

The Role of Relationship Status in Intimate Partner Homicide

by

Tatiana Andrea Pomerantz

BS in Biology, University of Florida, 2015

Submitted to the Graduate Faculty of the

Department of Epidemiology

Graduate School of Public Health in partial fulfillment

of the requirements for the degree of

Master of Public Health

University of Pittsburgh

2021

UNIVERSITY OF PITTSBURGH
GRADUATE SCHOOL OF PUBLIC HEALTH

This essay is submitted

by

Tatiana Andrea Pomerantz

on

April 21, 2021

and approved by

Essay Advisor:

Catherine Haggerty, PhD, MPH
Associate Professor
Department of Epidemiology
Graduate School of Public Health
University of Pittsburgh

Penelope K. Morrison, PhD, MPH
Assistant Professor
Department of Biobehavioral Health
Pennsylvania State University, New Kensington

Ada Youk, PhD, MA
Associate Professor
Department of Biostatistics
Department of Epidemiology
Graduate School of Public Health
University of Pittsburgh

Copyright © by Tatiana Andrea Pomerantz

2021

The Role of Relationship Status in Intimate Partner Homicide

Tatiana Andrea Pomerantz, MPH

University of Pittsburgh, 2021

Abstract

Intimate partner violence (IPV) is a serious public health problem in the United States. Between 1984 and 2008, one in five homicide victims were women killed by an intimate partner and one in four women experienced severe IPV. To date, little research has been conducted on intimate partner homicide (IPH). In particular, limited analyses have been conducted using the National Violent Death Reporting System (NVDRS) database. This analysis aims to expand the current understanding of IPH victim and perpetrator relationships as it relates to substance abuse, alcohol dependence, and mental health.

Data from the NVDRS system (2003-2015) was used to analyze the association between victim-perpetrator relationship status with victim substance use, alcohol dependence, and mental health. The analysis was restricted to female victims and male perpetrators of IPH. Additionally, cases were only kept if the victim's death was related to IPV. The analysis was further restricted by relationship type to include only romantic relationships (i.e., husband, ex-husband, boyfriend, ex-boyfriend). Of 234,612 cases, 4,655 were identified that fit this eligibility criteria. Stata 16 was used to conduct the analysis, which consisted of obtaining descriptive statistics and performing Chi-Square tests, Fisher's Exact tests, and analysis of adjusted residuals.

The final victim cohort was predominately white (62.2%) and married (42.6%) with a mean age of 39.7 years. Perpetrators were mostly white (52.8%) with a mean age of 42.6 years. Victims whose perpetrator was a boyfriend were more likely to have a substance abuse problem or alcohol dependence (p-value <0.001). Additionally, victims who were married to their perpetrator were more likely to have a current mental health problem (p-value = 0.01) or currently be receiving treatment for a mental health disorder at the time of death (p-value = 0.01).

Results of this analysis provide new insights into the psychosocial contexts in which IPH occurs. Victim substance abuse, alcohol dependence, and mental health are dependent on the type of relationship between victims and perpetrators of IPH. While further analysis is required, these findings are of public health significance because they will help identify women at risk of IPH and explore points of intervention.

Table of Contents

Acknowledgement	x
1.0 Introduction.....	1
1.1 Intimate Partner Violence Victim Profile	2
1.2 Risk Factors of Intimate Partner Violence	3
1.3 Perpetrators of Intimate Partner Violence	6
1.4 Health Consequences of Intimate Partner Violence.....	8
1.5 Intimate Partner Homicide.....	9
1.6 Role of Guns in Intimate Partner Homicide	10
1.7 Gaps in Data.....	10
2.0 Objective	12
3.0 Methods.....	13
3.1 National Violent Death Reporting System	13
3.2 Sample Selection	14
3.3 Statistical Analysis.....	15
4.0 Results	16
4.1 Sample Characteristics	16
4.2 Victim Alcohol and Substance Use Analysis	18
4.3 Victim Mental Health and Treatment Status Analysis	20
5.0 Discussion.....	23
5.1 Strengths and Limitations	25
5.2 Implications for Future Research	26

5.3 Public Health Significance	27
Appendix A National Violent Death Reporting System Variable Definitions.....	29
Bibliography	30

List of Tables

Table 1. Victim Demographics.....	17
Table 2. Perpetrator Demographics.....	18
Table 3. Contingency Table of Victim Alcohol Problem by Primary Relationship to Perpetrator	19
Table 4. Contingency Table of Victim Substance Abuse by Primary Relationship to Perpetrator	20
Table 5. Contingency Table of Victim Mental Health Problem by Primary Relationship to Perpetrator	21
Table 6. Contingency Table of Victim Mental Health Treatment by Primary Relationship to Perpetrator	22

List of Figures

Figure 1. Social-Ecological Model	4
--	----------

Acknowledgement

I would like to thank my essay advisor, Dr. Haggerty, for her help and guidance throughout this process. I would also like to thank my essay committee, Dr. Morrison and Dr. Youk, for their thoughtful comments and feedback. Additionally, I want to thank my preceptor, Dr. Chelsea Pallatino, for her mentorship and encouragement. Finally, I would like to express my sincere gratitude to my partner, Leah Klocke, for her patience, love and support.

1.0 Introduction

In the United States (US), a woman experiences violence at the hands of an intimate partner every nine seconds (Emory University School of Medicine, n.d.). The Centers for Disease Control and Prevention (CDC) defines intimate partner violence (IPV) as “physical violence, sexual violence, stalking, or psychological harm by a current or former partner or spouse” (Centers for Disease Control and Prevention, n.d.-a). IPV can occur among all relationship types regardless of age, race or sexual orientation. According to the 2015 National Intimate Partner and Sexual Violence Survey (NISVS), an annual telephone survey conducted among adult women and men in the United States, about one in four (36.4% or 43.6 million) women experience sexual violence, physical violence, and/or stalking by an intimate partner in their lifetime (Smith et al., 2018). Additionally, data from the NISVS reported that one in 18 (5.5% or 6.6 million) women had experienced IPV in the 12 months preceding the survey (Smith et al., 2018). Furthermore, violence perpetuated by intimate partners presents a serious public health issue with numerous downstream effects on individuals, families, and communities. IPV is therefore a prevalent public health issue in the United States, and it is important to understand risk factors in order to guide prevention programs. As a primary objective, this paper will explore the impact of relationship status on intimate partner homicide (IPH) victim substance use, alcohol dependence and mental health. This essay aims to understand the impact of relationship status between victim and perpetrator as a risk factor for IPV and IPH.

1.1 Intimate Partner Violence Victim Profile

Although intimate partner violence is not exclusive to any single demographic, rates differ among various racial and ethnic groups, largely due to variation in underlying risk factors among those groups. The 2010 NISVS reported that the lifetime self-reported prevalence of IPV was highest among American Indian or Alaska Native women (46%) followed by Black women (43.7%), Hispanic women (37.1%), White women (34.6%), and Asian or Pacific Islander women (19.6%) (Breiding, Chen, & Black, 2014). Findings from the National Violence Against Women Survey (NVAW) show that Hispanic women experienced slightly greater levels of IPV-related physical assault (53.2%) compared to non-Hispanic women (51.8%). However, non-Hispanic women stated that they had experienced rape at some point in their lifetime at higher rates (18.4%) than Hispanic women (14.6%) (Tjaden & Thoennes, 2000). Overall, minority women in the US are typically at greater risk of IPV victimization. A 2009 study using Dallas Police Department crime reports found that the majority of reported IPV occurred among non-Hispanic Black (46.2%) and Hispanic (37.7%) women and that rates were 2-3 times higher in these groups compared with non-Hispanic White women (Lipsky, Caetano, & Roy-Byrne, 2009). However, while Hispanic women experience greater levels of physical violence, non-Hispanic women experience greater levels of sexual violence.

Household income level is also highly associated with IPV. The 12-month prevalence of IPV was 9.7% for households making under \$25,000, 5.9% for households making \$25,000 to \$50,000, 3.0% for households making \$50,000 to \$75,000, and 2.8% for households making over \$75,000 (Breiding et al., 2014). Poverty and economic stress within a household are considered significant risk factors for IPV. For example, food and housing insecurity increase the likelihood of experiencing IPV. Women who stated that they had experienced food insecurity within the last

12 months had an IPV prevalence of 11.6% versus 3.2% among women who had not experienced food insecurity. Ten percent of women with housing insecurity stated they had experienced IPV in the past 12 months, while only 2.3% of women without housing insecurity experienced IPV in that time (Breiding et al., 2014). Thus, poverty and the stressors that accompany it have been found to be strong predictors of IPV.

Finally, it has been well documented that young age is also a significant risk factor for IPV. Over 70% of female victims of IPV had experienced some form of IPV by age 25. Data from the 2010 NISVS reported the 12-month IPV prevalence for women age 18-24 years was 14.8%, 8.7% for women age 25-34 years, 7.3% for women age 35-44 years, 4.1% for women age 45-54 years, and 1.4% for women age 55 and over (Breiding et al., 2014). Primary prevention for IPV must take place at least by 22 years of age and preferably before 18 years of age because most abuse related to IPV is initiated before women reach 18 years old (Peterman, Bleck, & Palermo, 2015). While it is important to initiate screening and prevention efforts early, these efforts should continue throughout adulthood since IPV can occur at any time in a person's life.

1.2 Risk Factors of Intimate Partner Violence

The Social-Ecological Model framework (Figure 1) can be used to understand the myriad of individual, relationship, community, and societal factors that contribute to the likelihood of becoming a victim of IPV (Centers for Disease Control and Prevention, n.d.-c).



Figure 1. Social-Ecological Model

At the individual level, low educational attainment, low socioeconomic status, alcohol and drug abuse, young age, history of childhood abuse, and history of domestic violence increase the risk of IPV. In this case, domestic violence refers to violence occurring within the home. It does not necessarily refer to IPV specifically. Conversely, the opposite of these risk factors often has a protective effect against IPV (Yakubovich et al., 2018). In one study comparing children who were abused or neglected to children who had no such history, it was found that children with history of abuse or neglect had an increased risk of IPV victimization resulting in physical injury (OR = 1.60, $p < 0.05$) (Widom, Czaja, & Dutton, 2014). Additionally, multiple studies have shown that IPV rates decline with age (Sanz-Barbero, Barón, & Vives-Cases, 2019) (Pathak, Dhairyan, & Tariq, 2019) (Capaldi, Knoble, Shortt, & Kim, 2012). Similarly, higher income and education levels have been shown to be protective against IPV. A 2018 study in Peruvian women found that increasing years of schooling by even one year reduced the risk of psychological violence by 1-2%, physical violence by 1-3%, and sexual violence by 1% (Weitzman, 2018). Overall, a one year increase in schooling reduced the risk of experiencing any form of IPV within the past 12 months by 2-4% (Weitzman, 2018).

Risk factors at the relationship level can also include jealousy between partners. A 2011 study recruited children at risk of delinquency and followed them into adulthood. The final sample included men aged 10 to 32 years old. The study found that jealousy was associated with

perpetrating IPV whereby jealousy was measured using the Couples Interview and Partner Issues Checklist (Kerr & Capaldi, 2011). In the study, men's jealousy was predictive of men's arrests for IPV and women's injuries for IPV (effect size = 0.60). Additionally, jealousy in men was also highly predictive of aggression when controlled for other factors. Moreover, one study found that social isolation of the victim, such as having a limited social network, particularly outside of the home, can be a major contributing factor to IPV. They not only found that women in abusive relationships had half as many contacts in their social networks ($p < 0.001$), but the relationships that they did have tended to reinforce the distorted view of violence as an acceptable behavior from an intimate partner (Katerndahl, Burge, Ferrer, Becho, & Wood, 2013). Social isolation may have already existed prior to the relationship or the perpetrator may manipulate the victim into isolating themselves from family and friends. Lastly, research has shown that decreased marital satisfaction and increased marital conflict are associated with physical aggression in intimate relationships and is therefore a potential risk factor for IPV. In the study, female victims had significantly lower levels of marital satisfaction than did male victims. Additionally, victims reported lower levels of marital satisfaction compared to perpetrators (Stith, Green, Smith, & Ward, 2008).

Factors at the community and societal level may also influence risk of IPV and are challenging to address. They include structural poverty, low social and economic status of women, weak laws surrounding IPV, poor implementation of IPV-related laws, and gender-inequitable social norms, such as those that link masculinity to dominance and aggression (World Health Organization, 2013). Cultural norms and beliefs, such as the right of a man to assert power over a woman, the right to physically discipline a woman, intercourse as a husband's right in marriage, and many other beliefs all perpetuate IPV. Notably, countries where these norms and beliefs are common also have few laws addressing violence against women and higher rates of gender-based

violence. Therefore, the more entrenched these norms and beliefs are, the higher the prevalence of IPV in these societies. While most IPV prevention is aimed at dealing with IPV at the individual and relationship level, these findings underscore the need to address IPV at all levels of the Social-Ecological Model to adequately address the global epidemic of violence against women (Hardesty & Ogolsky, 2020).

1.3 Perpetrators of Intimate Partner Violence

It is important to note that most research and related services regarding IPV has focused on victims; relatively speaking, there is far less information on perpetrators of IPV. However, risk factors for perpetration have also been identified and include age, substance use, and mental health (Singh et al., 2015). A 2015 study on adolescent relationships found that perpetration of IPV starts at a young age with about 13% of 13–16-year-olds surveyed having perpetrated some form of IPV already in their current or past relationships. By 17-20 years old, rates increased to 19%. By 21-24 years old, rates decreased to 15% and 10% by 25-28 years old (Johnson, Giordano, Manning, & Longmore, 2015). Notably, trends of young age as a risk factor for IPV perpetration mirror the trends of young age as a risk factor for IPV victimization.

Along with age, research has indicated that IPV is strongly correlated with perpetrator alcohol and substance abuse. A systematic review of studies of IPV found that men had been drinking in about 45% of cases when violence was directed at an intimate partner (“Alcohol-Related Intimate Partner Violence Among White, Black, and,” n.d.). Another study found that more than 40% of participants in alcohol treatment, both male and female, reported perpetrating IPV at some point in the 12 months prior (Chermack, Fuller, & Blow, 2000). Approximately 40-

60% of IPV incidents involve substance use at the time of the event (Easton, Swan, & Sinha, 2000). Moreover, evidence suggests that substance use often is a catalyst for IPV perpetration (Fals-Stewart, 2003). Given this, it is important to note that IPV in married couples often declines significantly after alcohol and/or substance abuse treatment (Kraanen, Scholing, & Emmelkamp, 2010).

Psychiatric disorders are also associated with increased IPV perpetration. A systematic review found that men who had been violent towards their partner were 2.8 times more likely to have depression, 3.2 times more likely to have generalized anxiety disorder, and 2.5 times more likely to have a panic disorder (Oram, Trevillion, Khalifeh, Feder, & Howard, 2014). Additionally, a survey in South Africa found that men with post-traumatic stress disorder (PTSD) were three times more likely to report perpetrating sexual violence when controlled for other demographic characteristics (Breet, Seedat, & Kagee, 2019). A meta-analysis of the relationships between mental health disorders (depression, anxiety, PTSD, antisocial personality, and borderline personality disorder) and IPV perpetration and victimization found that borderline and antisocial personality disorders correlated strongly with IPV perpetration. The very nature of these personality disorders, which often inhibit emotional regulation and lead to impulsivity, lead to situations where individuals are unable to refrain from violence against an intimate partner (Spencer et al., 2019). Furthermore, a systematic review of 17 studies, found that one fifth of perpetrators of intimate partner homicide had a mental illness at the time of the incident, and 30% had contact with mental health services in the past year prior to the homicide (Oram, Khalifeh, Trevillion, Feder, & Howard, 2014). In short, increasing the understanding of perpetrator risk factors is critical to identifying prevention methods for IPV, especially before it becomes lethal.

1.4 Health Consequences of Intimate Partner Violence

The health consequences of IPV for the victim are often severe. They include lasting physical injury, development of mental health disorders, and even death. The mental health consequences of IPV include depression, anxiety, post-traumatic stress disorder (PTSD), and substance use disorder. A 2001 study found that 40% to 60% of women who have experienced IPV suffer from PTSD (Karakurt, Smith, & Whiting, 2014). Victims of IPV also have higher rates of substance use disorders, often as a method of coping with IPV. In a survey of domestic violence shelters for women in North Carolina, it was reported that 26% to 50% of women in the shelters had an active substance use disorder (Martin, Moracco, Chang, Council, & Dulli, 2008). On top of the mental health and substance use issues, victims of IPV are at increased risk of experiencing physical injury. Among women who experienced IPV in their lifetime, about 35.2% of women reported being injured as a result and 19.3% required medical care (Smith et al., 2018). It has also been found that repeated physical assault significantly increases the risk of injuries and chronic diseases including chronic pain, osteoarthritis, and severe headaches. Importantly, women are still at risk of experiencing IPV during pregnancy, which can cause adverse birth outcomes such as miscarriage, low birth weight, preterm birth or neonatal demise (Alhusen, Ray, Sharps, & Bullock, 2015). Lastly, women who have experienced some form of IPV were more likely to currently be in poor overall health or have developed a chronic disease (Coker et al., 2002). The finding that IPV leads to poor long-term physical and mental health outcomes in women has important implications for addressing post-IPV health.

1.5 Intimate Partner Homicide

Unfortunately, death is a common outcome of IPV, and women are more likely than men to experience death due to IPV. While the majority of victims of homicide in the United States are male, 63% of female homicide victims were killed by a current intimate partner (Violence Policy Center, 2018). In other words, while women account for a smaller percentage of homicide victims overall, those that are victims of homicide are more likely to have been killed by a current intimate partner than any other class of perpetrator (e.g., stranger, family member, etc.). In addition, recent trends have shown an increase in homicides committed by a current intimate partner. From 2014 to 2017, there was a 19% increase in victims of intimate partner homicide, for which 68% of victims were women (“Murders by Intimate Partners Are on the Rise, Study Finds - The New York Times,” n.d.). This highlights the disparities in intimate partner homicide experienced by women compared to men.

The rates of IPH within each race mirror the rates of IPV. In data spanning 2003 to 2014, Black women had the highest rate of homicide (4.4 per 100,000), followed by American Indian/Alaska Native (4.3), Hispanic (1.8), White (1.5), and Asian/Pacific Islander (1.2) (Petrosky et al., 2017). Most victims (29.4%) were between the ages of 18 to 29 years old. Additionally, most victims had never been married and therefore most of the homicides were perpetrated by a boyfriend or girlfriend rather than a spouse (Petrosky et al., 2017). Moreover, homicides with female victims were more likely to be committed by a male when related to IPV (98.2% versus 88.5%, respectively) (Petrosky et al., 2017). A large share of victims of IPH are young minority women. This is important to emphasize as more research needs to be done to better understand these disparities in intimate partner homicide victimization and opportunities for prevention and intervention.

1.6 Role of Guns in Intimate Partner Homicide

Currently in the United States, there have been nearly one million women who have survived being shot or shot at by an intimate partner (Carlisle & Chan, 2019). Between 2010 and 2017, intimate partner homicides involving guns increased by 26% (Fridel & Fox, 2019). In another study, states in the upper quartile of firearm ownership had a 64.6% ($p < 0.001$) higher incidence rate of domestic firearm homicide (i.e. homicides occurring between members of a household) than states in the lower quartile (Kivisto, Magee, Phalen, & Ray, 2019). Similarly, in a review of 35,413 IPV incidents most incidents were perpetrated by a male towards a female victim and 79.5% involved a gun (Sorenson, 2017). This study also found that guns were used to threaten an intimate partner in 69.1% of cases. The presence of guns in the home is a large driving force of homicides in the United States, particularly intimate partner homicides. Weapons of any type are associated with a higher likelihood of injury and lethality of an IPV incident. However, guns pose the greatest danger, as most IPV incidents ending in homicide involve a gun.

1.7 Gaps in Data

While the field of IPV research has grown considerably in the last decade, there are still multiple gaps in data and the overall understanding of IPV. First, there is significantly more data on the victims of IPV than on the perpetrators of IPV. More data is needed on perpetrators of IPV in order to identify risk factors for, and ultimately prevent, intimate partner homicide. Secondly, though there have been studies that suggest that alcohol and substance use are associated with IPV perpetration, there are additional factors that need to be explored, such as mental health history,

abuse history and criminal history. As such, gaps exist in our understanding of risk factors that lead to IPV perpetration.

Another gap is in the data itself because IPV is substantially underreported. Factors that lead to underreporting vary and span from fear of retaliation or shame due to the stigma surrounding IPV. IPV data collected by organizations such as the CDC and World Health Organization (WHO) are typically collected through surveys which yield a great deal of information about victims of IPV. However, surveys may have self-report bias and the issues of stigma and shame can also cause victims not to disclose information. IPV is also dramatically underreported among immigrant populations due to a lack of social support, stigma and a fear of deportation, law enforcement and losing custody of children (Dicola & Spaar, 2016). The gaps are even more vast regarding intimate partner homicide. Intimate partner homicide data is most often recorded through the criminal justice perspective. Often it is up to police and investigators to infer the circumstantial factors surrounding an intimate partner homicide. This can make it difficult to understand the risk factors that lead to intimate partner homicide given that the victim is dead, and the perpetrator is unable or unwilling to provide more information on motives. In other cases, perpetrators commit suicide after IPH and therefore circumstantial factors surrounding the event are often inferred. Moreover, because IPV data is largely recorded through survey methods and IPH data is recorded through death reports, it is difficult to ascertain the percentage of IPV that results in intimate partner homicide. Ultimately, the more we can understand about IPV, especially as it relates to intimate partner homicide, the easier it will be to identify those at most risk.

2.0 Objective

The objective of this analysis is to explore the associations among IPH victim-perpetrator relationship type with victim substance abuse, alcohol dependence, and mental health status among women and girls aged 11 to 95 in the United States who were victims of intimate partner homicide and included in the National Violent Death Reporting System (NVDRS).

3.0 Methods

3.1 National Violent Death Reporting System

The NVDRS is an active state-based surveillance system created for the sole purpose of providing accurate and timely surveillance data on all violent deaths (e.g., violent deaths include homicides, suicides, unintentional firearm deaths, death as a result of assault, among other types of violent deaths) occurring in the United States (Hoven, 1992). The CDC routinely contacts relevant authorities in each state to collect death certificates, coroner/medical examiner reports, law enforcement reports, and toxicology report information into one anonymous database (Centers for Disease Control and Prevention, n.d.-b). The NVDRS started collecting data on violent deaths from six states in 2002, and by 2018 gradually expanded to include all fifty states, as well as Puerto Rico, and the District of Columbia. The system collects information from law enforcement, medical examiners, coroners, toxicology reports, and death certificates. For this analysis, data was used from the NVDRS spanning from 2003 to 2015 to assess the association between both victim-perpetrator relationship status and victim alcohol and substance abuse, and victim-perpetrator relationship status and victim mental health disorder.

3.2 Sample Selection

The raw NVDRS dataset consists of 234,612 total violent death incidents that occurred in 2003 to 2015. The analysis was restricted to include only violent deaths related to intimate partner violence (IPV). The dataset was first limited to incidents including only female victims ($n = 55,989$)¹. Then it was limited to incidents with only male perpetrators ($n = 9,997$).² It is important to note that of the 55,989 incidents with female victims, there were 44,285 incidents or 79% with missing perpetrator sex information. Thus, these incidents were not included in the sample. The following variable definitions are included in Appendix A. Incidents of IPV were identified using the variable *IntimatePartnerViolence_c* ($n = 4,836$). This sample was further restricted to include victim-perpetrator relationships listed as being that of a husband, ex-husband, boyfriend, or ex-boyfriend using the *VictimSuspectRelationship1_1* variable ($n = 4,683$). Lastly, the dataset was limited to incidents categorized as a homicide using the variable *AbstractorDeathmanner_c*. This resulted in a sample size of 4,656 IPV-related homicides involving a female victim and a male perpetrator. There was one outlier in which the perpetrator was listed as 11 years old. Upon review of the law enforcement information for this incident, it was determined that the age of the perpetrator was incorrect, and the perpetrator was likely older than 11 years old. However, this incident was still removed from the sample since the age of the perpetrator could not be

¹ While men are victims of IPV and IPH, the sample was limited to female victims because they make up a majority of IPH victims. According to the U.S. Bureau of Justice Statistics, in 2008, 4.9% of victims of IPH were male. Conversely, 95.1% of victims of IPH were female (Cooper & Smith, 2011).

² The sample was limited to male perpetrators because 70.3% of perpetrators in IPH are male, whereas 29.7% were female (Cooper & Smith, 2011).

determined. Therefore, the final sample size was 4,655 of intimate partner homicides with a female victim and male perpetrator.

3.3 Statistical Analysis

We used Chi-square tests to analyze whether there was a statistically significant difference between proportions for each variable. In cases where expected frequencies were less than 5, a Fisher's exact test was used. Furthermore, adjusted Pearson residuals were calculated for each association to determine the contribution of each association to the Chi-square value. Adjusted residuals are the raw residuals (difference between observed and expected count) divided by the standard deviation of all residuals. Since adjusted Pearson residuals are normally distributed, those cells with absolute values greater than $N(0,1)_{1-\alpha/2} = 1.96$ will have p-values of less than 0.05. In other words, an adjusted Pearson residual greater than 1.96 will be significant at $\alpha = 0.05$. The adjusted Pearson residuals were used to determine specifically which associations were driving the overall Chi-square significance. All analyses were completed using Stata 16.

4.0 Results

4.1 Sample Characteristics

Table 1 presents the characteristics of the IPH victims included in the sample. The age range for victims was 11 to 95 years old with a mean age of 39.7 years. The racial makeup of the victim sample was 62.2% white, 28.9% black, 4.9% other races, and 9.7% Hispanic or Latino. Thirty six percent of victims had a high school degree or less, 21.4% had greater than a high school education and 42.5% had an unknown education level. Forty-three percent of victims were married, in a civil union, or domestic partnership while 28.7% had never been married. Additionally, 17.6% were divorced, 4.9% were widowed, 4.2% were separated, and 1.7% were single or had an unknown marital status.

Table 1. Victim Demographics

Age	
Age Range, years	11 to 95
Mean Age, years \pm SD*	39.7 \pm 14.7
Race (N = 4,655)	
	N (%)
White	2,895 (62.2)
Black	1,344 (28.9)
Asian	87 (1.9)
Native Hawaiian or Pacific Islander	88 (1.9)
American Indian or Alaska Native	55 (1.2)
Unspecified or unknown	186 (4.0)
Not Hispanic or Latino	4,142 (89.4)
Hispanic or Latino	448 (9.7)
Unknown	45 (1.0)
Education (N = 4,427)	
Less than high school	525 (11.9)
High school graduate or GED	1,071 (24.2)
Some college, but no degree	403 (9.1)
Post-secondary degree	546 (12.3)
Unknown	1,882 (42.5)
Marital Status (N = 4,649)	
Married/Civil Union/Domestic Partnership	1,980 (42.6)
Never Married	1,332 (28.7)
Widowed	230 (5.0)
Divorced	817 (17.6)
Separated	196 (4.2)
Single or not otherwise specified	63 (1.4)
Unknown	31 (0.4)

Table 2 presents characteristics for the perpetrators of IPH in the sample. The age range for the final perpetrator cohort was 14 to 100 years old with a mean age of 42.6 years. The racial makeup was 52.8% white, 31.3% black, 8.2% other races and 9% Hispanic or Latino.

Table 2. Perpetrator Demographics

Age	
Age Range, years	14 to 100
Mean Age, years \pm SD	42.6 \pm 15.0
Race (N = 4,655)	
White	2,457 (52.8)
Black	1,459 (31.3)
Asian	61 (1.3)
Native Hawaiian or Pacific Islander	73 (1.6)
American Indian or Alaska Native	247 (5.3)
Unspecified or unknown	358 (7.7)
Ethnicity (N = 4,655)	
Not Hispanic or Latino	3,155 (70.5)
Hispanic or Latino	405 (9.1)
Unknown	915 (20.5)

4.2 Victim Alcohol and Substance Use Analysis

Table 3 presents a contingency table of relationship to perpetrator and victim alcohol dependence or problem. The Fisher's Exact test of association between relationship type and victim's alcohol dependence or problem was statistically significant (p-value <0.001). The observed frequency was more than the expected frequency for victims with an alcohol problem and had a boyfriend (p-value <0.001). The observed frequency was less than the expected frequency for victims with an alcohol problem and whose perpetrator was an ex-boyfriend (p-value = 0.003).

Table 3. Contingency Table of Victim Alcohol Problem by Primary Relationship to Perpetrator

Primary Relationship of Victim to Perpetrator		Victim had Alcohol Dependence or Alcohol Problem		p-value
		Yes	No	
Spouse (N = 2,058)	<i>Observed</i>	44	2,014	0.168
	<i>Expected</i>	51	2007	
Ex-spouse (N = 207)	<i>Observed</i>	4	203	0.597
	<i>Expected</i>	5	202	
Boyfriend (N = 1,698)	<i>Observed</i>	64	1,634	<0.001
	<i>Expected</i>	42	1,656	
Ex-boyfriend (N = 513)	<i>Observed</i>	3	510	0.003
	<i>Expected</i>	12	500	
Current or ex-boyfriend (N = 179)	<i>Observed</i>	1	178	0.091
	<i>Expected</i>	4	174	
Total		116	4,539	--
Fisher's Exact test significance		--	--	<0.001

Note: Expected frequencies are frequencies expected if the null hypothesis were true.

Table 4 presents a contingency table of relationship to perpetrator and victim substance abuse problem. The Chi-Square test of association for relationship type and victim substance abuse problem was statistically significant (p-value <0.001). The observed frequency was greater than the expected frequency for victims without a substance abuse problem and who were married (p-value <0.001). The observed frequency was less than the expected frequency for victims with a substance abuse problem and who were married (p-value <0.001). For victims with substance abuse problem and whose perpetrator was a boyfriend, the observed frequency was much greater than the expected frequency (p-value <0.001). While victims without a substance abuse problem and whose perpetrator was a boyfriend, the observed frequency was less than the expected frequency (p-value <0.001).

Table 4. Contingency Table of Victim Substance Abuse by Primary Relationship to Perpetrator

Primary Relationship of Victim to Perpetrator		Victim had Substance Abuse Problem		
		Yes	No	p-value
Spouse (N = 2,058)	<i>Observed</i>	52	2,006	<0.001
	<i>Expected</i>	84	1,974	
Ex-spouse (N = 207)	<i>Observed</i>	3	204	0.052
	<i>Expected</i>	8	199	
Boyfriend (N = 1,698)	<i>Observed</i>	113	1,585	<0.001
	<i>Expected</i>	69	1,629	
Ex-boyfriend (N = 513)	<i>Observed</i>	15	498	0.167
	<i>Expected</i>	21	492	
Current or ex-boyfriend (N = 179)	<i>Observed</i>	6	173	0.624
	<i>Expected</i>	7	172	
Total		189	4,466	--
Chi-Square test significance		--	--	<0.001

Note: Expected frequencies are frequencies expected if the null hypothesis were true.

4.3 Victim Mental Health and Treatment Status Analysis

Table 5 presents a contingency table of relationship to perpetrator and victim mental health problem. The Chi-Square test of association between relationship type and victim currently experiencing a mental health problem was statistically significant (p-value = 0.017). For victims who were married, but had a current mental health problem, the observed frequency was more than the expected frequency (p-value = 0.01). Conversely, victims who were married, but did not have a current mental health problem, the observed frequency was less than the expected frequency (p-value = 0.01). The observed frequency was less than the expected frequency for victims with a mental health problem and whose perpetrator was an ex-boyfriend (p-value = 0.01). While for

victims without a current mental health problem and whose perpetrator was an ex-boyfriend, the observed frequency was greater than the expected frequency (p-value = 0.01).

Table 3. Contingency Table of Victim Mental Health Problem by Primary Relationship to Perpetrator

Primary Relationship of Victim to Perpetrator		Victim had Current Mental Health Problem		
		Yes	No	p-value
Spouse (N = 2,058)	<i>Observed</i>	88	1,970	0.01
	<i>Expected</i>	71	1,987	
Ex-spouse (N = 207)	<i>Observed</i>	5	202	0.40
	<i>Expected</i>	7	200	
Boyfriend (N = 1,698)	<i>Observed</i>	54	1,644	0.43
	<i>Expected</i>	59	1,639	
Ex-boyfriend (N = 513)	<i>Observed</i>	7	506	0.01
	<i>Expected</i>	18	495	
Current or ex-boyfriend (N = 179)	<i>Observed</i>	7	172	0.74
	<i>Expected</i>	6	173	
Total		189	4,466	--
Chi-Square test significance		--	--	0.017

Note: Expected frequencies are frequencies expected if the null hypothesis were true.

Table 6 presents a contingency table of relationship to perpetrator and whether victim was currently receiving mental health treatment. The Fisher's Exact test association between relationship type and victim currently in treatment for mental health problem was statistically significant (p-value = 0.045). The observed frequency was greater than the expected frequency for victims currently in treatment and whose perpetrator was a spouse (p-value = 0.01). The observed frequency was less than the expected frequency for victims not currently in treatment and whose perpetrator was a spouse (p-value = 0.01). For victims with an ex-boyfriend and were in treatment, the observed frequency was less than the expected frequency (p-value = 0.02). While victims who

were not in treatment and whose perpetrator was an ex-boyfriend, the observed frequency was greater than the expected frequency (p-value = 0.02).

Table 4. Contingency Table of Victim Mental Health Treatment by Primary Relationship to Perpetrator

Primary Relationship of Victim to Perpetrator		Victim was in Treatment for Mental Health Problem		
		Yes	No	p-value
Spouse (N = 2,058)	<i>Observed</i>	64	1,994	0.01
	<i>Expected</i>	50	2,007	
Ex-spouse (N = 207)	<i>Observed</i>	5	202	0.97
	<i>Expected</i>	5	202	
Boyfriend (N = 1,698)	<i>Observed</i>	37	1,661	0.37
	<i>Expected</i>	42	1,656	
Ex-boyfriend (N = 513)	<i>Observed</i>	5	508	0.02
	<i>Expected</i>	13	500	
Current or ex-boyfriend (N = 179)	<i>Observed</i>	3	176	0.50
	<i>Expected</i>	4	175	
Total		189	4,466	--
Fisher's Exact test significance		--	--	0.045

Note: Expected frequencies are frequencies expected if the null hypothesis were true.

5.0 Discussion

The objective of this analysis was to explore the relationship between IPH victim-perpetrator relationship type and victim substance use, alcohol dependence, and mental health disorder status. Overall, the analysis found that victims who were married to the perpetrator were less likely to have a substance use disorder, but more likely to have a mental health problem or be in treatment for a mental health problem. Conversely, victims whose perpetrator was a boyfriend were more likely to have a substance use disorder or be alcohol dependent, and victims whose perpetrator was an ex-boyfriend were less likely to be alcohol dependent, have a mental health problem, or be in treatment for a mental health problem. This research has implications for identifying points of intervention for potential victims of IPH.

The results are supported by previous research regarding relationship type and its influence on substance use and alcohol use. The relationship between marital status and substance use has been noted elsewhere in health-related research (Fleming, White, & Catalano, 2010). A 2004 study that examined the rates of substance use among 35-year-old adults found that married individuals were significantly less likely to use cocaine, marijuana, or engage in heavy drinking behaviors compared to unmarried individuals (Merline, O'Malley, Schulenberg, Bachman, & Johnston, 2004). Similarly, the results of this analysis also predicted a lower likelihood of substance use and alcohol dependence in married female victims of IPH. Conversely, a dating relationship (i.e., boyfriend) predicted a higher likelihood of substance use and alcohol dependence. A 22-year cohort study in Norway (N = 177) that investigated the role of substances, including alcohol, at the time of an intimate partner homicide found that alcohol or other substances were present in 50% of perpetrators and 41% of victims (Vatnar, Friestad, & Bjørkly, 2019). The results of the

study point to a connection between the occurrence of intimate partner homicide and substance or alcohol use among victims. While further investigation is needed, the findings of our research suggest that special attention should be paid to women with substance use disorders or alcohol dependence in dating relationships as they are at greater risk of IPH victimization (Rivara, 1997).

The marriage effect, however, did not extend to mental health-related outcomes for female victims of IPH. There are several reasons why the marriage effect may not apply to mental health in relationships with IPV. While the positive effect of marriage on mental health is well studied, the effect of marriage on mental health within the context of IPV is not. This, combined with the fact that women who have experienced IPV have poor mental health outcomes, suggests that marriage does not confer a mental health benefit to women in relationships with IPV and may, in fact, exacerbate mental health issues. One meta-analysis found that mental health problems such as suicidal ideation, PTSD, and depression occur three to five times more often in survivors of IPV than in women who have never experienced IPV (Golding, 1999). Poor mental health in women experiencing IPV is well documented and occurs for several reasons. Since married couples predominantly cohabitate, victims may be financially reliant on the perpetrator, have multiple barriers to leaving the relationship (i.e. unable to secure housing) or fear losing custody of children (Storer, Rodriguez, & Franklin, 2018). Additionally, experiencing abuse in general leads to poor mental health (Pico-Alfonso et al., 2006). Moreover, our research found that married women were more likely to be receiving treatment for their mental health issues. Female victims of IPV are more likely to visit their primary care physician and, as a result, more likely to be referred to mental health treatment (Prosman, Lo Fo Wong, Bulte, & Lagro-Janssen, 2012). However, it is unclear how marriage affects this dynamic. These findings regarding mental health have implications for

the establishment of screening and intervention practices for IPV in primary care and mental health treatment settings.

5.1 Strengths and Limitations

One key strength of this analysis is the large sample size. The final sample size was 4,655 incidents of IPH. While no specific sample size was targeted in this analysis, the large sample size increases the reliability of the results. However, there are some limitations to this analysis. First, of the IPH cases with female victims about 79% were missing perpetrator sex information. Given that this analysis focused on male-female relationships, this is a significant limitation. Thus, this study is not generalizable to other populations experiencing IPV (e.g., LGBTQ+, male victims, etc.) Additionally, general underreporting of IPV may mean that homicides related to IPV were not identified as such and thus not coded appropriately in the NVDRS. Furthermore, missing data related to cohabitation status and perpetrator mental health and substance use meant that the analysis was limited in scope. Limited data on perpetrator substance use and mental health meant that this component of the relationship could not be analyzed. Given that substance use disorders are often present in both partners within a relationship and impact relationship dynamics and safety, this association would have been useful to examine. It may provide further context on potential factors contributing to IPV in the relationship, as well as entry points for prevention and intervention. Additionally, the distinction between cohabitating and non-cohabitating couples is important for further research. Cohabitation status may play a role in victim substance use behaviors and mental health-related outcomes.

5.2 Implications for Future Research

Future research should first address the limitations of this study. Cohabitation among unmarried couples has become increasingly more common in recent years (Fleming et al., 2010). Given this trend in living arrangements, future research should focus on potential differences based on cohabitation status and its implications for IPV. There is some recent research to suggest that cohabitation in dating relationships as opposed to marriage is a risk factor for IPV (Manning, Longmore, & Giordano, 2018). Future analyses should explore this association further within the context of IPH. Moreover, our finding that married women experienced poorer mental health poses the question of whether marriage is a risk factor for mental health problems when cooccurring with IPV. Additionally, it would be useful to explore how marriage impacts utilization of mental health treatment as opposed to dating relationships. Our analysis found that married women were more likely to be in mental health treatment and there is little to no research to explain this finding. It is important for further research to examine this and identify potential confounders and explanations for this finding. Finally, criminal history, substance use, and mental health status of the perpetrator should be identified and incorporated into future analyses. These details would provide a clearer picture of those at risk for perpetrating IPH. While the NVDRS is comprehensive in its collection of victim data, perpetrator data is severely lacking. This has implications for the NVDRS surveillance system as a whole. It would require improving how law enforcement agencies collect data on perpetrators and subsequently report this information to the NVDRS.

5.3 Public Health Significance

Violence against women is a worldwide epidemic. It exists in every country, including low-, middle- and high-income countries. The WHO estimates that one in three women worldwide have experienced physical and/or sexual intimate partner violence (Krantz & Garcia-Moreno, 2005). The WHO also reports that 38% of homicides with female victims are committed by a male intimate partner. The health consequences of IPV for women are numerous, with fatal outcomes such as homicide or suicide a potential reality. Over 42% of women who experience IPV report a serious physical injury as a result of IPV. Unintended pregnancies, gynecological problems, sexually transmitted infections including human immunodeficiency virus (HIV), increased likelihood of miscarriage, and pre-term birth are all common, as well as negative effects on mental health and overall physical health.

Women are not the only victims of IPV. Children who grow up in families where there is violence are more likely to suffer behavioral and mental health problems. A 2009 study found that approximately half of children exposed to IPV develop symptoms of trauma and high frequency of exposure often leads to PTSD (Levendosky, Bogat, & Martinez-Torteya, 2013). Additionally, they are more likely to be victims of IPV or perpetuate violence themselves. IPV in families is also linked to higher rates of infant and child mortality and morbidity, especially in lower income countries. Women who experience IPV are also less likely to work and commonly experience a loss of wages that limits their ability to care for themselves and their children (Krantz & Garcia-Moreno, 2005). A loss of wages also decreases the likelihood of exiting the relationship and increases dependence on the perpetrator.

This analysis is significant because it can be used to identify IPV victims that may be at increased risk for IPH. The finding that married female IPH victims are more likely receive mental

health treatment is important for the establishment of better screening practices in these settings. Furthermore, women in marriages with IPV have greater difficulty leaving the relationship due to legal and financial dependence, and greater perpetrator monitoring. This highlights the importance of prevention efforts in mental health treatment settings, as well as other touchpoints with the health care system. Additionally, our analysis found that women in dating relationships were more likely to experience substance use and alcohol dependence. The cohort study in Norway found that substance use and alcohol played a role in approximately half of intimate partner homicides that occurred over the course of the study (Vatnar et al., 2019). While more research is needed, dating relationships may be a significant risk factor for IPH. This is important as it can inform screening practices to identify women with substance use disorders or alcohol dependence in IPV-dating relationships as being at greater risk for IPH. Ultimately, the goal is prevention. While IPV is a pervasive problem in nearly all countries, it is vitally important that we identify women before they become victims of IPH. In summary, the social, economic, and health costs of IPV are not an individual problem, but a societal one that needs to be urgently addressed at all levels.

Appendix A National Violent Death Reporting System Variable Definitions

The following variable definitions used in this analysis are derived from the NVDRS Web Coding Manual Version 5.1 (Centers for Disease Control and Prevention, 2015).

AbstractorDeathmanner_c = Manner of death based on abstractor review of death certificate, law enforcement report, and coroner's/medical examiner report.

IntimatePartnerViolence_c = Identifies cases in which the homicide or legal intervention is related to immediate or ongoing conflict or violence between current or former intimate partners. This includes all deaths where a victim is killed by their current or former intimate partner.

VictimSuspectRelationship1_1 = Description of the primary relationship of the victim to the suspect.

AlcoholProblem_c = Person has alcohol dependence or problem (Table 3).

SubstanceAbuseOther_c = Person has a non-alcohol related substance abuse problem (Table 4).

MentalHealthProblem_c = Current mental health problem (Table 5).

MentalIllnessTreatmentCurrnt_c = Currently in treatment for mental health problem or substance abuse problem (Table 6).

Bibliography

- Alcohol-Related Intimate Partner Violence Among White, Black, and. (n.d.). Retrieved January 31, 2021, from <https://pubs.niaaa.nih.gov/publications/arh25-1/58-65.htm>
- Alhusen, J. L., Ray, E., Sharps, P., & Bullock, L. (2015). Intimate partner violence during pregnancy: maternal and neonatal outcomes. *Journal of Women's Health*, 24(1), 100–106. doi:10.1089/jwh.2014.4872
- Breet, E., Seedat, S., & Kagee, A. (2019). Posttraumatic stress disorder and depression in men and women who perpetrate intimate partner violence. *Journal of Interpersonal Violence*, 34(10), 2181–2198. doi:10.1177/0886260516660297
- Breiding, M. J., Chen, J., & Black, M. C. (2014). *Intimate Partner Violence in the United States 2010*. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.
- Capaldi, D. M., Knoble, N. B., Shortt, J. W., & Kim, H. K. (2012). A Systematic Review of Risk Factors for Intimate Partner Violence. *Partner abuse (Print)*, 3(2), 231–280. doi:10.1891/1946-6560.3.2.231
- Carlisle, M., & Chan, M. (2019, October 17). Here's Why Domestic Violence Kills So Many Women and Children in the U.S. Retrieved January 31, 2021, from <https://time.com/5702435/domestic-violence-gun-violence/>
- Centers for Disease Control and Prevention. (2015, June 30). National Violent Death Reporting System (NVDRS) Coding Manual Revised. Retrieved April 8, 2021, from <http://www.cdc.gov/injury>
- Centers for Disease Control and Prevention. (n.d.-a). Intimate Partner Violence. Retrieved January 23, 2021, from <https://www.cdc.gov/violenceprevention/intimatepartnerviolence/index.html>
- Centers for Disease Control and Prevention. (n.d.-b). National Violent Death Reporting System (NVDRS). Retrieved April 4, 2021, from <https://www.cdc.gov/violenceprevention/datasources/nvdrs/index.html>
- Centers for Disease Control and Prevention. (n.d.-c). The Social-Ecological Model: A Framework for Prevention. Retrieved April 4, 2021, from <https://www.cdc.gov/violenceprevention/about/social-ecologicalmodel.html>
- Chermack, S. T., Fuller, B. E., & Blow, F. C. (2000). Predictors of expressed partner and non-partner violence among patients in substance abuse treatment. *Drug and Alcohol Dependence*, 58(1-2), 43–54. doi:10.1016/s0376-8716(99)00067-8

- Coker, A. L., Davis, K. E., Arias, I., Desai, S., Sanderson, M., Brandt, H. M., & Smith, P. H. (2002). Physical and mental health effects of intimate partner violence for men and women. *American Journal of Preventive Medicine*, 23(4), 260–268. doi:10.1016/s0749-3797(02)00514-7
- Cooper, A., & Smith, E. L. (2011). Homicide Trends in the United States, 1980-2008.
- Dicola, D., & Spaar, E. (2016). Intimate Partner Violence. *American Family Physician*, 94(8), 646–651.
- Easton, C., Swan, S., & Sinha, R. (2000). Motivation to change substance use among offenders of domestic violence. *Journal of Substance Abuse Treatment*, 19(1), 1–5. doi:10.1016/s0740-5472(99)00098-7
- Emory University School of Medicine. (n.d.). Domestic Violence/Intimate Partner Violence Facts. Retrieved January 31, 2021, from <http://psychiatry.emory.edu/niaproject/resources/dv-facts.html>
- Fals-Stewart, W. (2003). The occurrence of partner physical aggression on days of alcohol consumption: a longitudinal diary study. *Journal of Consulting and Clinical Psychology*, 71(1), 41–52. doi:10.1037//0022-006x.71.1.41
- Fleming, C. B., White, H. R., & Catalano, R. F. (2010). Romantic relationships and substance use in early adulthood: an examination of the influences of relationship type, partner substance use, and relationship quality. *Journal of Health and Social Behavior*, 51(2), 153–167. doi:10.1177/0022146510368930
- Fridel, E. E., & Fox, J. A. (2019). Gender differences in patterns and trends in U.S. homicide, 1976–2017. *Violence and Gender*, 6(1), 27–36. doi:10.1089/vio.2019.0005
- Golding, J. M. (1999). Intimate Partner Violence as a Risk Factor for Mental Disorders: A Meta-Analysis. *Springer Science and Business Media LLC*. doi:10.1023/a:1022079418229
- Hardesty, J. L., & Ogolsky, B. G. (2020). A socioecological perspective on intimate partner violence research: A decade in review. *Family relations*, 82(1), 454–477. doi:10.1111/jomf.12652
- Hoven, A. R. (1992). Violence: a major public health problem. *The Journal of the Kentucky Medical Association*, 90(2), 59–60.
- Johnson, W. L., Giordano, P. C., Manning, W. D., & Longmore, M. A. (2015). The age-IPV curve: changes in the perpetration of intimate partner violence during adolescence and young adulthood. *Journal of Youth and Adolescence*, 44(3), 708–726. doi:10.1007/s10964-014-0158-z
- Karakurt, G., Smith, D., & Whiting, J. (2014). Impact of intimate partner violence on women's mental health. *Journal of family violence*, 29(7), 693–702. doi:10.1007/s10896-014-9633-2

- Katerndahl, D., Burge, S., Ferrer, R., Becho, J., & Wood, R. (2013). Differences in social network structure and support among women in violent relationships. *Journal of Interpersonal Violence*, 28(9), 1948–1964. doi:10.1177/0886260512469103
- Kerr, D. C. R., & Capaldi, D. M. (2011). Young men's intimate partner violence and relationship functioning: long-term outcomes associated with suicide attempt and aggression in adolescence. *Psychological Medicine*, 41(4), 759–769. doi:10.1017/S0033291710001182
- Kivisto, A. J., Magee, L. A., Phalen, P. L., & Ray, B. R. (2019). Firearm ownership and domestic versus nondomestic homicide in the U.S. *American Journal of Preventive Medicine*, 57(3), 311–320. doi:10.1016/j.amepre.2019.04.009
- Kraanen, F. L., Scholing, A., & Emmelkamp, P. M. G. (2010). Substance use disorders in perpetrators of intimate partner violence in a forensic setting. *International journal of offender therapy and comparative criminology*, 54(3), 430–440. doi:10.1177/0306624X08330189
- Krantz, G., & Garcia-Moreno, C. (2005). Violence against women. *Journal of Epidemiology and Community Health*, 59(10), 818–821. doi:10.1136/jech.2004.022756
- Levendosky, A. A., Bogat, G. A., & Martinez-Torteya, C. (2013). PTSD symptoms in young children exposed to intimate partner violence. *Violence Against Women*, 19(2), 187–201. doi:10.1177/1077801213476458
- Lipsky, S., Caetano, R., & Roy-Byrne, P. (2009). Racial and ethnic disparities in police-reported intimate partner violence and risk of hospitalization among women. *Women's Health Issues : Official Publication of the Jacobs Institute of Women's Health*, 19(2), 109–118. doi:10.1016/j.whi.2008.09.005
- Manning, W. D., Longmore, M. A., & Giordano, P. C. (2018). Cohabitation and Intimate Partner Violence during Emerging Adulthood: High Constraints and Low Commitment. *Journal of family issues*, 39(4), 1030–1055. doi:10.1177/0192513X16686132
- Martin, S. L., Moracco, K. E., Chang, J. C., Council, C. L., & Dulli, L. S. (2008). Substance abuse issues among women in domestic violence programs: findings from North Carolina. *Violence Against Women*, 14(9), 985–997. doi:10.1177/1077801208322103
- Merline, A. C., O'Malley, P. M., Schulenberg, J. E., Bachman, J. G., & Johnston, L. D. (2004). Substance use among adults 35 years of age: prevalence, adulthood predictors, and impact of adolescent substance use. *American Journal of Public Health*, 94(1), 96–102. doi:10.2105/ajph.94.1.96
- Murders by Intimate Partners Are on the Rise, Study Finds - The New York Times. (n.d.). Retrieved January 24, 2021, from <https://www.nytimes.com/2019/04/12/us/domestic-violence-victims.html>

- Oram, S., Khalifeh, H., Trevillion, K., Feder, G., & Howard, L. M. (2014). Perpetration of Intimate Partner Violence by People with Mental Illness. *European Journal of Public Health*, 24(suppl_2). doi:10.1093/eurpub/cku162.047
- Oram, S., Trevillion, K., Khalifeh, H., Feder, G., & Howard, L. M. (2014). Systematic review and meta-analysis of psychiatric disorder and the perpetration of partner violence. *Epidemiology and psychiatric sciences*, 23(4), 361–376. doi:10.1017/S2045796013000450
- Pathak, N., Dhairyawan, R., & Tariq, S. (2019). The experience of intimate partner violence among older women: A narrative review. *Maturitas*, 121, 63–75. doi:10.1016/j.maturitas.2018.12.011
- Peterman, A., Bleck, J., & Palermo, T. (2015). Age and intimate partner violence: an analysis of global trends among women experiencing victimization in 30 developing countries. *Journal of Adolescent Health*, 57(6), 624–630. doi:10.1016/j.jadohealth.2015.08.008
- Petrosky, E., Blair, J. M., Betz, C. J., Fowler, K. A., Jack, S. P. D., & Lyons, B. H. (2017). Racial and Ethnic Differences in Homicides of Adult Women and the Role of Intimate Partner Violence - United States, 2003-2014. *MMWR. Morbidity and Mortality Weekly Report*, 66(28), 741–746. doi:10.15585/mmwr.mm6628a1
- Pico-Alfonso, M. A., Garcia-Linares, M. I., Celda-Navarro, N., Blasco-Ros, C., Echeburúa, E., & Martinez, M. (2006). The impact of physical, psychological, and sexual intimate male partner violence on women's mental health: depressive symptoms, posttraumatic stress disorder, state anxiety, and suicide. *Journal of Women's Health*, 15(5), 599–611. doi:10.1089/jwh.2006.15.599
- Prosman, G.-J., Lo Fo Wong, S. H., Bulte, E., & Lagro-Janssen, A. L. M. (2012). Healthcare utilization by abused women: a case control study. *The European Journal of General Practice*, 18(2), 107–113. doi:10.3109/13814788.2012.675503
- Rivara, F. P. (1997). Alcohol and illicit drug abuse and the risk of violent death in the home. *The Journal of the American Medical Association*, 278(7), 569. doi:10.1001/jama.1997.03550070061039
- Sanz-Barbero, B., Barón, N., & Vives-Cases, C. (2019). Prevalence, associated factors and health impact of intimate partner violence against women in different life stages. *Plos One*, 14(10), e0221049. doi:10.1371/journal.pone.0221049
- Singh, V., Epstein-Ngo, Q., Cunningham, R. M., Stoddard, S. A., Chermack, S. T., & Walton, M. A. (2015). Physical dating violence among adolescents and young adults with alcohol misuse. *Drug and Alcohol Dependence*, 153, 364–368. doi:10.1016/j.drugalcdep.2015.05.003
- Smith, S. G., Zhang, X., Basile, K. C., Merrick, M. T., Wang, J., Kresnow, M., & Chen, J. (2018). *National Intimate Partner and Sexual Violence Survey: 2015 Data Brief* -

Updated Release. Atlanta, Georgia: National Center for Injury Prevention of Control, Centers for Disease Control and Prevention.

- Sorenson, S. B. (2017). Guns in intimate partner violence: comparing incidents by type of weapon. *Journal of Women's Health, 26*(3), 249–258. doi:10.1089/jwh.2016.5832
- Spencer, C., Mallory, A. B., Cafferky, B. M., Kimmes, J. G., Beck, A. R., & Stith, S. M. (2019). Mental health factors and intimate partner violence perpetration and victimization: A meta-analysis. *Psychology of violence, 9*(1), 1–17. doi:10.1037/vio0000156
- Stith, S. M., Green, N. M., Smith, D. B., & Ward, D. B. (2008). Marital Satisfaction and Marital Discord as Risk Markers for Intimate Partner Violence: A Meta-analytic Review. *Journal of Family Violence, 23*(3), 149–160. doi:10.1007/s10896-007-9137-4
- Storer, H. L., Rodriguez, M., & Franklin, R. (2018). leaving was a process, not an event": the lived experience of dating and domestic violence in 140 characters. *Journal of Interpersonal Violence, 886260518816325*. doi:10.1177/0886260518816325
- Tjaden, P., & Thoennes, N. (2000). *Full Report of the Prevalence, Incidence, and Consequences of Violence Against Women*. Centers for Disease Control and Prevention.
- Vatnar, S. K. B., Friestad, C., & Bjørkly, S. (2019). The Influence of Substance Use on Intimate Partner Homicide: Evidence from a Norwegian National 22-year Cohort. *International journal of forensic mental health, 1–12*. doi:10.1080/14999013.2018.1525777
- Violence Policy Center. (2018, September). When Men Murder Women. Retrieved January 28, 2021, from <https://www.vpc.org/studies/wmmw2016.pdf>
- Weitzman, A. (2018). Does Increasing Women's Education Reduce Their Risk of Intimate Partner Violence? Evidence from an Education Policy Reform. *Criminology; an interdisciplinary journal, 56*(3), 574–607. doi:10.1111/1745-9125.12181
- Widom, C. S., Czaja, S., & Dutton, M. A. (2014). Child abuse and neglect and intimate partner violence victimization and perpetration: a prospective investigation. *Child Abuse & Neglect, 38*(4), 650–663. doi:10.1016/j.chiabu.2013.11.004
- World Health Organization. (2013). *Global and Regional Estimates of Violence Against Women: Prevalence and Health Effects of Intimate Partner Violence and Non-partner Sexual Violence* (Illustrated., p. 56). Geneva, Switzerland: World Health Organization.
- Yakubovich, A. R., Stöckl, H., Murray, J., Melendez-Torres, G. J., Steinert, J. I., Glavin, C. E. Y., & Humphreys, D. K. (2018). Risk and Protective Factors for Intimate Partner Violence Against Women: Systematic Review and Meta-analyses of Prospective-Longitudinal Studies. *American Journal of Public Health, 108*(7), e1–e11. doi:10.2105/AJPH.2018.304428