

Knowledge, attitudes and practices regarding HIV/AIDS and STIs among youths and key populations in informal settlements of Nairobi, Kenya

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Abstract

Kenya is home to one of the worst HIV/AIDS epidemics, with higher prevalence rates in youths in urban slums. We conducted a cross-sectional mixed-methods study in Nairobi informal settlements. The aim was to investigate knowledge, attitudes and behaviours of this marginalized community, and to identify, with a bottom-up approach, the most appropriate interventions to increase the utilization of HIV/STIs services. Preliminary qualitative research was used to draw questionnaires, which assessed: STIs/HIV/AIDS knowledge, attitudes, and behaviours; access and barriers to STIs/HIV/AIDS services; perceived quality of services; the impact of COVID-19. One thousand and fifty-four respondents completed the questionnaire. 48.3% were youth in the community, 23% youth in school, 16.8% young mothers, 6.9% drug users and 5% people attending a technical-vocational training. We found unsatisfactory knowledge of STIs/HIV/AIDS transmission and prevention, and low condom use, mainly due to difficult access, poverty, and gender-based violence. We also found limited use of health services, and lack of trust due to poor attitude of the staff. COVID-19 has widened barriers to access to health services. To reach this population, it is necessary to implement educational interventions, facilitate access to free condoms, and train health centre staff to be more welcoming. Respondents found proximity strategies more efficient, including door-to-door testing and community outreach.

Key words

- HIV/AIDS
- sexual and reproductive health
- global health
- health service delivery

INTRODUCTION

HIV/AIDS and other sexually transmitted infections (STIs) are of major public health concern worldwide, accounting for more than 2.3 million people dying per year and 1 million newly infected each day [1]. Although global statistics reveal a general decline in AIDS related deaths and new HIV infections thanks to the concerted efforts of various stakeholders, the toll of HIV/AIDS continues to be harsh in developing countries, especially in Eastern and Southern Africa [2]; other STIs disproportionately affect low-income and middle-income countries as well [3]. STIs, in addition to being key epidemiological markers of unprotected sex, contribute adversely to sexual, reproductive and maternal-child health; lead to pelvic

inflammatory disease, genital malignancies and infertility and increase the risk of HIV acquisition and transmission [1, 4].

The youth are especially prone to HIV infection as well as other sexually transmitted infections: young people accounted for 27% of HIV infections in 2020 [2, 5, 6]. This disproportionate impact on adolescents and young adults is a result of a lack of correct health information and age-appropriate comprehensive sexuality education, leading to engagement in risky behaviours, and a lack of knowledge and access to adequate reproductive health service, due for instance to fear of shame and stigma or to parental consent barrier [2, 7-11]. Sixty percent of the adolescents living with HIV reside in Eastern and Southern Africa [11].

Similarly, due to the even higher probability of high-risk practices, marginalization and lack of adequate access to services, five key population (KP) groups are particularly vulnerable to HIV/AIDS and other STIs. These include: men who have sex with men, sex workers, transgender people, people who inject drugs and incarcerated people [2]. Not only do young people constitute a large percentage of most-at-risk groups, but they also frequently have higher HIV infection rates within these groups [12-15].

Kenya is home to one of the world's worst HIV and AIDS epidemics, with 1.4 million of people infected. The prevalence rate is 4.0% in the age group 15-49 [16]. Although the country did significant progress in fighting HIV in the last years, there is still a considerable number of new infections among youths, especially girls and KPs [17]. Previous studies carried out in the country found high numbers of STIs and HIV among young women [18] and street-connected youth [19]. According to the estimates of Kenya's Ministry of Health, in 2018 new infections in the youth population were disproportionately recorded in women: in the age group of 15-19 years, new HIV infections stand at 70% for women and 30% for men; in the age group 20-24, at 62% for women and 38% for men [20].

In Kenya, as elsewhere, HIV/AIDS prevalence rates in urban areas are higher than in rural areas [21-23], with strong intra-urban differences, especially in Nairobi, where the prevalence of HIV was much higher among slum residents compared with non-slum urban residents [24-26]. The increased vulnerability to HIV infection among the urban poor seems due to risky sexual practices, economic hardships, lower social cohesion, overcrowding, lack of security, multiple sexual partnerships, and early initiation of sex [27], but also very low awareness of HIV status [28], causing low access to testing and treatment. Misinformation and misconceptions about modes of transmission and treatments remain a widespread phenomenon [29, 30]. This is exacerbated by the lack of healthcare facilities and services, due to the informal and marginalized nature of these settlements [31-35].

Knowledge, attitudes and practices (KAPs) surveys regarding HIV/AIDS and STIs is one of the cornerstones in the fight against these diseases [8]: evaluating target targets' KAPs can help in designing appropriate and tailored prevention strategies, defining a baseline to evaluate the success of prevention strategies.

This present study was conducted within the project "Be free! Integration among community and health system for a youth population free from HIV and stigma" implemented by the Italian NGO *Medicus Mundi Italia* - MMI in collaboration with NO ONE OUT, an NGO based in Kenya, for which the Italian National Institute of Health (Istituto Superiore di Sanità - ISS) provided technical-scientific assistance for its design, coordination, and implementation. The "Be Free" Project aims at contributing to the national strategy to fight and end HIV, as envisaged by Kenya Vision 2030. The initiative aims at promoting the integration between communities and public health system, in order to guarantee access to prevention services and HIV treatment

for communities who live in the most hard-to-reach and marginalized areas, and to reduce the stigma and discrimination caused by HIV among adolescents and young people, particularly in women and KP in urban informal settlements.

The aim of the study, in addition to investigating knowledge attitudes and behaviours of youths, was to try to identify, with a bottom-up approach, the most appropriate interventions and practical solutions that might be implemented in the future, in order to increase the utilization of HIV/STIs testing services addressed to youths and KP.

METHODS

This is a cross-sectional study carried out from June to August 2021 in four sub-counties in Nairobi: Mathare, Embakasi North/West, Ruaraka, Kamukunji. These are informal settlements, poor in terms of incomes, assets, access to resources and environmental conditions. Target groups included: *i*) adolescents and young people in school; *ii*) adolescents and young people in the community; *iii*) young mothers; *iv*) vulnerable KPs, especially drug users. The survey was conducted with a mix of qualitative and quantitative methods. Initially, Focus Group Discussions (FGDs) were conducted to explore youth attitudes toward STIs and to design a more specific quantitative questionnaire. The questionnaire was administered to a convenience sample of youths, young mothers and KPs, selected through the collaboration of the co-researchers with the Community Health Volunteers (CHVs) engaged by the project in 10 Health Facilities of these urban sub-counties, with the aim to evaluate their KAPs regarding HIV/AIDS and STIs. Being a hard-to-reach community, participants were directly recruited in the proximity of the health facilities. The knowledge of the local context by the CHVs and the trust they hold from the local population and, in particular, from the young people living in these areas, was the key element ensuring the participants' adherence to the study.

Before the study took place, all participants were provided with information about the study's methods and objectives, emphasising that the responses would only be used to improve the health service delivery according to the needs of the population. The participation in both the FGDs and the questionnaire was completely voluntary. Verbal or signed informed consent was obtained from all respondents before the start of the investigation. Questionnaires were completed anonymously. The study was performed in line with the principles of the Declaration of Helsinki.

Focus Group Discussions

The first activity was the organisation of qualitative FGDs, whose questions have been developed in English and translated in Swahili. FGDs were conducted by three co-researchers (2 males, 1 female): one FDG in each of the four target groups, for a total of 12 FDGs (with 6 to 8 participant each). These were conducted in the selected areas by local researchers, under the supervision of a local supervisor, selected by the NGOs involved in the project.

The questionnaire

The questionnaire was developed by the researchers in Italy in collaboration with the local researchers in Nairobi, considering the reports of the FGDs. The content of the questionnaire was based on handbooks [36, 37] scientific literature [8, 23], and on the experience of similar project previously conducted by some research group members [38-40].

The questionnaire was pre-tested before administration by all co-authors and by local researchers to verify language, flow, clarity, readability and completeness, together with acceptability and response alternatives. It was made of 36 questions, grouped into five sections: i) socio-demographic characteristics (8 questions); ii) STIs/HIV/AIDS knowledge and source of information (3 questions); iii) STIs/HIV/AIDS behaviours (5 questions); iv) knowledge, access and barriers to STIs/HIV/AIDS test and treatment (including questions on healthcare providers' perceived attitude - 9 questions); v) youth centres and training activities on sexual and reproductive health, STIs and HIV (6 questions). An additional set of 5 questions concerning the impact of COVID-19 on daily life and STIs/HIV prevention programs was added due to the context in which the research was conducted. All 36 questions were multiple-choice, but 21 of them had a possible open-ended "other" answer.

The questionnaire was in English. It was self-administered, with the assistance of field survey workers (CHVs involved in the project), in case of need for translation purposes. The CHVs were trained by local researchers in collaboration with supervisors in Italy (remotely) and in Nairobi, together with the project partners in Kenya. The local researchers coordinated and supported the survey workers in all phases of the implementation. Data collection was completely anonymous.

Definitions and statistical analysis

Door-to-door testing/service in the community: testing strategy that sends an HIV Testing and Services counsellor door-to-door in the area of interest, accompanied by a CHV.

Outreach testing in the community: provision of free medical check-ups and general clinical management at no costs by healthcare workers who reach hotspots of KP after mapping out the area.

Inreach testing in the community: organization of a public health center aimed at capturing the population that cannot be reached over week days, with openings on weekends or public holidays, when the health facilities are closed to public and people feel free to express themselves.

Level of education was categorized, in the analysis, in two groups: low and high education, the latter including those who completed secondary school or had higher education.

Descriptive statistical tests on the items included in the questionnaire were performed. Continuous variables were expressed as median and interquartile range, whereas categorical variables were expressed as proportions. Differences in proportions between groups were evaluated by the chi-squared test, or with the exact

Fisher test where appropriate. p -values < 0.05 were considered statistically significant and all tests were two-sided. All analyses were performed with STATA version 16 (StataCorp LLC 4905 Lakeway Drive College Station, Texas, USA).

RESULTS

Study population

One thousand and fifty-four respondents completed the questionnaire; 55.6% were females and the median age was 22 years old (IQR 19-25). The target groups surveyed were mostly youth in the community (48.3% of the sample), followed by youth in school (23%), young mothers (16.8%), drug users (6.9%) and people who have attended a TVET education (Technical and Vocational Education and Training, 5%). Socio-demographic characteristics of the respondents, stratified by gender, are reported in *Table 1*.

STI/HIV/AIDS knowledge and source of information

Regarding STIs/HIV/AIDS knowledge, 96% of youths of reproductive age report having heard about HIV/AIDS, with no statistically significant differences by gender or population group. Seventy-eight percent report being aware of STI's complications, with a greater degree of knowledge about complications being shown by females (83.9% vs 76.5% by male, $p=0.003$), members of the "youth in school" (87.8%), "young mother" (83.5%) and people with TVET education (83.2%). However, many respondents do not recognize most of the possible complications of STIs: while about half reported infertility and pregnancy complications and 40% pelvic pain, only 29% reported cancer. The knowledge regarding STIs/HIV/AIDS complications is independent of education level except for infertility, recognised by 65.7% of people with higher education ($p=0.008$) (data not shown).

The main sources of information on HIV and STIs reported by respondents are social media (44.8%), followed by TV (39.3%), school (38.9%), family/friends (34.7%) and radio (34.6%). Less frequently reported are sexual and reproductive health trainings (27.0%) and very few respondents report turning to religious leaders as sources of information (6.4%). No significant difference is observed in information sources by gender. A higher education is significantly associated with a higher use of social media (49.4% vs 30.8% in the low education group, $p<0.001$), school (43.1% vs 26.1%, $p<0.001$) and other training courses (30.4% vs 16.7%, $p<0.001$), while respondents with lower education rely significantly more on family (44% vs 31.8% in the high education group, $p<0.001$), radio (41.2% vs 32.4%, $p=0.10$), and TV, although not significantly. Addressing religious leaders is not associated with a lower education but it is more frequent in the "TVET education" group (13.2%). Drug users report using mainly TV (52.8%) and radio (50%) as sources of information.

STI/HIV/AIDS behaviours and attitudes

Table 2 shows the reported attitudes towards risky behaviours. Ninety-four percent of the respondents report knowing how to protect themselves from HIV infection,

Table 1

Socio-demographic characteristics of the study population (absolute and relative frequencies), by gender (HIV/AIDS and STIs) in Nairobi, Kenya

Characteristics	Gender			p-value
	Male N (%)	Female N (%)	Total N (%)	
Age				
13-19	116 (26.3)	171 (30.8)	287 (28.8)	0.291
20-24	229 (51.9)	273 (49.2)	502 (50.4)	
25-40	96 (21.8)	111 (20.0)	207 (20.8)	
Population				
Youth in school	117 (25.2)	125 (21.4)	242 (23.0)	<0.001
Drug user	51 (11.0)	21 (3.6)	72 (6.9)	
Youth in community	268 (57.6)	239 (40.9)	507 (48.3)	
Young mother	-	176 (30.1)	176 (16.8)	
TVET education	29 (6.2)	24 (4.1)	53 (5.0)	
Level of education				
None	18 (3.8)	16 (2.7)	34 (3.2)	0.242
Primary school	75 (16.0)	124 (21.2)	199 (18.9)	
Secondary school	254 (54.3)	304 (52.0)	558 (53.0)	
Higher education	111 (23.7)	127 (21.7)	238 (22.6)	
Adult education	10 (2.1)	14 (2.4)	24 (2.3)	
Marital status				
Married	74 (16.0)	132 (22.7)	206 (19.7)	<0.001
Never married	362 (78.4)	382 (65.8)	744 (71.3)	
Separated	24 (5.2)	62 (10.7)	86 (8.2)	
Widowed	2 (0.4)	5 (0.9)	7 (0.7)	
Occupation				
Student	159 (34.0)	180 (30.8)	339 (32.2)	0.039
Wage labourer	82 (17.6)	80 (13.7)	162 (15.4)	
Formal employee	24 (5.1)	26 (4.4)	50 (4.7)	
Farmer	2 (0.4)	4 (0.7)	6 (0.6)	
Unemployed	129 (27.6)	217 (37.1)	346 (32.9)	
Self-employed	71 (15.2)	78 (13.3)	149 (14.2)	
Total	468 (44.4)	586 (55.6)	1,054 (100.0)	

with no significant difference by gender, target group or level of education; 60.9% recognize as effective using male condom, 38.5% abstinence, 32.3% partner fidelity, 22.8% female condom, and 12.7% PREP/PEP. However, more than half of the sample (51.6%) report having been previously engaged in risky behaviours.

Self-reported risky behaviours are more frequently found among males (significantly after the exclusion of “no answer”), drug users and subjects with a lower education level. The most provided reason for having previously engaged in risky behaviours is the lack of money/unemployment/poverty (41.1%), reported, in particular, by almost 35% of the employed people. 23.6% of respondents report, as a reason, the shame in asking the partner to use a condom or the fear of losing the partner or being beaten up, with no difference by sex ($p=0.678$). 18.8% report difficulty in finding available condoms and

almost 14.5% a lack of trust and the discomfort given by the condom. Only 2.4% attribute responsibility for their behaviour to peer influence.

Twenty percent of respondents admit being unaware that their behaviour was at risk for HIV infection. When asked to identify the riskiest behaviours for the transmission, 64.5% answer unprotected sexual intercourse; 53.1% having several sexual partners, while 27.9% attribute it to the use of drugs. Few identify anal intercourse (15.5%) or homosexual intercourse between men (14.2%). Fourteen percent are aware of mother-to-child transmission and only 0.5% recognized transfusions as a possible risk.

Regarding condom use, as shown in *Table 2*, 45% of the sample report not always using condoms when having sex, this percentage being higher among women (48%, $p=0.022$). Reasons for this behaviour include the

Table 2

Absolute and relative frequencies of self-reported risky behaviours and attitudes towards test and treatment for HIV/STIs, by gender in Nairobi, Kenya

STIs/HIV/AIDS behaviours	Total		% in males	% in females	p-value
	N	%			
Have you ever had any risky behaviour?					
Yes	543	51.6	55.3	48.5	0.088
No	456	43.3	39.7	46.1	
No answer	54	5.1	4.9	5.3	
Do you know how to protect yourself from STIs and HIV/AIDS?					
Yes	988	93.7	93.4	93.9	0.717
No	40	3.8	3.6	3.9	
No answer	27	2.6	3.0	2.2	
If "Yes", which one do you use?					
Male condom	602	60.9	74.2	50.4	<0.001
Abstinence	380	38.5	34.5	41.6	0.022
Faithfulness to one single partner	319	32.3	23.3	39.4	<0.001
Female condom	225	22.8	11.6	31.6	<0.001
PREP/PEP	125	12.6	8.7	15.8	0.001
Do you always use condoms when having sexual intercourse?					
Yes	441	41.8	46.5	38.0	0.022
No	473	44.8	40.9	48.0	
No answer	138	13.4	12.6	14.0	
Why do you /young people have difficulties in getting tests and treatments for HIV/STIs from hospitals and clinics?					
Lack of privacy (fear of bumping into someone you/they know)	503	47.7	43.9	50.3	0.038
Attitude of health workers	361	34.3	31.6	36.2	0.116
Long queues in hospitals and clinics	310	29.4	30.9	28.2	0.328
Lack of information	205	19.4	20.5	18.6	0.446
Facilities are far away/cost of transports	71	6.7	5.8	7.5	0.259
Fear of finding out you are positive	30	2.8	3.4	2.4	0.321
Too expensive	27	2.6	3.6	1.7	0.050
Stigma, discrimination, peer pressure	19	1.8	1.7	1.9	0.835
Other reasons	17	1.6	1.7	1.5	0.924

STI: sexually transmitted infection.

following: condoms make the intercourse less pleasant (39.3%); condoms bring a sense of infidelity (34.2%); shame/stigma/discomfort given by buying condoms from pharmacists or health care providers (25.8%); condoms are not readily available (14.8%); the price of condoms is too high (6.6%); the influence of religious leaders (4.9%). Although 61% consider condoms as a tool for protection, less than half of the respondents report using it. Lower levels of education are significantly associated with a lower usage of condoms (41.3% versus 50.1% in the high educational group, $p=0.016$).

Regarding the stigma against individuals with HIV/AIDS, 84.3% acknowledge that they are normal people whereas 5.3% blame them for their illness; 3.2% say that one cannot share utensils, glasses and cutlery, or the bed with these people; 2.2% think that they cannot have

children. No differences are observed by target group nor by gender. Instead, differences in stigma do exist regarding the education level: among people without education only 55.9% say they are normal people and significantly higher percentages think they are cursed or will die soon.

Knowledge, access and barriers to STIs/HIV/AIDS test and treatment

Most of the respondents (95.7%) report knowing where to get tested and treated for STIs/HIV/AIDS, with no significant difference by gender, target group or level of education. Among these, 69.5% claim they would turn to public hospitals and clinics in case of need; 56.3% to VCTs (Voluntary Counselling and Testing) and 23.4% to private services. Only 16.4% state

that they would seek help from Youth Friendly Services (YFS).

Only 39.8% report being aware of the availability of effective treatments for HIV/AIDS, independently from the gender and level of education of the respondents; of all groups, the least aware are young mothers (34.5%).

In case of infection, 88.0% of respondents claim they would take medications from hospitals and clinics and 7.2% from pharmacies, while 3.8% would rely on self-medication. 2.6% would turn to religious leaders, 0.6% to traditional physicians; 7 people respond that they would kill themselves in the event of infection. Only 0.9% claim they would seek counselling and psychosocial support.

As shown in *Table 2*, one of the main problems in getting tests and treatments seems to be related to lack of privacy and lack of confidentiality from the staff. There are no significant differences between male and female, except for lack of privacy (reported more frequently by women ($p=0.038\%$), in particular young mothers ($p=0.002$). Drug users say a problem is the attitude of health workers (44.4%, $p=0.021$, in comparison to the other target groups).

Regarding the frequency of testing, according to 68.9% of respondents, it would be appropriate to be tested for HIV regularly, 31.3% only after engaging in risky behaviour, 12.8% before entering a stable relationship, 8.1% if you have symptoms and 4.5% only before having children.

As shown in *Table 3*, when asked about possible strategies and ways to increase access to HIV/STIs services, half of the respondents to the questionnaire identify "door-to-door testing/service in the community" as the most effective, followed by outreach testing and increasing the offer of YFS.

More than half of respondents (55.1%), with no significant difference by gender or level of education, report that health care providers' attitudes towards young people who come to them for counselling, testing, and treatment are "not good". Among these, the most frequently reported reasons are: they ask too many questions (24.2%), they are judging (23.2%), they are unfriendly or rude (22.7%), and they do not keep confidentiality (18.2%). Drug users complain most about the attitude of the operators (70.4%), followed by young mothers (59.7%).

Youth centres and training activities on sexual and reproductive health, STIs and HIV

Fifty-five percent of respondents, with no significant difference by gender or level of education, report knowing the YFS that provide counselling, information, education, testing and treatment for STIs and HIV in their area. However, 57.4% of all respondents state they have never been to one (55% of people who have never attended a YFS are not aware of their existence). Level of education is significantly associated with attendance at youth centres: 44.4% of those with a high level of education report having been to one at least once, compared with 32.5% of those with a low level of education ($p=0.001$). Drug users are less aware of youth centres (50.7% do not know this service exists) and visit them

Table 3

Absolute and relative frequencies of responses on strategies to improve access and attitude of HIV/AIDS/STIs services in Nairobi, Kenya

According to you, what would make the access to these services easier?	N	%
Door-to-door testing/service in the community	507	48.1
Outreach testing in the community	379	36.0
More Youth Friendly Services	342	32.4
Self-test kits	257	24.4
Inreach testing in the community	139	13.2
Testing at school	115	10.9
Incentive to pay transport fees	38	3.6
Counselling and advertising	11	1.0
All services to be free of charge	2	0.2
Other	10	0.9
Do you have any suggestion to improve the attitude of health workers/Youth Friendly Services?		
Training	710	67.4
Hiring younger personnel	293	27.8
Availability of CMEs in the centres	139	13.2
Presence of HIV/STI positive people in the centre	128	12.1
Other	36	3.4
No answer	17	1.6

STI: sexually transmitted infection.

less than other groups (71.4% of them have never attended any YFS).

18.9% of the sample claim there are not enough YFS in the area; 90.3% believe it would be necessary to have more YFS, with no significant difference by gender, target group or level of education; 16.6% think there is a problem of accessibility to these facilities since they are far from their home.

The reasons for which 58.1% report preferring Health Centres over YFS for these services (counselling, information, education, testing and treatment) are primarily because the formers are free (54.5%), have more professional staff (41.4%) and are more accessible in terms of distance (26.2%); it is also reiterated that there are only few YFS (17.2%). However, 41.5% of respondents prefer YFS, especially youths in the community (46.2%), because of the following reasons: they are more youth-friendly (55.7%), the staff is friendlier and maintains confidentiality (48.4%) and is less judging (32.1%).

Only 53.3% of respondents report having participated in sexual education and STI/HIV training activities, with no significant difference between males and females. Level of education is significantly associated with having attended trainings (65.3% of respondents with higher education versus 51.9% of those with lower education, $p<0.001$). Drug users are the group that participated the least in the trainings (50.8%). Among those who report participating in trainings, only 20.9% received it at school, while 28.9% at health centres/hos-

pitals, 12.5% at NGOs, 6.9% at formal and informal community spaces, 5.4% in the Church, 5.0% within in-reach/outreach programs, and only 1.3% at Youth Centres; 18.6% of respondents reported other places. Those belonging to the “low education” group attend the training in 51.9% of the cases in comparison to the 65.4% of those belonging to the “high education” group. Among the top reasons for not taking part in training activities on the subject, the most common is not being aware of it (54.4%), followed by lack of accessibility (6.7% + 4.2% “it was far from where I live”), not being invited (6.7%) and the lack of time (6.3%). On the other hand, among those who participated in the trainings, the main benefits reported are: receiving sexual and reproductive education (76.4%) and information on family planning (32.2%), followed by receiving sanitary towels (26.5%) and/or financial incentives (15.9%).

COVID-19: knowledge and impact

Among the respondents, the vast majority (98.2%) report having heard of COVID-19 and 98.8% report knowing how to prevent the infection. Among the possible ways of prevention, the most frequently reported are wearing a face mask (92.7%), washing hands (88%), or using hand sanitizer (75.2%), followed by refraining from handshaking and hugging (58.3%) and keeping a distance of 1 meter from other people (56.8%). However, 5 subjects also indicate drinking/eating water, lemon, garlic, or praying.

The primary consequences that COVID-19 has had on youth in the community appear to be job loss and poverty (75.8%), followed by dropping out of school (43.8%), pregnancy (37.6%), violence at home (29.4%) and lack of food (28.1%). 21.1% of respondents report an increase in transactional sex while 9.2% report discontinuation of disease treatment and vaccinations.

Regarding the lack of access to hospitals and clinics for STIs/HIV diagnosis, counselling and treatment, 57.4% report a personal experience with COVID-19 impact. Among these, 43% report fear of getting COVID-19 in the health structures/centres and almost 40% Limitation of people accessing hospitals since they are taking in only small numbers; 30% report fear to be tested for COVID-19. Regarding the activities of the Youth Friendly Services, 53% of respondents complain that they were closed or that anyone without mask cannot be allowed (36%).

DISCUSSION

In this study, we developed and used a questionnaire to collect information about knowledge, attitude, practices, and possible interventions concerning STIs and HIV/AIDS from youths, young mothers, and drug users of informal settlements of Nairobi, Kenya. The content of the questionnaire was based on the results of qualitative research; using the results of FGDs to develop surveys has several advantages, including the possibility of learning about the local context, knowing the language of the target population in order to formulate comprehensible questions, and providing insight into the results of the questionnaires [41]. Moreover, the questionnaire was developed with the

constant support and participation of local collaborators, familiar with the setting in which the research was carried out.

The study population was from a marginalised, hard-to-reach and excluded community, disadvantaged in terms of social determinants of health and access to services, and characterised by widespread risky sexual behaviour and high HIV/AIDS prevalence [34, 42, 43]. The target population included, more specifically, highly vulnerable to sexually transmitted diseases groups, such as young people and drug users [5, 44, 45]. The latter, like other KPs, are often criminalized and marginalized, which exposes them to a higher risk of infection and adverse HIV outcomes, since they are often excluded from prevention and treatment services [2, 46]. Reproductive health services targeted at young people are also scarcely widespread or not easily accessible in many African countries [9, 47, 48]. Despite being at a stage of life characterised by impulsivity, increased social relationships and development of self and sexual identity, adolescents are often neglected by the health system [2, 5, 49, 50].

Among young people, there are major inequalities in disadvantage of women, who face discrimination, fewer opportunities for education and health and further difficulties in accessing sexual and reproductive health services, due to harmful gender norms and gender-based violence, especially in sub-Saharan Africa and in slums and informal settlements [2, 51, 52]. STIs and HIV are not the only hazard for this group; therefore, reproductive health services must also consider other social and health issues that young people may face, such as unwanted pregnancies, early forced marriages, and sexual abuse [53, 54].

In Kenya, the Government has adopted the Adolescent Reproductive Health and Development Policy [55] in 2003 to make reproductive health services available, accessible, acceptable and affordable to young people. Afterwards, in 2005, the Division of Reproductive Health of the Ministry of Health has published national guidelines for YFS provision of reproductive health programs, based on the World Health Organization (WHO)'s guidelines [17, 56]. YFS are defined by WHO as services that are accessible, acceptable and appropriate for young people, and meet their individual needs, including keeping convenient opening hours, privacy and confidentiality.

An important foundation for any prevention effort aimed at young people is to provide them with basic information on how to protect themselves and their partners from acquiring STIs and HIV [13, 57]. However, many young people do not have the basic knowledge and skills to prevent themselves from becoming infected with HIV and continue to have insufficient access to adequate information and misconceptions about these diseases [13, 58, 59].

In our sample, the participants' level of knowledge about STIs and HIV/AIDS transmission and prevention was heterogeneous. Although most respondents reported having heard of AIDS and being aware of STIs/HIV complications and routes of transmission, a much lower percentage identified them correctly when asked.

Inadequate sexual and reproductive health knowledge among youths may contribute to stigmatizing tendencies towards those infected and affected by HIV/AIDS and STIs [59]. In our sample, there is in fact considerable stigma towards HIV-positive people; some respondents even stated that they would commit suicide if diagnosed. A similar picture had already emerged from the FGDs, where only a small percentage of participants did not blame people living with HIV, while the widespread idea was that people who tested positive had brought it on themselves or deserved it, as HIV was a curse. As a consequence, people avoid testing themselves fearing to test positive and thus being isolated. Similarly, they avoid telling their partners about their status fearing being left or receiving physical abuse. Stigma, a weak social support network and poor inter-partner relationships are known to contribute to delayed testing [60].

Given the insufficient knowledge of our respondents, educational interventions may need to be implemented. Gender-transformative, age- and culturally- appropriate comprehensive sexuality education is in fact a key component of HIV and STI prevention and empowerment for adolescents and young people [2]; the lack of knowledge about risks and consequences is an important barrier to accessing reproductive health services [57].

Regarding the sources of information, despite significant differences related to the level of education, the relevance of social media and TV among respondents of our sample is considerable. These are in fact powerful means of communication to reach these target populations. While mass media such as TV and radio are known effective tools for changing HIV/AIDS related behaviour among young people in developing countries [13], evidence on the impact of social media interventions in these contexts is still scarce [61]. However, as social media becomes more and more widespread [62], its potential is even greater in these countries [63]: through highly cost-effective interventions, it can provide psychosocial support, build community engagement, increase awareness of HIV testing and services, and promote behaviour change such as spreading condom use [64]. The power of social media lies in the possibility of engaging the very stigmatized and discriminated high-risk individuals by connecting and creating virtual communities [65, 66].

A key role in reproductive health education, especially in developing countries, must be played by schools, which provide a comprehensive and structured opportunity for interventions to achieve high coverage of young people around the time they become sexually active - unlike other initiatives, which are often fragmentary and sporadic [13, 52, 67]. In our sample, only 38.9% of the sample reported receiving information on the topic at school, especially respondents with higher education: perhaps the topic is discussed late in the school curriculum, although to be effective sexual and reproductive health education should be targeted at young people before the onset of sexual activity. From the FGDs preceding the questionnaire, it appeared that some had participated in training activities also organized outside the school. However, two were the major limitations

found in these activities: only addressing general health topics without diving deep into the details of sexual and reproductive health and selecting participants based on age (i.e., 12-16 years old), therefore leaving out the youngest population. It is important to overcome inequalities in access to correct information, facilitating the empowerment of individuals and the increase of their health literacy.

Considering a possible underestimation because the behaviour was self-reported, we found a high percentage of people engaging in risky behaviour in our sample, especially women and respondents with lower education. Our findings are consistent with previous studies, in Africa and in Kenya [68, 69]: although many respondents know at least theoretically how to protect themselves and recognize the importance of condoms, few report using them when having sexual encounters. There is thus a gap between theoretical knowledge and practical application in daily life. The reasons are diverse and include social phenomena that are difficult to address, such as gender-based violence; however, among the practicable strategies, there is a need to increase the availability and accessibility of free condoms, considering that many responded that they committed risky behaviour due to lack of money, unemployment, and poverty. Socioeconomic status was in fact found as a significant predictor of consistent use of condoms in another study conducted in urban Kenya [70]. Condom programmes are among the most cost-effective interventions in the HIV response and should be reinforced [2], as many have also stated that they have difficulties in accessing condoms. The economic issue is not exclusively about access to condoms, but, as FGDs and other studies revealed, also about poverty driving young people to engage in transactional sex, which constitutes a further risk factor [30, 71].

Despite the government's efforts to bring young people closer to health services, the results of the questionnaire show only partial knowledge of the offer, limited use of services, and a distinct lack of trust: only 16.4% stated that they would seek help from YFS. The fact that YFS are little known is a major barrier to their use [57]: these services should be promoted and advertised, for instance through mass and social media. Poor access of young people to HIV testing services is consistent with another study conducted in Nairobi slums [23]. It is interesting to note that only 0.9% would seek counselling and psychosocial support in case of HIV/AIDS diagnosis; these are essential services for the support of the diagnosis of these diseases especially in younger groups and should be promoted [72].

One of the main problems in accessing SRH services seems to be related to lack of privacy and lack of confidentiality from the staff. Negative attitudes of service providers, often seen as judgmental or insensitive, are known as one of the most important barriers to youth access to reproductive health services [9, 57, 68, 73]. In Kenya, these attitudes are greatly influenced by religious and cultural backgrounds, professional training and orientation [17]. In our sample, the two most marginalised groups (drug users and young mothers) are the ones who complained most about the attitudes of

the staff, despite being the ones that need confidentiality the most [54]. Recommendations on the implementation of healthcare service provision should be characterized by a prompt, entertaining and welcoming environment that would encourage adolescents to interact freely, including additional training for staff and creating additional space for confidential counselling and examinations [57]. Providers must be sensitized to understand the needs of young people and be able to offer a comprehensive range of services [17, 74]. Staff training is recognized also by our respondents as a key strategy to improve the attitude of the operators of these facilities, to improve their communication skills with young people, increasing confidentiality and avoiding stigma. In addition to that, staff should take specific courses to interact and manage at-risk and fragile populations, as well as patients undergoing HIV/STIs tests or counselling on sensitive topics [74]. In addition, about 30% of our sample thought it would be helpful to hire younger personnel, consistently with previous studies [75, 76]. On the other hand, the presence of people with HIV/STIs in the centre, who might help combat the stigma and contribute to the psychological support of individuals at the time of diagnosis, was not recognised as a particularly effective strategy (only 12.1% of respondents).

Among the service provision methods identified as most efficient by respondents, proximity strategies seem to prevail, including door-to-door testing and community outreach. The facilitator role of outreach community-based approach in improving youth access to services is well acknowledged [30, 77, 78]. Another popular option in our sample was the inreach testing activity (organised either on weekends or public holidays). Again, the need for privacy and confidentiality is reiterated, as in previous studies [30, 79]. This becomes even more relevant for those subgroups that are even more marginalised and difficult to reach, such as drug users. Although our sample is limited and unrepresentative (72 respondents, 52 of whom are male), it is possible to assess the even greater inequalities faced by this group, excluded not only from health services but also from the tools to learn about and prevent the transmission of these infections.

Finally, since the survey was administered in the summer of 2021, a section on the impact of COVID-19 was included. Across the world, the COVID-19 pandemic has disrupted essential health services, including those needed to support the prevention, diagnoses, and treatment of HIV and STIs [1]. The pandemic and the actions taken to control transmission of the infection have put many children out of school, placing them — especially girls — at higher risk of contracting HIV and other STIs [2, 80]. Also in Kenya, everyday life has been dramatically affected by highly restrictive government-imposed measures such as stay-at-home curfews, prohibitions on mobility across national and county boundaries, and strict policing, especially affecting the urban poor and highly marginalized KP [81, 82]. The results of our survey also revealed that the pandemic has had a strong indirect impact, resulting not only from the infection itself but also from the

measures undertaken to contain the spreading of the virus, such as the lockdown. The restrictive measures, job losses and the fear of infection affected every aspect of life and access to health services. The pandemic has therefore abruptly interrupted the progress made in recent years and the consequences will be evident in the long term.

Study limitations and strengths

This study has some limitations that should be considered when interpreting the results. First, in order to cope with the difficulties of recruiting respondents in such a marginalized and hard-to-reach population, the sampling strategy was adapted to the context. Social desirability bias may have occurred, especially for self-reported behaviour: participants may not be comfortable disclosing sensitive topics and may therefore underreport risky sexual behaviours. In addition, the presence of the survey worker during the questionnaire completion, which was essential as support for any translation needs, may have impacted the veracity of some responses. However, the anonymity of the questionnaires hopefully encouraged the respondents to be honest in their responses.

Conversely, the most important strength of this study is the mixed-methods design and the development of a highly tailored questionnaire based on the results of qualitative FGDs, in collaboration with local staff, familiar with the context. Additionally, this research/action project provides strategies and practical solutions to implement in order to improve the health services. Lastly, the additional set of questions concerning COVID-19 brings more knowledge about the indirect impact of the pandemic in vulnerable settings.

CONCLUSION

The level of knowledge regarding HIV/AIDS transmission, prevention and control in our sample was not satisfactory; some misconceptions about HIV transmission, self-reported risky behaviours and discriminatory attitudes were observed among participants that call for concern and must be addressed promptly. Despite the efforts of the Kenyan government, we found a lack of awareness and limited access to sexual and reproductive health and youth friendly services.

Despite the methodological limitations of the study, due to the hard-to-reach nature of the target population, our findings call for strengthened and promoted HIV/AIDS/STIs interventions targeting adolescents, young adults, and marginalized KPs in urban informal settlements; these include appropriate comprehensive education, exploiting the potential of social media, promoting and facilitating access to free condoms, training health care workers to be more welcoming and developing proximity strategies.

Our research confirms the importance of investigating the health of groups and communities characterized by social marginality and deprived living conditions. Further studies are needed to evaluate the impact on the target population's KAP and relation with health-care services after the implementation of the suggested initiatives.

Authors' contributions

Conceptualization: MS, MET; funding acquisition: GO, MS, MET; investigation: JMM, RM, EIM, CO, GO; methodology: MS, MET; data curation: SC, MET; formal analysis: MET; resources: GO; software: SC; writing - original draft: SC, FMC; writing - review & editing: SC, FMC, MS, SC, JMM, RM, EIM, CO, GO, MET.

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Conflict of interest statement

The Authors have declared that no competing interest exists.

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