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[Experiences of Abuse May Be Linked to less HIV testing uptake among HIV-negative, High-Risk Women In The Southeastern United States]

By

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[Degree to be awarded: MPH]

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By

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An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
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ABSTRACT

[Experiences of Abuse May Be Linked to Less HIV Testing Uptake Among HIV-Negative, High-Risk Women In The Southeastern United States]

By: [Ogechukwu Etudo]

Women who experience IPV are at a significantly higher risk of contracting HIV than those who do not. The results of the few studies that have examined the link between IPV and HIV testing uptake have been inconsistent. This would be the first study to examine the association between IPV and past-year HIV testing behavior in a sample restricted to women at high-risk for HIV. Seventy-nine, HIV-negative, high-risk women between the ages of 18-50 from the greater Atlanta area participated in a cross-sectional survey between March and November 2014. Past-year emotional, physical and sexual IPV were measured using validated scales (The Index of Psychological abuse (IPA) scale and Severity of Violence Against Women Scale (SVAWS)). The outcomes were 'HIV test in the past year' and 'Years since last HIV test'. In bivariate analyses, higher mean scores on both the IPA and SVAWS scales were significantly associated with a lower likelihood of reporting HIV testing in the past year (p= 0.022 for IPA; p= 0.022 for SVAWS) and a higher likelihood of reporting more 'years since last HIV test (r=0.35, p=0.02 and r=0.34, p<0.01 respectively). The multivariate analysis was hindered due to inadequate sample size. Our results show that women who experience IPV may be less likely to obtain an HIV test in the past year. This is significant as these women are at greater risk of contracting HIV. It is imperative that they be adequately screened for IPV and referred to appropriate HIV testing and counseling services.

[Experiences of Abuse May Be Linked to Less HIV Testing Uptake Among HIV-Negative, High-Risk Women In The Southeastern United States]

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INTRODUCTION

Intimate Partner Violence (IPV) is a significant public health issue in the United States. According to the CDC, IPV is defined as a pattern of physical, sexual and emotional abuse "occurring between two people in a close relationship" (CDC 2012; McCall-Hosenfeld 2012). As per 2011 statistics, in the United States, approximately 27.3% of women reported experiencing sexual violence, physical violence or stalking in their lifetimes (CDC 2014b). As a consequence of IPV, an estimated 20% reported experiencing post-traumatic stress disorder, 13.4% reported a physical injury, 1.3% contracted a sexually transmitted infection and 1.7% became pregnant. IPV has also been significantly associated with chronic diseases such as breast cancer and invasive cervical cancer (Mathew et al 2013).

In the literature, IPV has been consistently associated with an increased risk of HIV acquisition (Karamagi et al 2006; Chandrasekaran et al 2007; El-Bassel et al 2007; Prabhu et al 2010; DiStefano et al 2013). Women reporting experiences of IPV were also more likely to report being diagnosed with other STDs, using alcohol and/or illicit drugs at last sex and having a main sexual partner who engaged in sex with multiple partners (Bauer et al 2001). These abused women were also more likely to use injection drugs, engage in unprotected sex with multiple partners and participate in transactional sex, placing themselves at high risk for contracting HIV (El-Bassel 2007). The inability to negotiate condom use due to fear of being beaten was reported by women in a study conducted in eastern Uganda (Karamagi et al 2006).

Research examining the association between women's experiences of IPV and HIV is relatively novel and the results have been varied. There have been studies published that found that women who experienced IPV were more likely to undergo HIV testing (Mitchell et al 2010; Takahashi et al 2011; McCall-Hosenfeld et al 2012; DiStefano et al 2013; Brown, M.J et al 2013; Nasrullah et al 2013) and others that found no association between IPV and HIV testing behavior (Hathaway et al 2000; Decker et al 2005; Karamagi et al 2006; Matthew et al 2013). In those studies, which demonstrated an association between IPV and an increased likelihood of HIV testing, it has been previously suggested by researchers that abused women may be more aware of their risk or may be encouraged by professionals such as shelter workers, healthcare and mental health practitioners to undergo HIV testing (McCall-Hosenfeld et al 2012; Nasrullah et al 2013.

It is important to note that these studies examined various populations of women in the U.S in a variety of contexts. To our knowledge, no study has examined the relationship between IPV and HIV testing in HIV-negative, non-pregnant, high-risk women residing in the southeastern United States, which is the ultimate aim of this study.

CHAPTER 2: COMPREHENSIVE REVIEW OF THE LITERATURE

Introduction to the literature review

In the literature, the existence of a link between women's experiences of intimate partner violence (IPV) and increased susceptibility to HIV infection has been consistently demonstrated. Researchers have also found that survivors of IPV are more likely to engage in behaviors, such as illicit drug use, unprotected sex, transactional sex, which place them at increased risk of acquiring HIV. Due to these risks, it is important that these women are tested regularly for HIV.

This review has several objectives. First of all, an overview of the burden of HIV/AIDS in the United States will be examined as well as that of intimate partner violence. Secondly, current recommendations for HIV testing as outlined by the Centers for Disease Control and Prevention (CDC) and the Institute of Medicine (IOM) will be discussed. Furthermore, studies which described a significant association between IPV and HIV testing behavior, will be reviewed, as well as those, which found no significant association. A brief summary and implications with respect to this thesis will be discussed as well.

The studies included in this review, which were all published within the last 20 years, were identified via a search utilizing the PubMed, EMBASE, Web of Science and Cochrane Library databases. The search also involved organization websites and recommendations from experts in the field. Studies that broadly examined the link between women's experiences of IPV and HIV were included in this review. However,

special emphasis was placed on studies that specifically evaluated the association

between on women's experiences of IPV and their likelihood of undergoing HIV testing

Overview of the burden of HIV in the United States

In the United States, an estimated 1.2 million people were living with HIV in 2011 (CDC

2014a). In 2010, there were approximately 47,500 new HIV infections in the United

States (CDC 2014a). With respect to racial breakdown, African Americans are the most

affected, accounting for 44% of new infections, despite the fact that they comprise only

12% of the U.S population (CDC 2014a). Women comprise approximately 25% of

Americans currently living with HIV, as well as 20% of new infections (CDC 2014a). It

is important to note that despite improvements in HIV testing and treatment in the past

few decades, the incidence of HIV has remained relatively unchanged, emphasizing the

need for more effective preventive interventions (Prowse et al 2013).

HIV testing guidelines and recommendations

In 2006, the CDC instituted revisions of previous guidelines for all patients in healthcare settings, as well as pregnant women (CDC 2006). Currently, the CDC recommends that adults and adolescents at high risk for HIV be screened at least annually and that such screening be strictly voluntary (CDC 2006). However, counseling is not required at the time of testing or screening even though it is strongly encouraged in clinical settings where high risk sexual behaviors are routinely assessed (i.e. STI clinics) (CDC 2006). The CDC also recommends that HIV testing be included as part of a routine panel of prenatal screening tests for pregnant women and that in areas of the country where the incidence of HIV is highest in this population, it is encouraged that they be re-screened in the third trimester (CDC 2006). In 2011, the Institute of Medicine (IOM) recommended that sexually actively women undergo annual counseling and screening for HIV infection (IOM 2011).

Overview of intimate Partner Violence (IPV) and its association with HIV

According to the CDC, IPV is violence that "occurs between two people in a close relationship." Specifically, IPV is defined as a pattern of "coercive control of one intimate partner by the other" and is comprised of physical violence, sexual violence, threats of physical or sexual violence and emotional abuse (Prowse *et al* 2013; CDC 2012). IPV is a significant public health issue in the United States, with approximately 30% of women and 10% of men reporting some form of IPV (CDC 2012). In addition, IPV has been blamed for the deaths of 2,340 people in the U.S in 2007 and approximately 70% of those deaths were females (CDC 2012; BOJ Statistics 2013). These numbers are

most likely an underestimation of the true scale of the problem as IPV tends to be underreported (Prowse et al 2013).

The relationship between IPV and HIV has been well documented in the literature. Several studies have shown a link between women's experiences of IPV and their likelihood of being infected with HIV (Prabhu *et al* 2010; Karamagi *et al* 2006; Chandrasekaran *et al* 2007). Others have demonstrated an independent link between IPV and HIV-associated high-risk behaviors such as injection drug use, unprotected sex with multiple partners, transactional sex, etc. (El-Bassel *et al* 2007). Prabhu *et al* found a significant association when the sample of women were stratified by marital status and single women and widowed women who experienced IPV were found to be significantly more likely to be infected with HIV than those who did not (Prabhu et al 2010). In focus group discussions conducted in Eastern Uganda, women reported that they were unable to negotiate condom use with their husbands and/or partners or receive HIV testing for fear of being beaten (Karamagi *et al* 2006). In a study conducted in Bangalore, India, Chandrasekaran *et al* found that of those women who reported IPV of any kind, 67% were found to be HIV positive (Chandrasekaran *et al* 2007).

In the opposite direction, (Mathew *et al* 2013) found that women diagnosed with HIV were found to be five times more likely to suffer from IPV than their HIV-negative counterparts. In addition, those women who were uncertain about their HIV status were nine times more likely to victimized by an intimate partner than those who were not (Mathew *et al* 2013). One study described the association between IPV and HIV

risk/infection as more than the 'bi-directional' phenomenon described above (DiStefano *et al* 2013). Instead, DiStefeno and colleagues argue that the relationship is 'synergistic 'with the two issues working in concert to contribute to negative health outcomes. Furthermore, the authors explain that the link between IPV and HIV is a 'syndemic intersection' bridged by factors such as illicit drug use, mental illness, transactional sex, etc. (DiStefano *et al* 2013).

Due to fact that survivors of abuse are more likely to engage in behaviors that place them at risk for HIV, it is essential that they receive HIV testing ,as recommended by the CDC and IOM. However, these women may be more likely to access emergency health services versus preventive care, including HIV testing (Vijayaraghavan et al 2012).

Studies that found a significant association between Intimate Partner Violence (IPV) and HIV testing behavior

The potential association between women's experiences of IPV and HIV testing behavior is a relatively new area of research in the literature. The results have been conflicting, with some studies reporting no association. However, others have found an association between at least one form of IPV perpetration or victimization and HIV testing behavior (Mitchell et al 2010; Takahashi et al 2011; McCall-Hosenfeld *et al* 2012; DiStefano *et al* 2013; Brown, M.J *et al* 2013; Nasrullah *et al* 2013).

In a survey of 24,000 people in ten southern African countries, Mitchell *et al* (2010) sought to determine if there was a relationship between IPV and HIV testing behavior. However, out of ten countries examined, a significant relationship between IPV and HIV

testing was found only in Swaziland, after other potential confounding factors were taken into account in a logistic regression model (Mitchell *et al* 2010). It was found that abused women in Swaziland were more likely to get tested (Mitchell *et al* 2010).

Takahashi *et al* (2011), in their community needs assessment examined a convenience sample of 179 Pacific Islanders (Chamorro and Samoan) in southern California. They found that those who reported experiences of IPV were more likely to receive an HIV test (Takahashi *et al* 2011). However, when the Chamorro and Samoan participants were examined separately, the association between IPV and HIV testing was significant for only those of Chamorro descent, despite the fact that the Samoans were more likely to report IPV than their Chamorro counterparts (Takahashi *et al* 2011). The authors attributed these somewhat counterintuitive results to inherent differences between both ethnic groups and/or bias introduced by the small sample size.

In a sample of 1,420 women from the Central Pennsylvania Women's Health Study longitudinal cohort where the relationship between women's experiences of IPV and their receipt of clinical preventive services was examined, McCall-Hosenfeld *et al* (2012) noted that IPV was an independent predictor of STI/HIV testing. Women who experienced IPV were twice as likely to undergo HIV/STI testing than those who did not have that experience (McCall-Hosenfeld *et al* 2012).

DiStefano *et al* in 2013, published a study that examined the association between IPV and HIV testing behavior in 1,400 undergraduate students in southern California. They

found that after controlling for other factors in a multivariate logistic regression model, students who were survivors of sexual violence and perpetrated verbal/emotional abuse in the past one year were significantly more likely to report ever being tested for HIV than those who did not have those experiences (DiStefano *et al* 2013). However, those who reported being survivors of physical violence, perpetrating sexual violence and witnesses to violence in the past year were not more likely to undergo HIV testing than those who did not have those experiences (DiStefano *et al* 2013).

In their study published in 2013, Brown and colleagues examined data from the 2006 and 2007 Behavioral Risk Factor Surveillance System (BRFSS), which collects IPV information from eight U.S states/territories. She and her colleagues found that the odds of undergoing HIV testing for women who reported experiencing IPV in their lifetime, was approximately twice that of women who reported no such experience (Brown *et al* 2013). This relationship remained unchanged after socio-demographic variables were adjusted for in a multivariate logistic regression model (Brown *et al* 2013).

Nasrullah *et al* (2013) described the association between various forms of IPV and ever testing for HIV by examining data from the 2005 BRFSS, collected from 15 U.S states and territories. This was one of the first studies to specifically limit their sample to non-pregnant women and found that ever testing for HIV was significantly associated with threatened physical violence, attempted physical violence, completed physical violence and coerced/forced sex (Nasrullah *et al* 2013). Essentially, women who experienced these forms of IPV were significantly more likely to report having ever tested for HIV than

women who had no IPV experience (Nasrullah *et al* 2013). Like most of the studies outlined above and unlike the study by (DiStefano *et al* 2013), emotional violence was not examined.

Studies that found an indeterminate or no association between Intimate Partner Violence (IPV) and HIV testing behavior

As has been mentioned above, research examining the relationship between IPV and HIV testing behavior is relatively novel and just as there have been studies that found a significant association between the two, there have also been studies published that found no association (Hathaway *et al* 2000; Decker *et al* 2005; Karamagi *et al* 2006; Matthew *et al* 2013).

In their study published in 2000, Hathaway *et al* examined data that had been collected from women aged 18-59 via the 1998 Massachusetts BRFSS. They found that although women who reported IPV were twice as likely to report undergoing an HIV test in the past year, it was not a statistically significant association. However, it is important to note that in this study, the women were asked about HIV testing for the purposes of infection control.

Deckler *et al* published a fascinating study in 2005 utilizing data collected from 9th and 12th grade female students via the 1999 and 2001 Massachusetts Youth Risk Behavior Surveys. They examined the association between physical, sexual or combined dating violence and HIV + other STI testing vs. HIV testing alone. Their results showed that there was no statistically significant relationship between dating violence (physical, sexual, combined) and HIV testing (Deckler *et al* 2005). However, they found a significant association between dating violence and HIV and other STI testing.

Mathew *et al* (2013) examined the relationship between IPV and HIV testing utilizing a sample of 1,474 women from 3 emergency departments in the southeastern U.S. They found that there was no significant relationship between women's experiences of IPV and their likelihood of undergoing HIV testing (Mathew *et al* 2013).

Karamagi and colleagues, in their study published in 2006, sought to understand if low uptake of voluntary counseling and testing (VCT) in the Mbale district in eastern Uganda was linked to women's experiences of IPV. They conducted several focus group discussions and they discovered pervasive fear among women with respect to seeking testing for HIV or negotiating condom use secondary to violent repercussions among their partners accusing them of being prostitutes or unfaithful (Karamagi *et al* 2006). It is important to remember that the context surrounding women's likelihood of undergoing HIV testing is different in Sub-Saharan Africa than the United States.

Other potential factors that may influence HIV testing behavior

IPV is one potential correlate or predictor of HIV testing behavior. A handful of studies have sought to examine other potential correlates of HIV testing. A study conducted by Tucker et al among women residing in shelters and low-income accommodations in Southern California found a significant positive correlation with testing among women who were raising children (Tucker *et al* 2003). In contrast, Adams et al, in a study conducted in South Africa, found in multivariate analyses that women who were raising children were less likely to test (Adams *et al* 2011). Other significant negative correlates of HIV testing identified by Adams and colleagues included age and conversation with

partner, while positive correlates included partners being tested and going to the police for help. The authors suggested that fear of retribution from a conversation with an abusive partner may explain the negative association between age, conversation with partner and testing. Conversely, the authors explain that women who seek help from police may be ready to test, especially if they receive reassurance about their safety.

Summary and implications for this thesis

In summary, consensus in the literature with respect to the relationship between women's experiences of IPV and HIV testing behavior is lacking. The majority of the studies described above examined the relationship between IPV and HIV testing behavior in the United States context. However, it is important to note that the United States is a large and extremely heterogeneous society, comprising numerous ethnic groups and individuals from diverse socioeconomic strata and within these, significant health disparities exist which may affect HIV testing uptake. These studies are examining different populations of women, pregnant, non-pregnant, HIV-negative and of varying ages as well. In addition, varying forms of IPV victimization and perpetration have being studied.

With respect to this thesis and to our knowledge, no study has specifically examined the relationship between IPV (threatened physical violence, completed physical violence, sexual violence and emotional violence) and HIV testing behavior in high-risk, non-pregnant women and HIV-negative women in the southeastern United States. In addition, this is the first study to our knowledge that has specifically examined testing within the

past year. The CDC and the Institute of Medicine (IOM) recommend annual testing for those who are at high risk for contracting HIV.

The main aim of our study is to determine what relationship exists between IPV and HIV testing behavior in a sample of HIV-negative, high-risk, non-pregnant women residing in the southeastern United States. Since abused women are at risk for HIV, it is important that they are receiving testing regularly, ideally in line with the CDC and IOM recommendations. However, this population may be less likely to access primary preventive services, in favor of emergency services leading us to hypothesize that within our study population, those who report more abuse would be less likely to receive regular testing than those who report less or none. Interestingly, as has been mentioned earlier in the literature review, several studies found associations between IPV and more testing. Perhaps, abused women in those study populations perceived greater risk associated with certain high-risk behaviors or were encouraged by healthcare professionals to receive testing. Our study is different in the sense that it is the first to examine this link in a study sample restricted to high-risk women, essentially controlling for risky behaviors in both abused and un-abused women. This enables us test the hypothesis that IPV is associated with less regular HIV testing uptake in this study sample. A secondary goal will be to determine what other factors may influence HIV testing, independent of IPV.

CHAPTER 3: MATERIALS AND METHODS

Participant recruitment and procedures

Between March and November 2014, high-risk HIV-negative, women aged 18-50, residing in the Atlanta community were recruited to participate in a cross-sectional study evaluating the association between experiences of IPV and various immune profiles linked to heightened HIV susceptibility. My thesis research evaluating the association between IPV and HIV testing behavior was nested within this study. Recruitment utilized various venues, including 3 Atlanta churches, a music festival, voluntary HIV testing fairs at a mall, violence awareness conferences, Emory University and residential areas. Potential participants were also identified via an existing database that had been developed as a result of previous HIV prevention research efforts at Emory University. Details of recruitment efforts included 30-minute interactive power point presentations about IPV (administered at the churches), as well as flyering. Fliers provided study inclusion criteria, contact information and described the study as a 'women's health study.'

Interested subjects were called and briefly screened for inclusion over the phone using a script. Those who received fliers were also screened when they called to express interest in participating in the study. The phone script included a reiteration of verbal consent to answer questions related to the study. It is important to note that in line with the World Health Organization guidelines on the conduct of gender-based violence research, care was taken not to mention it was an IPV study for the safety of participants and research staff (WHO 2011). Instead, during the scripted dialogue, the study was introduced to

potential subjects as a women's mental and physical health study administered through Emory University and Grady Memorial Health System.

Inclusion criteria were: being a woman aged 18-50, non-pregnant, HIV-negative and 'high risk'. In order to determine if subjects were high risk, women were asked over the phone if in the past five years, they had done or had one or more of the following: used IV drugs, cocaine, crack or methamphetamines, had a sexually transmitted infection, had unprotected sex with greater than four men, had protected sex with greater than six men, had sex with a known HIV-positive man, had sex in exchange for money, drugs or housing or has been with a partner who fit any of the above criteria. If the woman answered in the affirmative to one of these options, she was considered 'high risk' according to the 'Women's Interagency HIV Study' criteria. Women were excluded if they were pregnant, HIV-positive, over the age of 50 or not 'high-risk'.

Data collection and survey questionnaire

The study protocol was approved by the institutional review board (IRB) at Emory University and Grady Research Oversight Committee. Data collection via a cross-sectional survey occurred at the Grady Ponce De Leon Center in Atlanta, Georgia. On arrival, subjects were ushered to a secure room on the research floor, where written, informed consent was obtained prior to administration of the survey.

The survey was a standardized 72-item questionnaire. The first half of the questionnaire consisted of socio-demographic questions, questions related to HIV testing (barriers and motivators), high-risk behaviors and experiences of IPV. Medical history questions and questions related to immune function were included for the parent biomedical study. Subjects who failed to answer in the affirmative with respect to any of the high-risk behavior questions, tested positive for pregnancy or were HIV-positive, did not complete the second half of the questionnaire and were ultimately excluded from the study. Participants who met the inclusion criteria were instructed to complete the second half of the questionnaire. This half included questions related to drug/alcohol abuse, standardized questions on depression, post-traumatic stress disorder (PTSD) and discrimination. Data collected during the interview process were entered into a password-protected, secure database located in an Emory University 'T' drive created for the purposes of the study.

IPV questions

The IPV survey questions assessed past-year IPV experiences, were standardized and reflected the CDC's definition of IPV as violence that 'occurs between two people in a close relationship', characterized by a pattern of 'coercive control of one intimate partner by the other' and comprised of physical violence, sexual violence, threats of physical and/or sexual violence and emotional abuse (CDC 2012). The *Index of Psychological Abuse* scale, a 33-item scale with a Cronbach's alpha of 0.97 was utilized to measure to emotional IPV (CDC 2006(b)). The *Severity of Violence Against Women Scale,* a 46-item instrument with a Cronbach's alpha of between 0.89 and 0.96 measured threatened physical violence, completed physical violence and sexual violence (CDC 2006(b)).

Examples of questions from the *Index of Psychological Abuse* included: "To the best of your recollection, how many times in the past 1 year, if at all, has your current or prior sexual partner done any of these things to annoy or hurt you?" "How often has your partner refused to talk to you?", "accused you of having or wanting other sexual relationships"? "Told you about other sexual relationships your partner wanted or was having in order to hurt you?" Subjects had five answer options which included, 'never', 'rarely', 'sometimes', 'often' and 'not in the past year, but an intimate partner has done this to me before'.

Examples of questions from the *Severity of Violence Against Women Scale,* included: "How often, if it all, has your sexual partner(s) done the following behavior in the past year?" "Hit or kicked a wall, door or furniture?" "Made threatening gestures or faces at you?" "Shook a finger at you?" "Threatened you with a knife or gun?" "Pushed or

shoved you?" "Grabbed you suddenly or forcefully?" "Slapped you with the palm of their

hand?" "Demanded sex whether you wanted it or not?" "Made you have oral sex against

your will?" "Physically forced you to have vaginal sex?" etc. As with the *Index of Psych*

Abuse, the response options were, 'never', 'rarely', 'sometimes', 'often' and 'not in the

past year, but an intimate partner has done this to me before'.

Responses for each participant were added up to produce a composite score and based on

that score, the subject was deemed IPV positive or negative. The response 'never' was

assigned zero points, 'rarely' was assigned two points, 'sometimes', three points, 'often'

was assigned four points and 'not in the past year but a partner has done this to me

before' was assigned one point. Responses to the IPV questions from each scale were

added and each subject was given a numerical score.

HIV-testing questions

Participants were screened for history of HIV testing with the following questions "If

ever, what was the approximate year of your last HIV test?" "Have you ever tested

positive for HIV?"

In order to further delineate motivations, as well as barriers to HIV testing, participants

were asked to choose from a list of options, "Thinking about the last time you were tested

for HIV, which of the following reasons explain why you decided to get tested?" In

response to this question, subjects asked to provide 'yes' or 'no' answers to the following

options: "I felt I was at risk for HIV", "I was tested because I was pregnant", "My

healthcare provider suggested I get tested" "Family and/or friends suggested I get tested" "HIV testing was being offered at a health fair or public event" "Other" or "Not applicable". The second question subjects were asked was "Which of the following reasons discouraged you from getting HIV tested or made getting tested difficult in the past?" In response, subjects were asked to provide 'yes' or 'no' answers to the following options: "I was afraid my partner may find out" "I was ashamed or embarrassed" "I did not want to know" "I had problems arranging transportation to the HIV testing site" "I was concerned about the cost" I did not think I was at high risk for getting HIV infected" "I had a prior unpleasant experience in a healthcare setting or with a healthcare provider" "Other" and "I experienced no difficulty in getting HIV tested".

Variables

IPV

IPV was measured using *The Index of Psychological Abuse Scale*, a measure of emotional violence and the *Severity of Violence Against Women Scale*, a measure of threatened physical violence, completed physical violence, as well as sexual violence. The two IPV variables represent numerical sums of responses to the questions on the standardized questionnaires. The questions and responses were based on experiences of IPV in the past year.

Outcome variables

The two outcome variables were 'HIV testing in the past year' and 'Years since last HIV test'. The first variable 'HIV testing in the past year' was created as a categorical 'yes/no' variable and represented those who reported receiving an HIV test between 2013 and 2014. The second variable, 'Years since last HIV test' was created as a continuous variable and was derived from subtracting all responses from '2014'.

Covariates

Several relevant socio-demographic covariates were analyzed. Two of them (age and number of children) were continuous while the rest were divided into categories. These included age, number of children, race (Black, White, Other), education (<9th grade, 9th grade – high school, beyond high school), household income (<$10,000, >=$10,000), employment status (employed, unemployed), marital status (single/separated/divorced, married, not married but in an intimate relationship) and housing status (currently homeless, not homeless, homeless, but not currently).

Statistical analysis

All analyses were completed utilizing STATA 13 SE. Chi-square tests of association

analyses were performed for bivariate associations between the categorical socio-

demographic covariates and the categorical outcome variable (HIV testing in the past

year). Student t tests, as well as analyses of variance were performed to determine

bivariate associations between the categorical socio-demographic covariates and the

continuous outcome variable (Years since last HIV test). T tests and analyses of variance

were also used to decipher associations between the two IPV variables, the continuous

socio-demographic variables (age, number of children) and the categorical outcome

variable (HIV test in the past year).

A multivariate linear regression was generated to explore the association between IPV

and HIV testing uptake (as measured by years since last HIV test), while accounting for

potential socio-demographic covariates. Finally, in order to determine the potential

confounders in the association between IPV (as measured by the index of psychological

abuse scale and severity of violence against women scale) and HIV testing behavior in

the past year, tests of correlation and analyses of variance were performed. All analyses

were conducted at the 95% confidence level.

CHAPTER 3: RESULTS

Participant Characteristics

A total of 79 HIV-negative, non-pregnant women aged 18-50, with at least one HIV risk

factor were included in the statistical analysis. Table 1 provides a summary of the

demographic characteristics of the sample of 79 women. The total mean age was 34 years with a standard deviation of 8.53, while the mean number of children was 1.95 with a standard deviation of 1.84. Eighty percent (80% or 63/79) of the subjects self reported as Black, while 18% (14/79) self reported as White. Furthermore, 52% (41/79) of subjects reported receiving an education beyond school, 42% (33/79) received an education between 9th grade and a high school diploma, while 6% (5/79) reported that they were not educated beyond the 8th grade. Sixty-three percent (63% or 50/79) of the women stated that they were unemployed, while 75% (59/79) reported earning less than $10,000 a year. Only 3% (4/79) of participants reported being married. Approximately two-thirds (64% or 50/78) of women reported testing in the past year.

Correlates of Past-year HIV Testing

Bivariate associations between the main exposure of interest (IPV), demographic covariates and the primary outcome (HIV testing in the past year) were performed (Table 1). Psychological abuse (as measured by the *Index of Psychological Abuse Scale*) and physical and sexual abuse (as measured by the *Severity of Violence Against Women Scale*) were negatively associated with HIV testing in the past year (p=0.022 and p=0.022 respectively). The mean score on the Index of Psychological Abuse Scale was 32.78 (SE=3.22) for those who reported receiving an HIV test in the past year and 45.79 (SE=4.71) for those who reported not receiving a test in the past year. The mean score on the Severity of Violence Against Women was 28.82 (SE=3.91) for subjects who reported getting tested in the past year and 43.04 (5.67) for those who reported not receiving an

HIV test in the past year. No other demographic covariates were significantly associated with past-year testing.

Correlates of Recent HIV Testing Uptake

We next explored bivariate associations between the main exposure of interest (IPV), demographic covariates and the numerical primary outcome of years since last HIV test (Table 2). Age (r=0.26, p=0.02), emotional IPV (r=0.35, p=0.02) and threatened physical/completed physical/sexual IPV (r=0.34, p-value<0.01) were all positively correlated with 'years since last HIV test.' Essentially this unadjusted analysis is stating that being older and scoring higher on the IPV scales is associated with an increased likelihood of delayed testing. Although none of the categorical covariates were significantly associated with 'years since last HIV test', 'marital status' approached significance (p-value = 0.05). Married women reported an average of 2.5 years since their last HIV test vs. an average of 1 year for single/divorced/separated women and unmarried women in an intimate relationship.

Correlates of Past-year IPV Experience

To evaluate for potential confounders, bivariate analyses between demographic covariates and IPV experience were conducted (see table 3). Emotional IPV (as measured by the *Index of Psychological Abuse* scale) was positively correlated/associated with age (r=0.37, p<0.001), number of children (r=0.3, p<0.01), being Black vs. White or Other race (Average scale scores for Black = 42.06, White = 15.29, Other race = 28.50, p<0.001), employment status (average scale scores for Unemployed = 41.24, Employed =

29.62, p=0.04) and homelessness, (p<0.01). On the right side of the table, physical/sexual

IPV (as measured by the severity of violence against women scale) was

correlated/associated with age (r=0.28, p=0.01), number of children (r=0.3, p<0.01), race

(p<0.001), homelessness (p<0.01), marital status (p=0.01) and education (p=0.04).

Adjusted Exploration for the Link Between IPV and HIV Testing

In the multilinear regression model (see table 2), adjusting for all potential covariates

listed in table 1 (age, number of children, race, education, household income,

employment status and housing status), experience of IPV was no longer associated with

years since last HIV testing.

Motivations for and Barriers to HIV Testing

Motivators and barriers to HIV testing were further explored in a subset of women

(41/79). Table 4 provides a simple descriptive analysis of responses to those questions.

The most commonly reported motivators driving HIV testing were personal risk

perception (56%), testing being offered at a health fair or public event attended by the

participant (46%) and encouragement from a healthcare provider (44%). The most

commonly reported barriers to testing were shame or embarrassment (51%), not wanting

to know (44%) and cost concerns (32%). Almost half (43.90%) of the participants

reported experiencing no difficulties getting tested.

CHAPTER 3: DISCUSSION

Several studies have demonstrated that experiences of IPV place women at risk for contracting HIV, highlighting the need for regular HIV testing ((Prabhu et al 2010; Karamagi et al 2006; Chandrasekaran et al 2007). To date, most studies examining the relationship between IPV and HIV testing uptake have demonstrated positive or no correlation. To our knowledge, this is the first study to demonstrate the reverse, that IPV is associated with reduced uptake of regular HIV testing. This is a major strength of our study. Earlier in this thesis, we had hypothesized that earlier studies may have demonstrated a positive association between IPV and testing due to the fact that increased HIV risk perception may be more of a factor for abused women. Perhaps, the fact that our study is the first to limit the study sample to women at high risk for HIV may have reduced the effect of self-perceived or healthcare provider-perceived risk potentially driving the uptake of HIV testing.

In unadjusted bivariate analyses, both psychological abuse, physical and sexual abuse were associated with a reduced likelihood of receiving an HIV test in the past year. As was highlighted in the previous paragraph, these results are in contrast to what has been found in other studies, which also examined IPV, and found a significant association with lifetime HIV testing uptake. These studies reported IPV as being associated with an increased likelihood of receiving an HIV test in one's lifetime (McCall-Hosenfeld et al 2012; DiStefano et al 2013; Nasrullah et al 2013, Brown et al 2013). Perhaps, the responses of our subjects to questions about motivations and barriers to receiving an HIV test could shed some light as to why women who reported experiencing IPV were less

likely to receive an HIV test in the past year. The most common motivator to getting tested, reported by 56% of respondents was 'the feeling of being at risk for HIV'. This corroborates our explanation as to why increased testing among abused women was reported in earlier studies. Surprisingly, the most commonly cited barrier to testing (identified by half of respondents) was 'feeling ashamed or embarrassed' (51% of respondents). Perhaps there are unmeasured socio-cultural factors contributing to this 'stigma' and thus, discouraging testing among this majority African American population. Furthermore, only 14% stated that being 'afraid of their partner finding out' was a barrier to undergoing testing. This may be an encouraging sign that providers who do screen for IPV are successfully reassuring these individuals about the confidentiality, as well as ensuring their safety.

In another set of bivariate analyses, scores on the two IPV scales were found to be significantly positively correlated with years since last HIV test. It is important to note that this numerical variant of the primary outcome variable was created in order to maximize variability in the data. However, in multivariate analyses examining the predictors of the numerical outcome, associations between IPV and 'years since last test' cease to be significant when identified demographic covariates were adjusted for. Age was the only demographic covariate found to be 'significantly' positively correlated with years since last HIV test in the bivariate analysis. The results are somewhat similar to those published by (Adams et al 2011) where the socio-demographic covariates such as age and sexual activity in the past year were found to be associated with reduced odds of HIV testing among subjects in South Africa in both bivariate and multivariate analyses.

However, it must be noted that (Adams et al 2011) examined overall HIV testing versus testing in the past year. In our multivariate analysis examining potential correlates of 'years since last HIV test', after adjusting for all variables, we found that neither of the IPV variables nor the socio-demographic covariates were significantly associated with 'years since last HIV test'. Due to the exceedingly small sample size, it is difficult to draw conclusions from the results of the multivariate analysis.

Our study had several limitations. First, our sample size was very small, limiting statistical power and our ability examine associations between IPV and HIV testing behavior in the multivariate analysis. Secondly, all participants included in the analysis reported that they had been tested for HIV at least once in their lifetime. This result is extraordinarily high and substantially more so than had been reported in previous studies. Perhaps, this could be attributed to desirability bias and/or the fact that it was a very small convenience sample versus a random sample. Reporting bias is a significant potential limitation as we relied on participant self-reports. The cross-sectional nature of the study hindered our ability to causally evaluate these women's experiences of IPV and HIV testing uptake.

In conclusion, our study showed that IPV is a significant problem in this population, consisting mostly of African American women of low socio-economic status. This study also demonstrated that these women are highly likely to receive an HIV test at least once during their reproductive years, a promising sign that there is some level of contact with the healthcare system. By examining motivators and barriers to testing, we discovered

that providers who offer testing and counseling are most likely successfully reassuring abused women of their confidentiality and safety as these women reported little concern about their partners finding out that they were seeking testing. Overall, our study determined that women who suffer from more severe IPV may be less likely to receive an HIV test annually, as recommended by the Institute of Medicine (IOM 2011). Thus, it is imperative that when these women do seek IPV support services (i.e. shelters, mental health services, religious services, legal assistance, etc.) that they receive adequate HIV testing and counseling. It is also important that healthcare providers screen abused women for IPV when they seek emergency, as well as preventive health services.

IMPLICATIONS/RECOMMENDATIONS

The results of our research possess some implications for the future IPV research, as well as IPV screening and HIV testing in healthcare settings in the southeastern United States. As had been mentioned earlier, ours is the first study to examine the relationship between IPV and HIV testing behavior among high-risk, HIV negative and non-pregnant women. We found the burden of IPV to be high among this population of mostly African American women of low socio-economic status. Although they all reported receiving an HIV test at least once in their lifetime, those who reported more severe IPV victimization were less likely to receive annual testing as has been recommended by the CDC (CDC 2006) and the Institute of Medicine (IOM 2011) for those at high risk for HIV infection. Future studies with significantly larger sample sizes may be modeled after our study in order to further delineate the relationship between IPV and HIV testing behavior in this population.

Based on the recommendations by the IOM in 2011 (IOM 2011) calling for 'screening and counseling of women and adolescents for interpersonal and domestic violence', as well as annual HIV testing and counseling for sexually active women, a provision was included in the Affordable Care Act allowing for health plans in the exchange to cover both IPV and HIV screening without cost sharing (ASPE 2013). Following this, in January 2013, the United States Preventive Services Task Force released further recommendations calling for screening of 'all women of child-bearing age' for IPV (USPSTF 2013). However, as has been demonstrated by several studies, recommendations and insurance coverage are not sufficient to ensure screening when these women come in contact with the healthcare system. In their 2006 study, Kothari and Rhodes (Kothari and Rhodes 2006) found that women who visited the emergency room were asked if their injuries were related to IPV only one-third of the time. Overall, the prevalence of IPV screening in the United States is low and varies across healthcare settings (ASPE 2013). In 2002, (Elliott et al 2002) examined IPV screening among a large sample of family physicians, obstetricians/gynecologists and emergency medicine physicians. Only 6% reported routine screening, while 10% reported that they had never screened patients for IPV. (Stayton and Duncan 2005) published a comprehensive review of the literature and found that only between 3 and 41% of physicians reported routinely screening their patients for IPV. Some of the most common barriers to screening reported by physicians include minimal knowledge/education/training on the subject, lack of time, inadequate resources for referrals/follow-up, personal discomfort with the issue and fear of personal safety (Sprague et al, 2012).

Our study, the first to demonstrate IPV as being associated with reduced testing uptake in a sample restricted to women at high risk for HIV highlights the need for IPV screening and linkage to HIV testing and counseling. The majority of our subjects highlighted shame/embarrassment as a barrier to undergoing testing. A study conducted in 2002 in several large urban cities in the U.S found that stigma was independently associated with a decreased likelihood of HIV testing in a population similar to ours (Fortenberry et al 2002). One approach to addressing this problem would be to improve our understanding of this potential barrier to HIV testing uptake with more formative research that describes its socio-cultural underpinnings. With that understanding, we may advocate for more effective community-based outreach and education programs targeting these women. A second approach would be to call for mandatory training of resident physicians in IPV screening and linkage to HIV testing/counseling at the state level. This approach was initially proposed by Karen Oehme, who recommended state mandated training of physicians in IPV screening, counseling and referral in response to mandated insurance coverage for IPV screening under the Affordable Care Act (Oehme 2014). Training providers ensures that they are prepared to identify those women who may be at risk for IPV, refer them to for appropriate services (including mental health, HIV counseling and testing, shelters). Providers should also be trained to mitigate the stigma, shame or embarrassment which are significant barriers to many women seeking HIV testing and counseling.

There is no doubt that IPV is a significant public health issue in the United States, especially the southeastern part of the country. There exists a complex syndemic

interaction between socio-cultural norms, IPV and HIV-associated risk factors that influence the likelihood of HIV testing uptake among abused women residing in this part of the country. Addressing the complex problem of IPV and HIV testing uptake requires a multi-pronged approach at the research, community and policy levels.

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APPENDIX

Table A1: Summary of characteristics of studies examining the link between IPV
and HIV testing.

Author(s) / Date	Study population	Forms of IPV examined	Outcomes on IPV & testing behavior	Not
Mitchell et al 2010	Male and female respondents from 12 countries in East and Southern Africa	Not explicitly stated in article	Only in Swaziland were those who reported IPV more likely to have been tested in the past year	Lar (>2 test exa stuc soc reli; stig infl like for
Takahashi et al 2011	Male & female Pacific Islanders in Southern California (Samoan & Chamorro/Guamanian	Emotional, Physical IPV	IPV associated with increased HIV testing in Chamorros, but not Samoans	Inte diff kno yrs.
McCall-Hosenfeld et al 2012	Women aged 18-45 in Central Pennsylvania	Threatened & perpetrated physical and sexual IPV	IPV associated with increased HIV/STI testing	HIV exa
DiStefano et al 2013	Undergraduates >18 years of age in Southern California	Verbal, physical and sexual IPV (Experienced, witnessed & perpetrated)	Only verbal IPV (victimization) associated with increased HIV testing after co-variates adjusted for	Exc pop pop whi vs. 4%
Brown et al 2013	Women aged 18 and > sampled from 8 U.S States and territories	Physical and Sexual IPV	Women who reported lifetime IPV were 2x as likely to undergo HIV testing as women who did not	Ver size
Nasrullah et al 2013	Women aged 18 and > sampled from 15 U.S States and territories	Physical IPV (threatened, attempted, completed), Sexual IPV (unwanted sex)	Threatened (physical & sexual) violence, attempted (physical & sexual) violence, completed physical violence and unwanted sex associated with increased HIV testing	Ver size
Hathaway et al 2000	Women aged 18-59 in Massachusetts	Threatened & completed physical	Relationship between IPV & HIV testing not	HIV yea

		IPV, emotional IPV	statistically significant	infe...
Decker et al 2005	9th – 12th grade female students in Massachusetts	Physical & sexual dating violence	No significant relationship between physical & sexual dating violence and HIV only	Sig... rela... dati... STI... tog... ado... like... vs. preg...
Karamagi et al 2006	Married women aged 18 or > who had children 1 year or younger in eastern Uganda	Threatened & completed physical IPV, sexual coercion	Focus group discussions revealed women were unlikely to undergo testing due to fear of violent reprisals from their husbands	Mix... stud... con... U.S... pat... whe... stro...
Mathew et al 2013	Women aged 18-65 who visited the 2 EDs in a large southeastern U.S city	Physical, sexual & verbal IPV	No association found between any form of IPV and HIV testing	87%... Am...

Table A2: Variables created and utilized in the study

Variable	Measure	Variable type	Purpose
IPV	Index of Psych Abuse, Severity of Violence Against Women Scale Scores	Numerical	'Potential correlate'
HIV testing	Yes/No	Categorical	Outcome
HIV (years since last test)	= 2014 – year tested	Numerical	Outcome
Age		Numerical	Covariate
Level of education		Categorical	Covariate
Race		Categorical	Covariate
Employment		Categorical	Covariate
Marital status		Categorical	Covariate
Number of children		Numerical	Covariate
Income		Categorical	Covariate
Housing status		Categorical	Covariate

Table 1: Demographic characteristics of the population including univariate associations between predictors and testing					
Variable	**HIV test in past year**		**No HIV test in the past year**		
	Mean (SE)	N (%)	Mean (SE)	N (%)	p-valu
Total		50 (64.10)		28 (35.90)	
Age (years)	34.02 (1.16)		33.97 (1.72)		0.85
Number of children	2.04 (0.25)		1.86 (0.38)		0.67
Race					0.49
Black		39 (61.90)		24 (38.10)	
White		9 (69.23)		4 (30.77)	
Other		2 (100.00)		0 (0)	
Education					0.1
<9th grade		5 (100)		0 (0)	
9th grade - high school		19 (57.58)		14 (42.42)	
Beyond high school		26 (65.00)		14 (35.00)	

Household Income ($/year)					0.92
<10,000		37 (63.79)		21 (36.21)	
>=10,000		13 (65.00)		7 (35.00)	
Employment Status					0.49
Employed		20 (68.97)		9 (31.03)	
Unemployed		30 (61.22)		19 (38.78)	
Marital status					0.17
Single/separated/divorced		32 (72.73)		12 (27.27)	
Married		2 (66.67)		1 (33.33)	
Not married but in an intimate relationship		16 (51.61)		15 (48.39)	
Housing status					0.25
Currently homeless		5 (62.50)		3 (37.50)	
Not homeless		37 (60.66)		24 (39.34)	
Homeless, but not currently		8 (88.89)		1 (11.11)	
Index of Psychological Abuse Scale	32.78 (3.22)		45.79 (4.71)		0.022
Severity of Violence Against Women Scale	28.82 (3.91)		43.04 (5.67)		0.022

SE = standard error; SD= standard deviation; * = statistically significant p-value at p<0.05

Table 2: Univariate and multivariate associations between predictors and 'Years since last HIV test'

Variable	Univariate associations			Multivariate associa[tions]	
			Years since last HIV test		
	r	Mean (SD)	p-value	Beta (adj.)	CI
Age	0.26		0.02*	0.01	-0.01, 0.04
Number of Children	-0.01		0.91	-0.06	-0.20, 0.08
Race			0.52		
Black		1.86 (2.74)		-0.19	-0.84, 0.46
White		1.15 (0.69)		-0.65	-1.93, 0.63
Other		0.5 (0.71)		ref	
Education			0.38		
Less than 9th grade		0.2 (0.45)		-0.60	-1.49, 0.29
9th grade to high school diploma		1.85 (2.79)		-0.07	-0.52, 0.37
Beyond high school		1.78 (2.37)		ref	
Household income ($/yr)			0.67		
<10,000		1.76 (2.66)		0.20	-0.27, 0.66
>=10,000		1.5 (2.01)		ref	
Employment Status			0.68		
Unemployed		1.55 (2.75)		-0.05	-0.55, 0.46
Employed		1.8 (2.03)		ref	
Marital Status					
Single/Divorced/Separated		1.16 (1.31)	0.05	-0.06	-1.07, 0.96
In an intimate relationship but not married		1 (1.73)		0.20	-0.83, 1.23
Married		2.55 (3.48)		ref	
Homelessness			0.34		
Currently homeless		1.74 (2.38)		-0.63	-1.32, 0.06
Homeless, but not at the moment		0.56 (0.73)		-0.43	-1.09, 0.24
Not homeless		1.87 (2.66)		ref	
Index of psychological abuse scale	0.35		0.015*	0.007	-0.01, 0.02
Severity of Violence Against Women Scale	0.34		0.002*	0.006	-0.01, 0.02

r = correlation coefficient; SD = standard deviation; Beta (adj.) = adjusted beta coefficient; ref = reference category; *
= statistically significant p-value at p<0.05

Table 3: Univariate associations between covariates and index of psych abuse scale

Variable	Index of psych abuse scale			Severity of violence against w	
	r	Mean (SD)	p-value	r	Mean (SD)
Age	0.37		0.0007*	0.28	
Number of children	0.3		0.0064*	0.3	
Race			0.0006*		
Black		42.06 (22.88)			39.54 (28.47)
Other		28.50 (34.65)			32.50 (43.13)
White		15.29 (19.04)			6.43 (11.93)
Employment Status			0.0412*		
Unemployed		41.24 (22.97)			37.92 (27.83)
Employed		29.62 (25.65)			25.86 (30.42)
Homelessness			0.0052*		
Currently homeless		63.00 (19.66)			64.75 (31.95)
Homeless, but not at the moment		32.89 (21.20)			35.67 (28.36)
Not homeless		34.21 (23.75)			29.14 (26.83)
Marital Status			0.0639		
Single/Divorced/Separated		31.89 (24.07)			25.4 (26.49)
In an intimate relationship but not married		44.97 (22.28)			45.58 (29.38)
Married		30.67 (24.07)			30 (33.45)
Education			0.0603		
Less than 9th grade		30.80 (27.54)			32 (42.30)
9th grade to high school diploma		44.64 (21.74)			43.06 (26.74)
Beyond high school		31.56 (25.13)			25.98 (27.90)
Household income ($/yr)			0.9041		
<10,000		36.78 (25.75)			34 (31.29)
>=10,000		37.55 (20.86)			32 (22.6)

r = correlation coefficient; SD = standard deviation; * = statistically significant p-value at p<0.05

Table 4: Motivators and Barriers to undergoing HIV testing (Total N = 41)	
Motivations behind HIV testing	N (%)
I felt I was at risk for HIV	23 (56.10)
HIV testig was offered at a health fair/public event I attended	19 (46.34)
My healthcare provider suggested that I get tested	18 (43.90)
Other	12 (30.00)
Family and/or friends suggested I get tested	14 (34.15)
I was tested because I was pregnant	8 (19.51)
Barriers to testing	
I was ashamed or embarrassed	21 (51.22)
I did not want to know	18 (43.90)
I experienced no difficulty getting HIV tested	18 (43.90)
I was concerned about the cost of HIV testing	13 (31.71)
I did not think I was at high risk of getting infected	12 (29.27)
I had a prior unpleasant experience in a healthcare setting	9 (21.95)
I was afraid my partner would find out	6 (14.63)
I had problems arranging for transportation	6 (14.63)