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Frequency and Types of Intimate Partner Violence and Symptoms of Gynecologic Morbidity among Married Indian Women

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BA
University of Georgia
2007

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An abstract of
A thesis submitted to the Faculty of the
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Abstract

Frequency and Types of Intimate Partner Violence and Symptoms of Gynecologic Morbidity among Married Indian Women
By Amy Kaye Winter

This study examines the association between self-reported verbal, physical, and/or sexual intimate partner violence (IPV) and self-reported symptoms of gynecologic morbidity among 65,610 married Indian women (age 15-49). Data are taken from the 2005-2006 Indian National Family Health Survey-III. Regression models are fitted to identify associations between three types of self-reported IPV (verbal, physical, and sexual) and three symptoms of gynecologic morbidity (genital sores, abnormal vaginal discharge, and sexually transmitted infections). IPV is uniquely measured by examining self-reported physical, sexual, *and* verbal IPV, IPV frequency, and all combinations of IPV type. In the year preceding the survey, 24% of women reported any IPV (10% verbal, 19% physical, 6% sexual) and 10% reported at least one symptom of gynecologic morbidity. The model results indicate that after controlling for other covariates, experiencing physical, verbal, or sexual IPV is associated with an increased risk of gynecologic morbidity. Women who experience all three types of violence are at the highest risk of reporting each symptom (genital sore OR=4.57, abnormal discharge OR=3.24, STI OR=2.49; all p-values<0.05). There is a call for health providers to recognize IPV and provide treatment and resources for women who experience IPV. In addition, community awareness of the harmful consequences of IPV needs to be increased to reduce IPV tolerance.

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CHAPTER 1 – INTRODUCTION

Intimate Partner Violence (IPV) is the most common form of violence in women's lives (World Health Organization 2005). It affects women of all ages, socio-economic classes, and ethnicities around the world. A growing body of literature reflects that high levels of IPV exist throughout South Asia, specifically in India where gender cultural norms concerning the treatment of women have acted to increase the tolerance of IPV in this setting (Koenig, Stephenson et al. 2006; Jeyaseelan, Kumar et al. 2007). Based on the National Family Health Survey-III, India's equivalent of the Demographic and Health Survey, 35.49% of married Indian women reported experiencing physical IPV with or without sexual violence (Silverman, Decker et al. 2008).

In addition, the burden of gynecologic morbidity in developing country settings, and in India, is high. The estimated prevalence rate of curable STIs in North America and Western Europe is 2%; however it South and Southeast Asia the prevalence rate is 5%, and 12% in Sub-Saharan Africa (World Health Organization 2001). A number of studies from India have demonstrated the high levels of gynecologic morbidity ranging from 24%-34% of women reporting gynecologic morbidity (Prasad, Abraham et al. 2003; Patel, Weiss et al. 2006; Stephenson, Koenig et al. 2006).

The WHO recommended that in order to end domestic violence against women and its negative consequences, more research and collaboration is needed. Specifically, the 2005 report called for "more research on the magnitude and nature of the problem of violence against women, and its costs, in given countries or settings is therefore urgently needed to provide a stronger basis for advocacy and action" (World Health Organization

2005). This paper accomplishes this task by adding to the depth and breadth of our understanding of the affects of IPV on women's reproductive health in a developing country setting. Specifically, this analysis will examine the association between IPV and gynecologic morbidity among Indian women.

Intimate Partner Violence

Studies across the globe are increasingly documenting the important public health topic of Intimate Partner Violence (IPV) and its negative health effects on women (World Health Organization 1996; Campbell 2002; Heise, Ellsberg et al. 2002; Krug, Mercy et al. 2002). Heise et al. (2002) described violence against women as the most pervasive, yet least recognized human rights violation in the world. According to the World Health Organization (2005), IPV is the most common form of violence in women's lives. In fact, in a review of 48 population-based studies from around the world, the prevalence of IPV ranged from 10-69% among women who reported being physically assaulted by an intimate partner (Krug, Mercy et al. 2002). IPV is not just physical violence; it also includes verbal and physical threats, psychological abuse, controlling actions, sexual coercion, deprivation and neglect (World Health Organization 1996; Krug, Mercy et al. 2002). It has been documented that high levels of IPV exist throughout South Asia, and specifically in India (Koenig, Stephenson et al. 2006; Jeyaseelan, Kumar et al. 2007).

There are many factors that affect women's risk of intimate partner violence, including individual, inter-personal, community, and societal level factors. Each of these levels is associated with IPV in diverse ways. Demographic and personal behavior of the husband and wife affect women's risk of IPV. The inter-personal relationship and dynamics between husband and wife, for example the relationship power equity or age

difference in the relationship create positive/negative environment for IPV risk. At the community and societal levels, the larger environment is taken into account in which the wife's social support, community perceptions and societal norms around IPV are considered. IPV risk factors are important role players in the causal mechanisms between IPV and the resultant heath outcomes of women who have experienced IPV.

Intimate partner violence negatively affects women's overall mental and physical health. In a 10 country study conducted by the WHO, women who self-reported poor or very poor general health were also more likely to report a lifetime experience of physical or sexual IPV (Ellsberg, Jansen et al. 2008). A study from 1991 revealed a dose-response relationship based on the frequency of physical IPV and general physical and mental health (Koss, Koss et al. 1991).

Physical injuries or traumas are direct consequences of IPV; these injuries often affect the skin or musculoskeletal system, including lacerations, bruises, bites, punctures, broken bones, etc. IPV has also been linked to the most severe outcome, homicide (Campbell 2002; World Health Organization 2005). In addition, IPV is associated with morbidities to the neurological, respiratory, cardiovascular, gastrointestinal, and central nervous system, that may result in short term or permanent disabilities to the wife. Poor mental health outcomes are another negative result of violence against women. A range of mental health outcomes associated with intimate partner violence have included depression, sleep problems, anxiety, mental distress, PTSD, and suicidal thoughts and attempts (Hathaway, Mucci et al. 2000; Hurwitz, Gupta et al. 2006; Ellsberg, Jansen et al. 2008; Edwards, Black et al. 2009). The WHO multi-country study reported that women who had physical or sexual IPV or both, were significantly more likely to report higher

levels of emotional distress (measured through symptoms such as crying, inability to enjoy life, fatigue in the four weeks prior the survey), suicidal thoughts and suicidal attempts (World Health Organization 2005; Ellsberg, Jansen et al. 2008)

Women's reproductive health is also related to the experience of intimate partner violence, such as contraceptive use, unplanned pregnancies, induced abortions, pregnancy complications, and prenatal and antenatal care. For example, women who experience IPV are less likely to report contraceptive use, and therefore more likely to have unplanned pregnancies. A literature review of 51 studies reported that IPV was associated with the risk of unwanted pregnancies that may result in induced abortion (Coker 2007); this link between IPV and induced abortion was confirmed in a WHO 10 country study (World Health Organization 2005). Mothers who experience IPV were less likely to have prenatal or antenatal care (World Health Organization 2005; Salam, Alim et al. 2006).

Evidence from around the world has also shown an association between symptoms of gynecologic morbidity and IPV (McCauley, Kern et al. 1995; Jamieson and Steege 1997; Letourneau, Holmes et al. 1999; Coker, Smith et al. 2000). Campbell (2002) stated that "gynecological problems are the most consistent, longest lasting, and largest physical health difference between battered and non-battered women." While there is a demonstrated link between intimate partner violence and gynecologic morbidity, the majority of these studies come from developed country settings and utilized clinic-based samples, and/or measure only one type of IPV. Determining the true relationship between symptoms of gynecologic morbidity and IPV is the purpose if this paper.

Objective

- To examine the association between self-reported verbal, physical, and sexual IPV and self-reported symptoms of gynecologic morbidity among married Indian women of reproductive age (age 15-49).

Aims

- *Using nationally representative data of women (age 15-49) from India, examine the association between IPV and gynecologic morbidity*
- *Examine three symptoms of gynecologic morbidity (genital sore / lesion, abnormal vaginal discharge, STI)*
- *Examine frequency of all types of IPV (verbal, physical, sexual)*
- *Examine all possible sole experiences and combinations of IPV types (verbal alone; physical alone; sexual alone;, verbal and physical; verbal and sexual; physical and sexual; verbal and physical and sexual)*
- *The findings of this study will contribute to a broader understanding of the negative effects of intimate partner violence on women's reproductive health, specifically gynecologic morbidity*
- *The results will be used to inform current physicians and programmatic work in India about the link between IPV and gynecologic morbidity*

Study Setting: Women and IPV in India

India is the second most populous country in the world with 1.2 billion people and 3.3 million square kilometers of land. Thirty percent of the population lives in urban areas. The age structure resembles a normal population pyramid with 30% age 0-14, and

64.9% age 15-64. The sex ratio is slightly skewed in which 1.13 males/females under age 15; and the total fertility rate is 2.62 children born per woman. India is not only large in square kilometers and population density, but it also had a wide range of geographic, religious, SES, language, and ethnic diversity. In fact, all demographics and statistics vary across India by region (Dyson 1983). (CIA 2011)

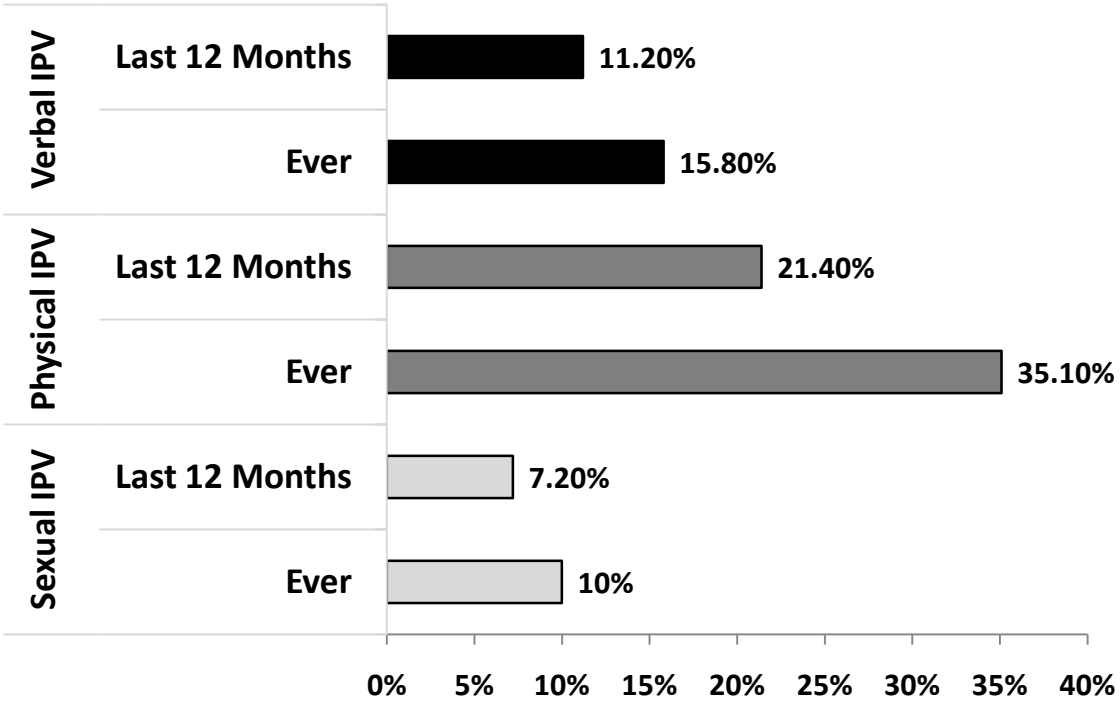
India is largely considered a patriarchal society, in which women's autonomy is low (Jejeebhoy and Sathar 2001). However, it is important to note that the level of women's autonomy is not consistent across the country, and higher levels generally exist in the north as compared to the south of the state (Dyson 1983; Jejeebhoy and Sathar 2001). Autonomy, as defined by Jejeebhoy et al. (2001), is the control women have over their own lives (considering equal voice with their husbands in matters affecting themselves and their families, control over material and other resources, access to information, ability to forge relationships with family and make independent decisions, and freedom from constraints on physical mobility). In a patriarchal society of gender stratification and low female autonomy, violence is often an unfortunate consequence.

In fact, in patriarchal societies understanding the status of women in a society, community, and family is incredibly valuable to understanding women's health, attitudes, and behavior. In simplest terms, women who lack autonomy, also lack power to refute violence, and lack mobility and independence to remove themselves from violence. Specifically, in societies like India, women are socialized to accept, tolerate, and even rationalize domestic violence (IIPS and Macro 2009). For example, women who say that wife beating is justified for any reason have a higher prevalence of physical or sexual

IPV (41-44%) than women who do not agree with any reason to justify wife beating (prevalence of physical or sexual IPV 30%) (IIPS and Macro 2009).

As a result, IPV in India is highly prevalent. According to the final report of the Indian National Family and Health Survey-III, 37% of ever-married Indian women have experienced verbal, physical, and/or sexual IPV in their lifetime (IIPS and Macro 2009). Figure 1 break down the statistics by verbal, physical, and sexual intimate partner violence (IIPS and Macro 2009). Physical IPV is the most experienced by Indian women with 35.10%, 15.89% reported ever experiencing sexual IPV, and 10% reported ever experiencing sexual IPV.

Figure 1: The prevalence of intimate partner violence in India, women age 15-49, 2005-2006



In a country like India, where the cultural grain of the society influences perpetration and tolerance of intimate partner violence, it is incredibly important to study the negative health consequences of IPV. This paper therefore will analyze the association between IPV and Indian women's reproductive health issues, specifically gynecologic morbidity.

CHAPTER 2 – LITERATURE REVIEW

Intimate Partner Violence

Violence is defined as "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, mal-development or deprivation" (World Health Organization 2002). In 1996, the World Health Assembly drew global attention to the issue of violence and adopted a resolution that declared violence a leading worldwide public health problem (World Health Organization 2002). In 2000, an estimated 1.6 million people worldwide died as a result of violence, a rate of 28.8 per 100,000 persons. However, the majority of violence is non-fatal and causes poor health outcomes that may result in permanent mental or physical disability (World Health Organization 2002). The World Health Organization (WHO) characterized three types of violence: interpersonal, self-inflicted, and collective (World Health Organization 2002).

Intimate Partner Violence (IPV) is one form of interpersonal violence. IPV is defined as acts of physical aggression such as hitting or kicking, forced intercourse and other forms of sexual coercion, psychological abuse such as intimidation and humiliation, and controlling behaviors such as isolating a person from family and friends or restricting access to information and assistance by an intimate partner (World Health Organization 2002). Heise et al. (2002) described violence against women as the most pervasive, yet least recognized human rights violation in the world. According to the WHO, IPV is the most common form of violence in women's lives (World Health Organization 2002;

World Health Organization 2005). In a review of 48 population-based samples from around the world, the percentage of women who reported being the victim of physical IPV ranged from 10-69% (Krug, Mercy et al. 2002). In a second population-based study (2000-2003) of ten countries, 15-71% of ever-partnered women reported ever experiencing physical and/or sexual violence (World Health Organization 2005; Ellsberg, Jansen et al. 2008). In a nine-country population-based study among Demographic Health Survey data, 17-48% of ever-married women reported physical abuse by a partner (Kishor and Johnson 2004). Physical intimate partner violence is most often accompanied by psychological or verbal abuse, and one in four IPV cases will experience sexual violence (World Health Organization 1996; Heise, Ellsberg et al. 2002; Krug, Mercy et al. 2002; World Health Organization 2002). For example, a study in Japan of 613 women found that less than 10% of the women had experienced only physical IPV, and that 57% reported experiencing all three types (physical, sexual, psychological) (Yoshihama and Sorenson 1994). Intimate partner violence cuts across countries, socio-economic status, religion, age, and cultural lines (World Health Organization 1996).

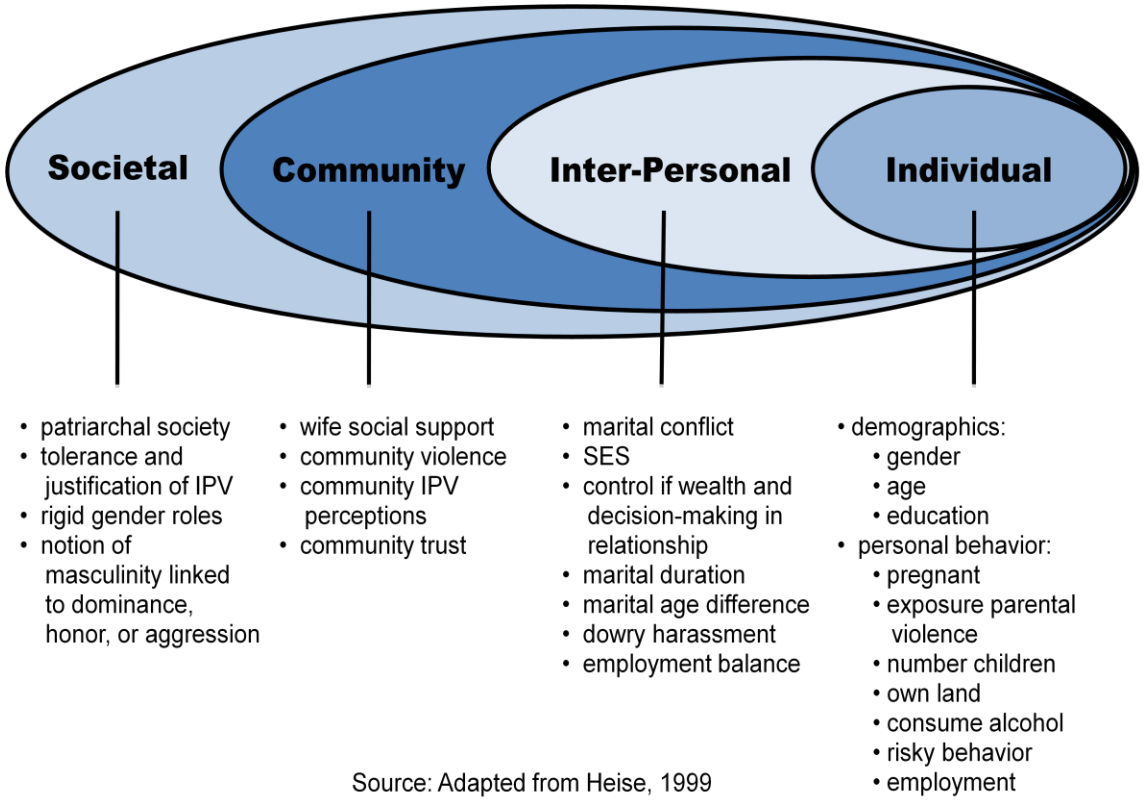
Substantial evidence suggests that high levels of IPV exist in South Asia where cultural norms regarding gender inequity have acted to increase the tolerance of IPV. For example, 78.7% of women from rural Bangladesh reported experiencing verbal IPV and 42.1% physical IPV (Koenig, Ahmed et al. 2003). In addition, 73% of women from urban slums in Bangladesh reported that they had experienced physical, verbal, or sexual IPV (Salam, Alim et al. 2006). Among a population of Pakistani women, 34% reported ever experiencing IPV (Fikree and Bhatti 1999). A representative study of the Indian population in 2007 showed that 26% of women reported ever-experiencing physical IPV,

including hitting, kicking, and beating (Jeyaseelan, Kumar et al. 2007). In northern India, 37% of husband's reported committing one or more episodes of physical or sexual violence against their wives in the preceding year (Stephenson, Koenig et al. 2006). Lastly, a community-based survey in two Indian states found that rates were minimally higher in north than south India states, but overall 41% of women reported physical IPV (Jejeebhoy and Cook 1997). Based on just these few reported prevalence rates of IPV, it is clear that high levels of IPV exist in South Asia.

Risk Factors Associated with IPV

There are many risk factors or characteristics that are associated with the experience of IPV among women. These factors can be broken down into four components: individual (victim and perpetrator), inter-personal, community, and societal levels. The following ecological framework was created to understand the interaction of these components at different levels of the environment (Figure 2). Each component of the framework will be discussed and examples of specific factors that fall within each component will be demonstrated. It is important to note that each factor was either associated with IPV or a specific risk factor that caused IPV (Heise, Ellsberg et al. 1999; World Health Organization 2002).

Figure 2: Ecological Framework for Understanding Intimate Partner Violence



Level 1: Individual

The first level, or individual characteristics of both the victim and perpetrator, is most commonly studied and includes biological and individual behavior factors. First, the victim's risk factors will be discussed, and then the perpetrator's risk factors. The most significant demographic characteristic of the victim is being a woman. While women can be the perpetrators of violence, the overwhelming majority of partner violence has been characterized as men abusing women (World Health Organization 1996). Other demographic characteristics include age, and education. In many studies, age was not a significant risk factor for IPV (Jeyaseelan, Sadowski et al. 2004; Jeyaseelan, Kumar et al. 2007). However, in the 2005 WHO multi-country study,

younger women, especially age15-19, were more likely to report physical or sexual IPV. It is believed that older women have a higher status than younger women and were therefore slightly protected from IPV, in addition, younger women are likely more pressured for sexual activity in an expectation to begin child bearing (World Health Organization 2005). Education of the wife was shown to be protective over physical, sexual, and psychological violence, possibly because these women were more empowered and able to choose their own husband or negotiate greater autonomy (Golding 1996; Panda and Agarwal 2005; World Health Organization 2005; Koenig, Stephenson et al. 2006; Jeyaseelan, Kumar et al. 2007).

Individual characteristics of the wife also help to explain risk factors of IPV. Pregnancy status of the wife affects her risk of IPV (Kaur and Garg 2009). For example, a range of 13-50% of the women were beaten for the first time during pregnancy, according to a 10 country study (World Health Organization 2005). Pregnancy often causes stress and frustration in the 'responsible' husband, which may result in violence against his wife. Women who witnessed parental violence or who were beaten as a child were also more likely to be a victim of physical, sexual, and psychological IPV (Panda and Agarwal 2005; Jeyaseelan, Kumar et al. 2007; Kaur and Garg 2009). It is thought that seeing violence at a young age may normalize the act of violence for the child and subsequently for the future wife. In addition, women with more autonomy are believed to be more able to choose their own husband or negotiate marriage relations; therefore it makes sense that wives who owned land were less likely to report psychological IPV, and women who owned a house or house and land were less likely to experience psychological and physical IPV (Panda and Agarwal 2005). However, this is not always

the case, and in fact, some studies have shown that women's autonomy and power in a marriage challenges gender roles, and may result in unwanted violence (Simister and Mehta 2010). Last, women who are childless, and not fulfilling the traditional role of a wife, have been shown to be significantly more likely to report physical and sexual violence (Koenig, Stephenson et al. 2006).

Many perpetrators' characteristics associated with IPV, are similar to victims' characteristics associated with IPV. For example, higher education of the husband was shown to be a protective factor over woman experiencing physical and psychological violence; however no significant difference was seen with sexual IPV (Panda and Agarwal 2005; Koenig, Stephenson et al. 2006; Jeyaseelan, Kumar et al. 2007). In addition, men who witnessed parental or intergenerational violence were more likely to report perpetrating physical, sexual, and psychological IPV (World Health Organization 2002; Panda and Agarwal 2005; Koenig, Stephenson et al. 2006). Human behavior is repetitive, and seeing violence at a young age normalizes the act for the husband.

One finding that has been demonstrated over and over again was that husbands who regularly consume alcohol are significantly more likely to perpetrate IPV (World Health Organization 2002; Jeyaseelan, Sadowski et al. 2004; Panda and Agarwal 2005; Jeyaseelan, Kumar et al. 2007). Under the influence of alcohol, men are likely more prone to anger and less prone to control over violent episodes. Sexual and physical IPV was more common among men who reported symptoms and current STDs and who took part in risk behaviors, including extramarital sexual relations (Martin, Kilgallen et al. 1999; Martin, Tsui et al. 1999). For example, among north Indian men who reported physical and sexual IPV were six times more likely to report extramarital sexual relations

(Martin, Kilgallen et al. 1999). It is hypothesized that men who take part in wife abuse, a less socially acceptable behavior, may be more likely to also violate traditional social norms by being involved in extramarital sexual activity (Martin, Kilgallen et al. 1999). Last, a husband who was employed (regularly or seasonally) was less likely to commit physically or psychologically abuse against his wife (Panda and Agarwal 2005). A working husband may be less likely to perpetrate violence against his wife because he is homeless or because he may have a higher income and less stress in the household.

Level 2: Interpersonal

The second level, interpersonal characteristics, in this framework looks at the relationship between the husband and wife, or perpetrator and victim. There has been less research to investigate how couple characteristics and behavior affect IPV. What is known is that a higher SES (higher per capita or household index) of the couple has shown to be protective over women experiencing physical violence because there is less stress in the household and likely more education of both the respondent and partner; however no significant difference was seen with sexual IPV (World Health Organization 2002; Panda and Agarwal 2005; Koenig, Stephenson et al. 2006; Jeyaseelan, Kumar et al. 2007). A review of literature regarding risk factors of IPV from the WHO found that the most consistent finding that was associated with IPV was conflict or discord in the marital relationship, a self-explanatory relationship (World Health Organization 2002). In addition, dyadic characteristics can also be considered within interpersonal characteristics. Employment is one such characteristic where it was found that compared to couples where the wife is not working and the husband is working, couples where the wife is working and husband is not, or where both are working are more likely to engage

in physical IPV (Jeyaseelan, Kumar et al. 2007). The more dowry harassment that exists between the couple and longer the marriage duration (specifically over 5 years) the more likely the women is also to experience physical IPV (Martin, Tsui et al. 1999; Koenig, Stephenson et al. 2006; Jeyaseelan, Kumar et al. 2007).

Level 3: Community

Community level factors explain IPV in the local environment. It includes the victims and perpetrators behaviors and relationships in their community, and characteristics of the community at large. Neighborhood and community residential environments play a critical role in promoting population health (Frye and O'Campo 2011). It was found that women who are in an environment of strong social support are less likely to report physical or psychological IPV (Panda and Agarwal 2005; Jeyaseelan, Kumar et al. 2007). Social support was defined as emotional support from at least three of the following groups (natal family, neighbors, co-workers, other) or from just natal family and neighbors. Therefore, women in this setting may feel more empowered, place more emotional stock in their support system, and maybe more likely to confront an abusive husband. For example, after controlling for age, income, and child abuse, American women who reported physical IPV or sexual and physical IPV were more likely to report not being active in voluntary groups, and not trusting people in their community (Bonomi, Anderson et al. 2007). In 2006, it was reported that a community environment of violent crimes (or a high district murder rate) was associated with both physical and sexual IPV. In addition, in communities where wife beating was considered a norm, women were more likely to report physical IPV (although not sexual) (Koenig,

Stephenson et al. 2006). Normalization of violence spreads across communities and households and may result in higher actual violence, and higher reports of violence.

Level 4: Societal

The last level that is associated with IPV is societal factors. These factors consist of larger cultural norms that create a broader environment in which violence is encouraged or discouraged. In patriarchal societies, such as exist in South Asia, there are cultural norms surrounding the poor value and treatment of women and dependence on men. These norms have acted to increase the tolerance of IPV among both males and females, institutionalized the practice of IPV, and even resulted in women and men rationalizing the practice (Prasad 1999; Kaur and Garg 2009). In the WHO multi-country study (2005), women reported justifications for IPV. According to the report, there was a residential difference in which women in urban areas were less likely to report any justification for IPV. However, the most commonly reported justification for wife beating was wives' infidelity, and the second most reported was disobeying her husband. Women who reported any justification for IPV were more likely to have experienced IPV, indicating that women learn to "accept" violence and view it as "normal" (World Health Organization 2005).

Health Outcomes or Associations with IPV

Intimate partner violence affects women's overall mental and physical health. A 2007 study of US women assessed the physical and mental health correlates with physical and sexual IPV. They used standard tools to evaluate the physical and mental health of the women (including the Short Form (SF-36) Health Survey). After controlling for age, income, and childhood experience of violence, it was reported that

adverse physical and mental health effects were associated with sexual IPV and both sexual and physical IPV (Bonomi, Anderson et al. 2007). In a 10 country study conducted by the WHO, women who self-reported poor or very poor general health were also more likely to report a lifetime experience of physical or sexual IPV (Ellsberg, Jansen et al. 2008). A study from 1991 revealed a dose-response relationship based on the frequency of physical IPV and general physical and mental health (Koss, Koss et al. 1991). The following sections will explore the effects of IPV on women's health in more detail. There were significant differences in the way these associations were studied, but it is clear that IPV has significant long-term and short-term physical and mental health effects.

The most obvious health outcome of IPV is the result of injury or trauma from physical violence. Resulting injuries included injuries to the skin, including but not limited to skin lacerations, contusions, abrasions, bruises, punctures, and bites (World Health Organization 2005; Bonomi, Anderson et al. 2007), and more serious injuries to the musculoskeletal system such as chronic neck and back pain, low back pain, arthritis, acute sprains and strains, degenerative joint disease, trauma related joint disease, broken bones, and injuries to eyes and ears (Coker, Smith et al. 2000; World Health Organization 2005; Bonomi, Anderson et al. 2007; Ellsberg, Jansen et al. 2008). IPV has also been linked to the most severe outcome, homicide (Campbell 2002; World Health Organization 2005). These types of injuries are easy to understand, and are often the direct result of physical violence.

Table 1: Health Outcomes of Intimate Partner Violence

Health Outcomes of Intimate Partner Violence			
Fatal outcomes	homicide		
	suicide		
	maternal mortality		
Nonfatal outcomes			
Skin	lacerations	**Respiratory**	acute upper respiratory infections
	contusions		shortness of breath
	abrasions	**Cardiovascular**	hypertension
	bruises		chest pain
	punctures		angina
	bites	**Central Nervous System**	fainting
Musculoskeletal	chronic neck & back pain		seizures
	arthritis		loss of consciousness
	low back pain		passing out
	broken bones	**Reproductive**	symptoms of gynecologic morbidity
	injury to ears/ears		unplanned pregnancies
	acute sprains, strains		induced abortion
	degenerative joint disease		spontaneous abortion
	trauma related joint disorders		poor use antenatal care
Neurological	migraines		poor use prenatal care
	frequent or severe headaches		non or inconsistent contraceptive use
Gastrointestinal	loss of appetite	**Mental Health**	suicidal thoughts
	eating disorders		suicidal attempts
	gastric reflux		sleep problems
	stomach ulcer		anxiety
	spastic colon		mental distress
	frequent ingestion		PTSD
	constipation		depression
	diarrhea		
	stomach pain		
	chronic irritable bowel syndrome		

In addition to physical injuries often sustained during trauma, women can experience injuries to the neurological, respiratory, cardiovascular, gastrointestinal, and central nervous systems. Based on four studies that sampled U.S. women age 18-65, women who reported physical or sexual or psychological IPV were more likely to report migraines or severe or frequent headaches (McCauley, Kern et al. 1995; Letourneau, Holmes et al. 1999; Coker, Smith et al. 2000; Bonomi, Anderson et al. 2007).

Additionally, an association between any type of IPV and respiratory symptoms (acute upper respiratory infections ad shortness of breath) was found to be significant (McCauley, Kern et al. 1995; Bonomi, Anderson et al. 2007). A review of the literature revealed that IPV was also associated with cardiac symptoms including hypertension, chest, and angina possibly due to stress from violence, a genetic disposition to these cardiac symptoms, or smoking, which has been shown to be associated with battered women (McCauley, Kern et al. 1995; Letourneau, Holmes et al. 1999; Coker, Smith et al. 2000; Campbell 2002). Across a multitude of studies, gastrointestinal symptoms were associated with physical, sexual, or psychological IPV (McCauley, Kern et al. 1995; Letourneau, Holmes et al. 1999; Coker, Smith et al. 2000; Campbell 2002; Ellsberg, Jansen et al. 2008). These many symptoms include loss of appetite, eating disorders, chronic irritable bowel syndrome, gastric reflux, stomach ulcer, spastic colon, frequent ingestion, constipation or diarrhea, and abdominal or stomach pain. It is believed that chronic stress was one casual pathway for the clear link between IPV and gastrointestinal symptoms. Last, IPV has been reported to affect the central nervous system by resulting in loss of consciousness, often a result of direct trauma, or other chronic affects including reoccurring fainting and seizing or passing out (Campbell 2002; World Health Organization 2005).

Women's reproductive health is also related to the experience of intimate partner violence, such as contraceptive use, unplanned pregnancies, pregnancy complications, prenatal and antenatal care, and gynecologic morbidity. For example, women who experience IPV are less likely to report contraceptive use, and therefore more likely to have unplanned pregnancies. A sample of northern Indian men and women revealed

women who experienced physical IPV were less likely to report contraceptive adoption, namely sterilization (Stephenson, Koenig et al. 2006). Within a different sample of northern Indian males, those who self-reported physical or sexual IPV were also significantly less likely to currently be using any contraceptive, and their wives more likely to have any unplanned pregnancy (Martin, Kilgallen et al. 1999). In fact, among rural Indian women, physical IPV temporally led to a decreased likelihood of adopting contraception and an increased likelihood of an unplanned pregnancy, as confirmed by analyzing a longitudinal dataset (Stephenson, Koenig et al. 2008). It is also important to note that in order to adhere to expected gender roles of high fertility and avoid IPV, Indian women will choose not to adopt reversible contraception (Wilson-Williams, Stephenson et al. 2008). However, reporting psychological IPV was found to be associated with any unplanned pregnancy, but not with current contraceptive use, implying that not all unplanned pregnancies can be explained by the lack of contraceptive use (Martin, Kilgallen et al. 1999); it was possible that verbal abuse discouraged a mother from wanting a child, even if there was intention and want for the child previously.

A longitudinal look at IPV among African American women found that women who reported a history of physical or sexual IPV went on to report inconsistent condom use with their partner (Seth, Raiford et al. 2010). A literature review of 51 studies reported that IPV was associated with the risk of unwanted pregnancies that may result in induced abortion (Coker 2007); this link between IPV and induced abortion was confirmed in a WHO 10 country study (World Health Organization 2005).

Self-reported physical, sexual, or psychological violence was significantly associated (bivariate analysis) with the number of miscarriages or pregnancy

complications a mother reports, and with abortion among US women (Letourneau, Holmes et al. 1999). Mothers who experience IPV were less likely to have prenatal or antenatal care (World Health Organization 2005; Salam, Alim et al. 2006). Care seeking is incredibly important to the health of the mother and child, and can be the difference between life and death for both. Evidence from around the world has also shown an association between symptoms of gynecologic morbidity and IPV. Campbell (2002) stated that "gynecological problems are the most consistent, longest lasting, and largest physical health difference between battered and non-battered women." Determining the true relationship between symptoms of gynecologic morbidity and IPV is the purpose if this paper. Therefore, past evidence on this topic will be discussed in depth in the following section.

In addition to physical health, mental health is significantly related to intimate partner violence. There is substantial evidence, specifically from developed countries, documenting a relationship between intimate partner violence (including physical, sexual, and verbal) and poor mental health. A range of mental health outcomes associated with intimate partner violence have included depression, sleep problems, anxiety, mental distress, PTSD, and suicidal thoughts and attempts (Hathaway, Mucci et al. 2000; Hurwitz, Gupta et al. 2006; Ellsberg, Jansen et al. 2008; Edwards, Black et al. 2009). For example, an Austrian study found an association between physical, sexual, and psychological violence and depressive disorders among women who attended a psychosomatic-gynecological outpatient clinic (Leithner, Assem-Hilger et al. 2009). Similarly, physical and psychological IPV was associated with poor mental health in India, Egypt, and the Philippines (Vizcarra, Hassan et al. 2004). And, a reported

association between IPV and poor mental health (anxiety and depression) was found in India (Kumar, Jeyaseelan et al. 2005). A recent study in north Goa, India, revealed that physical or sexual partner violence partially mediated the association between the partner's excessive alcohol use and the female's common mental disorders, defined as non-psychotic affective disorders such as depression or anxiety (Nayak, Patel et al. 2010). The WHO multi-country study reported that women who had physical or sexual IPV or both, were significantly more likely to report higher levels of emotional distress (measured through symptoms such as crying, inability to enjoy life, fatigue in the four weeks prior the survey), suicidal thoughts and suicidal attempts (World Health Organization 2005; Ellsberg, Jansen et al. 2008). However, the pathways of influence between intimate partner violence and poor mental health are not well understood; and both direct and indirect pathways of influence exist. Directly, the psychological effects of experiencing IPV have ranged from shock, fear, anxiety, fatigue, stress and humiliation to sleeping and eating disturbances, post-traumatic stress disorder (PTSD), and suicide (Heise, Raikes et al. 1994). The experience of violence or even fear of violence is stressful, and it is well known that stress has been associated with poor mental health (Kessler, Price et al. 1985; Walker and Browne 2006). Additionally, women who have experienced abuse may become isolated and withdraw themselves from social life as they try to hide the evidence of violence from others, or they have been forcibly isolated by their partners (Heise, Raikes et al. 1994; Nicolaidis, Curry et al. 2004). Isolation (whether voluntary or forced) results in decreased access to social capital and increased risk of depression (Nicolaidis, Curry et al. 2004). In fact, Coker, et al. (2002) found that abused women with a higher level of social support were less likely to report

poor mental health than abused women with lower social support. Indirectly, stress related factors, including a couple living in poverty, were positively associated with increased risks of IPV (Martin, Kilgallen et al. 1999). Stress has also been linked to increased alcohol consumption, which has been known to be directly associated with IPV perpetration (Rao 1997).

Gynecologic Morbidity

Gynecologic morbidity is the result of gynecologic problems, and generally refers to reproductive morbidity other than related to pregnancy, abortion, childbearing, and contraception (Chellan 2004). Specifically, Chellan (2004) defines gynecological morbidity as the "structural and functional disorder of the reproductive tract (genital tract) not related to pregnancy, delivery and puerperum, basically diagnosed by clinical and laboratory tests". Based on the mode of transmission, reproductive tract infections (RTI) are categorized into three types of infection: iatrogenic infections, endogenous infections, and sexually transmitted infections (Chellan 2004). Iatrogenic infections are caused by the presence of foreign micro-organisms in the reproductive tract through medical procedures conducted in unhygienic environments, such as a vaginal exam, abortion, and intrauterine device (IUD) placement. On the other hand, endogenous infections are caused by overgrowth of normally occurring organisms in the reproductive tract. Sexually transmitted infections (STI) are parasites, viruses, or bacteria transmitted mainly through sexual contact. Within these three categories there are a suite of bacteria, viruses, and parasites that can cause these infections, including but not limited to STIs such as *Neisseria gonorrhoeaw (*NG), *Chlamydia trachomatis* (CT), and *Trichomonas vaginalis* (TV), syphilis, HIV and RTIs such as bacterial vaginosis, candidas,

vulvovainitis, vaginal yeast infection, vulvitis, and cervicitis. Interestingly, all these types of infections produce similar symptoms in the vaginal region. Therefore, in order to measure the prevalence of gynecologic morbidity, researchers can clinically diagnosis RTI, STI, and urinary tract infections (UTI), or they can be considered a cohesive group, and symptoms of these infections can be measured. Just as there are a suite of bacteria and viruses that can cause infections, there are a plethora of symptoms that result from these infections. Differential symptoms include non-menstrual vaginal bleeding after intercourse, fibroids, decreased sexual desire, genital irritation, pain during intercourse, pelvic pain, abnormal vaginal discharge that may differ in color, odor, amount, or consistency, abnormal menstrual pain, difficulty passing urine, burning while passing urine, sexual dysfunction, genital sores/lesions, and many more. It is important to catch and treat symptoms of gynecologic morbidity because high levels can turn fatal if not treated properly (Chellan 2004).

The prevalence of gynecologic morbidity worldwide is difficult to measure. In resource-rich countries, the prevalence is low, due to adequate health care institutions to treat or cure infections. In developing areas, the story is very different, and prevalence ranges based on many social, behavioral, and individual factors. For example, the estimated prevalence rate of curable STIs in North America and Western Europe is 2%; however it South and Southeast Asia the prevalence rate is 5%, and 12% in Sub-Saharan Africa (World Health Organization 2001). In an nationally representative sample of Bangladeshi women, 19% self-reported painful or burning urination, 19% reported vaginal itching or irritation with discharge, 19% severe abdominal pain with discharge, 14% abdominal/vaginal pain during intercourse, 8% fever with discharge, 6% genital

sore or ulcer, and 4% odor with discharge (Decker, Miller et al. 2008). In a community based sample representing the population of Goa, India, 28% of women had a medically diagnosed RTI (BV, candida, TV, CT, or NG), and 4% had a medically diagnosed STI (NG, CT, TV) (Patel, Weiss et al. 2006). In northern India, is was self-reported that 34% of the population of women had at least one symptom of gynecologic morbidity (Stephenson, Koenig et al. 2006); specifically 22% non-menstrual bleeding after intercourse, 15% abnormal vaginal discharge, 13% paining or burning during urination or frequent or difficult urination, and 10% pain during intercourse. A community based study in southern India reported that 24.4% of the 150 participants self-reported at least one symptom related to reproductive tract, 18% vaginal discharge (Prasad, Abraham et al. 2003).

The majority of symptoms of gynecologic morbidity can be explained clinically. As discussed above they are caused by infections in the reproductive and urinary tracts. The next section will delve a little further and look at individual, behavioral, and environmental risk factors for RTI, STI, and UTI, or for the many symptoms of gynecologic morbidity.

Risk Factors of Symptoms of Gynecologic Morbidity

A review of gynecologic morbidity in southern India, found that low levels of education, pregnancy wastage, and contraception use were significant factors in gynecologic problems (Chellan 2004). Another study from India, however, contradicted the role of contraception in gynecologic morbidity and reported that condom use and oral contraceptives use were associated with a reduced risk of bacterial vaginosis (Patel, Kirkwood et al. 2006). The type of contraception used most likely explains this

difference; women who undergo sterilization and IUD placement (the two most common forms of contraception in India) are at a higher risk of iatrogenic infections than condom or oral contraceptive use. Salam reported that in Bangladesh, older women are more likely to be clinically diagnosed with an RTI than younger women (Salam, Alim et al. 2006). It is likely that older women are more likely to suffer from an RTI because the infection did not show itself until a later stage in life. Equity power in relationships can also play a role in HIV infection, specifically, the lower the equity in relationship power the more likely a woman would become infected with HIV in the future (Jewkes, Dunkle et al. 2010). Directly, the relationship can be explained because lower power equity in a relationship means women have less ability to negotiate contraceptive use. As found in a plethora of studies from around the world, husbands' extramarital relationships place wives at a higher risk of STI (Martin, Tsui et al. 1999; Patel, Kirkwood et al. 2006; Stephenson, Koenig et al. 2006). This relationship will be delved into further in the section of causal pathways. The latest comprehensive study of gynecologic morbidity from India used multivariate logistic regression to assess associations of gynecologic morbidity and reported that significant risk factors included high parity (>5), prior obstetric complications, large spousal age difference, shorter marital duration, and living in a rural area (Stephenson, Koenig et al. 2006). Higher parity and prior obstetric complications are directly related to gynecologic morbidity. A large spousal age difference may mean that older men are more likely to have had prior unprotected sexual relations and therefore place their younger wives at risk of STI. Women in rural areas are less likely to have access to a health facility or attend a health facility; therefore, their rates of gynecologic morbidity are generally higher than urban dwellers. In contradiction

to Chellan et al. (2004) study mentioned above, husbands and wives education were non-significantly associated with gynecologic morbidity in this northern India study. This is a surprising statistic, and may translate into the fact that SES and access to a health facility are inevitably more important to treating gynecologic morbidity than education.

Intimate Partner Violence and Gynecologic Morbidity

Evidence on the Link between IPV and Gynecologic Morbidity

Developed Country Settings

The association and causal pathway of intimate partner violence and gynecologic morbidity has been studied in a range of settings, with different samples, and using different measurements. However, the majority of studies were based in developed country settings among clinic based populations (McCauley, Kern et al. 1995; Jamieson and Steege 1997; Letourneau, Holmes et al. 1999; Coker, Smith et al. 2000). For example, a 1993 study surveyed adult females in the Baltimore area (n=1952); patients were recruited from four community-based primary care internal medicine practices. In a regression model, controlling for age, marital status, insurance status, drug or alcohol abuse, and other health outcomes (any emotional symptom, ever attempted suicide, diarrhea, and broken bones, sprains or serious cuts), McCauley et al. (1995) reported that physical and/or sexual IPV was associated with vaginal discharge ($p<0.001$). In addition, using bivariate chi square tests (which did not take into account any other factors), it was also found pain in pelvis or genital area and problem passing urine to be associated with physical and/or sexual IPV (McCauley, Kern et al. 1995). A similar finding regarding pelvic pain was reported in a small Norwegian study in the city of Trondheim (n=180), and in two larger U.K. studies (Schei 1990; Collett, Cordle et al. 1998; John, Johnson et

al. 2004). Based on bivariate analysis, physical IPV alone was associated with pelvic pain, in addition to symptoms of gynecologic morbidity, and pelvic inflammatory disease (PID) (Schei and Bakketeig 1989; Schei 1990; Schei 1991). In a similar bivaraite analysis (n=920), physical IPV alone was associated with pelvic pain, and abnormal pap smear, however no significant association was found with vaginal bleeding or fertility problems (John, Johnson et al. 2004). In addition, sexual IPV alone is also associated with pelvic pain, and irritable bowel syndrome among US women age 15-45 (n=581); again measured by chi square tests (Jamieson and Steege 1997). One problem is that psychological IPV was not considered by any of these three studies. Letourneau et al. (1999) added to the literature gap by examining at IPV as physical, sexual, and/or psychological. Among 191 American women, recruited from outpatient gynecologic clinics, those who reported any IPV were more likely to report severe pain during menstruation, pain during sex, and had one or STI (Letourneau, Holmes et al. 1999). All of these findings are helpful, however all findings except vaginal discharge in the McCauley study, are inconclusive because the chi square tests utilized did not control for other factors. There are a host of other possible explanations for these symptoms of gynecologic morbidity, other than IPV, that may interact with IPV or confound the true association. These possible mechanisms will be looked at further in the causal pathways section.

Coker, Smith et al. (2000), however, used logistic regression, controlling for age, race, insurance status, and witnessing parental violence, to test the true association between physical and/or sexual or psychological IPV and symptoms of gynecologic morbidity. The sample population was 1152 American women, age 18-65, recruited

from family practice clinics in the Carolinas between 1997 and 1999. The studied revealed that women who reported physical and/or sexual IPV were three times more likely to report an STI (95% CI 2.42-3.94), 50% more likely to report chronic pelvic pain (95% CI 1.05-2.10), 73% more likely to report a bladder or kidney infection (95% CI 1.21-2.40), and 63% more likely to have had a hysterectomy (95% CI 1.22-2.11). In addition, women who reported psychological IPV alone were 82% more likely to report an STI (95% CI 1.19-2.68), and 62% more likely to report chronic pain (95% CI 1.03-2.48). Based on this sample, any type of IPV was not significantly associated with infertility, and psychological IPV was not associated with bladder or kidney infection, or with hysterectomy (Coker, Smith et al. 2000). The limitations of this study were that it was based on a clinic-population and cannot be generalized, and was cross-sectional and therefore, the temporal order in unknown.

Three studies out of the US used non-clinic based samples and found similar results (Golding, Wilsnack et al. 1998; Letourneau, Holmes et al. 1999; Bonomi, Anderson et al. 2007). One of the earlier studies by Koss et al. (1991), used good random sampling technique via telephone surveys, to obtain a sample adult South Carolinian women within a health insurance plan (n=390) to understand the non-temporal association between physical IPV and symptoms of gynecologic morbidity. It was reported that the odds of having a gynecologic symptom was three times greater than average for women who did not experience physical IPV (Koss, Koss et al. 1991). This finding was an important step in research at the time, and led the path to looking at reproductive health outcomes of IPV; however, the sample size was very small, and only physical IPV was assessed. Bonomi et al. (2009) had similar recruiting strategies 25

years later, and used random selection from a large US health plan or insurance provider in the Washington state and northern Idaho region. The sample was made up of a sufficiently large sample size of 3,568 women, age 18-64. After adjusting for only age, women who reported any type of IPV within the last three partners were more likely to have an STI (OR=3.15, 95% CI 1.45-6.86), vaginitis/vulvitis/cervicitis (OR=1.56 95% CI 1.07-2.27), menstrual disorder (OR=1.84, 95% CI 1.33-2.56), and UTI (OR=1.79, 95% CI 1.36-2.36). However, there was no significant association with female genital symptoms (Bonomi, Anderson et al. 2009). Both Koss in Bonomi had population-based populations but they were limited to women within a certain health insurance plan, which biases the population and does not include women who do not have health insurance and who may be in poor health. Bonomi also limited the sample size to only English speaking women and included both women in hetero and homosexual relationships. In addition, both studies measurement of IPV was limited; Koss only measured physical IPV and Bonomi looked at all three together and was unable to discuss possible health differences in each type. A national representative study of over 4,000 women by Golding et al. (1998) used random sampling from two regional samples and one national sample, and measured adult sexual assault (defined as any unwanted sexual experience after age 18). After controlling for age, ethnicity, and education, sexual assault was significantly associated with menstrual pain, excessive menstrual bleeding, and sexual dysfunction (Golding, Wilsnack et al. 1998). This study can be generalized to the US, however, the definition of sexual assault included more than sexual assault by an intimate partner, such a sexual assault by a co-worker, stranger, family member, or friend. Even though Bonomi, Koss, and Golding's studies were population based samples, all were

cross-sectional, and no temporal order could be determined between IPV and symptoms of gynecologic morbidity.

One study, published this year, filled the temporal order gap in the literature by running a longitudinal study using a population based sample. Seth et al. (2010) sampled from African American women in the Atlanta area (n=848) age 18-29, who were a member of Kaiser Permanente Medical Centers. A regression analysis, which controlled for age, SES, partner's age, and barriers to condom use, found that women who experience physical or sexual IPV are 1.46 times more likely to be diagnosed with an STI (p-value=0.05). This paper showed a longitudinal relationship, in which IPV resulted in a laboratory confirmed positive diagnosis of an STI (Chlamydia, gonorrhea, and trichamonous) (Seth, Raiford et al. 2010). This study not only was population-based longitudinal, but also used medical tests to diagnosis STI rather than self-reported STI; however, psychological IPV was not considered.

Developing Country Settings

Between 2000 and 2003, the WHO conducted a 10-country study to assess domestic partner violence. A synthesis of the results is published in the 2005 "WHO Multi-country study on Women's Health and Domestic Violence against Women." Ellsberg, Jansen et al. (2008) also published results on the findings of this study with a focus on health outcomes, including vaginal discharge. The population-based surveys were conducted in 15 sites in ten study countries from all over the world (Bangladesh, Brazil, Thailand, Ethiopia, Japan, Namibia, Peru, Samoa, Serbia and Montenegro, and United Republic of Tanzania). The total sample consisted of 24,097 women age 15-49. This cross-sectional analysis utilized multivariate logistic regression to control for site,

age, education, and marital status, and found that a lifetime experience of physical and/or sexual IPV was significantly associated with vaginal discharge in all study sites except Japan (Ellsberg, Jansen et al. 2008). It would have been more helpful if the analysis controlled for other factors that have been shown to be associated with gynecologic morbidity, including extramarital relations. Therefore, the true affect of IPV on vaginal discharge could be biased away from the null.

There is a dearth of evidence from low-resource countries regarding IPV and symptoms of gynecologic morbidity. The following paragraphs will look over the slim evidence in the developing world and specifically India. Salam et al. (2006) conducted a cross-sectional study using cluster-sampling, in the slums of four urban cities in Bangladesh. Currently married women reproductive age (n=496) made up the sample, and physical, sexual, and psychological IPV was assessed (Salam, Alim et al. 2006). In addition, a medical doctor assessed the health-related responses in order to confirm health responses related to reproductive health problems or RTIs. In bivaraite analysis women who were suffering from an RTI were more likely to be a victim of IPV (p-value<0.01), however women who ever had an STI were not significantly more likely to be a victim of IPV. The small sample size of women with an STI was possibly the reason for the lack of significant association with IPV. The paper also included a multivariate logistic regression analysis to determine the factors related to the outcome of suffering from an RTI (yes, no). These results indicate that IPV was the most significant contributing factor (p<0.01) responsible for causing symptoms of RTI. In other words, after controlling for age, education, income, number of times the husband and wife has been married, number of children born, whether husband suffered from an STI, use of family

planning, and husband's use of alcohol, women who reported IPV were 1.85 times more likely to have an RTI than non-abused women (Salam, Alim et al. 2006). The strength of this study is the population-based sample, large sample size, medical diagnosis of RTI, and multivariate analysis, however, physical, sexual, and psychological IPV were looked at collectively, and it is impossible to discern if IPV type differs by RTI.

A second study out of Bangladesh also assessed the association between IPV and gynecologic morbidity. Decker et al. (2008) measured symptoms of gynecologic morbidity in the past six months by looking at seven STI symptoms, specifically "itching or irritation in vaginal area with a discharge", "genital sore or ulcer", "bad odor along with a discharge", "severe lower abdominal pain with a discharge not related with menstruation", "fever along with discharge", "problem with pain or burning while urinating or more frequent or difficult urination", and "pain in abdomen or vagina during intercourse". This cross-sectional analysis measured physical IPV alone, sexual IPV alone, and physical and sexual IPV, among 2865 married couples sampled via the Bangladesh Demographic Health Survey (Decker, Miller et al. 2008). Each STI symptom was modeled as an outcome based on exposure to each form of IPV in the past year, and adjusted for multiple covariates, based on the symptom. Among all possible links, the only significant relationships that were shown with IPV were vaginal itching or irritation and discharge and odor with discharge. Specifically, women with physical IPV only were 1.34 times more likely to report vaginal itching or irritation and discharge than non-abused women (95% CI 1.04-1.72), controlling for husband's recent STI, age, education, and religion. In addition, women with sexual IPV only were 2.08 times more likely to report odor with discharge than non-abused women (95% CI 1.17-3.70), after

controlling for husbands recent STI, education, wealth, and rural/urban. Interestingly, all other possible links between all outcomes with IPV (physical IPV only, sexual IPV only, or physical and sexual IPV only) were not significantly associated, which differs from other reports mentioned above (Decker, Miller et al. 2008). The possible explanation for these non-significant associations is because this analysis controlled for significant covariates in the regression analysis in contrast to the many studies above that utilized bivariate analysis. This analysis on IPV and symptoms of gynecologic morbidity has many advantages including it is population-based, looks at physical and sexual IPV alone and together, and uses multivariate regression. Limitations include self-reported symptoms of STI, cross-sectional in nature, and psychological IPV was not considered.

Parish et al. (2004) took the measurement of IPV a step further by assessing physical IPV frequency in China. Specifically, two measures of physical IPV were assessed, hit and hit hard (defined as an attach resulting in bleeding, bruise, swelling or sever pain of injury). The sample size consisted of Chinese men (n=1665) and women (n=1658) age 20-64, recruited randomly in order to represent the general population (Parish, Wang et al. 2004). After controlling for age, urban residence, and geographic location, the results revealed that women who reported being hit or hit hard were more likely to report a positive Chlamydia test, and a recent genitourinary symptom (defined as burning pain while urinating, genital lesion, blister or sore, genital discharge of unusual color or odor, warts, irregular vaginal bleeding, or lower abdominal pain). In addition, women who were hit hard were more likely to report sexual dissatisfaction than women who reported no abuse. Frequency measurements found that compared to women who were hit, women who were hit hard were more likely to ever have an STI (Parish, Wang

et al. 2004). The definition of physical IPV was very limited by only looking at hitting, and no other IPV types were considered. However, based on the results, IPV frequency matters for STI, but no longitudinal relationship could be assessed from the cross-sectional analysis.

A recent study used longitudinal data to assess the association between frequency of IPV and HIV infection in South Africa. Jewkes et al. (2010) used previously published cluster-randomized controlled trial undertaken in the Eastern Cape province of South Africa between 2002 and 2006. A total of 1099 women (aged 15–26) that were HIV negative at baseline and had at least one additional HIV test over 2 years of follow-up were included in the analysis (Jewkes, Dunkle et al. 2010). Both physical and sexual IPV was assessed and coded as ever experience of physical and/or sexual IPV: no episodes, one episode, and more than one episode. Results showed that 45 of 253 women who reported more than one episode of physical and/or sexual IPV at baseline acquired HIV (9.6 per 100 person-years) compared with 83 of 846 who reported one or no episodes (5.2 per 100 person-years). Adjusted (control for age, study treatment group, stratum, and person-years of exposure) multivariable Poisson model revealed that one or more incident of IPV predicted HIV incident (RR=1.51, p=0·032) (Jewkes, Dunkle et al. 2010). This is a very thorough analysis because it includes a population-based sample, longitudinal study, controlling for confounders, medically testing for HIV infection, and measuring physical and sexual IPV. It would have been enlightening to see if psychological IPV affected IPV incident, or if physical or sexual IPV had an individual impact on HIV infection.

India

There are three studies that analyzed the association between IPV on symptoms of gynecologic morbidity in India. In 2006, Patel et al. published a study looking at the determinants of RTIs among a population-based study in Goa, India. A random selection of 2,494 women age 18-45 was included in the study (Patel, Weiss et al. 2006). RTI was medically diagnosed using lab specimen, specifically the lab tested for STI's (*Neisseria gonorrhoeaw (*NG), *Chlamydia trachomatis* (CT), and *Trichomonas vaginalis* (TV)), bacterial vaginosis (BV), and candidiasis. In the end, three RTI outcomes were measured: 1) any STI, 2) BV, 3) candidiasis. After adjusting for age, literacy, number of children in the household, tapwater in the house, debt, and marital status all types of IPV was associated with BV, only sexual IPV was associated with any STI, and no type of IPV was associated with candida. This cross-sectional analysis was unable to explain which came first IPV or RTI, in addition by limiting the diagnosis to these five viruses and bacteria, generalization to any RTI is lacking.

A population-based sample of married women of reproductive age was used to analyze the association between IPV and HIV infection (Silverman, Decker et al. 2008). This sample was pulled from the NFHS-III conducted between 2005 and 2006 (n=28,139). IPV was measured as lifetime exposure to physical IPV alone, sexual IPV alone, and physical and sexual IPV. As a result, a woman who experienced physical and sexual IPV in her lifetime was almost four times more likely to be HIV positive (OR=3.92, 95% CI 1.41-10.94). There was not a significant association between sexual IPV alone or physical IPV alone and HIV infection. The model controlled for age education, household wealth, lifetime number of sexual partners, and lifetime condom

use (Silverman, Decker et al. 2008). The statistical power in this study was limited since only 0.22% of the sample was sero-positive. Therefore, all results may be misrepresented and lack generalizability.

The last study based in India was unique because it interviewed husbands and wives and linked their responses (Stephenson, Koenig et al. 2006). In total 3,642 couples from Uttar Pradesh in northern India, were surveyed and included in the cross-sectional analysis. Ages ranged in women from 15-45 and in men from 15-59 years old. Violence data was collected from the husband, and perpetrating physical and sexual IPV was measured. Women were asked questions regarding gynecologic morbidity including eight symptoms: non-menstrual bleeding after intercourse, pain or burning during urination or frequent or difficult urination, pain during intercourse, abnormal vaginal discharge, and those with abnormal vaginal discharge were asked further about vaginal itching/irritation, bad vaginal odor, severe abdominal pain, and fever. Multivariate logistic regression analysis was fitted to the outcome, if a woman had any of the eight symptoms of gynecologic morbidity. After adjusting for parity, prior obstetric complications, spousal age difference, wife's education, husband's education, husband's reported extramarital sex, current family planning use, marital duration, household asset score, and urban/rural residence, IPV was significantly associated with any symptom of gynecologic morbidity. Specifically, wives whose husbands reported sexual IPV alone were 1.42 times more likely to report at least one symptom of gynecologic morbidity (95% CI 1.04-1.75), and wives whose husbands reported both physical and sexual IPV were 1.72 times more likely to report a symptom of gynecologic morbidity (95% CI 1.05, 2.58). However physical IPV alone, was not significantly associated with a symptom of gynecologic

morbidity (Stephenson, Koenig et al. 2006). The result demonstrating a link between IPV and any symptom of gynecologic morbidity is fairly conclusive. However, there is not measurement of IPV frequency or psychological IPV. In addition, the sample included only women who were pregnant in the last three years, and limitation of the sample, possibly biasing toward a younger cohort of women.

Causal Pathways

There are several potential causal pathways to explain the association between gynecologic morbidity and IPV that remain in debate in the literature. The first important factor includes the role of STI transmission. Men who perpetrate IPV against their wives are also more likely to engage in extramarital relations, have inconsistent condom use, and have a history of STI (Martin, Kilgallen et al. 1999; Seth, Raiford et al. 2010). In turn, forced sex may lead to vaginal trauma, through a lack of lubrication or direct physical force, which increases the risk of STI transmission (Campbell 2002). Maman et al. (2000) verified this causal pathway and listed forced sex with an infected partner as one main mechanism that increases a women's risk of HIV.

In addition, limited or compromised negotiation of safer sex practices places women at risk of HIV and other STIs (Maman, Campbell et al. 2000). Women may fear to ask their husband to use a condom, believing that her insistence will imply unfaithfulness, and she may be at risk of a violent reaction (Kalichman, Williams et al. 1998). Women who lack sexual autonomy are often powerless to use contraception or refuse sex (Heise, Ellsberg et al. 2002). Negotiation is also closely tied to relationship power dynamics; the lower the equity in relationship power the more likely a woman

would become infected with HIV in the future (Jewkes, Dunkle et al. 2010). Therefore, gender inequity may also be tied to other gynecologic morbidity, including RTIs.

It has been shown that women who were exposed to violence as children are more likely to be in abusive relationships as adults (Panda and Agarwal 2005; Jeyaseelan, Kumar et al. 2007; Kaur and Garg 2009). It is also possible, that these women may be more likely to subsequently engage in their own high-risk behavior, including extramarital relations or alcohol abuse.

The last causal pathway is the affect of mental health on RTIs. Women who experience IPV are more likely to report mental health problems (Hathaway, Mucci et al. 2000; Ellsberg, Jansen et al. 2008; Duran, Oetzel et al. 2009). Three studies from India found an association between mental health and gynecologic symptoms, specifically abnormal vaginal discharge (Patel and Oomman 1998; Prasad, Abraham et al. 2003; Patel, Kirkwood et al. 2006). These cross-sectional analyses did not provide a temporal causal pathway, but illuminated links between IPV and vaginal discharge that may be somatic idioms for common mental health disorders. In other words, severe psychological distress, which may result from IPV, causes increased somatic symptoms including vaginal discharge.

However, what is missing is a more stringent analysis at the association between IPV and gynecologic morbidity, specifically by examining verbal IPV, in addition to physical and sexual, by assessing IPV frequency, and by analyzing different combinations of IPV type and its association to gynecologic morbidity.

CHAPTER 3 – MANUSCRIPT

FREQUENCY AND TYPES OF INTIMATE PARTER VIOLENCE AND SYMPTOMS OF GYNECOLOGIC MORBIDITY AMONG MARRIED INDIAN WOMEN

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Dr. Stephenson and I worked together to determine the thesis question, and the appropriate secondary data source. We also worked together to determine the journal to submit the resultant manuscript. I collected the data through the Demographic and Health Survey's website, and completed all parts of the thesis. This includes the literature review, all data analyses, table/figure development, and all writing. Over the past year, I met with Dr. Stephenson weekly to ask questions regarding the literature and STATA syntax. In addition, Dr. Stephenson all reviewed and edited all drafts of the thesis and manuscript.

Abstract

This study examines the association between self-reported verbal, physical, and/or sexual intimate partner violence (IPV) and self-reported symptoms of gynecologic morbidity among 69,484 married Indian women (age 15-49). Data are taken from the 2005-2006 Indian National Family Health Survey-III. Regression models are fitted to identify associations between three types of self-reported IPV (verbal, physical, and sexual) and three symptoms of gynecologic morbidity (genital sores, abnormal vaginal discharge, and sexually transmitted infections). IPV is uniquely measured by examining self-reported physical, sexual, *and* verbal IPV, IPV frequency, and all combinations of IPV type. In the year preceding the survey, 24% of women reported any IPV (10% verbal, 19% physical, 6% sexual) and 10% reported at least one symptom of gynecologic morbidity. The model results indicate that after controlling for other covariates, experiencing physical, verbal, or sexual IPV is associated with an increased risk of gynecologic morbidity. Women who experience all three types of violence are at the highest risk of reporting each symptom (genital sore OR=4.57, abnormal discharge OR=3.24, STI OR=2.49; all p-values<0.05). There is a call for health providers to recognize IPV and provide treatment and resources for women who experience IPV. In addition, community awareness of the harmful consequences of IPV needs to be increased to reduce IPV tolerance.

Keywords: intimate partner violence, gynecologic morbidity, STI, RTI, women, India

Introduction

Studies across the globe are increasingly documenting the important public health topic of intimate partner violence (IPV) and its negative health effects on women [1-4]. According to the World Health Organization (WHO), IPV is the most common form of violence in women's lives [5]. In fact, in a review of 48 population-based studies from around the world, the prevalence of IPV ranged from 10-69% among women who reported being physically assaulted by an intimate partner [4]. IPV is not just physical violence; it also includes verbal and physical threats, psychological abuse, controlling actions, sexual coercion, deprivation and neglect [3, 4]. A growing body of literature reflects that high levels of IPV exist throughout South Asia, specifically in India where gender cultural norms concerning the treatment of women have acted to increase the tolerance of IPV in this setting [6, 7]. In fact, based on the National Family Health Survey-III, 35.49% of married Indian women reported experiencing physical IPV with or without sexual violence, 7.68% reported both physical and sexual IPV, and 27.8% reported experiencing physical IPV only [8].

There is a demonstrated link between intimate partner violence and gynecologic morbidity [9-12]. The majority of these studies come from developed country settings, utilized clinic-based samples, and/or measures only one type of IPV. In the current analysis we use population-based data to examine the association between self-reported verbal, physical, and sexual IPV and self-reported symptoms of gynecologic morbidity among married Indian women (age 15-49). This paper fills a gap in the literature for three distinct reasons: it utilizes a population-based sample; it is set in a developing

country setting; and IPV is uniquely measured by examining verbal IPV (in addition to physical and sexual), frequency of each IPV type, and all combinations of IPV type.

Background

The association and causal pathways between intimate partner violence and gynecologic morbidity has been studied in a range of settings, with different samples, and using different measurements. The majority of studies were based in developed country settings. For example, a 1993 study surveyed adult females in the Baltimore area (n=1952) and found that after controlling for a range of confounders, physical and/or sexual IPV was associated with vaginal discharge ($p<0.001$) [9]. Coker, Smith et. al (2000) study of American women studied psychological IPV and revealed that women who reported psychological IPV alone were 82% more likely to report an sexually transmitted infection (STI) (95% CI 1.19-2.68), and 62% more likely to report chronic pelvic pain (95% CI 1.03-2.48). Fewer studies have examined this relationship in a developed country general population. One study, which utilized a population-based sample of 3,568 Idahoan women, reported that those who reported any type of IPV within the last three partners were more likely to have an STI (OR=3.15, 95% CI 1.45-6.86), vaginitis/vulvitis/cervicitis (OR=1.56 95% CI 1.07-2.27), and urinary tract infection (OR=1.79, 95% CI 1.36-2.36) [13].

Little evidence on the association between IPV and gynecologic symptoms come from developing countries. One seminal study, conducted by the WHO between 2000 and 2003, utilized population-based surveys that were conducted in 15 sites in ten study countries (Bangladesh, Brazil, Thailand, Ethiopia, Japan, Namibia, Peru, Samoa, Serbia and Montenegro, and United Republic of Tanzania). This cross-sectional study found

that a lifetime experience of physical and/or sexual IPV was significantly associated with vaginal discharge in all study sites except Japan [14]. However, this study did not consider verbal IPV, or IPV frequency. In a cross-sectional study from Bangladesh, women who reported any IPV (physical, sexual, or psychological) were 1.85 times more likely to have a reproductive tract infection (RTI) than non-abused women [15]. Among 2,865 Bangladeshi married couples, it was revealed that women with physical IPV only were 1.34 times more likely to report vaginal itching or irritation and discharge than non-abused women; and women with sexual IPV only were 2.08 times more likely to report odor with discharge than non-abused women. Interestingly, genital sore or ulcer was not associated with IPV measures (physical IPV only, sexual IPV only, or physical and sexual IPV only).

Only two studies from India have addressed the link between IPV and gynecologic morbidity. A 2005 population-based study in Goa, India, utilized a sample of 2,494 reproductive age women to assess IPV and clinical diagnosis of RTI and STI [16]. After adjusting for a range of confounders, all types of IPV (verbal, physical, and sexual) were associated with bacterial vaginosis, and only sexual IPV was associated with any STI. The second study based in India interviewed 3,642 couples from Uttar Pradesh, and found that IPV was significantly associated with symptoms of gynecologic morbidity, including abnormal discharge [17]. Specifically, wives whose husbands reported sexual IPV alone were 42% more likely to report at least one symptom of gynecologic morbidity (95% CI 1.04-1.75), and wives whose husbands reported both physical and sexual IPV were 72% times more likely to report any symptom of gynecologic morbidity (95% CI 1.05, 2.58). However physical IPV alone was not

significantly associated with any symptom of gynecologic morbidity [17]. Both of these studies failed to measure IPV frequency.

There are several potential causal pathways to explain the association between gynecologic morbidity and IPV that remain in debate in the literature. The first important factor includes the role of STI transmission. Men who perpetrate IPV against their wives are also more likely to engage in extramarital relations, have inconsistent condom use, and a history of STI [18, 19]. In turn, forced sex may lead to vaginal trauma, through a lack of lubrication or direct physical force, which increases the risk of STI transmission [1]. Maman et al. (2000) verified this causal pathway and listed forced sex with an infected partner as one main mechanism that increases a woman's risk of HIV.

In addition, limited or compromised negotiation of safer sex practices places women at risk of gynecologic morbidity [20]. Women may fear to ask their husband to use a condom, believing that her insistence will imply unfaithfulness, and she may be at risk of a violent reaction [21]. Women who lack sexual autonomy are often powerless to use contraception or refuse sex, therefore placing her at risk of STI [2]. Negotiation is also closely tied to relationship power dynamics; the lower the equity in relationship power the more likely a woman would become infected with HIV in the future [22]. Therefore, gender inequity may also be tied to other symptoms of gynecologic morbidity.

The last causal pathway is the affect of mental health on RTI. Women who experience IPV are more likely to report mental health problems [14, 23, 24]. Three studies from India found an association between mental health and symptoms of gynecologic morbidity, specifically abnormal vaginal discharge [25-27]. These cross-sectional analyses did not provide a temporal causal pathway, but illuminated links

between IPV and vaginal discharge that may be somatic idioms for common mental health disorders. In other words, severe psychological distress, which may result from IPV, causes increased somatic symptoms including vaginal discharge.

However, what is missing is a more stringent analysis at the association between IPV and gynecologic morbidity, specifically by examining verbal IPV, in addition to physical and sexual, by assessing IPV frequency, and by analyzing different combinations of IPV type and its association to gynecologic morbidity.

Data and Methods

Data from the 2005-2006 National Family Health Survey-III (NFHS-III), the Indian equivalent of the Demographic and Health Survey, were utilized for this analysis. The sample covered 99% of India's population, residing in its 29 states, and ultimately included a total of 124,385 reproductive-aged women (15-49) residing in 109,041 households.

The data set for analysis was comprised of ever married women of reproductive age (15-49) who were asked about intimate partner violence. The NFHS-III asked questions on IPV to only one eligible woman from each selected household in order to maintain confidentiality and protect the respondents as recommended by the WHO ethical guidelines [28]. The selection of one woman per sample household was random so that women who were selected for the intimate partner violence module of the questionnaire were a subsample of the entire NFHS-III sample (excluding 54,901 respondents). Additionally, this analysis was limited to only currently married women, excluding respondents who were not currently at risk of IPV by husband (excluding

3,874 respondents). The final sample size for analysis was 65,610 married women aged 15-49.

The NFHS-III included questions on self-reported symptoms of gynecologic morbidity. Gynecologic morbidity was measured by three outcomes: genital sore or ulcer, abnormal vaginal discharge, and sexually transmitted infections (STI). Specifically, women were asked 'during the last 12 months, have you had a genital sore or ulcer?'; 'during the last 12 months, have you had a bad smelling abnormal genital discharge?'; and 'during the last 12 months, have you had a disease which you got through sexual contact?' Each of the outcomes (genital sore, vaginal discharge, and STI) is dichotomous, coded as 0=no or don't know (reference), and 1=yes.

The key exposure of interest in the modeling of gynecological morbidity is the self-reported experience of verbal, physical, or sexual IPV. Verbal IPV was assessed by asking the respondent if her husband had ever humiliated her, threatened her with harm, insulted her, or made her feel bad. To assess physical IPV, respondents were asked whether their husbands had ever pushed, shook, or threw something, slapped, punched with fist or something harmful, kicked or dragged, tried to strangle or burn, or attacked them with a knife or weapon. Sexual IPV was assessed by asking the respondent if her husband had ever physically forced sex when not wanted, or forced other sexual acts when not wanted. For each type of IPV (verbal, physical, sexual) the respondents were asked if they had experienced that type of violence in the past 12 months, and if so did they experience it sometimes or often in the past 12 months. For IPV frequency, three categorical variables were created. Verbal, physical, and sexual IPV frequency were categorized as follows; not experienced violence in the past 12 months (0), sometimes in

the past 12 months (1), and often in the past 12 months (2). An additional categorical variable was created to capture all possible combinations of IPV experience over the previous 12 months; no IPV (0), verbal IPV only (1), physical IPV only (2), sexual IPV only (3), verbal and physical IPV (4), verbal and sexual IPV (5), physical and sexual IPV (6), and verbal, physical, and sexual IPV (7).

Data Analysis

Two logistic regression models were fitted for each of the measures of gynecologic morbidity: the first set of three models included the variables measuring frequency of each of the types of violence in the 12 months prior to the survey; the second set of three models included the categorical variable measuring all combinations of IPV type. The models controlled for several factors that have been shown to be associated with gynecologic morbidity in previous studies: region of India, respondent's age and education, socio-economic status, rural/urban residence, parity, current use of contraceptives, additional sex partners other than husband, pregnancy complications, marital duration, and husband's education. SES was the standard Demographic and Health Surveys' wealth index, based on questions concerning household ownership on a variety of consumer items. Respondents were asked how many extramarital sexual partners the respondent had in the prior 12 months, the variable was coded as yes (one or more partners), or no (no other partners). Complications during pregnancy were defined as experience of any of the following complications during her last pregnancy since 2001: difficulty of daylight vision, difficulty with night blindness, convulsions from fever, leg, body, or face swelling, excessive fatigue, vaginal bleeding, and in first two months after birth massive vaginal bleeding, or very high fever.

Results

Graph 1 displays the experience of IPV in the 12 months prior to the survey. Among all respondents, 10.13% experienced verbal IPV (7.69% sometimes; 2.44% often); 19.05% experienced physical IPV (15.60% sometimes; 3.45% often); and 6.03% experienced sexual IPV (4.65% sometimes; 1.38% often). It is clear that a larger proportion of respondents reported less frequency of IPV. Additionally, IPV was assessed by looking at all possible sole experiences and combinations of each type of IPV in the past 12 months. The most respondents experienced physical IPV only (10.27%). With the experience of physical violence there is often also verbal violence (4.72%), sexual violence (1.82%), or all three (2.17%). Three percent of respondents experienced only verbal IPV, and 1.70% experienced only sexual IPV. Only 0.32% reported both verbal and sexual IPV. In total, 23.90% of respondents reported experiencing any type of IPV (verbal, physical, or sexual) (not shown).

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Graph 1 about here
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Vaginal discharge was the most reported symptom, in which 8.65% of respondents said yes to having abnormal vaginal discharge (Table 1). Two percent of respondents reported having a genital sore or ulcer, and 1.16% of respondents reported receiving a disease through sexual contact, or an STI. The majority of respondents (75.95%) are between the ages of 20 and 39. Thirty-nine percent of the respondents have no education, and 8.99% have more than secondary education completed. Over half of the respondents are from rural areas (56.06%), and only 8.67% of respondents have had no children born.

Table 1 about here

Tables 2 and 3 show the results of the six logistic regression models that were assessed in this analysis; the following three paragraphs will report the results for genital sores, vaginal discharge, and then STI.

After controlling for all other variables in the model, IPV was significantly associated with reporting of genital sores (Table 2). Relative to women who reported no experience of verbal IPV, women who reported sometimes or often experiencing verbal IPV in the past 12 months were significantly more likely to report genital sores [sometimes experience OR=1.53 (1.30, 1.81), often experience OR=1.91 (1.47, 2.48)]. Respondents who reported sometimes experiencing physical IPV were 1.77 (1.53, 2.04) times more likely to report genital sores, and respondents who reported often experiencing physical IPV were 1.85 (1.44, 2.38) times more likely to report genital sores then respondents who reported no physical IPV in the past 12 months. Relative to women who reported no experience of sexual IPV, women who reported sometimes or often experiencing sexual IPV were significantly more likely to report genital sores [sometimes experience OR=1.66 (1.37, 2.20), often experience OR=2.09 (1.56, 2.81)]. Compared to women who reported no experience of any type of IPV, women who experienced verbal only, physical only, and sexual only were significantly more likely to report genital sores [verbal OR=2.40 (1.87, 3.09), physical OR=1.93 (1.64, 2.27), sexual OR=1.75 (1.20, 2.57)] (Table 3). Also compared to women with no experience of any type of IPV, women who reported both verbal and physical, both verbal and sexual, both physical and sexual, and all verbal, physical, and sexual IPV were also significantly more

likely to report genital sores [verbal & physical OR=2.89 (2.38, 3.50), verbal & sexual OR=4.18 (2.40, 7.27), physical & sexual OR=4.20 (3.26, 5.42), verbal & physical & sexual OR=4.57 (3.66, 5.72)].

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Table 2 about here
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IPV was also significantly associated with vaginal discharge after controlling for all other variables in the model. Relative to women who reported no experience of verbal IPV, women who reported sometimes or often experiencing verbal IPV in the past 12 months were significantly more likely to report vaginal discharge [sometimes experience OR=1.45 (1.33, 1.59), often experience OR=1.40 (1.19, 1.64)] (Table 2). Respondents who reported sometimes experiencing physical IPV were 1.58 (1.46, 1.70) times more likely to report vaginal discharge, and respondents who reported often experiencing physical IPV were 1.88 (1.63, 2.16) times more likely to report vaginal discharge then respondents who reported no physical IPV in the past 12 months. Relative to women who reported no experience of sexual IPV, women who reported sometimes or often experiencing sexual IPV were significantly more likely to report vaginal discharge [sometimes experience OR=1.55 (1.40, 1.72), often experience OR=1.54 (1.28, 1.85)]. Compared to women who reported no experience of any type of IPV, women who experienced verbal only, physical only, and sexual only were significantly more likely to report vaginal discharge [verbal OR=1.88 (1.63, 2.17), physical OR=1.77 (1.62, 1.92), sexual OR=1.89 (1.59, 2.25)] (Table 3). Also compared to women with no experience of any type of IPV, women who reported both verbal and physical, both verbal and sexual, both physical and sexual, and all verbal, physical, and sexual IPV were also significantly

more likely to report vaginal discharge [verbal & physical OR=2.35 (2.12, 2.62), verbal & sexual OR=3.11 (2.22, 4.35), physical & sexual OR=2.73 (2.34, 3.17), verbal & physical & sexual OR=3.24 (2.83, 3.71)].

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Table 3 about here
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Similar to the other measures of gynecologic morbidity, STI was significantly associated with IPV after controlling for all variables, although not for every measure of IPV. Relative to women who reported no experience of verbal IPV, women who reported sometimes or often experiencing verbal IPV in the past 12 months were significantly more likely to report STI [sometimes experience OR=1.39 (1.09, 1.76), often experience OR=1.54 (1.06, 2.24)] (Table 2). Respondents who reported sometimes experiencing physical IPV were 1.63 (1.34, 1.98) times more likely to report STI, and respondents who reported often experiencing physical IPV were 2.19 (1.58, 3.02) times more likely to report STI then respondents who reported no physical IPV in the past 12 months. Relative to women who reported no experience of sexual IPV, women who reported sometimes or often experiencing sexual IPV were more likely to report STI, although the association was non-significant at alpha level 0.05 [sometimes experience OR=1.06 (0.79, 1.40), often experience OR=1.02 (0.63, 1.65)]. Compared to women who reported no experience of any type of IPV, women who experienced verbal only, physical only, and sexual only were more likely to report STI, although the association was non-significant among sexual only [verbal OR=1.95 (1.37, 2.76), physical OR=1.92 (1.55, 2.37), sexual OR=1.01 (0.57, 1.81)] (Table 3). Also compared to women with no experience of any type of IPV, women who reported both verbal and physical, both

verbal and sexual, both physical and sexual, and all verbal, physical, and sexual IPV were also significantly more likely to report STI [verbal & physical OR=2.33 (1.79, 3.03), verbal & sexual OR=3.40 (1.58, 7.32), physical & sexual OR=2.05 (1.35, 3.10), verbal & physical & sexual OR=2.48 (1.74, 3.52)].

Discussion

We have demonstrated that intimate partner violence is associated with gynecologic morbidity among Indian women. Specifically, there appears to be a dose-response relationship between all types of IPV and genital sore, in which the women who experienced verbal, physical, or sexual IPV often had higher odds of genital sore than women who reported sometimes experiencing these types of violence. There appears to be no dose-response relationship with the outcomes vaginal discharge and STI, in which any frequency of verbal, physical, or sexual IPV was associated with the two outcomes. In addition, the analyses on combinations of IPV type demonstrated that two or more types of IPV appear to affect gynecologic morbidity differently than one type of IPV alone. Specifically, women who experienced at least two types of IPV had higher odds of reporting every symptom of gynecologic morbidity, than women who reported experiencing verbal, physical, or sexual IPV alone.

The results reported in this study largely corroborate findings from previous studies from developed and developing countries concerning risk factors for self-reported gynecologic morbidity. Of central interest was this study's demonstration of associations between verbal, physical, and sexual forms of IPV (frequency and combinations of type) and symptoms of gynecologic morbidity. Our results demonstrated that after controlling for a number of other demographic, socioeconomic, and partnership factors, significant

associations between IPV and gynecologic morbidity remained, confirming results of previous studies [9, 11, 14, 15, 19, 26, 29-31]. However, this study went further by utilizing a population-based study among women in India, and by examining the association between gynecologic morbidity and three types of IPV (verbal, physical, sexual) via all combinations of IPV type, and the frequency of each form of IPV. For example, our finding of increased risk of vaginal discharge and genital sores/ulcers among women with different combinations of IPV has been reported in at least four other developing country studies [14, 17, 29, 30]. In addition, our study assessed IPV frequency by type and found that women who reported often experiencing physical IPV had a higher odd of reporting gynecologic morbidity then women reported sometimes experiencing physical IPV. This is similar to Parish, Wang et al. (2004) study from China which reported that women who were hit harder had a higher odd of reporting a genitourinary symptom then women who were hit.

However, in contrast to our results, Decker, Miller et al. (2008) reported that experience of physical and sexual IPV was not associated with vaginal discharge, and the physical and/or sexual IPV was not associated with genital sore/ulcer. It is surprising that two such similar studies from South Asia have conflicting results; there are a couple features in the studies that may explain the reported difference. First, social and economic distinctions between India and Bangladesh may elucidate reported differences; however this finding requires further investigation. Second, the sample sizes differ vastly, n=2,865 in Bangladesh and n=65,610 in our study; a larger sample size results in more power and significance of association is more likely. Third, Decker controls for husband's recent STI; however, our data did not include this information and it was

therefore not controlled for the in model. Our finding that physical IPV alone was associated with gynecologic morbidity also contradicts Stephenson, Koenig et al. (2006) finding that physical IPV was not associated with any symptom of gynecologic morbidity. In this case Stephenson, Koenig et al. (2006) controlled for husband's reported extramarital sex, similar to Decker who controlled for husband's recent STI in the Bangladesh study. It is possible that husband's recent STI or reported extramarital sex would confound the relationship in our models, however further research is needed to explore this link.

This cross-sectional study analysis found significant associations between each measure of IPV and each symptom of gynecologic morbidity, except in the relationship between sexual IPV and STI. Specifically, women who experience sexual IPV sometimes or often were not significantly more likely to report and STI then women who did not report sexual IPV. In addition, women who reported only sexual IPV were also not significantly more likely to report an STI compared to women who did not report any IPV; however when sexual IPV was coupled with other IPV types there were significant associations with reported STI. This is a surprising finding because it is inconsistent with previous findings. For example, Patel, Weiss et al. (2006) study out of Goa reported that sexual IPV alone was associated any reported STI (*Neisseria gonorrhoeaw (*NG), *Chlamydia trachomatis* (CT), and *Trichomonas vaginalis* (TV)). It is likely that no association was reported in this analysis because STI was measured via self-report, versus the Patel study that medically diagnosed STI with lab specimen. In addition, the Patel, Weiss et al. (2006) study had a larger proportion of respondents with any STI among its population, and was able to capture more power in the association. The self-

reported measure of STI is one limitation in the study. However, the other two symptoms of gynecologic morbidity (abnormal discharge and genital sores) are also symptoms of STI and likely capture the true association better than an actual report of STI.

In addition to the inability to control for husband's extramarital behavior or STI prevalence, and self-reported measurement of STI, there are a couple of other limitations that should be considered in this study. The frequency of IPV, measured a 'sometimes' and 'often' is a highly subjective measure of IPV frequency. A more objective way would have been to ask the respondent the number of experiences of IPV and measure frequency as a continuous variable. However, this study's measure at IPV frequency still allows for one of the first assessments of IPV frequency and gynecologic morbidity. Second, due to the cross-sectional nature of this analysis, temporal order cannot be determined. However, even though it is cross-sectional, our findings meet several criteria for the inference of actuality, including strength of the associations, consistency of the associations, and the plausibility of effect [14]. Third, vaginal discharge and genital sore/ulcer is also self-reported, rather than clinically diagnosed. Results of previous studies have demonstrated that there are low levels of agreement between medically diagnosed symptoms of gynecologic morbidity and self-reported symptoms [32]. We acknowledge that similar to reported STI, self-reported measurement technique is likely to result in lower reported gynecologic morbidity. Despite these limitations, this study fills a large gap in the literature by looking at IPV and gynecologic morbidity in India, and measuring verbal IPV (in addition to physical and sexual), frequency of IPV, and all combinations of IPV type.

Conclusion

The results of this study demonstrate that it does not matter what type of IPV, what frequency of IPV type, or what combinations of IPV a woman experiences, her risk of gynecologic morbidity is higher than women who do not experience any IPV. This study adds to the depth and breadth of our understanding of the affects of IPV on women's reproductive health in a developing country setting, as requested by the WHO in order to end domestic violence against women and its negative consequences [5]. Specifically, this analysis fills a gap in the literature by demonstrating the relationship between IPV and gynecologic morbidity in a resource-poor setting by utilizing a population-based sample, and uniquely measuring IPV. The overall prevalence of IPV needs to decrease drastically so that programs' attempts to empower women and improve women's health and societal quality of life will not be undermined [33]. There is also a need to incorporate IPV screening and services in gynecologic clinic settings, especially in research-poor settings such as rural India where both IPV and gynecologic morbidity are often overlooked. Last, it is important to integrate questions regarding women's gynecologic health when talking to women who have experienced IPV.

Works Cited

1. Campbell, J.C., *Health consequences of intimate partner violence.* Lancet, 2002. **359**(9314): p. 1331-6.
2. Heise, L., M. Ellsberg, and M. Gottmoeller, *A global overview of gender-based violence.* Int J Gynaecol Obstet, 2002. **78 Suppl 1**: p. S5-14.
3. World Health Organization, *Violence against women: WHO Consultation*. 1996, World Health Organization,: Geneva.
4. Krug, E.G., et al., *The world report on violence and health.* Lancet, 2002. **360**(9339): p. 1083-8.
5. World Health Organization, *WHO Multi-country Study on Women's Health and Domestic Violence against Women: summary report on initial results on prevalence, health outcomes and women's responses*, WHO, Editor. 2005.
6. Jeyaseelan, L., et al., *Physical spousal violence against women in India: some risk factors.* J Biosoc Sci, 2007. **39**(5): p. 657-70.
7. Koenig, M.A., et al., *Individual and contextual determinants of domestic violence in North India.* Am J Public Health, 2006. **96**(1): p. 132-8.
8. Silverman, J.G., et al., *Intimate partner violence and HIV infection among married Indian women.* JAMA, 2008. **300**(6): p. 703-10.
9. McCauley, J., et al., *The "battering syndrome": prevalence and clinical characteristics of domestic violence in primary care internal medicine practices.* Ann Intern Med, 1995. **123**(10): p. 737-46.

10. Letourneau, E.J., M. Holmes, and J. Chasedunn-Roark, *Gynecologic health consequences to victims of interpersonal violence.* Womens Health Issues, 1999. **9**(2): p. 115-20.

11. Coker, A.L., et al., *Physical Health Consequences of Physical and Psychological Intimate Partner Violence.* American Family Medicine, 2000. **9**.

12. Jamieson, D.J. and J.F. Steege, *The association of sexual abuse with pelvic pain complaints in a primary care population.* Am J Obstet Gynecol, 1997. **177**(6): p. 1408-12.

13. Bonomi, A.E., et al., *Medical and Psychosocial Diagnoses in Women with a History of Intimate Partner Violence.* Arch Intern Med, 2009. **169**(18).

14. Ellsberg, M., et al., *Intimate partner violence and women's physical and mental health in the WHO multi-country study on women's health and domestic violence: an observational study.* Lancet, 2008. **371**(9619): p. 1165-72.

15. Salam, A., A. Alim, and T. Noguchi, *Spousal abuse against women and its consequences on reproductive health: a study in the urban slums in **Bangladesh**.* Matern Child Health J, 2006. **10**(1): p. 83-94.

16. Patel, V., et al., *The burden and determinants of reproductive tract infections in India: a population based study of women in Goa, India.* Sex Transm Infect, 2006. **82**(3): p. 243-9.

17. Stephenson, R., M.A. Koenig, and S. Ahmed, *Domestic violence and symptoms of gynecologic morbidity among women in North India.* Int Fam Plan Perspect, 2006. **32**(4): p. 201-8.

18. Martin, S.L., et al., *Sexual behaviors and reproductive health outcomes: associations with wife abuse in India.* JAMA, 1999. **282**(20): p. 1967-72.

19. Seth, P., et al., *Intimate partner violence and other partner-related factors: correlates of sexually transmissible infections and risky sexual behaviours among young adult African American women.* Sex Health, 2010. **7**(1): p. 25-30.

20. Maman, S., et al., *The intersections of HIV and violence: directions for future research and interventions.* Soc Sci Med, 2000. **50**(4): p. 459-78.

21. Kalichman, S.C., et al., *Sexual coercion, domestic violence, and negotiating condom use among low-income African American women.* J Womens Health, 1998. **7**(3): p. 371-8.

22. Jewkes, R.K., et al., *Intimate partner violence, relationship power inequity, and incidence of HIV infection in young women in South Africa: a cohort study.* Lancet, 2010. **376**(9734): p. 41-8.

23. Duran, B., et al., *Intimate partner violence and alcohol, drug, and mental disorders among American Indian women in primary care.* Am Indian Alsk Native Ment Health Res, 2009. **16**(2): p. 11-27.

24. Hathaway, J.E., et al., *Health status and health care use of Massachusetts women reporting partner abuse.* Am J Prev Med, 2000. **19**(4): p. 302-7.

25. Prasad, J., et al., *Symptoms related to the reproductive tract and mental health among women in rural southern India.* The National Medical Journal of India, 2003. **16**(6): p. 5.

26. Patel, V., et al., *Gender disadvantage and reproductive health risk factors for common mental disorders in women: a community survey in India.* Arch Gen Psychiatry, 2006. **63**(4): p. 404-13.

27. Patel, V. and N. Oomman, *Mental Health Matters Too: Gynaecological Symptoms and Depression in South Asia* Reproductive Health Matters, 1998. **7**(14): p. 30-38.

28. World Health Organization, *Putting Women First: Ethical and Safety Recommendations for Research on Domestiv Violence Against Women*, Department of Gender and Women's Health Family and Community Health, Editor. 2001: Geneva.

29. Decker, M.R., et al., *Intimate partner violence and sexually transmitted disease symptoms in a national sample of married Bangladeshi women.* Int J Gynaecol Obstet, 2008. **100**(1): p. 18-23.

30. Parish, W.L., et al., *Intimate partner violence in China: national prevalence, risk factors and associated health problems.* Int Fam Plan Perspect, 2004. **30**(4): p. 174-81.

31. Stephenson, R., M.A. Koenig, and S. Ahmed, *Domestic violence and contraceptive adoption in Uttar Pradesh, India.* Stud Fam Plann, 2006. **37**(2): p. 75-86.

32. Bulut, A., et al., *In search of truth: Comparing alternative sources of information on reproductive tract infection.* Reproductive Health Matters, 1995. **3**(6): p. 31-39.

33. IIPS and Macro, *National Family Health Survey (NFHS-3)*. 2009, Indian Institute of Population Sciences: Mumbai.

Graph 1: Distribution of the self-reported frequency of verbal, physical, and sexual IPV and the combinations of IPV, self-reported within the 12 months prior to the survey, among women aged 15-49, India (n=65,610)

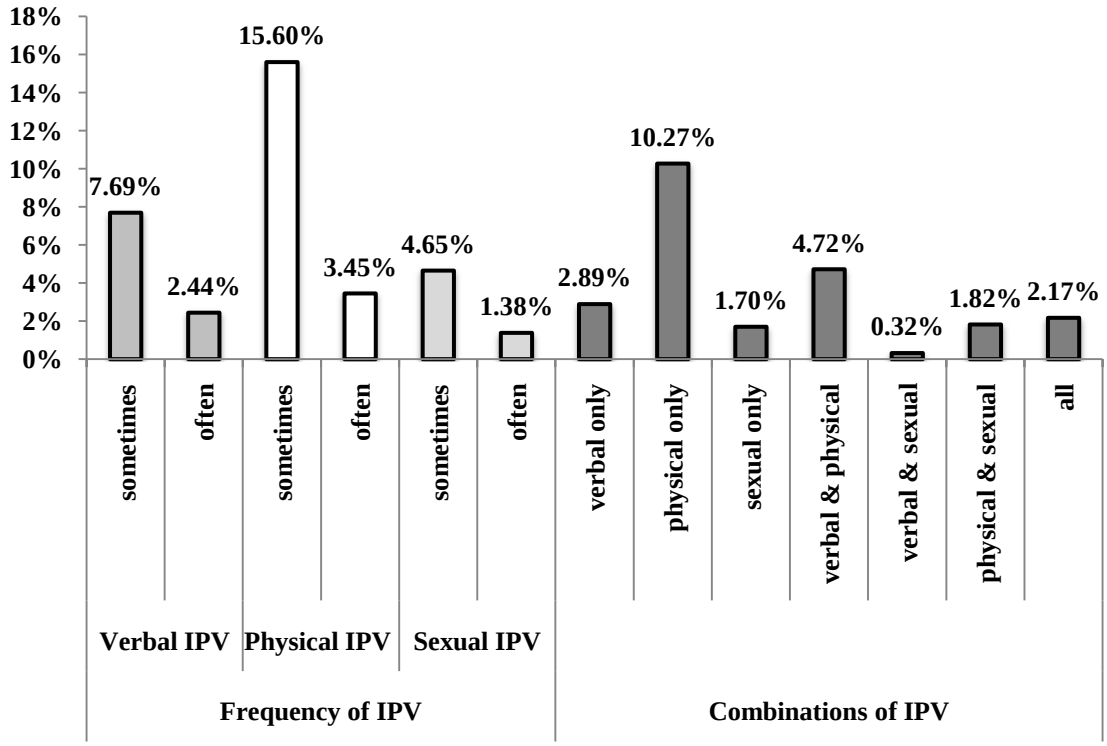

Table 1: Distribution of each independent variables overall and across each dependent variable, among women age 15-49, India (n=65,610)

		Overall n (%)	Genital Sore n (%)	Vaginal Discharge n (%)	STI n (%)
Genital Sore[a]		1,349 (2.09)			
Vaginal discharge[b]		5,671 (8.65)			
STI[c]		757 (1.16)			
Verbal IPV[d] *past 12 months*	**not at all**	58,833 (89.87)	1,014 (1.73)	4,545 (7.73)	604 (1.03)
	sometimes	5,036 (7.69)	223 (4.44)	824 (16.39)	106 (2.11)
	often	1,597 (2.44)	103 (6.46)	282 (17.68)	45 (2.82)
Physical IPV[e] *past 12 months*	**not at all**	53,019 (80.95)	822 (1.55)	3,769 (7.11)	502 (0.95)
	sometimes	10,215 (15.60)	398 (3.90)	1,471 (14.41)	186 (1.83)
	often	2,260 (3.45)	124 (5.50)	422 (18.72)	68 (3.01)
Sexual IPV[f] *past 12 months*	**not at all**	61,617 (93.97)	1,122 (1.82)	4,881 (7.93)	674 (1.10)
	sometimes	3,046 (4.65)	160 (5.26)	598 (19.67)	62 (2.04)
	often	908 (1.38)	66 (7.29)	186 (20.55)	20 (2.21)
Combinations of Verbal, Physical, and Sexual IPV[g] *past 12 months*	**none**	49,741 (76.10)	705 (1.42)	3,312 (6.66)	447 (0.90)
	verbal only	1,891 (2.89)	71 (3.76)	243 (12.88)	36 (1.90)
	physical only	6,714 (10.27)	199 (2.97)	820 (12.23)	119 (1.78)
	sexual only	1,112 (1.70)	29 (2.61)	161 (14.50)	12 (1.08)
	verbal & physical	3,085 (4.72)	138 (4.47)	489 (15.86)	71 (2.31)
	verbal & sexual	207 (0.32)	14 (6.76)	46 (22.22)	7 (3.40)
	physical & sexual	1,191 (1.82)	77 (6.48)	246 (20.69)	26 (2.18)
	verbal & physical & sexual	1,420 (2.17)	101 (7.14)	322 (22.76)	37 (2.61)
Region of India	**northeast**	10,836 (16.52)	314 (2.90)	1,088 (10.05)	45 (0.42)
	north	11,933 (18.19)	110 (0.92)	1,042 (8.74)	141 (1.18)
	central	11,802 (17.99)	223 (1.89)	1,628 (13.8)	287 (2.43)
	east	9,885 (15.07)	249 (2.52)	1,054 (10.67)	148 (1.50)
	west	8,541 (13.02)	159 (1.86)	465 (5.45)	92 (1.08)
	south	12,613 (19.22)	294 (2.33)	394 (3.13)	44 (0.35)
Age	**15-19 years old**	2,979 (4.54)	46 (1.55)	248 (8.33)	32 (1.08)
	20-24 years old	10,514 (16.02)	210 (2.00)	932 (8.88)	119 (1.13)
	25-29 years old	14,546 (22.17)	298 (2.05)	1,345 (9.25)	157 (1.08)
	30-34 years old	13,798 (21.03)	295 (2.14)	1,283 (9.31)	1 (1.34)
	35-39 years old	10,975 (16.73)	257 (2.34)	930 (8.48)	143 (1.31)
	40-44 years old	7,611 (11.60)	140 (1.84)	595 (7.82)	75 (0.99)
	45-49 years old	5,187 (7.91)	103 (1.99)	338 (6.52)	46 (0.89)
Education[h]	**no education**	25,598 (39.02)	545 (2.13)	2,773 (10.84)	373 (1.46)
	primary	10,022 (15.28)	261 (2.61)	972 (9.71)	111 (1.11)
	secondary	24,089 (36.72)	476 (1.98)	1,697 (7.05)	218 (0.91)
	higher	5,897 (8.99)	67 (1.14)	229 (3.89)	55 (0.94)

Residence	**urban**	28,832 (43.94)	471 (1.64)	1,923 (6.68)	294 (1.02)
	rural	36,778 (56.06)	878 (2.39)	3,748 (10.20)	463 (1.26)
SES	**poorest**	9,054 (13.80)	276 (3.05)	1,183 (13.08)	149 (1.65)
	poorer	10,407 (15.86)	271 (2.61)	1,160 (11.16)	146 (1.41)
	middle	12,675 (19.32)	262 (2.07)	1,133 (8.94)	152 (1.20)
	richer	15,174 (23.13)	270 (1.78)	1,164 (7.68)	133 (0.88)
	richest	18,300 (27.89)	270 (1.48)	1,031 (5.64)	177 (0.97)
Parity	**0**	5,745 (8.76)	111 (1.94)	444 (7.74)	49 (0.86)
	1-2	28,999 (44.20)	548 (1.89)	2,087 (7.20)	284 (0.98)
	3-4	21,399 (32.62)	451 (2.11)	2,031 (9.50)	261 (1.22)
	≥5	9,467 (14.43)	239 (2.53)	1,109 (11.73)	163 (1.72)
Current Contraceptive Use	**no method**	27,501 (41.92)	528 (1.92)	2,269 (8.26)	289 (1.05)
	traditional method	5,462 (8.32)	121 (2.22)	611 (11.19)	72 (1.32)
	female / male sterilization	23,540 (35.88)	533 (2.27)	1,988 (8.45)	288 (1.23)
	other modern method	9,107 (13.88)	167 (1.84)	803 (8.82)	108 (1.19)
Extramarital Sexual Partners[i]	**none**	65,465 (99.91)	1339 (2.05)	5,656 (8.65)	757 (1.16)
	one or more	62 (0.09)	8 (12.90)	13 (20.97)	0 (0.00)
Pregnancy complications	**not pregnant or none**	48,245 (73.53)	856 (1.78)	3,656 (7.58)	487 (1.01)
	one or more	17,365 (26.47)	493 (2.84)	2,015 (11.62)	270 (1.56)
Marital Duration	**≤4 years**	10,998 (16.76)	177 (1.61)	794 (7.23)	95 (0.87)
	5-9 years	14,080 (21.46)	284 (2.02)	1,197 (8.51)	158 (1.12)
	10-19 years	25,040 (38.16)	542 (2.17)	2,368 (9.46)	310 (1.24)
	≥20 years	15,492 (23.61)	346 (2.24)	1,312 (8.48)	194 (1.25)
Husband's Education[j]	**no education**	14,614 (22.44)	327 (2.24)	1,579 (10.82)	207 (1.42)
	primary	10,190 (15.65)	277 (2.72)	999 (9.81)	116 (1.14)
	secondary	30,905 (47.46)	607 (1.97)	2,534 (8.21)	322 (1.04)
	higher	9,406 (14.45)	127 (1.35)	499 (5.31)	104 (1.11)

[a] n missing=66 [b] n missing=59 [c] n missing=142 [d] n missing=144 [e] n missing=116

[f] n missing=39 [g] n missing=249 [h] n missing=4 [i] n missing=83 [j] n missing=495

Table 2: Logistic Regression Models: Analysis of gynecologic morbidity and frequency of IPV among women age 15-49, India (n=65,610)

		Genital Sore OR (95% CI)	Vaginal Discharge OR (95% CI)	STI OR (95% CI)
Verbal IPV *(ref=none)*	**sometimes**	1.53 (1.30, 1.81)†	1.45 (1.33, 1.59)†	1.39 (1.09, 1.75)†
	often	1.91 (1.47, 2.48)†	1.40 (1.19, 1.64)†	1.54 (1.06, 2.24)†
Physical IPV *(ref=none)*	**sometimes**	1.77 (1.53, 2.04)†	1.58 (1.46, 1.70)†	1.63 (1.34, 1.98)†
	often	1.85 (1.44, 2.38)†	1.88 (1.63, 2.16)†	2.19 (1.58, 3.02)†
Sexual IPV *(ref=none)*	**sometimes**	1.66 (1.37, 2.20)†	1.55 (1.40, 1.72)†	1.06 (0.79, 1.41)
	often	2.09 (1.56, 2.81)†	1.54 (1.28, 1.85)†	1.02 (0.63, 1.65)
Region of India *(ref=northeast)*	**north**	0.35 (0.28, 0.44)†	0.92 (0.83, 1.01)	2.96 (2.09, 4.19)†
	central	0.62 (0.52, 0.75)†	1.39 (1.27, 1.51)†	5.64 (4.07, 7.83)†
	east	0.74 (0.61, 0.88)†	0.92 (0.84, 1.02)	3.28 (2.32, 4.64)†
	west	0.71 (0.58, 0.88)†	0.58 (0.51, 0.65)†	2.76 (1.91, 4.00)†
	south	0.87 (0.72, 1.04)	0.30 (0.26, 0.34)†	0.85 (0.55, 1.31)
Age *(ref=20-24 years old)*	**15-19 years old**	0.71 (0.50, 1.00)	0.85 (0.73, 1.00)	1.04 (0.68, 1.60)
	25-29 years old	1.01 (0.82, 1.24)	1.00 (0.90, 1.11)	0.86 (0.65, 1.13)
	30-34 years old	1.09 (0.86, 1.39)	0.99 (0.87, 1.12)	1.02 (0.74, 1.41)
	35-39 years old	1.17 (0.89, 1.54)	0.89 (0.77, 1.03)	0.94 (0.64, 1.38)
	40-44 years old	0.92 (0.66 1.28)	0.84 (0.71, 1.00)	0.64 (0.41, 1.02)
	45-49 years old	1.02 (0.71, 1.47)	0.72 (0.59, 0.87)†	0.58 (0.35, 0.97)†
Education *(ref=no education)*	**primary**	1.25 (1.06, 1.47)†	1.03 (0.95, 1.13)	0.98 (0.78, 1.24)
	secondary	1.26 (1.06, 1.49)†	0.93 (0.86, 1.02)	0.97 (0.77, 1.22)
	higher	0.95 (0.67, 1.34)	0.63 (0.53, 0.76)†	0.90 (0.59, 1.36)
Residence *(ref=urban)*	**rural**	1.27 (1.11, 1.46)†	1.23 (1.15, 1.32)†	1.12 (0.93, 1.35)
SES *(ref=middle)*	**poorest**	1.44 (1.19, 1.76)†	1.09 (0.99, 1.20)	0.86 (0.66, 1.11)
	poorer	1.20 (1.00, 1.43)	1.06 (0.97, 1.16)	0.92 (0.73, 1.17)
	richer	0.96 (0.80, 1.15)	1.00 (0.91, 1.10)	0.79 (0.62, 1.01)
	richest	1.05 (0.85, 1.31)	0.94 (0.84, 1.05)	0.89 (0.67, 1.19)
Parity *(ref=0)*	**1-2**	0.53 (0.41, 0.68)†	0.66 (0.58, 0.75)†	0.83 (0.58, 1.18)
	3-4	0.46 (0.35, 0.61)†	0.64 (0.55, 0.74)†	0.80 (0.54, 1.20)
	≥5	0.48 (0.36, 0.66)†	0.63 (0.54, 0.74)†	0.87 (0.57, 1.34)
Current Contraceptive Use *(ref=none)*	**traditional method**	1.18 (0.96, 1.46)	1.52 (1.38, 1.69)†	1.37 (1.05, 1.80)†
	female / male sterilization	1.32 (1.14, 1.53)†	1.37 (1.27, 1.48)†	1.31 (1.09, 1.59)†
	other modern method	1.15 (0.95, 1.39)	1.32 (1.20, 1.44)†	1.17 (0.92, 1.49)
Extramarital Sexual Partners *(ref=none)*	**one or more**	3.54 (1.56, 8.04)†	1.55 (0.80, 3.02)	*
Pregnancy complications *(ref=none)*	**one or more**	1.89 (1.64, 2.19)†	1.48 (1.38, 1.59)†	1.52 (1.27, 1.83)†
Marital Duration *(ref ≤4 years)*	**5-9 years**	1.19 (0.95, 1.49)	1.08 (0.97, 1.22)	1.22 (0.90, 1.66)
	10-19 years	1.48 (1.13, 1.93)†	1.31 (1.14, 1.51)†	1.38 (0.95, 2.01)
	≥20 years	2.00 (1.41, 2.83)†	1.54 (1.28, 1.85)†	1.98 (1.22, 3.20)†

Husband's Education *(ref=no education)*	**primary**	1.25 (1.05, 1.48)†	0.98 (0.90, 1.07)	0.92 (0.73, 1.17)
	secondary	1.13 (0.96, 1.34)	0.99 (0.91, 1.07)	1.00 (0.81, 1.23)
	Higher	1.02 (0.78, 1.33)	0.86 (0.75, 0.98)†	1.26 (0.91, 1.74)

† Significant at alpha level 0.05

* Not included in model because no respondents reported one or more additional sexual partners and STI

Table 3: Logistic Regression Models: Analysis of gynecologic morbidity and sole existence and combinations of IPV types among women age 15-49, India (n=65,610)

		Genital Sore OR (95% CI)	Vaginal Discharge OR (95% CI)	STI OR (95% CI)
Combinations of Verbal, Physical, and Sexual IPV *(ref=none)*	**verbal only**	2.40 (1.87, 3.09)†	1.88 (1.63, 2.17)†	1.95 (1.37, 2.76)†
	physical only	1.93 (1.64, 2.27)†	1.77 (1.62, 1.92)†	1.92 (1.55, 2.37)†
	sexual only	1.75 (1.20, 2.57)†	1.89 (1.59, 2.25)†	1.01 (0.57, 1.81)
	verbal & physical	2.89 (2.38, 3.50)†	2.35 (2.12, 2.62)†	2.33 (1.79, 3.03)†
	verbal & sexual	4.18 (2.40, 7.27)†	3.11 (2.22, 4.35)†	3.40 (1.58, 7.32)†
	physical & sexual	4.20 (3.26, 5.42)†	2.73 (2.34, 3.17)†	2.05 (1.35, 3.10)†
	verbal & physical & sexual	4.57 (3.66, 5.72)†	3.24 (2.83, 3.71)†	2.48 (1.74, 3.52)†
Region of India *(ref=northeast)*	**north**	0.36 (0.29, 0.45)†	0.93 (0.84, 1.02)	3.02 (2.13, 4.28)†
	central	0.63 (0.52, 0.76)†	1.39 (1.27, 1.52)†	5.71 (4.11, 7.92)†
	east	0.74 (0.62, 0.89)†	0.92 (0.84, 1.02)	3.33 (2.36, 4.71)†
	west	0.73 (0.59, 0.90)†	0.59 (0.52, 0.66)†	2.85 (1.97, 4.13)†
	south	0.88 (0.73, 1.06)	0.30 (0.27, 0.34)†	0.86 (0.56, 1.33)
Age *(ref=20-24 years old)*	**15-19 years old**	0.71 (0.50, 1.01)	0.85 (0.73, 1.00)	1.04 (0.68, 1.60)
	25-29 years old	1.01 (0.82, 1.24)	1.00 (0.91, 1.11)	0.86 (0.65, 1.14)
	30-34 years old	1.10 (0.86, 1.39)	0.99 (0.87, 1.12)	1.03 (0.74, 1.42)
	35-39 years old	1.16 (0.88, 1.53)	0.89 (0.77, 1.03)	0.94 (0.64, 1.38)
	40-44 years old	0.91 (0.66, 1.28)	0.84 (0.71, 1.00)	0.64 (0.41, 1.02)
	45-49 years old	1.01 (0.71, 1.46)	0.72 (0.59, 0.87)†	0.58 (0.34, 0.96)†
Education *(ref=no education)*	**primary**	1.25 (1.06, 1.47)†	1.03 (0.95, 1.13)	0.98 (0.78, 1.24)
	secondary	1.26 (1.06, 1.49)†	0.93 (0.86, 1.02)	0.97 (0.77, 1.22)
	higher	0.96 (0.68, 1.35)	0.64 (0.53, 0.76)†	0.90 (0.59, 1.37)
Residence *(ref=urban)*	**rural**	1.27 (1.11, 1.46)†	1.23 (1.15, 1.32)†	1.11 (0.92, 1.34)
SES *(ref=middle)*	**poorest**	1.44 (1.18, 1.75)†	1.09 (0.99, 1.20)	0.86 (0.66, 1.11)
	poorer	1.19 (1.00, 1.43)	1.06 (0.97, 1.16)	0.92 (0.73, 1.17)
	richer	0.95 (0.79, 1.14)	1.00 (0.91, 1.09)	0.78 (0.61, 1.00)
	richest	1.05 (0.85, 1.30)	0.94 (0.85, 1.06)	0.89 (0.67, 1.19)
Parity *(ref=0)*	**1-2**	0.53 (0.41, 0.68)†	0.66 (0.58, 0.75)†	0.83 (0.58, 1.19)
	3-4	0.46 (0.35, 0.61)†	0.64 (0.55, 0.74)†	0.81 (0.55, 1.20)
	≥5	0.49 (0.36, 0.66)†	0.63 (0.54, 0.74)†	0.88 (0.57, 1.34)
Current Contraceptive Use *(ref=none)*	**traditional method**	1.18 (0.95, 1.45)	1.52 (1.37, 1.68)†	1.37 (1.04, 1.79)†
	female / male sterilization	1.33 (1.14, 1.54)†	1.37 (1.27, 1.48)†	1.31 (1.08, 1.59)†
	other modern method	1.15 (0.95, 1.40)	1.31 (1.20, 1.44)	1.17 (0.91, 1.49)
Extramarital Sexual Partners *(ref=none)*	**one or more**	3.86 (1.72, 8.68)†	1.61 (0.83, 3.11)	*
Pregnancy complications *(ref=none)*	**one or more**	1.88 (1.63, 2.16)†	1.47 (1.37, 1.58)†	1.51 (1.26, 1.82)†
Marital Duration *(ref ≤4 years)*	**5-9 years**	1.19 (0.95, 1.49)	1.08 (0.96, 1.21)	1.21 (0.89, 1.65)
	10-19 years	1.48 (1.13, 1.93)†	1.31 (1.14, 1.51)†	1.37 (0.94, 2.00)
	≥20 years	2.00 (1.41, 2.82)†	1.54 (1.28, 1.85)†	1.98 (1.22, 3.20)†

Husband's Education *(ref=no education)*	**primary**	1.25 (1.05, 1.48)†	0.98 (0.90, 1.07)	0.92 (0.72, 1.16)
	secondary	1.13 (0.96, 1.34)	0.98 (0.91, 1.07)	0.99 (0.81, 1.22)
	higher	1.02 (0.78, 1.33)	0.86 (0.75, 0.98)†	1.25 (0.91, 1.73)

† Significant at alpha level 0.05

* Not included in model because no respondents reported one or more additional sexual partners and STI

CHAPTER 4 – DISCUSSION and PUBLIC HEALTH IMPLICATIONS

Discussion

These findings offer the first evidence of married Indian women's increased risk of symptoms of gynecologic morbidity based on their experience of verbal, physical, and sexual IPV, and different combinations and frequency of IPV type, after adjusting for several factors that have been shown to be associated with gynecologic morbidity in previous studies. Specifically, there appears to be a dose-response relationship between all types of IPV and genital sore, in which the women who experienced verbal, physical, or sexual IPV often had higher odds of genital sore than women who reported sometimes experiencing these types of violence. There appears to be no dose-response relationship with the outcomes vaginal discharge and STI, in which any frequency of verbal, physical, or sexual IPV was associated with the two outcomes. In addition, the analyses on combinations of IPV type demonstrated that two or more types of IPV appear to affect gynecologic morbidity differently than one type of IPV alone. Specifically, women who experienced at least two types of IPV had higher odds of reporting every symptom of gynecologic morbidity, than women who reported experiencing verbal, physical, or sexual IPV alone. Overall, it does not matter what type of IPV, what frequency of IPV type, or what combinations of IPV a woman experiences, her risk of symptoms of gynecologic morbidity is higher than women who do not experience any IPV.

The results of our study mostly support findings from previous studies in developed and developing countries. However, the comparisons are sometimes difficult

to make because of diverse measurements of gynecologic morbidity, and different contextual factors in developed countries versus developing countries.

There are a range of techniques and indicators to measure gynecologic morbidity. Techniques here refer to the way the indicator is measured. The most ideal technique is to conduct a clinical exam of each participant to determine prevalence of symptoms, however this is very expensive. Other studies will choose one or two diseases or viruses to measure through lab samples. Yet, the majority of studies, especially population-based samples, utilize self-reported data because it is the cheapest and easiest to obtain. In addition to the technique used to measure the indicator, there are also large ranges of indicators that can be assessed of gynecologic morbidity, including disease or viruses themselves, or their symptoms. A variety of these indicators are listed in the literature review, but just a few include diseases such as irritable bowel syndrome or pelvic inflammatory disease; viruses such as STI (Chlamydia, HIV, gonorrhea), bladder or kidney infection, urinary tract infection, vaginitis; and symptoms such as pelvic pain, vaginal bleeding, pain during sex, genital sore, pain during urination, and abnormal vaginal discharge. Our study used a self-reported technique to measure three indicators of gynecologic morbidity; two symptoms - vaginal discharge, and genital sores - and an infection or STI. Therefore, while our analysis largely corroborates previous studies findings that IPV is associated with gynecologic morbidity, it is necessary to delve into the studies that also specifically also measured our indicators. The following four paragraphs will compare findings from previous literature that used similar measurement indicators to our study, first in developed country settings and then in developing country settings.

Three of the studies discussed in the literature review from developed countries used regression models to assess the relationship between IPV and gynecologic morbidity and largely the findings are consistent with our findings (McCauley, Kern et al. 1995; Coker, Smith et al. 2000; Seth, Raiford et al. 2010). For example, McCauley et al. (1995) Baltimore study also found that the experience of physical and/or sexual was associated with vaginal discharge; Seth et al. (2010) and Coker et al. (2000) also found that physical and/or sexual IPV was associated with STI; and Coker et al. (2000) went on to corroborate our findings by reporting psychological IPV alone was also associated with STI. However, these regression models controlled for factors related to the environmental context of a developing area such as insurance status, drug or alcohol abuse, marital status, and race. These factors are testament to the fact that environment matters in health, and a different countries context, specifically wealth status, may affect difficult to assess health outcomes. Therefore, the following paragraphs will compare this study's findings to other developing countries, within a more similar health context.

Vaginal discharge was specifically measured in at least four studies, and genital sore in at least three studies mentioned in the literature review. All these studies used self-reported surveys to measure the symptoms. The WHO 10-country study found that a life time experience of physical and/or sexual IPV was associated with reported vaginal discharge (Ellsberg, Jansen et al. 2008). This same finding was verified in our study that women who reported physical IPV, sexual IPV, and physical and sexual IPV were more likely to report vaginal discharge. Decker et al. (2008) reported that discharge (measured as vaginal irritation with a discharge and odor with discharge) was associated with physical IPV only, and sexual IPV only, which is consistent with our findings. However,

in contrast to our results, Decker et al. (2000) reported that physical and sexual IPV was not associated with vaginal discharge, and the physical and/or sexual IPV was not associated with genital sore/ulcer. There are a couple differences in the studies that may explain the difference. First, while the data sets used were very similar and known as the Demographic Health Surveys, Decker et al. (2000) studied married women in Bangladesh and our study focused on married women in India. There are different cultural context between Bangladesh and India that likely affect the relationship. Second, the sample sizes are vastly different, n=2,865 in Bangladesh and n=65,610 in our study. Third, Decker et al. (2000) controls for husband's recent STD; however, our data did not include this information and it was therefore not controlled for the in model. The majority of our findings are also consistent with a study out of northern India (Stephenson, Koenig et al. 2006). Stephenson et al. (2006) reported that gynecologic morbidity however was measured slight differently, in which eight symptoms (including vaginal discharge and genital sores) were lumped into one dichotomous outcome; yes reported any symptom or no did not report any symptom. Similar to our findings, women who experienced sexual IPV alone, or physical and sexual IPV were more likely to report gynecologic morbidity. However, physical IPV alone was not associated, which contradicts our studies results. Stephenson et al. (2006) controlled husband's reported extramarital sex, similar to Decker et al. (2000) that controlled for husband's recent STD in the Bangladesh study. It is possible that husband's recent STD or reported extramarital sex would confound the relationship in our models; however, it is unlikely that it would affect the model enough to make the association between IPV and gynecologic morbidity insignificant because the associations are so strong. Lastly, Parish et al. (2004) study from China found the being

hit or hit hard was linked to a self-reported recent genitourinary symptom (including vaginal discharge and genital sore/lesion). In fact, this is one study that assessed IPV frequency by measuring hit and hit hard physical IPV, and reported that women who were hit harder had a higher odd of reporting a genitourinary symptom then women who were hit (Parish, Wang et al. 2004). Our study also found that women who reported often experiencing physical IPV had a higher odd of reporting a genitourinary symptom then women reported sometimes experiencing physical IPV.

Three studies from Asia, reported a significant associations of RTIs and STIs with IPV, similar to our findings (Parish, Wang et al. 2004; Patel, Weiss et al. 2006; Salam, Alim et al. 2006). However, all three studies used medical diagnosis to measure the existence of an infection, rather than asking them questions about symptoms. Therefore, while our findings do corroborate, it is slightly problematic to compare different measuring techniques. Specifically, by using self-reported symptoms, our study was more likely to miss women who may actually have a RTI, STI, or other gynecologic problems. This will result in misclassification of women, and possible bias.

This cross-sectional study analysis found significant associations between each measure of IPV and each symptom of gynecologic morbidity, except in the relationship between sexual IPV and STIs. Specifically, women who experience sexual IPV sometimes or often were not significantly more likely to report and STI then women who did not report sexual IPV. In addition, women who reported only sexual IPV were also not significantly more likely to report an STI compared to women who did not report any IPV; however when sexual IPV was coupled with other IPV types there were significant associations with reported STI. This is a surprising finding because it is not consistent

with previous findings. For example, Patel et al. (2006) found that sexual IPV alone was associated any reported STIs (*Neisseria gonorrhoeaw (*NG), *Chlamydia trachomatis* (CT), and *Trichomonas vaginalis* (TV)). It is likely that no association was reported in this analysis because STI was measured via self-report, versus Patel et al. (2006) study that medically diagnosed STI with lab specimen. In addition, the Patel et al. (2006) study had a larger proportion of respondents with any STI among its population, and was able to capture more power in the association. The self-reported measure of an STI is one limitation in the study. However, the other two symptoms of gynecologic morbidity (abnormal discharge and genital sores) are also symptoms of STIs and likely capture the true association better than an actual report of STI.

In addition to the self-reported measurement of STI and the inability to control for husband's extramarital behavior or STI prevalence, there are a couple other limitations that should be considered in our study. The frequency of IPV, measured a 'sometimes' and 'often' is a highly subjective look at IPV. A slightly more objective way would have been to ask the number of experiences of IPV and measure frequency as a continuous variable. However, this look at IPV frequency still allows one of the first looks at IPV frequency and gynecologic morbidity. Second, due to the cross-sectional analysis, temporal order cannot be determined. However, even though it is cross-sectional, our findings meet several criteria for the inference of actuality, including strength of the associations, consistency of the associations, and the plausibility of effect (Ellsberg, Jansen et al. 2008). Third, vaginal discharge and genital sore/lesion is also self-reported, rather than clinically diagnosed. Results or previous studies have demonstrated that there is low levels of agreement between medically diagnosed symptoms of gynecologic

morbidity and self-reported symptoms (Bulut, Yolsal et al. 1995). We acknowledge that similar to reported STI, self-reported measurement technique is likely to result in lower reported gynecologic morbidity. Despite these limitations, this study fills a large gap in the literature by looking at IPV and gynecologic morbidity in India, and measuring verbal IPV and frequency of IPV.

Public Health Implications & Recommendations

The WHO recommended that in order to end domestic violence against women and its negative consequences, more research and collaboration is needed. Specifically, the 2005 report called for "more research on the magnitude and nature of the problem of violence against women, and its costs, in given countries or settings is therefore urgently needed to provide a stronger basis for advocacy and action. More research needs be carried out on the causes of violence against women in different cultures and in different circumstances" (World Health Organization 2005). This paper accomplishes this task by adding to the depth and breadth of our understanding of the affects of IPV on women's reproductive health in a developing country setting.

In addition, this finding greatly helps focus recommendations to improve women's quality of life in developing countries. Ultimately, all forms of intimate partner violence are associated with poor reproductive health in Indian women, and likely women in other developing areas of the world. This finding has a number of important public health implications for women all over the world who are at risk of intimate partner violence. Three recommendations in order to reduce IPV and its affective outcome on women's gynecologic health are listed below.

1. Decrease the overall prevalence of intimate partner violence

Since 2006, India does have a comprehensive domestic violence law, known as the Protection of Women from Domestic Violence Act 2005. Key characteristics of the law include the prohibition of marital rape and the provision of protection and maintenance orders against husbands and partners who are emotionally, physically, or economically abusive (IIPS and Macro 2009). However, the rates of IPV continue to remain high, and undermine women's health. According to the NFHS-3 Final Report, there is a very high level of acceptance of wife beating by women which suggests that women may feel powerless against such violence and will tend to accept it without question (IIPS and Macro 2009). The experience of violence and the silent acceptance of violence by women will inevitably undermine any program attempts to empower women and will continue to be a barrier in the improvement of women's and societal quality of life (IIPS and Macro 2009). Therefore, it is imperative to decrease the overall prevalence of IPV in women's lives.

The WHO listed two set of recommendations that focused on reducing and preventing domestic violence against women (World Health Organization 2005). These recommendations revolved around two main themes including strengthening national commitment and action, promoting primary prevention. The first set recommendations involve changing social norms by promoting gender equity and women's human rights. The WHO focused on the state level and suggests that the county establish multisectoral plans to address violence, enlist leaders to speak out against violence, and enhance capacity to monitor data collection for violence against women. However, changing social norms can also take place at the regional, community, and familial levels. NGOs

can work to decrease the acceptance of violence in communities. For example, a small organization in Tamil Nadu, India, uses skits and clowns to raise awareness about violence against women (Blossom: Art Culture and Human Development).

The second set of recommendations involves preventing IPV. These include implementing and evaluating programs aimed at primary prevention of IPV, and making physical environment safer for women. In addition, a focus on prioritizing prevention of child sexual abuse, since as shown in the literature review it is seen that women who witnessed and experienced abuse as a child were more likely to experience abuse as an adult.

2. Support IPV victims and screen for symptoms of gynecologic morbidity

The second recommendation can actually be considered two recommendations. The first step is to have integrated community programs that are advertised to help women who have been abused. In WHOs 10-country study, it was reported that in all countries the interviewer that frequently the first person that abused women had ever talked to about their partner's physical violence (World Health Organization 2005). Therefore, more programs will greater reach toward target populations are important to increase women's access to IPV services. Second, it is important to integrate questions regarding women's gynecologic health when talking to women who have experienced IPV. In other words, once women seek IPV services, there should be a physical and mental health questionnaire to access possible negative health consequences of IPV, including questions regarding women's reproductive health. Therefore, if women are reporting symptoms of gynecologic morbidity, they can be lead to health services that will treat possible RTIs, STIs, UTIs, or diseases.

3. Screen for IPV in gynecologic clinics

As discussed in the previous paragraph, women are not very likely to report IPV and seek help. Therefore, based on the demonstrated link of IPV and gynecologic morbidity, clinicians and public health professionals are encouraged to integrate screening for IPV in gynecologic clinics, especially in resource-poor settings such as rural India where both IPV and gynecologic morbidity are overlooked. Specifically, when women present for care, it is recommended that the questionnaire regarding past history include at least one sensitive question regarding past experience of violence. If the women reports violence in her history, the physician should in turn speak more with the patient about possible symptoms of gynecologic morbidity, and link her to IPV services. Therefore, clinics would need to create community partnerships to work with organizations or programs that can continue to help women who experience IPV.

In other words, the overall recommendation is to link IPV patients to medical services and to social support services, regardless of which facility or service the women seeks first.

REFERENCES

Blossom: Art Culture and Human Development. from http://www.blossomtrust.org.in/.

Bonomi, A. E., M. L. Anderson, et al. (2009). "Medical and Psychosocial Diagnoses in Women with a History of Intimate Partner Violence." Arch Intern Med **169**(18).

Bonomi, A. E., M. L. Anderson, et al. (2007). "Health outcomes in women with physical and sexual intimate partner violence exposure." J Womens Health (Larchmt) **16**(7): 987-997.

Bulut, A., N. Yolsal, et al. (1995). "In search of truth: Comparing alternative sources of information on reproductive tract infection." Reproductive Health Matters **3**(6): 31-39.

Campbell, J. C. (2002). "Health consequences of intimate partner violence." Lancet **359**(9314): 1331-1336.

Chellan, R. (2004). "Gynecological Morbidity and Treatment Seeking Behavior in South India: Evidence from the Reproductive and Child Health Survey 1998-1999." Journal of Health and Population in Developing Countries.

CIA. (2011). "The World Factbook: India." Retrieved April 5, 2011, from https://www.cia.gov/library/publications/the-world-factbook/geos/in.html.

Coker, A. L. (2007). "Does physical intimate partner violence affect sexual health? A systematic review." Trauma Violence Abuse **8**(2): 149-177.

Coker, A. L., P. J. Smith, et al. (2000). "Physical Health Consequences of Physical and Psychological Intimate Partner Violence." American Family Medicine **9**.

Collett, B. J., C. J. Cordle, et al. (1998). "A comparative study of women with chronic pelvic pain, chronic nonpelvic pain and those with no history of pain attending general practitioners." Br J Obstet Gynaecol **105**(1): 87-92.

Decker, M. R., E. Miller, et al. (2008). "Intimate partner violence and sexually transmitted disease symptoms in a national sample of married Bangladeshi women." Int J Gynaecol Obstet **100**(1): 18-23.

Duran, B., J. Oetzel, et al. (2009). "Intimate partner violence and alcohol, drug, and mental disorders among American Indian women in primary care." Am Indian Alsk Native Ment Health Res **16**(2): 11-27.

Dyson, T. M. M. (1983). "On kinship structure, female autonomy, and demographic behavior in India." Population and development review **9**(1): 35-60.

Edwards, V. J., M. C. Black, et al. (2009). "Physical and sexual intimate partner violence and reported serious psychological distress in the 2007 BRFSS." Int J Public Health **54 Suppl 1**: 37-42.

Ellsberg, M., H. A. Jansen, et al. (2008). "Intimate partner violence and women's physical and mental health in the WHO multi-country study on women's health and domestic violence: an observational study." Lancet **371**(9619): 1165-1172.

Fikree, F. F. and L. I. Bhatti (1999). "Domestic violence and health of Pakistani women." Int J Gynaecol Obstet **65**(2): 195-201.

Frye, V. and P. O'Campo (2011). "Neighborhood Effects and Intimate Partner and Sexual Violence: Latest Results." J Urban Health.

Golding, J. M. (1996). "Sexual assault history and women's reproductive and sexual health." Psychol Women Q **20**: 101-121.

Golding, J. M., S. C. Wilsnack, et al. (1998). "Prevalence of sexual assault history among women with common gynecologic symptoms." Am J Obstet Gynecol **179**(4): 1013-1019.

Hathaway, J. E., L. A. Mucci, et al. (2000). "Health status and health care use of Massachusetts women reporting partner abuse." Am J Prev Med **19**(4): 302-307.

Heise, L., M. Ellsberg, et al. (1999). Ending Violence Against Women. Population Reports, XXVII (Number 4, Series L, Number 11).

Heise, L., M. Ellsberg, et al. (2002). "A global overview of gender-based violence." Int J Gynaecol Obstet **78 Suppl 1**: S5-14.

Heise, L. L., A. Raikes, et al. (1994). "Violence against women: a neglected public health issue in less developed countries." Soc Sci Med **39**(9): 1165-1179.

Hurwitz, E. J. H., J. Gupta, et al. (2006). "Intimate partner violence associated with poor health outcomes in U.S. South Asian women." Journal of Immigrant and Minority Health **8**(3): 11.

IIPS and Macro (2009). National Family Health Survey (NFHS-3). Mumbai, Indian Institute of Population Sciences.

Jamieson, D. J. and J. F. Steege (1997). "The association of sexual abuse with pelvic pain complaints in a primary care population." Am J Obstet Gynecol **177**(6): 1408-1412.

Jejeebhoy, S. J. and R. J. Cook (1997). "State accountability for wife-beating: the Indian challenge." Lancet **349 Suppl 1**: sI10-12.

Jejeebhoy, S. J. and Z. A. Sathar (2001). "Women's Autonomy in India and Pakistan: The Influence of Religion and Region." Population and development review **27**(4): 687-712.

Jewkes, R. K., K. Dunkle, et al. (2010). "Intimate partner violence, relationship power inequity, and incidence of HIV infection in young women in South Africa: a cohort study." Lancet **376**(9734): 41-48.

Jeyaseelan, L., S. Kumar, et al. (2007). "Physical spousal violence against women in India: some risk factors." J Biosoc Sci **39**(5): 657-670.

Jeyaseelan, L., L. S. Sadowski, et al. (2004). "World studies of abuse in the family environment--risk factors for physical intimate partner violence." Inj Control Saf Promot **11**(2): 117-124.

John, R., J. K. Johnson, et al. (2004). "Domestic violence: prevalence and association with gynaecological symptoms." BJOG **111**(10): 1128-1132.

Kalichman, S. C., E. A. Williams, et al. (1998). "Sexual coercion, domestic violence, and negotiating condom use among low-income African American women." J Womens Health **7**(3): 371-378.

Kaur, R. and S. Garg (2009). "Domestic Violence Against Women: A Qualitative Study in a Rural Community." Asia Pac J Public Health.

Kessler, R. C., R. H. Price, et al. (1985). "Social Factors in Psychopathy: Stress, Social Support, and Coping Processes." Annual Review Psychology **36**: 531-572.

Kishor, S. and K. Johnson (2004). Profiling Domestic Violence: A Multi-Country Study. M. DHS.

Koenig, M. A., S. Ahmed, et al. (2003). "Women's status and domestic violence in rural Bangladesh: individual- and community-level effects." Demography **40**(2): 269-288.

Koenig, M. A., R. Stephenson, et al. (2006). "Individual and contextual determinants of domestic violence in North India." Am J Public Health **96**(1): 132-138.

Koss, M. P., P. G. Koss, et al. (1991). "Deleterious effects of criminal victimization on women's health and medical utilization." Arch Intern Med **151**(2): 342-347.

Krug, E. G., J. A. Mercy, et al. (2002). "The world report on violence and health." Lancet **360**(9339): 1083-1088.

Kumar, S., L. Jeyaseelan, et al. (2005). "Domestic violence and its mental health correlates in Indian women." Br J Psychiatry **187**: 62-67.

Leithner, K., E. Assem-Hilger, et al. (2009). "Physical, sexual, and psychological violence in a gynaecological-psychosomatic outpatient sample: prevalence and implications for mental health." Eur J Obstet Gynecol Reprod Biol **144**(2): 168-172.

Letourneau, E. J., M. Holmes, et al. (1999). "Gynecologic health consequences to victims of interpersonal violence." Womens Health Issues **9**(2): 115-120.

Maman, S., J. Campbell, et al. (2000). "The intersections of HIV and violence: directions for future research and interventions." Soc Sci Med **50**(4): 459-478.

Martin, S. L., B. Kilgallen, et al. (1999). "Sexual behaviors and reproductive health outcomes: associations with wife abuse in India." JAMA **282**(20): 1967-1972.

Martin, S. L., A. O. Tsui, et al. (1999). "Domestic violence in northern India." Am J Epidemiol **150**(4): 417-426.

McCauley, J., D. E. Kern, et al. (1995). "The "battering syndrome": prevalence and clinical characteristics of domestic violence in primary care internal medicine practices." Ann Intern Med **123**(10): 737-746.

Nayak, M. B., V. Patel, et al. (2010). "Partner alcohol use, violence and women's mental health: population-based survey in India." Br J Psychiatry **196**: 192-199.

Nicolaidis, C., M. Curry, et al. (2004). "Violence, mental health, and physical symptoms in an academic internal medicine practice." J Gen Intern Med **19**(8): 819-827.

Panda, P. and B. Agarwal (2005). "Marital Violence, Human Development and Women's Property Status in India." World Development **33**(5): 823-850.

Parish, W. L., T. Wang, et al. (2004). "Intimate partner violence in China: national prevalence, risk factors and associated health problems." Int Fam Plan Perspect **30**(4): 174-181.

Patel, V., B. R. Kirkwood, et al. (2006). "Gender disadvantage and reproductive health risk factors for common mental disorders in women: a community survey in India." Arch Gen Psychiatry **63**(4): 404-413.

Patel, V. and N. Oomman (1998). "Mental Health Matters Too: Gynaecological Symptoms and Depression in South Asia " Reproductive Health Matters **7**(14): 30-38.

Patel, V., H. A. Weiss, et al. (2006). "The burden and determinants of reproductive tract infections in India: a population based study of women in Goa, India." Sex Transm Infect **82**(3): 243-249.

Prasad, J., S. Abraham, et al. (2003). "Symptoms related to the reproductive tract and mental health among women in rural southern India." The National Medical Journal of India **16**(6): 5.

Prasad, S. (1999). "Medicolegal response to violence against women in India." Violence Against Women **5**(5): 478-506.

Rao, V. (1997). "Wife-beating in rural south India: a qualitative and econometric analysis." Soc Sci Med **44**(8): 1169-1180.

Salam, A., A. Alim, et al. (2006). "Spousal abuse against women and its consequences on reproductive health: a study in the urban slums in **Bangladesh**." Matern Child Health J **10**(1): 83-94.

Schei, B. (1990). "Psycho-social factors in pelvic pain. A controlled study of women living in physically abusive relationships." Acta Obstet Gynecol Scand **69**(1): 67-71.

Schei, B. (1991). "Physically abusive spouse--a risk factor of pelvic inflammatory disease?" Scand J Prim Health Care **9**(1): 41-45.

Schei, B. and L. S. Bakketeig (1989). "Gynaecological impact of sexual and physical abuse by spouse. A study of a random sample of Norwegian women." Br J Obstet Gynaecol **96**(12): 1379-1383.

Seth, P., J. L. Raiford, et al. (2010). "Intimate partner violence and other partner-related factors: correlates of sexually transmissible infections and risky sexual behaviours among young adult African American women." Sex Health **7**(1): 25-30.

Silverman, J. G., M. R. Decker, et al. (2008). "Intimate partner violence and HIV infection among married Indian women." JAMA **300**(6): 703-710.

Simister, J. and P. S. Mehta (2010). "Gender-based violence in India: long-term trends." J Interpers Violence **25**(9): 1594-1611.

Stephenson, R., M. A. Koenig, et al. (2008). "Domestic violence, contraceptive use, and unwanted pregnancy in rural India." Stud Fam Plann **39**(3): 177-186.

Stephenson, R., M. A. Koenig, et al. (2006). "Domestic violence and contraceptive adoption in Uttar Pradesh, India." Stud Fam Plann **37**(2): 75-86.

Stephenson, R., M. A. Koenig, et al. (2006). "Domestic violence and symptoms of gynecologic morbidity among women in North India." Int Fam Plan Perspect **32**(4): 201-208.

Vizcarra, B., F. Hassan, et al. (2004). "Partner violence as a risk factor for mental health among women from communities in the Philippines, Egypt, Chile, and India." Inj Control Saf Promot **11**(2): 125-129.

Walker, L. and A. Browne (2006). "Gender and Victimization by Intimates." Journal of Personality **53**(2): 179-195.

Wilson-Williams, L., R. Stephenson, et al. (2008). "Domestic violence and contraceptive use in a rural Indian village." Violence Against Women **14**(10): 1181-1198.

World Health Organization (1996). Violence against women: WHO Consultation. Geneva, World Health Organization,. **document FRH/WHD/96.27**.

World Health Organization (2001). Global Prevalence and Incidence of Selected Curable Sexually Transmitted Infections Overview and Estimates Geneva.

World Health Organization (2002). World Report on Violence and Health: Summary. Geneva.

World Health Organization (2005). WHO Multi-country Study on Women's Health and Domestic Violence against Women: summary report on initial results on prevalence, health outcomes and women's responses. WHO.

Yoshihama, M. and S. B. Sorenson (1994). "Physical, sexual, and emotional abuse by male intimates: experiences of women in Japan." Violence Vict **9**(1): 63-77.

SIGNATURE FOR NON-RESEARCH PROJECTS

Hubert Department of Global Health

This study examines the impact of experiencing verbal, physical, and/or sexual intimate partner violence (IPV) and self-reported symptoms of gynecologic morbidity among 69,484 married Indian women (age 15-49). Secondary data will be utilized and taken from the 2005-2006 Indian National Family Health Survey-3, India's equivalent to the Demographic and Health Survey. Regression models are fitted to identify associations between three types of IPV (verbal, physical, and sexual) and three symptoms of gynecologic morbidity (past year history of genital sores, abnormal vaginal discharge, and sexually transmitted infections). IPV is uniquely measured by examining IPV severity and all combinations of IPV type. In the year preceding the survey, 24% of women reported any IPV (10% verbal, 19% physical, 6% sexual) and 10% reported at least one symptom of gynecologic morbidity. The model results indicate that after controlling for other covariates, experiencing physical, verbal, or sexual IPV is associated with an increased risk of gynecologic morbidity. Women who experience all three types of violence are at the highest risk of reporting each symptom (genital sore OR=4.57, abnormal discharge OR=3.24, STI OR=2.49; all p-values<0.05). There is a call for physicians to be cognizant and recognize the needs of women who experience IPV. In addition, community awareness of the harmful consequences of IPV needs to be increased to reduce tolerance of IPV in India. This is a secondary data analysis. There is no need to submit this proposal for IRB clearance.

I have read the attached information and verify that this project is not research and therefore <u>does not</u> need to be submitted to the Emory University Institutional Review Board.

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Signature of Thesis Advisor **Date**