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Trauma and Transmission:

A Qualitative Study of HIV Risk Behaviors in Women with Incarcerated Partners

By

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To my parents, brother, Taylor, and Paxton

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Literature Review

INTRODUCTION

Women with incarcerated male partners, defined as women in committed heterosexual relationships with men in prison or jail, are vulnerable to acquiring HIV infection through the pathways of trauma, PTSD, and substance misuse. This already vulnerable subpopulation's HIV risk is potentially increased further by incarceration. In this review of literature, I will present empirical studies of: 1) the effect of incarceration on HIV risk, 2) women with incarcerated partners as a high-risk group for HIV, 3) the role of trauma in increasing HIV risk in an already vulnerable population, and 4) current HIV prevention interventions for high-risk women and how the interventions incorporate the cumulative contexts of HIV risk that affect many women with incarcerated partners.

HIV AND INCARCERATION

A brief history of mass incarceration in the United States

In 1982, President Ronald Reagan officially declared the war on drugs (Alexander, 2010). A few years following this declaration, crack cocaine began to infiltrate African-American inner-city neighborhoods. Crack cocaine use was widely sensationalized in the media, and public support mounted for tough anti-crack legislation (Alexander, 2010). The laws passed by Congress were disproportionately stringent, and some argued that they led to racial biases. Crack cocaine could lead to jail time sometimes 100 times longer than for powder cocaine convictions, and while possession of 500 grams of powder cocaine was required to mandate a minimum five-year sentence, it only required possession of 28 grams of crack cocaine for the same sentence (Shein, 1993).

It has been thirty years since the declaration of the war on drugs, and the United States incarcerates more people per capita than any other country in the world, with 2.3 million adults in jail or prison (West, 2010). Incarceration most affects individuals in low-income communities, disproportionately affecting African-American men, who make up 40% of the incarcerated population, despite comprising only 14% of the population (Rastogi, Johnson, Hoeffel, & Drewery, 2011). Despite the supposed original intent of curtailing violence with harsh laws demanding long sentences, the majority of drug arrests are for relatively minor, non-violent offenses, much more often due to possession rather than sales (Alexander, 2010). This has led to the social concentration of incarceration among specific populations (Garland, 2001), resulting in high levels of absence of fathers and partners from impoverished neighborhoods. Because the incarcerated population is dynamic and prisoners move between correctional facilities and their communities, the effects of incarceration – both at the community and individual level – reverberate loudly outside the walls of prisons and jails.

The effect of mass incarceration on HIV in the community

With nearly a million African-American men incarcerated and many of these men coming from the same inner-city neighborhoods, these communities feel first-hand the

effects of the absence of these men. Incarceration can increase opportunities for HIV-discordant relationships by interfering with sexual networks and increasing the number of changes in sexual partnership, possibly increasing sexual relationships between high- and low-risk individuals (Khan, Epperson, et al., 2011b).

Additionally, the high rate of incarceration can influence transmission of HIV in the community by lowering the male-to-female sex ratio, which may alter intimate relationship dynamics. Studies have shown that a lower sex ratio is associated with greater HIV risk behaviors, such as unprotected sex with a risky partner (Green et al., 2012; Pouget, Kershaw, Niccolai, Ickovics, & Blankenship, 2010). A study of racial/ethnic disparities in heterosexual HIV transmission used Census data to find that African-American men in counties with a low sex ratio and high incarceration rate were significantly more likely to have multiple partners (Pouget et al., 2010). The low male-to-female sex ratio may also shift the sexual power dynamic to favor the men in other ways. For example, men may be able to more easily engage in non-monogamous relationships, placing women at greater risk of infection. This may also lessen women's power to negotiate for safer sex, out of fear that the man may leave her for a woman who is, for example, less stringent about condom use (Thomas & Sampson, 2005).

HIV in the incarcerated population

In addition to the effects of incarceration on HIV risk in the community, HIV directly and profoundly impacts incarcerated individuals. HIV seroprevalence in the incarcerated population is reported to be about four times greater than in the general population (Maruschak, 2010). It is expected that the actual seroprevalence is even higher given that HIV testing is not mandatory in prisons (Grinstead, Comfort, McCartney, Koester, & Neilands, 2008; Lanier & Paoline, 2005). Further, one study estimated that about a quarter of all individuals with HIV had spent time in prison or jail in a given year, despite only about 3% of the overall US population spending time in prison or jail during the same time period (Hammett, Harmon, & Rhodes, 2002).

This disproportionately high HIV rate among the incarcerated population is primarily attributed to a greater history of injection drug use and deep-seated forces of racism and structural barriers that affect the populations who also have a high prevalence of incarceration (Grinstead et al., 2005). The majority of HIV infection is thought to occur outside of correctional facilities. However, HIV transmission may occur within prisons or jails, although it is difficult to accurately estimate the frequency of this type of transmission (Centers for Disease Control and Prevention (CDC), 2006; Grinstead et al., 2005; Thomas, Levandowski, Isler, Torrone, & Wilson, 2008). Unprotected sex may occur in prison among men who identify as heterosexual for a variety of reasons. In ethnographic interviews, recently released men cited satiation of their sexual needs and the need to have a partner to protect them from violence as reasons that they had sex with other prisoners while incarcerated (Thomas et al., 2008). Needles may also be shared for tattooing and injection of drugs during incarceration (Lane et al., 2004).

Women with incarcerated partners and HIV risk

Women with incarcerated partners most often live in the same low-income communities that are devastated by incarceration, which means that the majority are low-income African-American and Latina women. Although the National Sexual Health Survey found that 7% of women reported having a male intimate partner with any history of incarceration, a study of urban African-American women found that a staggering 22% had an intimate partner with a history of incarceration (Grinstead et al., 2005). Another study estimated that 42% of low-income women in San Francisco have a sexual partner with a history of incarceration (Kim, Page-Shafer, Ruiz, & Reyes, 2002).

In addition to exposure to incarceration through incarcerated partners, women with incarcerated partners are also more likely to have been indirectly exposed to incarceration through family members. A study of men who were recently released from prison in the San Francisco Bay Area and their female partners found that women with recently released partners had an average of 4.3 family members who were incarcerated (Wildeman et al., 2013). Women with incarcerated partners are likely to have experienced personal incarceration as well; the same study found that 60% of women with recently released partners had spent time in prison or jail during their lifetime (Wildeman et al., 2013). A study in Baltimore similarly found that 85% of women with incarcerated partners reported having ever been arrested (Davey-Rothwell et al., 2012). This is significant given that studies have demonstrated that women with a personal history of incarceration are significantly more likely than women in the general population to inject drugs, engage in sex work, and have a history of forced sex, potentially further compounding the risk behaviors associated with having a partner with a history of incarceration (Davey-Rothwell et al., 2012; Kim et al., 2002).

Other potential factors affecting HIV risk in women with incarcerated partners include possibly low levels of education attainment with higher likelihood of having dropped out of high school (Wildeman, Lee, & Comfort, 2013). Low-income minority women with low levels of education attainment are already at high risk for HIV due to poverty, racism, and structural barriers such as poor healthcare access, and this risk is further increased by the prevalence of incarceration in the communities that they belong to (Harawa & Adimora, 2008).

Incarceration-related HIV risks affecting women with incarcerated partners

Women with incarcerated partners are exposed to additional HIV risk due to the transient nature of incarceration. Incarcerated individuals, who have a higher HIV seroprevalence and may be exposed to additional HIV risks during incarceration, frequently move between correctional facilities and their communities due to short sentences and incarceration for parole violations. This can impact HIV transmission given that about half of all incarcerated men identify as being in a committed heterosexual relationship with the intention of reuniting with their partners upon release (Grinstead Reznick, Comfort, McCartney, & Neilands, 2010; Khan, Behrend, et al., 2011a). In a study

using ethnographic interviews with prisoners who were released, several men expressed a need to release their pent-up sexual frustration by having sex with multiple women upon release (Thomas et al., 2008). Some of these interviewees also discussed their return to heterosexual activity upon release and their inability to disclose their sexual activity during incarceration to their female partners (Thomas et al., 2008). Furthermore, a study found that after the release of HIV-positive individuals from a prison in North Carolina, the average time until sex was six days after release and that 30% of these individuals believed that the possibility of transmitting HIV to their main sex partner was "very likely" or "somewhat likely" (Stephenson et al., 2006).

In addition to the high HIV seroprevalence rates among prisoners and the risk of transmission of HIV inside prisons, women with incarcerated partners may face additional HIV risks generated by the emotional strain they experience while their partners are incarcerated (Comfort, Grinstead, Faigeles, & Zack, 2000). Studies have found that emotional distress, defined as depression or anxiety, is linked to greater HIV risk behaviors, including risky sexual behavior and the sharing of needles and injection tools (Sterk, Theall, & Elifson, 2006). The hardships that women may experience in their partners' absence, such as social stigma, financial difficulties, and separation from family and friends who criticize the relationship, may also isolate them from other members of their network and increase dependence on their incarcerated partners. This increase in dependence may push women to reassure their partner that they trust in him by taking additional risks such as having unprotected sex (Comfort et al., 2000).

The loss of male partners to prisons and jails may leave women financially strained. As a result, some women may resort to sex work to supplement their lessened income (Kramer & Comfort, 2011). Other women may seek new partners for financial help, as well as emotional and physical support. One study found that 50% of women with incarcerated primary partners reported having other sex partners during their primary partner's incarceration and that they were three times more likely than those without an incarcerated partner to have had five or more sexual partners in the past year (Davey-Rothwell et al., 2012). This need for support may be intensified by stigma associated with having an incarcerated partner, which could inhibit the woman from seeking public assistance or social services (Davey-Rothwell et al., 2012). The seeking out of non-incarcerated partners may increase the woman's HIV risk, possibly through the development of a power-skewed relationship driven by financial dependence (Thomas et al., 2008). These financial needs are most urgent for women with children, which is significant given that about 60% of men in prison have children (Austin & Irwin, 2011).

Open communication is associated with increased condom use and decreased unprotected sex (Bruhin, 2003). However, women with incarcerated partners may encounter difficulty communicating with their partners about sex. During the partner's incarceration, the in-person visits lack privacy, stifling the couple's ability to openly discuss sexual health issues such as HIV testing or condom use (Kramer & Comfort, 2011). After the partner's release, communication difficulties remain and can worsen as the men struggle to find employment, contribute to the household, and adjust to life outside the prison (Braman, 2007; Hagan & Coleman, 2001; Kramer & Comfort, 2011; Travis & Waul, 2004).

Also contributing to women's HIV risk after release is the perception held by many female partners that prisons and jails do not increase the risk of becoming infected with HIV (Kramer & Comfort, 2011). Confusion around HIV testing policies in correctional facilities can also lead women to believe that their partners are mandatorily tested and that they would be informed if the partner received a positive test result (Comfort et al., 2000). Despite the increase in HIV seroprevalence among incarcerated men, less than a quarter of women visiting their primary partners in prison believed that incarcerated men were more likely to be infected with HIV (Grinstead et al., 2005). This perception may prevent women from feeling the need to protect themselves with a recently released partner (Comfort et al., 2000; Grinstead et al., 2005; Kramer & Comfort, 2011). Additionally, in the context of instability, unprotected sex may be an important means of showing that commitment has been maintained, even through constant cycles between incarceration and freedom (Comfort, Grinstead, McCartney, Bourgois, & Knight, 2005). All of these barriers to communication and comprehension, in the context of showing commitment, work together to increase sexual risk behaviors.

Assessing HIV risk and prevalence in women with incarcerated partners

Multiple studies have shown associations between having a partner with a history of incarceration and high-risk behaviors independent of socioeconomic factors such as poverty and substance use, including unprotected sex, sex work, multiple sex partners, and partner concurrency (Davey-Rothwell, Villarroel, Grieb, & Latkin, 2012; Epperson, El-Bassel, Chang, & Gilbert, 2010; Khan, Miller, et al., 2008a; Khan, Wohl, et al., 2008b; Kim et al., 2002; Rogers et al., 2012). Although there are no known statistics specifically regarding HIV prevalence in women with incarcerated partners, it is known that these women are likely to belong to the same communities affected by incarceration. Thus, women with incarcerated partners are more likely to be low-income and African-American or Latina – two minority groups that collectively account for almost 80% of new HIV infections among women (Centers for Disease Control and Prevention (CDC), 2011). Additionally, given that over 80% of new HIV infections among women are due to heterosexual contact, relationship dynamics influencing sexual risk behaviors play a critical role in HIV transmission among women (Centers for Disease Control and Prevention (CDC), 2011).

TRAUMA AND HIV RISK BEHAVIORS

Trauma exposure can be caused by events that involve experiencing or witnessing threat to life or physical integrity, including rape and sexual assault, child abuse, being kidnapped, torture, witnessing violence, and war (Donovan, Neylan, Metzler, & Cohen, 2012; Kessler, 1995). Trauma is fairly common in the general population, with at least half of all US adults having experienced at least one major traumatic stressor (Kessler, 1995). Trauma has been associated with an increase in sexual risk behaviors and injection drug use, which both directly increase HIV risk. Additionally, it is associated with substance use, which may increase the risk for unprotected sex and multiple partners (Dube et al., 2003; Gielen et al., 2007).

Childhood trauma

Epidemiology in the United States

There is a growing body of research on the influence of childhood trauma on chronic diseases and social and emotional problems. This rising interest was stimulated by the CDC's National Center for Chronic Disease Prevention and Health Promotion in a study of over 17,000 adult HMO members at Kaiser Permanente. Adverse childhood experiences were measured using the ACE score, which is calculated based on answers to questions about exposure to abuse, neglect, witnessing domestic violence, and household dysfunction. Baselines surveys were taken from 1995 to 1997 with participant follow-up for more than fifteen years. The results from the baseline survey led to the publication of a number of papers demonstrating the significant impact of the ACE score on a variety of health outcomes, including chronic disease such as autoimmune disease and ischemic heart disease, reproductive health such as fetal death and teen pregnancy, sexual behavior, health risk behaviors such as drug and alcohol abuse and obesity, intimate partner violence, and mental health issues such as depression and suicidality. A graded relationship was found for many of the health outcomes, lending support to the idea that there is a neurobiological relationship and that cumulative trauma causes a proportional increase in adverse health outcomes. The findings were also surprising in that adverse childhood experiences were found to be fairly common, with 52% experiencing at least one (Felitti et al., 1998). However, white and Asian individuals, as well as college graduates, were found to have experienced statistically fewer adverse childhood experiences (Felitti et al., 1998).

According to the annual child maltreatment report published by the Children's Bureau of the U.S. Department of Health & Human Services, there were an estimated 681,000 unique victims of child maltreatment – neglect, physical abuse, psychological maltreatment, or sexual abuse – in 2011. The most common type of child maltreatment was neglect (78.5%), with a much lower rate of physical abuse (17.6%), and a sexual abuse rate of 9.1%, which is a pattern consistent with prior years ("Child Maltreatment 2011," 2012). African-American children had the highest rates of victimization at 14.3 victims per 1,000 children in the population, followed by American Indian or Alaska Native children at a rate of 11.4 victims per 1,000 children, and multiple racial descent children at a rate of 10.1 victims per 1,000 children. Hispanic children were victimized at a rate of 8.6 victims per 1,000 children, and white children at a rate of 7.9 victims per 1,000 children. This percentage and rate among ethnicities has been steady over several years ("Child Maltreatment 2011," 2012). Many papers have attempted to explain why African-American children are involved in cases of child maltreatment at almost twice the rate of white children. In investigating this racial disparity in child maltreatment, a study in *Pediatrics* found that the racial differences were more likely to be due to higher risk due to factors such as poverty rather than racial reporting bias (Drake et al., 2011).

Epidemiology among high-risk women

There is reason to believe that childhood trauma may be even more common among women with incarcerated partners. As discussed earlier, women with incarcerated

partners are most commonly African-American or Latina, from low-income communities, and have lower levels of education attainment. Studies have found that childhood trauma is associated with behaviors more commonly found in women with incarcerated partners, such as higher rates of substance use and sexual risk behaviors (Davey-Rothwell et al., 2012; Khan, Wohl, et al., 2008b). There is also evidence that women with incarcerated or recently released partners have a higher than average number of family members with a history of incarceration, which may have contributed to trauma if they were witness to a family member's arrest or experienced household dysfunction as children as a result of family member's incarceration (Harlow, 1999; Wildeman et al., 2013). Additionally, women with incarcerated partners are more likely to have a personal history of incarceration. A survey of inmates and probationers conducted by the Bureau of Justice Statistics found that women in the correctional population were more likely to have experienced child abuse than women in the general population, with 23-37% of inmate women reporting having been physically or sexually abused as children, compared to 12-17% in the general population (Harlow, 1999). Interestingly, the survey found that men in the correctional population did not face significantly different rates of child abuse from men in the general population. Among female prisoners, nonparental care was also found to be a risk factor, with abuse reported by 87% of female prisoners who had spent their childhood in foster care or institutions (Harlow, 1999). Nonparental care may be common among women with incarcerated partners as well: A recent Bay Area survey of women with incarcerated partners found that 20% were in foster care before the age of eighteen (Wildeman et al., 2013).

Influence on HIV risk behaviors

Child maltreatment via the ACE score has been linked to a variety of HIV risk behaviors, including illicit drug use, injected drug use, and promiscuity (Anda et al., 2006). There is a strong link between childhood trauma and substance use. Studies show that as many as two-thirds of individuals undergoing treatment for substance misuse report physical, sexual, or emotional abuse during childhood (Rohsenow, Corbett, & Devine, 1988; Swan, 1998). One of the retrospective cohort ACE studies found that each ACE increased the likelihood of drug initiation, illicit drug use problems, addiction to illicit drugs, and parenteral drug use across all four cohorts (Dube et al., 2003). Another ACE study looking specifically at the effects of sexual abuse found that women who experienced childhood sexual abuse had significantly increased adjusted odds ratios for later having alcohol problems and using illicit drugs, as well as suicide attempts, depression, marrying an alcoholic, and having current marriage and family problems (Dube et al., 2005). The likelihood of having a substance use disorder in women who were sexually abused as children may be associated with the type of sexual abuse experienced. An epidemiologic study found that the odds ratio for drug dependence and intercourse sexual abuse was especially high at 5.7, while it was lower for other types of sexual abuse (Kendler et al., 2000). Other studies reflect similar patterns of sexual abuse by intercourse being associated with greater risk of adverse consequences (Dube et al., 2005).

Additionally, childhood trauma is associated with sexual risk behaviors. The ACE studies have found that ACEs have a graded relationship with early onset of intercourse,

high lifetime number of sexual partners, history of sexually transmitted disease, and self-perceived risk for AIDS (Felitti et al., 1998; Hillis, Anda, Felitti, & Marchbanks, 2001; Hillis, Anda, Felitti, Nordenberg, & Marchbanks, 2000). A possible explanation for this is that women who have experienced childhood trauma may be less able to protect themselves and that their desire to achieve intimacy may outweigh their perceived risks.

Intimate partner violence

Epidemiology in the United States

Intimate partner violence is defined as physical, sexual, or psychological harm by a current or former partner or spouse (Saltzman, Fanslow, McMahon, & Shelley, 2002) Although both men and women are victimized by an intimate partner, 86 percent of victims are female (Shannan Catalano, 2012). In fact, almost a third of women will be a victim of intimate partner violence at some point in their lives ("Intimate Partner Violence and Healthy People 2010 Fact Sheet," 2003). However, intimate partner violence disproportionately affects women depending on household composition, with women in single-mother families being the most severely affected. According to the Bureau of Justice Statistics' National Crime Victimization Survey, females 12 and over in single-mother households were ten times more likely to experience intimate partner violence compared to households with married adults and children, and six times more likely to experience intimate partner violence compared to single women with no children (Shannan Catalano, 2012). There are also some slight racial disparities. The rate of intimate partner violence in black women has been higher than white women in the period 1993-2010 for fourteen of the eighteen recorded years, but the difference was insignificant for the latest numbers for 2009-2010 (Shannan Catalano, 2012).

Epidemiology among high-risk women

Women who are particularly vulnerable to intimate partner violence often belong to population subgroups that are also vulnerable to HIV transmission. This includes young women, women who use substances, women living in poverty, and African-American women, although it is unclear what is responsible for this racial disparity (Gielen et al., 2007). We have established in the previous childhood trauma section that childhood trauma is associated with behaviors such as substance use and sexual risk behaviors and that women with incarcerated partners and women with a personal history of incarceration are more likely to report child abuse compared to the general population. Additionally, a risk factor for child abuse is nonparental care, which is more common among incarcerated women and women with incarcerated partners. There is significant overlap between risk factors for childhood trauma and intimate partner violence. One of the ACEs is the witnessing of intimate partner violence growing up, and studies have shown that witnessing of intimate partner violence is associated with a significant increase in the total number of ACEs. Individuals who grew up witnessing intimate partner violence had an adjusted odds ratio about two to six times higher for any individual ACE than those who did not grow up witnessing intimate partner violence (Dube, Anda, Felitti, Edwards, & Williamson, 2002). There are numerous studies that suggest that intimate partner violence

is more common in women who have experienced childhood abuse. The ACE categories of childhood physical abuse, childhood sexual abuse, and growing up with a battered mother all have a statistically significant graded relationship with the risk of intimate partner violence (Whitfield, Anda, Dube, & Felitti, 2003). Another study of predominantly African-American and Latina women in methadone clinics found that women who reported childhood physical abuse or childhood sexual abuse were nine or four times, respectively, more likely to report intimate partner violence (Gilbert, El-Bassel, Schilling, & Friedman, 1997).

Influence on HIV risk behaviors

Intimate partner violence is a devastating form of gender inequality. It has increasingly been linked to a variety of physical and mental health conditions including headaches, gastrointestinal problems, obesity, depression, anxiety, and PTSD ("Intimate Partner Violence and Healthy People 2010 Fact Sheet," 2003) These adverse health effects affect overall health and can indirectly increase HIV risk. More directly, intimate partner violence is strongly associated with substance use and sexual risk behavior. Studies have shown that recent intimate partner violence is associated with injection of drugs, with one study finding that injection of drugs is specifically associated with more severe sexual intimate partner violence (El-Bassel et al., 2007). The physical and psychological pain caused by intimate partner violence may lead women to inject drugs as a means of coping with intimate partner violence (Burke, Thieman, Gielen, O'Campo, & McDonnell, 2005; El-Bassel et al., 2007). Studies have also shown that women who have experienced intimate partner violence are more likely to use substances prior to sex, which may be a sign of coping (Beadnell, Baker, Morrison, & Knox, 2000). Additionally, the connection between intimate partner violence and injection of drugs may be a result of gender-based inequalities related to injecting drugs. Intimate partner violence in relationships that involve substance use have an additional layer of power and control, resulting in women taking both sexual and substance use-related risks (Gielen et al., 2007). Women may be coerced by their male partners into injecting drugs to obtain financial and social support and to preserve their relationships (El-Bassel et al., 2007). Women in coercive relationships may also be forced to engage in risky sexual behaviors, including sex work.

Women who experience intimate partner violence are most at risk for HIV through high-risk heterosexual contact (Campbell et al., 2008; Coker, 2007; Maman, Campbell, Sweat, & Gielen, 2000). Multiple sexual risk behaviors have been associated with intimate partner violence, including having concurrent partners, risky sexual partners, exchange sex partners, an increase in lifetime casual sex partners, and a decrease in condom use negotiation (Teitelman, Ratcliffe, Dichter, & Sullivan, 2008) (Cavanaugh, Hansen, & Sullivan, 2009; Coker, 2007; El-Bassel et al., 2007; El-Bassel, Gilbert, Wu, Go, & Hill, 2005; Stockman, Campbell, & Celentano, 2010; Stockman et al., 2013; Wingood et al., 2006). It is unclear whether the concurrent partners are a result of women seeking out other partners in response to the intimate partner violence or men acting violent in response to discovering infidelity. The decrease in condom use negotiation may be a result of physical and sexual violence in response to past attempts to negotiate (Davila, 2002; Davila & Brackley, 1999; Gielen et al., 2007; Maman et al., 2000). One study found that African-

American women who experienced intimate partner violence were over nine times likely to report threats of physical violence when asking their partners to use condoms, compared to women who did not experience intimate partner violence (Wingood & DiClemente, 1997). Due to the abundance of sexual risk behaviors associated with intimate partner violence, women who have experienced intimate partner violence have increased rates of STIs (Gielen et al., 2007; Laughon et al., 2007). In the case of HIV, the relationship between HIV and intimate partner violence is bidirectional: Exposure to intimate partner violence increases HIV risk, and HIV-positive women are more likely to experience intimate partner violence (Tufts, Clements, & Wessell, 2010). In addition to increased risk of substance use problems and STIs, women experiencing intimate partner violence are at greater risk for PTSD.

Post-traumatic stress disorder

The Diagnostic and Statistical Manual of Mental Disorders (DMS-IV-TR) defines PTSD using defined criteria and symptom clusters. Criteria include a history of exposure to a traumatic event involving a threat to physical integrity and a response of intense fear, helplessness, or horror, followed by symptoms from each of the three symptom clusters – intrusive recollection, avoidant/numbing, and hyper-arousal – that last for more than a month and cause clinically significant distress or impairment ("Diagnostic and Statistical Manual of Mental Disorders," 2000). Intrusive recollection involves persistently re-experiencing the traumatic event, avoidant/numbing involves persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness, and hyper-arousal involves increasing arousal such as outbursts of anger and difficulty concentrating.

The U.S. National Comorbidity Survey Replication (NCS-R) estimates that the lifetime prevalence of PTSD among adult Americans is 6.8%, while current past year PTSD prevalence is estimated at 3.5% (Kessler et al., 2005a; Kessler, Chiu, Demler, Merikangas, & Walters, 2005b). The lifetime prevalence of PTSD among women is 9.7%, compared to 3.6% for men (Kessler et al., 2005a). Childhood sexual abuse and intimate partner violence both increase a woman's risk for PTSD. Women exposed to intimate partner violence are about three to six times more likely to develop PTSD compared to women who have not been exposed to intimate partner violence (Golding, 1999; T. P. Sullivan & Holt, 2008). Drug and alcohol dependencies often co-occur with PTSD and can independently and concurrently increase HIV risk behaviors (Cavanaugh et al., 2009). Because women with partners with a history of incarceration may have experienced childhood sexual abuse at higher rates and may be more likely to have drug and alcohol dependencies, it is not surprising that a study has found that 19% of women with recently released partners reported having PTSD (Wildeman et al., 2013). The same study found that of the women who had ever been incarcerated, 45% reported having PTSD.

PTSD has been associated with a variety of risky sexual behaviors. PTSD may be a mediating factor connecting childhood sexual abuse to HIV risk (Plotzker, Metzger, & Holmes, 2007). However, even after controlling for childhood abuse and demographic covariates, PTSD was found to be associated with unprotected sex with risky primary and

non-primary partners, sex with multiple partners, traded sex, and dysfunctional sexual behavior, such as having sex with a near-stranger (Cavanaugh et al., 2009; El-Bassel, Gilbert, Vinocur, Chang, & Wu, 2011). Due to its significant overlap with intimate partner violence, it is also associated with partner violence related to condom use (El-Bassel et al., 2011). PTSD may interfere with women's sexual decision-making, making her more vulnerable to risky behavior (Cavanaugh et al., 2009). This disruption may be more severe in women whose PTSD was related to intimate partner violence. For example, these women may be afraid of retaliation from male partners, making them less able to negotiate safe sex and more vulnerable to forced sex. Substance use is also closely associated with PTSD: women using substances reported more severe PTSD compared to women using no substances or using only alcohol (T. P. Sullivan & Holt, 2008). The combination of substance use and PTSD has a multiplier effect. When both PTSD and substance use co-occur, women have four times greater odds of sexual risk behavior (Cavanaugh et al., 2009).

Furthermore, numerous studies have looked at trauma and PTSD among women with HIV. HIV-positive women were found to have disproportionately high rates of trauma and PTSD (Brief et al., 2004; Myers et al., 2006; Sherr et al., 2011). A meta-analysis found that the rate of intimate partner violence was twice as high among HIV-positive women, while the rate of PTSD was five times as high, compared to the general population of women (Machtinger, Wilson, Haberer, & Weiss, 2012b). PTSD can adversely affect the health of individuals living with HIV in a variety of ways: PTSD may increase involvement in risky behaviors, decrease adherence to antiretroviral medications, and decrease immune function (Brief et al., 2004). A recent study found that HIV-positive women reporting recent trauma had more than four times the odds of antiretroviral failure and more than three times the odds of inconsistent condom use with HIV-negative or unknown serostatus partners (Machtinger, Haberer, Wilson, & Weiss, 2012a).

HIV PREVENTION

HIV prevention interventions for high-risk women

Since the beginning of the AIDS epidemic, a variety of HIV prevention interventions have been conceived and implemented with the goal of reducing HIV risk behavior. Meta-analyses of HIV prevention intervention studies have reached mixed conclusions on the effectiveness of current interventions on reducing sexual risk behaviors. One meta-analysis of fourteen interventions found that interventions that included condom provision, condom education, and/or HIV counseling and testing were effective in decreasing sexual risk behaviors and that reduction of depression may have moderated this decrease in sexual risk behaviors (Lennon, Huedo-Medina, Gerwien, & Johnson, 2012). Similarly, another meta-analysis of fourteen interventions found that the interventions were statistically significant in decreasing risky sexual behaviors, especially the frequency of unprotected sex (Neumann et al., 2002). However, another meta-analysis reviewing HIV prevention interventions targeting sexual risk behaviors among women found that they had little impact on condom use or number of sexual partners and that social and

contextual factors related to HIV risk were often overlooked (Logan, Cole, & Leukefeld, 2002). This paper suggests that by overlooking larger factors and focusing solely on the individual while ignoring the context in which individuals interact and the gender norms and identities that influence women's lives, HIV prevention interventions are less effective at implementing change.

HIV prevention interventions addressing trauma

For women affected by trauma, HIV prevention interventions that focus solely on HIV risk may not be effective because of trauma's deleterious effects on women's self-efficacy and desire to protect themselves. Additionally, the psychosocial contexts in some women's lives may interfere with their ability to implement risk reduction. For example, women who are experiencing intimate partner violence may have difficulty negotiating safe sex practices due to fear of violence (El-Bassel, Gilbert, Rajah, Foleno, & Frye, 2000). This circumstance is particularly difficult for low-income women experiencing intimate partner violence because they are more likely to be dependent upon their partners for basic needs, making them more susceptible to male-dominated sexual decision-making (Logan et al., 2002). For these women, attempts to implement sexual risk reduction may put them at risk for further intimate partner violence or decrease their access to basic needs (Cavanaugh et al., 2009). Due to these additional factors at play for women experiencing trauma, multi-modal HIV prevention interventions need to take context into consideration in order to help women effectively implement sexual risk reduction practices (Logan et al., 2002).

Trauma can be incorporated into HIV prevention interventions in a variety of ways and may also be used to decrease transmission risk in individuals who are both HIV-positive and have experienced trauma. For example, coping group interventions utilize cognitive-behavioral treatment strategies for effectively dealing with stressors related to HIV and sexual trauma. In coping group interventions, risk reduction skills are taught as integral components to forming a healthy relationship that involves safety, intimacy, power, and self-esteem, and issues surrounding sexual relations after sexual abuse, revictimization, and HIV infection are addressed (Sikkema et al., 2008). A study comparing a coping group intervention to a standard therapeutic support group for individuals with both HIV/AIDS and a history of childhood sexual abuse found that the coping intervention was significantly more effective at reducing unprotected sex, showing that coping group interventions could reduce transmission risk behavior among individuals with HIV and histories of sexual trauma (Sikkema et al., 2008).

For high-risk women who are HIV-negative, trauma-focused mental health treatment and empowerment-focused HIV prevention interventions have been shown to be effective in reducing sexual risk behaviors, including risk for sexual victimization and intimate partner violence (Engstrom, El-Bassel, Go, & Gilbert, 2008; Hien et al., 2010; Risser, Hetzel-Riggin, Thomsen, & McCanne, 2006; Sikkema et al., 2010). As discussed previously, women with both PTSD and substance use disorder are more likely to engage in HIV risk behaviors and are at increased risk for adverse health outcomes. The most studied

intervention for a dual diagnosis of PTSD and substance use disorder is Seeking Safety, a cognitive behavioral group therapy HIV intervention that was designed for women with PTSD and substance use disorder (Najavits, Weiss, Shaw, & Muenz, 1998). Seeking Safety involves education about PTSD and substance use disorder, promotion of functional behaviors and self-control skills to manage overwhelming emotions, and relapse prevention training (Najavits, Weiss, & Liese, 1996). A study comparing Seeking Safety to Women's Health Education, an attention control psychoeducational group, found that in the group of women who were at higher sexual risk, those receiving Seeking Safety had significant reductions in the number of episodes of unprotected sex compared to women receiving Women's Health Education (Hien et al., 2010). Groups beyond women with a dual diagnosis may also benefit from Seeking Safety. Although it was originally designed for a specific subpopulation, it has been implemented and evaluated in a variety of other subpopulations, including young African-American men and male veterans (Boden et al., 2012; Najavits, Schmitz, & Johnson, 2009).

HIV prevention interventions for women with incarcerated partners

Because women with incarcerated partners have unique contexts of HIV risk, HIV prevention programs have been developed specifically for this vulnerable subpopulation. HOME (Health Options Mean Empowerment) is a peer educator-based risk reduction program that was developed by researchers at the University of California, San Francisco, specifically for women visiting men in prison (Grinstead et al., 2008). The six HOME training sessions offered included a viewing and discussion of a short film, Inside/Out, which had been created by the UCSF team and featured formerly incarcerated men and their female partners discussing prison-specific HIV risks. HOME training sessions also included education about HIV/AIDS and hepatitis C, community referrals, and teaching of community-building and outreach skills (Grinstead et al., 2008). In their evaluation of the effectiveness of the HOME intervention, Grinstead and colleagues found that the women in the intervention group did not have an increase in the number of unprotected penetrative intercourse episodes after partners' releases from prison, while women in the comparison group did have an increase (Grinstead Reznick et al., 2010). Women in the intervention group were also more likely to discuss a greater number of HIV-related topics with their partners, be tested for HIV, and have partners get tested for HIV (Grinstead Reznick et al., 2010). In order to reach a wider population, this intervention was adapted to expand to the community setting. Health Access Program for Prevention, Empowerment, and Networking (HAPPEN) is an adaptation of HOME that was created through partnerships with community-based organizations (Mahoney, Bien, & Comfort, 2013). The sessions were similar to the sessions provided by HOME and also incorporated messages of empowerment, but HAPPEN added a session focusing on intimate partner violence and its impact on HIV risk reduction behaviors. This session integrated skills-building and self-efficacy so that women could be better equipped to protect themselves in the face of gender-based violence. Further adaptation, evaluation, and expanded implementation of trauma-informed HIV prevention interventions is necessary to effectively diminish the multi-faceted HIV burden that women with incarcerated partners face.

SUMMARY

African-American and Latina women account for over 70% of new HIV infections among women in the US, and the vast majority of HIV infections among women are due to heterosexual contact. Women with incarcerated partners, who are predominantly low-income women of color, are especially vulnerable to HIV due to the immense disruption incarceration causes in their lives, relationships, and communities. Unfortunately, women who are particularly vulnerable to HIV transmission often belong to population subgroups that are also vulnerable to childhood trauma and intimate partner violence. Because childhood trauma and intimate partner violence are associated with increased HIV risk behaviors, possibly through mediation by PTSD and substance use, HIV prevention interventions for high-risk women should take into consideration the contexts of the women's experiences.

QUESTION FORMULATION

Although numerous studies have found associations between childhood trauma, intimate partner violence, substance use, and HIV risk behaviors, causality and temporality have been difficult to establish, especially through cross-sectional studies. In order to better understand the mechanisms by which these events and behaviors interact and to understand the collective impact of these experiences, the literature calls for further qualitative research, as well as prospective studies (Campbell et al., 2008; Gielen et al., 2007). These steps are critical to developing an effective, trauma-informed intervention that takes important social and contextual factors into account to aid women in integrating these factors into practice in order to reduce HIV risk behaviors.

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ABSTRACT

Background: In the United States, women at highest risk for acquiring HIV are often affected by childhood trauma, intimate partner violence, and substance use. Although numerous studies have found associations between childhood trauma, intimate partner violence, substance use, and HIV risk behaviors, the pathway to HIV risk behavior has not been well described.

Methods: This qualitative study conducted one-on-one, semi-structured interviews with sixteen women in a residential drug treatment facility to explore their histories of trauma and substance use, and how their experiences affect their decisions surrounding HIV risk behavior. Interview transcripts were coded and analysis was performed using a team-based iterative process based in grounded theory.

Results: Participants had high rates of personal trauma, with all sixteen participants discussing traumatic events in childhood. Half of participants discussed experiences with sex work, and the majority of participants discussed experiences with intimate partner violence. Six major themes emerged as links connecting early trauma and substance exposures to HIV risk behaviors: 1) Early trauma exposure; 2) Early substance exposure; 3) Childhood exposures leading to substance use as a coping mechanism; 4) Childhood exposures leading to substance use to satisfy the need for intimacy; 5) Impaired psychological development leading to increased sexual risk behaviors; 6) Cycle of retraumatization.

Conclusions: Childhood trauma and early exposure to substance use were often experienced in our participants. Frequently, our participants linked early trauma and substance exposures to low self-efficacy and the use of substances to cope. Eventually this combination of exposures and responses led to HIV risk behaviors and retraumatization through increased sexual risk-taking, substance dependence, risky partner choice, and sex work. HIV prevention interventions for this population should be empowerment-focused and expand beyond individual behavior change to include the broader social factors of violence and poverty. Our study reveals additional possibilities for intervention including: 1) mental health services for young girls who have experienced trauma, 2) education and support services for parents of young girls with traumatic experiences to improve the parental response, and 3) integrated parenting education for high-risk substance-using women to break the intergenerational cycle of addiction and trauma.

INTRODUCTION

In the United States, African-American and Latina women account for over 70% of new HIV infections among women, and the majority of HIV infections among US women are due to heterosexual contact.[1,2] Women in these populations who are vulnerable to HIV transmission may also be at increased risk for childhood trauma[3,4] and intimate partner violence.[5] Further increasing their risk is the high prevalence of incarceration in low-income minority communities.[6-8]

Although numerous cross-sectional studies[9-19] have found associations between childhood trauma, intimate partner violence, substance use, and HIV risk behaviors, causality and temporality have been difficult to establish.[5,20] Through in-depth interviews we explored the associations between childhood trauma, intimate partner violence, substance use, and HIV risk behaviors in order to better understand the mechanisms by which these events and behaviors interact and to understand the collective impact of these experiences. The aims of this study were to 1) investigate how high-risk women view and reflect on their own trauma, 2) investigate how they relate their own trauma to HIV risk and HIV risk behaviors, 3) identify key factors that precipitate engagement in HIV risk behaviors, and 4) understand participants' perceptions of their own life course. The long-term objective was to inform the design of future HIV prevention interventions by integrating social and contextual factors in an effort to aid high-risk women in reducing HIV risk behaviors.

METHODS

Participants were recruited through Health Access Program for Prevention, Empowerment, and Networking for Women (HAPPEN), a community-based, six-session HIV prevention intervention for women with incarcerated partners in the San Francisco Bay Area.[21] Eligibility criteria for this study included participation in HAPPEN while in a residential drug treatment facility, ability to speak and understand English, and previous relationship with a man with a history of incarceration.

A semi-structured interview guide was developed containing open-ended questions about trauma history, the influence of trauma on substance use, sexual risk behavior, and self-efficacy (Table 1). Qualitative researchers, multi-disciplinary physicians, and HAPPEN participants offered suggestions that contributed to the final interview guide. Sixteen in-depth, one-on-one interviews were conducted at a residential treatment facility or on the University of California – Berkeley campus. Interviews lasted approximately one hour and were conducted from July 2012 to March 2013. The interviews were digitally recorded, professionally transcribed, and reviewed for accuracy. Basic demographic information was collected at the time of the participants' enrollment in HAPPEN.

Table 1. Examples of questions in semi-structured interview guide

In your childhood, did you have any exposure to illicit drug use among your friends or family? Did you see anyone using drugs?
When did you start using drugs? What was going on in your life at the time? What influenced you to start using drugs?
Do you think substance misuse has impacted your ability to protect yourself from getting HIV, e.g. using clean needles (if applicable) or in condom negotiation? If so, how?
How have your past experiences affected your ability to protect yourself with your partner who has a history of incarceration?
Did you experience an event that you felt was traumatic during your childhood? If you are comfortable, can you tell me about this/these event/s?
How did you cope with these events? How did these events make you feel? Did they impact how you saw yourself?
Have you ever experienced intimate partner violence? How did you cope with these events? How did these events make you feel? Did they impact how you saw yourself?
Do you think your experiences with trauma have impacted your ability to protect yourself from getting HIV, e.g. using clean needles (if applicable) or in condom negotiation? If so, how?

The primary coder (N.T.) performed quantitative counts from the transcripts to gather information about particular variables of interest. Questions about HIV and HCV status, involvement in sex work, personal history of incarceration, and individual Adverse Childhood Events (ACEs) were not explicitly asked in the interviews, but were derived from participants' narratives.

Interview data were analyzed using an iterative process based in grounded theory to explore experiences of trauma, substance misuse, and HIV risk.[22] Transcripts were entered into ATLAS.ti qualitative data analysis software for coding and analysis. Two authors (N.T. and M.M.) independently coded three transcripts and discussed coding discrepancies until resolution was reached. A final codebook was used by the same two team members to independently code additional transcripts and determine inter-coder reliability. Once high inter-coder reliability was reached, the primary coder (N.T.) independently coded remaining interviews using the final codebook. Throughout this process, all authors reviewed transcripts and collaborated to develop themes.

Human subjects approval for this study was obtained from the University of California San Francisco Committee on Human Research and the University of California Berkeley Committee for the Protection of Human Subjects Institutional Review Boards.

RESULTS

Characteristics of the study participants are shown in Table 2. All sixteen participants discussed traumatic childhood experiences, including emotional, physical, or sexual abuse, witnessing their mothers being treated violently, household substance abuse, mental illness, and parental incarceration, separation, divorce, or abandonment.

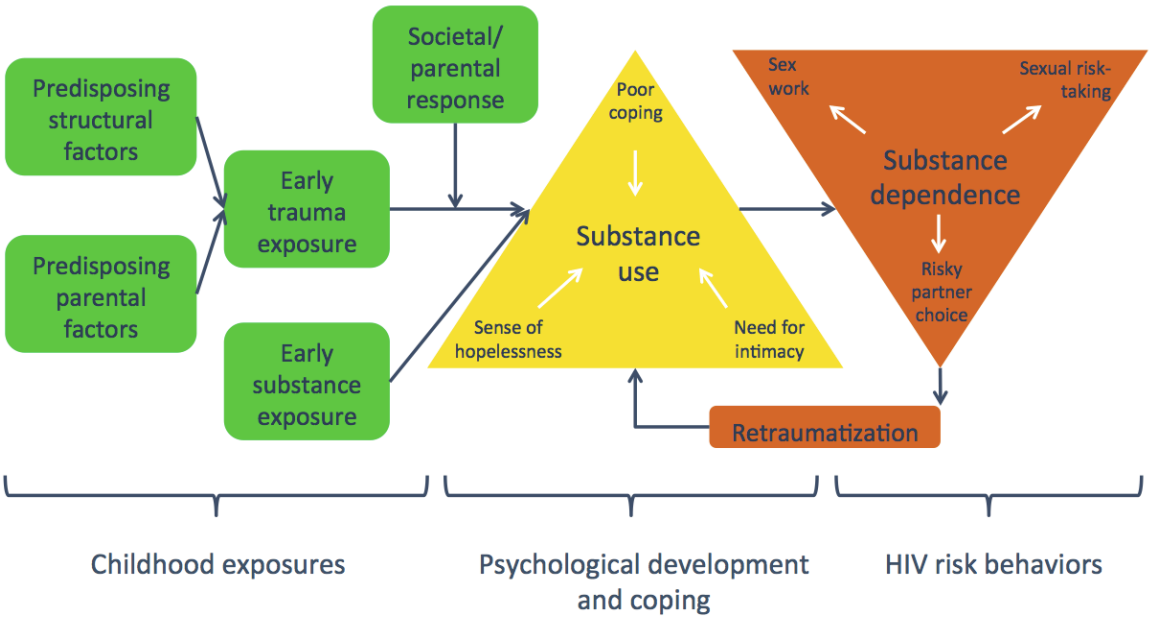
Table 2. Participant characteristics

Age, median (range)	42 (25-54)
Gender, n (%)	
Biological female	12 (75)
Male-to-female transgender	3 (19)
Female hermaphrodite	1 (6)
Race/ethnicity, n (%)	
African American	8 (50)
White	7 (44)
Latino	1 (6)
Age at initiation of substance use, median (range)	15.5 (12-31)
Discussed childhood experiences with, n (%):	
Emotional abuse	5 (31)
Physical abuse	4 (25)
Sexual abuse	8 (50)
Mother treated violently	3 (19)
Household substance abuse	8 (50)
Household mental illness	1 (6)
Parental separation, divorce, or abandonment	12 (75)
Incarcerated household member	5 (31)
Discussed personal experiences with, n (%):	
Substance use	16 (100)
Sex work	8 (50)
Intimate partner violence	13 (81)
Personal incarceration	11 (69)

Our process model (Fig. 1) spans three life stages. The first stage of childhood exposures includes early exposure to trauma and drugs, as well as structural and parental factors influencing the trauma. The second stage of psychological development and coping is described by a sense of hopelessness and the use of substances as a means of coping and achieving intimacy. The final stage of HIV risk behaviors includes both sexual risk behaviors and substance use risk behaviors. Our process model also includes six major themes linking early trauma and substance exposures to HIV risk behaviors: 1) Early trauma exposure; 2) Early substance exposure; 3) Childhood exposures leading to substance use as a coping mechanism; 4) Childhood exposures leading to substance use to

satisfy the need for intimacy; 5) Impaired psychological development leading to increased sexual risk behaviors; 6) Cycle of retraumatization.

Figure 1. Theoretical model of the pathway from early trauma and substance exposure to HIV risk behavior



Theme 1: Early trauma exposure

Childhood trauma was prevalent in this population, including both direct and witnessed violence. Broader structural factors as well as parental factors predisposed individuals to a combination of severe early trauma and a lack of social and psychological support to cope with the effects of the trauma.

Predisposing structural factors

Participants confronted structural barriers based on poverty, sexuality, and race from early life.

A 47-year-old transgender woman with an addicted mother and a father who never returned from Vietnam describes being left "in the basement buck naked with no food." She explained:

At the age of 11, I ended up selling my body to get food for my family … I did what I had to do. That was really based on one trick. I clipped [robbed] him and took his money and went out and bought food and bought Christmas presents and clothing for my sisters and my brother.

Another participant linked her lack of educational opportunity with her addiction to drugs and participation in sex work:

This was my only way of getting any type of monetary value of anything because I didn't have no skills, so I didn't know anything else. It never entered my mind to go get a job or a trade. It just never entered my mind. I just was on drugs.

Racial and cultural factors contributed to feelings of isolation for many participants. A 52-year-old transgender Latina woman explained how the intersection of cultural norms and sexuality influenced her family's abusive behavior:

Being from a Hispanic background and being transgender, that was a big taboo … When I was a kid, my parents or my siblings would catch me wearing girls' clothing. My parents, especially my dad, I would get a lot of beatings for that… It affected my self-esteem because I didn't see myself as smart, I didn't see myself as pretty or good-looking. I didn't see myself as wanted.

Predisposing parental factors

Violence in the household while growing up was common among participants. A 54-year-old African-American woman described a particularly traumatic event she witnessed in her household and how it became a turning point in her life:

When I was young, my mother killed my grandfather in front of us on Thanksgiving Day, in front of the whole family. [My grandfather] was abusing my grandmother because she was vulnerable because she had had a brain stroke, and my mother killed him because he abused her mother. She cut the turkey, and then she shot him, and the whole house was unstable. My mother was an only child, so we didn't have anybody to go with. Group homes or foster care, stuff like that. They separated five children, sent all kind of different ways. It was just like a down spiral of my life after that.

Half of the participants described childhood sexual abuse, often by parents. A 48-year-old African-American woman described her mentally ill mother's inappropriate sexual behavior toward her as a child and how the trauma caused her to conceal her feelings:

I think I was probably about 17. [My mom] was sad and lonely, and she was a little tipsy. She was sitting on the couch masturbating. I said, "Mom, are you okay?" She was like, "I'm masturbating." I thought, "Mom, you're fucking not supposed to say that to me." She was crying … It was pretty traumatic. That's when I realized that she was a little bit not quite right, and also that she was asking for help and that she was really sad … I felt really sorry for her, and I realized that she was mentally disturbed … I drank more then, but not around her. I didn't ever want her to see me sad. I had to stuff a lot of stuff away.

Five participants discussed growing up with incarcerated household members. Parental incarceration often had substantial effects that expanded far beyond the absence of a parental figure. A 25-year-old Caucasian woman recounted her father's imprisonment and how it impacted the way that she dealt with being molested:

When I was little, [my dad] was off and on in prison. He got out of prison this last time when I was eight. The first time [I was molested], I was probably four. I briefly remember that. It was

my babysitter. Then when I was probably seven to nine off and on, it was one of my dad's friends. I was always scared to tell my dad because he might kill him, and I didn't want to lose my dad because he would go back to prison. I just tried to forget about it, act like it never happened.

Societal/parental response to trauma

Societal and parental attitudes toward childhood trauma shaped participants' responses to trauma. A 48-year-old African-American woman described how she dismissed her own trauma due to her friends' experiences with more severe trauma as well as her gendered expectations of patriarchy and male sexuality:

My father felt me up a couple times when he was drunk, to see if I was developing. I thought, if I was a guy, if I was drunk, I might do something stupid like that, but he shouldn't have done that … I kind of thought, if a guy's doing that, I guess it would be my dad. All the guys with daughters, it was happening. All of them were doing it. When I talked to some of my friends, their dads' friends were having sex with the daughters. I was like, "Wow, I was really lucky that we weren't being auctioned off like that." I felt like my dad was just around the wrong group of guys.

Participants described inadequate social and psychological support following their traumatic experiences. A 30-year-old African-American woman who was raped when she was eight years old described:

I remember waking up and someone was like standing over me with like a knife to my throat. And they told me that I would … it was a white man, he had dark blue jeans, and he told me that if I said anything that he would kill me and my brother and took me into the garage and put me on my dad's car. After that, after, because he told me that he was going to kill, he would kill somebody in my family, I thought about it for a while. First I was in pure shock. Because you're a kid and you just woke up, it's shocking. So I did think about it. I'm not going to say I just ran and was like, "Mom and Daddy," no, I didn't do that … Then I thought about it, then I went and told them. They called the police. The police came. They didn't do a really thorough investigation. My mom, she kind of checked me out. And nothing really happened after that and I went to school the next day like nothing ever happened.

The insufficient response to her initial trauma by her parents affected her relationship with them and how she coped, placing her at greater risk for repeated trauma and isolation:

I just wish that I guess maybe if it would have been taken more serious [by my parents] and not like I had slept walk into a garage or whatever, and then them telling me later on in life that they found fingerprints on the car. It was kind of like something that was just swept under the rug. It affected [my relationship with] them to where I didn't tell them about things that affected me in the future. So like when I was molested when I was eleven, I didn't tell anybody about it because I felt like nothing was done when I was young, so I just kept it inside of me. Then when I was in an abusive relationship at thirteen and I got pregnant in that

relationship and it was physically abusive, I didn't tell anybody because I just felt like there was no point in me telling anybody. So I felt like this is just kind of how life is, and this is how life takes place.

In some cases, early parental response to such childhood traumatic events may have helped to prevent some adverse long-term effects. A 27-year-old Caucasian woman explained how counseling helped her recover after witnessing a traumatic event:

I saw my mom almost get raped when I was like seven. That was really, really bad, like I guess I walked in on it, and something woke me up, I guess hearing her trying to tell him, "No, no, go home, go home!" … I had jumped on him or something, and he flung me off and I got blacked out for a little bit, against the wall … I was in counseling for like three years, in the beginning. I slept on my mom's ... on the floor next to her bed for a year. And then after that we moved from the place, and then after that I slept outside of her door. And my psychiatrist had told her to stop letting me sleep on the floor next to her bed, and try to learn how to sleep in my bed again.

Theme 2: Early substance exposure

Half of participants faced the added challenge of early access to substances, including use and sale of drugs in the household. The average age at initiation of substance use among participants was 16 years, with a range of 12-31 years. Cocaine use by parents at a child's birthday party was described by one participant as "a different kind of party" in a separate room behind closed doors. Eight participants also described household members as substance abusers. One participant's alcoholic father would ask her to fetch his "magic elixir" out of the freezer for him. This normalizing of drug use created a sense of intrigue about drugs for some, and represented a barrier to intimacy with their parents for others.

Theme 3: Childhood exposures leading to substance use as a coping mechanism

After experiencing childhood trauma, many participants experienced low self-efficacy and used drugs, which were often easily accessible, as a means of coping.

A 48-year-old African-American woman described the role of substances in escaping the pain in her life:

I've been raped, I've been kidnapped, I've been held at gunpoint. I've been in a lot of pain. Still, at the time, I would be able to just sweep it under the rug. We know it's all going to come back out of the rug, but I needed to sweep it under the rug, and then dance on top of the rug after. I would do more drugs to clean up on top of the rug, and shake it out, having danced my feet off so hard that they bled.

The 25-year-old Caucasian woman who was abused by her father's friend at a young age offered another example of substance use as coping after a tragic event:

When I was 18, I was selling [cocaine,] and these two brothers tried to rob me and my friend didn't know that they had a gun. He just jumped on him and he got shot. He died. I didn't know how to cope with it. I became a crackhead.

Theme 4: Childhood exposures leading to substance use to satisfy the need for intimacy

Twelve participants described losing a parent to separation, divorce, or abandonment. Lacking the ability to cope effectively with unresolved trauma, some participants used drugs to satisfy a need for intimacy. A 31-year-old Caucasian woman expressed her struggle to connect with her often-absent, substance-using mother:

My mom, I love her to death, but she was more like my friend than my mother. She was in and out of my life, like a lot. She would leave me at people's houses. I didn't know the people. She would tell me she was going to the store and would be right back. She would be gone for like weeks at a time. I could remember just crying and crying, wanting her to come back. Then she would and then she'd do it again. I watched her on drugs, like my whole childhood, in and out of prison. I started using meth when I was 13. The first person I got high with was her … I wanted to try the drug, I wanted to use it because that's what the grownups were doing … I'd be like one of them, so then she'd want to be around me.

In the context of poor psychological development due to childhood trauma, the social experience of engaging in substance use and the sharing of needles can transform into an expression of love transmitted by disease. The participant continued to describe her experience in adulthood after her mother was released from prison:

My mom has hepatitis C and two other liver diseases. When my first son was like two, I shot up after my mom. I knew she was sick. She knew she was sick, and I have hepatitis C now because of it. It was like a part of me wanted to show her that I didn't care, "I don't care what you have. I love you that much that it doesn't matter to me."

In addition to familial love, the transmission of love through needle-sharing was seen in intimate relationships. In another example, a 42-year-old Caucasian woman discussed her experience of sharing needles as an expression of loving her partner wholly with a willingness to share his disease:

I shared needles one time with the love of my life, who I knew had hep C. But I didn't want to divide our stuff, like have separate cookers and separate needles. I just kind of purposely got hep C because he got it. He ended up OD'ing and dying on me, but I thought I'd be with him forever so I didn't care about the hep C, but that's why I got it. He said I was stupid to do that, but I just didn't care because I loved him and it didn't bother me if I had hep C. Like if he had it, then I wanted to have it too.

Theme 5: Impaired psychological development leading to increased sexual risk behaviors

In the setting of poor psychological development, participants became dependent on drugs in order to cope with trauma and satisfy a need for intimacy. In many cases, this substance dependence interacted with low self-efficacy to increase sexual vulnerability. Many participants described choosing risky partners and half of the participants discussed engaging in sex work. Many described a nonchalant attitude toward personal sexual protection. The 30-year-old African-American woman who was raped when she was eight years old described a sense of hopelessness as the reason for foregoing condom use while engaging in sex work:

Me catching any disease, any type of situation, me being involved in the wrong situation doesn't matter, because I don't even want to be here as a person, so regardless of what I bring to me, it doesn't matter. Because I'm already trying to figure out a way out.

Equipped with a similar mentality toward self-protection, a 42-year-old Caucasian woman spoke about being molested by her adoptive father and how that affected her self-esteem, substance abuse, and desire to protect herself as a sex worker:

I've had low self-esteem since I was a child, probably because of the molestation, but the drug and alcohol use probably pushed me more into low self-esteem… I think I didn't care enough about myself to care whether I needed protection or not. Even though I was deathly afraid of HIV, I never thought enough of myself to protect myself because my self-esteem was low. I just, I didn't care about myself a lot.

In a more extreme example, a 34-year-old Caucasian woman recalled how she deliberately engaged in potentially destructive behaviors in order to increase her own HIV risk:

I got HIV on purpose. [My spouse] had come to San Francisco and they found him floating off the pier, dead. So, when he died, being that he was my life, my everything, I didn't think of anything. [My spouse] and I had a mutual friend who had HIV. I didn't even think about having a relationship with him because I didn't, you know, I was scared of it. But it got to a point where I thought to myself: I don't want to love, I don't want to like, I don't want to hate. I was on dope at the time as well … So, I knew exactly what I was doing. I actually remember the day that I contracted it.

A prevailing need for intimacy and the search for connection and acceptance led some participants to enter unhealthy relationships to attain the illusion of protection and companionship. The 47-year-old African-American woman who grew up with an absent father and abusive, addicted mother expressed her motivation for continuing romantic involvement with an abusive crack dealer:

I think I became accustomed to being abused so I allowed myself to be placed in those positions. I was seeking and searching to be loved because I never was loved. Even though it

wasn't real and I know today it wasn't real, it felt good at the time. It felt better than the pain and it was a way to escape from everything else. I created this world of make believe and I lived in it for all these years.

Theme 6: Cycle of retraumatization

Sexual vulnerability and sexual victimization in the background of poor psychological development can increase opportunities for greater trauma and reinforce poor coping through continued retraumatization. Thirteen participants discussed experiences with intimate partner violence. Because sexual relationships, despite being potentially detrimental, superficially satisfy a need for intimacy, it can be challenging to break the cycle. The 54-year-old African-American woman quoted earlier about watching her mother kill her grandfather explained how her childhood trauma and substance dependence interacted to influence her relationship with her abusive pimp:

He had that salt and pepper gray hair, and he was older than me, and before we became lovers, we were like friends. He was always giving me advice on life and stuff. I guess I was mixed up with my illusion of my grandfather and that authority figure, and the male acceptance in a relationship and all. It was all mixed up, and then, we were in a very abusive relationship for years. See, I have an artificial elbow, artificial wrist, an artificial knee, and screwed up my collarbone. That was one boyfriend that used to beat me up all the time. I kept going back, so … but I was on drugs. I used … now that it's all done, I wonder if I hadn't been on drugs, would I have tolerated that? I don't know.

In addition to causing immediate physical harm and increasing HIV risk by decreasing the woman's ability to negotiate sexual protection, the impact of intimate partner violence is multi-faceted in that the long-term psychological effects can also be debilitating. The 31-year-old Caucasian woman who became addicted to crack cocaine after being initiated by her mother described:

He started off being a "trick" like just to make money. I started dating him because he had a lot of money and he seemed … he was older. He would take care of me and I liked that. I felt safe. Well, he started abusing me, and he would beat me … [The last time I saw him,] he ran from behind this building with a gun and grabbed me around the neck and started beating me with the gun. He beat me so many times with the gun I would fall. I would pass out and come back to, and he stomped my face with steel-toed boots. Through all this, I could remember just begging him to stop, "Stop, please stop." There was just blood everywhere. It was so bad. And so they sent him to jail. Well, when he was beating me with the gun, the gun went off, and it missed my head by like two inches … It was very traumatizing. For a year straight, I would wake up in the middle of the night and I would call the jail to make sure he was still there. It was hard to sleep. I thought I'd see him everywhere. I thought he was everywhere.

Sexual vulnerability, especially in the context of sex work, may be psychologically traumatizing and may alter a sense of self through infusion of shame or guilt. In the context of blunted psychological development, drugs may be used to cope with the damaging psychological and physical effects of sex work, inducing a cycle of substance dependence,

sex work, low self-efficacy, and retraumatization. A 42-year-old Caucasian woman explained:

I was a survivor of the World Trade Center bombing, and I was there for 9/11. That's when my use started really heavily after that. Something just clicked in my head and I started using drugs a lot more. I was a drug addict. I used heroin and cocaine. My dad put me out on the streets. I struggled. I ended up becoming a prostitute to keep myself in a hotel, paying just like day-by-day and I did dates to get money for drugs. The more dates I did, the more fucked up, or messed up about it, I felt. So I used more drugs. It was just like a vicious cycle.

DISCUSSION

The analysis of our interviews led us to a theoretical model that includes six primary themes and describes a pathway from early trauma and substance exposure to increased HIV risk behavior. The themes which are discussed in detail throughout our manuscript include: 1) Early trauma exposure; 2) Early substance exposure; 3) Childhood exposures leading to substance use as a coping mechanism; 4) Childhood exposures leading to substance use to satisfy the need for intimacy; 5) Impaired psychological development leading to increased sexual risk behaviors; 6) Cycle of retraumatization.

Previous studies have found associations between childhood trauma, intimate partner violence, substance use, and HIV risk behaviors. [9-11,13,14,18,19,23-34] However, many of these studies are cross-sectional, making it difficult to establish causality and temporality. Our study contributes to existing literature by qualitatively exploring how these events and behaviors interact to increase HIV risk, revealing potential intervention targets. This study is a step toward elucidating these mediating factors and understanding how the collective impact of these experiences grows over the life course.

Our results about trauma exposure and response merit further discussion and exploration. In our interviews, we did not specifically ask women about PTSD (post-traumatic stress disorder) and we do not have data about how many women met the diagnostic criteria for this disorder. However, several women explicitly spoke about experiencing what they referred to as "PTSD", and many more women described their responses to traumatic events with PTSD-like terms. Specifically, women described symptoms of traumatic nightmares, avoidance of trauma-related stimuli, trauma-related distress, self-destructive behavior, and sleep disturbances. In many cases, intimate partner violence led to substance use as a coping mechanism and a destructive cycle of trauma, stress response, and substance abuse.

Although we did not formally analyze this as a theme, one common topic in our interviews involved parental abuse and witnessing of parental suffering in childhood trauma. For example, participants described experiencing abuse by substance-using parents or neglect by incarcerated parents, witnessing of parents physically harming other family members, and growing up in a home without stability or structure provided by the parents. This gives us a glimpse of the intergenerational effects of addiction and how the cycle of trauma is entrenched in families. In future analyses, we plan to examine these

familial patterns more closely, in the hopes of gaining clues as to how to effectively break this cycle.

There were several limitations to our study. Participants may have felt pressure to present themselves in the best possible light. However, based on the many disclosures involving illicit substances and other behaviors participants said they were ashamed of, the responses seemed candid and unbiased. Regarding the quantitative data in this study, adverse childhood experiences were counted from participants' narratives and may be underreported. Because our small sample size and inclusion of women in the Bay Area who were in a residential treatment program and participated in HAPPEN, results may not be generalizable to other populations. It is also possible that the women who consented to the study varied in trauma history, HIV risk behaviors, and life course, from the women who declined to consent.

In spite of these limitations, our study has significant strengths. We accessed a marginalized and high-risk population and gathered information on sensitive and relatively unexplored topics. Through qualitative interviews, we were able to bring these individuals' voices to the forefront. In doing so, we learned about potential mediating factors between early trauma and increased HIV risk, giving us insight regarding potential future interventions for this vulnerable population.

Our process model and the themes we have explored offer potential mechanistic explanations for the greater success of programs attuned to and addressing the traumatic exposure of this particular population. Based on our findings, future directions include the development of a trauma-informed intervention at three levels.

First, our exploration of cumulative trauma and substance use as mediating factors increasing HIV risk behaviors highlight the potential of a program for adolescent girls with early life trauma experience and early exposure to substance use that helps them with coping skills to avoid the cycle of substance use, retraumatization, and sexual vulnerability. The prevalence of early life trauma described by our participants emphasizes a need to reach women earlier in their life course before negative coping skills and risky behaviors become more ingrained. Interventions for children and adolescents who have experienced trauma may be necessary to reduce immediate traumatic responses and avoid cumulative retraumatization.[35]

Secondly, immediately after a child experiences a traumatic event, an intervention that educates parents to have a supportive response toward their child may help reduce traumatic stress responses in the child, improving long-term outcomes In addition, an early positive parental response may be important after a childhood trauma, eventually affecting future HIV risk behaviors as an adult. One study found that hostile parenting is independently correlated with increased acute post-traumatic symptoms, which predict poorer long-term outcomes.[36]

Lastly, later in the life course, an empowerment and trauma-informed intervention for women with a history of childhood trauma and substance use may help women

understand the relationship between trauma and substance use and how their interaction affects decisions around partner choice and HIV risk behaviors. Existing literature has found mixed results for the success of general HIV prevention interventions in reducing HIV risk behaviors. [37-39] Our study highlights the importance of expanding HIV prevention interventions beyond a focus on individual behavior change to address the broader social factors of violence and poverty psychologically and emotionally influencing women at risk. Trauma-focused mental health treatment and empowerment-focused HIV prevention interventions have been developed for high-risk women, and they have been shown to be effective in reducing sexual risk behaviors, including risk for sexual victimization and intimate partner violence.[40-43] HIV prevention programs specifically for women with incarcerated partners have also been implemented with results showing decreases in unprotected sex.[44] Additionally, our glimpse into the intergenerational effects of substance dependence, the cycle of trauma in families, and our participants' expressed desires to create better lives for their own children sheds light on the potential of integrated parenting education to help women break the cycle at their generational level.

This study has important public health implications as it elucidates the mediating factors linking childhood exposures and trauma to substance use and HIV risk behaviors. We hope our study will be useful to those working in mental health and HIV prevention as additional information to inform holistic and inter-disciplinary prevention programs that better serve girls and women at risk.

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