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Sexual Behavior Among Orphaned Adolescents in Western Kenya: A Comparison of Institutional- and Family-Based Care Settings

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 A B S T R A C T

Purpose: This study sought to assess whether risky sexual behaviors and sexual exploitation of orphaned adolescents differed between family-based and institutional care environments in Uasin Gishu County, Kenya.

Methods: We analyzed baseline data from a cohort of orphaned adolescents aged 10–18 years living in 300 randomly selected households and 19 charitable children's institutions. The primary outcomes were having ever had consensual sex, number of sex partners, transactional sex, and forced sex. Multivariate logistic regression compared these between participants in institutional care and family-based care while adjusting for age, sex, orphan status, importance of religion, caregiver support and supervision, school attendance, and alcohol and drug use.

Results: This analysis included 1,365 participants aged ≥ 10 years: 712 (52%) living in institutional environments and 653 (48%) in family-based care. Participants in institutional care were significantly less likely to report engaging in transactional sex (adjusted odds ratio, .46; 95% confidence interval, .3–.72) or to have experienced forced sex (adjusted odds ratio, .57; 95% confidence interval, .38–.88) when controlling for age, sex, and orphan status. These associations remained when adjusting for additional variables.

 IMPLICATIONS AND
 CONTRIBUTION

Orphaned adolescents in institutional care were less likely to report having engaged in transactional sex or having experienced forced sex. These findings have implications for orphan care policy and suggest that families need additional support to care for adolescent orphans in their home environment.

Conflicts of Interest: The authors have no conflicts of interest to disclose.

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Conclusions: Orphaned adolescents living in family-based care in Uasin Gishu, Kenya, may be at increased risk of transactional sex and sexual violence compared to those in institutional care. Institutional care may reduce vulnerabilities through the provision of basic material needs and adequate standards of living that influence adolescents' sexual risk-taking behaviors. The use of single items to assess outcomes and nonexplicit definition of sex suggest the findings should be interpreted with caution.

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There are 55 million orphaned children living in sub-Saharan Africa, a significant proportion of whom (27%) have been orphaned because of the HIV/AIDS epidemic [1]. In Kenya, there are approximately 2.6 million orphans due to all causes, of whom 38% were orphaned due to AIDS, representing 12% of children aged <18 years in the country [2]. Globally, young people aged 10–24 years accounted for 39% of all new HIV infections in 2012, with 72% of these cases occurring in sub-Saharan Africa [3]. Orphaned children living in HIV endemic settings are at high risk of HIV infection, [4,5] which may be associated with changes in caregiver and care environment.

The death (orphan) or disappearance (separated) of one (single orphan/separated) or both parents (double orphan/separated) [6] often involves changing caregiver(s) and care environment of the child [7,8]. These changes may result in significant psychological distress and alter risk-taking behaviors [9–12]. Paternal orphans typically continue to reside with their mothers; however, maternal orphans are much less likely to remain with their fathers [13]. Extended families care for over 90% of double orphans and single orphans not living with a surviving parent [14]. With growing numbers of orphans requiring care and support [14], in combination with high levels of poverty, rapid urbanization, and the dissolution of traditional households in sub-Saharan Africa, some extended families have not been able to meet care-taking expectations and responsibilities [8,15,16]. As a result, other types of care environments have emerged in sub-Saharan Africa to address the growing orphan crisis [14], including institutional care (orphanages) and community-based care [7,8,17]. Institutional care has been criticized as an unfavorable solution because of its historical limitations in their meeting children's developmental and psychosocial needs, caregiver abuse, and human rights violations [18–20]. The United Nations Children's Fund and Save the Children have recommended that countries move toward the deinstitutionalization of orphaned children [18,19].

A meta-analysis revealed that orphaned adolescents have a significantly greater HIV seroprevalence than their nonorphaned peers [5]. Orphan status has been associated with having an earlier sexual debut, multiple partners, and transactional sex [5], and orphans may be at heightened risk of physical and sexual abuse compared to nonorphans [21,22]. However, some studies in western Kenya have found that orphan status was not significantly associated with increased sexual risk-taking behaviors among adolescents [23–25]. Rather, sociocultural, psychological, economic, and contextual factors were found to play a significant role in increasing orphaned adolescent sexual risk-taking behavior in this region [24,25]. Other studies have found that resiliency characteristics [26], economic status [27,28], social support, and primary caregiver play a protective role in decreasing adolescents' risky behaviors [29]. Therefore, it is likely

that changing family structure, caregiver relationships, and living arrangements impact orphaned adolescents' sexual risk practices. Changes in caregiver and care environment upon the death or disappearance of one or both parents may expose orphaned and separated adolescents to sexual exploitation [22] and diminish or eliminate protective mechanisms, normally enacted by parents, that reduce adolescent risky behaviors [30–32].

Because of differences previously found in care environments in Uasin Gishu (UG) County, Kenya [8], it is likely that care environment plays an important role in orphaned and separated adolescents' sexual risk-taking behaviors. Yet, the effect of care environment (broadly defined here as institutional care vs. family-based care) on orphaned and separated adolescents' sexual risk-taking behavior and sexual exploitation has not been investigated. Therefore, we sought to determine if care environment (institutional care vs. family-based care) contributed to differences in sexual behaviors and sexual exploitation of orphaned and separated adolescents using baseline data from the Orphaned and Separated Children's Assessment Related to their Health and Well-Being (OSCAR) Project.

Methods

Study setting

UG County is one of the 47 counties of Kenya. In 2010, UG County had approximately 894,179 individuals from 202,291 households, of whom 41.5% were aged ≤ 14 years. Approximately 51.3% of UG County population live below the Kenyan poverty line. Eldoret town is the headquarters of UG county and has a population of 289,389 [33]. It is home to Moi University, Moi Teaching and Referral Hospital (MTRH), and the Academic Model Providing Access to Healthcare Program [34].

OSCAR's Health and Well-Being Project

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. The study aims to describe these care environments, determine whether they are able to meet the basic 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 study began enrolling participants in June 2010.

Human subjects protection

The Moi University College of Health Sciences and MTRH Institutional Research and Ethics Committee and the Indiana

University Institutional Review Board approved this study. Heads of households or the Directors of Charitable Children's Institutions (CCIs) provided written informed consent for children's participation. Individual written informed assent was provided by each child aged ≥ 7 years. Fingerprints were used for both children and guardians who were unable to sign or write their name.

Study population

The project follows a cohort of orphaned and separated children from communities within eight administrative Locations in UG County and includes 300 households, 19 CCIs, and 100 street-involved children and youth [35]. This study includes any orphaned or separated (a child whose biological parent(s) are absent from their life) [6] child aged ≤ 18 years, living within the sampled care environment, regardless of the reason for orphanhood. The present analysis was restricted to baseline data collected from June 2010 to November 2012 from participants aged 10–18 years.

Eligibility, sampling, and recruitment

Family-based care environments. Family-based care is that which occurs in the community and may take a number of forms including care by a surviving parent, extended family, or foster care [8]. Households were recruited following extensive community consultations, establishment of a sampling frame, and approached individually by community health workers [35]. In-depth details regarding the study's sampling strategy can be found elsewhere [35]. In brief, there were 2,181 households identified caring for orphaned and separated adolescents that became the sampling frame, from which the project randomly sampled 300 households. Eligible households were required to be caring for orphaned and/or separated children but may also have been caring for their own biological children. In order not to "single out" the orphaned child in the household, all children in the household were eligible to participate. In total, there were 221 (14.9%) nonorphaned children in households that were caring for orphans who participated in the study. There were no households or participants from family-based care environments, which 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 [8,35].

Institutional care environments. Under the Kenyan Children Act (2001), orphanages and other institutions serving orphans are called CCIs (i.e., children's homes), if they are able to accommodate ≥ 20 children [36]. All institutions 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 used 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 nonregistered CCIs. In total, of the 21 CCIs identified in UG County, which were contacted, 20 agreed to participate, and one was ineligible. All study procedures for the children in CCIs took place in situ at the institution. 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. In total, there were 51 (3.7%) biological offspring of CCI personnel who participated in the study.

Study procedures

Sociodemographics and sexual practices were ascertained through a standardized clinical encounter and psychosocial data collection process that was conducted in situ at CCIs and at the OSCAR Project clinic for household participants. 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 who could not read or write well enough to complete it on their own).

Measures and sources of data

Sociodemographic characteristics were ascertained during the clinical encounter. These included age, sex (male/female), orphan/separated status (maternal, paternal, double, not orphaned), and school attendance (currently attending school, yes/no, not applicable). A single orphan/separated child was defined as a child whose mother (maternal) or father (paternal) had died or was completely absent from their life. A double orphan/separated child was defined as a child for whom both parents were deceased or absent from their life [6]. For the purposes of analyses, we combined orphaned and separated children into the categories of maternal, paternal, or double orphan.

Sexual activity which was self-reported in the psychosocial assessment included the following questions: have you started having a boyfriend or girlfriend (yes, no, unsure, refuse to answer); age of the first boyfriend or girlfriend; have you ever had consensual sex (yes, no, unsure, refuse to answer); age of sexual debut (how old were you when you first had sex?); number of people have you ever willingly had sex with (1, 2–5, 5–10, >10); have you ever exchanged sex for money, food, and/or shelter (many times, sometimes, not in the past 6 months but this has happened, never); has anyone ever tried or forced you to have sex when you did not want them to (many times, sometimes, not in the past 6 months but this has happened, never).

Hypothesized risk and protective indicators which were self-reported in the psychosocial assessment tool and included religious affiliation (Christian, Muslim, other, none, refuse to answer), importance of religion in life (most important, very important, somewhat important, not important at all), caregiver support (this person is helpful when I have a problem, yes/no), caregiver knows what you do with your free time (does not know, knows a little, knows a lot, unsure, refuse to answer), and any alcohol and or drug use (yes, no, refuse to answer).

Table 1

Sociodemographic characteristics of children aged 10–18 years at baseline stratified by care environment and orphan status

Characteristics	Overall N = 1,365 N (%)	Institutional-based care (n = 712)				Family-based care (n = 653)			
		n (%)				n (%)			
		Maternal orphan (n = 46)	Paternal orphan (n = 57)	Double orphan (n = 609)	Total	Maternal orphan (n = 70)	Paternal orphan (n = 316)	Double orphan (n = 267)	Total
Mean age (SD)	13.9 (2.3)	13.9 (2.5)	13.9 (2.5)	13.9 (2.3)	13.9 (2.3)	14 (2.3)	14 (2.4)	13.8 (2.3)	13.9 (2.3)
Sex									
Male	714 (52.3)	28 (60.9)	28 (49.1)	341 (56.0)	397 (55.8)	41 (58.6)	151 (47.8)	125 (46.8)	317 (48.5)
Female	651 (47.7)	18 (39.1)	29 (50.9)	268 (44.0)	315 (44.2)	29 (41.4)	165 (52.2)	142 (53.1)	336 (51.5)
Religious affiliation									
Christian	1,241 (90.9)	43 (93.5)	53 (93.0)	574 (94.3)	670 (94.1)	66 (94.3)	271 (85.8)	234 (87.6)	571 (87.4)
Muslim	37 (2.7)	0 (0)	0 (0)	13 (2.1)	13 (1.8)	1 (1.4)	18 (5.7)	5 (1.9)	24 (3.7)
Other	2 (.15)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.4)	1 (.3)	0 (0)	2 (.3)
None	21 (1.5)	1 (2.2)	1 (1.8)	4 (.7)	6 (.8)	1 (1.4)	7 (2.2)	7 (2.6)	15 (2.3)
Refuse to answer	2 (.15)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (.7)	2 (.3)
Missing	62 (4.5)	2 (4.3)	3 (5.3)	18 (3.0)	23 (3.2)	1 (1.4)	19 (6.0)	19 (7.1)	39 (6.0)
Importance of religion in life									
Most important	404 (29.6)	17 (37.0)	22 (38.6)	191 (31.4)	230 (32.3)	21 (30.0)	83 (26.3)	70 (26.2)	174 (26.7)
Very important	831 (60.9)	26 (56.5)	32 (56.1)	383 (62.9)	441 (61.9)	41 (58.6)	193 (61.1)	156 (58.4)	390 (59.7)
Somewhat important	57 (4.2)	1 (2.2)	0 (0)	14 (2.3)	15 (2.1)	5 (7.1)	18 (5.7)	19 (7.1)	42 (6.4)
Not important at all	73 (5.4)	2 (4.3)	3 (5.3)	21 (3.4)	26 (3.7)	3 (4.3)	22 (7.0)	22 (8.2)	47 (7.2)
Currently in school									
Yes	1,294 (94.8)	45 (97.8)	52 (91.2)	596 (97.9)	693 (97.3)	65 (92.9)	289 (91.5)	247 (92.5)	601 (92.0)
No	60 (4.4)	0 (0)	5 (8.8)	7 (1.1)	12 (1.7)	4 (5.7)	25 (7.9)	19 (7.1)	48 (7.4)
Missing	11 (.8)	1 (2.2)	0 (0)	6 (1.0)	7 (1.0)	0 (0)	2 (.6)	1 (.4)	4 (.6)
Caregiver support: this person is helpful when I have a problem									
Yes	1,129 (82.7)	41 (89.1)	45 (78.9)	526 (86.4)	612 (86.0)	57 (81.4)	253 (80.1)	207 (77.5)	517 (79.2)
Caregiver knows what you do with your free time?									
Does not know	155 (11.4)	8 (17.4)	6 (10.5)	80 (13.1)	94 (13.2)	9 (12.9)	29 (9.2)	23 (8.6)	61 (9.3)
Knows a little	897 (65.7)	28 (60.9)	40 (70.2)	408 (67.0)	476 (66.9)	38 (54.3)	215 (68.0)	168 (62.9)	421 (64.5)
Knows a lot	100 (7.3)	4 (8.7)	5 (8.8)	45 (7.4)	54 (7.6)	5 (7.1)	19 (6.0)	22 (7.0)	46 (7.0)
Unsure	16 (1.2)	1 (2.2)	0 (0)	8 (1.3)	9 (1.3)	1 (1.4)	1 (.3)	5 (1.9)	7 (1.1)
Refuse to answer	197 (14.4)	5 (10.9)	6 (10.5)	68 (11.2)	79 (11.1)	17 (24.3)	52 (16.5)	49 (18.4)	118 (18.1)
Alcohol and drug use									
Yes	121 (8.9)	3 (6.5)	4 (7.0)	72 (11.8)	79 (11.1)	6 (8.6)	14 (4.4)	22 (8.2)	42 (6.4)
No	1,162 (85.1)	41 (89.1)	49 (86.0)	506 (83.1)	596 (83.7)	63 (90.0)	280 (88.6)	223 (83.5)	566 (86.7)
Missing	82 (6.0)	2 (4.4)	4 (7.0)	31 (5.1)	37 (5.2)	1 (1.4)	22 (7.0)	22 (8.2)	45 (6.9)

Statistical analysis

Sociodemographic variables were analyzed by care environment (institutional vs. household) and stratified by orphan status. Means and standard deviations and medians and interquartile ranges were computed for normally distributed and non-normally distributed continuous variables, respectively. The chi-square tests were used to compare categorical and binary variables.

Primary outcomes of interest were ever had consensual sex (yes vs. no), number of lifetime consensual sex partners (1 vs. >1), ever exchanged sex for food, money, and/or shelter (yes vs. no), and forced sex (yes vs. no). The exposure of interest was care environment (family-based care vs. institutional care). Logistic regression models were used to characterize the association between care environment and the four sexual behavior outcomes. In these models, we adjusted for potential confounding factors: age, gender, orphan status, importance of religion, currently in school, caregiver support, caregiver knows what you do with your free time, and any alcohol or drug use. We adjusted for multiple comparisons using Bonferroni correction. We assessed missing data for all measures and models and have included the sample size for each primary model run. As no >15%

of data were missing for any of the complete case analyses in adjusted models, we did not attempt any additional adjustment for missing data.

Results

Included in this analysis were 1,365 participants aged 10–18 years, of whom 712 (52%) resided in institutional care environments and 653 (48%) in family-based care. The mean age was 13.9 years (standard deviation: 2.3), and 52% were male (Table 1). Most participants in institutional care environments were double orphans (86%) in comparison to 41% of those in family-based care. Paternal orphans (82%) comprised the majority of single orphans (59%) in family-based care.

Almost all participants reported a Christian religious affiliation (91%), and 90% indicated that religion was the most important or a very important component of their life, with minimal variation between care environments. A significantly higher proportion of orphans in institutional care were currently in school in comparison to family-based care (97% vs. 92%, $p < .001$). Adolescents residing in institutions were more likely to report that their caregiver was helpful when they had a problem

Table 2
Orphaned adolescent's sexual behaviors stratified by care environment

	Overall	Institutional-based care				Family-based care			
	N = 1,365	(n = 712)				(n = 653)			
		N (%)	Maternal orphan (n = 46)	Paternal orphan (n = 57)	Double orphan (n = 609)	Total	Maternal orphan (n = 70)	Paternal orphan (n = 316)	Double orphan (n = 267)
Started having a boyfriend or girlfriend?									
Yes	279 (20.4)	8 (17.4)	16 (28.1)	114 (18.7)	138 (19.4)	21 (30.0)	64 (20.3)	56 (21.0)	141 (21.6)
No	988 (72.4)	35 (76.1)	37 (64.9)	462 (75.9)	534 (75.0)	46 (65.7)	224 (70.9)	184 (68.9)	454 (69.5)
Unsure	16 (1.2)	1 (2.2)	1 (1.8)	4 (.7)	6 (.8)	2 (2.9)	3 (9.9)	5 (1.9)	10 (1.5)
Refuse to answer	22 (1.6)	0 (0)	0 (0)	8 (1.3)	8 (1.1)	0 (0)	6 (1.9)	8 (3.0)	14 (2.1)
Missing	60 (4.4)	2 (4.3)	3 (5.3)	21 (3.4)	26 (3.7)	1 (1.4)	19 (6.0)	14 (5.2)	34 (5.2)
Age of having the first boyfriend or girlfriend, median (interquartile range)	14 (12–15)	13 (13–14)	13 (11–15)	13 (12–15)	13 (12–15)	13 (12–15)	14 (12–16)	13 (12–15)	14 (12–15)
Age of having the first consensual sex, median (interquartile range)	14 (12–16)	13 (10–15)	15 (12–16)	12 (9–15)	13 (10–15)	14 (12–16)	15 (14–16)	13 (11–14)	14 (12–16)
Ever had consensual sex									
Yes	233 (17.07)	5 (10.87)	11 (19.3)	93 (15.27)	109 (15.31)	13 (18.57)	62 (19.62)	49 (18.35)	124 (18.99)
No	1,006 (73.7)	36 (78.26)	40 (70.18)	474 (77.83)	550 (77.25)	52 (74.29)	217 (68.67)	187 (70.04)	456 (69.83)
Unsure	8 (.59)	0 (0)	1 (1.75)	0 (0)	1 (.14)	1 (1.43)	5 (1.58)	1 (.37)	7 (1.07)
Refuse to answer	39 (2.86)	1 (2.17)	0 (0)	17 (2.79)	18 (2.53)	1 (1.43)	9 (2.85)	11 (4.12)	21 (3.22)
Missing	79 (5.79)	4 (8.7)	5 (8.77)	25 (4.11)	34 (4.78)	3 (4.29)	23 (7.28)	19 (7.12)	45 (6.89)
Number of consensual sex partners									
1	165 (70.82)	2 (4.0)	4 (36.36)	63 (67.74)	69 (63.3)	7 (53.85)	53 (85.48)	36 (73.47)	96 (77.42)
2–5	26 (11.16)	1 (2.0)	4 (36.36)	14 (15.05)	19 (17.43)	2 (15.38)	2 (3.23)	3 (6.12)	7 (5.65)
6–10	16 (6.87)	1 (2.0)	1 (9.09)	7 (7.53)	9 (8.26)	1 (7.69)	3 (4.84)	3 (6.12)	7 (5.65)
>10	16 (6.87)	1 (2.0)	1 (9.09)	4 (4.3)	6 (5.5)	2 (15.38)	3 (4.84)	5 (10.2)	10 (8.06)
Missing	10 (4.29)	0 (0)	1 (9.09)	5 (5.38)	6 (5.5)	1 (7.69)	1 (1.61)	2 (4.08)	4 (3.23)
Ever exchanged sex for money, food, and shelter									
Many times	29 (2.1)	1 (2.2)	0 (0)	13 (2.1)	14 (2.0)	4 (5.7)	5 (1.6)	6 (2.2)	15 (2.3)
Sometimes	33 (2.4)	0 (0)	2 (3.5)	10 (1.6)	12 (1.7)	2 (2.9)	9 (2.8)	10 (3.7)	21 (3.22)
Not in the past 6 months	56 (4.1)	4 (8.7)	2 (3.5)	14 (2.3)	20 (2.8)	2 (2.9)	15 (4.7)	19 (7.1)	36 (5.51)
Never	1,153 (84.5)	38 (82.6)	49 (86.0)	541 (88.8)	628 (88.2)	59 (84.3)	261 (82.6)	205 (76.8)	525 (80.4)
Missing	94 (6.9)	3 (6.5)	4 (7.0)	31 (5.1)	38 (5.3)	3 (4.3)	26 (8.2)	27 (10.0)	56 (8.58)
Has anyone tried or forced you to have sex when you did not want them to									
Yes	123 (9.0)	7 (15.2)	3 (5.3)	43 (7.1)	53 (7.4)	7 (10.0)	29 (9.2)	34 (12.7)	70 (10.72)
No	1,154 (84.5)	37 (80.0)	49 (86.0)	537 (88.2)	623 (87.5)	62 (88.6)	263 (83.2)	206 (77.2)	531 (81.32)
Missing	88 (6.5)	2 (4.3)	5 (8.8)	29 (4.8)	36 (5.1)	1 (1.4)	24 (7.6)	27 (10.0)	52 (7.96)

(86% vs. 79%, $p = .0012$). Nine percent of participants reported having ever used alcohol or drugs; this was highest among double orphans in institutional care (12%).

Table 2 summarizes orphaned and separated adolescents' sexual behaviors stratified by care environment. Overall, 17% of participants reported that they had ever had consensual sex, (15% institutional vs. 19% family-based care), with a median age of 14 years (interquartile range: 12–16 years) at sexual debut. A higher proportion of paternal orphans in institutional care reported that they had started having a girlfriend or boyfriend (28%) and a higher proportion of paternal orphans in both care environments reported having ever had consensual sex (19% and 20%) in comparison to all other orphans. Among participants who had ever willingly had sex, 58 (25%) reported having had more than one sexual partner. Overall, 118 (9%) participants reported having ever exchanged sex for money, food and/or shelter, with a higher proportion of those in family-based care ($n = 72$, 11%) in comparison to institutional care ($n = 46$, 6%). Likewise, a higher proportion of adolescents in family-based care reported that someone had tried or forced them to have sex (11%)

in comparison to those in institutional care (7%). Maternal orphans (15%) in institutional care and double orphans (13%) in family-based care most frequently reported this outcome.

Table 3 presents the unadjusted analyses for sexual behavior outcomes for participants living in the two care environments. There was no significant difference in participants reporting ever having consensual sex between care environments. Adolescents residing in institutional care were twice as likely (odds ratio [OR], 1.97; 95% confidence interval [CI], 1.07–3.62) to report having voluntarily had sex with more than one partner; 50% less likely (OR, .53; 95% CI, .36–.79) to have ever exchanged sex for money, food, and/or shelter; and 35% less likely to report being forced to engage in sex (OR, .65; 95% CI, .44–.94).

In adjusted analyses (Table 4), the strength of associations remained when controlling for age, gender, and orphan status, with the exception of having voluntarily had sex with more than one partner, which became nonsignificant when adjusted for these factors (adjusted OR [AOR], 1.74; 95% CI, .85–3.57). The associations between care environment and having ever exchanged sex for food, money, and/or shelter, and forced sex

Table 3

Associations between care environment and sexual behavior (unadjusted)

	OR (95% CI) Ever had sex N = 1,365	OR (95% CI) Number of partners 1 versus >1 N = 233	OR (95% CI) Exchange sex N = 1,271	OR (95% CI) Forced sex N = 1,277
Institutional care environment (ref = HH)	.95 (.67–1.33)	1.97 (1.07–3.62)*	.53 (.36–.79)**	.65 (.44–.94)*

p Values not calculated for 95% confidence intervals (CIs) that include 1.

OR = odds ratio.

* $p < .05$.** $p < .0125$ (Bonferroni adjustment for multiple comparisons of $p < .05/4 = .0125$).

remained similar when adjusted for the importance of religion, school enrolment, and caregiver support. When adjusted for “caregiver knows what you do with your free time,” the association between forced sex and care environment became nonsignificant (AOR, .67; 95% CI, .41–1.08). Participants who reported that their caregiver knew a little or a lot of what a participant did with their free time were significantly less likely to report exchanging sex (AOR, .32; 95% CI, .19–.55), forced sex (AOR, .35; 95% CI, .21–.58), and, although it failed to reach statistical significance, having had more than one consensual sexual partner (AOR, .41; 95% CI, .17–1.0).

When adjusted for reported alcohol and drug use, adolescents in institutional environments remained less likely to report exchanging sex (AOR, .37; 95% CI, .23–.6) and forced sex (AOR, .5; 95% CI, .32–.78) in comparison to those living in family-based care. Across participants, those who reported alcohol and drug use were significantly more likely to report ever having sex

(OR, 2.19; 95% CI, 1.28–3.72), exchanging sex (OR, 6.17; 95% CI, 3.78–10.07), and forced sex (OR, 7.98; 95% CI, 4.99–12.75).

Discussion

These findings suggest that orphaned adolescents' sexual behaviors and risks are influenced by care environment. Overall, living in institutional care appears to independently protect orphaned adolescents in this setting, especially from sexual exploitation (i.e., exchanging sex, sexual violence), compared to orphaned adolescents living in family-based care. As the cohort gets older and more participants transition through adolescence, the relationship between care environment, sexual debut, exploitation, and risky behavior merits longitudinal investigation not only to elucidate risk and protective mechanisms in relation to care environment but also to describe the mechanisms of action for this effect.

Table 4

Associations between care environment and sexual behavior adjusting for resiliency and risk factors (all models adjusting for age, gender, and orphan status)

	AOR (95% CI) Ever had sex N = 1,365	AOR (95% CI) Number of partners 1 versus >1 N = 233	AOR (95% CI) Exchange sex N = 1,365	AOR (95% CI) Forced sex N = 1,365
Institutional care environment (ref = HH)	.96 (.64–1.46) n = 1,355	1.74 (.85–3.57) n = 233	.46 (.3–.72)** n = 1,271	.57 (.38–.88)** n = 1,277
Adjusting for importance of religion				
Care environment (ref = HH)	.95 (.62–1.46) n = 1,282	1.57 (.76–3.23) n = 222	.51 (.33–.8)** n = 1,257	.63 (.41–.96)** n = 1,277
Importance of religion (ref = most important)				
Very/somewhat important	1.13 (.75–1.70)	.97 (.5–1.86)	.82 (.54–1.26)	.82 (.55–1.24)
Not important at all	1.5 (.53–4.22)	.18 (.02–1.49)	3.45 (1.74–6.82)	2.04 (.98–4.24)
Adjusting for currently in school				
Care environment (ref = HH)	1.06 (.7–1.62) n = 1,346	1.77 (.86–3.64) n = 222	.48 (.31–.75)** n = 1,262	.60 (.39–.92)* n = 1,268
Currently in school	.41 (.22–.76)	1.63 (.42–6.24)	.44 (.2–.98)	.40 (.19–.86)
Adjusting for caregiver support				
Care environment (ref = HH)	.98 (.65–1.48) n = 1,355	1.64 (.79–3.38) n = 223	.48 (.31–.74)** n = 1,271	.61 (.40–.93)* n = 1,277
This person is helpful when I have a problem	.66 (.42–1.03)	.46 (.22–1.0)	.65 (.39–1.06)	.42 (.27–.66)
Adjusting for caregiver knows what you do with your free time				
Care environment (ref = HH)	.95 (.61–1.48) n = 1,160	2.13 (.97–4.68) n = 206	.4 (.25–.66)** n = 1,143	.67 (.41–1.08) n = 1,147
Caregiver knows what you do with your free time? (ref = doesn't know)				
Knows a little/a lot	.95 (.53–1.69)	.41 (.17–1.0)	.32 (.19–.55)	.35 (.21–.58)
Unsure	1.18 (.52–2.68)	.3 (.07–1.33)	.63 (.29–1.36)	.36 (.15–.88)
Refuse to answer	****	****	3.06 (.98–9.53)	3.97 (1.34–11.77)
Adjusting for alcohol/drug use				
Care environment (ref = HH)	.93 (.61–1.43) n = 1,274	1.62 (.78–3.38) n = 221	.37 (.23–.60)** n = 1,253	.50 (.32–.78)** n = 1,259
Alcohol/drug use	2.19 (1.28–3.72)	1.38 (.66–2.9)	6.17 (3.78–10.07)	7.98 (4.99–12.75)

p Values not calculated for 95% confidence intervals that include 1.

AOR = adjusted odds ratio.

* $p < .05$.** $p < .0125$ (Bonferroni adjustment for multiple comparisons of $p < .05/4 = .0125$).

****No data.

This study confirms the independently protective effects of caregiver supervision and support, especially as related to transactional sex and sexual violence [32,37]. Similarly, being in school is strongly associated in this study with reduced sexual risks that include being sexually active. As expected, alcohol and drug use is strongly associated with increased risk-taking behavior and exploitation. Religion appeared to have no effect on sexual risks with the exception that adolescents for whom religion was of little import were more likely to engage in transactional sex.

In general, orphans in sub-Saharan Africa may be at risk of experiencing a forced first sexual encounter in comparison to their nonorphaned peers [11,21]. Our findings demonstrate that parental/guardian/caregiver supervision may play a role in reducing these risks, and therefore, programs aimed at strengthening parenting skills may merit implementation and future research. Even when controlling for these potentially protective factors however, the effect of care environment did not change. We hypothesize that poverty in this setting is likely driving orphaned adolescents' engagement in transactional sex, especially among the relatively economically deprived households participating in this study [8]. These findings are in line with other sub-Saharan African settings, where orphans and other vulnerable adolescents living in extreme poverty were significantly more likely to engage in transactional sex [10,23,24,28]. Strengthening the capacity of families to care and provide for orphaned and vulnerable children and adolescents may have the ability to reduce transactional sex and prevent forced sexual encounters. Social protection strategies, such as cash transfers, education, insurance, and nutritional support, may have the capacity to reduce transactional sex among orphaned adolescents living in family-based care through alleviating extreme poverty and thereby the need to exchange sex for food, gifts, money, or other items [38,39]. Other strategies to strengthen family-based care, such as community-based care programs and support [8], which are responsive to the sociocultural and economic context, should be implemented and rigorously evaluated for their ability to reduce adolescent sexual risk-taking behavior and exploitation.

Strengths and limitations

This study had several limitations. First, the outcome measures were self-reported. Adolescent sexual behavior is a sensitive topic, and because the study relied on self-reports, it was subject to social desirability bias, with participants likely to underreport on their sexual practices. This may have been particularly true of participants living in institutional care who may have been afraid to disclose their sexual behaviors for fear of repercussions. In addition, missing data from some respondents could have altered the estimates of outcomes and variables included in the models. We attempted to minimize this potential source of bias by assuring the participants during each assessment of privacy and confidentiality in data handling. In addition, we encouraged participants to complete the assessment themselves but had a clinical psychologist available to assist them in the event that they needed clarification to any questions, in an attempt to have encouraged more honest responses. Second, the term "sex" was not explicitly defined as vaginal intercourse, and therefore, adolescents may have interpreted the meaning of "sex" differently based on their age and knowledge. Finally,

outcomes were measured using a single item, therefore reducing their potential reliability.

There are also several strengths to our study. First was the relatively large sample size, which increased the power to detect differences between care environments. Second, the random selection of households caring for orphaned children and the near universal inclusion of all registered institutional environments in the county reduced the potential for any selection bias in the study design, thus increasing confidence in the generalizability of our findings. Third, by focusing predominantly on a population of orphaned adolescents in different care environments, we have been able to go beyond comparisons of orphaned and nonorphaned populations and elaborate on the factors associated with sexual health risk behaviors among orphans.

In this study, care environment was not associated with orphaned and separated adolescents' sexual initiation. Orphaned and separated adolescents living in institutional environments were less likely than those in family-based environments to report engaging in transactional sex and being forced into sex. Institutional care may reduce vulnerabilities through the provision of basic material needs, an adequate standard of living, and stronger adolescent–caregiver relationships. Increasing social and economic support to households caring for OVC may reduce sexual risk-taking behaviors and the potential for exploitation.

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