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Samuel Ayaya

Allison DeLong

Lonnie Embleton

David Ayuku

Edwin Sang

See next page for additional authors

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Authors

Samuel Ayaya, Allison DeLong, Lonnie Embleton, David Ayuku, Edwin Sang, Joseph Hogan, Allan Kamanda, Lukoye Atwoli, Dominic Makori, Mary A. Ott, Caroline Ombok, and Paula Braitstein



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Prevalence, incidence and chronicity of child abuse among orphaned, separated, and street-connected children and adolescents in western Kenya: What is the impact of care environment?

Samuel Ayaya ^{a,b}, Allison DeLong ^c, Lonnie Embleton ^d, David Ayuku ^e, Edwin Sang ^b, Joseph Hogan ^c, Allan Kamanda ^f, Lukoye Atwoli ^{e,g}, Dominic Makori ^b, Mary A. Ott ^h, Caroline Ombok ^b, Paula Braitstein ^{b,d,i,*}

^a Department of Child Health and Paediatrics, Moi University, College of Health Sciences, School of Medicine, Eldoret, Kenya

^b Academic Model Providing Access to Healthcare (AMPATH), Eldoret, Kenya

^c Department of Biostatistics, School of Public Health, Brown University, Providence, RI, USA

^d Division of Epidemiology, Dalla Lana School of Public Health, University of Toronto, Toronto, Canada

^e Department of Mental Health and Behavioral Sciences, College of Health Sciences, School of Medicine, Moi University, Eldoret, Kenya

^f Moi Teaching and Referral Hospital, Eldoret, Kenya

^g Aga Khan University Medical College, East Africa, Nairobi, Kenya

^h Department of Pediatrics, Indiana University, School of Medicine, Indianapolis, USA

ⁱ Department of Medicine, College of Health Sciences, School of Medicine, Eldoret, Kenya

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ABSTRACT

Background: The effect of different types of care environment on orphaned and separated children and adolescents' (OSCA) experiences of abuse in sub-Saharan Africa is uncertain.

Objective: Our two primary objectives were 1) to compare recent child abuse (physical, emotional, and sexual) between OSCA living in institutional environments and those in family-based care; and 2) to understand how recent child abuse among street-connected children and youth compared to these other vulnerable youth populations.

Participants and setting: This project followed a cohort of OSCA in Uasin Gishu County, Kenya (2009–2019). This analysis includes 2393 participants aged 18 years and below, 1017 from institutional environments, 1227 from family-based care, and 95 street-connected participants.

Methods: The primary outcome of interest was recent abuse. Multiple logistic regression was used to estimate the odds of recent abuse at baseline, follow-up, and chronically for each abuse domain and adjusted odds ratios (AOR) between care environments, controlling for multiple factors.

Results: In total, 47 % of OSCA reported ever experiencing any kind of recent abuse at baseline and 54 % in follow-up. Compared to those in family-based care, street-connected participants had a much higher reported prevalence of all types of recent abuse at baseline (AOR: 5.01, 95 % CI: 2.89, 9.35), in follow-up (AOR: 5.22, 95 % CI: 2.41, 13.98), and over time (AOR: 3.44, 95 % CI: 1.93, 6.45). OSCA in institutional care were no more likely than those in family-based care of

* Corresponding author at: Dalla Lana School of Public Health, University of Toronto, Division of Epidemiology, 155 College Street, Toronto, ON, M5T 3M7, Canada.

E-mail address: paula.braitstein@utoronto.ca (P. Braitstein).

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reporting any recent abuse at baseline (AOR: 0.85 95 % CI: 0.59–1.17) or incident abuse at follow-up (AOR: 0.91, 95 % CI: 0.61–1.47).

Conclusion: OSCA, irrespective of care environment, reported high levels of recent physical, emotional, and sexual abuse. Street-connected participants had the highest prevalence of all kinds of abuse. OSCA living in institutional care did not experience more child abuse than those living in family-based care.

1. Introduction

All children under the United Nations Convention of the Rights of the Child have the right to be protected from “*all forms of physical or mental violence, injury or abuse, neglect or negligent treatment, maltreatment or exploitation, including sexual abuse, while in the care of parent(s), legal guardian(s) or any other person who has the care of the child*” (Article 19) (United Nations High Commissioner for Human Rights, 1990). In 2014, a global estimate from 96 countries found that over one billion children aged two to 17 years had experienced physical, emotional, and/or sexual violence in the past year (Hillis, Mercy, Amobi, & Kress, 2016). In Africa, it was estimated that 200 million children aged two to 17 years were exposed to violence in the past year, with 80 % of children aged two to 14 years and 50 % of children aged 15–17 experiencing any violence in the past year (Hillis et al., 2016). Adolescent girls in sub-Saharan Africa experience the highest rates of physical and sexual violence globally (UNICEF, 2014). More than seven in 10 children aged two to 14 years living in sub-Saharan Africa are disciplined in a violent manner, and countries in the region show the highest level of support for corporal punishment, where it may be socially accepted that physical punishment is needed to raise a child (UNICEF, 2014). Evidence suggests that orphaned and separated children and adolescents (OSCA) (those semi-permanently or permanently separated from their biological parents) in sub-Saharan Africa may be particularly vulnerable to experiencing physical and/or sexual abuse in comparison to their non-orphaned peers (Kidman & Palermo, 2016; Nyamukapa et al., 2010; Pascoe et al., 2010). Together, these data indicate an alarming social and public health problem of child abuse and neglect in the region. Experiencing violence in childhood has consequences for child development and predisposes adults to a number of morbidities including HIV, and pre-mature mortality (Felitti, 2019; Hillis, Anda, Felitti, Nordenberg, & Marchbanks, 2000; Ystgaard, Hestetun, Loeb, & Mehlum, 2004; Zlotnick, Tam, & Robertson, 2004).

Sub-Saharan Africa is home to 37 % of the world’s 140 million orphaned children and adolescents who have lost one (single orphan) or both parents (double orphan) (UNICEF, 2015). In Kenya as of 2012, it was estimated that there were 2.6 million orphaned children, with 15 % of these children being double orphans. Over half of all orphaned and vulnerable children in Kenya live in households reporting wealth in the lowest two quintiles (Lee et al., 2014). With 36 % of Kenyans living below the poverty line (2018), combined with the sheer numbers of children requiring care and support (Lee et al., 2014), many families struggle to meet traditional care-taking expectations and meet orphaned children’s basic needs (Embleton et al., 2014; Morantz, Cole, Ayaya, Ayuku, & Braitstein, 2013a; Nyambedha, Wandibba, & Aagaard-Hansen, 2001; Nyambedha, Wandibba, & Aagaard-Hansen, 2003). In sub-Saharan Africa, the majority of all orphans not living with a surviving parent are cared for by extended families (Monasch & Boerma, 2004; UNICEF, 2006). Extended families, particularly those headed by grandparents, are not always able to meet the material needs of the orphaned children in their care (Foster, 2000; Heymann, Earle, Rajaraman, Miller, & Bogen, 2007; Hosegood et al., 2007; Miller, Gruskin, Subramanian, Rajaraman, & Heymann, 2006; Nyambedha et al., 2003). While the extended family is considered the ideal environment for taking care of orphaned children, numerous factors have contributed to the incapacity of extended families to take on traditional caretaking responsibilities including: the HIV/AIDS epidemic, poverty, political and economic instability, armed conflict, urbanization, and shifting traditional social-cultural values (Abebe & Aase, 2007; Foster, 2000; Nyambedha et al., 2003; Oleke, Blystad, & Rekdal, 2005; Petrowski, Cappa, & Gross, 2017). As a result, in many sub-Saharan African countries, institutions such as orphanages and rescue centers have been established to respond to the crisis of orphaned and vulnerable children.

Globally, it has been estimated that there are 2.7 million children aged 0–17 living in residential care, including 286,000 children in eastern and southern Africa (Petrowski et al., 2017). Evidence has linked institutional care with poor cognitive development, growth, and social-psychological health deficits; much of this evidence comes from Eastern Europe (Berens & Nelson, 2015; Nelson, 2007; Smyke et al., 2007; Van IJzendoorn et al., 2020). A 2017 systematic review of nine studies (four covering sub-Saharan African countries) conducted between 2011 and 2015, concluded that abuse was pervasive in institutional care. However, the authors also concluded that there was a dearth of evidence on abuse in institutional care, that the definitions and measurement of abuse varied between studies, and that other care environments, such as foster care, do not ensure protection for children (Sherr, Roberts, & Gandhi, 2017). The temporal sequence of experiences of abuse may also be an important factor for consideration, as children may experience maltreatment prior to institutionalization. In Kenya, Morantz et al., 2013a and Morantz et al., 2013b found that 90 % of non-orphans were admitted to institutional care due to maltreatment, and orphans were most commonly admitted due to destitution (Morantz et al., 2013a). It is likely that context and quality of care matters with respect to the harmful effects of institutional care on child well-being. Most recently, Huynh et al. (2019) found that quality of care predicted child psychological well-being regardless of care environment (family-based vs. institutional) across five low- and middle-income countries (LMICs) (Huynh et al., 2019). This work builds on a growing body of evidence from sub-Saharan Africa and other LMICs, that has demonstrated that children in institutional care environments have health and well-being outcomes on par with those in family-based settings (Atwoli et al., 2014; Braitstein et al., 2013; Closson et al., 2016; Embleton et al., 2014, 2017; Gray et al., 2015; Huynh et al., 2019; Whetten et al., 2009). Nonetheless, there is a growing international policy debate about the extent to which institutional care settings negatively affect children’s physical,

cognitive, and psychosocial well-being (Braitstein, 2015; Huynh et al., 2019; Newton, 2017). International organizations have taken a clear position of deinstitutionalization and actively promote policy to reduce the number of children in institutional care (Berens & Nelson, 2015; Newton, 2017; Petrowski et al., 2017; Save the Children, 2003; UNICEF, 2004). Consequently, many countries including Rwanda, Uganda, and Ethiopia are adopting national deinstitutionalization policies (Berens & Nelson, 2015; Sherr et al., 2017). However, in highly resource-constrained settings such as sub-Saharan Africa, deinstitutionalizing without suitable alternative care arrangements and follow-up, or returning children to unsafe family environments, could place children further at risk of child abuse (Newton, 2017), or result in OSCA resorting to self-care on the streets, particularly given the established high rates of violence experienced by children in domestic settings on the continent (Hillis et al., 2016; UNICEF, 2014). There are estimated to be tens to hundreds of million of SCY globally suggesting that many children are falling through the cracks of family and dysfunctional child protection systems. (UNICEF, 2012) We have previously demonstrated that the major drivers of children and youth to the street globally are poverty, family conflict and child abuse. (Embleton, Lee, Gunn, Ayuku, & Braitstein, 2016) Once on the street, children and youth are at high risk of violence, substance use, preventable morbidity and mortality, and at least in Kenya, they have a higher risk of mortality relative to their counterparts in the general population (Atwoli et al., 2014; Embleton, Mwangi, Vreeman, Ayuku, & Braitstein, 2013; 2015; Embleton, Ayuku, Makori, Kamanda, & Braitstein, 2018; Kibel et al., 2020; Wachira et al., 2016; Winston et al., 2015; Woan, Lin, & Auerswald, 2013).

How OSCA's experiences of physical, emotional, and sexual abuse in sub-Saharan Africa are affected by care environment is not well described. Few studies have compared OSCA's experiences of abuse between family-based and institutional care environments within the same geographic contexts. Across 5 LMICs in Asia and sub-Saharan Africa, Gray et al., 2015 found that orphans in institutional care were no more likely to experience abuse than those in family-based care, and that more than 50 % of orphans in both care environments had experienced physical or sexual abuse by aged 13 (Gray et al., 2015). Only a few studies involve OSCA in self-care on the streets in sub-Saharan Africa and these were cross-sectional (Atwoli et al., 2014; Braitstein et al., 2013). While this population has reported experiencing significant physical and sexual violence (Chimdess & Cheire, 2018; Nada & Suliman, 2010; Kudrati, Plummer, & Yousif, 2008; Hills, Meyer-Weitz, & Asante, 2016; Wachira et al., 2015), and evidence suggests SCY experience more bullying, physical and sexual abuse than OSCA in other care environments (Atwoli et al., 2014), additional evidence is needed to elucidate how the prevalence, incidence and chronicity of abuse experienced by SCY compares to those OSCA living in institutional and family-based environments. Overall, the evidence suggests that OSCA in self-care on the streets, family-based, and institutional care settings experience high levels of abuse in sub-Saharan Africa (Gray et al., 2015; Hills et al., 2016; Kidman & Palermo, 2016; Kudrati et al., 2008; Kuyini, Alhassan, Tollerud, Weld, & Haruna, 2009; (Morantz et al., 2013b); Nada & Suliman, 2010; Nichols et al., 2014; Sherr et al., 2017; Shibuya & Taylor, 2013). However, it remains uncertain based on the very limited evidence, whether OSCA living in institutional care environments experience a higher prevalence, incidence or chronicity of child abuse than those in family-based care in sub-Saharan Africa, and how abuse among SCY compares to these other vulnerable populations.

We sought to understand whether, in a region of western Kenya, OSCA living in institutional care environments experienced more recent child abuse when compared to those in family-based care, and how this compared to recent child abuse among SCY. The primary objective of this analysis was to ascertain the prevalence, incidence, and chronicity of any recent abuse, including emotional, physical, and sexual, among OSCA aged at least ten years living in a random sample of households caring for orphans (family-based environments) in comparison to OSCA living in institutional environments and a small non-random sample of SCY. Our primary hypothesis was that children living in institutional environments would have higher prevalence of any kind of recent abuse compared to those living in family-based environments, but that SCY would report the highest levels of recent abuse.

2. Methods

2.1. Study description

OSCAR's Health and Well-Being Project is a longitudinal cohort evaluating the effects of living in different care environments on the physical and mental health outcomes of orphaned and separated children aged 18 years of age or less at baseline living in Uasin Gishu County (UG), Kenya. The first phase of the OSCAR cohort (2009–13, called OSCAR 1) sought to describe the care environments in UG County, determine whether they were able to meet the basic socioeconomic needs of the resident children, and examine the effect of the care environments and care characteristics on resident children's physical and mental health over time. The second phase of OSCAR (2015-present, here called OSCAR 2) maintained the initial cohort and sought to explain differences in health and well-being between care environments. The study enrolled participants from May 31, 2010 to April 24, 2013. Details of the participating institutions and households, such as size, type of institution, and sources of material support have been previously reported (Embleton et al., 2014).

2.2. Study setting

UG County is one of 47 counties in Kenya. In 2010, UG County had a population of approximately 894,179 individuals from 202,291 households. Eldoret town is headquarters of UG County and has a population of 289,389. Approximately 51.3 % UG County population live below the Kenyan poverty line (Government of Kenya, 2011). Over half (485,307 persons) of the population of Uasin Gishu County is below the age of 18 years, and it was predicted to be home to approximately 234,471 children and adolescents aged 10–19 by 2014 (Kenya National Bureau of Statistics, 2015). Eldoret is home to Moi University, Moi Teaching and Referral Hospital (MTRH), and the Academic Model Providing Access to Healthcare Program (Einterz et al., 2007).

2.3. Human subjects protection

The Moi University College of Health Sciences and MTRH Institutional Research and Ethics Committee, the Indiana University Institutional Review Board, and the University of Toronto Research Ethics Boards approved this study. Written informed consent was provided by the head of household, Director of Charitable Children's Institution, or in the case of SCY, by the District Children's Officer. Individual written informed assent was provided by each child aged seven years and above. Fingerprints were used for both children and guardians who were unable to sign or write their name. The consent and assent processes were documented through the use of consent and assent notes to ensure that children understood what they were being asked to do, that it was for research, and that they had the right to refuse to participate or answer questions. Participating children including street children were offered their choice of an exercise book and two pens or a colouring book and crayons.

2.4. Study participants

The project follows a cohort of OSCA from communities within 8 administrative Locations in UG County, and includes 300 households, 19 Charitable Children's Institutions, and 100 SCY (Kamanda et al., 2013). Eligible children were aged 18 years of age or less at baseline, living within the sampled care environment. Orphaned or separated children were defined as those whose biological parent(s) are absent from their life irrespective of the reason (death, abandonment, etc.) and irrespective of the cause of death of the parent(s) (i.e. not just children orphaned from HIV/AIDS). The present analysis was restricted to participants who were at least aged 10 years at enrollment or follow-up assessment. For the purposes of this study, baseline is taken as the time of OSCAR enrollment or the first visit at age 10 or older.

2.5. Eligibility, sampling and recruitment

2.5.1. Street-connected children and youth (SCY)

SCY were defined as children and youth who were spending a portion or majority of their time on the streets, who may or may not return home to an adult caregiver/guardian at night. SCY were recruited directly from the street as well as through community-based organizations using snowball-sampling methods by a trained and experienced street youth outreach worker. SCY aged 18 years of age or younger and willing to participate were referred to the OSCAR clinic at MTRH for assenting and registration.

2.5.2. Family-based care environments

Family-based care is that which occurs in the community and may take a number of forms including: kinship care by a surviving parent or extended family member, or formal or informal foster care (United Nations General Assembly, 2009). Following extensive community consultation and establishment of a sampling frame, Community Health Workers recruited households constituting family-based care environments. In total, 2181 eligible households were identified that were caring for OSCA (but may have also been caring for their own biological children); this became the sampling frame, from which the project randomly sampled 300 households in UG County (Kamanda et al., 2013). In order not to 'single out' the orphaned child in the household, all children in the household irrespective of orphan status were eligible to participate. In total there were 221 (14.9 %) non-orphaned children in households at baseline who participated in the study (Kamanda et al., 2013). No households or participants from family-based care environments declined to participate in the study. Consent, registration, enrolment and all individual study procedures for recruited households took place at the central OSCAR clinic located at MTRH. Additional details about eligibility, sampling, and recruitment, and an in-depth description of family-based and institutional care environments can be found in the respective publications (Embleton et al., 2014; Kamanda et al., 2013).

2.5.3. Institutional care environments

Under the Kenyan Children Act (2001), orphanages and other institutions serving orphans are called Charitable Children's Institutions (CCIs) (i.e. orphanages or rescue centers), if they are able to accommodate at least 20 children (National Council for Law Reporting with the Authority of the Attorney General, 2012). All CCI's were eligible for recruitment into the study provided they met the criteria of the Kenyan Children Act (2001) and were located within the UG county boundaries. The UG County Children's Department maintains a list of registered and unregistered institutions and has monthly meetings with them in the UG Children's Services Forum. Two methods were used to identify and recruit CCIs to participate in the project. First the project utilized the lists of registered CCIs maintained by the UG Children's Department and contacted them with a formal letter of introduction from the District Children's Officer. Second, snowball-sampling techniques were used with community members and other stakeholders to identify and contact non-registered CCIs. In total, of the 21 CCIs identified in UG County which were contacted, 20 agreed to participate, and one was ineligible. All children including the biological offspring of CCI personnel living in the institution (e.g. children of so-called House Parents) were eligible to participate in order not to 'single out' the orphaned children.

2.6. Study procedures

Data collection processes were conducted *in situ* at CCIs and at the OSCAR Project clinic for households and SCY. Socio-demographics were ascertained through a standardized clinical encounter instrument and data concerning physical, emotional, and sexual abuse were ascertained through the OSCAR psychosocial encounter instrument. The clinical encounter, which was administered

by a nurse and medical officer, was intended to be an enhanced well-child 'check-up' that included a complete physical history and review of health symptoms. The psychosocial instrument was self-administered (for those who could read and write) or psychologist-administered (for those that could not read or write well enough to complete it on their own). These assessments were implemented with participants aged at least ten years of age and annually thereafter for children in family-based and CCIs and semi-annually for SCY. A clinical psychologist is always available during the assessments to assist in case of questions, lack of understanding, or emotional distress.

2.7. Measures and sources of data

Socio-demographic characteristics were ascertained during the clinical encounter. These included age, gender (boys/girls), orphan/separated status (maternal, paternal, double, not orphaned), school attendance (currently attending school, yes/no, not applicable), and time living with caregiver (< 6 months, 6 months – 2 years, 2–5 years, > 5 years, all life, unknown). A maternal/paternal orphan/separated child was defined as a child whose mother/father had died or was completely absent from her or his life. A double orphan/separated child was defined as a child for whom both parents were deceased or absent from their life. For the purposes of analysis, we combined orphaned and separated children into the categories of maternal, paternal, or double orphan.

The primary exposure of interest was care environment (family-based care vs. institutional care and family-based care vs. street-based). The primary outcome of this analysis was recent child abuse collected using an instrument called the Child Abuse Screening Tool for Children at Home (ICAST-CH) which measures violence against children. It was developed by the International Society of the Prevention of Child Abuse and Neglect (IPSCAN) (<http://www.ispcan.org/>) in partnership with UNICEF and the United Nations Secretary General's Study on violence against children. The 11 questions from ICAST-CH that were included in the OSCAR study can be found in supplementary Table A. The instrument captures emotional, physical and sexual abuse. There were three questions specific to the emotional and physical abuse domains and four questions specific to sexual abuse. A final domain capturing 'any abuse' was taken across all 11 questions.

Emotional abuse was defined as someone in the home of the child who used drugs and/or alcohol in a way that frightened them; said they wished the child were dead or had never been born; or threatened to hurt or kill the child including invoking evil spirits against them. Physical abuse was defined as the child feeling they did not get enough to eat and/or drink even though there was enough for everyone; having to wear dirty, torn clothes that were not warm enough/too warm, or sleep on the ground without a blanket even though there were clothes/mattresses/ blankets available; if someone in the child's home hit, beat or slapped them hard enough to cause injury; or whether someone in the home had burned or scalded the child (including putting hot chillies or peppers in their mouth), choked, smothered, or tried to drown them. Sexual abuse was defined as having exchanged sex for money, shelter, food, protection, or anything else; made to look at or touch an adult's 'private parts' (genitals) or if an adult wanted to look at the child's; or if someone had tried or forced the child to have sex when the child did not want to. The sexual abuse questions were not restricted to abuse by those in a child's home and so could have been perpetrated by someone in the wider community.

For all questions, responses took on 4 levels and included 'Never', 'Sometimes', 'Many times', and 'Not in the past 6 months, but this has happened'.

The primary outcome for this analysis was 'Recent Abuse', defined as reporting having experienced abuse 'Many times' or 'Sometimes' (as per the IPSCAN source survey). At each visit, if a respondent reported 'Many times' or 'Sometimes' to any question within a domain (i.e. physical, sexual, emotional), the response was coded as 'Recent Abuse'. If participants reported 'Not in the past 6 months, but this has happened' to any question within a domain, then 'Not Recently' was coded thus. If all values for a domain reported 'Never' then the value was set to 'Never'. If any of the questions had a missing outcome and none of the 'Recent' or 'Not Recent' measures was selected, then the measure was set to missing. For analyses, each of the four abuse outcomes (any abuse, emotional abuse, physical abuse, sexual abuse) was dichotomized into 'Recent Abuse' vs 'Never or Not recent abuse'.

2.8. Statistical methods

Socio-demographic and abuse variables at the baseline visit were summarized overall and by care environment (institutional-based, family-based, and street-based). Comparisons of baseline rates of the four dichotomous abuse outcomes between care environments made use of multivariable logistic regression. The bootstrap was used to account for clustering within care environment. Each institution, family-based setting, and SCY was given a unique identifier. For each of 2000 bootstrap samples, these identifiers were sampled with replacement, keeping the number of each type consistent with the original dataset. Each time a specific care environment was drawn, all children and visits in that care environment were included in the sample. Multiple logistic regression was used to estimate the odds of recent abuse for each abuse domain and adjusted odds ratios (AORs) using the family-based setting as the reference. The 95% confidence intervals (CI) were calculated as the 2.5th and 97.5th percentiles of the 2000 estimated ORs. All models included care environment as the main predictor and adjusted for age (10–13 and 14 or older), gender, orphan/separated status (non-orphan, double orphan, single orphan), time with the current primary caregiver (0–5 years, >5 years, all life), OSCAR phase 1 or 2, and time from enrollment to the baseline visit (i.e. when the child first turned 10 years).

Transition models were used to compare incident and chronic abuse in follow-up by care environment (Diggle, Heagerty, Liang, & Zeger, 2002). Incident abuse was defined as having not experienced recent abuse at one visit followed by experiencing recent abuse at the visit one year later (i.e. transitioning from 'Never or not recent' to 'Recent' at the next time step). Chronic abuse was defined similarly, except we examined transitions from 'Recent' to 'Recent' abuse one year later. These transitions were examined using an interaction between care environment and abuse at the earlier time period. ORs were calculated from adjusted models for binomial

outcomes fitted using generalized estimating equations (GEE) assuming exchangeable correlation among longitudinal observations from the same children in the same home. These analyses used the same 2000 bootstrap samples as the baseline analysis and adjusted for the same covariates as measured at the time of the earlier visit. Some of the models did not converge; these results were omitted from the summaries and the number of converged models out of 2000 attempts was captured. Non-convergence was often due to small numbers within certain strata for the street youth; therefore, as a sensitivity analysis, we also compare the institutions to the family-based homes omitting the SCY data. This sensitivity analysis is presented as supplementary data in Table B and C.

As a secondary analysis, the baseline and transition models were fit with interactions to compare baseline prevalence, incidence and chronicity of abuse among subsets of the study population (Supplemental Table D): males, females, children < 14, children \geq 14, and by orphan status (non, single and double orphan). As an additional sensitivity analysis, models were fit separately to the OSCAR 1 and OSCAR 2 datasets.

3. Results

3.1. Sociodemographic characteristics of participants

The present analysis includes 70,130 months of follow-up data for 2393 participants: 1071 in institutional care, 1227 in family-based care, and 95 street-connected youth. Of these, 66 % were aged 10–13, 34 % aged 14–18, and 48 % were girls (Table 1). Overall 54 % were double orphans, 25 % paternal orphans, 8% maternal orphans, and 13 % were non-orphans. The majority of participants (93 %) were currently attending school, and 68 % had been living with their current caregiver for five or more years. There were major sociodemographic differences among participants from the three care environments (Table 1). A larger proportion (63 %) of children connected to the streets were 14–18 years of age, in comparison to 33 % and 32 % of children in institutional- and family-based care environments. Approximately half of participants in institutional- and family-based environments were boys, while 77 % of SCY were boys. The majority (78 %) of children living in institutional-based care environments were double orphans, compared to 32 % of children in family-based environments and 71 % of SCY. While 98 % of children in institutional- and 96 % of children in family-based environments were currently attending school, only 6% of SCY were. Three-quarters of children in family-based environments had been there their whole lives, compared to 7% of children in institutional-based care and 6% of SCY. Half of SCY had been street-involved for 2 or more years.

Table 1
Sociodemographic characteristics of participants at baseline stratified by care environment.

Study and Sociodemographic Characteristics	Total N = 2393 n (%)	Institution N = 1071 n (%)	Family-based N = 1227 n (%)	Street-based N = 95 n (%)
Mean #of Study Visits (min, max)	3 (1, 6)	3 (1, 6)	3 (1, 6)	2 (1, 4)
Number of Study Visits				
1	481 (20 %)	287 (27 %)	171 (14 %)	23 (24 %)
2	526 (22 %)	239 (22 %)	261 (21 %)	26 (27 %)
3	843 (35 %)	263 (25 %)	538 (44 %)	42 (44 %)
4	393 (16 %)	218 (20 %)	171 (14 %)	4 (4%)
5	125 (5%)	54 (5%)	71 (6%)	0 (0%)
6	25 (1%)	10 (1%)	15 (1%)	0 (0%)
Gender				
Girls	1144 (48 %)	485 (45 %)	637 (52 %)	22 (23 %)
Boys	1249 (52 %)	586 (55 %)	590 (48 %)	73 (77 %)
Age Group				
10–13	1586 (66 %)	720 (67 %)	831 (68 %)	35 (37 %)
14–18	807 (34 %)	351 (33 %)	396 (32 %)	60 (63 %)
Orphan Status at Enrollment				
Double Orphan	1304 (54 %)	840 (78 %)	397 (32 %)	67 (71 %)
Maternal Orphan	182 (8%)	56 (5%)	122 (10 %)	4 (4%)
Paternal Orphan	592 (25 %)	62 (6%)	515 (42 %)	15 (16 %)
Non-Orphan	315 (13 %)	113 (11 %)	193 (16 %)	9 (9%)
Time with Caregiver at Enrollment				
<6 Months	97 (4%)	74 (7%)	13 (1%)	10 (11 %)
6 Months - 2 years	186 (8%)	146 (14 %)	19 (2%)	21 (22 %)
2–5 years	453 (19 %)	315 (29 %)	106 (9%)	32 (34 %)
>5 years	615 (26 %)	436 (41 %)	165 (13 %)	14 (15 %)
All Life	1002 (42 %)	79 (7%)	917 (75 %)	6 (6%)
Unknown	40 (2%)	21 (2%)	7 (1%)	12 (13 %)
Currently Attending School				
No	155 (6%)	13 (1%)	53 (4%)	89 (94 %)
Unknown	8 (0%)	7 (1%)	1 (0%)	0 (0%)
Yes	2230 (93 %)	1051 (98 %)	1173 (96 %)	6 (6%)

3.2. Comparison of abuse

Overall, 47 % of participants at baseline reported having experienced any kind of recent abuse: 32 % reported any emotional abuse (23 % in the past six months, i.e. recent), 39 % reported any physical abuse (32 % in the past six months), and 18 % reported any sexual abuse (13 % in the past six months). Participants reported experiences of abuse varied by care environment (Table 2A). SCY had a much higher reported prevalence of recent emotional, physical, and sexual abuse than children in family- or institutional-based care environments. Participants in family-based care had a higher reported prevalence of recent sexual abuse (14 %) than those living in institutional-based care (10 %) at baseline.

These findings were consistent with recent abuse reported during study follow-up among those with at least 1 follow-up visit ($n = 1912$): 54 % of participants reported any recent abuse in follow-up (35 % emotional, 45 % physical, and 20 % sexual) (Table 2B). Again, children connected to the streets had much higher reported prevalence of recent abuse in all categories (83 % physical, 64 % emotional, 32 % sexual) compared to those living in other care environments. Prevalence of physical (46 % vs. 39 %) and sexual abuse (23 % vs. 14 %) during study follow-up was higher in family-based care environments in comparison to institutional-based care.

As seen in Table 3A, after adjusting for age, gender, orphan status, length of time in the care environment, OSCAR phase 1 or 2, and time from enrollment to the baseline visit (i.e. when the child first turned 10 years) there was no statistical difference between institutional- and family-based environments in the odds of any recent abuse at baseline, and recent emotional or physical abuse, although all these ORs were less than 1 indicating slightly better outcomes in institutional-based care. Notably, children living in institutional-based care environments had 45 % lower odds of experiencing recent sexual abuse at baseline (95 % CI: 0.37 – 0.83) in comparison to those living in family-based care. When analyzing the study phases separately a similar pattern emerged, except we found a higher, but non-significant, odds of emotional abuse in institutional-based care versus family-based settings among the subset of children with baseline visits (i.e. turning 10) in phase 2 (AOR = 1.27, CI = 0.83–1.93, $p = 0.263$).

The odds of incident (Table 3B) and chronic (Table 3C) recent abuse did not vary significantly between institutional and family-based care environments when the OSCAR study phases were combined in one model. However, when the data from phase 2 was analyzed separately, we found higher rates of incident emotional abuse in institutional-based care (AOR 2.95, CI = 1.28–8.80, $p < 0.006$) in comparison to family-based settings, but only 1282 (64 %) bootstraps converged. There were significantly lower rates of chronic sexual abuse in institutional-based care (AOR = 0.23, CI = 0.06–0.97, $p = 0.035$) in comparison to family-based settings, with only 345 bootstraps converging. The sensitivity analysis corroborated these findings (Supplementary Tables B and C).

Conversely, compared to children in family-based settings, SCY had statistically significantly higher odds of abuse across almost all measures and analyses (Tables 3A–3C), including any recent abuse at baseline and incident and chronic abuse during follow-up. The only exception was the ORs for incident sexual abuse (AOR = 1.98, CI = 0.95–3.87) and chronic sexual abuse (AOR = 1.52, CI = 0.60–3.56), while high, did not reach the level of statistical significance. Specifically, SCY had 5.01 times (95 % CI: 2.89–9.35) odds of any abuse at baseline and 5.22 (95 % CI: 2.41–13.98) times higher odds of any incident abuse in follow-up in comparison to those in family-based environments. SCY were significantly more likely to experience recent emotional, physical, and sexual abuse at baseline and follow-up in comparison to those in family-based care.

In stratification of the data to examine more closely the effects of age, gender and orphan status between institutional-based care and family-based settings showed some patterns. At baseline, institutional care environments were protective for girls for any abuse, emotional abuse, and sexual abuse; for boys for sexual abuse; for those that were younger for emotional and sexual abuse; for double orphans for sexual abuse; and for non-orphans for emotional and sexual abuse in comparison to family-based environments

Table 2A

Abuse reported at baseline among participants in institutional-based, family-based and street-based care environments.

Types of Abuse	Total N = 2393 n (%)	Institution N = 1071 n (%)	Family-based N = 1227 n (%)	Street-based N = 95 n (%)
Any Abuse Ever				
No	1209 (51 %)	547 (51 %)	648 (53 %)	14 (15 %)
Yes	1125 (47 %)	503 (47 %)	548 (45 %)	74 (78 %)
Unknown/missing	59 (2%)	21 (2%)	31 (3%)	7 (7%)
Any Emotional Abuse				
Never	1599 (67 %)	728 (68 %)	841 (69 %)	30 (32 %)
Not Recently	204 (9%)	110 (10 %)	81 (7%)	13 (14 %)
Recently	544 (23 %)	218 (20 %)	281 (23 %)	45 (47 %)
Unknown/missing	46 (2%)	15 (1%)	24 (2%)	7 (7%)
Any Physical Abuse				
Never	1426 (60 %)	652 (61 %)	756 (62 %)	18 (19 %)
Not Recently	165 (7%)	93 (9%)	69 (6%)	3 (3%)
Recently	758 (32 %)	311 (29 %)	380 (31 %)	67 (71 %)
Unknown/missing	44 (2%)	15 (1%)	22 (2%)	7 (7%)
Any Sexual Abuse				
Never	1910 (80 %)	894 (83 %)	961 (78 %)	55 (58 %)
Not Recently	120 (5%)	57 (5%)	56 (5%)	7 (7%)
Recently	303 (13 %)	103 (10 %)	174 (14 %)	26 (27 %)
Unknown/missing	60 (3%)	17 (2%)	36 (3%)	7 (7%)

Table 2B

Recent Abuse reported at follow-up among participants in institutional-based, family-based and street-based care environments with at least 1 follow-up visit.

Types of Abuse	Total N = 1912 n (%)	Institutional-based N = 784 n (%)	Family-based N = 1056 n (%)	Street-based N = 72 n (%)
Any Abuse Ever				
No	865 (45 %)	381 (49 %)	475 (45 %)	9 (12 %)
Yes	1034 (54 %)	395 (50 %)	576 (55 %)	63 (88 %)
Unknown/missing	13 (1%)	8 (1%)	5 (0%)	0 (0%)
Any Emotional Abuse				
No	1236 (65 %)	519 (66 %)	69 (65 %)	26 (36 %)
Yes	666 (35 %)	259 (33 %)	361 (34 %)	46 (64 %)
Unknown/missing	10 (1%)	6 (1%)	4 (0%)	0 (0%)
Any Physical Abuse				
No	1047 (55 %)	470 (60 %)	565 (54 %)	12 (17 %)
Yes	855 (45 %)	309 (39 %)	486 (46 %)	60 (83 %)
Unknown/missing	10 (1%)	5 (1%)	5 (0%)	0 (0%)
Any Sexual Abuse				
No	1519 (79 %)	664 (85 %)	806 (76 %)	49 (68 %)
Yes	379 (20 %)	110 (14 %)	246 (23 %)	23 (32 %)
Unknown/Missing	14 (1%)	10 (1%)	4 (0%)	0 (0%)

Table 3A

Multivariable logistic regression comparing baseline abuse between institutional and family-based environments, and SCY and family-based environments. Values presented as the median adjusted OR, and 95 % CI represent the 2.5th and 97.5th percentiles across all converged bootstrap samples, N represents the number of converged bootstrap samples out of 2000.

Outcome	Comparison Groups ^a	AOR (95 % CI), # converged bootstraps, p-value	OSCAR Phase 1 AOR (95 % CI), # converged bootstraps, p-value	OSCAR Phase 2, # converged bootstraps, AOR (95 % CI), p-value
Any abuse	CCI vs HH	0.85 (0.59, 1.17), N = 2000, p = 0.341	0.76 (0.51, 1.09), N = 2000, p = 0.140	1.09 (0.61, 1.72), N = 2000, p = 0.747
	SCY vs HH	5.01 (2.89, 9.35), N = 2000, p < 0.001	4.64 (2.64, 8.81), N = 2000, p < 0.001	
Emotional Abuse	CCI vs HH	0.73 (0.50, 1.03), N = 2000, p = 0.073	0.67 (0.43, 1.01), N = 2000, p = 0.059	1.27 (0.83, 1.93), N = 2000, p = 0.263
	SCY vs HH	2.57 (1.60, 4.26), N = 2000, p < 0.001	2.45 (1.50, 4.10), N = 2000, p < 0.001	
Physical Abuse	CCI vs HH	0.96 (0.63, 1.38), N = 2000, p = 0.829	0.91 (0.59, 1.33), N = 2000, p = 0.670	0.84 (0.41, 1.49), N = 2000, p = 0.569
	SCY vs HH	6.09 (3.61, 11.05), N = 2000, p < 0.001	5.98 (3.48, 10.79), N = 2000, p < 0.001	
Sexual Abuse	CCI vs HH	0.55 (0.37, 0.83), N = 2000, p = 0.004	0.58 (0.37, 0.90), N = 2000, p = 0.013	0.45 (0.21, 0.87), N = 2000, p = 0.017
	SCY vs HH	2.08 (1.09, 3.78), N = 2000, p = 0.026	2.17 (1.11, 4.03), N = 2000, p = 0.019	

^a Comparison Groups: CCI = institutional; HH = family-based care; SCY = street-based.

(Supplementary Tables D).

4. Discussion

This study, through nearly ten years of follow-up, documented substantial experiences of physical, emotional, and sexual abuse among OSCA living in family- and institutional-based care environments, and among children connected to the streets in Uasin Gishu County, Kenya. Regardless of care environment, almost half (47 %) of participants had experienced any kind of abuse at baseline, and 54 % experienced recent abuse during follow-up. Our findings did not find substantial differences in OSCA's experiences of abuse between institutional- and family-based care environments, with the exception of sexual abuse, which was significantly higher in family-based care environments at baseline (but not follow-up). SCY experienced alarming levels of physical, emotional, and sexual abuse, at baseline and in follow-up. Our findings demonstrate unacceptable levels of all types of abuse experienced by OSCA in this region, in all care environments, all of which contravenes the Convention on the Rights of the Child (United Nations High Commissioner for Human Rights, 1990).

Our findings are in alignment with what Gray et al. (2015) found, that experiences of physical, emotional, and sexual abuse were not higher in OSCA living in institutional-based care in comparison to those in family-based care in five LMIC (Gray et al., 2015). Our

Table 3B

Multivariable logistic regression comparing incident abuse between institutional and family-based environments, and SCY and family-based environments. Values presented as the median adjusted OR, and 95 % CI represent the 2.5th and 97.5th percentiles across all converged bootstrap samples, N represents the number of converged bootstrap samples out of 2000.

Outcome	Comparison Groups ^a	AOR (95 % CI), # converged bootstraps, p-value	OSCAR Phase 1 AOR (95 % CI), # converged bootstraps, p-value	OSCAR Phase 2, # converged bootstraps, AOR (95 % CI), p-value
Any abuse	CCI vs HH	0.91 (0.61, 1.47), N = 1999, p = 0.680	0.82 (0.50, 1.43), N = 1999, p = 0.439	1.63 (0.83, 3.58), N = 1272, p = 0.134
	SCY vs HH	5.22 (2.41, 13.98), N = 1999, p < 0.001	4.80 (2.19, 12.71), N = 1999, p < 0.001	
Emotional Abuse	CCI vs HH	0.98 (0.66, 1.46), N = 2000, p = 0.900	0.83 (0.51, 1.36), N = 2000, p = 0.449	2.95 (1.28, 8.80), N = 1282, p = 0.006
	SCY vs HH	4.06 (2.11, 7.83), N = 2000, p = 0.001	3.65 (1.88, 6.88), N = 2000, p = 0.001	
Physical Abuse	CCI vs HH	0.82 (0.52, 1.35), N = 2000, p = 0.424	0.82 (0.50, 1.39), N = 2000, p = 0.432	0.59 (0.20, 1.45), N = 1278, p = 0.274
	SCY vs HH	6.16 (3.18, 13.46), N = 2000, p < 0.001	6.01 (3.12, 13.19), N = 2000, p < 0.001	
Sexual Abuse	CCI vs HH	0.67 (0.37, 1.23), N = 2000, p = 0.189	0.60 (0.30, 1.19), N = 1999, p = 0.134	0.69 (0.19, 1.96), N = 343, p = 0.519
	SCY vs HH	1.98 (0.95, 3.87), N = 2000, p = 0.074	1.80 (0.84, 3.67), N = 1999, p = 0.126	

^a Comparison Groups: CCI = institutional; HH = family-based care; SCY = street-based.

Table 3C

Multivariable logistic regression comparing chronic abuse between institutional and family-based environments, and SCY and family-based environments. Values presented as the median adjusted OR, and 95 % CI represent the 2.5th and 97.5th percentiles across all converged bootstrap samples, N represents the number of converged bootstrap samples out of 2000.

Outcome	Comparison Groups ^a	AOR (95 % CI), # converged bootstraps, p-value	OSCAR Phase 1 AOR (95 % CI), # converged bootstraps, p-value	OSCAR Phase 2, # converged bootstraps, AOR (95 % CI), p-value
Any abuse	CCI vs HH	1.08 (0.80, 1.45), N = 1999, p = 0.592	1.13 (0.82, 1.56), N = 1999, p = 0.404	1.03 (0.23, 2.87), N = 1275, p = 0.951
	SCY vs HH	3.44 (1.93, 6.45), N = 1999, p < 0.001	3.49 (1.96, 6.81), N = 1999, p < 0.001	
Emotional Abuse	CCI vs HH	1.10 (0.77, 1.56), N = 2000, p = 0.614	1.11 (0.72, 1.72), N = 2000, p = 0.616	1.33 (0.34, 4.68), N = 1283, p = 0.673
	SCY vs HH	2.59 (1.32, 4.99), N = 2000, p = 0.003	2.62 (1.31, 5.21), N = 2000, p = 0.008	
Physical Abuse	CCI vs HH	1.02 (0.74, 1.41), N = 2000, p = 0.872	1.13 (0.79, 1.60), N = 2000, p = 0.469	0.54 (0.14, 1.99), N = 1281, p = 0.317
	SCY vs HH	2.90 (1.65, 5.32), N = 2000, p < 0.001	3.12 (1.77, 5.91), N = 2000, p < 0.001	
Sexual Abuse	CCI vs HH	1.05 (0.52, 1.94), N = 2000, p = 0.879	1.58 (0.76, 3.11), N = 1999, p = 0.202	0.23 (0.06, 0.97), N = 345, p = 0.035
	SCY vs HH	1.52 (0.60, 3.56), N = 2000, p = 0.363	2.12 (0.76, 5.67), N = 1999, p = 0.131	

^a Comparison Groups: CCI = institutional; HH = family-based care; SCY = street-based.

findings are in contrast to what [Sherr et al. \(2017\)](#) reported in a systematic review of abuse in institutional care environments, where four studies comparing institutional care to other forms of care or the general population found that the levels of abuse were higher in institutional care ([Sherr et al., 2017](#)). The present evidence does not support the conclusion that OSCA in institutional care environments experience higher levels of abuse than those in other forms of care in western Kenya, which is a significant conclusion in the context of the on-going debate and calls for deinstitutionalization ([Berens & Nelson, 2015](#); [Braitstein, 2015](#); [Huynh, 2014](#); [Van IJzendoorn et al., 2020](#)).

The higher prevalence of sexual abuse in family-based care environments in comparison to institutional-based care in the present study is in alignment with findings across sub-Saharan Africa, which have consistently shown that OSCA living in extended families experience sexual abuse ([Cluver & Gardner, 2007](#); [Kidman & Palermo, 2016](#); [Nichols et al., 2014](#); [Morantz et al., 2013b](#); [Oleke, Blystad, Moland, Rekdal, & Heggenhougen, 2006](#)). We previously found that a higher proportion of OSCA in family-based care environments reported exchanging sex for money, food, and or shelter in comparison to those living in institutional-based care

environments, and that a higher proportion reported that someone had tried or forced them to have sex, and this was highest among double orphans (Embleton et al., 2017). Moreover this study found that caregiver supervision and support reduced the likelihood of exchanging sex and experiencing sexual violence, suggesting the role and relationship of the caregiver to the child is an important factor to consider when assessing sexual violence experienced by OSCA in family-based care environments (Embleton et al., 2017). Studies generally haven't documented or accounted for the kinship of the caregiver to the child (aunt, uncle, grandmother, foster parent, etc.) when reporting experiences of sexual abuse in OSCA living in extended families in sub-Saharan Africa. However, relationship to caregiver may be an important factor in experiences of abuse in family-based care environments. Evidence from North America suggests that the genetic relationship of kin to children placed in care may be an important factor for experiencing abuse (Helton, Boutwell, & DiBernardo, 2017). Research from sub-Saharan Africa suggests that orphaned adolescent girls may be highly vulnerable to experiencing sexual abuse in cases of paternal orphaning or absence, and double orphaning (Kidman & Palermo, 2016). In the current study, 42 % of OSCA in family-based care were paternal orphans or experienced paternal absence, and 32 % were double orphans, which may contribute to heightened vulnerability to experiencing sexual abuse in family-based care environments, as suggested by Kidman and Palermo's findings (Kidman & Palermo, 2016). Future research on child sexual abuse experienced by OSCA living in family-based care environments should account for the relationship of the caregiver to child and further examine the role of caregiver supervision and support in OSCA's experiences of sexual abuse. These findings have implications for strengthening child protection systems to ensure children are living in safe care environments and designing interventions in community settings to prevent and respond to abuse.

The prevalence of all types of abuse we found across care environments is very high. We found that cumulatively, 60 % of OSCA reported experiencing any abuse, which is comparable to the 2014 base case estimate of 50 % of children aged 2–17 years in Africa experiencing any abuse in the past year (Hillis et al., 2016). Of particular concern are the alarmingly high levels of abuse experienced by SCY. It is likely that SCY experience abuse, neglect, and maltreatment, in the context of extreme poverty prior to street-involvement (Embleton et al., 2016). Orphanhood, abandonment, and abuse have been reported as reasons for children and youths' street-involvement in Kenya (Save the Children, 2012; Seidel et al., 2018; Sorber et al., 2014; Suda, 1997). In semi-rural Kenya, orphans with street-connections reported significant adverse childhood events, including physical, sexual, and verbal abuse (Seidel, Chang, Mwongera, Gitari, & Goodman, 2017) and our data support this. We previously found that SCY in UG County were significantly most likely to screen positive for post-traumatic stress disorder and traumatic events than OSCA in other care environments (Atwoli et al., 2014). Their street-connections, coupled with their reports of adverse childhood experiences, and post-traumatic stress symptoms (Atwoli et al., 2014; Seidel, Chang, Mwongera, Gitari, & Goodman, 2017), suggest that vulnerable children and youth are falling through the child protection system into self-care on the streets to escape harmful domestic care environments (Embleton et al., 2014). As Morantz et al., 2013a found, 90 % of non-orphans were admitted to institutional care due to maltreatment in western Kenya (Morantz et al., 2013a), and therefore institutions in this region may play an important role in preventing children who experience childhood maltreatment from entering life on the streets, which is evidently rife with abuse. While the extended family is the ideal care environment for an orphaned child, in situations when it is not in the best interest of the child, such as abuse and neglect, the child is entitled to special protection and assistance by the State under the Convention of the Rights of the Child (Article 20) (United Nations High Commissioner for Human Rights, 1990). SCY in this region are urgently in need of special protection and assistance, which respect their rights and safeguards them from experiences of abuse, which may include temporary or permanent placement in alternative care environments (Office of the United Nations High Commissioner for Human Rights, 2017). For SCY without primary or proxy caregivers, the State is the *de facto* caregiver and is obliged to provide care (Office of the United Nations High Commissioner for Human Rights, 2017). As outlined in the Convention on the Rights of the Child, General Comment No. 21 on Children in Street Situations, types of care may include: drop-in centres; night shelters; day-care centres; residential care; foster care; family reunification; independent living, and long-term care options including adoption (Office of the United Nations High Commissioner for Human Rights, 2017). Given that in the present analysis, OSCA living in institutional care environments in this region of western Kenya did not have a higher prevalence of reported abuse than those in family-based care, institutional care may be a critical safety net for SCY in this context when living with extended family is not feasible or safe, particularly given the extremely high levels of recent abuse reported by the SCY population. Our stratified data (Supplementary Table D) suggest there may be a strategic opportunity for institutions to provide support for those most at risk particularly of sexual abuse: females, younger individuals, double orphans, and all SCY.

This study has important strengths. First, it included a large sample of OSCA living in different care environments including SCY and was able to compare the prevalence, incidence, and chronicity of recent abuse across care environments. Second, the longitudinal nature of this study allowed us to measure experiences of recent abuse reported over time, and ascertain baseline abuse, incident abuse reported during study follow-up, and chronic abuse during the study period. Furthermore, we were able to conduct our analysis to look at the prevalence and incidence of specific types of abuse (physical, emotional, and sexual) in addition to a composite measure of 'any abuse'. Finally, we provided evidence that contradicts the hypothesis that physical, emotional, and sexual abuse is more prevalent in institutional-base care than in family-based care environments.

This study also has limitations. Outcome measures were self-reported, and participants may have been reluctant to disclose experiences of physical, emotional, and / or sexual abuse. We believe that any reporting bias arising from this is likely non-differential in nature since irrespective of care environment participants may have been afraid to disclose for fear of being driven out of where they are. Participants may have been ashamed to disclose experiences of abuse or fearful of the repercussions from their caregiver(s). Next, these findings may not be generalizable to other counties in Kenya, due to differences in care environment and OSCA, including SCY, across the country. SCY were not randomly sampled, and only a small sample of SCY were included in the study, and they therefore may not be representative of all SCY in UG County or across the country.

5. Conclusion

In this study, OSCA, irrespective of care environment, reported experiencing high prevalence, incidence, and chronicity of recent physical, emotional, and sexual abuse in this region of western Kenya. SCY experienced significantly more recent abuse at baseline and follow-up across all types of abuse. OSCA living in institutional care environments did not experience more recent child abuse than those living in family-based care environments. Overall our findings demonstrate that strategies are urgently needed to prevent child abuse across all care environments in western Kenya but SCY require immediate protection and are urgently in need of safe alternative care to reduce the harms associated with self-care on the streets.

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Appendix A. Supplementary data

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