, in addition to beneficial effects such as reduced anxiety [28]. Having a deep relationship and the support of a sexual partner was regarded as a key motivator to initiate PrEP. In one study in Mozambique, the importance of supporting the KPs was emphasized, as most participants believed that someone could not take PrEP without the support of their partner. Moreover, most participants noted their positive relationships with healthcare providers, counselors, and peer groups [32].

Furthermore, like this study, previous studies found that women were more interested in PrEP [31], and young females were more willing to use PrEP [30]. The presence of a sexual partner with high-risk behaviors can cause fear of HIV acquisition and, as a result, a reason for PrEP uptake [29]. Sex differences have been reported as a reason to start PrEP due to the importance of women, particularly young women, and FSW, maintaining their health [28]. Women are more likely to use PrEP when they are dependent on their sexual partners to obtain this medication, as well as when they lack the power of choice in sexual relationships [34, 35]. However, the presence of a supportive sexual partner can be a powerful motivator to initiate this medication [32]. In summary, the option to begin and sustain PrEP is significantly shaped by the interpersonal relationships and support networks in individuals' lives. Recognizing these elements is crucial for formulating effective public health strategies to boost PrEP adoption among KPs. By creating support environments, public health initiatives can improve the efficacy of PrEP as a preventive strategy against HIV transmission. Additionally, by addressing both individual and contextual challenges—through engagement with supportive partners and enhanced access to healthcare services—health interventions can empower women to take control of their sexual health, thereby markedly decreasing their risk of HIV infection.

Organizational preparedness and population awareness were reported as critical indicators among the facilitators. The appropriate management of drug distribution that makes PrEP accessible to people was also noted as an important facilitator. The organizational framework of health service centers in Iran, including DIC and VCT centers, facilitates convenient access to PrEP for a substantial population of KPs due to the high access of these populations to these harm reduction services. One study in Uganda demonstrated that increasing PrEP access for KPs may help increase PrEP uptake [36]. Furthermore, another study in the United States showed that sharing information increases PrEP uptake. They demonstrated the importance of increasing PrEP knowledge among women and improving organizations' capacity to educate, screen, and administer PrEP services [37]. Moreover, as a facilitator, the availability of alternate methods, such as injections, which can address barriers to daily oral PrEP, was introduced [38]. Studies have shown that injectable PrEP may reduce stigma-related social harm because it is less visible than daily tablets [39]. As a result, with appropriate medication distribution, KPs can have improved access to this program [36]. Furthermore, effective information sharing and methods acceptable by the KPs will make it easier to receive PrEP [32, 37]. Finally, fewer visits to healthcare services could reduce stigma and increase the desire to start PEP. As such, injectable PrEP can also be beneficial in this situation [38, 39]. Healthcare systems must be equipped with the necessary resources and trained personnel who can effectively communicate the benefits and availability of PrEP. Population awareness is equally crucial. Without adequate knowledge about PrEP, its benefits, and how to access it, potential users may remain uninformed and hesitant to seek these services. In addition, ensuring that PrEP is readily available at healthcare facilities and that there are no barriers to access is essential for increasing uptake. By addressing these areas, public health initiatives can significantly enhance the uptake of PrEP among vulnerable populations, ultimately contributing to the reduction of HIV transmission rates.

In our study, some subcategories, including lack of knowledge among healthcare providers, insufficient infrastructure, and organizational barriers, were reported as barriers to the program's implementation. This contrast of reports between KPs and healthcare providers can be evaluated from two aspects. First, KPs mentioned that healthcare providers ought to deliver PrEP to them because they believed healthcare providers had sufficient knowledge and skills. However, providers themselves have expressed the need for PrEP education. Previous

studies confirm our findings [40, 41]. Second, it may be that KPs need to be made aware of these circumstances and organizational challenges. So, addressing these barriers before the program's implementation should be addressed by the health system.

Other studies have reported barriers at the individual and community levels. One study reported that healthcare providers' biases influence awareness, intention, and acceptance of PrEP among KPs [38], in addition to the KP's lack of information and understanding. A lack of knowledge of healthcare providers leads to an inability to create willingness and demand to receive PrEP in KPs [37, 38]. In addition, the KP's concern about the effectiveness of PrEP in preventing HIV, as well as the drug's side effects, leads to a lack of trust in the healthcare providers [42, 43]. Studies showed that medical mistrust has a detrimental impact on PrEP initiation [43]. Furthermore, studies have indicated that this lack of confidence can be attributed to health concerns, such as side effects and concerns about HIV prevention [42]. Other barriers include not wanting to take an extra daily pill, challenges attending PrEP visits, PrEP-related stigma, and the need for more information about PrEP [44]. To address these barriers effectively and enhance PrEP uptake among KPs, we can train and be aware of healthcare providers and KPs. Comprehensive training should be implemented for healthcare providers focusing on PrEP knowledge, cultural competency, and bias reduction. Additionally, it is necessary to collaborate with community organizations serving KPs to disseminate information about PrEP in culturally suitable ways. Also, community-based participatory research involving KPs in designing and implementing health interventions can help build trust between healthcare providers and KPs.

Similar to our findings, a study in the United States identified cultural barriers to PrEP use, such as the stigma associated with using HIV preventive strategies [37]. Moreover, some cultural habits (such as stigma) can make it difficult to receive PrEP. These challenges are not limited to the general population as healthcare providers show similar behaviors, such as stigma [45]. Stigma is an important factor that affects the implementation of HIV preventive strategies such as PrEP [37, 44]. Individual and community barriers are important factors that must be considered for the program's successful implementation. As a result, activities to reduce stigma, such as campaigns to promote PrEP in the community and the collaboration of influential community leaders, can support PrEP adoption and reduce the stigma associated with its use.

Finally, some barriers at the organizational level were also reported in prior studies [33, 46–48]. Typically, the economic challenges associated with healthcare are particularly pronounced in nations with constrained resources like Iran, presenting a significant barrier to the delivery of free PrEP. The studies conducted in sub-Saharan Africa identified organizational barriers such as medication regulatory requirements, cost-effectiveness concerns, and a lack of health system capacity [46, 48]. One study indicated that healthcare system constraints (such as financial concerns) might prevent adequate PrEP implementation [33]. Similarly, another study reported organizational barriers, such as insufficient resources and a lack of healthcare providers [47]. The lack of infrastructure and resources is an important barrier to prescribing and receiving PrEP [46, 47]. Furthermore, more funding for organizations positively affects the field of PrEP education and delivery [38]. In addition, more healthcare providers are needed to increase the coverage to address the health needs of KP [49]. Therefore, a lack of healthcare providers may lead to insufficient training in KPs. As a result, it is important to pay attention to the organizational barriers to implementing PrEP successfully. To overcome these organizational barriers and enhance the implementation of PrEP, several strategies should be considered: secure additional funding through public-private partnerships or grants earmarked explicitly for PrEP programs. Improve healthcare infrastructure by establishing more clinics that specialize in HIV prevention services, including PrEP provision. Partner with NGOs focusing on HIV prevention to leverage their expertise and resources in educating communities about PrEP. By addressing these organizational barriers through targeted strategies, public health initiatives can significantly improve the implementation of PrEP, ultimately enhancing its accessibility and effectiveness as a tool for HIV prevention among key populations.

Limitations

Our study had two main limitations. First, this study was conducted in eight provinces of Iran with a relatively small number of participants in each region. The sample of KPs was not a random sample of target groups, as this was a qualitative study with purposive sampling. As a result, they were only representative of some KPs in Iran. Second, when we conducted this study, PrEP was unavailable in Iran, and some participants may not understand some cons and pros of using PrEP. To reduce this limitation, we tried to explain the cons and pros of using PrEP at the beginning of the interview. Although participants had opinions about whether PrEP would be acceptable and used by KPs in Iran if appropriately offered, the actual acceptability, use, and barriers to use among KPs require further research on when PrEP will be available in the country.

Conclusion

This study showed several barriers to implementing PrEP, and any disregard for these challenges can be an obstacle to PrEP implementation. PrEP implementation has facilitators and barriers at the individual, interpersonal, societal, and organizational levels. Identified facilitators may help PrEP implementation and enhance PrEP initiation among KPs. Addressing identified barriers is essential because KPs remain at high risk for acquiring HIV, and a thoughtful plan for PrEP implementation is important for reducing HIV transmission trends among KPs in Iran.

Abbreviations

PrEP	Pre-exposure prophylaxis
KPs	Key populations
FSW	Female sex workers
MSM	Men who have sex with men
PWID	People who inject drugs
PLHIV	Sexual partners of people living with HIV
VCT	Voluntary Counseling and Testing

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12913-024-11933-w.

Supplementary Material 1.

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Authors' contributions

H.M: Contribution to the work's acquisition, analysis, and design, and confirmation of the sent version. F.T: Contribution to the work's acquisition, analysis, and design, and confirmation of the sent version. P.M: Contribution to the conception, design of the work, interpretation of data, and confirmation of the sent version. A.M: Contribution to the conception, and design of the work, revised drafted work, and confirmation of the sent version. P.S: Contribution to the conception, and design of the work, revise drafted work, and confirmation of the sent version. R.G: Contribution to the conception, design of the work, and confirmation of the sent version. H.S: Contribution to the conception, design of the work, interpretation of data, revise drafted work, and confirmation of the sent version. All authors reviewed the manuscript.

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Data availability

All data generated or analyzed during this study are included in this published article.

Declarations

Ethics approval and consent to participate

The Ethics committee of Kerman University of Medical Sciences approved the study protocol (Ethics code: IR.KMU.REC.1401.443).
Participation in this study was voluntary and anonymous; names or other personal identifiers were not collected as a condition for participation. Participants could refuse to answer any question or stop the interview at any time. Due to the stigma toward HIV and key populations in Iran and the fear of patients signing written documents, verbal informed consent was obtained from all participants in this study. The ethics committee of Kerman University of Medical Sciences approved the procedure for obtaining verbal informed consent.

Competing interests

The authors declare no competing interests.

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