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Childhood and adolescent factors shaping vulnerability to underage entry into sex work: a quantitative hierarchical analysis of female sex workers in Nairobi, Kenya

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ABSTRACT

Objective To explore factors associated with early age at entry into sex work, among a cohort of female sex workers (FSWs) in Nairobi, Kenya.

Background Younger age at sex work initiation increases the risk of HIV acquisition, condom non-use, violence victimisation and alcohol and/or substance use problems. This study aimed to understand factors in childhood and adolescence that shape the vulnerability to underage sex work initiation.

Design Building on previous qualitative research with this cohort, analysis of behavioural–biological cross-sectional data using hierarchical logistic regression.

Participants and measures FSWs aged 18–45 years were randomly selected from seven Sex Workers Outreach Programme clinics in Nairobi, and between June and December 2019, completed a baseline behavioural–biological survey. Measurement tools included WHO Adverse Childhood Experiences, Alcohol, Smoking and Substance Involvement Screening Test and questionnaires on sociodemographic information, sexual risk behaviours and gender-based violence. Descriptive statistics and logistic regression were conducted using hierarchical modelling.

Results Of the 1003 FSWs who participated in the baseline survey (response rate 96%), 176 (17.5%) initiated sex work while underage (<18 years). In the multivariable analysis, factors associated with entering sex work while underage included incomplete secondary school education (aOR=2.82; 95% CI=1.69 to 4.73), experiencing homelessness as a child (aOR=2.20; 95% CI=1.39 to 3.48), experiencing childhood physical or sexual violence (aOR=1.85; 95% CI=1.09 to 3.15), young age of sexual debut (≤15 years) (aOR=5.03; 95% CI=1.83 to 13.79) and being childless at time of sex work initiation (aOR=9.80; 95% CI=3.60 to 26.66).

Conclusions Lower education level and childhood homelessness, combined with sexual violence and sexual risk behaviours in childhood, create pathways to underage initiation into sex work. Interventions designed for girls and young women at these pivotal points in their lives could help prevent underage sex work initiation and their associated health, social and economic consequences.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The random sample, large sample size and broad eligibility criteria enhanced the study diversity and the generalisability of the results.
- ⇒ The multilevel framework and the breadth of data collected made it possible to identify effects that interventions could target.
- ⇒ The conceptual framework was informed by qualitative research conducted among this cohort.
- ⇒ All behavioural data collected were self-reported, and some answers depended on recall of events that happened many years ago, leading to potential recall bias and social desirability bias.
- ⇒ Themes of childhood physical and sexual violence and intimate partner violence were the key factors of this study; experiences may have been under-reported due to the normalisation of violence or the stigma associated with being the victim of violence.

INTRODUCTION

Female sex workers (FSWs) are at increased risk of adverse physical and mental health outcomes compared with women who do not sell sex. They have a disproportionately higher burden of HIV than the general population, with up to 37% of FSWs in sub-Saharan Africa (SSA) being diagnosed with HIV,[1] and are at increased risk of violence,[2] stigma, discrimination, and in some cases, criminalisation.[3] Diverse studies from multiple regions globally show that between 20% and 40% of FSWs enter into sex work as minors.[4–6] Women who initiate sex work while

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under the age of 18 years face greater risks of adverse sexual health outcomes,[7–9] inconsistent condom use[10] and barriers to condom negotiation.[7 9–13] Other adverse health outcomes of underage initiation into sex work include harmful alcohol and substance use,[13 14] increased prevalence of mental health problems[15] and increased physical and sexual violence victimisation from different perpetrators.[16–18] These adverse outcomes are often accompanied by stigma and discrimination, violence from official authorities, and barriers to healthcare.[19] While some studies report an increased prevalence of HIV in adolescent girls and young women (AGYW) who initiate sex work under the age of 18 years compared with those who initiate sex work as adults,[12 20 21] others find no significant difference in HIV prevalence between the two groups.[9 10 21]

Despite the harmful outcomes, studies exploring reasons for initiation into sex work primarily report on life circumstances at the time of entry into sex work, such as economic or food insecurity due to limited employment prospects.[22–28] However, the pathways that lead to entry into sex work are often complex and multifactorial. The early environment individuals grow up in and their experiences influence their future risk.[29–32] Our previous qualitative research conducted with 47 FSWs in Nairobi, Kenya, as part of the Maisha Fiti study, found that childhood and adolescent vulnerabilities such as childhood abuse, incomplete education, teenage pregnancy and the breakdown of early intimate relationships were crucial in contributing to the subsequent trajectory of sex work initiation.[33] This is important when considering the design of targeted interventions. While a few quantitative studies from Northern America have explored factors that lead to underage age entry into sex work,[13 14 34] studies from SSA have included early life factors and underage sex work initiation as aspects of wider research on vulnerabilities faced by sex workers.[7 8 10 16 35 36]

Given the high proportion of women who enter into sex work under the age of 18 and the adverse behavioural and health consequences they face as a result, the experiences of AGYW leading to underage entry into sex work warrant further research. AGYW from SSA face unique challenges and experiences such as lower school retention than boys, gender-based violence and poverty,[37–40] and being able to identify adolescent girls who are at increased risk of entering into sex work could inform the development of tailored interventions to minimise underage sex work entry. The aim of this study is to build on our previous qualitative research[33] and analyse quantitative data from a large representative sample of FSWs in Nairobi, Kenya, in order to understand childhood and adolescent factors which shape vulnerability to underage entry into sex work in this context.

METHODS

Study design

This study is a baseline cross-sectional study of data collected from June 2019 to December 2019, as part of a longitudinal observational study called Maisha Fiti.

Setting

Nairobi is the capital city of Kenya and comprises approximately 4.4 million people.[41] An estimated 40 000 FSWs are located in Nairobi, working from 2000 different places known as 'hotspots'.[42 43] To provide access to healthcare services for this population, Partners for Health and Development in Africa and the University of Manitoba formed the Sex Workers Outreach Programme (SWOP) in 2008. Funded by the Centers for Disease Control and Prevention and the U.S. President's Emergency Plan for AIDS Relief (CDC-PEPFAR), SWOP comprises seven clinics providing free clinical, harm reduction and counselling services to 'key populations' in Nairobi County, including approximately 33 000 FSWs. Additional programmes provide services for other FSWs.

Participants and recruitment

The Maisha Fiti study is a mixed methods longitudinal study exploring the impact of structural and social factors on markers of inflammation in the blood and genital tract. The Maisha Fiti sample size calculations and sampling methodology have been described elsewhere.[44] In brief, the study was designed with sufficient power to identify the presence of genital inflammation in women who had recently experienced physical or sexual violence. Assuming a 2:1 ratio of recent exposure to violence, enrolling 750 women who were HIV negative would detect a 10% difference in the proportion of women with genital inflammation (25% vs 15%) at 90% power. As SWOP clinics report the prevalence of HIV in FSWs is approximately 25%, a target sample size of 1000 was chosen for the study. The Maisha Fiti eligibility criteria included women aged 18–45 years who self-identified as a sex worker, who were not pregnant or breastfeeding and who did not suffer from any self-reported chronic illness other than HIV that might affect their immunology. Potential participants were identified using SWOP clinic lists and included all FSWs who met the eligibility criteria and had visited a clinic in the past 12 months. The sampling frame consisted of 10 292 FSWs, from which 1200 were randomly sampled, with numbers selected proportional to each SWOP clinic size. Women under the age of 25 were over-sampled to enable sufficient power for analyses stratified by age.

Selected women were initially contacted by phone and introduced to the Maisha Fiti study. Those who were interested in participating were invited to the dedicated study clinic in central Nairobi, where they were provided with detailed oral and written information about the study and screened for eligibility. Eligible women provided written informed consent and were enrolled into the study after which they completed a baseline behavioural–biological survey. Participants were reimbursed 500 KSH (~US$5) for their travel costs and time and were also provided with clinical care and psychological support during study visits. After completing the baseline behavioural-biological survey, 40 women were randomly selected

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to also participate in qualitative in-depth interviews, described elsewhere.[33]

Patient and public involvement

Before the study began, a community advisory group comprising FSWs, peer educators and key stakeholders (including Sex Worker Advocacy Groups and local policymakers) was convened. This group met with the study team at least quarterly and helped inform the study design and provide outreach and sensitisation about the study to the sex work community.

Research team and data collection

The Maisha Fiti study team comprised a study coordinator, three community liaison members, two research assistants, a clinical team (a counsellor, doctor and two nurses), two qualitative social scientists and seven Maisha Fiti Study Champions, all experienced with working with FSWs in Nairobi. Prior to the start of the study, the research team undertook three weeks of intensive training on study modules including but not limited to confidentiality, violence, mental health and alcohol and substance use. All research tools were translated into Swahili, pretested, piloted and amended following team feedback.

The Maisha Fiti study design, procedures and data collection have been described elsewhere.[44 45] In brief, the baseline behavioural–biological survey included questions on sociodemographics, sexual risk behaviours, violence, adverse childhood experiences, alcohol and substance use and mental health. Questionnaires were administered through face-to-face interviews by the research associates and clinical team members in either Swahili or English.

HIV status was screened using rapid HIV tests. Blood samples were collected for confirming positive HIV tests using HIV DNA GeneXpert, and to test for *Treponema pallidum* (syphilis) using rapid plasma reagin assay. Participants provided urine samples which were used to test for pregnancy, and *Chlamydia trachomatis* and *Neisseria gonorrhoeae* using GeneXpert Assay. Vaginal swabs were self-collected and used to test for *Trichomonas vaginalis* using the OSOM Trichomonas Rapid Test (SEKISUI Diagnostics) and for Bacterial Vaginosis using Gram's stain and Nugent scoring.

Conceptual framework

A qualitative study was first conducted to explore the data from the in-depth interviews. The results of this study are described elsewhere,[33] and the conceptual framework developed from this analysis is shown in figure 1. In brief, we found that the childhood of FSWs was shaped by experiences of violence in childhood at an interpersonal level, and poverty and incomplete education at a structural/community level. The adolescence and young adulthood of FSWs were shaped by early pregnancy and/or marriage, intimate partner violence, dependents at an interpersonal level and insufficient money at a structural/community level. For this study, we utilised the conceptual framework that was developed from the analysis of the qualitative data and undertook this quantitative study to identify variables in the behavioural–biological survey that related to domains in childhood and adolescence that emerged from the exploratory qualitative analysis. The main outcome of this quantitative study was underage entry into sex work. Key exposures of interest across the life course were adverse childhood experiences (childhood), sexual risk behaviours (adolescence) and interpersonal relationships (adolescence/young adulthood).

Age of entry into sex work

Age of entry into sex work was assessed using the self-reported question 'How old were you when you first received money/goods in exchange for sex?' Those who were aged 17 or younger when they first sold sex were coded as having entered sex work while underage. This age cut-off was chosen as the Children's Act of Kenya defines a child as 'any individual under 18 years of age'[46] and to enable comparison with other literature.

Exposure variables

The following exposure variables were self-reported and collected at baseline using the behavioural–biological survey.

- Current age was defined as the age reported by participants at the baseline interview.
- Education level was defined as the highest level completed according to the Kenyan system of education and comprised of primary, secondary and higher education.
- Adverse childhood experiences were measured using the WHO Adverse Childhood Experiences International Questionnaire (WHO ACE-IQ).[47] Three questions from WHO ACE-IQ (bullying from peers, and physical and emotional neglect from parents or guardians) were not included due to the length of the questionnaire. An additional question on living on the streets under the age of 18 years was incorporated into the questionnaire as it was considered to be important in this population. We examined individual associations of adverse childhood events with the outcomes.
- Age at sexual debut was defined as the age at which first penile insertive vaginal sex with a male partner occurred. Participants were also asked whether they willingly had sex that first time or if they were tricked, pressured or forced.
- Age at first live birth was determined by asking those who had ever been pregnant about the age of their eldest child and, based on their current age, calculating their age when the child was conceived.
- Children born prior to entry into sex work was a binary variable formed by calculating the difference between the age of the eldest child and the age at which participants entered into sex work. If both events occurred

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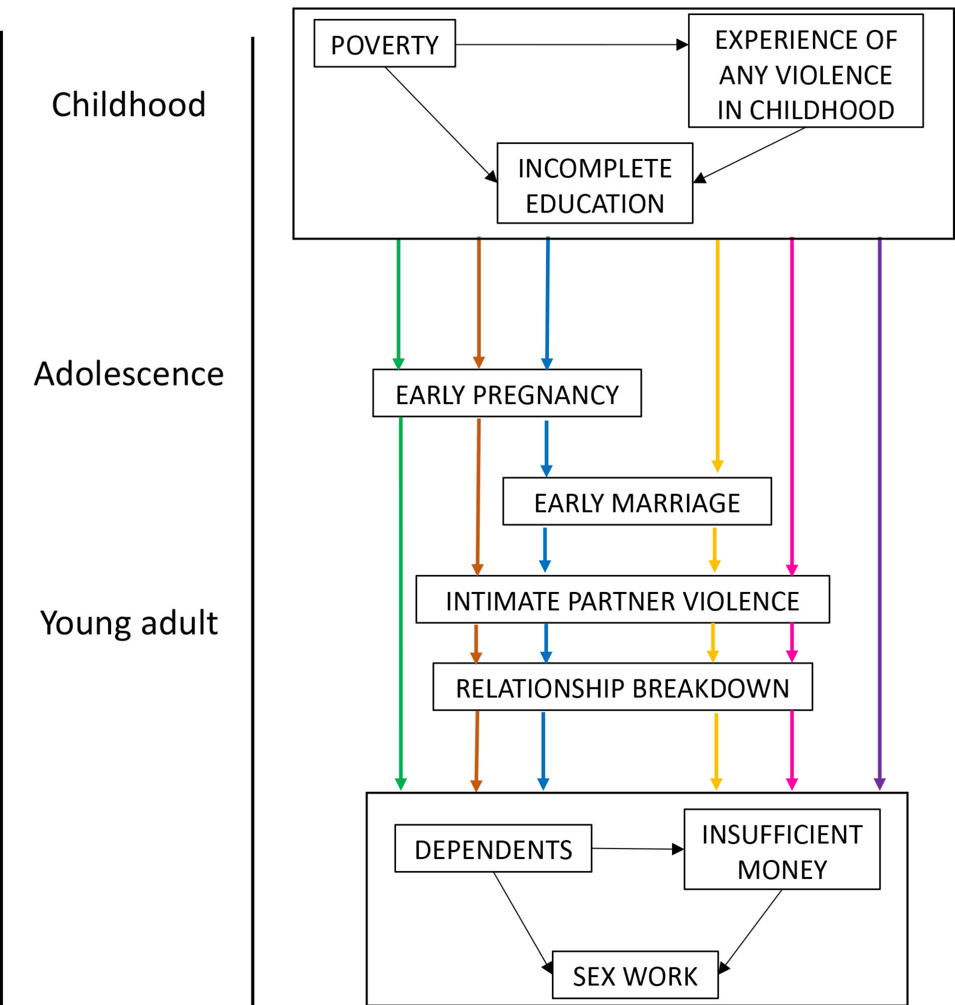

Figure 1 Conceptual framework for exploring syndemic cofactors shaping the early lives of women who enter into sex work.

in the same year, participants were classified as having children who were born prior to entry into sex work.

- Experiences of physical or sexual intimate partner violence were collected using the WHO Violence Against Women 13-item Questionnaire which quantifies the severity and frequency of interpersonal violence (IPV) and measured any physical and/or sexual violence ever experienced from an intimate partner.

Analysis

All analyses were conducted in STATA V.16.1. To account for the over-sampling of <25 year olds, data were weighted during the analysis. Associations were estimated using ORs, and p values were obtained using the likelihood ratio test. A hierarchical modelling approach based on the conceptual framework was used to build a multivariable model for the outcome, chronologically describing the relationship between childhood and adolescent factors and age of entry into sex work.[48] Level 1 variables included sociodemographic characteristics (current age, education level, country of birth) and adverse childhood experiences (lived on streets, death of one or both parents, experiences of physical and/or sexual violence, experiences of war and/or collective violence). Level 2 variables included sexual risk behaviours in adolescence (marital status, number of live children, age of sexual debut, being tricked, pressured or forced into sexual debut, age of first formal or informal marriage, age of first live birth, HIV status). Level 3 variables included interpersonal relationships (ever experienced physical and/or sexual intimate partner violence and having one or more children prior to sex work entry) during adolescence and young adulthood.

SWOP clinic and current age were included as a fixed effect in each model to allow for between-clinic clustering and as an a priori confounder of other exposures of interest, respectively. These are the key factors to adjust for, as clinic may reflect unmeasured sociodemographic confounders, and age may reflect exposure to unmeasured risk factors. Other factors were adjusted for in the multivariable model. A global model containing sociodemographic characteristics and all the level 1 (adverse childhood experiences) variables was first created, and then the least important variable in accounting for the outcome was removed from the model before re-estimating. This process was continued until no variables with

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p>0.1 remained and model 1 was complete. Model 2 was created by adding all level 2 (sexual risk behaviours) variables to model 1 and conducting backward elimination of level 2 variables. Model 3 was created by adding all level 3 (interpersonal) variables to model 2 (which contained levels 1 and 2 variables with p<0.1) and conducting backward elimination of level 3 variables. Missing data were reported if more than 5% of observations were missing.

RESULTS

Sociodemographic and participant characteristics

Of 1200 FSWs who were randomly selected for the sampling frame, 1039 were eligible and 1003 participated in the study (96.5% response rate). The characteristics of participants are detailed in table 1. At the time of baseline interview, the median age of study participants was 32 (IQR 26–39), with 11.7% of women aged under 25, and 48.9% aged 35 and over. Most women were born in Kenya (98.7%), and most had not completed secondary school (70.1%). The median age of sexual debut was 16 years (IQR 15–18); 31.3% said that their sexual debut was not consensual (ie, they were tricked, pressured or forced). Overall, 81.2% of women had ever been married or cohabited with a sexual partner; of these, 29.9% were first married/cohabited before 18 years of age. The majority of women (96.3%) reported ever having been pregnant, of whom 23.8% reported having their first live birth while they were under 18 years old; 71.9% had at least one child prior to entering into sex work. Over one in four (28.0%) women had a positive HIV diagnosis at the time of the interview.

The median age at which women reported first selling sex was 21 years (IQR 18–26), and regularly selling sex ('How old were you when you started selling sex regularly?') was 24 years (IQR 20–28). Almost one-fifth (17.5%) of FSWs reported that they first began sex work before the age of 18 years, with the median age of sex work initiation in this group being 16 years (IQR 15–17), and the median age at which they were regularly selling sex being 18 years (IQR 16–23).

Associations between underage sex work entry and sociodemographic characteristics and adverse childhood experiences

We first examined level 1 (sociodemographic characteristics and adverse childhood experiences) factors associated with underage entry into sex work. Those who initiated sex work under the age of 18 were more likely than their counterparts to be aged 18–24 at baseline (OR=2.14, 95% CI=1.44 to 3.19). In bivariate analyses (table 1), level 1 variables that were independently associated with increased odds of underage entry into sex work (p value<0.1) included not having completed secondary school (OR=2.72, 95% CI=1.74 to 4.26), having lived on the streets while under the age of 18 years (OR=2.86, 95% CI=1.89 to 4.33), experience of physical and/or sexual violence in childhood (OR=1.93, 95% CI=1.21 to 3.07) and being exposed to war or collective violence in childhood (OR=1.40, 95% CI=1.01 to 1.96).

In the multivariable analyses shown in table 2, model 1—which controlled for current age and clinic, and introduced sociodemographic characteristics and childhood experiences from level 1—variables that remained associated with increased odds of underage entry into sex work were: not having completed secondary school (aOR 2.82, 95% CI=1.69 to 4.73; p<0.001), having lived on the streets as a child (aOR=2.20, 95% CI=1.39 to 3.48; p=0.001) and experiencing physical and/or sexual violence during childhood (aOR=1.85, 95% CI=1.09 to 3.15; p<0.05).

Associations between underage sex work entry and sexual risk behaviours

We next examined associations of level 2 (sexual risk behaviours in adolescence) factors with underage sex work entry. In bivariate analyses (table 1), level 2 variables that were independently associated with increased odds of underage entry into sex work (p value<0.1) included sexual debut aged 15 or under (OR=5.62, 95% CI=3.93 to 8.02), getting married aged 15 or under (OR=5.02, 95% CI=2.97 to 8.47) and having first live birth aged 15 or under (OR=2.07, 95% CI=1.25 to 3.43).

In the multivariable analyses (table 2), model 2, which controlled for age, clinic and variables from model 1 that were significant (p<0.1), the only variable that remained associated with increased odds of underage entry into sex work was sexual debut aged 15 years or younger (aOR=5.03, 95% CI=1.83 to 13.79, p<0.005).

Associations between underage sex work entry and interpersonal relationships

Finally, we examined the associations of level 3 (interpersonal relationships) factors with underage entry into sex work. In bivariate analyses of level 3 variables (table 1), being childless by the time of entry into sex work was associated with increased odds of underage entry into sex work (OR=13.73, 95% CI=0.04 to 0.08).

In model 3 of the multivariate analyses (table 2), after controlling for age, clinic and significant variables from models 1 and 2 and introducing variables from level 3, being childless at the time of entry into sex work remained associated with increased odds of underage entry into sex work (aOR=9.80, 95% CI=3.60 to 26.66).

DISCUSSION

We found that 17.5% of the FSWs in Nairobi, Kenya, participating in this study began sex work while under the age of 18 years. Our findings illustrate that a lower education level, having lived on the streets, experiencing physical or sexual violence during childhood, a younger age of sexual debut and having no children prior to entry into sex work were key factors in childhood and adolescence that shape underage entry into sex work in Nairobi, Kenya.

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Table 1 Sociodemographics of study participants

		Total (n=1003)	Began sex work<18 (n=176)*	Crude OR (95% CI)	P value*
Level 1: sociodemographic characteristics and adverse childhood experiences					
Current age					
Median age (IQR)		32 (26–39)	28 (23–37.5)		
18–24		212 (11.7%)	57 (26.9%)	2.14 (1.44 to 3.19)	
25–34		353 (39.4%)	55 (15.6%)	1.06 (0.73 to 1.54)	
35+		438 (48.9%)	64 (14.6%)	Reference	<0.001
Education level					
None/some primary		169 (17.8%)	39 (23.1%)	3.31 (1.95 to 5.63)	
Some secondary		525 (52.3%)	109 (20.8%)	2.72 (1.74 to 4.26)	
Completed secondary/higher education		309 (29.9%)	28 (9.1%)	Reference	<0.001
Place of birth					
Within Kenya	No	14 (1.3%)	4 (28.6%)		
	Yes	989 (98.7%)	172 (17.4%)	2.09 (0.65 to 6.72)	0.22
Adverse childhood experiences					
Ever lived on the streets while<18 years old	No	878 (88.0%)	133 (15.1%)		
	Yes	125 (12.0%)	43 (34.4%)	2.86 (1.89 to 4.33)	<0.001
One or both parents died while<18 years old	No	593 (58.5%)	95 (16.0%)		
	Yes	408 (41.5%	81 (19.9%)	1.31 (0.95 to 1.82)	0.10
Experienced any physical or sexual violence in childhood	No	212 (20.7%)	24 (11.3%)		
	Yes	791 (79.3%)	152 (19.2%)	1.93 (1.21 to 3.07)	0.01
Exposed to war or collective violence in childhood	No	649 (65.7%)	104 (16.0%)		
	Yes	353 (34.3%)	72 (20.4%)	1.40 (1.01 to 1.96)	0.05
Level 2: sexual risk behaviours in adolescence					
Age at sexual debut					
Median age (IQR)		16 (15–18)	15 (13–16)		
≤15 years old		368 (37.2%)	121 (32.9%)	5.62 (3.93 to 8.02)	
16+		628 (62.8%)	54 (8.6%)	Reference	<0.001
Circumstances of sexual debut					
Tricked, forced or pressured into having sex	No	695 (68.7%)	116 (16.7%)		
	Yes	306 (31.3%)	59 (19.3%)	1.22 (0.86 to 1.73)	0.26
Marital status					
Ever married/cohabited with sexual partner	No	216 (18.8%)	46 (21.3%)		
	Yes	787 (81.2%)	130 (16.5%)	0.78 (0.53 to 1.15)	0.22
Age at first marriage					
Median age (IQR)		19 (17–22)	17 (16–20)		
≤15 years old		76 (9.7%)	31 (40.8%)	5.02 (2.97 to 8.47)	
16–17		166 (20.2%)	36 (21.7%)	2.14 (1.36 to 3.37)	
18+		542 (70.2%)	63 (11.6%)	Reference	<0.001
Pregnancy					
Ever been pregnant	No	52 (3.7%)	9 (17.3%)		
	Yes	951 (96.3%)	167 (17.6%)	1.23 (0.59 to 2.58)	0.58
Age at first live birth (of women who had ever been pregnant)					
Median age (IQR)		19 (18–22)	18 (16–20)		

Continued

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Table 1 Continued

		Total (n=1003)	Began sex work<18 (n=176)*	Crude OR (95% CI)	P value*
≤15 years old		94 (10.2%)	24 (25.5%)	2.07 (1.25 to 3.43)	
16–17		135 (13.6%)	32 (23.7%)	1.83 (1.17 to 2.87)	
18+		697 (76.2%)	104 (14.9%)	Reference	<0.005
Number of live children					
None		95 (7.2%)	16 (16.8%)	0.77 (0.41 to 1.45)	
1–2		644 (63.5%)	111 (17.2%)	0.83 (0.57 to 1.19)	
3+		264 (29.3%)	49 (18.6%)	Reference	0.53
HIV status					
Current status	Negative	746 (72.0%)	134 (18.0%)		
	Positive	257 (28.0%)	42 (16.3%)	0.98 (0.67 to 1.42)	0.90
Level 3: interpersonal relationships					
Intimate partner violence					
Ever experienced physical or sexual intimate partner violence	No	442 (43.7%)	74 (16.7%)		
	Yes	560 (56.3%)	102 (18.2%)	1.18 (0.85 to 1.64)	0.32
Dependents					
Nulliparous (being childless) at entry into sex work	No	656 (71.9%)	39 (5.9%)		
	Yes	266 (28.1%)	122 (45.9%)	13.73 (0.04 to 0.08)	<0.001

*Age at which female sex workers began sex work is missing for 12 participants, the following analyses have been conducted on data from 991 participants.

In our study, individuals who did not complete their secondary education were more likely to initiate sex work while under the age of 18 years. Consistent with the findings of our study, other research has shown that years of education are significantly correlated with the timing of entry into sex work, with underage sex work initiators reporting fewer completed years.[7 14 16] AGYWs from impoverished backgrounds in SSA are less likely to complete school due to a lack of resources and sociocultural gender norms,[24 25 49] but interventions such as Determined, Resilient, Empowered, AIDS-free, Mentored and Safe programme (DREAMS)[50] in Nairobi, Kenya, and Samata[51] in Karnataka, India have shown some evidence in improving secondary school completion among adolescent girls.

Along with incomplete education, having lived on the streets was an adverse childhood experience that was strongly associated with underage sex work initiation in our study. Studies from Kenya have identified that street-connected children and youth are vulnerable to underage entry into sex work, initially either through exploitation or survival sex.[52–54]

The prevalence of FSWs reporting childhood physical and/or sexual violence in our study was two times that reported by a nationally representative sample of women in Kenya.[55] Childhood sexual violence, and to a lesser extent physical violence, are well-researched risk factors for later life abuse and entry into sex work.[14 26 28 33 36 56–60] Our findings of an association between childhood physical and/or sexual violence and underage entry into sex work are similar to those of recent studies of FSWs in Northern America,[34 61] West Africa[8] and Kenya.[16] Poverty is a structural factor that can precipitate childhood abuse and street connectedness and can negatively impact school retention.[62 63] In our previous qualitative study, poverty was reported as a factor that was prevalent in childhood among this population of FSWs, with many describing how it limited their education, and in some instances resulted in accepting sex in exchange for food.[33]

In addition to adverse childhood experiences, sexual debut at a younger age has been shown to be a risk factor for subsequent entry into sex work.[64] We found that sexual debut aged 15 years or under, regardless of circumstance, was strongly associated with underage initiation. These results replicated those of Parcesepe's study of FSWs in Mombasa,[16] and a study from South Africa reported that younger FSWs were more likely to report both a younger age of sexual debut and age of entry into sex work.[65] There is a scarcity of qualitative or quantitative studies exploring the age of sexual debut in relation to the age of sex work initiation, and our study adds to this literature.

The conceptual framework guiding our analysis was derived from our previous qualitative research exploring factors shaping the early lives of FSWs.[33] In this study, while the childhood experiences of underage initiators were similar to the total study population, there were some important differences during the adolescence of those who entered into sex work aged under 18 years. Although

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Table 2 Multivariable hierarchical logistic regression—factors associated with age of entry into sex work under 18 years of age (n=1003)

	Adjusted OR (95% CI)	P value
Model 1: distal sociodemographic characteristics and childhood experiences*		
Current age		
18–24	2.44 (1.54 to 3.88)	
25–34	1.10 (0.72 to 1.69)	
35+	Reference	<0.001
Education level		
None/some primary	3.48 (1.88 to 6.46)	
Some secondary	2.82 (1.69 to 4.73)	
Completed secondary/ higher education	Reference	<0.001
Adverse childhood experiences		
Ever lived on the streets while <18 years old	2.20 (1.39 to 3.48)	<0.005
Experienced any physical or sexual violence in childhood	1.85 (1.09 to 3.15)	0.02
Model 2: sexual risk behaviours in adolescence†		
Age at sexual debut		
≤15 years old	5.03 (1.83 to 13.79)	
16+	Reference	<0.005
Model 3: interpersonal relationships‡		
Dependents		
Nulliparous (being childless) at entry into sex work	9.80 (3.60 to 26.66)	<0.001

*Model 1 adjusted for current age, clinic, education level, lived on the streets as a child, experience of childhood physical or sexual violence.
†Model 2 adjusted for current age, clinic, model 1 variables and age at sexual debut.
‡Model 3 adjusted for current age, clinic, models 1 and 2 variables and dependents.

IPV, early pregnancy and the need to care for dependents are commonly cited as reasons precipitating entry into sex work,[24 25 66] in this study, there was no association between first live birth aged 15 and under or IPV and underage entry into sex work. However, underage initiators of sex work were significantly more likely not to have children before sex work than those who entered into sex work aged 18 and older, mirroring the few previous research studies comparing women who initiated sex work while underage versus as adults.[16 67]

This study provides insights into pivotal events that shape the childhood and adolescence of AGYW in Nairobi who enter sex work while aged under 18 years. Strengths of this study are the use of the behavioural–biological survey that included validated survey tools such as the ACE-IQ, and the use of qualitative interviews to inform the conceptual pathway. This study has some limitations that need to be acknowledged. The sampling methodology only included FSWs in Nairobi who were registered at a SWOP clinic and therefore may have under-represented more marginalised women who did not access these services. As AGYW may first participate in transactional sex relationships before becoming sex workers, the outcome measure may conflate with transactional sex work, which is different to sex work.[68] The prevalence of adverse childhood experiences and intimate partner violence may be underestimated in this population due to the normalisation of violence, recall bias and under-reporting due to social desirability bias. The variable measuring IPV captured any instances of IPV up to the baseline interview and did not specifically capture IPV prior to entry into sex work. However, it was an important finding in the qualitative analysis and thus was included in this study.

Conclusion

This study highlights key social and structural challenges at critical periods in the lives of AGYW that need to be addressed in order to prevent them from entering into sex work at a young age. Structural interventions to increase school retention and completion are urgently needed and should be complemented by efforts to enhance child protection services, particularly for street-connected children. Community-level strategies for raising awareness about and preventing domestic violence and childhood abuse are critical. Creating awareness of sexual risk behaviours in adolescence by including sexual and reproductive health education in the national school curriculum and increasing access to sexual healthcare for minors in Kenya would be beneficial to the welfare of AGYW. Knowledge of early life risk factors can help to identify at-risk youth who would benefit from extra support and interventions to improve their livelihood options and quality of life.

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Contributors TSB and JK conceptualised the Maisha Fiti study. TSB was the principal investigator and acquired funding, and JK, JS, HAW and RKau were coinvestigators. RKab, ZJ and JK were responsible for study management. RKab, JK, MK, HB, ZJ, PN, EN and the Maisha Fiti Study Champions were involved in the investigation and validation of the study. PS, TSB, AB and HAW conceptualised the methodology and research analysis. PS prepared the manuscript. PS, TSB, HAW, NK, GFM and KD were involved in the supervision and reviewing and editing of the writing. All authors reviewed the manuscript and approved the final version. JK and TSB are joint last authors. PS is responsible for the overall content as the guarantor.

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REFERENCES

1. Baral S, Beyrer C, Muessig K, *et al*. Burden of HIV among female sex workers in low-income and middle-income countries: a systematic review and meta-analysis. *Lancet Infect Dis* 2012;12:538–49.
2. Deering KN, Amin A, Shoveller J, *et al*. A systematic review of the correlates of violence against sex workers. *Am J Public Health* 2014;104:e42–54.
3. Lyons CE, Schwartz SR, Murray SM, *et al*. The role of sex work laws and Stigmas in increasing HIV risks among sex workers. *Nat Commun* 2020;11:773.
4. Blanchard JF, O'neil J, Ramesh BM, *et al*. Understanding the social and cultural contexts of female sex workers in Karnataka, India: implications for prevention of HIV infection. *J Infect Dis* 2005;191 Suppl 1:S139–46.
5. Shannon K, Kerr T, Strathdee SA, *et al*. Prevalence and structural correlates of gender based violence among a prospective cohort of female sex workers. *BMJ* 2009;339:b2939.
6. Wechsberg WM, Luseno WK, Lam WKK, *et al*. Substance use, sexual risk, and violence: HIV prevention intervention with sex workers in Pretoria. *AIDS Behav* 2006;10:131–7.
7. Grosso AL, Ketende S, Dam K, *et al*. Structural determinants of health among women who started selling sex as minors in Burkina Faso. *J Acquir Immune Defic Syndr* 2015;68 Suppl 2:S162–70.
8. Grosso A, Berg L, Rucinski K, *et al*. Sexual and reproductive health service needs associated with Underage initiation of selling sex among adult female sex workers in guinea-Bissau. medRxiv. *IJERPH* 2022;19:12715.
9. Khezri M, Shokoohi M, Mirzazadeh A, *et al*. Early sex work initiation and its association with Condomless sex and sexually transmitted infections among female sex workers in Iran. *Int J STD AIDS* 2020;31:671–9.
10. Parcesepe AM, L'Engle KL, Martin SL, *et al*. Early sex work initiation and condom use among alcohol-using female sex workers in Mombasa, Kenya: a cross-sectional analysis. *Sex Transm Infect* 2016;92:593–8.
11. Silverman JG, Saggurti N, Cheng DM, *et al*. Associations of sex trafficking history with recent sexual risk among HIV-infected Fsws in India. *AIDS Behav* 2014;18:555–61.
12. Goldenberg SM, Chettiar J, Simo A, *et al*. Early sex work initiation independently elevates odds of HIV infection and police arrest among adult sex workers in a Canadian setting. *J Acquir Immune Defic Syndr* 2014;65:122–8.
13. Goldenberg SM, Rangel G, Vera A, *et al*. Exploring the impact of Underage sex work among female sex workers in two Mexico–US border cities. *AIDS Behav* 2012;16:969–81.
14. Kramer LA, Berg EC. A survival analysis of timing of entry into prostitution: the differential impact of race, educational level, and childhood/adolescent risk factors. *Sociological Inquiry* 2003;73:511–28. 10.1111/1475-682X.00069 Available: https://onlinelibrary.wiley.com/toc/1475682x/73/4
15. Willis BM, Levy BS. Child prostitution: global health burden, research needs, and interventions. *Lancet* 2002;359:1417–22.
16. Parcesepe AM, L'Engle KL, Martin SL, *et al*. Early sex work initiation and violence against female sex workers in Mombasa, Kenya. *J Urban Health* 2016;93:1010–26.
17. Silverman JG, Servin A, Goldenberg SM, *et al*. Sexual violence and HIV infection associated with adolescent vs adult entry into the sex trade in Mexico. *JAMA* 2015;314:516–8.
18. Decker MR, McCauley HL, Phuengsamran D, *et al*. Violence Victimisation, sexual risk and sexually transmitted infection symptoms among female sex workers in Thailand. *Sex Transm Infect* 2010;86:236–40.
19. Silverman JG. Adolescent female sex workers: invisibility, violence and HIV. *Arch Dis Child* 2011;96:478–81.
20. Stoner MCD, Rucinski KB, Lyons C, *et al*. Differentiating the incidence and burden of HIV by age among women who sell sex: a systematic review and Meta-Analysis. *J Int AIDS Soc* 2022;25:e26028.
21. Grosso A, Busch S, Mothopeng T, *et al*. HIV risks and needs related to the sustainable development goals among female sex workers who were commercially sexually exploited as children in Lesotho. *J Int AIDS Soc* 2018;21:e25042.
22. Shokoohi M, Khezri M, Karamouzian M, *et al*. Reasons for entering into sex work in Iran: A comparison between women who initiated sex work as minors and those as adults. *Sexuality & Culture* 2022;26:762–75.
23. Saggurti N, Verma RK, Halli SS, *et al*. Motivations for entry into sex work and HIV risk among mobile female sex workers in India. *J Biosoc Sci* 2011;43:535–54.
24. Gysels M, Pool R, Nnalusiba B. Women who sell sex in a Ugandan trading town: life histories, survival strategies and risk. *Soc Sci Med* 2002;54:179–92.
25. Scorgie F, Chersich MF, Ntaganira I, *et al*. Socio-demographic characteristics and behavioral risk factors of female sex workers in sub-Saharan Africa: a systematic review. *AIDS Behav* 2012;16:920–33.
26. McClarty LM, Bhattacharjee P, Blanchard JF, *et al*. Circumstances, experiences and processes surrounding women's entry into sex work in India. *Culture, Health & Sexuality* 2014;16:149–63.
27. Sinha S. Reasons for women's entry into sex work: A case study of Kolkata, India. *Sexuality & Culture* 2015;19:216–35.
28. Wilson HW, Widom CS. The role of youth problem behaviors in the path from child abuse and neglect to prostitution: A prospective examination. *J Res Adolesc* 2010;20:210–36.
29. Avison WR. Incorporating children's lives into a life course perspective on stress and mental health. *J Health Soc Behav* 2010;51:361–75.

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30 Boullier M, Blair M. Adverse childhood experiences. *Paediat Child Health* 2018;28:132–7.
31 Currie J, Widom CS. Long-term consequences of child abuse and neglect on adult economic well-being. *Child Maltreat* 2010;15:111–20.
32 Hertzman C, Power C, Matthews S, *et al*. Using an interactive framework of society and Lifecourse to explain self-rated health in early adulthood. *Soc Sci Med* 2001;53:1575–85.
33 Shah P, Beattie TS, Kabuti R, *et al*. Syndemic of factors that shape the early lives of women who enter into sex work: a qualitative methods study from Nairobi. *BMJ Open* 2023;13:e068886.
34 Footer KHA, White RH, Park JN, *et al*. Entry to sex trade and long-term Vulnerabilities of female sex workers who enter the sex trade before the age of eighteen. *J Urban Health* 2020;97:406–17.
35 Schulkind J, Mbonye M, Watts C, *et al*. The social context of gender-based violence, alcohol use and HIV risk among women involved in high-risk sexual behaviour and their intimate partners in Kampala, Uganda. *Culture, Health & Sexuality* 2016;18:770–84.
36 Zalwango F, Eriksson L, Seeley J, *et al*. Parenting and money making: sex work and women's choices in urban Uganda. *Wagadu* 2010;8:71–92.
37 Bhattacharjee P, Ma H, Musyoki H, *et al*. Prevalence and patterns of gender-based violence across adolescent girls and young women in Mombasa, Kenya. *BMC Womens Health* 2020;20:229.
38 Gender Women and Civil Society Department (AGHC). Country gender note for Kenya in the context of the bank CSP 2014-2018 mid term review: is gender a number one poverty issue? 2017.
39 Hyun M, Okolo W, Munene A. USAID/Kenya gender analysis report. 2020.
40 Kimani EN, Kombo DK. Gender and poverty reduction: A Kenyan context. *Educat Res Rev* 2010;5:024–30.
41 Kenya National Bureau of Statistics. *2019 Kenya Population and Housing Census*. Nairobi, Kenya: Government of Kenya, 2019.
42 Kimani J, McKinnon LR, Wachihi C, *et al*. Enumeration of sex workers in the central business district of Nairobi, Kenya. *PLoS One* 2013;8:e54354.
43 National AIDS and STI Control Programme (NASCOP). *Key population mapping and size estimation in selected counties in Kenya: Phase 1 key findings*. Nairobi, Kenya: Ministry of Health, Government of Kenya, 2019.
44 Beksinska A, Jama Z, Kabuti R, *et al*. Prevalence and correlates of common mental health problems and recent suicidal thoughts and Behaviours among female sex workers in Nairobi, Kenya. *BMC Psychiatry* 2021;21:503.
45 Beksinska A, Nyariki E, Kabuti R, *et al*. Harmful alcohol and drug use is associated with Syndemic risk factors among female sex workers in Nairobi, Kenya [International journal of environmental research and public health. 2022;19:7294]. *Int J Environ Res Public Health* 2022;19:7294.
46 National Council for Law Reporting. The children act, 2001. Nairobi, Kenya. 2010.
47 World Health Organization. *Adverse Childhood Experiences International Questionnaire (ACE-IQ)*. Geneva, Switzerland: World Health Organization, 2020. Available: https://www.who.int/publications/m/item/adverse-childhood-experiences-international-questionnaire-(ace-iq)
48 Victora CG, Huttly SR, Fuchs SC, *et al*. The role of conceptual frameworks in Epidemiological analysis: a Hierarchical approach. *International Journal of Epidemiology* 1997;26:224–7.
49 Mbonye M, Nalukenge W, Nakamanya S, *et al*. Gender inequity in the lives of women involved in sex work in Kampala, Uganda. *J Int AIDS Soc* 2012;15:1–9.
50 Mulwa S, Chimoyi L, Agbla S, *et al*. Impact of the DREAMS interventions on educational attainment among adolescent girls and young women: causal analysis of a prospective cohort in urban Kenya. *PLoS One* 2021;16:e0255165.
51 Prakash R, Beattie TS, Javalkar P, *et al*. The Samata intervention to increase secondary school completion and reduce child marriage among adolescent girls: results from a cluster-randomised control trial in India. *J Glob Health* 2019;9:010430.
52 Embleton L, Logie CH, Ngure K, *et al*. Intersectional stigma and implementation of HIV prevention and treatment services for adolescents living with and at risk for HIV: opportunities for improvement in the HIV continuum in sub-Saharan Africa. *AIDS Behav* 2023;27:162–84.
53 Cumber SN, Tsoka-Gwegweni JM. The health profile of street children in Africa: A literature review. *J Public Health Afr* 2015;6:566.
54 Cusick L. Youth prostitution: a literature review. *Child Abuse Review* 2002;11:230–51. 10.1002/car.743 Available: https://onlinelibrary.wiley.com/toc/10990852/11/4
55 MInistry of Labour and Social Protection of Kenya. Department of children's services. violence against children in Kenya: findings from a national survey. Nairobi, Kenya. 2019.
56 Coetzee J, Gray GE, Jewkes R. Prevalence and patterns of Victimization and Polyvictimization among female sex workers in Soweto, a South African Township: a cross-sectional, respondent-driven sampling study. *Glob Health Action* 2017;10:1403815.
57 Jewkes R, Otwombe K, Dunkle K, *et al*. Sexual IPV and non-partner rape of female sex workers: findings of a cross-sectional community-centric national study in South Africa. *SSM Ment Health* 2021;1.
58 McCarthy B, Benoit C, Jansson M. Sex work: A comparative study. *Arch Sex Behav* 2014;43:1379–90.
59 Pack AP, L'Engle K, Mwarogo P, *et al*. Intimate partner violence against female sex workers in Mombasa, Kenya. *Culture, Health & Sexuality* 2014;16:217–30.
60 Stoltz J-AM, Shannon K, Kerr T, *et al*. Associations between childhood Maltreatment and sex work in a cohort of drug-using youth. *Soc Sci Med* 2007;65:1214–21.
61 Boyce SC, Brouwer KC, Triplett D, *et al*. Childhood experiences of sexual violence, pregnancy, and marriage associated with child sex trafficking among female sex workers in two US-Mexico border cities. *Am J Public Health* 2018;108:1049–54.
62 Gwirayi P. The role of macro-systemic contexts in understanding the Aetiology and epidemiology of child sexual abuse in Southern Africa. *J Sustain Develop Africa* 2010;12:253–68.
63 Embleton L, Lee H, Gunn J, *et al*. Causes of child and youth homelessness in developed and developing countries: A systematic review and meta-analysis. *JAMA Pediatr* 2016;170:435–44.
64 Ramesh BM, Beattie TSH, Shajy I, *et al*. Changes in risk Behaviours and prevalence of sexually transmitted infections following HIV preventive interventions among female sex workers in five districts in Karnataka state, South India. *Sex Transm Infect* 2010;86:i17–24.
65 Milovanovic M, Jewkes R, Matuludi M, *et al*. Sex work and young women: a cross sectional study to understand the overlap of age and sex work as a central Tenet to epidemic control in South Africa. *AIDS Care* 2023;35:555–63.
66 Dugas M, Bédard E, Kpatchavi AC, *et al*. Structural determinants of health: a qualitative study on female sex workers in Benin. *AIDS Care* 2019;31:1471–5.
67 Loza O, Strathdee SA, Lozada R, *et al*. Correlates of early versus later initiation into sex work in two Mexico-U.S. border cities. *J Adolesc Health* 2010;46:37–44.
68 Stoebenau K, Wamoyi J, Holmes A, *et al*. *Transactional sex and HIV risk: from analysis to action*. Geneva: Joint United Nations Programme on HIV/AIDS and STRIVE, 2018.

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