



# HHS Public Access

Author manuscript

*J Loss Trauma*. Author manuscript; available in PMC 2020 January 31.

Published in final edited form as:

*J Loss Trauma*. 2019 ; 24(2): 129–142. doi:10.1080/15325024.2018.1560692.

## Prevalence of parental bereavement among female sex workers (FSW) in Kibra, Kenya

Christy A. Denckla, PhD<sup>1</sup>, Linnet Ongeru, MD<sup>2</sup>, Linet Ouma<sup>2</sup>, Benson Singa, MD<sup>2</sup>, Charity Maingi<sup>2</sup>, Rose Bosire, PhD<sup>2</sup>, Phelgona Otieno, MD<sup>2</sup>, Danvers Omolo<sup>2,4</sup>, David C. Henderson, MD<sup>3</sup>, Lori B. Chibnik, PhD<sup>1</sup>, Karestan C. Koenen, PhD<sup>1</sup>, Veronica Manduku, MD<sup>2</sup>

<sup>1</sup>Harvard T. H. Chan School of Public Health, 677 Huntington Ave., Boston, MA, 02115, USA

<sup>2</sup>Kenya Medical Research Institute (KEMRI), P.O. Box 54840 00200, Nairobi, Kenya

<sup>3</sup>Boston Medical Center, Boston University, 720 Harrison Ave., Boston, MA, 02118 USA

<sup>4</sup>United Nations Food and Agriculture Organization, Southern Sudan

### Abstract

Female sex workers (FSW) residing in Kibra, Kenya experience elevated exposure to adverse events, yet the prevalence of parental bereavement is not well characterized. This cross-sectional pilot study on 301 FSWs residing in Kibra, Kenya found that 67.7% of these women were parentally bereaved. Significantly fewer parentally bereaved women reported historical use of condoms and emergency contraception compared to non-bereaved women, and older age of paternal bereavement was significantly associated with current contraceptive use. Prevalence rates of bereavement among this cohort are well over the national Kenyan average, and further research on the specific impact of bereavement is warranted.

### Keywords

Female Sex Workers (FSW); parental bereavement; reproductive health; Kenya

The death of a parent during childhood can have health consequences across the lifespan because it occurs at a time of heightened developmental vulnerability. While there is evidence that many children are robust to negative sequelae after exposure to adverse conditions (Bonanno & Diminich, 2013; Masten, 2014), other studies have found that childhood bereavement significantly increases the likelihood of developing adult major depression, bipolar disorder, and schizophrenia (Agid et al., 1999). Younger age at parental bereavement is also associated with increased risk for adverse mental health outcomes including high risk sexual behavior, posttraumatic stress disorder, poor school performance, and disordered eating (Beam, Servaty-Seib, & Mathews, 2004; Berg, Rostila, & Hjern, 2016; Keyes et al., 2014; Operario, Underhill, Chuong, & Cluver, 2011). Additionally,

Corresponding Author: Christy A. Denckla, cdenckla@hsph.harvard.edu, tel: +1 347 369-4176, Harvard T. H. Chan School of Public Health, 677 Huntington Ave., Boston, MA, 02115, USA.

Conflict of Interest Statement: All authors declare no conflicts of interest related to this study

parental bereavement can be associated with global functional impairment (Kaplow, Saunders, Angold, & Costello, 2010), obesity (Weinberg et al., 2013), and high risk health behaviors (Hamdan et al., 2012). However, most of this work has been conducted on populations in higher income countries, and less is known about the prevalence, consequences, and health correlates of parental death on populations in low and middle income countries (LMICs) with higher rates of exposure to socioeconomic disadvantage.

In lower income countries, parental bereavement can occur against a backdrop of compounding exposures to adversity, and prior work in both high and low income countries has shown that cumulative adversity increases risk for adverse health outcomes (Cluver, Gardner, & Operario, 2007; Cluver & Orkin, 2009; Slopen, Koenen, & Kubzansky, 2014; Suliman et al., 2009). For example, female sex workers (FSW) residing in Kibra, Kenya represent a cohort of women faced with increased risk of adversity exposure and socioeconomic disadvantage, yet few studies have characterized their rates of exposure to interpersonal adversity, such as bereavement. The consequence of which is that it is unknown if these women experience higher rates of parental bereavement in comparison to the national Kenyan average. A 2012 population-based nationally representative study estimated that there were 1.8 million children orphaned by one or both parents in Kenya (Lee et al., 2014). In Kenya, nearly 40% of the population is under 18 (21,023,000 estimated in 2012; [UNICEF, 2015]), and estimates of prevalence of parental bereavement in the general population Kenya could fall in the range of 12%, with prior studies showing rates as high as 37.8% in cohorts living in informal settlements (Fotso, Holding, & Ezeh, 2009). The general estimate of 12% parental bereavement prevalence in Kenya is nearly four times higher than estimates for parental bereavement in American and European settings, which range from 4-5% (US Census, 2010-2016; Parsons, 2011). By comparison, South African cohorts have estimated prevalence rates for parental bereavement of 27.3% (Operario et al., 2007), which is still less than the prevalence noted in a Kenyan informal settlement of 37.8% (Fotso, Holding, & Ezeh, 2009). However, the rates of parental bereavement among marginalized groups within Kenya, such as female sex workers residing in Kibra, Kenya, has not yet been characterized in the extant literature.

The informal settlement of Kibra, located in Nairobi, Kenya, is one of the largest informal settlements in East Africa with population estimates around 800,000 living within one square mile (Odek et al., 2009). It is characterized by extremely poor living conditions; residents lack government hospitals and access to basic health and human services such as electricity, running tap water, and adequate housing (Mutisya & Yarime, 2011). In this highly economically marginalized setting, many women have no source of income; nearly 5% of the reproductive aged female Kenyan population is thought to earn income from transactional sex and it is likely that the proportion in Kibra is even higher (Odek et al., 2014). For those individuals earning income from transactional sex, risk for exposure to HIV/AIDS is disproportionately high - upwards of 29.5% - or nearly three times higher than the national Kenyan average among similar aged women (Musyoki et al., 2015). Moreover, risk for unwanted pregnancies and physical and sexual violence is high (Amuyunzu-Nyamongo, Okeng'o, Wagura, & Mwenzwa, 2007; Elmore-Meegan, Conroy, & Agala, 2004).

Parental bereavement among FSWs could be associated with increased socioeconomic disadvantage and greater rates of risky sexual behaviors compared to parentally bereaved youth from higher socioeconomic levels. First, work has shown that women may be more likely to engage in riskier, but higher paying, transactional sex after experiencing health shocks; bereavement exposure among this group may further increase risk in an already highly exposed setting (Robinson & Yeh, 2011). Second, epidemiological evidence suggests that loss of a parent in childhood is associated with increase rates of HPV infection and cervical cancer (Lu et al., 2016), as well as riskier sexual behaviors compared to non-bereaved children (Operario, Pettifor, Cluver, MacPhail, & Rees, 2007). Third, bereavement has been identified as a clinical concern among FSWs; when available, FSWs present to healthcare clinics with concerns about bereavement and loss (Stevenson & Petrak, 2007). However, limitations to prior work, including lack of documentation comparing the effects of bereavement among a similarly exposed comparison group, makes it difficult to determine if bereavement specifically, rather than general compounded adversity exposure, are associated with adverse health status.

The primary aim of this pilot study is to describe the prevalence of bereavement among a cohort of sex workers residing and working in Kibra, Kenya. Our secondary aim was to explore associations among parental bereavement and reproductive health, hypothesizing that parentally bereaved FSWs, when compared to non-bereaved FSWs, would endorse more adverse reproductive health conditions. We first estimate and report descriptive data on this cohort, including marital status, level of education, prevalence of bereavement, and age when parent died. Next, we conducted between-group comparisons between bereaved and non-bereaved groups to test for differences in reproductive health indicators (contraceptive use and self-reported physical symptoms of an STI).

## Methods

### Procedure

Data for the present analysis were drawn from questionnaires administered to a sample of female sex workers (FSW) residing in Kibra Sub-County, Nairobi, Kenya. The primary study sought to estimate patterns of alcohol and substance use among FSWs, and was approved by the Centre of Clinical Research Scientific Committee and the Scientific and Ethics Review Unit at the Kenya Medical Research Institute (KEMRI). Inclusion criteria were: 1) Being a mature minor (defined as being between 14 to 18 years old and pregnant or a mother, or head of household), 2) An adult female greater than 18 years old, 3) Willing and able to sign informed consent, 4) Residing in Kibra, and 5) Deriving income from consensual sex.

Potentially eligible women were recruited through community –based organizations and Community Health Volunteers (CHV) who maintain direct contact with FSW's in this setting, including the Strategic Community Development Network (SACODEN) register, a community based organization located in Kibra settlement that provides health services to FSWs. Pilot consultation with community-based organizations and knowledgeable CHV's suggested that two primary factors were relevant to successful study enrollment. First, in Kibra, FSW's operate in closed cohorts with clear social boundaries such that women

belonging to one cohort do not engage with other cohorts. Cohorts have a single leader entrusted with decision making regarding extension of social support, group savings, and organizing medical care. As a result, buy-in from the group leader was essential for successful recruitment. Second, given the highly-impooverished setting in which the study was conducted, risk of double recruitment (participants attempting to enroll twice in the study) and risk of women who were not FSWs attempting to enroll was high. Therefore, the following recruitment strategy was adopted. CHV's identified and provided study background material to known FSW cohort leaders across several sub-communities in Kibra. A total of 10 cohort leaders were identified, each with a cohort membership of approximately 50 women. The CHV then provided cohort leaders with referral information, including date, time, and place, to direct eligible cohort members to learn more about the study. Potential participants were consented privately by a study team member, making it clear that participation was voluntary. CHVs were compensated \$5USD per day for study assistance, FSW participants were compensated \$4USD for participation, and FSW cohort leaders were not compensated for informing cohort members about the study, but were eligible to participate themselves in the study. After formal consent, participants completed face-to-face interviews conducted by qualified health staff trained on study procedures to interview and collect data using a structured questionnaire administered in Kiswahili, the local language. All interviews were carried out in the SACODEN office which is situated within the Kibra community. Interviews were individually conducted in a quiet, private room free of distraction, and were then transcribed to English by bi-lingual Kiswahili-English research assistants.

### Study Population

A priori power calculations were based on a conservative estimate of 50% prevalence of substance abuse in the sample size consistent with the primary study aims, following procedures outlined by Salganik (2006). This yielded a target recruitment of 300. The participant sample examined in the present report included 301 women who met criteria for definition of a FSW, including a girl or a woman who is engaging in consensual sex, including peno-vaginal, anal or oral sex involving transaction of commercial value, either money or anything in kind. The average age of the sample was 25.58 (SD 7.52), range 14-56.

### Measures

All measures were extracted from a semi-structured survey administered to all participants that addressed the following domains.

**Bereavement.**—Participants were asked to indicate if both, one, or none of their biological parents were presently alive. Specific questions included: “Are both your parents alive?” (yes/no response); If participant answered yes, they were further asked, “If parent deceased please specify how old you were when this happened” (for both mother and father).

**Contraceptive use.**—Contraceptive use was queried for total lifetime prior use a) Women were asked “Have you ever used any contraception?”, and current use b) “Are you currently using any method of contraception?” Contraceptive use was queried for nine types including

the contraceptive pill, injection, condom, emergency pills, withdrawal, periodic abstinence, tubal ligation, implant, and intra uterine contraceptive device (IUCD). A composite “total contraceptive use” variable was coded by tallying all counts of contraceptive use.

**Sexual health.**—Health conditions indicative of a sexually transmitted infection (STI) were queried for eight physical symptoms of gynecological conditions present in the past three months including: pain while passing urine, vaginal odor, abnormal vaginal discharge, itchy vulva/vagina, vaginal ulcers, inguinal swelling, lower abdominal pains, and abnormal bleeding. A composite “total sexual health symptoms” variable was coded by tallying all counts of endorsed sexual health symptoms.

### Approach to Analysis

The study first sought to characterize rates of bereavement among this group of FSWs, and secondly to explore associations between parental bereavement and reproductive health. We first examined data for missingness, then proceeded to analyze descriptive statistics. We conducted between-group comparisons (non-bereaved, single parent bereaved, two parent bereaved) women in levels of education, age, and marital status using chi-square and one-way ANOVAs. Next, we conducted between group chi-square comparisons to examine differences between non-bereaved and bereaved FSWs along the following health indicators: history of contraceptive use, current contraceptive use, and sexual health symptoms. Finally, we fit a logistic regression model to examine associations between age of parental bereavement, demographic variables, and reproductive health indicators. All statistical analyses were completed in SPSS, Version 23 (IBM, 2015).

### Results

There were no missing data for age and marital status, and only one missing data point for level of education and parental bereavement status. Missing data on sexual and reproductive health variables ranged from 0% to less than 10% and was therefore considered missing at random. Among the 301 women included in the current analyses, 11 reported (3.7%) no education, 149 (49.7%) reported that their highest level of education was primary education, 131 (43.7%), secondary education, and 9 (3%) tertiary education. Only one woman reported that she was cohabitating with a romantic partner, while 175 (58.1%) reported they were single, 22 (7.3%) were divorced, 87 (28.9%) were separated, and 16 (5.3%) were widowed.

Over two-thirds, or 203 women (67.7% of the full sample) reported that at least one parent had died. Of those bereaved, 78 (38.4%) reported only their father had died, 30 (14.8%) reported only their mother was deceased, and almost half, 92 (45.3%) stated that both parents were deceased. The average age when women experienced maternal bereavement was 12.34 years-old (SD 9.71), and paternal bereavement was 11.60 years-old (SD 9.48).

Next, we explored associations between parental bereavement and primary demographic variables (educational attainment and marital status). There were significant differences between women bereaved by both parents, those bereaved by one parent, and those women not bereaved in self-reported educational attainment  $X^2(6)=21.61, p=.001$  with a greater proportion of women bereaved by both parents having no education (6.6% vs. 3.4% and

1.9%), or only primary level education (60.4% vs. 33.7% non-bereaved women). A greater proportion of non-bereaved women had obtained a secondary education (59.2%) compared to those bereaved by both parents (31.9%). We did not find evidence of a significant difference in marital status between non-bereaved, single-parent bereaved, and dual-parent bereaved women. Finally, there were no between-group differences in mean prior contraceptive use, current contraceptive use, or mean sexual health symptoms.

We then conducted between-group comparisons for bereaved and non-bereaved women on indicators of reproductive health, including current and past contraceptive use, as well as self-reported symptoms consistent with a sexually transmitted infection (STI). Results are reported in Table 2. Categories with less than 10% rates of endorsement were not analyzed due lack of power to detect between group differences. We found that the non-bereaved group was significantly more likely to report prior condom use,  $X^2(1)=4.39$ ,  $p=.036$ , as well as prior use of the emergency pill,  $X^2(1)=5.72$ ,  $p=.017$ . All other between group comparisons were not significant.

Finally, we examined association between age at which parental bereavement occurred and current contraceptive use separately for maternal and paternal bereavement. We found that older age of paternal bereavement was significantly associated with current contraceptive use,  $OR=1.08$ ,  $p=.01$ , 95%  $CI = 1.02-1.13$ , such that being older when paternal bereavement occurred was associated with greater likelihood of current use of contraception. There was no association with age at maternal death. In addition, there was no association between age at either maternal or paternal bereavement and sexual health physical symptoms.

## Discussion

Parental bereavement is associated with elevated health risks and may further compound risk for exposure to adverse conditions among marginalized and highly exposed cohorts. The primary aim of this study was to characterize rates of parental bereavement among a cohort of female sex workers (FSWs) residing in the informal settlement of Kibra, Nairobi, Kenya given the lack of descriptive information on this topic in the extant research literature. We found a remarkably high rate of parental bereavement, wherein 67.7% of this cohort of relatively young women (mean age of 25.58 years old) reported that at least one parent had died. The exceedingly high rate of two thirds of the entire cohort experiencing parental bereavement far outpaces that of 4-5% in the US and Europe, and even the Kenyan national average of 12% by a factor of nearly 7. Even considering that this FSW cohort is a slightly older cohort than the under 18 cohorts noted previously, the high rates of bereavement in this sample still exceeds the national Kenyan average by a wide margin. This suggests that FSWs may carry a disproportionate burden of parental bereavement even when compared to a South African HIV-affected cohort, or the general Kenyan population.

The lifelong effects of this disproportionate burden could be significant, yet longitudinal studies among this cohort are not reported in the extant literature to characterize these effects. Our results are consistent with prior work in sub-Saharan Africa, including work in Kenya, demonstrating an association between parental bereavement and lower educational attainment (Bicego, Rutstein, & Johnson, 2003; Mishra, Arnold, Otieno, Cross, & Hong,

2007). Further health effects on physical health conditions such as lower rates of immunization among bereaved children suggest that mortality rates may be higher in an LMIC setting (Radcliff, Racine, Brunner Huber, & Whitaker, 2012). Several studies in the South African setting among AIDS-orphaned children suggests higher rates of adverse mental health conditions such as depression, interpersonal problems, posttraumatic stress and behavior problems compared to non-bereaved children in the same setting (Cluver, Fincham, & Seedat, 2009; Cluver et al., 2007; Cluver & Orkin, 2009). Our findings provide some pilot evidence suggesting that further research on the effects of parental bereavement among FSWs is an important area for further research and future findings could have implications for treatment and intervention.

The secondary aim was to examine associations among parental bereavement and reproductive health. Our findings are consistent with prior work suggesting an association between parental bereavement and reproductive health behaviors (see Operario et al., 2011 for review). For example, parental bereavement has been found to be associated with increased HIV risk among a South African cohort, as well as early debut and having unprotected sex (Operario et al., 2007). We found some evidence that maternal vs. paternal bereavement is differentially associated with reproductive health behaviors, partly consistent with prior work in Zimbabwe noting that maternal bereavement carries higher risk for adverse sexual health behaviors among women (Kang, Dunbar, Laver, & Padian, 2008). However, we found a potentially protective effect for paternal rather than maternal presence, as older age at paternal bereavement was associated with increased likelihood of current condom use, whereas no effect of age at maternal bereavement was noted. It may be that maternal and paternal influence on sexual health behaviors are informed by different cultural norms between Kenya and Zimbabwe; however, our results do support prior observations that maternal and paternal bereavement may have a differential impact on the reproductive health behaviors of bereaved offspring.

The limitations generally associated with cross-sectional studies apply here. As a result, we were unable to make any conclusions regarding causality between parental bereavement and adverse sexual health conditions. It may be that adverse sexual health conditions were present prior to parental bereavement and therefore did not have a significant impact on the pattern of findings we note here. However, given the younger age of this cohort and the young average age at bereavement, the likelihood that adverse sexual health conditions predated bereavement is unlikely. A second limitation to the current study is that we did not have data to control for other childhood factors that are likely to confound the association between parental bereavement and health conditions, such as family socioeconomic status, parental employment, resource attainment, familial social support, access to healthcare, and psychological resources. Therefore, the associations noted here between parental bereavement and sexual health indicators could reflect exposure to any number of adverse events that the women in this study are likely to be exposed to. Third, data was collected via self-report and not cross-referenced with census or death records, therefore there may be some unreliability in prevalence estimates given retrospective bias recall. Fourth, although the focus of our investigation was on bereavement, other factors such as urban poverty and low perceived support can have greater effects on adverse outcomes than bereavement alone, and in this study these two characteristics could have been confounded. We sought to

minimize this limitation by comparing bereaved and non-bereaved in a similar setting of urban poverty, but other unmeasured variables could have explained our findings. Fifth, we did not consider resilience factors which have in other Kenyan settings been shown to be important factors on adjustment outcomes after exposure to parental bereavement (Fotso et al., 2009). Finally, the study methodology restricted study enrollment to known FSWs with membership in an informal group with a leader known to community health workers, and community based organizations that provide daily services to this population. Therefore, results of the study have limited generalizability and may not apply to FSWs not operating in cohorts under informal group leadership.

In conclusion, findings from our study suggest that this cohort of FSWs, characterized by compounding exposures to life stressors, carries a disproportionate burden of parental bereavement that outpaces Kenyan, South African, European, and North American populations by a wide margin. Future longitudinal studies with prospective data on this vulnerable cohort should consider the complex effect of this highly prevalent adverse life event on health conditions as a step toward improving preventive interventions and treatment. Qualitative work could be especially informative to better understanding the contextual factors that influence how bereavement impacts these women. More broadly, it is likely that further research on any factor hypothesized to increase risk for adverse health outcomes among this cohort of highly vulnerable FSWs, which already carries a baseline HIV risk prevalence of 29.5%, warrants further research (Musyoki et al., 2015).

## Acknowledgements

We thank Edwina Achieng and Pamela Owino, Community Health Volunteers (CHV's) involved in mobilizing and sensitizing female sex workers to this study. Also, we posthumously acknowledge Julia Amayo, study co-investigator and the director of the Strategic Community Development Network (SACCODEN), who unfortunately passed on earlier this year.

Funding: Kenya Medical Research Institute Internal Research Grant Number SP/IRG/01013

## Literature Cited

- UNAIDS (2010). Joint United Nations Programme on HIV/AIDS (UNAIDS) Global Report: UNAIDS Report on the Global AIDS Epidemic 2010. Geneva, Switzerland Retrieved from [http://www.unaids.org/globalreport/Global\\_report.htm](http://www.unaids.org/globalreport/Global_report.htm).
- Agid O, Shapira B, Zislin J, Ritsner M, Hanin B, Murad H, Lerer B (1999). Environment and vulnerability to major psychiatric illness: a case control study of early parental loss in major depression, bipolar disorder and schizophrenia. *Molecular Psychiatry*, 4(2), 163–172. [PubMed: 10208448]
- Amuyunzu-Nyamongo M, Okeng'o L, Wagura A, & Mwenzwa E (2007). Putting on a brave face: the experiences of women living with HIV and AIDS in informal settlements of Nairobi, Kenya. *AIDS Care*, 19 Suppl 1, S25–34. doi:10.1080/09540120601114618 [PubMed: 17364385]
- Beam MR, Servaty-Seib HL, & Mathews L (2004). Parental loss and eating-related cognitions and behaviors in college-age women. *Journal of Loss and Trauma*, 9(3), 247–255. doi: 10.1080/15325020490458336
- Berg L, Rostila M, & Hjern A (2016). Parental death during childhood and depression in young adults - a national cohort study. *Journal of Child Psychology and Psychiatry*, 57(9), 1092–1098. doi: 10.1111/jcpp.12560 [PubMed: 27058980]



- Bicego G, Rutstein S, & Johnson K (2003). Dimensions of the emerging orphan crisis in sub-Saharan Africa. *Social Science & Medicine*, 56(6), 1235–1247. doi:10.1016/s0277-9536(02)00125-9 [PubMed: 12600361]
- Bonanno GA, & Diminich ED (2013). Positive adjustment to adversity: Trajectories of minimal-impact resilience and emergent resilience. *Journal of Child Psychology and Psychiatry*, 54(4), 378–401. doi:10.1111/jcpp.12021 [PubMed: 23215790]
- Cluver L, Fincham DS, & Seedat S (2009). Posttraumatic stress in AIDS-orphaned children exposed to high levels of trauma: The protective role of perceived social support. *Journal of Traumatic Stress*, 22(2), 106–112. doi:10.1002/jts.20396 [PubMed: 19319917]
- Cluver L, Gardner F, & Operario D (2007). Psychological distress amongst AIDS-orphaned children in urban South Africa. *Journal of Child Psychology and Psychiatry*, 48(8), 755–763. doi:10.1111/j.1469-7610.2007.01757.x [PubMed: 17683447]
- Cluver L, & Orkin M (2009). Cumulative risk and AIDS-orphanhood: Interactions of stigma, bullying and poverty on child mental health in South Africa. *Social Science & Medicine*, 69(8), 1186–1193. [PubMed: 19713022]
- US Census (2010-2016). Annual estimates of the resident population by single year of age and sex for the United States: April 1, 2010 to July 1, 2016 (NC-EST2016-AGESEX-RES). Retrieved from <https://www.census.gov/data/datasets/2016/demo/popest/nation-detail.html>
- Elmore-Meegan M, Conroy RM, & Agala CB (2004). Sex workers in Kenya, numbers of clients and associated risks: An exploratory survey. *Reproductive Health Matters*, 12(23), 50–57. doi:10.1016/s0968-8080(04)23125-1 [PubMed: 15242210]
- Fotso JC, Holding PA, & Ezeh AC (2009). Factors conveying resilience in the context of urban poverty: The case of orphans and vulnerable children in the informal settlements of Nairobi, Kenya. *Child and Adolescent Mental Health*, 14(4), 175–182. doi:10.1111/j.1475-3588.2009.00534.x
- Hamdan S, Mazariegos D, Melhem NM, Porta G, Payne MW, & Brent DA (2012). Effect of parental bereavement on health risk behaviors in youth: A 3-year follow-up. *Archives of Pediatrics & Adolescent Medicine*, 166(3), 216–223. [PubMed: 22393180]
- IBM Corp. (2015). IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.
- Kang M, Dunbar M, Laver S, & Padian N (2008). Maternal versus paternal orphans and HIV/STI risk among adolescent girls in Zimbabwe. *AIDS Care*, 20(2), 214–217. doi:10.1080/09540120701534715 [PubMed: 18293132]
- Kaplow JB, Saunders J, Angold A, & Costello EJ (2010). Psychiatric symptoms in bereaved versus nonbereaved youth and young adults: a longitudinal epidemiological study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 49(11), 1145–1154. doi:10.1016/j.jaac.2010.08.004 [PubMed: 20970702]
- Keyes KM, Pratt C, Galea S, McLaughlin KA, Koenen KC, & Shear KM (2014). The burden of loss: Unexpected death of a loved one and psychiatric disorders across the life course in a national study. *American Journal of Psychiatry*, 171(8), 864–871. doi:10.1176/appi.ajp.2014.13081132 [PubMed: 24832609]
- Kimanga DO, Ogola S, Umuro M, Ng'ang'a A, Kimondo L, Murithi P, Group KS (2014). Prevalence and incidence of HIV infection, trends, and risk factors among persons aged 15–64 years in Kenya: results from a nationally representative study. *Journal of Acquired Immune Deficiency Syndromes*, 66 Suppl 1, S13–26. doi:10.1097/QAI.0000000000000124
- Lee VC, Muriithi P, Gilbert-Nandra U, Kim AA, Schmitz ME, Odek J, Mokaya R, Galbraith JS, and the KAIS Study Group. (2014). Orphans and vulnerable children in Kenya: results from a nationally representative population-based survey. *Journal of Acquired Immune Deficiency Syndromes*, 66 Suppl 1, S89–97. doi:10.1097/QAI.0000000000000117
- Lu D, Sundstrom K, Sparen P, Fall K, Sjolander A, Dillner J, Fang F (2016). Bereavement is associated with an increased risk of HPV infection and cervical cancer: An epidemiological study in Sweden. *Cancer Research*, 76(3), 643–651. doi:10.1158/0008-5472.CAN-15-1788 [PubMed: 26634926]
- Masten AS (2014). Global perspectives on resilience in children and youth. *Child Development*, 85(1), 6–20. [PubMed: 24341286]

- Mishra V, Arnold F, Otieno F, Cross A, & Hong R (2007). Education and nutritional status of orphans and children of HIV-infected parents in Kenya. *AIDS Education and Prevention*, 19(5), 383–395. [PubMed: 17967109]
- Musyoki H, Kellogg TA, Geibel S, Muraguri N, Okal J, Tun W, Kim AA (2015). Prevalence of HIV, sexually transmitted infections, and risk behaviours among female sex workers in Nairobi, Kenya: results of a respondent driven sampling study. *AIDS Behavior*, 19 Suppl 1, S46–58. doi:10.1007/s10461-014-0919-4 [PubMed: 25428282]
- Mutisya E, & Yarime M (2011). Understanding the grassroots dynamics of slums in Nairobi: the dilemma of Kibera informal settlements. *International Transaction Journal of Engineering, Management, and Applied Science and Technologies*, 2(2), 197–213.
- Odek WO, Busza J, Morris CN, Cleland J, Ngugi EN, & Ferguson AG (2009). Effects of micro-enterprise services on HIV risk behaviour among female sex workers in Kenya's urban slums. *AIDS Behavior*, 13(3), 449–461. doi:10.1007/s10461-008-9485-y [PubMed: 18998204]
- Odek WO, Githuka GN, Avery L, Njoroge PK, Kasonde L, Gorgens M, Moses S (2014). Estimating the size of the female sex worker population in Kenya to inform HIV prevention programming. *PLoS ONE*, 9(3), e89180. doi:10.1371/journal.pone.0089180 [PubMed: 24595029]
- Operario D, Pettifor A, Cluver L, MacPhail C, & Rees H (2007). Prevalence of parental death among young people in South Africa and risk for HIV infection. *Journal of Acquired Immune Deficiency Syndromes*, 44(1), 93–98. [PubMed: 17075394]
- Operario D, Underhill K, Chuong C, & Cluver L (2011). HIV infection and sexual risk behaviour among youth who have experienced orphanhood: systematic review and meta-analysis. *Journal of the International AIDS Society*, 14(1), 2–11. [PubMed: 21219607]
- Parsons S (2011). Long-term impact of childhood bereavement Preliminary analysis of the 1970 British Cohort Study (BCS70). London: Childhood Wellbeing Research Centre.
- Radcliff E, Racine EF, Brunner Huber LR, & Whitaker BE (2012). Association between family composition and the well-being of vulnerable children in Nairobi, Kenya. *Maternal Child Health Journal*, 16(6), 1232–1240. doi:10.1007/s10995-011-0849-y [PubMed: 21750894]
- Robinson J, & Yeh E (2011). Transactional sex as a response to risk in Western Kenya. *American Economic Journal: Applied Economics*, 3(1), 35–64. doi:10.1257/app.3.1.35
- Salganik MJ (2006). Variance estimation, design effects, and sample size calculations for respondent-driven sampling. *Journal of Urban Health*, 83(6 Suppl), i98–112. doi:10.1007/s11524-006-9106-x [PubMed: 16937083]
- Slopen N, Koenen KC, & Kubzansky LD (2014). Cumulative adversity in childhood and emergent risk factors for long-term health. *Journal of Pediatrics*, 164(3), 631–638. doi:10.1016/j.jpeds.2013.11.003 [PubMed: 24345452]
- Stevenson C, & Petrak J (2007). Setting up a clinical psychology service for commercial sex workers. *International Journal of STD & AIDS*, 18(4), 231–234. [PubMed: 17509171]
- Suliman S, Mkabale SG, Fincham DS, Ahmed R, Stein DJ, & Seedat S (2009). Cumulative effect of multiple trauma on symptoms of posttraumatic stress disorder, anxiety, and depression in adolescents. *Comprehensive Psychiatry*, 50(2), 121–127. doi:10.1016/j.comppsy.2008.06.006 [PubMed: 19216888]
- UNICEF (2015). *The State of the World's Children 2015: Reimagine the Future*. New York, NY Retrieved from [https://www.unicef.org/publications/index\\_77998.html](https://www.unicef.org/publications/index_77998.html).
- Weinberg RJ, Dietz LJ, Stoyak S, Melhem NM, Porta MG, Payne MMW, & Brent DA (2013). A prospective study of parentally bereaved youth, caregiver depression, and body mass index. *The Journal of Clinical Psychiatry*, 74(8), 834–840. doi:10.4088/JCP.12m08284 [PubMed: 24021503]

**Table 1:**

Comparisons between parentally bereaved vs. non-bereaved sex workers across demographic, contraceptive use, and sexual health conditions.

	Not bereaved, n=98	Single parent bereaved, n=108	Dual parent bereaved, n=92	Test statistic
Age	25.08 (6.13)	24.20 (6.96)	27.79 (8.97)	$F(2, 295) = 6.20, p = .002$
Education				$1 < 0^*, 2^*$
None	3.1%	1.9%	6.6%	$X^2(6) = 21.61, p = .001^{**}$
Primary	33.7%	55.6%	60.4%	
Secondary	59.2%	38.9%	31.9%	
Tertiary	4.1%	3.7%	1.1%	
Marital Status				$X^2(8) = 15.31, p = .05$
Single	68.4%	57.4%	46.7%	
Divorced	4.1%	7.4%	10.9%	
Separated	19.4%	31.5%	37.0%	
Widowed	7.1%	3.7%	5.4%	
Cohabiting	1.0%	0%	0%	
Prior contra. use	3.34 (1.54)	2.83 (1.29)	3.13 (1.44)	$F(2, 284) = 2.14, p = .12$
Current contra. use	1.36 (.51)	1.32 (.49)	1.41 (.61)	$F(2, 270) = 2.20, p = .11$
Sexual health cond.	1.05 (1.35)	1.01 (1.48)	.73 (1.38)	$F(2, 295) = 1.47, p = .23$

Note.

\*  $p < .05$

\*\*  $p < .01$

Contra. = Contraceptive; Cond. = conditions

**Table 2:**

Association between bereavement status and sexual health, including use of contraceptives and STI symptoms, among female sex workers in Kibra, Nairobi, N=301.

Outcome	Non-bereaved n=98	Bereaved n=200	$\chi^2$	<i>p</i>
Prior contraceptive use (yes)				
Contraceptive pill	26 (27.1%)	45 (23.9%)	.336	.562
Injection	60 (62.55)	119 (63.0%)	.006	.939
Condom	80 (83.3%)	137 (72.1%)	4.39	.036*
Emergency pill	38 (39.6%)	49 (25.8%)	5.73	.017*
Implant	38 (39.6%)	78 (41.3%)	.075	.784
Current contraceptive use (yes)				
Injection	30 (33.0%)	68 (38.2%)	.713	.399
Condom	51 (56.0%)	91 (50.3%)	.807	.369
Implant	26 (28.6%)	53 (29.6%)	.031	.859
Sexual health symptoms (yes)				
Pain	20 (20.4%)	36 (18.2%)	.212	.645
Discharge	26 (26.8%)	35 (17.7%)	3.307	.069
Itchiness	25 (25.5%)	45 (22.7%)	.281	.596
Abdominal pain	15 (15.3%)	28 (14.6%)	.063	.802

*Note.*

\*  $p < .05$

\*\*; Only outcome variables with frequency of use greater than 10% of the total sample are displayed in the table; 3 participants are missing data on bereavement status and not included in column totals.