

Foster Care History and HIV Infection among Drug-Using African American Female Sex Workers

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Abstract Foster care has been associated with increased HIV risk behaviors among youth, yet long-term association with HIV infection has not been examined. This study explored the associations between foster placement, victimization, mental health, onset of sex work and HIV infection among highly vulnerable female sex workers. 562 drug-involved African American women were enrolled into an intervention study to increase health services utilization and reduce HIV risk. Seventeen percent reported a history of foster placement. Foster history was associated with significantly lower educational attainment, higher victimization, and more severe mental health problems. Women with foster histories reported significantly earlier entry into paid sex work, with some 62% active in the sex trade before age 18. Multivariate analyses found that foster care was independently associated with HIV seropositivity, and that early sex work partially mediated this association. The potential long-term health vulnerabilities associated with foster placement are understudied and warrant additional research.

Keywords Women · Sex workers · HIV · Foster care

Resumen La colocación de jóvenes en los hogares de bienestar familiar ha sido asociada con un aumento de riesgo para el VIH, pero todavía la asociación a largo plazo con la infección del VIH no ha sido examinada. Este estudio explore la asociación entre la colocación de jóvenes en bienestar familiar y victimización, salud mental,

comienzo en el trabajo del sexo, e infección del VIH entre mujeres muy vulnerable que son trabajadoras sexuales. 562 mujeres Afro-Americanas involucradas en uso de drogas fueron registradas en una prueba de intervención para establecer conexiones con servicios de salud y reducir el riesgo del VIH. Diecisiete por ciento fueron parte de un hogar de bienestar familiar. Este historial fue asociado con rendimiento educativo significativamente más bajo, victimización más alta y problemas de salud mental más severos. Además, estas mujeres reportaron entrada significativamente más temprana al trabajo del sexo, con 62% haciendolo activamente antes de la edad de 18. Análisis multivariados encontraron que los hogares de bienestar familiar fueron asociados independientemente con seropositividad al VIH, y que el trabajo sexual antes de 18 parcialmente mediaba esta asociación. Las vulnerabilidades potenciales a largo plazo de salud asociadas con colocación en hogares de bienestar familiar no son estudiadas suficientemente y merecen investigación adicional.

Palabras claves Mujeres · Trabajadores del sexo · VIH · Cuidado de crianza

Introduction

Foster care placement currently impacts more than 500,000 children and adolescents in the United States [1]. Formally defined as a system for out-of-home care for children in state custody, foster care encompasses a variety of settings and may involve placement in kinship care, family foster homes, or group homes. Most frequently, foster care entry is the result of child neglect, abandonment, or abuse within the home [2–4]. More often than not, foster children's traumatic histories are entangled with other life problems,

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including low income, poor education, and unstable housing [5, 6].

Because of these difficult personal histories, prior research has identified foster care youth as at-risk for numerous social, emotional, and behavioral problems [7–11]. In particular, adolescents in foster care are more likely to exhibit significant mental health problems in comparison to community samples of adolescents [5], and also engage in substance use and HIV sexual risk behaviors at higher rates than their non-foster care counterparts [2, 4, 12]. Although patterns of elevated risk behaviors are well-established in the literature, it has been difficult for researchers to pinpoint their etiology, as multiple pre-placement factors are often intertwined with negative experiences and instability associated with foster care itself [5, 6, 13].

Much less is known about the effects of foster care participation on adult outcomes, as long-term studies are limited [14]. Research examining individuals who have aged out-of foster care is logistically difficult to implement, however, existing studies tend to parallel the findings of research conducted among foster care youth. In this regard, adult alumni of foster care have been found to display even higher rates of mental health disorders and drug dependence than youth still in custodial care, and much higher rates than found among the general population [5]. Other research echoes these findings, documenting that foster or kinship care history is associated with HIV risk behaviors in adult women [15].

This constellation of findings suggests that the observed patterns of risk behaviors among foster care adolescents may persist into adulthood. Although research is extremely scarce with regard to vulnerability to especially high-risk lifestyles, there are some indications that foster care participants exhibit high levels of involvement in prostitution, both as adolescents and later as adults. In surveying individuals emancipated from the foster care system, Reilly [16] found that some 11% reported exchanging sex for money since leaving care. Similarly, a small study of sexually abused youths in out-of-home care found that 15% were engaged in sex exchange at the time of the interview [17].

Early entry into sex work has been identified as a significant predictor of HIV infection in a number of recent studies [18–20]. Findings from this research indicate that initiation of sex work before the age of 18 confers multiple risks, including increased physical and sexual victimization, which likely contribute to higher levels of sexual risk behaviors among adolescent sex workers [18, 20, 21]. In addition, biological differences in the developing female genital tract also increase vulnerability to HIV infection in young women [22, 23]. Taken together, these findings suggest that sex work involvement during the adolescent

years may represent a critical period with regard to HIV acquisition. Given that adolescents in foster care often carry histories of abuse and instability, have few financial resources, and low social support [24], it is conceivable that early sex work may disproportionately impact this vulnerable group, thereby increasing risk for HIV.

Within this context, the present study examined foster care histories among drug-involved adult female sex workers. We explored the associations between foster placement, victimization, mental health, onset of sex work, patterns of sexual risk behaviors, and HIV infection among these highly vulnerable women. In particular, we sought to understand the connection between foster care history and age of entry into sex work and to describe their associations with HIV infection. Although foster care has been associated with a number of drug and sexual risk behaviors among youth in prior studies, to our knowledge this study is among the first to examine the associations between foster care history, patterns of sex work, and HIV infection in adulthood.

Methods

Target Population and Study Eligibility

The data for this analysis were drawn from a large randomized intervention trial designed to test the relative effectiveness of two case management protocols in: (1) linking underserved African American women with health services; and, (2) reducing risk behaviors for HIV. Participants in this intervention trial were drug-using African American women who solicit clients for sex exchange on the primary and secondary prostitution “strolls” in Miami, Florida. Study inclusion was limited to African American women based on the authors’ prior studies with sex workers in the Miami area, which indicated that African American women were nearly twice as likely as sex workers of other race/ethnic groups to test HIV-positive [25]. Eligible participants were defined as African American women ages 18–50 who had: (a) traded sex for money or drugs at least three times in the past 30 days; and, (b) used cocaine, crack, or heroin three or more times a week in the past 30 days.

Study Recruitment

Participants in the study were located for recruitment through traditional targeted sampling strategies [26], which are useful for studying hard-to-reach populations. Targeted sampling is a purposeful, systematic sampling method by which specified populations within geographical districts are identified, and detailed plans are constructed to recruit

specified numbers of individuals within each of the target areas.

Study recruitment was carried out by a team comprised of both professional outreach workers and active sex workers. The outreach staff was indigenous to the target recruitment areas, and several members of the team had prior experience conducting outreach for local community service and treatment agencies. In addition, the use of active sex workers as recruiters provided access to many locations on and off the primary “strolls” where potential participants were found. The use of sex worker recruiters yielded a variety of advantages in the recruitment effort, including: their familiarity with active drug user networks and drug “copping areas”; their ability to approach potential clients with appropriate language, dress, and methods; and, their insider status, which helped to build the trust and confidence necessary for successful outreach and recruitment, particularly with highly marginalized populations.

Field Site

Based on the study’s targeted sampling plan, the project’s intervention center was established to the north of downtown Miami near two of the major sex worker “strolls” in the area. This location is also immediately adjacent to several traditionally African American residential areas long steeped in poverty, and is easily reachable by public transportation, bicycle, or on foot. The project is known locally as “Women Protecting Women,” because it is designed exclusively for female clients and is fully staffed by women as well.

Study Procedures

Study recruiters made contact with potential participants in various street locations. Interested individuals participated in telephone screening for eligibility. Those meeting project eligibility requirements were scheduled for appointments at the project intervention center, where they were re-screened on arrival. After eligibility was confirmed, informed consent was obtained. The baseline interview was then administered, which took approximately 1 h to complete. Clients were paid a \$25 stipend upon completion of the baseline interview, and each received a hygiene kit containing a variety of risk reduction materials. Follow-up assessments were conducted at 3 and 6 months post baseline. Study protocols were approved by the University of Delaware’s Institutional Review Board.

Data Collection and Measures

Interviews were conducted using laptop computer-assisted personal interviews (CAPI). The Global Appraisal of

Individual Needs (GAIN, v. 5.4; [27]) was the primary component of the standardized baseline and follow-up assessments. This instrument captured detailed information on demographics, substance use, physical and mental health status, physical and mental health services utilization, barriers to services utilization, homelessness, victimization, treatment history, as well as lifetime and 90 day measures of drug use frequency and sexual risk behaviors.

Mental health subscales in the GAIN are based on DSM-IV-R symptom criteria: 9 items assess past year depression, 12 items assess past year anxiety, and 13 items assess stress disorders related to trauma over a 12 month period [27–29]. In all cases, higher scores indicate greater problem severity. Summary scores yield classifications of: none/minimal (0–1), moderate (2–5) and severe (6–9) for depression; none/minimal (0–1), moderate (2–6), and severe (7–12) for anxiety, and none (0), moderate (1–4) and severe (5–13) for traumatic stress. Alpha reliability coefficients for the depression, anxiety, and traumatic stress scales were 0.83, 0.87, and 0.8, respectively.

The General Victimization Scale (GVS) [30] is a measure of types of victimization experienced by the participant (including lifetime physical, emotional and sexual victimization), age of onset, the number of traumagenic factors involved in the victimization (six dichotomous items including duration and severity of abuse, type and relation of perpetrator, not being believed or helped), and current worry about victimization. Given the pervasive violence in the street sex work context, we chose not to ask the four “current worry” items as they were likely to be universally endorsed. As such, our study-specific GVS scale consisted of 11 items in total. We examined these elements independently in our analyses rather than relying on a single summary victimization score.

Beyond the GVS items, participants also reported past 90 day victimization by sex work clients, as well as all other perpetrators, including boyfriends, partners, family members, and strangers. Recent abuse by clients was measured by seven items querying numbers of past 90 day violent episodes, including physical assault, rape, and assault with weapons.

We supplemented the GAIN instrument with items on sex work, including age at first paid sex work, and overall length of sex work. Two additional items measure foster care history. The primary item assessing this domain was: “Were you ever placed in foster care before you were 18?” A secondary item queried the age of first foster placement.

The primary outcome measure for this analysis was HIV infection. Because HIV testing was beyond the scope of the study, these data were captured by self-report, using the following item: “What was the result of your last HIV test (for which you received the results)?”

Data Analysis

All analyses were conducted using the Predictive Analytics Software (PASW formerly SPSS) version 18. Only baseline data were examined for this paper.

Mental health scales (Depressive Symptoms Scale, Anxiety/Fear Symptoms Scale, and Traumatic Stress Index) were scored as none/minimal, moderate, and severe (“0”, “1”, or “2”) according to clinically meaningful cut points established by the scales’ authors. For analysis, participants classified as “severe” on any one of these three scales was considered to demonstrate SMI (serious mental illness).

For analysis, we dichotomized age at first paid sex work in order to examine the impact of adolescent versus adult initiation to the sex trade. We compared participants with sex work onset at age 17 or younger with those reporting onset at 18 or older. This cut point allows a useful comparison with the existing literature on adolescent female sex workers.

Descriptive analyses utilized χ^2 -square and *t*-tests to examine differences in sociodemographic factors, victimization, mental health, sex work onset, sexual risk behaviors, and HIV infection by foster care status.

Subsequently, a multivariate logistic regression model was developed to examine the main effects of foster care history and age of sex work initiation on HIV serostatus. Moderation effects were also examined by computing an interaction term for foster care and age of sex work onset. Following moderation analysis, a mediation model was tested a priori using the Baron and Kenny [31] approach, and a Sobel test was conducted to examine significance of the mediating effect. The mediating variable is sex work onset prior to age 18 (0 vs. 1), in which 1 indicates “yes”, and 0 indicates otherwise.

Results

Study recruitment began in May, 2007, and through June 2010, 562 eligible clients had been enrolled into the study and completed baseline interviews. Seventeen percent of the sample indicated a history of foster care placement. Table 1 presents descriptive information comparing foster care alumni with their non-foster care counterparts on demographics, victimization histories, mental health symptoms, sex work onset, sexual risk behaviors, and HIV status.

On average, women reporting foster care experience were several years younger (35.5 vs. 40.1, $t = 4.9$; $P < 0.01$) and were less likely to have completed a high school education than those with no history of foster care (34.4 vs. 50.9%, $\chi^2 = 8.7$; $P < 0.01$). The prevalence of homelessness in the past 90 days was elevated for both

groups, but did not differ by foster care status (58.3 vs. 54.1%, $\chi^2 = 0.58$; $P = 0.45$).

Foster care history was associated with a significantly higher lifetime prevalence of all abuse types, as well as onset of abuse prior to age 18. Recent victimization by sex work clients was also significantly more likely among the foster care group (43.8%) compared to their non-foster care counterparts (32.0%; $\chi^2 = 4.9$; $P = 0.03$). Of the women with lifetime histories of both foster care and abuse ($n = 85$), 45.9% reported that their first foster placement occurred prior to the onset of abuse.

Foster care alumni reported significantly higher past year symptomatology across all categories of psychological distress. Clinically significant or severe depression was reported by 69.8% of the foster care group versus 52.8% of the non-foster ($\chi^2 = 9.3$; $P < 0.01$) and severe anxiety by 52.1 versus 38.6% ($\chi^2 = 6.0$; $P = 0.02$), respectively. Past year traumatic stress was significantly higher among foster care participants as well, with 79.2% endorsing severe symptom levels compared to 60.3% of the non-foster group ($\chi^2 = 12.2$; $P < 0.01$).

Significantly earlier ages of sexual debut were reported by the foster care group compared to their non-foster counterparts (13.2 vs. 14.9; $t = 4.2$; $P < 0.01$). As well, age of entry into paid sex work differed significantly by foster care status, with 62% of foster care alumni initiating sex work prior to age 18, compared to 37% of those without foster history ($\chi^2 = 20.2$; $P < 0.01$). Finally, although current sexual risk behaviors showed no association with foster care status, foster care women reported a much higher prevalence of HIV infection (28.6%) than those without foster care history (16.3%; $\chi^2 = 7.6$; $P < 0.01$).

Table 2 displays the results of a multivariate logistic regression model predicting HIV seropositivity. Controlling for age, which differed significantly by foster care status in the bivariate analyses, we found that both foster care history and sex work onset prior to age 18 demonstrated significant main effects on HIV infection. The odds of HIV seropositivity were 3.7 times greater for foster alumni than their non-foster care counterparts ([95% CI 1.62, 8.35]; $P = 0.002$); similarly, the odds of HIV infection were 2.1 times higher among women reporting paid sex work before age 18, compared to women initiated to the sex trade at an older age ([95% CI 1.25, 3.54]; $P = 0.005$). The interaction term for foster care and sex work onset did not reach statistical significance (OR .49; [95% CI .166, 1.46]; $P = 0.20$), indicating that moderation was not present.

Foster care history had a significant association with both early sex work onset and HIV status in the bivariate analyses. Based on these findings, we tested a mediation model a priori to examine whether age at sex work onset mediated the relationship between foster care history and HIV serostatus, controlling for current age (Fig. 1).

Table 1 Selected characteristics of drug-involved female sex workers by foster care history ($N = 562$)

Variable	Foster care ($n = 96$)	No foster care ($n = 466$)	Test of statistical difference (P value)
Demographics			
Age (mean/SD)	35.5 (9.1)	40.1 (8.2)	$t = 4.9$ ($P < 0.01$)
Education			
High school or more (% yes)	34.4	50.9	$\chi^2 = 8.7$ ($P < 0.01$)
Homeless (% yes past 90 days)	58.3	54.1	$\chi^2 = 0.58$ ($P = 0.45$)
Victimization			
Ever attacked with weapon	81.3	63.9	$\chi^2 = 10.8$ ($P < 0.01$)
Ever struck or beaten	76.0	64.6	$\chi^2 = 4.7$ ($P = 0.03$)
Ever raped/sexually abused	77.1	58.7	$\chi^2 = 11.4$ ($P < 0.01$)
Ever emotionally abused	88.5	75.5	$\chi^2 = 7.8$ ($P < 0.01$)
Abuse before age 18 (% yes)	68.8	45.5	$\chi^2 = 17.2$ ($P < 0.01$)
Violence from clients (% yes past 90 days)	43.8	32.0	$\chi^2 = 4.9$ ($P = 0.03$)
Violence from others (% yes past 90 days)	21.9	16.3	$\chi^2 = 1.7$ ($P = 0.19$)
Abuse-related traumagenic factors (mean/SD) ^a	4.7 (1.2)	4.0 (1.4)	$t = -4.5$ ($P < 0.01$)
Mental health			
Severe depression (% yes past year)	69.8	52.8	$\chi^2 = 9.3$ ($P < 0.01$)
Severe anxiety (% yes past year)	52.1	38.6	$\chi^2 = 6.0$ ($P = 0.02$)
Severe traumatic stress (% yes past year)	79.2	60.3	$\chi^2 = 12.2$ ($P < 0.01$)
Any SMI (% yes past year)	87.5	71.2	$\chi^2 = 10.9$ ($P < 0.01$)
Sexual risk			
Age 1st sex (mean/SD)	13.2 (3.7)	14.9 (3.5)	$t = 4.2$ ($P < 0.01$)
Sex work before age 18 (% yes)	61.5	36.7	$\chi^2 = 20.2$ ($P < .01$)
No. of sexual partners, past 90 days (mean/SD)	21.5 (32.5)	19.4 (42.6)	$t = -0.47$ ($P = 0.64$)
No. unprotected sex acts, past 90 days (mean/SD)	22.2 (62.4)	16.5 (40.1)	$t = -1.1$ ($P = 0.26$)
Health outcomes			
HIV + (% yes) ^b	28.6	16.3	$\chi^2 = 7.6$ ($P < 0.01$)

^a $N = 494$, includes only those reporting any history of abuse

^b $N = 534$, includes only those reporting prior HIV testing and result

Table 2 Multivariate logistic regression model predicting HIV serostatus among drug-involved female sex workers

	B	Odds ratio	95% CI	Sign.
HIV + status^a				
Age	0.066	1.068	(1.04, 1.10)	0.000
Foster care ^b	1.30	3.681	(1.62, 8.35)	0.002
Sex work before age 18 ^b	0.743	2.103	(1.25, 3.54)	0.005
Foster*sex work < 18	-0.711	0.491	(0.166, 1.46)	0.200

^a $N = 534$

^b Reference category is 'no'

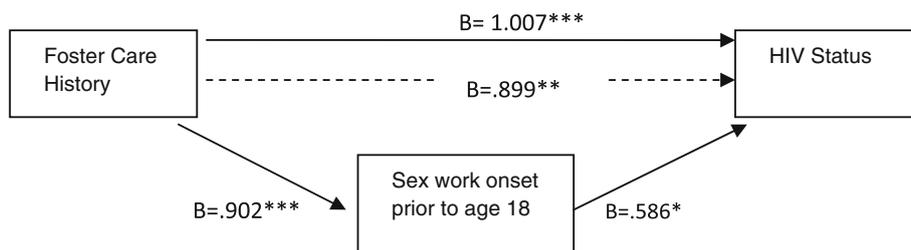


Fig. 1 Regression model examining mediation effects of early sex work on the relationship between foster care history and HIV status. *Indicates significance at $P \leq 0.05$, **indicates significance at $P \leq 0.01$, ***indicates significance at $P \leq 0.001$

Foster care history predicted both the outcome variable, HIV status, (OR 2.737; [95% CI 1.575, 4.757]; $P < 0.001$), and the mediator, sex work prior to age 18 (OR 2.464; [95% CI 1.554, 3.908]; $P < 0.001$). Controlling for foster care history, early sex work was also found to predict HIV status (OR 1.797; 95% CI [1.133, 2.849]; $P < 0.05$). In a regression model that included both foster history and age of sex work onset as predictors of HIV status, the impact of foster history was reduced and the association between age of sex work onset and HIV status was significant ($P < 0.05$). A Sobel test was performed to test for mediation. The result (2.091; $P = 0.037$; 2-tailed) indicated that the indirect effect of foster care history through the mediator, early sex work onset, was significant.

Discussion

The present study documented an elevated prevalence of foster care history among a large sample of highly vulnerable female sex workers. Seventeen percent reported foster care placement as children, which far exceeds estimates of 2–3% among the US adult general population [32]. Interestingly, foster care history is also disproportionately elevated in other marginalized adult populations, including jail inmates and the homeless, where prevalence of foster care history reaches 25–30% [32–35]. While not causal, the magnitude of foster care history among high-risk adult populations would appear to warrant further investigation in well-controlled epidemiologic studies.

To our knowledge, this study is one of the first to explore foster care history as it relates to health behaviors and outcomes among marginalized adult women. While the overall sample of female sex workers was characterized by high levels of social problems and life stressors, our findings indicate that foster care history was associated with additional disadvantage in a number of areas, including lower educational attainment, higher victimization, and more severe mental health problems. Although it is reasonable to expect that the prevalence of early abuse would be higher among foster care participants based on events that may have led to placement, our findings indicate that for many women, abuse first occurred after entry into the foster care system. While not conclusive given the limitations of our data, this finding provides some support for the idea that foster placement may contribute to adversity and instability in the lives of vulnerable young women.

We found that women with foster care histories reported significantly earlier entry into paid sex work, with some 62% active in the sex trade prior to age 18. Our subsequent multivariate analyses demonstrated that foster care history was strongly associated with early entry into sex work, and

was directly associated with HIV infection as well. This is consistent with recent findings demonstrating that paid sex work in adolescence represents a strong predictor of HIV infection [18–20]. Our analyses indicated that sex work onset before age 18 partially mediated the relationship between foster history and HIV infection. This provides evidence that early sex work onset carries a portion of the influence of foster care history to HIV status. Interestingly, the main effects of foster care on HIV infection remained strong even when age of sex work onset was included as a mediator, suggesting that other, perhaps unmeasured, correlates of foster care also contribute to risk for HIV.

Our findings should be viewed within the context of several study limitations. First, our study gathered retrospective data from a sample of marginalized women sex workers. We do not suggest that our data are generally representative of foster care experience, nor are we able to demonstrate a causal effect of foster care placement on the outcomes reported by our sample. In addition, this study was not designed to examine the impact of foster care placement, and therefore we may lack detailed data on aspects of participants' foster care histories that contributed to the findings we observed. Finally, the data were gathered exclusively through self-report, and therefore information on foster care placement, HIV risk behaviors, victimization, and mental health symptoms may have suffered from reporting biases. Although we are confident that the use of specially trained female interviewers mitigated potential reporting deficiencies to a good extent, caution is nevertheless warranted in interpretation.

Despite these limitations, this study provided substantial evidence that foster care history is associated with early initiation to the sex trade. Consistent with the literature on adolescent sexuality that indicates low levels of condom use among sexually active adolescent girls [36–38], we speculate that early sex work among our sample was likely accompanied by high levels of unprotected sexual behavior, which though unmeasured in the current study, would reasonably contribute to the elevated level of HIV infection we documented.

Because prospective, longitudinal examinations of health-related risk behaviors and outcomes among foster care alumni are not widely available, it is difficult to situate the data from the present study within the context of prior research. One small study that surveyed young adults within 5 years of foster care emancipation found that 30% had experienced a serious health problem, 32% needed care and could not obtain it, and that only 54% rated their health as very good or excellent [16]. These trends are troubling for a group of young people below age 25, and it is reasonable to suggest that health problems among such a cohort would only increase over time. Clearly, the potential long-term health vulnerabilities associated with foster care

experience are understudied and warrant additional research.

Among this sample of African American women already disadvantaged by poverty and discrimination, foster care placement and early entry into the sex trade were associated with heightened risk for HIV acquisition. From a public health perspective, it appears critical that transitional services offered for young women aging out of foster care be augmented to address health-related risks, particularly increasing access to HIV prevention education and testing. Independent living and life skills programs that have been implemented in many communities may serve as the most appropriate vehicle for this type of HIV prevention initiative. Given that the foster care system is already overburdened and underfunded, brief, low-cost group-level educational interventions would appear to be most feasible in addressing this need. In view of the fact that nearly 30% of foster care alumni in our sample reported being HIV-positive, the implications for HIV prevention are significant.

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References

1. US Department of Health and Human Services. Child Welfare Information Gateway. Fact sheet: foster care statistics (February 2009). <http://www.childwelfare.gov/pubs/factsheets/foster.pdf>. Accessed 24 Aug 2010.
2. Gramkowski B, Kools S, Paul S, Boyer CB, Monasterio E, Robbins N. Health risk behavior of youth in foster care. *J Child Adolesc Psychiatr Nurs*. 2009;22(2):77–85.
3. Rosenfeld A, Pilowsky D, Fine P. Foster care: an update. *J Am Acad Child Adolesc Psychiatry*. 1997;36:448–58.
4. Pilowsky DJ, Wu L. Psychiatric symptoms and substance use disorders in a nationally representative sample of American adolescents involved with foster care. *J Adolesc Health*. 2006;38:351–8.
5. Pecora PJ, White CR, Jackson LJ, Wiggins T. Mental health of current and former recipients of foster care: a review of recent studies in the USA. *Child Fam Soc Work*. 2009;14:132–46.
6. Jones Harden B. Safety and stability for children in foster care: a developmental perspective. *Futur Child*. 2004;14(1):31–48.
7. Reinherz H, Giaconia R. Comorbidity of substance use post-traumatic stress disorders in a community sample of adolescents. *Am J Orthopsychiatry*. 2000;70:253–63.
8. Riggs S, Alario AJ, McHorney C. Health risk behaviors and attempted suicide in adolescents who report prior maltreatment. *J Pediatr*. 1990;116:815–21.
9. Rotheram-Borus MJ, Mahler KA, Koopman C, Langabeer K. Sexual abuse history and associated multiple risk behavior in adolescent runaways. *Am J Orthopsychiatry*. 1996;66(3):390–400.
10. Taussig HN. Risk behaviors in maltreated youth placed in foster care: a longitudinal study of protective and vulnerability factors. *Child Abuse Negl*. 2002;26:1179–99.
11. Silverman A, Reinherz H, Giaconia R. The long-term sequelae of child and adolescent abuse: a longitudinal community study. *Child Abuse Negl*. 1996;20:709–23.
12. Backovic D, Marinkovic JA, Grujlcic-Sipetic S, Maksimovic M. Differences in substance use patterns among youths living in foster care institutions and birth families. *Drugs Educ Prev Policy*. 2006;13(4):341–51.
13. Redding R, Fried C, Britner P. Predictors of placement outcomes in treatment foster care: implications for foster parent selection and service delivery. *J Child Fam Stud*. 2000;4:425–47.
14. Doyle JJ. Child protection and child outcomes: measuring the effects of foster care. *Am Econ Rev*. 2007;97(5):1583–610.
15. Carpenter SC, Clyman RB, Davidson AJ, Steiner JF. The association of foster care or kinship care with adolescent sexual behavior and first pregnancy. *Pediatrics*. 2001;108(3):1–6.
16. Reily T. Transition from care: status and outcomes of youth who age out of foster care. *Child Welf*. 2003;82(6):727–46.
17. Farmer E, Pollock S. Managing sexually abused and/or abusing children in substitute care. *Child Fam Soc Work*. 2003;8:101–12.
18. Silverman J. Adolescent female sex workers: invisibility, violence and HIV. *Arch Dis Child*. 2011;96:478–81. doi:10.1136/adc.2009.178715.
19. Shannon K, Bright V, Gibson K, Tyndall M. Sexual and drug-related vulnerabilities for HIV infection among women engaged in survival sex work in Vancouver, Canada. *Can J Public Health*. 2007;98:465–9.
20. Decker M, McCauley H, Phuengsamran D, Janyam S, Silverman J. Sex trafficking, sexual risk, sexually transmitted infection and reproductive health among female sex workers in Thailand. *J Epidemiol Community Health*. 2010. doi: 10.1136/jech.2009.096834.
21. Limpakarnjanarat K, Mastro T, Saisorn S, Uthavivoravit W, Kawkungwal J, Korattana S, Young N, Morse S, Schmid D, Weniger B, Nieburg P. HIV-1 and other sexually transmitted infections in a cohort of female sex workers in Chiang Rai, Thailand. *Sex Transm Infect*. 1999;75:30–5.
22. Silverman J, Decker M, Gupta J, Maheshwari A, Willis BM, Raj A. HIV prevalence and predictors of infection in sex-trafficked Nepalese girls and women. *JAMA*. 2007;298:536–42.
23. Gupta J, Raj A, Decker M, Reed E, Silverman J. HIV vulnerabilities of sex-trafficked Indian women and girls. *Int J Gynaecol Obstet*. 2009;107:30–4.
24. Lopez P, Allen PJ. Addressing the health needs of adolescents transitioning out of foster care. *Pediatr Nurs*. 2007;33(4):345–55.
25. Inciardi JA, Surratt H, Kurtz S. HIV, HBV and HCV infections among drug-involved, inner city, street sex workers in Miami, Florida. *AIDS Behav*. 2006;10:139–47.
26. Watters J, Biernacki P. Targeted sampling: options for the study of hidden populations. *Soc Prob*. 1989;36:416–30. doi:10.1525/sp.1989.36.4.03a00070.
27. Dennis ML, Titus JC, White MK, Unsicker JJ, Hodgkins D. Global appraisal of individual needs—initial (GAIN-I). Bloomington: Chestnut Health Systems; 2002.
28. Bohlrig EM, Dennis ML. Development of an abbreviated symptom checklist: preliminary analysis of the HSCL-90 in a methadone-maintenance population. NC: Research Triangle Institute. 1996.
29. Kulka RA, Schlenger WE, Fairbank JA, Jordan BK, Hough RL, Marmar CR, Weiss DS. Assessment of post traumatic stress disorder in the community: prospects and pitfalls from recent studies of Vietnam Veterans. *Psychol Assess*. 1991;3:547–60. doi:10.1037/1040-3590.3.4.547.
30. Titus JC, Dennis ML, White WL, Scott CK, Funk RR. Gender differences in victimization severity and outcomes among adolescents treated for substance abuse. *J Child Maltreatment*. 2003;8(1):19–35. doi:10.1177/1077559502239612.
31. Baron R, Kenny D. The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J Pers Soc Psychol*. 1986;51:1173–82. doi:10.1037/0022-3514.51.6.1173.

32. Firdion J. Foster care. In: Levinson D, editor. *Encyclopedia of homelessness*. Thousand Oaks: Sage; 2004. p. 167–71.
33. Burt M, Aron L, Douglas T, Valente J, Lee E, Iwen B. *Homelessness: programs and the people they serve*. Washington, DC: Interagency Council on the Homeless; 1999.
34. Burt M, Aron L, Lee E. *Helping America's homeless: Emergency shelter or affordable housing?*. Washington, DC: The Urban Institute Press; 2001.
35. James D. *Profile of jail inmates, 2002*. Washington, DC: US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics; 2004.
36. Kaiser Family Foundation. *US teen sexual activity*. Washington, DC: Henry J. Kaiser Family Foundation; 2005.
37. Crosby R, DiClemente R, Wingood G, Cobb B, Harrington K, Davies S, Hook E, Kim Oh M. Condom use and correlates of African American adolescent females' infrequent communication with sex partners about preventing sexually transmitted diseases and pregnancy. *Health Educ Behav*. 2002;29:219–31.
38. Teitelman A, Ratcliffe S, Morales-Aleman M, Sullivan C. Sexual relationship power, intimate partner violence, and condom use among minority urban girls. *J Interpers Violence*. 2008;23:1694–712.