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Original Research Article

FACTORS ASSOCIATED WITH HIV AWARENESS AND TESTING AMONG MALE YOUTH IN URBAN SLUMS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: HIV testing facilitates early diagnosis, timely treatment and prevention of transmission. Young men in urban slum communities may face barriers to testing, but evidence on determinants of HIV testing in this population is limited. This study assessed HIV-testing uptake and associated factors among young men aged 18–24 years attending an urban health centre.

Materials and Methods: A facility-based cross-sectional study was conducted among men aged 18–24 years residing in a slum community and attending an urban health centre. Systematic random sampling was used. Data on socio-demographic characteristics, sexual behaviour, HIV awareness, sexually transmitted infection (STI) symptoms and drug use were collected using a semi-structured questionnaire. Associations were assessed using chi-square or Fisher's exact tests, followed by binary logistic regression.

Results: Among 267 participants, 90 (33.7%) had ever undergone HIV testing, while 177 (66.3%) had never been tested. Testing was significantly associated with age ($p<0.001$), education ($p=0.0039$), HIV awareness ($p<0.001$) and STI symptoms ($p=0.005$). In multivariable analysis, increasing age ($p=0.013$), school dropout ($p=0.017$), STI symptoms ($p=0.011$) and HIV awareness ($p<0.001$) were positively associated with HIV testing, whereas drug use ($p=0.031$) and condom use before marriage ($p=0.004$) were negatively associated. Sex before marriage was not significantly associated with testing ($p=0.693$).

Conclusion: Only one-third of young men had ever undergone HIV testing, indicating a substantial testing gap. Integrating HIV education and provider-initiated testing into routine primary-care and STI services, together with confidential and youth-friendly testing options, may improve HIV-testing uptake among young men in disadvantaged urban communities.

Keywords: HIV testing, youth, urban slums

INTRODUCTION

Human immunodeficiency virus (HIV) infection remains an important global public health problem despite substantial advances in prevention, diagnosis and antiretroviral treatment. The global burden of HIV remains considerable, with approximately 42.4 million people estimated to be living with HIV in 2023, although HIV-related mortality has declined substantially with increasing access to antiretroviral therapy.[1] Early diagnosis remains a critical component of HIV control because knowledge of HIV status facilitates timely linkage to treatment and prevention services and reduces the potential for onward transmission.[2]

India has a comparatively low HIV prevalence in the general population, but its large population results in a substantial absolute burden of infection. Estimates have placed the number of people living with HIV in India at approximately 2.4 million in the 2020s, with substantial geographic and population-level variation in the epidemic.[3] Population-based studies have demonstrated that HIV prevalence in India varies according to socioeconomic, demographic and

behavioural characteristics. In a population-based study in Guntur district, Andhra Pradesh, Dandona et al. reported an adjusted HIV prevalence of 1.72% among adults aged 15–49 years, with differences according to socioeconomic status and other population characteristics.[4]

HIV testing is an essential entry point into HIV prevention and treatment services, yet testing uptake in India has historically been limited. In a population-based study of 12,994 sexually active adults aged 15–49 years in Guntur district, Dandona et al. reported an age-, sex-, urban- and rural-adjusted HIV-testing prevalence of 21.1%; testing was reported by 18.8% of men and 27.2% of women.[5] Increasing educational attainment, urban residence and occupations requiring mobility were significantly associated with greater uptake of HIV testing. Awareness of voluntary counselling and testing centres was also low, indicating that inadequate knowledge of available testing services may be an important barrier to HIV testing.[5]

Young people are an important population for HIV prevention because adolescence and early adulthood are periods characterized by changes in sexual behaviour, social relationships, substance use and health-care-seeking practices. Adolescents and young adults have consistently demonstrated lower levels of HIV testing than desirable. A recent systematic review and meta-analysis of individuals aged 10–25 years estimated the pooled HIV-testing prevalence at approximately 32% and identified age of 20 years or older and higher educational attainment among factors associated with testing.[6] Earlier evidence has similarly shown that young people are among the groups least likely to seek HIV testing and most likely to remain unaware of their HIV status.[7]

Young men warrant particular attention because their engagement with HIV testing may differ from that of women. Indian studies have demonstrated substantial sex differences in HIV-testing uptake and in the circumstances under which testing occurs. In the Guntur population-based study, men were less likely than women to have undergone HIV testing, and men were more likely to report voluntary testing, whereas women frequently underwent testing in relation to pregnancy.[5] Among married men in India, knowledge of HIV transmission and knowledge of places where HIV testing was available were significantly associated with willingness to undergo testing and with previous HIV testing. Educational, socioeconomic and occupational characteristics were also associated with testing behaviour.[8]

HIV-related knowledge therefore appears to be an important determinant of testing. Young people may not perceive themselves to be at risk or may be unaware of the availability and benefits of HIV testing. Interventions aimed at increasing HIV testing among young people have identified education and alternative methods of test delivery as important approaches for improving testing uptake.[7] In addition, barriers such as stigma, fear of a positive result and concerns regarding confidentiality may influence young people's willingness to seek HIV testing.[9] These considerations are particularly relevant for young men in disadvantaged urban communities, where access to confidential and youth-friendly health services may be limited.

Behavioural and clinical characteristics may also influence HIV-testing behaviour. Sexual behaviour, condom use, substance use and symptoms suggestive of sexually transmitted infections (STIs) may increase perceived HIV risk or provide opportunities for health-care providers to recommend testing. However, objective risk and perceived risk do not necessarily correspond, and HIV testing may depend on knowledge, previous health-care experiences and accessibility of services rather than risk behaviour alone.[8,10]

The setting in which HIV testing is provided may also influence uptake. A systematic review of HIV testing among adolescents and young adults found that acceptance of testing differed according to the model of service delivery, with primary-care and hospital settings demonstrating substantial potential for reaching young people.[11] Evidence from interventions among young people further suggests that provider-offered testing, home testing, educational approaches and alternative testing venues can improve testing uptake or intention to test.[7] More recent evidence also indicates that HIV self-testing is highly acceptable among adolescents and young adults and may provide additional opportunities to reach individuals who face barriers related to privacy, stigma or convenience.[12]

Despite the importance of HIV testing among young people, evidence regarding determinants of HIV testing specifically among young men aged 18–24 years living in urban slum communities in India remains limited. Understanding the factors associated with testing in this population is important for identifying missed opportunities for early diagnosis and for designing appropriate interventions within primary health-care settings. Therefore, the present study was undertaken to determine the proportion of young men aged 18–24 years who had ever undergone HIV testing and to assess the association of socio-demographic characteristics, sexual behaviour, HIV awareness, STI symptoms and selected behavioural risk factors with HIV testing.

MATERIALS AND METHODS

Study design, settings, sampling and participants: A facility-based, cross-sectional study was conducted. The study was conducted over a period of 12 months, from January to December 2019. Males between the age group of 18 to 24 years, attending the Outpatient Department (OPD) of an Urban Health Centre were approached for the study.

The sample size was calculated using the formula $n = 4pq/l^2$, assuming a prevalence (p) of 22% for HIV testing based on a study by Dandona et al, with q =

78 and an admissible error (l) of 5%. The calculated sample size was 274.56, which was rounded off to 275.

The number of males in this age group in the last one year attending the OPD was approximately 1300. Systematic random sampling was employed and every 4th eligible male was approached for participation in the study, with the starting point chosen randomly. If a selected participant refused, the next eligible participant was approached. A total of 301 youth were approached and 29 refused to participate. (Refusal rate: 9.4%). Among the 275 who consented to participate, 8 were excluded due to ineligibility.

Ethical considerations: The research protocol was approved by the Institutional Ethics Committee at Topiwala National Medical College and BYL Nair Charitable hospital with reference number ECARP/2018/144. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

The rationale of the study was explained and written informed consent was obtained from those who consented to participate in the study. Youth residing in the slum for at least 6 months and attending the OPD, were eligible for inclusion. Those who were seriously ill (unable to participate in an interview due to acute medical conditions) or who did not consent were excluded. All participants were informed of their right to withdraw at any time.

Confidentiality was ensured during data collection with only the interviewer and subject being present in the room during the interview. Data was coded for anonymity.

Data collection: A semi-structured interview schedule was utilized to collect data with the interviewer recording data on a paper form which was later entered into an electronic format. Face-to-face interviews were conducted by the interviewer to collect data on socio-demographic details, ever and current tobacco use, alcohol and drug use, physical violence, HIV awareness and testing and sexual behaviour. For the current study, only the variables relating to age, education, school dropout, family type, marital status, sexual behavior, HIV awareness and testing, symptoms of sexually transmitted infections (STI) and drug use were analyzed. The following operational definitions were used:

Youth: People in the age group between 18 to 24 years

Education: Levels were assessed based on the Kuppuswamy's Socioeconomic Scale

Drug use: An individual who used drugs at least once in his life time.

Drop out from school: Interruption of formal education for a continuous period of at least one month

HIV awareness: Able to correctly identify the agent and transmission of disease

Statistical Analysis: Among the 275 males who consented, 8 records were excluded from analysis due to incomplete data and for not meeting the eligibility criteria. Analysis was performed using R statistical software (version 4.3.2). Categorical variables were presented as counts and percentages, inferential statistics used Pearson's chi square test with Yates continuity correction or Fisher's exact test as application. Multivariate analysis utilized binary logistic regression with HIV testing (yes/no) as a binary outcome.

RESULTS

[Table 1] depicts the socio-demographic characteristics and HIV testing among the participants. Among the 267 participants, 90 (33.7%) had been tested for HIV, while 177 (66.3%) had not. A statistically significant association was observed between age group and HIV testing ($p < 0.001$). The proportion of participants who had been HIV tested increased with age, from 20.0% among those aged 18–20 years to 43.5% among those aged 20–22 years and 48.4% among those aged 22–24 years. Education was also significantly associated with HIV testing ($p = 0.0039$). The highest proportion of HIV testing was observed among postgraduate participants (100.0%), followed by graduates (45.95%) and those with secondary education (45.21%), whereas HIV testing was least common among illiterate participants (12.5%). However, the postgraduate group consisted of only two participants, so this percentage should be interpreted cautiously. Family type was not significantly associated with HIV testing ($p = 0.3624$), with HIV testing reported among 29.7% of participants from joint families and 35.8% from nuclear families; none of the three participants from broken families had been tested.

[Table 2] presents the association between marital and sexual characteristics and HIV testing status. No statistically significant association was observed between marital status and HIV testing ($p = 0.891$). The proportion of participants who had been HIV tested was similar among married (33.3%) and unmarried participants (34.0%), while none of the two widowed participants had been tested. Similarly, ever having had sex was not significantly associated with HIV testing ($p = 0.550$); 35.2% of participants who had never had sex and 30.6% of those who had had sex reported HIV testing. Sex before marriage was also not significantly associated with HIV testing ($p = 1.000$), with almost identical proportions tested among those who reported no sex before marriage (33.7%) and those who reported sex before marriage (33.8%).

[Table 3] shows a strong statistically significant association between HIV awareness and HIV testing status ($p < 0.001$). Among participants who were aware of HIV, 45.95% had been tested, compared with only 6.10% among those who were not aware. This indicates that HIV testing was considerably more common among participants with HIV awareness. Similarly, STI symptoms were significantly associated with HIV testing ($p = 0.005$).

Among participants reporting STI symptoms, 66.67% had undergone HIV testing, compared with 31.33% among those without STI symptoms. Participants with STI symptoms were more likely to have been tested for HIV.

[Table 4] presents the association between selected risk factors and HIV testing status. None of the examined risk factors showed a statistically significant association with HIV testing at the 5% significance level. School dropout was not significantly associated with HIV testing (p = 0.298), although a slightly higher proportion of participants who had dropped out of school had been tested compared with those who had not (37.21% vs. 30.43%). Similarly, age at first intercourse was not significantly associated with HIV testing (p = 0.544). Among participants reporting age at first intercourse of 15–19 years, 30.0% had been tested, compared with 36.36% among those reporting 20–24 years. Condom use before marriage was also not significantly associated with HIV testing (p = 0.115). Participants who reported condom use had a lower proportion of HIV testing than those who did not (12.50% vs. 35.06%), although this difference did not reach statistical significance. Drug use was likewise not significantly associated with HIV testing (p = 0.172); 10.0% of participants reporting drug use had been tested compared with 34.63% among those who reported no drug use.

The multivariable logistic regression analysis showed that age, school dropout, drug use, STI symptoms, HIV awareness, and condom use before marriage were significantly associated with HIV testing, whereas sex before marriage was not statistically significant. For every one-year increase in age, the odds of HIV testing increased by approximately 22% (B = 0.200, Exp(B) = 1.221, p = 0.013). Participants who had experienced school dropout had 2.15 times higher odds of HIV testing compared with those who had not dropped out (B = 0.765, Exp(B) = 2.149, p = 0.017). Drug use was associated with lower odds of HIV testing, with drug users having approximately 91% lower odds compared with the reference group (B = −2.424, Exp(B) = 0.089, p = 0.031). Sex before marriage was not significantly associated with HIV testing (B = 0.155, Exp(B) = 1.168, p = 0.693). Participants reporting STI symptoms had approximately 15 times higher odds of HIV testing (B = 2.704, Exp(B) = 14.943, p = 0.011). Similarly, HIV awareness was strongly associated with HIV testing, with approximately 11.9 times higher odds among participants in the relevant awareness category (B = 2.474, Exp(B) = 11.872, p < 0.001). In contrast, condom use before marriage was associated with substantially lower odds of HIV testing (B = −3.859, Exp(B) = 0.021, p = 0.004). This is depicted in [Table 5].

Table 1: Sociodemographic characteristics versus HIV testing status

		HIV tested (No)	HIV tested (Yes)	P value
Age group	18-20	104 (80.00%)	26 (20.00%)	< 0.001
	20-22	26 (56.52%)	20 (43.48%)	
	22-24	47 (51.65%)	44 (48.35%)	
Education	graduate	20 (54.05%)	17 (45.95%)	0.00391 *
	higher secondary	70 (74.47%)	24 (25.53%)	
	illiterate	7 (87.50%)	1 (12.50%)	
	post graduate	0 (0.00%)	2 (100.00%)	
	primary	40 (75.47%)	13 (24.53%)	
	secondary	40 (54.79%)	33 (45.21%)	
Family type	broken	3 (100.00%)	0 (0.00%)	0.3624 *
	joint	52 (70.27%)	22 (29.73%)	
	nuclear	122 (64.21%)	68 (35.79%)	
Total		177 (66.3%)	90 (33.7%)	

* Fisher's exact test

Table 2: Marital characteristics versus HIV testing status

		HIV tested (No)	HIV tested (Yes)	P value
Marital status	married	8 (66.67%)	4 (33.33%)	0.8906 *
	unmarried	167 (66.01%)	86 (33.99%)	
	widowed	2 (100.00%)	0 (0.00%)	
Ever had sex	no	118 (64.84%)	64 (35.16%)	0.5498 #
	yes	59 (69.41%)	26 (30.59%)	
Sex before marriage	no	128 (66.32%)	65 (33.68%)	1 #
	yes	49 (66.22%)	25 (33.78%)	
Total		177 (66.3%)	90 (33.7%)	

* Fisher's exact test. # Yates continutity correction

Table 3: HIV knowledge and STI versus HIV testing status

		HIV tested (No)	HIV tested (Yes)	P value
HIV awareness	no	77 (93.90%)	5 (6.10%)	< 0.001 #
	yes	100 (54.05%)	85 (45.95%)	
STI symptoms	no	171 (68.67%)	78 (31.33%)	0.005032 #
	yes	6 (33.33%)	12 (66.67%)	
Total		177 (66.3%)	90 (33.7%)	

Yates continutity correction

Table 4: Risk factors versus HIV testing status

		HIV tested (No)	HIV tested (Yes)	P value
School dropout	no	96 (69.57%)	42 (30.43%)	0.298 #
	yes	81 (62.79%)	48 (37.21%)	
Age at first intercourse	10-14	3 (100.00%)	0 (0.00%)	0.5443 *
	15-19	42 (70.00%)	18 (30.00%)	
	20-24	14 (63.64%)	8 (36.36%)	
	NA	118 (64.84%)	64 (35.16%)	
Condom use before marriage	No	163 (64.94%)	88 (35.06%)	0.1145 #
	Yes	14 (87.50%)	2 (12.50%)	
Drug use	no	168 (65.37%)	89 (34.63%)	0.1719 *
	yes	9 (90.00%)	1 (10.00%)	
Total		177 (66.3%)	90 (33.7%)	

* Fisher's exact test

Yates continutity correction

Table 5: Multivariate analysis

Predictor	B	Exp(B)	P-value
Constant	−7.090	0.001	<0.001
Age	0.2	1.221	0.013
School dropout	0.765	2.149	0.017
Drug use	−2.424	0.089	0.031
Sex before marriage	0.155	1.168	0.693
STI symptoms	2.704	14.943	0.011
HIV awareness	2.474	11.872	<0.001
Condom use before marriage	−3.859	0.021	0.004

DISCUSSION

The present study found that 90 of 267 participants (33.7%) had ever undergone HIV testing, while 177 (66.3%) had never been tested. Thus, approximately two-thirds of young men attending the urban health centre had never undergone HIV testing, indicating a substantial gap despite their contact with a health-care facility. The proportion tested in the present study was higher than that reported by Dandona et al., who found that 21.1% of adults in a population-based study in Guntur district had ever undergone HIV testing, with a corresponding prevalence of 18.8% among men.[5] The higher proportion observed in the present study may reflect differences in the study population and setting, as the present study included young men attending an outpatient facility, whereas the Dandona study was community-based and included adults aged 15–49 years. Nevertheless, the finding that two-thirds of participants had never been tested highlights a potentially important missed opportunity for HIV prevention and early diagnosis.

The overall proportion of participants who had ever been tested was similar to the pooled testing prevalence of approximately 32% reported in a recent systematic review and meta-analysis of adolescents and young adults.[6] Although direct comparison should be made cautiously because the populations, countries, age ranges and health-care settings differed, the consistency of these findings suggests that suboptimal HIV-testing uptake among young people remains a broader concern.

Age was strongly associated with HIV testing in the present study. The proportion tested increased progressively from 20.0% among participants aged 18–20 years to 43.5% among those aged 20–22 years and 48.4% among those aged 22–24 years (p<0.001). This association remained significant in the multivariable model, with the odds of HIV testing increasing by approximately 22% for every one-year increase in age. This finding is consistent with the systematic review and meta-analysis by Yu et al., which identified age ≥20 years as a factor associated with HIV testing among adolescents and young adults.[6] Older young adults may have greater autonomy in making health-care decisions, greater exposure to sexual and reproductive health information, and more frequent interaction with health services. Increasing age may therefore provide greater opportunity and motivation for HIV testing.

Education was significantly associated with HIV testing in the bivariate analysis. The lowest proportion of testing was observed among illiterate participants, while testing was generally more common among participants with higher educational attainment. This finding is consistent with Indian evidence. Dandona et al. found that increasing education was significantly associated with HIV-testing uptake in Guntur district.[5] Similarly, Das et al., in their analysis of married men participating in the National Family Health Survey, found educational attainment to be associated with previous HIV testing and willingness to undergo testing.[8] Education may influence testing through improved health literacy, greater understanding of HIV transmission and prevention, and greater awareness of available testing services. The 100% testing proportion observed among postgraduate participants in the present study should, however, be interpreted cautiously because this group contained only two participants.

A particularly important finding was the strong association between HIV awareness and testing. Among participants who were aware of HIV, 45.95% had been tested compared with only 6.10% among

those who were not aware. This association remained highly significant in the multivariable model, with participants with HIV awareness having approximately 12 times higher odds of testing. This finding is consistent with Indian evidence showing an important role for HIV-related knowledge in testing behaviour. Das et al. reported that knowledge of HIV transmission and knowledge of places where HIV testing was available were significant correlates of both willingness to test and previous testing among Indian men.[8] These findings suggest that increasing knowledge about HIV and testing services may be an important component of interventions aimed at increasing HIV-testing uptake among young men.

The relationship between awareness and testing also has important implications for primary health care. Merely making HIV testing available may not be sufficient when young people have limited knowledge about HIV transmission, prevention and the benefits of knowing their HIV status. Educational interventions targeted at young people have been shown to improve intention to test, particularly when combined with accessible methods of test delivery.[7] Incorporating brief HIV education into routine outpatient consultations, youth-focused services and community-based programmes may therefore help increase awareness and normalize HIV testing.

STI symptoms were also strongly associated with HIV testing. Among participants reporting STI symptoms, 66.67% had undergone HIV testing compared with 31.33% among those without symptoms (p=0.005). The association became stronger after adjustment, with participants reporting STI symptoms having approximately 15 times higher odds of HIV testing. This finding is clinically plausible because individuals presenting with symptoms suggestive of an STI may have increased perceived HIV risk and may be more likely to receive a recommendation for HIV testing during a health-care encounter. It also suggests that STI-related consultations may represent an important opportunity for provider-initiated HIV testing.

However, this association should not be interpreted as causal. Because the study was cross-sectional, the temporal sequence between STI symptoms and HIV testing cannot be established. Participants may have sought HIV testing because of STI symptoms, or both outcomes may have been related to an underlying sexual or health-care-seeking characteristic. Furthermore, STI symptoms were self-reported and were not confirmed by laboratory testing.

In contrast, marital status, ever having had sex and sex before marriage were not significantly associated with HIV testing in the bivariate analyses. Testing proportions were similar among married and unmarried participants, and participants who had ever had sex did not differ significantly from those who had never had sex. Likewise, sex before marriage was not associated with testing. These findings suggest that HIV-testing behaviour in this population may not be determined solely by reported sexual experience. Among Indian men, previous testing has been associated with knowledge, education, socioeconomic characteristics and other factors in addition to sexual behaviour.[8] Furthermore, sensitive sexual behaviours may be under-reported because of social desirability, particularly during face-to-face interviews, which may have attenuated associations in the present study.

School dropout was not significantly associated with HIV testing in the bivariate analysis. However, after adjustment, participants who had experienced school dropout had 2.15 times higher odds of HIV testing. The emergence of this association after adjustment suggests that the relationship between school dropout and testing may have been influenced by other characteristics, including age, education and HIV awareness. School dropout may also act as a marker of broader social circumstances associated with patterns of health-care utilization. Nevertheless, because the association was not observed in the unadjusted analysis and because the study was not specifically designed to examine pathways linking school dropout to HIV testing, this finding should be interpreted cautiously.

Drug use was associated with markedly lower odds of HIV testing in the multivariable analysis. Participants who reported drug use had approximately 91% lower odds of having undergone HIV testing compared with those who reported no drug use. This finding is important because young people who use drugs may experience stigma, social marginalization and reduced engagement with conventional health services. HIV-testing interventions among young people have highlighted the importance of offering testing through accessible and acceptable delivery approaches rather than relying exclusively on conventional facility-based services.[7,10] However, the number of participants reporting drug use in the present study was small, and the adjusted estimate may therefore be unstable. Larger studies with adequate representation of young people who use drugs are required to confirm this association.

Condom use before marriage was not significantly associated with HIV testing in the bivariate analysis but was associated with substantially lower odds of testing after adjustment. This finding should be interpreted particularly cautiously. The small number of participants reporting condom use may have resulted in sparse-data problems and an unstable regression coefficient, particularly after simultaneous adjustment for several behavioural variables. Furthermore, condom use is a preventive behaviour and should not be interpreted as indicating that individuals who use condoms do not require HIV testing. The inverse association may instead reflect confounding or characteristics of the small subgroup. Further studies with larger samples and more detailed measures of sexual behaviour are required to clarify this finding.

The differences between the bivariate and multivariable findings emphasize that HIV-testing behaviour is multifactorial. Some variables that were

not significant individually became significant after adjustment, suggesting that age, education, awareness and behavioural characteristics may interact or confound one another. This is consistent with the broader literature, which indicates that HIV-testing behaviour among young people is influenced by individual, interpersonal and health-system factors rather than by objective HIV risk alone.[2,10]

The findings have several implications for primary health-care practice. First, the fact that two-thirds of young men attending the health centre had never undergone HIV testing suggests that routine outpatient encounters represent an important opportunity to offer or promote testing. Second, the strong association between HIV awareness and testing supports integration of HIV education into services accessed by young men. Third, STI-related consultations appear to be particularly valuable opportunities for HIV testing. Finally, the lower odds of testing among participants reporting drug use suggest the need for targeted and non-stigmatizing approaches for young men who use drugs.

The choice of HIV-testing delivery model may be important for addressing these gaps. A systematic review of HIV-testing models among adolescents and young adults found that acceptance varied by setting, with primary-care and hospital-based approaches demonstrating substantial potential for reaching young people outside North America.[11] Interventions designed to increase HIV testing among young people have also identified provider-offered testing, alternative testing venues, home testing and educational interventions as potentially effective approaches.[7] More recent evidence indicates that HIV self-testing is highly acceptable among adolescents and young adults and can provide greater privacy, autonomy and convenience.[12] Such approaches may be particularly useful for young men who are reluctant to attend services specifically identified as HIV-testing centres.

Strengths and limitations: The present study has several strengths. It specifically examined young men aged 18–24 years, a population for which evidence from urban slum settings in India is limited. The study assessed a broad range of potential determinants, including socio-demographic characteristics, sexual behaviour, HIV awareness, STI symptoms and drug use. Systematic random sampling was used to recruit eligible participants, and multivariable logistic regression allowed simultaneous assessment of several potential determinants of HIV testing.

Several limitations should also be considered. First, the cross-sectional design prevents determination of temporal or causal relationships between the identified factors and HIV testing. Second, participants were recruited from a single urban health centre and therefore may not be representative of all young men living in urban slums, particularly those who do not seek health care. Third, sexual behaviour, drug use, STI symptoms and previous HIV testing were self-reported and may have been affected by recall and social desirability bias. Fourth, some subgroups were small, including postgraduate participants and participants reporting drug use, which may have resulted in imprecise estimates in the multivariable analysis. Finally, the outcome was ever having undergone HIV testing rather than recent testing; therefore, the study cannot determine whether participants were being tested at an appropriate frequency according to their individual level of risk.

CONCLUSION

In conclusion, only one-third of young men attending the urban health centre had ever undergone HIV testing, indicating a substantial testing gap. Older age, HIV awareness and STI symptoms were strongly associated with HIV testing, while drug use was associated with lower odds of testing after adjustment. These findings suggest that improving HIV awareness, incorporating HIV testing into routine primary-care and STI services, and providing confidential, acceptable and youth-oriented testing options may help improve HIV-testing uptake among young men living in urban disadvantaged communities. Further multicentre studies with larger samples are needed to confirm these associations and evaluate interventions specifically designed to improve HIV testing among young men.

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