

Background

HIV remains a significant global health challenge, with approximately 39.9 million people affected worldwide by the end of 2023 [1]. In Iran, the HIV epidemic has shown

(sufficient vs. insufficient) [14], lifetime history of drug use (yes vs. no), lifetime history of drug injection (yes vs. no), history of shared injection in the last injection (yes vs. no), lifetime history of tattooing (yes vs. no), lifetime history of receiving opioid agonist therapy (yes vs. no).

The categorization of age into two groups (< 30 vs. ≥ 30 years) was based on its significance as a threshold for distinguishing younger individuals from middle-aged populations and aligns with previous research on HIV risk factors [15, 16].

Statistical analysis

We used descriptive statistics to compare the characteristics of participants stratified by self-perceived risk of HIV. Variables with a p -value < 0.2 in the bivariable analysis were entered into a multivariable regression model [17].

The final model was fitted using a backward elimination approach [17]. Crude odds ratios (COR) and adjusted odds ratios (AOR), along with 95% confidence intervals (CIs), were reported. P

Characteristics	Total N(%)
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Table 2 Multivariable logistic regression analysis to identify correlates of self-perceived risk for HIV among people in prisons in Iran, 2017

Characteristics	Adjusted odds ratio (95% CIs; P-value)
Age (years)	
<30	1.50 (1.13, 2.00; 0.006)
≥30	1
Marital status	
Never married	1.58 (1.12, 2.23; 0.008)
Divorced, widowed, temporary marriage	1.79 (1.31, 2.44; <0.001)

Our study revealed a low prevalence of high self-perceived HIV risk among people in prisons in Iran, with only one in 15 reporting a high-risk perception. While comparisons with regional studies are limited due to

scarce evidence from the Eastern Mediterranean region, our findings are comparable with a study in Scotland, where 12.4% and 7.3% of people in prisons had a medium and high self-perception of risk for HIV acquisition, respectively [18]. However, these estimates contrast sharply with studies from the USA, where an estimated 78.2% of 855 people in prison had a significantly higher self-perceived HIV risk [19]. Several factors, including cultural, social, and healthcare system differences between Iran and the USA, likely influence this disparity. In liberal high-income settings, HIV awareness is promoted through public health campaigns, and individuals may have more access to HIV-related information and prevention resources. In Iran, however, the relatively lower level of HIV awareness, socio-cultural stigma around HIV testing, and limited funding and staffing allocated to HIV education in prisons may contribute to a lower perceived risk of acquisition among people in prisons. To address this low-risk awareness in Iranian prisons, implementing targeted interventions, including comprehensive HIV education, increased access to sterile tattooing and injection equipment, routine HIV testing, and peer education programs are warranted.

Our analysis of demographic variables showed that people under 30 years of age and those who were unmarried had significantly higher odds of perceiving themselves at high risk for HIV acquisition. These findings align with a cross-sectional study of 826 HIV-negative men in prisons in the USA, which demonstrated that younger age was associated with higher self-perceived HIV risk [19]. The elevated risk perception among younger and unmarried individuals may be attributed to their higher engagement in risky behaviors. For instance, a study on Iranian people in prisons found that those aged 18–29 and single individuals had significantly higher odds of non-injection drug use in the month prior to being in prison [20]. Furthermore, the prevalence of lifetime tattooing among people in prisons in Iran during 2015–2016 was higher in those under 35 compared to those 35 and older [21]. These patterns of risk behavior

particularly effective in improving risk awareness and prevention efforts among people in prisons.

We acknowledge the limitations of our study. First, we did not assess the sexual orientation of participants, as this could be a sensitive topic inside Iranian prisons. Second, other data, such as information on condom use, STI symptoms, having same-sex practice among men, and age at first sexual intercourse, were self-reported and thus subject to potential recall, reporting, and social desirability biases. These biases could have led to under-reporting of high-risk behaviors. Moreover, social desirability bias may have influenced participants to report lower self-perception of HIV risk, particularly in a stigmatized prison environment. Variations in prison types, regional differences, and the diversity in incarceration conditions across Iran may affect the external validity of our results. Lastly, this was a cross-sectional study, making it challenging to determine the direction of the association and draw causal conclusions about the observed associations. Despite these limitations, our study has several strengths. It is one of the largest nationwide surveys conducted in Iranian prisons, offering robust data on self-perception of risk for HIV acquisition and its correlates in this understudied population. Using a multistage random sampling approach and face-to-face interviews enhanced the reliability and generalizability of the findings. Future research should explore longitudinal designs to better understand the causal pathways of risk perception and behavior. In addition, integrating methods to minimize biases, such as inclusion of peer interviewers, could improve data accuracy in future studies. Furthermore, using qualitative methods could provide deeper insights into the contextual and cultural factors influencing self-perception of risk for HIV acquisition among people in prisons.

Conclusions

Our study reveals a complex interplay of sociocultural, demographic, clinical, and sexual factors influencing HIV risk perception among people in prisons in Iran. Alarmingly, only less than 7% of people in prisons had a high self-perception of risk for HIV acquisition. Implementing targeted educational programs aimed at raising HIV awareness, including tailored interventions addressing the specific behaviors identified in this study, such as condomless sex, drug use, and STI symptoms are warranted. Regular and accessible health screenings should be prioritized, along with increased access to preventive measures, such as condoms and harm reduction strategies. Additionally, peer-led initiatives could be key in promoting risk awareness and safer behaviors. Policymakers could also consider integrating these interventions into broader prison health policies to improve overall HIV prevention efforts. By bridging the gap between actual

and perceived risk, people in prisons could be empowered to make informed decisions about their health and contribute to the broader goal of reducing HIV transmis-

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