

Access to and use of sexual and reproductive health services among street children and young adults in Kampala, Uganda: Does Migration matter?

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Research article

Keywords: Rural-urban migration, street children and young adults, sexual and reproductive health services, Uganda

Posted Date: January 11th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-19753/v3>

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Version of Record: A version of this preprint was published on February 23rd, 2021. See the published version at <https://doi.org/10.1186/s12913-021-06173-1>.

Abstract

Background: While the nexus of migration and health outcomes is well acknowledged, the effect of rural-urban migration on use of sexual and reproductive health (SRH) services has received less attention. We assessed the effect of rural-rural migration on the use of SRH services while controlling for confounding and whether there is a difference in the use of SRH services among migrant and non-migrant street children and young adults.

Methods: Data were collected among 513 street children and young adults aged 12 - 24 years using face-to-face interviews using venue-based time-space sampling (VBTS). Using STATA 16.00, multivariate logistic regression analysis was performed to identify factors associated with SRH services use, with rural-urban migration status as the main predictor. Participants were further classified as new migrants (≤ 2 years of stay in city), established migrants (> 2 years of stay in city), or non-migrants (lifelong native street children) with no rural-urban migration history.

Results: Overall, 18.13% of the street children and young adults had ever used contraception/family planning, 58.67% had ever tested for HIV and knew their status while 34.70% had ever been screened for sexually transmitted infections (STIs). Non-migrant street children and young adults were 2.7 times more likely to use SRH services (HIV testing, STI screening and family planning) compared to the migrants (aOR = 2.7, 95%CI 1.23-5.97). Other factors associated with SRH services use among street children and young adults include age (aOR=4.70; 95%CI 2.87 - 7.68), schooling status (aOR = 0.33, 95%CI 0.15-0.76), knowledge of place of care (aOR = 2.71, 95%CI 1.64 - 4.46) and access to SRH information (aOR = 3.23, 95%CI 2.0 - 5.24).

Conclusions: Access to and use of SRH services among migrant street children and young adults is low compared to the non-migrant street children and young adults and is independently associated with migration status, age, schooling status, knowledge of place of SRH care and access to SRH information. Our findings call for the need to design and implement multi-dimensional interventions to increase use of SRH services among street children and young adults while taking into consideration their migration patterns.

Background

Sexual and reproductive health (SRH) is an essential part of universal health coverage and is primarily incorporated in the sustainable development goal 3 on healthy lives and wellbeing, which ensures universal access to SRH services, including family planning, information and education(1). Young people aged 10 to 24 years lie at the very heart of sustainable development as they are the ones most affected by impacts related to poverty, conflict and migration(2). Young people have the agility and ability to adopt and maintain safe behaviours alter the situation against sexually transmitted infections (STIs), human immunodeficiency virus (HIV) and early pregnancy than adults (3). Nonetheless, issues of adolescents' access to quality and confidential SRH services are often disregarded when drafting policies(4)(5).

The need to address the SRH rights of adolescents and young people is critical in improving their SRH outcomes(6). However, lack of awareness about SRH information and place to seek care as well as maltreatment by health workers often limit young people's access to SRH services(7). In particular, young women face numerous challenges that prevent them from using quality SRH services, including stigma, fear of contraceptive side-effects and unaffordable healthcare costs(8)(9). Within the context of urban health, street children and young adults face several health risks including high rates of unwanted pregnancies, STIs, sexual violence and poor maternal and child health outcomes(10)(11).

The topic of rural-urban migration has been at the centre of debates around urbanisation and development at the global, continental and national levels, due to its influence on social and economic underdevelopment of rural areas(12)(13). While the migration process is acknowledged a social determinant of health(14), literature on the effect of internal migration on the SRH services use is limited, with most studies exploring the nexus of international migration and maternal health outcomes conducted in high-income countries(15)(16). For instance, In Italy, female immigrants were found to be at greater risk of receiving inadequate healthcare services compared to the native females(17). A few studies in Sub-Saharan Africa that have investigated the impact of migration on health care, indicate that migrants exhibit disproportionately a higher risk for acquisition of HIV and other STIs compared to non-migrants (18)(19). These studies indicate that the link between rural-urban migration and SRH services use remain an under-researched area especially among hard-to-reach populations such as the street children and youth who constitute the focus of our study.

In Uganda, an increasingly internal migration phenomenon resulting from urbanisation has caused an influx of street children and young people who are most at risk in all fronts (20). All regions of Uganda have experienced rural-urban migration with the majority of the street children and youth reported to be coming from the Karamoja sub-region(21). Despite efforts to improve the policy space around adolescent SRH(22), implementation of SRH programs, especially those impacting the most vulnerable groups such as the street children and young adults, remains problematic. The lack of recognition of street children and young adults in policies and strategic plans of the Kampala Capital City Authority(23), may lead to social exclusion of this already marginalised group from accessing basic social services including SRH services. Moreover, the schism between policy and practice— those making policies about migrants' entitlements versus those providing health services to migrants—is increasingly apparent.

The question of whether rural-urban migration influences the use of SRH services among street children and young adults in urban environments in Uganda is not fully understood. There are no reliable statistics of street children in Uganda. Our study attempts to fill this knowledge gap by investigating the factors that influence the use of SRH services among street children and young adults in Kampala city, with rural-urban migration status as the main predictor of interest. A strategic focus on the nexus of rural-urban migration and access to quality SRH services among the street children and young adults, an otherwise hard-to-reach group, is critical for guiding the future planning and implementation of SRH interventions that target the urban poor youth, guided by the 2030 Agenda for the Sustainable Development Goals

(SDGs) principle of leave no one behind and the Kampala capacity city's aspiration for improved quality of life and human capital needed to support city economic development(23)(24).

Conceptual framework

The conceptual framework of this study largely borrows from the social ecological model (SEM) of health behaviour to understand the interaction between several predictors of SRH services use among the street children and young adults, including rural-urban migration status(25)(26). Ecological models explicitly consider the individual, interpersonal, broader community, organizational and policy contexts of behaviour while incorporating social influences, which in our study context, was deemed most appropriate(27)(28). Within the context of migration, other competing theories may explain association between migration and reproductive health behaviours. These include, the healthy migrant effect model which posits that, over time, individuals who migrate could have healthier behaviours and better outcomes than the native population(29). We used the social ecological model to guide the interviews, data analysis and interpretation of the findings.

Methods

Using a cross sectional study design, we assessed the association of rural-rural urban migration with SRH services utilisation which controlling for other socio-demographic factors and whether there is a difference in the use of SRH services among migrant and non-migrant street children and young adults in Kampala, Uganda's capital city. The study was implemented in three of the five divisions of Kampala capital city, namely: Makindye, Central and Rubaga divisions. Kampala capital city comprises of a night population of approximately 1 507 080 people. Availability of health facilities in Kampala capital city remains the highest in the country at 8.4 facilities per 10 000 population (30). Anecdotal sources estimate a population of 10 000 street children in Uganda, majority of whom live in Kampala capital city (31) (32). We conducted face-to-face interviews among a random sample of 513 children and young adults aged 12–24 years who; a) had continuously stayed in Kampala capital city for at least 3 months prior to the study, b) spent most of their time on the streets of Kampala capital city, and c) consented to participate in the study. Elsewhere, street children have been defined to include both children of and children on the streets within the age group(33).

The study applied a two-stage venue-based time-space sampling (VBTS) technique. VBTS techniques are widely applied in contexts where no comprehensive lists or census data of the target population exists to sample hard-to-reach populations using peer driven recruitment(34). Venues were defined as public or private locations within the city where street children and young adults congregate, live and spend most of their daytime to earn a livelihood. These included urban spaces such as streets, bars and restaurants, markets, parks, bus stations, traffic lights and road junctions as well as temporary shelters. First, to identify the venues where street children congregate during the day and could be contacted, we conducted a pre-survey rapid mapping exercise that involved interviews with key stakeholders (urban

local leaders and service providers) and geo-mapping of parishes and estimated populations of street children at each venue.

In the absence of any mapping or longitudinal data of locations of street children, we considered this pre-survey mapping exercise as the most feasible and appealing approach to inform our sampling strategy. The venues served as the primary sampling units for data collection and were selected by with equal probability. Therefore, parishes with more congregation venues had proportionately a high sample of street children interviewed. New venues were added if the research assistant noticed other locations in the field that were not on the initial list. The identification of the venues and street children and young adults was made possible with the help of the local urban leaders, service provider NGOs and street children's landlords or caregivers. Overall, we enlisted a total 167 venues in 27 parishes from the three purposively selected divisions.

Second, at each of the selected venue, we applied Respondent Driven Sampling (RDS) to recruit the eligible street children and young adults using their network groups to participate in the interviews. Since the number of the street children and young adults during the fixed time interval was small (15 or fewer), we interviewed all eligible participants found in each venue. RDS is a chain referral sampling method that produces a stable sample regardless of the make-up of initial recruits(35).

Dependent variables

We created a binary composite variable "SRH services use" from three dependent variables, namely: a) ever used contraception or family planning in lifetime; b) HIV testing in the past 12 months, and c) history of STI screening in the last 12 months preceding the survey. Hence a participant who responded "yes" to the three questions was considered to have ever used SRH services: *a) In the past 12 months, have you sought for STI testing/screening? (Yes/No); b) In the last 12 months, have you taken an HIV test and know your HIV status? (Yes/No); and c) Have you used any modern family planning (Yes/No)*. A positive ("yes") response to any one of these services was regarded as SRH services use. Positive responses to the above questions were further validated with follow-up questions on the type of family planning methods used and STI symptoms experienced. Previous studies have used similar categorisation of SRH services and self-reports as a measure of health service utilisation and is thus deemed appropriate for our study(36)(37).

Independent variables

Rural-urban migration aspects measured comprised the following: place (district/region) of origin, duration of stay, intra-urban mobility and number of return movements to the city. Specific questions included: *In which district/region were you born? Which year and month did you first come to arrive to settle in Kampala capital city?; For how long have you stayed in Kampala capital city?; How many places*

have you stayed in since you first settled/arrived in the city?; In the past 24 months, have you returned to your home district/region of origin? (Yes/No). If yes, how many times did you go back to your place of birth/origin and returned to the city (round trips)? In this study, street children and young adults with a rural-urban migration experience were classified as “migrants” while street children and young adults with no rural-urban migration history were considered “non-migrants”. Individuals were further classified as new migrants (≤ 2 years of stay in city), established migrants (> 2 years of stay in city), or non-migrants (lifelong native street children) with no rural-urban migration history. Previous studies have used similar categorisations for migration status (38)(39). Street children and young adults who had more than one repeat movements to their district of origin in the past 24 months preceding the survey were classified as “circular migrants”. Other independent variables included participant’s characteristics such as age, sex, marital status, schooling experience, education level, daily income earned and living arrangements, as illustrated in the study framework (Figure 1).

Procedures

Between May and July 2019, data were collected using a pretested interviewer-administered semi-structured instrument programmed in English and two local languages, *Luganda* and *Ngakarimajong*, on mobile android PDA using CTO Survey tool. Luganda and Ngakarimajong are the most spoken languages by the street children and young adults. The electronic tool ensured minimisation of errors and completeness of interviews. Since the street children and young adults are connected through social networks, eligible respondents were recruited through respondent driven sampling in which street children had to lead the researcher to their peers for inclusion in the study. To ensure comprehension and high response rate, a team of 14 trained male and female research assistants conducted the interviews. All interviews took place in private spaces at the selected venues and along the streets. Participants who are unable to provide the required information due to illness were excluded. Written consent with the street children and young adults was obtained before interviews. Informed written consent was obtained from caregivers of children aged below 14 years while study participants aged 14 years and above consented on their own. The National Council of Science and Technology guidelines on ethics and research with human subjects considers the age group 14 to 17 years to be emancipated minors and hence able to provide own consent without parental or guardian permission(40).

Data analysis

To examine the factors associated with the use of SRH services, including rural-urban migration status as the main explanatory variable of interest, we performed a stepwise binary logistic regression analysis using Stata version 16.00 version while controlling for confounding. Stepwise binary logistic regression has been applied elsewhere (41). The choice of variables in the final multivariate regression analysis models was guided by the conceptual framework while assessing for multicollinearity among the predictor variables. We first tested for independent effects of each outcome variable (HIV testing, STI screening and FP use) using separate regression models, followed by the combined regression model (SRH service use). We examined possible differences between the models by using the same explanatory

variables across all the models and R-squared values. Also, we performed a sub-analysis of factors associated with SRH services use stratified by migration status. All analyses were two-tailed, and a p -value of 0.05 or less was deemed statistically significant. Lastly, we report results from the four multivariate logistic regression analysis models.

Results

Background characteristics

Table 1 shows the background characteristics of the street children and young adults by migration status. Overall, 82.85% ($n = 425$) and 17.15% ($n = 88$) of the street children and young adults were migrant and non-migrant, respectively. Most of the street children and young adults were aged 18 years and above and were mostly male. More migrants (76.50%) than non-migrants (58.57%) had attained pre-school or primary school education while the majority (56.82%) of non-migrants had attained secondary education. More than three quarters (89.67%) of the street children and young adults were not in school. Most (79.53%) of the street children and young adults were not married and only 16.76% were either married or living with a partner. In terms of living arrangement, more than half (63.38%) of the new migrants stayed with a sexual partner or friend compared to established migrants (57.45%) and non-migrants (37.50%). Non-migrant street children and young adults earned more than the threshold value of 1USD daily compared to new and established migrant street children and young adults. About half of the street children and young adults were orphans. There was no significant difference in orphanhood status by migration status.

Prevalence of use of SRH services

Table 1 findings show that 61.99% ($n=318$) of the street children and young adults received at least one component of the SRH services (HIV testing, FP and STIs screening) in the last 12 months. Across all the components, use of SRH services was generally lower among the migrants compared to non-migrant street children and young adults. More (30.68%) of the non-migrant street children and young adults had ever used a modern family planning method than established migrants (17.73%) and new migrants (14.44%). About three quarters (73.86%) of the lifelong native street children and young adults had ever tested for HIV in the past 12 months and knew their status compared to 51.76% and 63.12% of new migrants established migrants, respectively. Similarly, the prevalence of STI screening in the past 12 months was low among migrants, with 26.41% of new migrant and 38.30% of established migrants screened for STIs compared to 55.68% of their non-migrant counterparts. The differences in SRH services utilisation are significant at the 0.05 p -value. Additional findings (not shown in the table) revealed a condom as the commonly used FP method (77.03%). The majority (68.39%) of the street children and young adults reporting accessing SRH services through public sector primary health facilities compared to 31.61% access from non-governmental organisations (NGO) and private health facilities.

Factors associated with use of SRH services

Table 2 shows findings from the bivariate logistic regression analysis of socio-demographic and migration variables on use of SRH services (STI screening, HIV testing and FP) among street children and young adults. Use of SRH services was associated with increasing age, with those aged above 18 years being 5.8 times more likely to use SRH services than the younger age group (cOR = 5.84, 95%CI 3.95 - 8.64). Regarding marital status, street young adults in conjugal relationships were 2.5 times more likely to use SRH services than street young adults in non-conjugal relationships (cOR = 2.47, 95%CI 1.43 - 4.26). Individuals who perceived themselves as permanent residents of the city were twice likely to use SRH services than the mobile/seasonal street children (cOR = 1.93, 95%CI 1.32 - 2.81). Use of SRH services more than doubled with attainment of post primary education (cOR = 2.71, 95% 1.69 - 4.34). Intra-urban mobility (movement between urban spaces) was associated with SRH services use among street children (cOR = 2.13, 95%CI 1.43 - 3.15). However, the odds of using SRH services decreased with migration status (cOR = 0.52, 95%CI 0.36 - 0.74), duration of stay (cOR = 0.64, 95%CI 0.42 - 0.97) and tribe/ethnicity (cOR=0.56, 95%CI 0.37 - 0.82). The reduced odds of using SRH services further supports our hypothesis that migration inhibits use SRH services among migrant street children and young adults in urban spaces.

Migration as the main predictor of use of SRH services

Table 3 shows findings from the four multivariate binary logistic regression models with SRH services use (model 1), STI screening (model 2), HIV testing (model 3) and use of family planning (model 4) as the main outcome variables. The final models included ten predictors of SRH services use including rural-urban migration status, age, sex, daily income, schooling status, and other known predictors of SRH services utilisation. The findings reveal that non-migrant street children and young adults were 2.7 times more likely to use SRH services than their migrant counterparts (aOR = 2.71, 95%CI 1.23 – 5.97), implying that SRH services utilization is generally low among new and established migrants compared to non-migrants or lifelong native street children and young adults. We did not find a significant relationship between circular and non-circular migrants (street children and young adults who had more than one repeat movement between the city and place/district of origin) and use of SRH services.

Other predictors of SRH services use

Other factors that predicted use of SRH services among the street children and young adults include, age, knowledge of place of care for SRH services and access to SRH information. Older street young adults aged 18-24 years were 4.7 times more likely to use SRH services than those aged 12-17 years (aOR = 4.70; 95%CI 2.87 - 7.68); The odds of having used modern FP methods was 67% lower if the street children and young adults were in-school as opposed to the out-of-school counterparts (aOR = 0.33; 95%CI 0.15 - 0.76). Street children and young adults with knowledge of place of SRH care were 3.2 times

more likely to use FP services compared to individuals without knowledge of a place of SRH care (aOR = 3.37, 95%CI 2.04 - 5.34). Street children and young adults who reported having received SRH education in the past 6 months were 2.7 times more likely to use SRH services than those did not have access to information (aOR = 2.71, 95%CI 1.64 - 4.46). Results from the multivariate regression models 2, 3 and 4 revealed findings similar to those of the pooled outcome (SRH services use) with some slight variations in the measures of the strength of association. STI screening and HIV testing services use were associated with migration status, age and SRH education. For instance, the association between migration status and use of FP services was insignificant except for FP services in which there was a 70% lower likelihood of having used FP services among Christians as opposed to non-Christians (aOR = 0.30, 95%CI 0.15 - 0.62). Street children and young adults aged 18 - 24 years were five times more likely to use FP services than their counterparts aged 12 - 18 years (aOR = 5.30, 95%CI 2.28 - 12.33). The odds of having ever used FP was 10.4 times higher if the street children and young adults knew the place of FP care as opposed to not knowing the place of FP care (aOR = 10.44, 95%CI 4.87 - 22.38). We did not find any significant difference in use of FP services between new migrants, established migrants and non-migrant (lifelong native) street children and young adults (OR = 0.85, 95% 0.37-1.92).

Multivariate regression analysis based on sample stratification by migration status revealed significant differences in the use of SRH services among street children and young adults with regards to age, schooling status, SRH education and place of SRH care. Among new migrants alone, increased SRH services use was associated with age (aOR=6.32,95%CI 3.28 - 12.17), SRH education in past 6 months (aOR = 2.48, 95%CI 1.32 - 4.65) and knowing a place of FP care (aOR = 2.68, 95%CI 1.44 - 4.99). Among established migrants, odds of use of SRH services were increased by 4-fold if the street children were older than 18 years and above (aOR = 3.69, 95%CI 1.27 - 10.72), received SRH education (aOR = 3.62, 95%CI 1.19 - 10.99) or knew place of FP care (aOR = 3.54, 95%CI 1.34 - 9.30). Similarly, among non-migrants, the odds of SRH services utilisation were increased with age (aOR = 8.76, 95%CI 1.38 - 55.52). which implies. No significant gender differences between use of SRH services and migration status were observed.

Discussion

This is the first study in Uganda to primarily investigate the nexus between rural-urban migration and SRH services utilisation among street children and young adults using quantitative methods, through the social ecological lens. Our study reveals rural-urban migration as a key determinant of SRH services use among street children and young adults in Kampala, with migrants being disproportionately affected compared to non-migrants. Other predictors of use of SRH services among street children and young adults included age, schooling status, access to SRH education and knowledge of a place of SRH care. Religion was a major predictor of use of contraception.

Returning to the question of whether rural-urban migration influences SRH services use, the low use of SRH services (HIV testing, STI screening and FP) among migrants compared to the non-migrants confirms our hypothesis that non-migrant street children and young adults are likely to have better use of

SRH services than rural-urban migrants. It also demonstrates migration status as a barrier to access to and use of SRH services (HIV testing, STI screening and FP) among rural-urban migrant street children and young adults living in urban environments. This finding is plausible given the social context within which migrant street children and young adults live, adapt and socialise while on the streets of Kampala.

Conversely, the odds of using SRH services were 1.4 times higher among established migrants (> 2 years of stay in city) compared to new migrants (\leq 2 years of stay in city). It should be noted that street life is a process that requires adaptation to the new street environment, as the newcomers may take some time to establish social and peer support networks, which is critical for healthcare support. As such, street children and young adults especially established migrants must dully navigate the challenges of street while also adapting to the new street culture and language. Therefore, the newcomers may take some time to establish social and peer support networks which is critical for social support during healthcare seeking(42)(43).

Reduced utilisation of family planning especially among rural-urban migrant street young adults could potentially result into increased fertility that could further escalate the country's annual population growth rate of 2.88%, which seems to be growing faster than government's capacity to deliver vital services(44). However, this result contrasts sharply with the Kenyan study in which use of modern contraception was higher in migrants than non-migrant women(45). The difference with our findings could be attributed to different methods and study population used. Unlike our study, the Kenyan study utilised national demographic and health survey data of sexually active women of reproductive age group and looked at different migration streams, to explain the differences.

In our study, we observed an association between age and use of SRH services. This finding may suggest that older street young adults are stronger and therefore can navigate the complex urban health care system with ease compared to their young counterparts, who may require support from adults in seeking healthcare services. It is possible that older street young adults are involved in health compromising practices such as drugs, risky sexual behaviour and hence more likely to seek healthcare than the young street children.

The reduced odds of using SRH services especially HIV testing services among in-school street children and young adults as opposed to their out-of-school counterparts may suggest limited access to SRH information and services within the school environment due to restrictive policies. In Uganda, the current policy does not allow distribution of SRH commodities and hence prohibiting the sexually active learners within from accessing them within the school environment. Such restrictive educational policies that include sanctions against young people found to be in possession of condoms while in school hinder effective implementation sexual behaviour interventions in many low to middle income countries(46). When in school, the in-school street children may be omitted from SRH services that are provided to their out-of-school counterparts within urban community environment. Within the local context, with most street children being out-of-school, the community environment remains the most appropriate avenue for delivery of SRH information and services to this marginalised group of urban poor

youth. Earlier studies have demonstrated the role of access to SRH information in contraceptive use among young people(47).

In our study, religion and not gender dynamics strongly influenced the uptake of family planning among street children and young adults. The low uptake of family planning among Christians compared to non-Christians could be attributed to the myths, misconceptions, cultural and religious beliefs about modern contraception which are widely held by many rural communities in Uganda from which the street children and young adults originate. Previous qualitative studies done in Uganda and Tanzania confirm religious and cultural beliefs remain an impediment to uptake of family planning methods among women and men of reproductive age(48)(49). This result suggests high unmet need for contraception among street young people and provides an opportunity for responders to engage urban street children and young adults on changing their religious perceptions and practices on modern contraceptives. Since young people are ardent followers of their faith leaders, involving the latter is critical in addressing the SRH rights and needs of street children and youth.

This study had some strengths and limitations. First, we were able to establish the association between rural-urban migration and use of SRH services among street children and young adults, as the main explanatory variable while controlling for confounding as guided by the study theory. Second, the use of a large sample size with adequate power to detect the minimum meaningful difference in establishing a relationship between predictors and use of SRH services is another strength. Our data are cross-sectional and therefore preclude our ability to determine the direction of causality. We did not control for sexual behaviours and participants' household characteristics which might possibly confound the relationship between migration and SRH services use. However, the lack of a well-defined formal housing structure (temporary shelters) in which the street children and young adults live within urban spaces could not permit analysis of household characteristics.

The lack of an association between internal circular migration of street children and SRH services use could be attributed to limited opportunities to access to SRH and other support services during the migration process. Most circular migrants are also likely to be new migrants or stayed for a short time in the urban spaces and hence with low SRH services utilisation as revealed by the study findings. Available literature seem to report limited accessibility to health services among international migrants during the migration cycle or integration in host communities(24). The importance of research on implications of rural-urban circular migration of limiting access to SRH services in the context of rural-urban migration require further exploration.

It is probable that migrant street young adults could have used contraceptives prior to migration, in which case, the results of our study could overestimate contraceptive use among migrants. However, we did not find a significant association in the use of FP services between new migrants (≤ 2 years of stay in city) and established migrants (> 2 years of stay in city). Therefore, it is unlikely that use of contraceptives among street children and young adults prior to migrating to Kampala would substantially influence estimates of FP services utilisation in our study sample. Moreover, results from nationally representative

population-based surveys of 15-24 year-olds show that contraceptive services are still underutilized in rural areas of Uganda(50). Given the fact that all regions of Uganda have experienced rural-urban migration of street children and young adults, we believe that our study findings could be generalisable to all street children and young adults in Ugandan cities.

As a final note on the study theoretical underpinning, our study findings illustrate the synergetic relationship between individuals, interpersonal and their social environment factors which interact to influence the use of SRH services among the street children and young adults through the social ecological lens. Previous research on SRH services utilisation have adopted the socio-ecological model(51). Our finding on low utilisation of SRH services among new and established migrant street children and young adults compared to the lifelong native street children contrasts with the healthy migrant effect model which posits that, over time, individuals who migrate could have healthier behaviours than the native population(29). Lastly, this study provides new knowledge on the understanding of the nexus of rural-urban migration and SRH services utilisation among street children and young adults in Kampala, Uganda. It highlights the need for future research on the impact of rural-urban migration on street children and young adults' SRH behaviour and outcomes.

Conclusions

In conclusion, use of SRH services is low among migrant street children and young adults compared non-migrants or lifelong native street children, and is independently associated with migration status, age, schooling status, knowledge of place of SRH care and access to SRH information. Rural-urban migrant street children and young adults are less likely to use SRH services than their non-migrant counterparts. Other factors associated with use of SRH services among street children and young adults include age, schooling status, knowledge of place of FP care and provision of SRH education. Our study findings point to the need for the Kampala Capital City Authority's (KCCA), Ministry of Health and other key responders to design multi-level effective interventions, guided by the socio-ecological lens, to improve equitable access to and use of SRH services among street children and young adults in the Kampala metropolitan area and ultimately contribute to their improved SRH.

Multi-level effective interventions at individual, community and societal levels should include delivery of integrated SRH-HIV outreach and mobile clinic services to the urban spaces where street children live or congregate during daytime; tailored SRH and HIV peer-to-peer education messages using multimedia campaigns; provision of responsive SRH services for the marginalised migrant street children and young adults at the Kampala city's health facilities. At the society level, improving the policy environment, living arrangements and conditions of street children and young adults especially those with a rural-urban migration experience is critical in achieving universal access to adolescent SRH services for all, without leaving behind vulnerable street children and young adults. The recognition of street children and young adults as a priority vulnerable group in national and urban policies and plans.

Abbreviations

aOR – Adjusted Odds Ratio

cOR – Crude Odds Ratio

HIV – Human Immunodeficiency Virus

FP – Family planning

SRH – Sexual and reproductive health

STIs – Sexually transmitted infections

RDS – Respondent Driven Sampling

Declarations

Ethics approval and consent to participate

The study protocol and all study materials were reviewed and approved by the Maastricht University Faculty of Health, Medicine and Life Sciences Ethics Committee (Ref. BvdB/Pvs/01001), Netherlands, Makerere University School of Social Sciences Research and Ethics Committee (Ref. MAKSS REC 12.18.389) and the Uganda National Council of Science and Technology (Ref. HS348ES). Permission to conduct the study in the Kampala metropolitan area will be sought from the KCCA's Directorate of Public Health and Environment (Ref. DPHE/KCCA/201/17). Informed written consent for publication of and participation in the study was obtained from the street children and/or their caregivers.

Consent for Publication

Not applicable.

Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

The study was supported by the Care and Public Health Research Institute (CAPHRI), Maastricht University, Netherlands and the first author.

Authors' contributions

MFB participated in the conception, design and implementation of the study, analysis, interpretation and drafting of the manuscript. PB, CAM and BHWB participated in the study conception, design, analysis, interpretation and drafting of the manuscript. All authors read, edited and approved the final manuscript.

Acknowledgements

We would like to thank the urban local authorities, study participants and the study team for their kind support and cooperation during study implementation.

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Tables

Table 1: Background characteristics of street children and young adults by migration status, Kampala, Uganda, 2019

Characteristic		New migrants (%) (n=284)	Established migrants (%) (n=141)	Non-migrants (%) (n=88)	Total (%) (N=513)
Age (in complete years) **					
	12-17	44.72	26.24	35.23	38.01
	18-24	55.28	73.76	64.77	61.99
Age (mean, Sd)		17.94(3.04)	19.11(2.98)	19.08(3.43)	18.46(3.14)
Gender **					
	Male	47.89	66.67	82.95	59.06
	Female	52.11	33.33	17.05	40.94
Schooling status**					
	Out of school	93.66	87.23	80.68	89.67
	In school	6.34	12.77	19.32	10.33
Highest education attained **					
	Primary	76.50	72.13	39.77	67.68
	Secondary	23.04	27.05	56.82	31.15
	Tertiary	0.46	0.82	3.41	1.17
Marital Status **					
	Married/cohabiting	21.48	14.18	5.68	16.76
	Not Married/single	77.11	80.85	85.23	79.53
	Divorced/separated/widowed	1.41	4.96	9.09	3.71
Living arrangement **					
	Stays alone	11.97	12.06	12.50	12.09
	Stays with partner/friends	63.38	57.45	37.50	57.30
	Stays with parents	3.52	12.06	32.95	10.92
	Stays with siblings/other	21.13	18.44	17.05	19.69
Daily income earned (USD)**					
	<1 USD	40.47	21.67	19.05	32.27
	≥1 USD	59.53	78.33	80.95	67.73
Orphanhood status					
	Orphaned	46.83	53.90	53.41	49.90
	Non-orphaned	53.17	46.10	46.59	50.10

Prevalence of SRH services use

Tested for HIV & know status in the past 12 months**

No	137(48.24)	52(36.88)	23(26.14)	212(41.33)
Yes	147(51.76)	89(63.12)	65(73.86)	301(58.67)

Ever used modern family planning method**

No	243(85.56)	116(82.27)	61(69.32)	420(81.87)
Yes	41(14.44)	25(17.73)	27(30.68)	93(18.13)

Screened/tested for STI in the past 12 months **

No	209(73.59)	87(61.70)	39(44.32)	335(65.30)
Yes	75(26.41)	54(38.30)	49(55.68)	178(34.70)

Ever used SRH services (HIV test, STI screening or FP) **

No	127(44.72)	48(34.04)	20(22.73)	195(38.01)
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	Yes	157(55.28)	93(65.96)	68(77.27)	318(61.99)
Knows place of care for FP services **	No	158(55.63)	74(52.48)	25(28.41)	257(50.10)
	Yes	126(44.37)	67(47.52)	63(71.59)	256(49.90)

*** Significant at the 5% p-value.*

Table 2: Bivariate analysis of selected predictors and migration aspects with SRH services use among street children and young adults in Kampala, Uganda, 2019

Characteristic	Use of SRH services		cOR (95% CI)
	Never used n (%)	Ever used n (%)	
Gender (N=513)			
Male	110(56.41)	193(60.69)	1
Female	85(43.59)	125(39.31)	0.84(0.58-1.20)
Age in years **			
12-17	123(63.08)	72(22.64)	1
19-24	72(36.92)	246(77.36)	5.84 (3.95-8.64)
Marital Status **			
Not married	176(90.26)	251(78.93)	1
Married/cohabiting	19(9.74)	67(21.07)	2.47(1.43-4.26)
Perceived residence status **			
Mobile/seasonal	137(70.26)	175(55.03)	1
Permanent	58(29.74)	143(44.97)	1.93(1.32-2.81)
Highest education attained**			
Primary	121(80.67)	168(60.65)	1
Secondary +Tertiary	29(19.33)	109(39.35)	2.71(1.69-4.34)
Schooling status **			
Out of school	164(84.10)	296(93.08)	1
In school	31(15.90)	22(6.92)	0.39(0.22-0.70)
Daily income earned**			
Less than 1 USD	65(38.92)	77(28.21)	1
1 USD and above	102(61.08)	196(71.79)	1.62(1.08-2.44)
Migration status			
New migrants (\leq 2 years of stay)	127(65.13)	157(49.37)	1
Established migrants ($>$ 2 years of stay)	48(24.62)	93(29.25)	1.57(1.03-2.38)
Non migrants (lifelong native street children)	20(10.26)	68(21.38)	2.75(1.59-4.78)
Intra-urban mobility **			
1 place (move)	99(56.57)	95(38.00)	1
2 or more places (multiple moves)	76(43.43)	155(62.00)	2.13(1.43-3.15)
Place of origin/birth**			
Outside Kampala district	175(89.74)	250(78.62)	1
Kampala district	20(10.26)	68(21.38)	2.38(1.48-4.06)
Region of birth**			
Other regions	126(64.62)	171(53.77)	1
Central region	68(35.38)	147(46.23)	1.57(1.09-2.27)
District of birth/origin**			
Born outside Kampala	175(89.74)	250(78.62)	1
Born in Kampala	20(10.26)	68(21.38)	2.38(1.39-4.02)
Ethnicity (tribe)**			
Other tribes	113(57.95)	226(71.07)	1
Ngakarimajong	82(42.05)	92 (28.93)	0.56(0.37-0.82)
Circular movement			

Non-circular migrant	94(74.02)	112(71.34)	1
Circular migrant	33(25.98)	45(28.66)	1.14(0.68-1.94)

**** Significant at the 5% p-value.**

Table 3: Multivariate analysis of demographic and migration status with SRH services use among street children and young adults in Kampala, Uganda, 2019.

Indicator variable	Model 1 (SRH use) aOR (95% CI)	Model 2 (STI screening) aOR (95% CI)	Model 3 (HIV testing) aOR (95% CI)	Model 4 (Ever used FP) aOR (95% CI)
Migration status				
New migrants	1 (reference)	1 (reference)	1 (reference)	1 (reference)
Established migrants	1.42(0.82- 2.47)	1.38(0.82- 2.33)	1.66(0.97- 2.85)	0.90(0.45- 1.81)
Non-migrants	2.71(1.23- 5.97)	2.43(1.25- 4.72)	2.93(1.38- 6.24)	0.85(0.37- 1.92)
Age (0=<18yrs,1= 18yrs & above)	4.70(2.87- 7.68)	2.68(1.58- 4.55)	4.03(2.48- 6.53)	5.30(2.28- 12.33)
Gender (0=male,1=female)	0.76(0.42- 1.37)	0.81(0.445- 1.44)	0.83(0.46- 1.47)	0.62(0.28- 1.37)
Enrollment status (0=out of school,1=in school)	0.33(0.15- 0.76)	0.77(0.33- 1.79)	0.34(0.15- 0.78)	0.12(0.01- 1.04)
Urbanicity status (0,1=non urban)	1.04(0.65- 1.67)	0.64(0.04- 1.00)	1.09(0.69- 1.73)	0.62(0.34- 1.13)
Household income in USD (0= ≤1USD,1=>1USD)	1.21(0.72- 2.03)	1.37(0.81- 2.30)	1.05(0.63- 2.01)	2.03(0.95- 4.34)
Religion (0=Non- Christian,1=Christian)	1.07(0.59- 1.95)	0.86(0.49- 1.52)	1.14(0.63- 2.03)	0.30(0.15- 0.62)
Marital status (0=Not married,1=married)	1.61(0.75- 3.45)	1.83(0.93- 3.59)	1.77(0.84- 3.73)	0.79(0.32- 1.97)
Received SRH education in past 6 months (0=no,1=yes)	2.71(1.64- 4.46)	2.10(1.33- 3.33)	3.05(1.88- 4.95)	1.41(0.76- 2.60)
Perceived availability of a place to go to for FP services (0=no,1=yes)	3.23(2.0- 5.24)	2.60(1.65- 4.11)	2.77(1.74- 4.40)	10.44(4.87- 22.38)

<i>nstant</i>	0.21(0.09-0.46)	0.99(0.04-0.23)	0.18(0.08-0.37)	0.03(0.01-0.09)
<i>eudo r-squared</i>	0.2441	0.1573	0.2285	0.2915

Figures

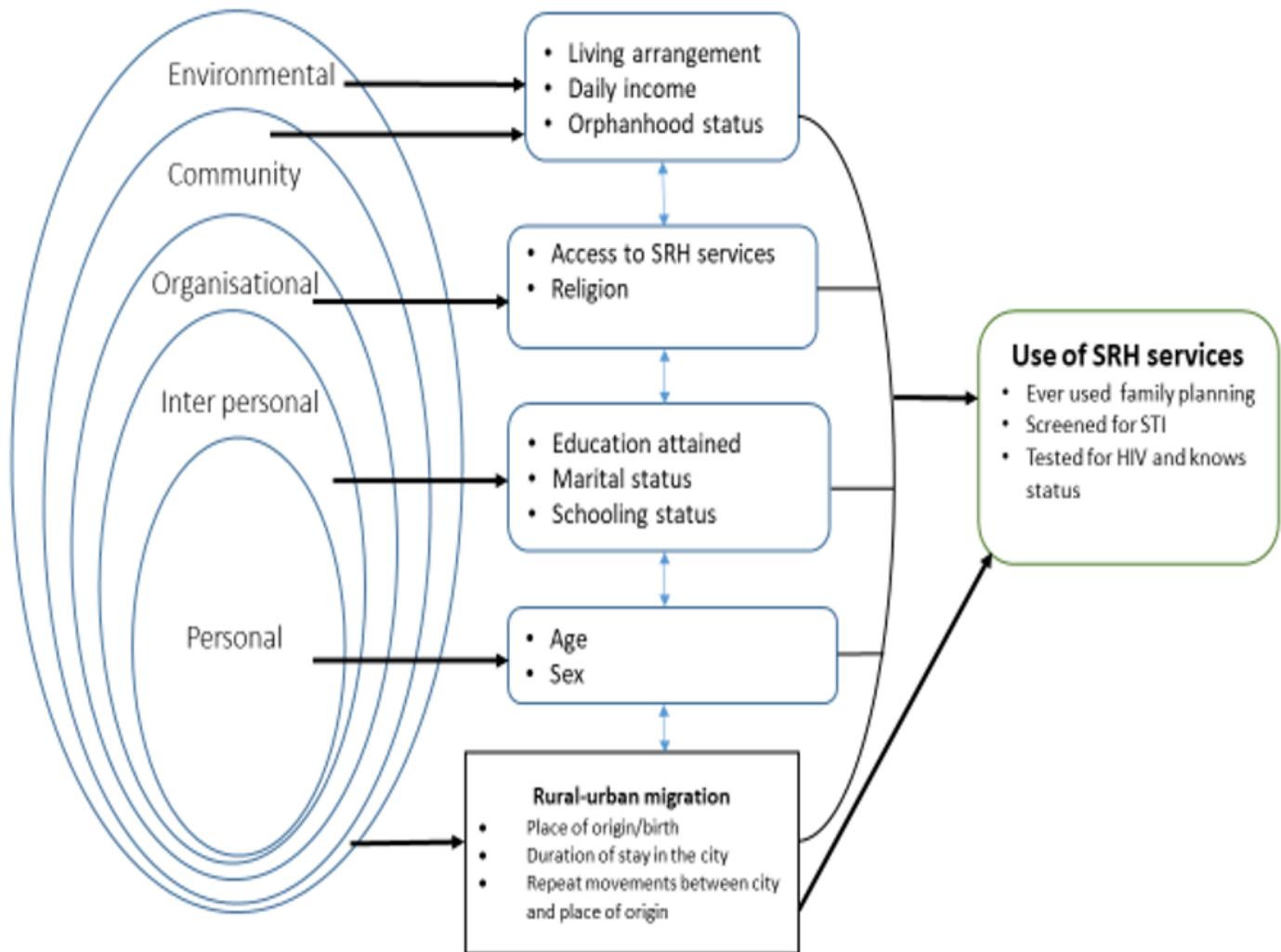


Figure 1

A socio-ecological framework showing independent factors associated with use of SRH services among street children and young adults, Kampala, Uganda, 2019.