

**An Examination of Providers' Awareness, Knowledge of Screening and Treatment,
and Perceived Barriers Associated with Intimate Partner Violence-related Traumatic
Brain Injury**

by

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Introduction According to the Centers for Disease Control and Prevention, an estimated 10 million men and women are physically abused by an intimate partner. Injuries to the head, neck, and face (HNF) occur at a high rate with survivors of intimate partner violence (IPV). HNF injuries have the potential to result in traumatic brain injury (TBI) which may lead to chronic and negative physical (headaches, chronic pain, persistent vertigo) and mental health outcomes (post-traumatic stress disorder, anxiety, depression) if left untreated. Providers' awareness of IPV-related TBI, screening tools and resources, and perceived barriers are important factors when examining IPV-related TBI.

Methods A mixed methods approach was used for data collection. The sample included providers from a variety of domains, including social work, healthcare, legal, and mental health. Three focus groups and two one-on-one interviews with providers were conducted and recorded. Prior to the focus groups and interviews, demographic data were collected via a survey. In the focus groups and interviews, providers were asked a series of open-ended questions and all audio files were transcribed and coded.

Results Several providers noted that the connection between TBI and IPV is valid and that they are more likely to screen for possible TBI in their clients following their participation in the study. Overall, providers were not aware of screening tools for TBI although some were able to

name local facilities and resources. Providers noted that symptoms of TBI overlap significantly with other health conditions, which can make identification difficult. Providers discussed reservations, such as a lack of proper training, knowledge, and skills to accurately identify, diagnose and treat IPV-related TBI.

Conclusion The literature regarding IPV-related TBI is in its infancy and many aspects of this condition are still poorly understood. The results of our study support the need for an education-based intervention regarding IPV-related TBI, screening tools and available resources. Future research should examine the perceptions of TBI providers on IPV and IPV-related TBI, address the overlap of TBI symptoms with other health conditions, the efficacy of education-based interventions, and mandatory screening to increase the identification rate of IPV-related TBI.

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Preface

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1.0 Introduction

Intimate partner violence (IPV) affects millions of women worldwide and one in four women in the United States (US) (Black et al., 2011). Black et al. (2011) found that approximately 30% of women in the US report having at least one lifetime experience of a physical altercation with an intimate partner. In addition to physical violence, 50% of women in the United States will report at least one lifetime instance of psychological violence by an intimate partner (Black et al., 2011). Several negative physical and mental health outcomes are associated with IPV. Survivors of IPV are more likely to suffer from chronic physical pain and substance use disorders (Wong & Mellor, 2014). One study (Ochs, Neuenschwander, & Dodson, 1996) determined that 94% of survivors of IPV reported injuries to the head, neck, or face which may result in a traumatic brain injury, and strangulation has been identified as a common injury sustained during incidents of IPV (Sheridan & Nash, 2007).

The Centers for Disease Control and Prevention (CDC) defines traumatic brain injury (TBI) as an injury to the head that results in an alteration of mental status; these can be classified as mild, moderate, and severe (CDC, 2020b). The classification of a TBI is based on the level of damage to the skull, internal damage to the brain, and subsequent symptoms that develop due to the nature of the head injury (Swanson et al., 2017). Typically, mild TBIs are classified differently than moderate and severe because mild TBIs can be more difficult to identify and diagnose due to underreporting. TBIs can result from direct hits to the head, indirect damage caused by whiplash (McKee & Daneshvar, 2015), or even anoxic injuries that are caused by a lack of oxygen to the brain (Prosser, Grigsby, & Pollock, 2018). IPV-related TBI results from all three of those types of injuries but is not regularly screened for by providers.

Screening for IPV-related TBI is not frequently performed for several reasons. First, providers tend to be more concerned with the immediate safety of their clients or patients; second, providers may attribute the signs and symptoms of TBI to the stress of being a victim or survivor of IPV rather than a potential TBI; and finally, providers may not have the necessary education, training, or resources such as referrals or screening tools to feel confident in accurately identifying and diagnosing IPV-related TBI.

IPV-related TBI is the result of head trauma sustained during physical acts of IPV. Symptoms of IPV-related TBI overlap significantly with symptoms of trauma and stress and frequently are attributed to the IPV only and not necessarily the combination of IPV and TBI. Consistently, survivors of IPV with reported or possible TBI have worse physical and emotional health outcomes such as increased rates of post-traumatic stress disorder, memory loss, blacking out, ears ringing, dizziness, vision and hearing difficulties, and difficulty concentrating (Campbell et al., 2018; Cimino et al., 2019; Iverson, Dardis, Grillo, Galovski, & Pogoda, 2019). Women who sustained an IPV-related TBI were 5.9 times more likely to be diagnosed with PTSD compared to those with no history of IPV-related TBI (Iverson, Dardis, & Pogoda, 2017).

Goldin, Haag, and Trott (2016) examined nine different TBI screening tools and found that none of them was suitable for survivors of IPV because the screening tools were either too complicated and required training, did not ask specifically about instances of violence, or were an interview style screening tool that could increase the risk of retaliation by the abuser. One screening tool that was not examined by Goldin, Haag, and Trott (2016) is the HELPS Screening Tool. The HELPS is a short, self-report, and easily understood TBI screening tool but it has not been validated for survivors of IPV. Proper identification of IPV-related TBI is necessary to avoid the development of chronic physical and mental health outcomes in survivors.

One chronic issue that may affect an individual following a TBI is post-concussion syndrome (PCS). PCS occurs following a poorly treated or untreated TBI in which lingering symptoms may affect an individual for weeks, months, and even years past the initial head injury. Post-concussion syndrome symptoms are similar to the acute symptoms of concussion, such as headaches, dizziness, cognitive dysfunction, and memory difficulties (Prince & Bruhns, 2017). Emerging evidence demonstrates that TBI can result in emotional instability and may result in increased irritability, anxiety, depression, and mood swings (Bergersen, Halvorsen, Tryti, Taylor, & Olsen, 2017; Katz, Cohen, & Alexander, 2015). These symptoms may never resolve without proper treatment and therapy but, without a formal diagnosis, survivors may never seek treatment. Providers must be educated on this intersection and trained to identify it so they can aid survivors in seeking the correct treatment.

This master's thesis examines providers' awareness of the intersection of intimate partner violence and traumatic brain injury. This thesis draws from a larger study for which data were collected using focus groups and one-on-one interviews. It focuses on awareness of IPV-related TBI and possible screening tools and resources, as well as obstacles or reservations that providers may have when examining possible IPV-related TBI. Background is provided on IPV, TBI, and IPV-related TBI. Each of those sections describes the prevalence (including definitions, signs, or symptoms), screening measures, resources, and negative physical and mental health outcomes. The author describes the study, including recruitment, data collection, and analysis. Emerging themes are discussed, and quotes provide context for thematic categories. The thesis concludes with a discussion of future directions for the current study as well as additional opportunities to explore IPV-related TBI.

2.0 Background

2.1 Intimate Partner Violence

The CDC (2018) defines IPV as “physical violence, sexual violence, stalking, or psychological harm by a current or former partner or spouse” that can occur in heterosexual or same-sex relationships which includes casual partners. IPV can also be defined as behaviors that result in sexual, physical, or psychological harm in an intimate relationship that can include married, unmarried, and live-in partners (Patra, Prakash, Patra, & Khanna, 2018). Society and research use the term domestic violence (DV) and intimate partner violence interchangeably even though they refer to different types of violence within different types of relationships.

Domestic violence is described as the misuse of power by an adult in a relationship to control another person through the use of control, fear, violence, and various forms of abuse (Kaur & Garg, 2008). The World Health Organization (WHO) states that domestic violence is not limited to a heterosexual couple but can be considered any violence within a home that is between spouses, parents and children, or an individual and someone over the age of 60, commonly referred to as elderly abuse (WHO, 2012).

The term IPV was defined approximately 20 years ago and was created to better understand the different types of violence that can exist within various types of romantic relationships. The term IPV is used in this thesis instead of DV, but some of the participants used them interchangeably. IPV relationships were the primary focus for this study. Given the lack of literature, researchers wanted to examine TBI in the context of romantic or intimate relationships

instead of all types of relationships in which violence may occur. This study focused on female survivors and victims of IPV given the high prevalence rate of women affected by IPV.

2.1.1 Prevalence of IPV

IPV is a global health issue that affects both men and women. An estimated 30% of women around the world will have at least one lifetime experience of physical and/or sexual violence by an intimate partner (Devries, Mak, García-Moreno, et al., 2013). However, differences are observed across countries, with physical and sexual IPV ranging from 3.5% in Armenia to 46% in Afghanistan. IPV can go underreported so true global prevalence may be difficult to determine (Coll, Ewerling, García-Moreno, Hellwig, & Barros, 2020). In 2010, the National Intimate Partner and Sexual Violence Survey (NISVS) found that one in four women in the United States have experienced physical violence, including being beaten and hit with a fist or object, and 48.4% have been exposed to psychological violence by either a current or former intimate partner in their lifetime (Black et al., 2011). The rates of IPV differ among racial and gender groups, which suggests that certain groups are at higher risk for an IPV-related TBI than others.

The NISVS has looked at racial and gender disparities when examining IPV. The 2010 NISVS report found that 46% of Native American/Alaska Native women and 43.7% of non-Hispanic Black women reported some instance of IPV in their lifetime, which was defined as an instance of intimate partner rape, physical violence, and/or stalking (Black et al., 2011). Using the same definition for IPV, the NISVS report found that Hispanic women and non-Hispanic White women reported comparatively lower rates of lifetime IPV (37.1% and 34.6%, respectively) (Black et al., 2011). Several research studies have reported similar IPV racial disparities in rates of IPV

with Black women and Native American women reporting higher lifetime rates of IPV (Cho, 2012; Halpern, Spriggs, Martin, & Kupper, 2009; Wahab & Olson, 2004).

Gender differences in survivors and victims of IPV have been noted in the literature but this difference can be difficult to interpret or fully understand due to underreporting. The NISVS found that, in the US, 28.5% of men have experienced IPV (rape, physical violence, and/or stalking) in their lifetime and 13.8% of men have experienced at least one instance of severe physical violence (e.g., being hit with a fist or object, beaten or slammed against something) in their lifetime. The NISVS survey shows a high rate of IPV among many groups, but underreporting is a major barrier that makes it difficult to understand the true prevalence of IPV in the US and across the globe.

Underreporting is the failure to report or disclose something fully. Underreporting is common among survivors and victims of IPV, which makes determining an accurate prevalence of IPV-related TBI difficult. In India, researchers found that the most reported reason for not reporting was stigma, shame and/or embarrassment associated with being a victim or survivor (Vranda, Kumar, Muralidhar, Janardhana, & Sivakumar, 2018). The “iceberg of domestic violence” is the concept that the number of reporting cases of IPV or DV represents only a small portion of the actual number of cases, and that most cases are unknown to society and research (Gracia, 2004). The underreporting of IPV highlights the need for proper, trauma informed processes and screening tools specifically designed for survivors of IPV that do not increase risk to the victims and survivors. Any processes aimed at increasing disclosure rates must also seek to reduce stigma and not revictimize the survivors.

2.1.2 Screening for IPV

In general, screening tools are used to identify or detect underlying conditions or diseases prior to any signs or symptoms. For IPV, screening tools can be used to detect abuse or violence during all three stages of abuse. The cycle of abuse was first identified by Dr. Lenore Walker in her book *The Battered Woman* (Walker, 1979). Walker (1979) breaks down the cycle of abuse into three distinct stages: The Build Up Phase, The Acute Battering Incident, The Respite or Honeymoon Phase.

According to Walker (1979), The Build-Up Phase is a slow progression of behaviors that the abuser will try to rationalize such as increased anger or less severe acts of physical or emotional violence, like punching objects or name calling. The Acute Battering Incident is the culmination of the smaller acts of violence that results in an explosive discharge of violence that cannot be rationalized or dismissed. Typically, after this, a calm follows and the abuser or couple will try to minimize the severity of the incident. Finally, The Respite or Honeymoon Phase is when the abuser becomes apologetic, makes excuses for their behavior, and claims that it will never happen again. Screening for IPV could allow for intervention before the violence can progress to more aggressive, dangerous or even lethal situations.

Even though IPV is recognized as a major public health concern, there is a lack of consensus on the mandatory use of screening tools to identify individuals who may be at increased risk for IPV. In 2018, the US Preventative Services Task Force (USPSTF) recommended that healthcare providers and clinicians screen for IPV in all women of reproductive age and if a woman screens positive, provide referrals and support services (USPSTF, 2018). The USPSTF statement did not define reproductive age but the WHO defines reproductive age as 15-49 years (WHO, 2006). Other organizations, such as the American Academy of Family Physicians, the American

College of Obstetrics and Gynecology, and the American College of Emergency Physicians (ACEP) advocate for routine IPV screening of all patients and encourage others to incorporate it into standard patient care practices (ACEP, 2019; Dicola & Spaar, 2016; Jones III & Horan, 2002). In addition, the ACEP advocates for training of Emergency Department (ED) personnel (e.g., physicians, nurse practitioners, and physician assistants) to recognize, assess for and intervene in situations of IPV (ACEP, 2019). Despite consistent recommendations, no federal mandate requires screening for IPV and only 9%-40% of clinicians report routinely screening for IPV (Todahl & Walters, 2011).

A systematic review conducted to examine the validity of available IPV screening tools determined that only three assessed all three areas of abuse (physical, sexual, and psychological) and were also validated against proper reference standards (Arkins, Begley, & Higgins, 2016). The three screening tools that were determined to be the most accurate at identifying IPV were the Abuse Assessment Screen (AAS), Humiliated, Afraid, Rape, Kick (HARK), and the Women Abuse Screening Tool (WAST). The HARK was determined to have the strongest psychometric properties but was the least researched; it has been evaluated using only a small sample size, and has not been studied in men or in a mental health setting (Arkins et al., 2016).

One assessment that can be used by individuals or in a clinical setting is “The Danger Assessment,” (DA) which asks a series of questions to allow individuals to determine lethality risk in an abusive relationship (Danger Assessment, 2020). The DA asks women to mark days on the calendar when abuse occurred and rank the incident on a 1 to 5 severity scale. Previously described IPV screening tools focus on determining if an individual is currently in an abusive relationship while the DA is validated to predict future lethality as well as evaluate current abuse (Campbell,

Webster, & Glass, 2008). The DA asks about potential TBIs but has not been validated to measure IPV-related TBI.

Two randomized controlled trials (RCT) examined the efficacy of screening for IPV in a healthcare setting. Both studies (Klevens et al., 2012; MacMillan et al., 2009) determined that screening IPV does not automatically reduce rates of IPV. Klevens et al. (2012) conducted a three arm RCT (screening + resource list; no screening + resource list; and no screening and no resource list) and utilized the Partner Violence Screen (PVS) instrument. Researchers found no significant differences between the three groups in Quality of Life (QoL) measures or in reported days unable to work, complete housework, number healthcare related visits, or recurrence of partner violence between groups at the one-year follow-up.

MacMillan et al. (2009) had similar results in a two arm RCT that utilized the WAST and collected QoL measures. Both groups completed the WAST and were seen by a treating physician. One group completed the WAST prior to their appointment and one group completed the WAST after their appointment. This RCT determined that there were no statistically significant differences between the two groups, but this study had a high lost-to-follow up rate (43%), which had to be accounted for during analysis due to potential bias. The two studies focused solely on the utilization of IPV screenings and did not examine the combination of using screening tools and having an IPV advocate present.

Kendall et al. (2009) identified ED patients with IPV-related risk factors, who were then offered a consultation with an IPV advocate or counselor who completed a safety assessment. Patients were contacted following their consultation and provided an opportunity for continued IPV counseling. Researchers found that the presence of IPV advocates in emergency departments was beneficial with 96% of their sample reporting an increase in perceived safety following the

intervention and half of their sample having completed a safety plan at their follow-up (Kendall et al., 2009). Another research group found that over time, women who disclosed IPV and received an in-person IPV advocate intervention had more significant decline in IPV scores and depressive symptoms when compared to those who received a business card referral only (Coker et al., 2012). IPV advocates play an important role in the success of IPV interventions and may serve a crucial role intervening in situations of IPV.

2.1.3 Availability of IPV Resources

Several types of IPV resources exist across the US. Resources include hotlines, such as the National Domestic Violence Hotline, which allows victims and survivors to speak with an advocate 24 hours a day, seven days a week (National Domestic Violence Hotline, 2020), and a similar hotline that is run by the Office on Women's Health (Office on Women's Health, 2018). Neither hotline offers specific medical advice but can educate victims and survivors on how to identify violence/abusive behaviors, inform them of local resources, and describe de-escalation strategies. Domestic Violence Intervention Programs (DVIPs) have been established across the United States to provide other types of resources. The services that DVIPs offers include transitional housing, group and individual counseling, advocacy, and emergency shelter (Iyengar & Sabik, 2009).

Even though DVIPs are funded in several ways, including legislative acts, researchers estimate that a lack of funding and space have resulted in the DVIPs refusing services to about 5,200 women a day across the United States (Iyengar & Sabik, 2009). Researchers found that in a 24 hour period, at least 48,350 people in the United States utilized domestic violence services, which is roughly 16 people per 100,000, depending on the geographic region (Health Affairs,

2009). This same analysis found that a lack of resources meant that over 5,000 requests for services could not be addressed (Health Affairs, 2009).

Pittsburgh, Pennsylvania, has several IPV resources that are available for survivors and victims. One shelter founded in the Pittsburgh area is the Women's Center and Shelter of Greater Pittsburgh (WCS) (WCS, 2020b). Founded in 1974, WCS was one of the first six shelters established that offered services and shelter for female victims of abuse (WCS, 2020b). WCS offers a wide range of services, including a 24-hour hotline, emergency shelter, a children's program, legal and medical advocacy, support groups, LGBTQIA+ advocacy, and a program called the Men's Group, which offers counseling to help men who are currently abusing their partners or have abusive tendencies (WCS, 2020a). The WCS website provides three methods of contact: options to chat online with someone, a 24-hour hotline number and a 24-hour text support number which are all available in multiple languages.

In addition to WCS, several other IPV resources are available to victims and survivors in the Pittsburgh area including Crisis Center North, the Center for Victims, Alle-Kiski Area HOPE Center, and Womanspace East. Another resource in Pittsburgh is the Domestic Violence Prosecution Unit, which was created by the District Attorney's Office and specializes in the prosecution of domestic violence cases (Allegheny County District Attorney's Office, 2020). The availability of resources and personnel, as well as the support of the legal system, is essential when working with survivors and victims of IPV. Despite the availability of resources, survivors of IPV experience high rates of poor health outcomes and decreased quality of life. The facilities and organizations that focus on IPV in Pittsburgh are beneficial when conducting research that seeks to understand IPV from a provider's perspective.

2.1.4 Health outcomes associated with IPV

IPV can result in several negative physical and mental health outcomes (WHO, 2013). According to the WHO, negative health outcomes of violence can be “immediate and acute, long-lasting and chronic, or fatal” (WHO, 2012). The WHO further clarifies those by defining immediate and acute injuries as bruises, lacerations, and broken bones and describing long-lasting and chronic injuries such as injuries to the head, eyes, ears, and abdomen; and fatal injuries that includes femicide and AIDS-related deaths that can cause potential disabilities (WHO, 2012).

Disability from severe physical injuries can manifest in several ways, including chronic pain, substance use disorders, gastrointestinal disorders, and traumatic brain injury (TBI) (Wong & Mellor, 2014). Specific health problems linked to lifetime experiences of IPV include difficulty walking, difficulty with daily activities, pain, memory loss, dizziness, and vaginal discharge (Ellsberg, Jansen, Heise, Watts, & Garcia-Moreno, 2008). Survivors of IPV are at an increased risk of degenerative joint disease, low back pain, chest and abdominal pain, and headaches compared to women with no history of IPV (Bonomi et al., 2009; Breiding, Black, & Ryan, 2008). In addition to those chronic health issues, women with one instance of IPV were more likely to report heart or circulatory disease, chronic pain, nerve system damage and respiratory distress, including asthma (Coker, Smith, & Fadden, 2005). The effects of IPV are detrimental for an individual physically and also mentally.

Negative mental health outcomes related to IPV have been well studied. In a 1999 literature review, mental health disorders with the highest prevalence included depression (47.6%), post-traumatic stress disorder (63.8%) and alcohol and drug abuse (18.5% and 8.9%, respectively) (Golding, 1999). A more recent systematic review found that 16 studies noted an association between the presence of depressive symptoms and experiences of IPV (Devries, Mak, Bacchus, et

al., 2013). Between 35% to 70% of women who have experienced IPV reported receiving a diagnosis of depression compared to the general population (Gerlock, 1999; Petersen, Gazmararian, & Andersen Clark, 2001; Stein & Kennedy, 2001).

One study examined PTSD and depression in 142 women who had an experience of physical abuse in the past six months and found that 49% of the sample (n=69) received a comorbid diagnosis of PTSD and depression; those with a comorbid diagnosis had more maladaptive behaviors (Nixon, Resick, & Nishith, 2004). Women with a history of IPV were 3.26 times more likely to be diagnosed with depression and 2.73 times more likely to be diagnosed with anxiety compared to women with no history of IPV (Bonomi et al., 2009). Both physical disability and negative mental health outcomes can result in lifetime decreases in quality of life, including increased levels of stress. Physical and mental health outcomes associated with IPV can manifest in individuals who have a history of TBI in the absence of a reported experience with IPV. Determining the cause of these symptoms in an individual is important for determining a proper treatment plan.

2.1.5 Head, Neck, and Face Injuries Sustained from IPV

The most common types of injuries sustained by victims and survivors of IPV are head, neck and face (HNF) injuries, which increases susceptibility and risk for sustaining a TBI (Saddki, Suhaimi, & Daud, 2010; Sheridan & Nash, 2007). Strangulation or attempted strangulation is associated with an increased risk of intimate partner femicide, or death from IPV (Campbell et al., 2003; Glass et al., 2008). Attempted strangulation and suffocation during IPV altercations have been identified as common injuries (Sheridan & Nash, 2007). Survivors of prior non-fatal

strangulations are 6.7 times more likely to experience attempted homicide and 7.48 times more likely of being killed in a subsequent experience of IPV (Glass et al., 2008).

In 1996, researchers determined in a study of 127 people at an emergency department that approximately 23% of patients were victims of DV and that 94.4% of the victims of DV had sustained a head, neck, and face injury during their violent encounter (Ochs et al., 1996). Even though this study's sample size was small, the observed high rate of HNF injuries suggests that survivors and victims of IPV have a higher risk of an IPV-related TBI. Assessing survivors and victims of IPV for TBI will help to determine the types of interventions that must be utilized when working with this population.

2.2 Traumatic Brain Injury

The CDC (2020b) defines TBI as a “disruption in the normal function of the brain that can be caused by a bump, blow, or jolt to the head, or a penetrating head injury.” As noted above, TBI can be classified into three main categories based on severity of the mechanism and symptoms: mild, moderate or severe. Mild TBI, or more commonly known as a concussion, typically shows normal structural imaging, involves less than 30 minutes of loss of consciousness (LOC), less than 24 hours of alteration of consciousness or mental state, less than 24 hours of post-traumatic amnesia (PTA), and a Glasgow Coma Scale (GCS) between 13-15 (Swanson et al., 2017).¹

¹ The score on the GCS is determined by the eye response, verbal response, and motor response of an individual; a higher score indicates a less severe injury or status.

Moderate and severe TBI can have normal or abnormal structural imaging, LOC greater than 30 minutes, an alteration of consciousness or mental state more than 24 hours, PTA greater than 24 hours, and a GCS score ranging from 3-12 (Swanson et al., 2017). If treated properly, most individuals will recover from mild TBI while moderate and severe TBI can have more long-term negative health outcomes even with treatment.

The main types of TBI are direct and closed, direct and open, indirect, and anoxic. A direct and closed TBI is a hit to the head that does not result in structural damage to the skull while a direct and open injury is one that does result in structural damage (McKee & Daneshvar, 2015). Indirect TBI refers to events where there is no physical assault to the head but some action results in movement of the brain inside the skull, commonly known as whiplash. An indirect TBI can result from sudden stops in a motor vehicle or violent shaking (McKee & Daneshvar, 2015). Anoxic brain injuries are TBIs that result from a lack of oxygen to the brain, most commonly associated with strangulation in the IPV field (Prosser et al., 2018). Any of these types can occur during an incident of IPV either through a direct hit to the head (striking and/or slamming), whiplash from shaking, or anoxia from strangulation. All types of TBI can result in negative, long-term health consequences, especially when left untreated.

2.2.1 Prevalence of TBI

According to the CDC, in 2014, an estimated 2.87 million Americans were seen by a physician for a TBI related trauma (CDC, 2020a). In 2010, the CDC found that 80.7% of identified individuals who sustained a TBI were being diagnosed, treated, and released from an ED (CDC, 2010, 2020a). The 2010 and 2020 CDC reports found that falls accounted for 35.2% and 48% of all TBIs, respectively. The second leading cause in 2010 was motor vehicle accidents (17.3%)

while the 2020 report concluded that 17% of TBI-related ED visits were due to individuals being struck by or falling against an object. The CDC also determined in 2014 that there were roughly 288,000 hospitalizations and 56,800 deaths due to TBI. The CDC found that roughly 5.3 million individuals in the US live with a disability that is attributed to TBI (CDC, 2015). The CDC determined that intentional self-harm was the leading cause of TBI-related deaths (CDC, 2020a).

There are gender and age differences when examining those with TBIs in the United States. In 2010, males had 1.4 times as many TBIs compared to females and males had more TBIs when comparing age groups (CDC, 2010). A reason for this difference may be that men engage in more high-risk activities and behaviors that may cause more serious injuries. When examining mild TBI, female athletes have higher incidence rates and risk factors compared to male athletes (Covassin, Swanik, & Sachs, 2003; Gessel, Fields, Collins, Dick, & Comstock, 2007; Lincoln et al., 2011). The CDC found that children (0 to 17 years, 49%) and older adults (aged 65+, 81%) were more likely to be injured via a fall compared to other mechanisms and that falls also contributed to 52% of the hospitalizations (CDC, 2020a).

It should be noted that the estimate of total sustained TBIs may not be accurate due to the number of concussions and other mild head injuries that go underreported (McDonald, Burghart, & Nazir, 2016). Underreporting occurs when individuals do not understand the seriousness of mild TBIs, or the symptoms are so mild that the individual does not pursue treatment. An estimated 50-75% of athletes do not report a concussion to their coaches, parents or training staff (McCrea, Hammeke, Olsen, Leo, & Guskiewicz, 2004; Register-Mihalik et al., 2013). McCrea et al. (2004) found that 66% of the athletes in their sample did not consider the injury serious enough to report. Register-Mihalik et al. (2015) determined that athletes with increased knowledge about concussions were more likely to report a possible head injury. This underreporting of TBIs

emphasizes the need for proper screening tools that do not rely on self-reported symptoms by an individual and that have more objective measures of cognitive function and symptom burden following TBI. Underreporting also highlights the need for more education of those likely to incur a TBI.

2.2.2 Screening for TBI

While symptoms of severe and moderate TBI present quickly following the injury, some symptoms of mild TBI can have a delayed onset, which can make initial identification difficult (Duhaime et al., 2012). An example of this is cognitive symptoms that are not present until an individual attends school or is asked to do homework. Screening for TBI following any situation that could have resulted in an impact to the head (e.g., a car accident with loss of consciousness) is essential for making a timely diagnosis.

Several medical tests and screening tools can be used to identify possible mild, moderate and severe TBIs. To determine an initial diagnosis, a Magnetic Resonance Imaging (MRI) or a Computerized Tomography (CT) scan is performed to determine if internal damage was caused by the head injury, which may require additional tests, surgery, or extended hospitalization. Following imaging, if there is no internal damage, clinicians, physicians, and athletic trainers can use acute screening tools to determine the severity of the mild TBI. Some screening tools record symptom burden and test cognitive function such as the Standardized Assessment of Concussion (SAC), the Sport Concussion Assessment Tool 3 (SCAT3), and the Acute Concussion Evaluation (ACE). If the results are positive, a referral to a concussion specialist for treatment and overall management of the injury should be made.

Some screening measures are designed to help an individual recall previous experiences that may have resulted in a TBI. These include the Ohio State University Traumatic Brain Injury Identification (OSU-TBI-ID), the Brain Injury Screening Questionnaire (BISQ), and the T-B-I Screening. These screening tools ask individuals to recall times when they may have been hit by something or someone, such as being injured during an assault, playing sports, or in a car accident. This helps clinicians understand if an individual has been in a situation that might have resulted in a TBI, even if they were undiagnosed.

All screening tools ask about the cause of the reported injury, such as a motor vehicle accident, fall, or being struck by an object but the purpose of these screening tools is not to determine if IPV is the cause of the injury. An example of this is if someone responds “yes” to being struck by an object, no follow-up questions ask about what type of object or the exact nature of how the injury was sustained.

The military uses several different types of screening tools to identify TBI during deployment and in a clinical setting. The primary screening tools are the Defense and Veterans Brain Injury Center (DVBIC) TBI Screening, the Military Acute Concussion Evaluation (MACE) and the MACE2, which ask about more acute instances of TBI instead of a lifetime exposure. The military-based screening measures talk about combat-related violence and not necessarily IPV-related violence. The primary mechanism of injury for service members are blast related injuries during training and combat operations (DVBIC, 2020b). The Defense and Veterans Brain Injury Center (DVBIC) recorded 413,858 diagnosed TBIs among service members between 2000-2019 (DVBIC, 2020a)..

Re-injury prior to an individual receiving treatment and allowing them to fully heal can result in increased rates of mental health disorders and poor performance on neuropsychologic

testing (Guskiewicz et al., 2007; Matser, Kessels, Lezak, Jordan, & Troost, 1999). The quick and correct identification of concussions is crucial for ensuring that individuals are receiving timely care and treatment. Identification of a TBI in an individual's lifetime can help clinicians and physicians determine if symptoms should be attributed to a TBI or another health concern.

2.2.3 Available resources for TBI

There are several different facilities and places for individuals suffering from a TBI to get treatment. Initial treatment for a TBI can be provided at a hospital or emergency room, where up-to-date identification and treatment protocols for TBI may or may not be used. Follow-up treatment specifically for a brain injury can occur with neurosurgeons, neurologists, or neuropsychologists, who may refer patients out for additional therapies. Severity of the TBI will determine the course of follow-up and treatment. Specialists and the subsequent treatment offered are essential for a full recovery from a TBI, but access can be limited due to a lack of insurance or underinsurance, transportation, and income (Albrecht, O'Hara, Moser, Mullins, & Rao, 2017) as well as a lack of local TBI facilities or specialists. These barriers may result in survivors of IPV not seeking out treatment for their potential head injuries, even after leaving a violent relationship.

Pittsburgh has a wide variety of facilities for treatment of individuals diagnosed with TBI. For milder TBIs, the University of Pittsburgh Medical Center (UPMC) Sports Medicine Concussion Program and the Concussion Center with Allegheny Health Network (AHN) are the two primary locations for identification, management and treatment of concussions. The AHN website notes that care for advanced concussion symptoms and treatment for more severe concussions are available (Allegheny Health Network, 2020). The UPMC Sports Medicine Concussion Program offers comprehensive treatment plans developed by a team of physicians

based on years of research (UPMC Sports Medicine, 2020). The UPMC Sports Medicine Concussion Program has eight clinics throughout Pittsburgh and a new facility in Altoona and also performs baseline testing in numerous high schools in the Pittsburgh area as well as with the Pittsburgh Steelers. Both websites utilize language specific to sports-related concussions, which may make some victims and survivors less likely to use their services.

Baseline testing provides an assessment of pre-injury neurocognitive functioning and symptom burden. Following an injury to the head, the same measures are repeated, and the pre- and post-injury assessments are compared. Baseline testing is useful because of individual differences that inherently exist. Without a baseline assessment, clinicians may have a difficult time determining if an individual's post-injury scores are due to a concussion or individual factors (Covassin, Elbin, Stiller-Ostrowski, & Kontos, 2009). Currently, baseline testing is primarily performed on athletes since these individuals are at most risk of regular re-injuries.

Baseline testing has to be repeated to account for any cognitive changes overtime, especially in adolescents, who have increased intelligence as they age. There are no studies that examine the efficacy of baseline testing in adults, and baseline testing in adults is seldom ever performed. Baseline testing may be useful in adult populations, especially in victims and survivors of IPV given the rate of repeated TBIs, but it may be difficult to obtain a true baseline that measures cognitive function prior to a head injury. The results of a baseline test may not be accurate if performed too soon following a TBI or if an individual is still experiencing symptoms from a previous TBI.

The clinical resources that are available and amount of research that is performed in the Pittsburgh area have made it a premier location for individuals with TBI to receive up-to-date treatment and recommendations. UPMC and the University of Pittsburgh combined resources to

build a Concussion Research Laboratory that studies concussions to “[translate] research into better clinical care” for patients (University of Pittsburgh Department of Orthopaedic Surgery, 2020). Available facilities for more moderate or severe TBIs include ReMed of Pittsburgh at BrainLine, Brain Injury Rehabilitation at UPMC Mercy, and the Brain Injury Rehabilitation Program at Children’s Institute of Pittsburgh. The University of Pittsburgh formed the Brain Trauma Research Center with the Neurological Surgery Department to develop research studies and collect data to improve clinical outcomes following a severe TBI (University of Pittsburgh School of Medicine Neurological Surgery, 2020). The UPMC Concussion Program does not adhere to the USPSTF recommendation to screen all women of reproductive age for IPV, but referrals are made if the patient self-discloses a history of IPV. Information on IPV screening practices at the AHN Concussion Clinic were not readily available.

2.2.4 Health outcomes associated with TBI

Health outcomes associated with TBI can be somatic, cognitive, and affective. Somatic symptoms that are commonly reported following a TBI, especially a mild TBI, are headache, sleep disturbance, dizziness, nausea, visual changes, and noise and light sensitivity (Prince & Bruhns, 2017). Cognitive symptoms include problems with attention and memory, slowed processing speeds, difficulty staying on task or multitasking, and increased distractibility (Prince & Bruhns, 2017). New evidence has shown that patients diagnosed with mild TBI report increased irritability, anxiety, depression, and emotional instability or mood swings (Bergersen et al., 2017; Katz et al., 2015). As stated earlier, these mood swings can also be found in victims and survivors of IPV.

TBI can be diagnosed at different time points following the incident as acute, subacute, or chronic. There is some variation in the definitions, but TBIs are typically classified as acute when

evaluated within 24 hours of the injury, subacute when evaluated within three months post-injury and chronic when diagnosis occurs three months or more post-injury. Kontos et al. (2020) demonstrated that individuals who were seen by neuropsychologists within seven days of their mild TBI recovered faster and had lower rates of prolonged recovery times (≥ 30 days) than those who were treated within eight to 20 days of their injury. Early treatment and intervention can lead to decreased symptom burden and faster recovery (Kontos et al., 2020). Prolonged or extended recovery times can result in increased wage loss, symptom burden, and more visits to doctors, which can increase the financial burden for treatment. These increased burdens are also experienced in survivors of IPV.

If left untreated, mild TBIs can result in post-concussion syndrome (PCS), in which symptoms are present for weeks or months following the injury (Bazarian et al., 1999). While the Diagnostic and Statistical Manual of Mental Disorders (DSM) does not have a specific definition for PCS, the WHO outlines PCS as

a syndrome that occurs following head trauma (usually sufficiently severe to result in loss of consciousness) and includes a number of disparate symptoms such as headache, dizziness, fatigue, irritability, difficulty in concentration and performing mental tasks, impairment of memory, insomnia, and reduced tolerance to stress, and emotional excitement, or alcohol. (WHO, 2010, F07.2)

Symptoms of PCS are similar to the acute symptoms following concussion, but the symptoms linger past the acute phase of the injury. As determined by Kontos et al. (2020), the longer it takes for an individual to receive treatment for their mild TBI, the longer their recovery

takes, and the more burden is placed on the individual. In one study (Chen, Johnston, Petrides, & Ptito, 2008), functional and structural brain imaging was utilized to examine differences between male athletes with a history of multiple concussions and a control group with no concussions in the past 12 months. Researchers found no differences on neurocognitive performance tasks but determined that the concussed group had a reduction in activity in their prefrontal region, which is associated with working memory ability (Chen et al., 2008). Survivors of IPV may have undiagnosed and untreated TBI due to barriers to treatment. This delay in treatment or lack of treatment can lead to PCS in some survivors of IPV.

2.3 IPV-related TBI

TBI in survivors of IPV is an emerging public health concern that has not been extensively studied. As noted earlier, many survivors and victims of IPV report being hit in the head, neck or face during violent encounters with their partners, or experiencing strangulation (Saddki et al., 2010; Sheridan & Nash, 2007). Following an incident of IPV, primary concerns of providers are often focused on the victim's safety. Further complicating the identification of possible IPV-related TBI is that victims may not recall the events due to the trauma or TBI and may not disclose the IPV due to stigma or fear or retaliation. Women living with IPV-related TBI report being more concerned with and prioritizing safety; living in fear affects their ability to seek help and access resources (Ivany et al., 2018). The primary focus of safety over TBI treatment may increase the rates of PCS in survivors since it may be weeks, months, or even years before the need for treatment is identified, if at all.

A subpopulation of IPV survivors are female veterans who can receive multiple head injuries from situations of IPV as well as combat situations such as being near explosives. Iverson et al. (2019) found that female veterans who have experienced an IPV-related TBI with persistent symptoms had worse psychosocial health outcomes when re-evaluated 18 months later. Another study examined IPV-related TBI in Black women and found that TBI increased comorbid diagnosis of PTSD and depression (Cimino et al., 2019). Campbell et al. (2018) found that more central nervous system symptoms (e.g., headaches, dizziness, and cognitive slowing) were reported in women who had a probable TBI and probable IPV compared to women who reported no TBI and probable IPV. Participants' TBI history was classified as "probable" because the TBI history was self-reported and symptom-based since head injuries in survivors of IPV are not always diagnosed by a medical professional. In 2017, researchers (Iverson et al., 2017) found that women with IPV-related TBI were 5.9 times more likely to have probable IPV-related PTSD compared to those with no IPV-related TBI history. These studies highlight the effects of TBI in civilians and veterans who are also survivors of IPV and emphasize the importance of screening for TBI in survivors of IPV in any population where IPV is disclosed.

2.3.1 Incidence of PCS in survivors and victims of IPV

The incidence of PCS in survivors of IPV is unknown and there is a lack of research that examines the relationship between the diagnosis of PCS and IPV. Several studies have noted the presence of PCS symptoms in survivors of IPV such as headache (18-77%) (Corrigan, Wolfe, Mysiw, Jackson, & Bogner, 2003; Monahan & O'Leary, 1999), memory loss (31-77%) (Corrigan, Wolfe, Mysiw, Jackson, & Bogner, 2003; Monahan & O'Leary, 1999; Wilbur et al., 2001), dizziness (21-77%) (Corrigan, Wolfe, Mysiw, Jackson, & Bogner, 2003; Monahan & O'Leary,

1999; Wilbur et al., 2001), insomnia (25-67%) (Monahan & O'Leary, 1999; Wilbur et al., 2001), anxiety (10-83%) (Corrigan, Wolfe, Mysiw, Jackson, & Bogner, 2003; Wilbur et al., 2001), depression (14-81%) (Corrigan, Wolfe, Mysiw, Jackson, & Bogner, 2003; Wilbur et al., 2001), apathy (88%) (Monahan & O'Leary, 1999), and irritability (100%)(Corrigan, Wolfe, Mysiw, Jackson, & Bogner, 2003; Jackson, Philp, Nuttall, & Diller, 2002; Monahan & O'Leary, 1999; Smith, Mills, & Taliaferro, 2001; Wilbur et al., 2001). To be defined as PCS, individuals need to endorse a cluster of symptoms following a head trauma and should be diagnosed by a professional. Due to the barriers that survivors of IPV face seeking medical help, obtaining a diagnosis for PCS may be too difficult. These barriers prevent researchers from establishing the true relationship between IPV and PCS.

2.3.2 Screening for IPV-related TBI

Few TBI-related screening tools ask about physical violence or assault, and only one TBI screening tool has been designed to work with populations who experienced IPV. In 2016, Goldin, Haag, and Trott sought to evaluate nine TBI screening tools to determine if any met the following criteria: 1) document events that can lead to TBI in an IPV situation; and 2) safe endorsement of an event or did not increase risk of retaliation; and 3) simplicity of administration. Goldin, Haag, and Trott (2016) recognized that two of the nine instruments were close to meeting all three criteria: the Ohio State University TBI Identification Method (OSU-TBI-ID) and Brain Injury Screening Questionnaire (BISQ). The OSU-TBI-ID met the first and third criteria but should be revised to allow for self-report rather than an interview to reduce the risk of retaliation. Researchers also found that the Brain Injury Screening Questionnaire (BISQ) can be used with survivors of IPV and meets criteria one and two, but it requires training and there is a cost associated with

accessing it. In summary, Goldin, Haag, and Trott (2016) found that none of the nine instruments met all three criteria and that none of the TBI screening tools was suitable for survivors of IPV.

Goldin, Haag, and Trott (2016) did not evaluate the HELPS Screening Tool. The HELPS was designed to be a simple but effective self-report or interview style screening tool that can be administered without training. HELPS asks the following questions:

- **H**ave you ever **H**it or been **H**it on the **H**ead;
- Were you ever seen in the **E**mergency room, hospital, or by a doctor because of a head injury?
- Did you **L**ose consciousness? (Not everyone who suffers a TBI loses consciousness);
- Are you having cognitive or social **P**roblems in your daily life?;
- Did you experience a significant **S**ickness following your head injury?

A person with a positive result on the HELPS should be referred to a physician or TBI or concussion specialist for evaluation and diagnosis. A brief literature search did not indicate that the HELPS has been validated for survivors of IPV. Providers need to be able to have access to and knowledge of available screening tools to properly identify and diagnose IPV-related TBI and make timely and appropriate referrals.

3.0 Methods

3.1 Study Overview

This thesis is based on data collected through a larger study, *Increasing Awareness and Understanding of the Relationships between IPV and TBI*. All data were collected between October 2018 – May 2019 and this study was approved by the University of Pittsburgh Institutional Review Board (PRO18050527). Survivors (n=11) of IPV and providers that work with survivors of IPV (n=22) in the Pittsburgh area were asked about their perspectives and awareness of the relationship between TBI and IPV. Focus groups and interviews were held with providers. Both providers and survivors were compensated \$25 for their participation. Survivors of IPV were involved in the larger study but this thesis will only describe the processes and results associated with the provider focus groups and interviews.

3.2 Study Design and Recruitment of Providers

Recruitment strategies included targeted email outreach to providers working with victims and survivors of IPV and TBI as well as community partner organizations affiliated with the Magee IPV Task Force. The Magee IPV Task Force members include medical and legal advocates, social workers, rehabilitation specialists, nurses, researchers, and graduate level students who have experience working with victims and survivors of IPV. Core members of the IPV Task Force were part of the study team and were involved in the development of the study questions.

Study team members contacted individuals who participated in past research studies on IPV. Flyers (see Appendix A) were distributed by the Magee IPV Task Force in the local community to healthcare, social service, and IPV-related organizations. Initially, the eligibility criterion for the providers was specific to individuals who work in the IPV or an IPV-related TBI field. Through recruitment and expressed interest in the flyer, the study team recruited legal, social, IPV, and healthcare providers for the study who were over the age of 18 and worked within the Pittsburgh area. The decision to expand the inclusion criteria was due to the lack of research regarding IPV-related TBI. By expanding the criteria, researchers were able to gain an understanding of the various levels of awareness and knowledge across provider types. The level of awareness, knowledge of screening tools, and perceived barriers may be different by provider type which is important information when attempting to develop ways of addressing IPV-related TBI.

Three focus groups and two one-on-one interviews were conducted with providers utilizing open-ended questions. The open-ended questions explored the providers' definitions and awareness of IPV, TBI and IPV-related TBI. The questions also asked providers to describe any specific challenges or reservations they have when discussing IPV-related TBI. IPV was used instead of domestic violence to refer to the type of violence that providers' clients or patients experienced but some participants used these terms interchangeably. For the purpose of this study, TBI encompassed all types of head injuries, ranging from standard concussions to more severe head trauma.

3.3 Data Collection

A demographic survey was administered to all participants that collected age, gender, marriage status, income, number of children, and occupation (see Appendix B). The provider demographic survey also included four closed-ended questions about IPV and TBI: 1) Have you ever screened for TBI; 2) Have you ever identified a patient with TBI; 3) Have you ever screened for IPV; and 4) Have you ever identified IPV?

This study included the development of a brochure (Appendix C) to be made available to healthcare providers, social workers, and DV/IPV advocates as a resource for educating their clients about IPV, TBI and IPV-related TBI and available referral services. The brochure included general information regarding the signs and symptoms of IPV and TBI, quotes from survivors to provide context on IPV-related TBI, and resources for survivors of IPV or survivors who want to learn more about brain injury. All participants provided feedback after reviewing the brochure in-person or over the phone. Edits were made to the brochure based on the feedback from both providers and survivors.

3.4 Data Analysis

Demographic data were analyzed using the statistical software package, IBM SPSS (IBM Corp. Released 2017. Version 25. Armonk, NY). Descriptive analyses and frequencies were done on the mean age of provider participants and the distributions of gender, race, annual income, and highest level of education attainment of the provider participants. Frequency analyses were performed on the four questions that were asked on the demographic survey to establish the

number of participants who screened for or identified IPV and TBI among patients or clients while providing care.

All audio files were transcribed verbatim by an MPH-trained qualitative researcher. Audio recording issues resulted in data loss with the first focus group. Notes taken by a study co-investigator were used as a transcript substitute to elucidate discussion themes during the coding process.

The coding team included a post-doctoral associate, clinical nurse researchers, a lawyer, a medical social worker, and an MPH student. All coding team members had previous experience or received training on coding qualitative data. The codebook was developed based on the focus group and interview questions (e.g., How do you define TBI?). The codebook included the identified code groups, definitions, and the code or abbreviations. The following domains were identified during the coding process: definitions and perceptions, future directions, IPV-related TBI events and sequelae, and response to IPV-related TBI. An example of a code, definition and domain is: IPV_def which was used when providers or survivors describe how they define IPV, including the related signs and dimensions of abuse and was included in the definitions and perception domain.

The process went as follows: the study team coded one or two documents, met to review the codes, then refined them as needed, and recoded when necessary. Once new codes were agreed upon, a revised codebook was distributed, and the study team members recoded all transcripts using the updated codebook. This iterative process continued until all transcripts were coded by all study team members.

Due to physical distancing and institutional guidelines for remote work due to the COVID-19 pandemic, a standard qualitative data management software could not be utilized because not

all study team members had access to the same program remotely. A combination of Atlas.ti and manual coding in Microsoft Word was used to code the data. For this thesis, only the coded transcripts available in Microsoft Word were used for data analysis. Available coded transcripts were compared to find similar codes across all transcripts and develop emerging themes. The analysis examined the following research questions:

- 1) What is the level of awareness that providers have regarding the connection between IPV and TBI as well as IPV-related TBI?
- 2) What is the level of awareness that providers have about screening for IPV-related TBI and what resources or possible referrals for clients are they aware of?
- 3) What barriers and facilitators influence providers when trying to identify IPV-related TBI?
- 4) What specific reservations and/or challenges do providers face when working with their clients who may have IPV-related TBI?

4.0 Results

4.1 Overview

A total of 22 providers with experience working with survivors of IPV participated. Three focus groups (n=6, n=10, n=4) were conducted in or around Pittsburgh at a women's-centered hospital, an IPV shelter, and a research center. There was a single trained moderator for the three focus groups who was provided with a moderator guide. The moderator guide included a script with nine open-ended questions and probes for the discussions (Appendix D). Focus groups ranged from 45-60 minutes in length. The two one-on-one interviews were conducted over the phone by a post-doctoral researcher. The interviews were completed with providers who reported a high level of experience with IPV-related TBI but were unable to be present for the focus groups. The interviews used the same questions as the focus groups and were 30-35 minutes in length. All providers were given a pre-/post-questionnaire to evaluate if levels of knowledge or awareness changed due to participation in the focus group discussion. All participants were asked to review an IPV-related TBI and provide feedback.

The occupation of the participants are as follows: ten social workers, three legal advocates, an academic physician, an administrative advocate, a case manager, a counselor, a doula, a mental health counselor, a nurse manager, a rehabilitation counselor, and a registered nurse case manager. Demographic surveys were collected from all 22 participants, who were between 23-65 years of age. A majority of the participants identified as female, Caucasian, and reported an annual income of $\geq 40,000$ \$ (Table 1). All provider participants reported having at least a bachelor's degree, with 14 (63.6%) having a master's degree (Table 1).

Table 1 Demographics of Provider Participants

Age in years (mean, range)	39.8 (23-65)
Gender (n, %)	22
Male	1 (4.5)
Female	21 (95.5)
Race (n, %)	22
White	18 (81.8)
African American	3 (13.6)
Asian/Pacific Islander	1 (4.5)
Highest Level of Education (n, %)	22
Bachelor's	6 (27.3)
Master's	14 (63.6)
Professional	1 (4.5)
Doctoral	1 (4.5)
Income (n, %)	22
\$25,000 –\$28,000	8 (36.4)
\$40,000 –>\$75,000	13 (59.1)
No Answer	1 (4.5)

All providers responded to the four questions about screening for and identifying IPV and TBI. The majority of providers responded that they do not screen patients for TBI (n=15, 68.2%) and have never identified a patient with TBI (n=12, 54.5%). A majority of providers reported that they screen for IPV (n=18, 81.8%) and have identified IPV (n=19, 86.4%). Providers frequently screen and identify suspected IPV but have a lower rate of screening and identifying TBI in their clients across all types of occupations (Table 2).

Table 2 Responses to TBI and IPV Survey Questions by Occupation

	Screen TBI	ID TBI	Screen IPV	ID IPV
	Yes	Yes	Yes	Yes
	(n, %)	(n, %)	(n, %)	(n, %)
Academic Physician (n=1)	0 (0)	1 (100)	1 (100)	1 (100)
Administrative Advocate (n=1)	0 (0)	0 (0)	1 (100)	1 (100)

Case Manager (n=1)	0 (0)	1 (100)	1 (100)	1 (100)
Counselor (n=1)	0 (0)	0 (0)	1 (100)	0 (0)
Doula (n=1)	0 (0)	0 (0)	1 (100)	1 (100)
Legal Advocate (n=3)	1 (33.3)	2 (66.6)	2 (66.6)	2 (66.6)
Mental Health Counselor (n=1)	1 (100)	1 (100)	1 (100)	1 (100)
Nurse Manager (n=1)	0 (0)	1 (100)	0 (0)	1 (100)
Rehab Counselor (n=1)	1 (100)	1 (100)	0 (0)	1 (100)
RN Case Manager (n=1)	0 (0)	1 (100)	0 (0)	0 (0)
Social Worker (n=10)	3 (30)	2 (20)	10 (100)	10 (100)

4.1.1 Defining TBI and IPV

When asked to define TBI, providers stated that it is a result of an injury to the brain that is caused by some type of trauma. Trauma included significant blows to the head that result in contusions to the brain, more mild concussions, and anoxic brain injuries that result from a lack of oxygen to the brain; strangulation was mentioned specifically. Participants were asked about signs or symptoms of TBI as well. They discussed these from several domains such as somatic, cognitive, and emotional. Somatic symptoms focused primarily on headaches, dizziness and/or vertigo, nausea, excessive fatigue and vomiting. Cognitive symptoms focused primarily on memory difficulties, difficulty keeping focus on tasks, and processing challenges such as difficulty finding words. Emotional symptoms included mood instability or the emergence of anxiety or depression.

Participants defined IPV and most commonly associated manipulation, power and control (reproductive, social, and financial), and emotional and physical violence as dimensions of IPV. Several participants referenced the Power and Control Wheel (Appendix E), which describes patterns that exist within abusive and violent relationships and provides a framework for understanding how abusers establish and maintain control over their partners. One participant noted a difference between being assaulted on the street compared to experiencing IPV within the home.

4.1.2 Emerging Themes

Four emerging themes were identified for this thesis: 1) overall awareness that IPV-related TBI exists but is not always addressed or identified by providers in their jobs; 2) inconsistent knowledge of screening procedures for IPV-related TBI; 3) level of awareness of IPV-related TBI treatment services and referrals; and 4) provider reservations and specific challenges when working with clients who have IPV-related TBI. The subsequent sections describe the four major themes in detail and provide quotations from the provider focus groups and interviews. Quotations have been shortened and repetitive clauses (e.g., um, ah, like) have been removed for clarity.

4.1.3 Overall awareness of IPV-related TBI

Providers recognized that IPV-related TBIs occur and that there is definitely a relationship between IPV and TBI but very little known about the strength of the correlation. Providers recognized that even though IPV-related TBI should be considered, they do not make the connection while treating survivors as part of their job:

I mean, I think recently looking into this from the work that's being done at the shelter, I think that I don't connect these dots enough, but I can see where people that have mood swings, these things are pretty prevalent.

We know that there's physical violence or they've had, they've been hit on the head or something. I don't think, at least I don't feel like I always think first thing is "traumatic brain injury."

I definitely think that there's a relationship between them, but I feel that as a society and even personally we don't know to the full extent what that relationship is... There's definitely a correlation there but I don't think we know really to what extent and how severe that is.

I've known clients who have said to me "oh, I was this way before and now I can't remember things" or "now I have a seizure disorder" or "now I have all these other different medical/health issues" that they didn't have prior to um, unfortunately, being beaten up by their abuser or being choked to the point of black outs and losing consciousness repeatedly over time.

4.1.4 Inconsistent level of awareness and opportunities to screen for IPV-related TBI

Providers discussed screening opportunities and knowledge of screening procedures for clients with IPV-related TBI. Providers had different levels of knowledge related to screening tools and acknowledged missed screening opportunities that could aid in the proper identification of IPV-related TBI. Providers noted that their current screening tools were not sufficient for identifying IPV-related TBI:

If they screen positive for intimate partner violence, it automatically generates a consult to me, so everything has to come back through me and I'm also the TBI coordinator, so it just works out at my facility.

I think in the past I've definitely had the opportunity, but our screening is not in-depth at all...

They are going to be screened for TBI always and they are going to be screened for intimate partner violence annually, it's just whether those, there's no connection between those two screens, they are completely independent.

No, right now, unfortunately, I think it's something that I only talk about when it's an obvious segue to something they've said. If they said 'headaches,' then I'll ask about it. If they say something like 'memory problems,' I'll ask about it, but I don't ask about it in a true screening sense where there are no symptoms.

4.1.5 Level of awareness of IPV-related TBI treatment services and referrals

A few providers were able to describe treatment options, referrals, and other resources they could provide their clients who may have an IPV-related TBI. All of the referrals or resources described by the providers were local facilities that specialize in the treatment of concussions or moderate to severe TBIs.

So, it depends on, I haven't seen too many traumatic brain injuries in my office that I know of, but I have seen a lot of concussions. So, along the same lines, I would do, we have a set group of people that I send patients to for neurocognitive testing.

... then also over to the concussion center at the sports center and they do a really nice job with, there's psychologists there... the center over at physical medicine rehab center at [a local hospital] is more for inpatient so I usually use the concussion center if I am worried about any type of traumatic brain injury, I'll start there at the sports center.

...They'll work with the individual to just do some research and do some education and help them find reputable resources and get them hooked up with you know, the appropriate organizations and things like that that they need to and then we'll make sure they are following up with these resources.

Two providers described that screening for TBI provides an opportunity to increase IPV disclosure rates among victims and survivors because it would create an opportunity to discuss the

symptoms that victims or survivors are experiencing without having to disclose the IPV immediately:

... if the patient's not really ready to tell their doctor that they are either a prior or current victim of domestic violence, they may get nervous if [we] just pull that out of the air like we somehow saw that on them when they weren't ready to disclose so if we make it to and normalize it to a medical problem, the rate of disclosure is easier on people ... if we want to help fix the abdominal pain or the chronic headaches, we need to know what the stressor is that is fueling that in order to kind of completely take care of the problem.

If a woman is deciding whether or not she wants to make a move and she's fearful that there will be violence next, does she have a doctor and maybe get pre-screened for concussion as an opportunity to seek some type of medical service later on...

4.1.6 Provider reservations and specific challenges

Providers described several challenges when working with survivors of IPV and survivors living with IPV-related TBI. The specific challenges that participants noted could be separated into four major categories: 1) overlap of symptoms of TBI with other health concerns, trauma, and stress; 2) impact of cognitive deficits suffered by survivors with IPV-related TBI to recall details and make decisions; 3) reservations regarding their roles and responsibilities within the context of identifying and diagnosing IPV-related TBI; and 4) the impact of IPV survivors being unable to seek help.

4.1.6.1 Symptoms of TBI overlap with symptoms of other health issues, trauma, and stress

Many symptoms of TBI, such as headaches, cognitive complaints, and mood changes, can also be connected to experiencing stress or violence in life. This was a major reason that providers had a lack of awareness of IPV-related TBI. Many providers recognized this overlap as a prominent barrier to properly identifying TBI in their clients and patients. Providers observed that they are more likely to attribute these symptoms to the stress or violence instead of a potential TBI.

Some of the symptoms that you were saying earlier are almost symptoms of just going through a traumatic experience, not necessarily being struck in the head so that was, how do you figure that.

I think it makes a lot of sense to like, maybe these headaches or these emotional things that have always been attributed to domestic violence but not directly to the traumatic brain injury.

Almost like that Venn Diagram where there is overlap... I don't know a domestic violence survivor who is not tired and has headaches and is part of your survival instinct when you are in danger, your light sensitivity goes up, your smell goes up... so that doesn't necessarily mean that it's a traumatic brain injury.

...I think what's difficult is that the symptoms of TBI often overlap the symptoms of daily stress of living in a stressful situation.

...we see this, and it could be TBI, it could be PTSD, it could be just acute stress, there's a lot of reasons the brain, it works in this weird way... I see in some of my concussion patients who have an underlying anxiety disorder... but their coping skills are low, or they have a true mental health disorder like anxiety, or they really just don't have good coping skills to begin with.

I mean, I think that to say, 'your symptoms are consistent with a traumatic brain injury, we're not going to be able to tell you right now, but these could also just be related to stress.'

Some providers attribute signs and symptoms of TBI to specific health conditions, which increases the difficulty of making a correct diagnosis and referral for treatment.

Mood swings, irritability, trouble focusing, difficulty concentrating, chronic headaches, changing headaches, maybe poor performance, like poor performance in school or at work, a lot of people coming to me asking if they have ADHD because that's kind of the newest thing on the block.

So, one of the things that I struggle with because our girls are all 100% opiate use disorder, is whenever they talk about not being able to find the words and headaches and stuff, we are also seeing if they are in withdrawal and if their meds are at the right level so its weening out 'is this withdrawal or is this from the IPV'; so that's another level that we have trouble with.

4.1.6.2 Impact of cognitive dysfunction in survivors with possible IPV-related TBI

Some symptoms of TBI, like cognitive difficulties, memory complaints, and increased fatigue, can make it difficult for survivors with IPV-related TBI to accurately describe their symptoms or recall the events that led to their TBI. Providers noted that this inability to accurately describe what happened increases the difficulty of proper management.

... I mentioned before like difficulty with short term memory and one of the big ones is confabulation and not that they are purposefully making things up or lying but because they have difficulty with short term memory, they don't remember all of the events the way it happened so the brain naturally wants to fill in those gaps... with things that might not have played out that way that they remember it.

...one of the things that we see in our post-concussive patients is that they have this delayed processing time and in situations of emergency, I'm not sure I would be able to simulate that in my office to make sure that their processing time was quick enough. And I don't know what they are remembering.

So you want to make sure that you are doing your due diligence and investigating anything that they are telling us, we want to make sure we are taking that seriously and not ignoring it or blowing it off like 'they don't know what they are talking about' but at the same time not jumping to any conclusions until we learn a little bit more about this situation because we don't want to create a situation between them and their loved one where you know, we

are accusing that loved one of abusing them or doing something where that's not really what happened.

4.1.6.3 Roles and responsibilities of providers

Several providers described that screening for TBI is not their primary concern when working with survivors or victims of IPV. Providers who are social workers or IPV advocates are focused on the development of a safety plan with their clients.

I think sometimes my initial reaction or gut is like 'oh, my god, is you safe, where are you going when you leave here, how, you know, figuring that piece out,' I mean, as social workers, that's usually what we are called upon.

And then I do a lot of safety planning, safety planning and resources.

Women often tell us a lot, probably more than we want to hear, but a lot and then it's just really kind of doing the basics like, you know, talking about safety.

Something you look at is safety and the harm versus that physical symptoms sometimes if they are not showing any kind of symptoms.

We're more handling the, the psychosocial stuff and the safety.

My first thought is always safety. Like, 'do you have somewhere safe to stay' you know, the criminal side of it, 'do you want to file charges' occasionally they do, sometimes they don't.

Depending on the setting of the evaluation, screening can be performed by an individual or by a team. Providers who are part of a team noted that they rely on other professionals to identify and treat possible TBIs. Providers described a lack of expertise on TBIs as a barrier to identifying IPV-related TBI.

We're also seeing them in a hospital setting so we know that that's kind of part of their visit, that they've seen the doctor so the doctors going to cover that side of all their physical symptoms.

I don't feel like I'm an expert, not being a medical provider, I don't feel like I'm, that I could speak to, I mean I can give them you know, what I could read off of a page, but I don't feel like I have the expertise to truly go into what that all means, and I probably would defer education like that to the medical provider.

...if a patient is complaining of headaches or short-term memory, we can bring that up to our physician and talk with our patient as well and we can kind of decide on what's occurring so it makes it a little bit easier, but like [another participant] said, I don't feel like I'm an expert, I can definitely refer but I don't feel comfortable talking about it...

I think that's different for us, we are in a hospital and clinic setting so there's a medical professional available to check them, so we aren't really asking those questions as much because they are already being examined.

I just feel like a lot of us are in integrated teams, so we all try to stay in our role to allow it to function as best as possible and someone who is going to do it better than I, then I am going to refer.

4.1.6.4 Effects of IPV survivors being unable to seek help

One challenge that providers face is that some survivors are not aware that they need to utilize resources, seek out care, or need additional help once they are out of their violent situation. Providers commented that survivors may also attribute their symptoms to other health conditions and that it is the providers' responsibility to educate their clients on the possibility of a TBI.

That is one of the biggest obstacles that we see is trying to help them understand how getting counseling or support groups could still be beneficial to them, even several years post-incident. Because I mean, there are residual effects that last a lifetime sometimes, you know, and they're not really addressing it and they think that because they're out of the situation they don't need to, and they don't really understand how that's impacting their daily lives. So that can be difficult.

Or sometimes they think, or they thought of it like, 'oh, that's just the reaction to the stress of the situation,' like having headaches and stomach aches... it's stress, you know, that's how it is getting expressed because they are so stressed out.

I think our job is to educate them that this could be traumatic brain injury, and, in that case, I would put it this way, 'it could be traumatic brain injury, this also may just be all stress related and you don't have a traumatic brain injury, but you might. We also need to look at your brain and make sure it's OK and there's nothing we need to do for that.'

Several providers endorsed not only education of all providers, but also educating survivors on IPV-related TBI to allow them to make the decision to pursue additional treatment for their symptoms. A few providers noted that a diagnosis of a TBI in a survivor of IPV may give them ownership and control over their symptoms while others were concerned that it could cause survivors to feel more damaged or unable to recover. Depending on the severity of the TBI, many individuals can experience a full recovery from their TBI.

5.0 Discussion

To our knowledge, this is the first qualitative research study that examined the perceptions of different types of providers regarding IPV-related TBI. The findings of this analysis contribute to the development of literature that focuses specifically on the level of understanding, knowledge, and insight that providers have on the relationship between TBI and IPV. The findings can help guide future research and education efforts to allow providers to feel more equipped to identify, discuss, and refer their clients to proper resources and help them make appropriate referrals.

Providers in this study understood that survivors of IPV are at increased risk of TBI but did not make the connection prior to their participation in study research activities. Participants recognized that TBI goes largely unidentified and untreated. This study emphasizes the need for education on the incidence and prevalence of TBI in victims and survivors of IPV. One possible reason for a lack of identification is underreporting of violence and low disclosure rate by victims and survivors of IPV. Underreporting is a major barrier when working with survivors of IPV. There are several reasons for underreporting, including a lack of financial resources, insufficient insurance coverage, stigma, and still being in the violent relationship. Addressing the low disclosure rates within this population is necessary when addressing IPV-related TBI.

Providers recognized the signs and symptoms of TBI in their clients but typically attributed the symptoms to other factors such as PTSD, depression, stress, and even substance abuse or withdrawal from substance abuse. Previous literature has shown that survivors of IPV with probable TBI are at an increased risk of PTSD and depression (Devries, Mak, Bacchus, et al., 2013; Dutton et al., 2006; Wong & Mellor, 2014) so the ability to differentiate between symptoms of TBI and symptoms of mental health or trauma is necessary for proper recommendations for

additional treatment. Providers also recognized symptoms in their clients such as headaches, forgetfulness, processing difficulties, and mood swings but most participants attributed this to the stress of living as a survivor of IPV, mental health issues, or substance abuse rather than TBI. These symptoms, if caused by TBI, could be reduced with proper treatment and therapy, and possibly improve the overall quality of life in survivors of IPV, but this requires appropriate and accurate screening tools to increase accurate diagnosis rates.

Providers described a lack of available screening tools, especially ones that connect IPV and TBI. The lack of available screening tools is described by Goldin, Haag, and Trott (2016), who determined that current TBI and IPV screenings were not comprehensive and did not reduce or eliminate the risk of retaliation for survivors of IPV. The HELPS Screening Tool can allow for assessment of TBI in survivors and victims of IPV, but more research should be conducted to verify the validity of using the HELPS Screening Tool in this population. If the HELPS is validated for this population, more providers should be educated on its existence and use it. Another screening tool that could be adapted for use in an IPV population is the DA. The DA has been validated to measure lethality and asks about possible head injuries (Campbell et al., 2008). The existing DA tool may be utilized or the assessment could be modified to measure IPV-related TBI. The intersection and connection between IPV and TBI should be recognized in a validated screening tool that can be administered or designed in a self-report format to avoid increased risk of retaliation.

Another concern is that survivors with IPV-related TBI who are not properly screened are living with undiagnosed TBI, which may result in long-term health consequences. A provider who is both the IPV and TBI coordinator at a local military hospital noted that she is told when anyone screens positive for IPV or domestic violence and a consultation is automatically scheduled.

During her consultation, she is able to screen for TBI because she has the background and knowledge to assess the risk of TBI in her clients (personal communication, AB). Building this automatic referral into other types of healthcare settings (e.g., the ED, primary care offices, and social worker office) may increase TBI identification rates and decrease chronic health issues from untreated TBI.

An unexpected topic raised during the focus groups and interviews centered around the roles and responsibilities of providers at their workplace and how those impacted their comfort with identifying IPV-related TBI. Depending on their occupation, providers had various levels of responsibilities in identifying and diagnosing TBI in their clients. Providers in a hospital setting relied more on physicians to identify TBI, make a proper diagnosis and recommend appropriate referrals. Several providers described a collaborative process with physicians when working with an IPV victim or survivor and deferring to physicians when it comes to physical injuries. The providers noted that they lacked the expertise to identify TBI and that psychosocial injuries, not physical injuries, were their primary concern when evaluating IPV. The effects of relying on a collaborative framework for treating survivors with IPV need to be better understood to see if such an approach is a barrier or an enabler for identifying IPV-related TBI and how the framework may impact the comfort of providers in advocating for their clients, regardless of the type of injury.

5.1 Future Clinical and Research Directions

5.1.1 Future Analysis of Study Data

The data analyzed for this thesis were part of a larger study that examined both provider and survivor perspectives on IPV-related TBI. Additional analyses can be conducted of provider and survivor responses to determine if both groups have similar or different levels of awareness and perspectives. An additional analysis should examine the difference in responses of all provider types or domains and their places of work. Specifically, it would be useful to compare the responses of the ten social workers to the rest of the participants for potential differences in perception of IPV-related TBI. Providers work environment may also influence their perspective and reservations when discussing IPV-related TBI with their clients. This formal analysis was not performed due to time constraints, but differences were observed between those who work in a hospital or team setting compared to primary care physicians who typically work by themselves.

5.1.2 Implications for Pittsburgh IPV and TBI services

The presence of many and diverse IPV and TBI related resources in Pittsburgh creates a unique opportunity to study and address IPV-related TBI from a comprehensive approach. Pittsburgh women's shelters, EDs, and social work outreach programs can receive additional education on how to identify possible TBI and make appropriate referrals. Clinics that treat TBI should implement mandatory screening and follow the USPSTF recommendations and screen reproductive age women. The UPMC and AHN concussion clinics can revise their websites to use more inclusive language that is not sports specific to encourage survivors and victims of IPV to

reach out for treatment. From a research perspective, the number of IPV and TBI services allows for extensive research to be done on the outcomes following TBI and the efficacy of treatment of possible TBI in survivors of IPV.

5.1.3 Education of All Types of Providers

The definition of TBI within the context of this study was very broad even though mild TBI and moderate or severe TBI are considered to be different in terms of identification and treatment. According to the CDC, mild TBI results in short-term symptoms and individuals usually make a full recovery with treatment while moderate and severe TBI can have lifelong, detrimental effects on individuals with or without treatment (CDC, 2019). Mild TBI is more difficult for physicians to diagnose compared to moderate and severe TBI due to delayed onset of symptoms and no clinical imaging available for diagnosis (Duhaime et al., 2012). Future research should focus on providers' perspectives on mild TBI, or concussions, and the relationship to IPV since it is easier to treat but can be more difficult to identify and diagnose, potentially leading to chronic issues that providers may not immediately connect to a head injury. Providers must be educated to recognize the signs and symptoms so they can immediately recognize potential violent experiences among patients with a possible TBI.

Educating providers and survivors that many TBIs are treatable with the proper therapies may decrease this concern of being labeled as damaged. Level of awareness as well as perceptions about the recovery outcomes of TBI may be potential barriers to increasing the disclosure and identification rate of IPV-related TBI. Even though providers were aware that IPV-related TBI exists, they did not have confidence with identifying or recognizing the signs and symptoms of TBI in their clients due to an overlap of symptoms with other concerns (e.g., stress, trauma,

substance abuse), a lack of knowledge regarding screening tools, and a concern about level of expertise on the issue. Future research should examine the efficacy of educating providers on TBI screening tools that can be used or adapted for use with survivors of IPV to help address these three main issues in the absence of a validated IPV-related screening tool.

Beyond IPV and TBI providers, survivors of IPV receive services from many sources, including housing authorities, physicians, physician assistants, nurses, legal advocates, case managers, and law enforcement. All of these providers need to be educated on the level of risk that survivors of IPV have with IPV-related TBI but they may not all benefit from the same type of education. Medical professionals would need to screen to determine the signs and symptoms and suggest a treatment or referral plan while legal advocates can screen to provide evidence that an order of protection is needed. Since strangulation can be classified as a first- or second-degree felony, noting the cause and type of injuries from a medical and legal perspective could have implications how a prosecutor may charge an abuser. Future research should determine if different education is needed for different types of providers which information is more beneficial for various professions.

Several providers noted that they are more aware of IPV-related TBI as a result of participating in the study. Those providers said they will take IPV-related TBI into consideration when discussing symptoms with their clients. This underscores the need for more education/exposure opportunities (e.g., CEUs) regarding IPV-related TBI for providers who work with survivors and victims of IPV. The first step to increasing identification rates of IPV-related TBI is educating providers of all types to make them aware that IPV-related TBI exists and provide them with the tools, training, and knowledge to identify and make proper recommendations.

The USPSTF recommends screening for IPV in women of reproductive age but that does not mean that concussion clinics are doing so. Future research should examine the IPV screening practices and awareness of IPV-related TBI of TBI providers and determine their comfort screening for IPV. Research should seek to understand the reasons that TBI providers do not screen for IPV and determine ways to overcome those barriers.

5.1.4 Development of an IPV-related TBI Screening Tool

An imperative next step to addressing IPV-related TBI is the development and validation of a screening tool to identify IPV-related TBI. This screening tool could be developed to be used by IPV providers or TBI providers. A positive screening would mean different recommendations based on the provider type that is performing the screening. An IPV provider would refer their client to a TBI or concussion specialist and, if needed, referral to financial aid services to address any financial burden or insurance coverage problems. A TBI provider would be able to speak with their patient about their experiences and develop a more targeted treatment plan to address the psychological effects of the trauma they may be experiencing in addition to the TBI symptoms. A physician, legal advocate, or other types of providers would be able to refer to both IPV and TBI providers for comprehensive care. Future research should determine if the HELPS or the DA tool can be modified and validated to accurately measure and screen for IPV-related TBI. If the HELPS and DA tool cannot be validated to measure IPV-related TBI, future research should examine if an existing TBI screening tool, like the OSU-TBI or BISQ, could be modified and validated. If no existing screening tool can be modified or validated to measure IPV-related TBI, future research should develop a new and validated screening tool.

5.1.5 IPV during the COVID-19 Pandemic

The context of IPV during the COVID-19 pandemic increases difficulties that already exist when working with survivors of IPV. The combination of IPV and the COVID-19 pandemic has been described as a “pandemic within a pandemic” with increased financial and emotional stress leading to a potential surge in cases of IPV (Evans, Lindauer, & Farrell, 2020). At the beginning of the pandemic, stay-at-home orders and lockdowns forced survivors and abusers to reside in the same household for extended periods of time. Experts anticipated a surge in demands for IPV resources but in some parts of the US, calls to DV hotlines dropped more than 50% (Fielding, 2020). This sudden decrease is most likely due to victims not having a safe space to connect with IPV services because their abuser is constantly nearby and monitoring their behaviors. Survivors of IPV may be having fewer interactions with mandated reporters or physicians that could help to identify IPV or IPV-related TBI. Fewer interactions mean fewer opportunities to provide services and recommendations.

While virtual care could help survivors of IPV connect with physicians and providers of IPV services, if they are not safe within their own home, virtual care may not be beneficial. Even during a pandemic, safe places need to be established for survivors and victims to receive necessary services. Survivors may have limited internet access which adds an additional barrier to utilizing virtual care. Future research should examine the utility of phone applications (apps), such as the RUSafe app (Technology Safety, 2020) and MyPlan app (MyPlan, 2020), as an alternative or an addition to virtual care. Identifying code words or non-verbal signals may also be beneficial for survivors and victims to communicate when they are not safe within the home or it is not safe to discuss IPV related topics during a telemedicine visit. Another feature that should be considered is the use of chat features and the inclusion of an emergency exit feature that quickly closes out

any program. Any IPV-related TBI screening tools would need to be designed for use in a virtual or telemedicine setting. Future research should examine if IPV-related TBI screenings can be utilized via telemedicine or should be built into an existing app.

5.1.6 Policy Implications

This analysis highlights the need for various healthcare settings to adopt an automatic referral program that is built into their electronic charting system or an education program that trains all providers to recognize when an IPV-related TBI screening is necessary. Both the addition to the charting system and an education program are needed since conversations with survivors may not be kept electronically to maintain confidentiality. If a chart note is made that references an incident of IPV, an automatic recommendation to conduct a TBI screening and use a validated tool should appear and be administered.

Concussion clinics should be required to follow the USPSTF recommendation and screen all reproductive age women for IPV-related TBI, regardless of their mechanism of injury. Concussion clinics should have resource material, such as brochures, readily available in their offices. When a patient screens positively for an IPV-related TBI, clinicians should provide additional resources for the IPV while treating the TBI. All concussion and TBI specialists should be required to attend education or training seminars that inform them of the incidence rate and prevalence of IPV-related TBI and how to promote safe, trauma-informed care in their practices. IPV-related TBI cannot be addressed only from the IPV side; both IPV and TBI providers need to become more educated on the prevalence of IPV-related TBI to begin addressing this public health issue.

A state level policy that should be implemented is the addition of a social worker or IPV advocate to a TBI or concussion clinic team. This social worker should be available for immediate consult if IPV is disclosed so that the treating clinician can have support when addressing IPV-related TBI in their patients. In Pennsylvania, strangulation is considered a misdemeanor when it occurs between strangers or non-household family members and is a second-degree or first-degree felony if the strangulation occurs between members of the same household or family. Many states have passed legislation that defines strangulation as a misdemeanor but there are still states that classify it as assault. Federal policy should be implemented that, at minimum, makes IPV- or DV-related strangulation a felony and compel states to change their laws. This change in classification helps to protect survivors and victims of IPV from being revictimized by their abuser because their abuser is serving an extended jail time. It also validates that their experience and trauma is taken seriously by the legal system.

From the federal policy level, the USPSTF recommendation should be changed to a mandate to allow more women to disclose possible IPV. The CDC needs to provide more requests for application (RFAs) and funding for researchers to study IPV-related TBI and its consequences. Another option would be to expand the Family Violence and Prevention Services Act to provide funding for IPV-related TBI research. Any women's shelter that receives federal aid should be provided with additional funding to develop programs that help survivors and victims identify possible IPV-related TBI symptoms and find appropriate treatment options. Education standards need to be developed for concussion specialists and provide incentives for concussion clinics that promote a comprehensive approach to treating concussions and do not focus solely on sports-related concussions.

Screening for IPV-related TBI is essential for the identification of TBI and providing proper treatment to survivors. Following the development of a validated IPV-related TBI screening tool, a federal mandate should be implemented that requires medical professionals and IPV providers to screen all patients or clients over the age of 18 for IPV-related TBI. Normalizing screening for IPV-related TBI can help to reduce retaliation or stigma since it is not about singling out an individual. Screening for IPV-related TBI allows survivors and providers an opportunity to discuss IPV in the context of a medical problem and may increase IPV disclosure rates.

6.0 Conclusion

Individually, IPV and TBI is its own major public health issue that affects millions each year (Black et al., 2011; Faul, Xu, Wald, Coronado, & Dellinger, 2010). Injuries sustained from IPV are commonly concentrated to the head, neck and face. Head, neck and face injuries can include blunt trauma (e.g., striking or slamming of the head), indirect damage (i.e., whiplash), or an anoxic injury (i.e., strangulation) which can all result in a TBI. TBIs can be classified as either mild, moderate, or severe. Mild TBIs, or concussions, have sequelae that are not as severe but can be more difficult to identify and diagnose due to underreporting. In contrast, moderate or severe TBIs are easier to identify but individuals are at higher risk of developing major chronic disabilities. Mild, moderate, and severe TBIs can decrease quality of life, especially if left untreated. Survivors of IPV are at risk of sustaining a TBI which can result in the development of numerous negative physical and mental health outcomes that can be chronic in nature.

The psychological and physical effects from IPV-related TBI can cause undue burden to survivors and decrease their overall quality of life. PTSD and depression were found to be diagnosed frequently in survivors with IPV-related TBI. Survivors of IPV also report high levels of chronic physical symptoms, including headaches, dizziness, and gastrointestinal issues. Separately, symptoms of TBI and IPV may seem similar to each other, other health conditions, and even substance use or withdrawal. Emerging literature demonstrates that researchers acknowledge the connection between instances of IPV that results in a TBI, but little is known if IPV providers are aware of IPV-related TBI.

Researchers conducted three focus groups and two one-on-one interviews with providers of a diverse background, including social workers, legal advocates, and case managers to

understand their perspectives and awareness of IPV-related TBI. All transcripts were coded, and a codebook developed and updated when new codes were added. Demographic data were collected that captured age, gender, occupation, income, and education level. This thesis examined providers' awareness of IPV-related TBI, possible screening tools or resources available, and obstacles or reservations when addressing IPV-related TBI.

The results demonstrated that providers have a general awareness of IPV-related TBI but do not immediately consider it when working with their clients. Providers had various levels of knowledge and access to screening tools to properly identify IPV-related TBI and some providers were able to identify local facilities that could be used to treat IPV-related TBI. A majority of the discussion across all focus groups and interviews centered around the fact that symptoms of TBI can be easily attributed to the trauma and stress of IPV or even other health conditions. Providers also noted that their training and expertise is with IPV which contributes to attributing their client's signs and symptoms to IPV rather than a TBI.

Another central topic among providers focused on their established roles and responsibilities. Many providers, especially those in a hospital and team setting, noted that it is not their primary role to screen or identify TBI and that they trust the treating physician to make that diagnosis. Providers described their primary role as working with their client to ensure their safety, either by getting them to a shelter or developing a safety plan. A few providers commented that because of their participation in the focus group, they will take TBI into consideration when working with their patients or clients.

This study emphasizes the need for education programs for a variety of providers to increase the awareness and knowledge of IPV-related TBI. Providers who could benefit from an education program about IPV-related TBI are IPV and TBI providers, medical professionals (e.g.,

general medicine or family, emergency department, and urgent care physicians), legal advocates, case managers, and nurses. The lack of a validated IPV-related TBI screening tool and mandatory policies regarding screening make it difficult to ascertain the true incidence of IPV-related TBI. Understanding the true impact of IPV-related TBI on survivors is imperative for the development of protocols and provides important context for receiving funding to provide additional resources or perform future research studies. The development of a validated IPV-related TBI screening tool must occur before any policy about screening can be mandated on a state or federal level.

6.1 Limitations

This study and analysis provide insight into the emerging public health concerns of IPV-related TBI but there are a few limitations. The study sample was small (n=22) and the vast majority (95%) of providers were female, which may have created a gender bias. Our findings may not be generalizable to a population of providers with greater gender and racial diversity. The definition of TBI was very broad in the context of this study which made analysis difficult at times. Mild TBI is typically separated from moderate to severe TBI in terms of severity as well as recovery outcomes. Thus, we were unable to compare providers' descriptions of TBI symptoms and the impact of TBI across mild, moderate, and severe TBI. All providers were recruited and work within Pittsburgh so the results may not be applicable to providers outside of the Pittsburgh area. The analysis did not examine differences in responses by provider type. The diverse provider type allowed for a broad understanding of awareness of IPV-related TBI, but recommendations may differ based on provider type and work setting. Finally, the data loss of the first focus group limited our ability to extract additional quotes from the coded transcripts.

6.2 Future Directions

Future clinical directions should examine the development of a referral program between IPV service providers and TBI specialists. A referral program that provides safe, trauma-informed care could increase IPV disclosure rates and identification rates for IPV-related TBI. The data analyzed were a small part of a much larger study that assessed both provider and survivor perspectives on IPV-related TBI. The influence of provider type and work environment (e.g., IPV shelter, hospital, physician office) on their responses should be examined to understand potential differences in awareness and comfort with IPV-related TBI. Education of other types of providers, including ED physicians, physician assistants, housing and shelter workers, legal advocates, and law enforcement should be considered as well. Future research should examine if IPV-related TBI education interventions need to be tailored to different provider types or work locations. Future research should validate or modify an existing screening tool (HELPS, Danger Assessment) or modify of an existing TBI screening tool (OSU-TBI, BISQ). The validation of a screening tool will help to increase awareness and identification of IPV-related TBI.

This analysis highlights several areas where policy implications should be considered. An organization-based policy is that of instituting mandatory automatic referrals in all charting systems. In addition, hospitals and organizations should require TBI specialists to be trained on providing trauma-informed care to reduce the risk of revictimizing the patient. State level policies need to require the addition of a social worker or IPV advocate to a TBI or concussion clinic team. This social worker should be available for immediate consult if IPV is disclosed so that the treating clinician can have support when addressing IPV-related TBI in their patients. Federal policy should change the USPSTF recommendation to a mandate to allow more opportunities for victims and survivors to disclose possible IPV. Additional federal funding should be allocated to research

to study IPV-related TBI, its consequences, and ways of increasing identification. There should be a federal standard for the education of concussion and TBI specialists that includes training on providing trauma-informed care. Following the validation of an IPV-related TBI screening tool, a mandate should be implemented that requires medical professionals and IPV providers to screen all patients over the age of 18 for IPV-related TBI. This will contribute to normalizing the screening process for IPV and IPV-related TBI and provide an opportunity to address any medical concerns without forcing a survivor or victim to disclose.

Appendix A Provider Recruitment Flyer

RESEARCH VOLUNTEERS NEEDED!

NEEDED: HEALTH CARE PROVIDERS AND VICTIM ADVOCATES

FOR: A FOCUS GROUP FOR A RESEARCH STUDY

ABOUT: TRAUMATIC BRAIN INJURY RELATED TO INTIMATE PARTNER VIOLENCE

LOCATION: MAGEE-WOMENS HOSPITAL



For this study, we are interested in learning from health care providers and victim advocates about:

- Your ideas about intimate partner violence
How you address the topic of traumatic brain injury when talking with your clients about intimate partner violence
How you address the topic of intimate partner violence when talking with your patients about traumatic brain injury

For the study, interested provider participants would complete a brief demographic survey, a pre-post quiz, and participate in a focus group. All participants will be compensated \$25 for their time completing the research activities.

Table with 8 columns, each containing contact information for the IPV/TBI Research Study, including contact name, email, and phone number.

Appendix B Provider Demographic Survey

PROVIDER SURVEY

1. Please write your current age (years).
2. What is your gender? a. Male b. Female c. Transgender d. Gender nonconforming e. Prefer not to answer
3. What is your race? a. Caucasian b. African American c. Hispanic d. Asian/Pacific Islander e. American Indian/Alaskan Native f. Other _____ g. Prefer not to answer
4. What is your marital status? a. Single b. Currently married c. Widowed d. Divorced e. Separated
5. Do you have children? a. Yes b. No
6. Are you currently pregnant? a. Yes b. No, but trying to become pregnant c. No d. I don't know
7. What is your highest level of education completed? a. No formal education b. Primary education c. Secondary education d. Some college education e. Associate's degree

<ul style="list-style-type: none"> f. Bachelor's degree g. Master's degree h. Professional degree i. Doctoral degree
8. What is your occupation?
<p>9. Please indicate the range of your current yearly earnings from the choices provided below.</p> <ul style="list-style-type: none"> a. <12,000 b. 12,000-15,000 c. 15,001-20,000 d. 20,001-25,000 e. 25,001-28,000 f. 28,001-32,000 g. 32,001-36,000 h. 36,001-40,000 i. 40,001-50,000 j. 50,001-60,000 k. 60,001-75,000 l. >75,000 m. Prefer not to answer
<p>10. Do you screen patients for head injuries or traumatic brain injuries?</p> <ul style="list-style-type: none"> a. Yes b. No
<p>11. Have you ever identified a patient with a head injury or traumatic brain injury?</p> <ul style="list-style-type: none"> a. Yes b. No
<p>12. Do you screen for intimate partner violence among your patients?</p> <ul style="list-style-type: none"> a. Yes b. No
<p>13. Have you ever identified intimate partner violence among your patients?</p> <ul style="list-style-type: none"> a. Yes b. No

Appendix C IPV-related TBI Brochure

Has your partner ever...?

Made you feel as if you can't come and go as you please?

Said or done things that scare you or made you feel bad about yourself?

Threatened to kill you or your children, or made you believe he or she might try to kill you?

Strangled you?

Does your partner have a gun?

Hit or banged your head?



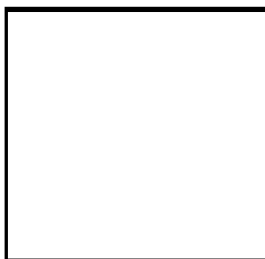
Do not minimize your symptoms. You have a medical condition and deserve medical attention.

Brain Injury Association of America
1-800-444-6443

National Domestic Violence Hotline:
1-800-799-7233

PA SAVIN:
Pennsylvania Statewide Automated Victim
Information and Notification.

This brochure was funded by the Council on Brain Injury



TRAUMATIC BRAIN INJURY: THE SILENT EPIDEMIC



One in three women and one in five men experience domestic violence.

Most domestic violence victims suffer injuries to the head, face, or neck at some time.



**MOST PEOPLE WHO HAVE
SUFFERED A BRAIN INJURY DO
NOT KNOW THAT...**

...you could have a brain injury even if you weren't knocked out.

...choking or strangling can cause a brain injury.

"I don't remember much of anything half the time."

- a year following an attack where the victim's boyfriend punched her in the face repeatedly and strangled her with a telephone cord.

"For as long as I can remember, my mother took aspirin every day, complaining of unbearable headaches. Sometimes she locked herself in the bedroom with the lights off, asking me to take my siblings outside because she could not tolerate the noise. As she got older, her naps grew longer and longer and her sensitivity to light and noise intensified. Her doctors asked the same question repeatedly, "What type of head trauma has your mother had?" I always answered the same way: Over 40 years of severe,

ongoing trauma." They focused on treating her physical symptoms. They ignored her history of violent abuse by my father."

DO YOU EVER HAVE...?

Slower thinking or reaction time?

Difficulty following or understanding conversations, especially in groups?

Difficulty following step-by-step instructions?



Difficulty making decisions or working through daily problems?

Slurred speech or difficulty finding the right words?

Difficulty remembering past events or upcoming appointments?

Appendix D Provider Focus Group Moderator Guide and Questions

Provider Focus Group Moderator's Guide

Hello, my name is [moderator's name] and I am a professor at the University of Pittsburgh School of Nursing. Welcome and thank you for joining us today. We are conducting this focus group discussion on traumatic brain injury and domestic violence. According to Rebecca Voelker (JAMA, 2018) survivors of IPV is a largely overlooked population for brain injuries. Unlike athletes who are sidelined after a concussion-causing hit, survivors of IPV often have little or no time to recover in between hits. Perpetrators of IPV don't care, and surely, don't ask if their victims are still dizzy or symptomatic from their previous injuries. It's these repetitive concussive and subconcussive brain injuries that ultimately result in extremely bad outcomes 8, 10, or 15 years later.

Today you will be asked to answer questions about your definitions, opinions, experiences regarding these topics. Please feel free to take a name tent and write down a name you would like to be addressed by during your participation in the focus group. This name can be a pseudonym and does not need to be your real name. The focus group/interview will take approximately one hour to complete. A focus group is a facilitated discussion that focuses on acquiring the insight of participants in a group setting on a particular topic. Everyone is welcome to answer any and all questions. You are welcome to agree and disagree with other participants, but we ask for you to treat others with respect and not interrupt them. Additionally, it is expected that you will respect the privacy of others and not share anything that others have disclosed outside of this room after our discussion ends. We want to know your ideas about domestic violence and how you address the topic of traumatic brain injury when talking to your patients about domestic violence.

As a health professional who interacts with patients who may have experienced a traumatic brain injury, we consider you an expert on this issue. We have several questions we would like to ask you. Our discussion will be informal. We would like for you to mention anything you think is relevant to our conversation. There are no benefits and no risks to you as a participant in this research. You will receive a gift card of \$25.00 as an honorarium for your completion of the focus group discussion. Your participation will be anonymous, and your responses will be kept electronically in password-protected files. While your participation in this research study is appreciated and valued, it is also voluntary. You can stop participating at any time without penalty.

You can contact the researchers of this study at 412-641-4984 if you have any questions about this research. With your permission, we would like to record our conversation today. If you have any questions or concerns, please let me know. If you are not interested in participating, thank you for your time, you are welcome to leave. For those who are interested in participating, by continuing to remain in our group you are consenting to participate. We will get started shortly.

FOCUS GROUP QUESTIONS

Providers Focus Group Questions

1. How would you define TBI? What warning sign or symptoms of TBI are you familiar with?
2. When you hear the phrase “domestic violence,” what do you think of? What is domestic violence in your experience? How do you define domestic violence? What is the sort of things you look for in making this determination?
3. Describe the relationship between domestic violence and TBIs.
4. Do you feel comfortable talking with patients about the connections between relationships, physical health such as domestic violence and TBI? If so, how do you respond to patients who have experienced domestic violence or domestic violence-related TBIs?
5. What reservations do you have about talking to an individual about domestic violence and/or TBI?
6. How do you treat a patient with an identified or suspected history of IPV? Do you screen them for domestic violence?

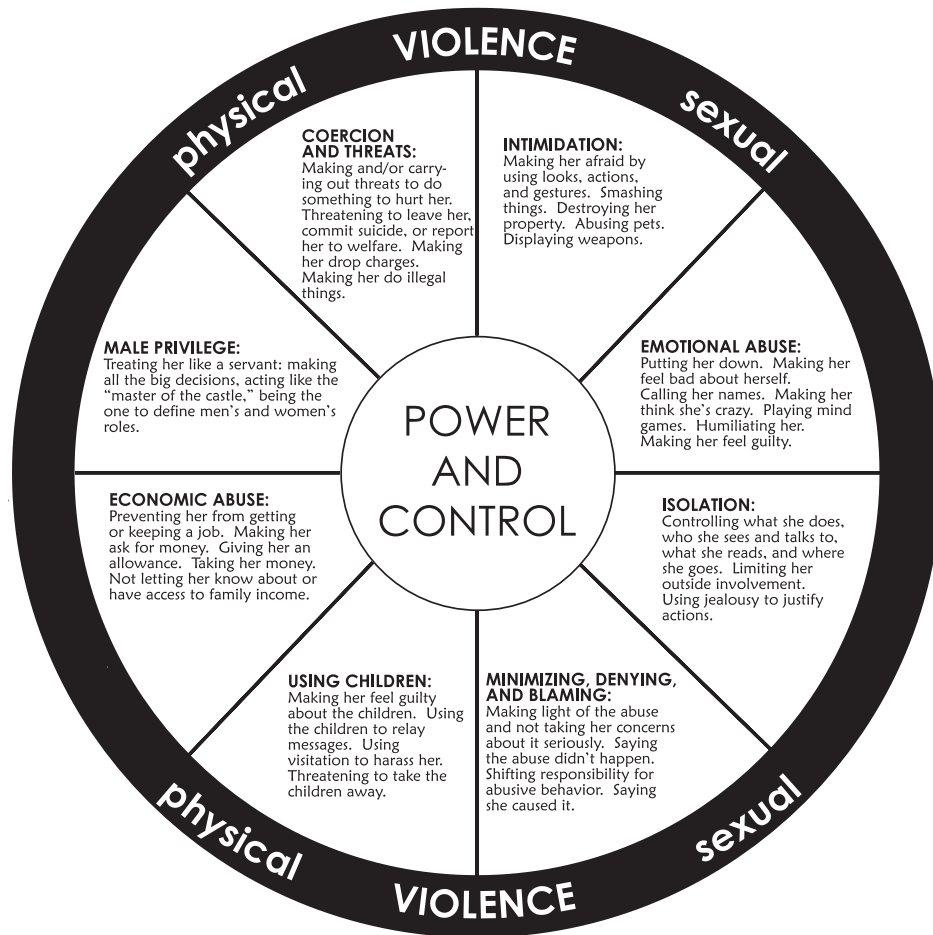
7. How do you treat a patient with a TBI? Do you screen them for IPV? (Probes: When you identify a situation of IPV, how do you address related injuries, including TBI? What is your primary concern in these cases?)
8. What referrals and/or recommendations do you make in these situations?
9. Are there other things you would like to know about domestic violence and TBIs? (Probe: or about how to address these issues with patients?)

Appendix E Power and Control Wheel

POWER AND CONTROL WHEEL

Physical and sexual assaults, or threats to commit them, are the most apparent forms of domestic violence and are usually the actions that allow others to become aware of the problem. However, regular use of other abusive behaviors by the batterer, when reinforced by one or more acts of physical violence, make up a larger system of abuse. Although physical assaults may occur only once or occasionally, they instill threat of future violent attacks and allow the abuser to take control of the woman's life and circumstances.

The Power & Control diagram is a particularly helpful tool in understanding the overall pattern of abusive and violent behaviors, which are used by a batterer to establish and maintain control over his partner. Very often, one or more violent incidents are accompanied by an array of these other types of abuse. They are less easily identified, yet firmly establish a pattern of intimidation and control in the relationship.



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Bibliography

- ACEP. (2019). Domestic Family Violence. Retrieved from <https://www.acep.org/patient-care/policy-statements/domestic-family-violence/>
- Albrecht, J. S., O'Hara, L. M., Moser, K. A., Mullins, C. D., & Rao, V. (2017). Perception of Barriers to the Diagnosis and Receipt of Treatment for Neuropsychiatric Disturbances After Traumatic Brain Injury. *Arch Phys Med Rehabil*, 98(12), 2548-2552. doi:10.1016/j.apmr.2017.06.007
- Allegheny County District Attorney's Office. (2020). Domestic Violence. Retrieved from <http://alleghenycountyda.us/domestic-violence/>
- Allegheny Health Network. (2020). Orthopaedic Conditions: Concussion Center. Retrieved from <https://www.ahn.org/services/orthopaedic/conditions/concussion-center.html>
- Arkins, B., Begley, C., & Higgins, A. (2016). Measures for screening for intimate partner violence: A systematic review. *Journal of psychiatric and mental health nursing*, 23. doi:10.1111/jpm.12289
- Bazarian, J. J., Wong, T., Harris, M., Leahey, N., Mookerjee, S., & Dombovy, M. (1999). Epidemiology and predictors of post-concussive syndrome after minor head injury in an emergency population. *Brain Inj*, 13(3), 173-189. doi:10.1080/026990599121692
- Bergersen, K., Halvorsen, J., Tryti, E. A., Taylor, S. I., & Olsen, A. (2017). A systematic literature review of psychotherapeutic treatment of prolonged symptoms after mild traumatic brain injury. *Brain Inj*, 31(3), 279-289. doi:10.1080/02699052.2016.1255779
- Black, M., Basile, K., Breiding, M., Smith, S., Walters, M., Merrick, M., . . . Stevens, M. (2011). *The National Intimate Partner and Sexual Violence Survey (NISVS): 2010 summary report*.
- Bonomi, A. E., Anderson, M. L., Reid, R. J., Rivara, F. P., Carrell, D., & Thompson, R. S. (2009). Medical and psychosocial diagnoses in women with a history of intimate partner violence. *Arch Intern Med*, 169(18), 1692-1697. doi:10.1001/archinternmed.2009.292
- Breiding, M. J., Black, M. C., & Ryan, G. W. (2008). Chronic disease and health risk behaviors associated with intimate partner violence-18 U.S. states/territories, 2005. *Ann Epidemiol*, 18(7), 538-544. doi:10.1016/j.annepidem.2008.02.005
- Campbell, Anderson, J. C., McFadgion, A., Gill, J., Zink, E., Patch, M., . . . Campbell, D. (2018). The Effects of Intimate Partner Violence and Probable Traumatic Brain Injury on Central Nervous System Symptoms. *J Womens Health (Larchmt)*, 27(6), 761-767. doi:10.1089/jwh.2016.6311

- Campbell, Webster, D., & Glass, N. (2008). The Danger Assessment Validation of a Lethality Risk Assessment Instrument for Intimate Partner Femicide. *J Interpers Violence*, 24, 653-674. doi:10.1177/0886260508317180
- Campbell, Webster, D., Koziol-McLain, J., Block, C., Campbell, D., Curry, M. A., . . . Laughon, K. (2003). Risk factors for femicide in abusive relationships: results from a multisite case control study. *American journal of public health*, 93(7), 1089-1097. doi:10.2105/ajph.93.7.1089
- CDC. (2010). Traumatic Brain Injury in the United States: Emergency Department Visits, Hospitalizations and Deaths: 2002-2006. Retrieved from https://www.cdc.gov/traumaticbraininjury/pdf/blue_book.pdf
- CDC. (2015). Report to Congress on Traumatic Brain Injury in the United States: Epidemiology and Rehabilitation. Retrieved from https://www.cdc.gov/traumaticbraininjury/pdf/TBI_Report_to_Congress_Epi_and_Rehab-a.pdf
- CDC. (2019). Traumatic Brain Injury & Concussion: Severe TBI. Retrieved from <https://www.cdc.gov/traumaticbraininjury/severe.html#:~:text=Individuals%20with%20a%20mild%20TBI,long%20effects%20from%20the%20injury.>
- CDC. (2020a). Traumatic Brain Injury & Concussion: Get the Facts. Retrieved from https://www.cdc.gov/traumaticbraininjury/get_the_facts.html
- CDC. (2020b). Traumatic Brain Injury/Concussion. Retrieved from <https://www.cdc.gov/traumaticbraininjury/index.html#:~:text=CDC%20defines%20a%20traumatic%20brain,especially%20children%20and%20older%20adults>
- Chen, J. K., Johnston, K. M., Petrides, M., & Pfitz, A. (2008). Neural substrates of symptoms of depression following concussion in male athletes with persisting postconcussion symptoms. *Arch Gen Psychiatry*, 65(1), 81-89. doi:10.1001/archgenpsychiatry.2007.8
- Cho, H. (2012). Racial differences in the prevalence of intimate partner violence against women and associated factors. *J Interpers Violence*, 27(2), 344-363. doi:10.1177/0886260511416469
- Cimino, A. N., Yi, G., Patch, M., Alter, Y., Campbell, J. C., Gundersen, K. K., . . . Stockman, J. K. (2019). The Effect of Intimate Partner Violence and Probable Traumatic Brain Injury on Mental Health Outcomes for Black Women. *J Aggress Maltreat Trauma*, 28(6), 714-731. doi:10.1080/10926771.2019.1587657
- Coker, A. L., Smith, P. H., & Fadden, M. K. (2005). Intimate partner violence and disabilities among women attending family practice clinics. *J Womens Health (Larchmt)*, 14(9), 829-838. doi:10.1089/jwh.2005.14.829
- Coker, A. L., Smith, P. H., Whitaker, D. J., Le, B., Crawford, T. N., & Flerx, V. C. (2012). Effect of an in-clinic IPV advocate intervention to increase help seeking, reduce violence, and

- improve well-being. *Violence Against Women*, 18(1), 118-131. doi:10.1177/1077801212437908
- Coll, C. V. N., Ewerling, F., García-Moreno, C., Hellwig, F., & Barros, A. J. D. (2020). Intimate partner violence in 46 low-income and middle-income countries: an appraisal of the most vulnerable groups of women using national health surveys. *BMJ Global Health*, 5(1), e002208. doi:10.1136/bmjgh-2019-002208
- Corrigan, J. D., Wolfe, M., Mysiw, W. J., Jackson, R. D., & Bogner, J. A. (2003). Early identification of mild traumatic brain injury in female victims of domestic violence. *Am J Obstet Gynecol*, 188(5 Suppl), S71-76. doi:10.1067/mob.2003.404
- Covassin, T., Elbin, R. J., 3rd, Stiller-Ostrowski, J. L., & Kontos, A. P. (2009). Immediate post-concussion assessment and cognitive testing (ImPACT) practices of sports medicine professionals. *J Athl Train*, 44(6), 639-644. doi:10.4085/1062-6050-44.6.639
- Covassin, T., Swanik, C. B., & Sachs, M. L. (2003). Sex Differences and the Incidence of Concussions Among Collegiate Athletes. *J Athl Train*, 38(3), 238-244.
- Danger Assessment. (2020). What is the Danger Assessment? Retrieved from <https://www.dangerassessment.org/About.aspx>
- Devries, K. M., Mak, J. Y., Bacchus, L. J., Child, J. C., Falder, G., Petzold, M., . . . Watts, C. H. (2013). Intimate partner violence and incident depressive symptoms and suicide attempts: a systematic review of longitudinal studies. *PLoS Med*, 10(5), e1001439. doi:10.1371/journal.pmed.1001439
- Devries, K. M., Mak, J. Y. T., García-Moreno, C., Petzold, M., Child, J. C., Falder, G., . . . Watts, C. H. (2013). The Global Prevalence of Intimate Partner Violence Against Women. *Science*, 340(6140), 1527-1528. doi:10.1126/science.1240937
- Dicola, D., & Spaar, E. (2016). Intimate Partner Violence. *Am Fam Physician*, 94(8), 646-651.
- Duhaime, A. C., Beckwith, J. G., Maerlender, A. C., McAllister, T. W., Crisco, J. J., Duma, S. M., . . . Greenwald, R. M. (2012). Spectrum of acute clinical characteristics of diagnosed concussions in college athletes wearing instrumented helmets: clinical article. *J Neurosurg*, 117(6), 1092-1099. doi:10.3171/2012.8.Jns112298
- Dutton, M. A., Green, B. L., Kaltman, S. I., Roesch, D. M., Zeffiro, T. A., & Krause, E. D. (2006). Intimate partner violence, PTSD, and adverse health outcomes. *J Interpers Violence*, 21(7), 955-968. doi:10.1177/0886260506289178
- DVBIC. (2020a). DoD Worldwide Numbers for TBI. Retrieved from <https://dvbic.dcoe.mil/dod-worldwide-numbers-tbi>
- DVBIC. (2020b). TBI & the Military. Retrieved from <https://dvbic.dcoe.mil/tbi-military>

- Ellsberg, M., Jansen, H. A. F. M., Heise, L., Watts, C. H., & Garcia-Moreno, C. (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. *The Lancet*, 371(9619), 1165-1172. doi:[https://doi.org/10.1016/S0140-6736\(08\)60522-X](https://doi.org/10.1016/S0140-6736(08)60522-X)
- Evans, M. L., Lindauer, M., & Farrell, M. E. (2020). A Pandemic within a Pandemic — Intimate Partner Violence during Covid-19. *New England Journal of Medicine*. doi:10.1056/NEJMp2024046
- Faul, M., Xu, L., Wald, M., Coronado, V., & Dellinger, A. (2010). Faul, M. , Xu, L. , Wald, M.M. , Coronado, V. & Dellinger, A.M. Traumatic brain injury in the United States: national estimates of prevalence and incidence, 2002-2006. *Inj. Prev.* 16, A268. *Injury Prevention - INJ PREV*, 16. doi:10.1136/ip.2010.029215.951
- Fielding, S. (2020). In quarantine with an abuser: surge in domestic violence reports linked to coronavirus. *The Guardian*. Retrieved on 8th April.
- Gerlock, A. A. (1999). Health impact of domestic violence. *Issues Ment Health Nurs*, 20(4), 373-385. doi:10.1080/016128499248547
- Gessel, L. M., Fields, S. K., Collins, C. L., Dick, R. W., & Comstock, R. D. (2007). Concussions among United States high school and collegiate athletes. *J Athl Train*, 42(4), 495-503.
- Glass, N., Laughon, K., Campbell, J., Block, C. R., Hanson, G., Sharps, P. W., & Taliaferro, E. (2008). Non-fatal strangulation is an important risk factor for homicide of women. *The Journal of emergency medicine*, 35(3), 329-335. doi:10.1016/j.jemermed.2007.02.065
- Golding, J. M. (1999). Intimate Partner Violence as a Risk Factor for Mental Disorders: A Meta-Analysis. *Journal of Family Violence*, 14(2), 99-132. doi:10.1023/A:1022079418229
- Gracia, E. (2004). Unreported cases of domestic violence against women: towards an epidemiology of social silence, tolerance, and inhibition. *Journal of Epidemiology and Community Health*, 58(7), 536. doi:10.1136/jech.2003.019604
- Guskiewicz, K. M., Marshall, S. W., Bailes, J., McCrea, M., Harding, H. P., Jr., Matthews, A., . . . Cantu, R. C. (2007). Recurrent concussion and risk of depression in retired professional football players. *Med Sci Sports Exerc*, 39(6), 903-909. doi:10.1249/mss.0b013e3180383da5
- Halpern, C. T., Spriggs, A. L., Martin, S. L., & Kupper, L. L. (2009). Patterns of intimate partner violence victimization from adolescence to young adulthood in a nationally representative sample. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine*, 45(5), 508-516. doi:10.1016/j.jadohealth.2009.03.011
- Health Affairs. (2009). The Dangerous Shortage Of Domestic Violence Services. *Health Affairs*, 28(Supplement 1), w1052-w1065. doi:10.1377/hlthaff.28.6.w1052

- Ivany, A. S., Bullock, L., Schminkey, D., Wells, K., Sharps, P., & Kools, S. (2018). Living in Fear and Prioritizing Safety: Exploring Women's Lives After Traumatic Brain Injury From Intimate Partner Violence. *Qual Health Res*, 28(11), 1708-1718. doi:10.1177/1049732318786705
- Iverson, K. M., Dardis, C. M., Grillo, A. R., Galovski, T. E., & Pogoda, T. K. (2019). Associations between traumatic brain injury from intimate partner violence and future psychosocial health risks in women. *Compr Psychiatry*, 92, 13-21. doi:10.1016/j.comppsy.2019.05.001
- Iverson, K. M., Dardis, C. M., & Pogoda, T. K. (2017). Traumatic brain injury and PTSD symptoms as a consequence of intimate partner violence. *Compr Psychiatry*, 74, 80-87. doi:10.1016/j.comppsy.2017.01.007
- Iyengar, R., & Sabik, L. (2009). The dangerous shortage of domestic violence services. *Health Aff (Millwood)*, 28(6), w1052-1065. doi:10.1377/hlthaff.28.6.w1052
- Jackson, H., Philp, E., Nuttall, R. L., & Diller, L. (2002). Traumatic brain injury: A hidden consequence for battered women. *Professional Psychology: Research and Practice*, 33(1), 39-45. doi:10.1037/0735-7028.33.1.39
- Jones III, R. F., & Horan, D. L. (2002). The American College of Obstetricians and Gynecologists: responding to violence against women. *International Journal of Gynecology & Obstetrics*, 78(S1), S75-S77. doi:10.1016/S0020-7292(02)00048-6
- Katz, D. I., Cohen, S. I., & Alexander, M. P. (2015). Mild traumatic brain injury. *Handbook of clinical neurology*, 127, 131-156. doi:10.1016/b978-0-444-52892-6.00009-x
- Kaur, R., & Garg, S. (2008). Addressing domestic violence against women: an unfinished agenda. *Indian journal of community medicine : official publication of Indian Association of Preventive & Social Medicine*, 33(2), 73-76. doi:10.4103/0970-0218.40871
- Kendall, J., Pelucio, M. T., Casaletto, J., Thompson, K. P., Barnes, S., Pettit, E., & Aldrich, M. (2009). Impact of emergency department intimate partner violence intervention. *J Interpers Violence*, 24(2), 280-306. doi:10.1177/0886260508316480
- Klevens, J., Kee, R., Trick, W., Garcia, D., Angulo, F. R., Jones, R., & Sadowski, L. S. (2012). Effect of screening for partner violence on women's quality of life: a randomized controlled trial. *JAMA*, 308(7), 681-689. doi:10.1001/jama.2012.6434
- Kontos, A. P., Jorgensen-Wagers, K., Trbovich, A. M., Ernst, N., Emami, K., Gillie, B., . . . Collins, M. W. (2020). Association of Time Since Injury to the First Clinic Visit With Recovery Following Concussion. *JAMA Neurology*, 77(4), 435-440. doi:10.1001/jamaneurol.2019.4552
- Lincoln, A. E., Caswell, S. V., Almquist, J. L., Dunn, R. E., Norris, J. B., & Hinton, R. Y. (2011). Trends in concussion incidence in high school sports: a prospective 11-year study. *Am J Sports Med*, 39(5), 958-963. doi:10.1177/0363546510392326

- MacMillan, H. L., Wathen, C. N., Jamieson, E., Boyle, M. H., Shannon, H. S., Ford-Gilboe, M., . . . McNutt, L. A. (2009). Screening for intimate partner violence in health care settings: a randomized trial. *JAMA*, *302*(5), 493-501. doi:10.1001/jama.2009.1089
- Matser, E. J., Kessels, A. G., Lezak, M. D., Jordan, B. D., & Troost, J. (1999). Neuropsychological impairment in amateur soccer players. *JAMA*, *282*(10), 971-973. doi:10.1001/jama.282.10.971
- McCrea, M., Hammeke, T., Olsen, G., Leo, P., & Guskiewicz, K. (2004). Unreported concussion in high school football players: implications for prevention. *Clin J Sport Med*, *14*(1), 13-17. doi:10.1097/00042752-200401000-00003
- McDonald, T., Burghart, M. A., & Nazir, N. (2016). Underreporting of Concussions and Concussion-Like Symptoms in Female High School Athletes. *J Trauma Nurs*, *23*(5), 241-246. doi:10.1097/jtn.0000000000000227
- McKee, A. C., & Daneshvar, D. H. (2015). The neuropathology of traumatic brain injury. *Handbook of clinical neurology*, *127*, 45-66. doi:10.1016/B978-0-444-52892-6.00004-0
- Monahan, K., & O'Leary, K. D. (1999). Head injury and battered women: an initial inquiry. *Health Soc Work*, *24*(4), 269-278. doi:10.1093/hsw/24.4.269
- MyPlan. (2020). Empowering Decisions for a Safe Path Forward. Retrieved from <https://www.myplanapp.org/>
- National Domestic Violence Hotline. (2020). Here for You: National Domestic Violence Hotline. Retrieved from <https://www.thehotline.org/>
- Nixon, R. D. V., Resick, P. A., & Nishith, P. (2004). An exploration of comorbid depression among female victims of intimate partner violence with posttraumatic stress disorder. *J Affect Disord*, *82*(2), 315-320. doi:10.1016/j.jad.2004.01.008
- Ochs, H. A., Neuenschwander, M. C., & Dodson, T. B. (1996). Are head, neck and facial injuries markers of domestic violence? *J Am Dent Assoc*, *127*(6), 757-761. doi:10.14219/jada.archive.1996.0311
- Office on Women's Health. (2018). Relationships and Safety: Get Help.
- Patra, P., Prakash, J., Patra, B., & Khanna, P. (2018). Intimate partner violence: Wounds are deeper. *Indian journal of psychiatry*, *60*(4), 494-498. doi:10.4103/psychiatry.IndianJPsychiatry_74_17
- Petersen, R., Gazmararian, J., & Andersen Clark, K. (2001). Partner violence: implications for health and community settings. *Womens Health Issues*, *11*(2), 116-125. doi:10.1016/s1049-3867(00)00093-1
- Prince, C., & Bruhns, M. E. (2017). Evaluation and Treatment of Mild Traumatic Brain Injury: The Role of Neuropsychology. *Brain sciences*, *7*(8), 105. doi:10.3390/brainsci7080105

- Prosser, D. D., Grigsby, T., & Pollock, J. M. (2018). Unilateral anoxic brain injury secondary to strangulation identified on conventional and arterial spin-labeled perfusion imaging. *Radiology case reports*, *13*(3), 563-567. doi:10.1016/j.radcr.2018.02.004
- Register-Mihalik, J. K., Guskiewicz, K. M., McLeod, T. C., Linnan, L. A., Mueller, F. O., & Marshall, S. W. (2013). Knowledge, attitude, and concussion-reporting behaviors among high school athletes: a preliminary study. *J Athl Train*, *48*(5), 645-653. doi:10.4085/1062-6050-48.3.20
- Saddki, N., Suhaimi, A. A., & Daud, R. (2010). Maxillofacial injuries associated with intimate partner violence in women. *BMC Public Health*, *10*, 268. doi:10.1186/1471-2458-10-268
- Sheridan, D. J., & Nash, K. R. (2007). Acute injury patterns of intimate partner violence victims. *Trauma Violence Abuse*, *8*(3), 281-289. doi:10.1177/1524838007303504
- Smith, D. J., Jr., Mills, T., & Taliaferro, E. H. (2001). Frequency and relationship of reported symptomology in victims of intimate partner violence: the effect of multiple strangulation attacks. *The Journal of emergency medicine*, *21*(3), 323-329. doi:10.1016/s0736-4679(01)00402-4
- Stein, M. B., & Kennedy, C. (2001). Major depressive and post-traumatic stress disorder comorbidity in female victims of intimate partner violence. *J Affect Disord*, *66*(2-3), 133-138. doi:10.1016/s0165-0327(00)00301-3
- Swanson, T. M., Isaacson, B. M., Cyborski, C. M., French, L. M., Tsao, J. W., & Pasquina, P. F. (2017). Traumatic Brain Injury Incidence, Clinical Overview, and Policies in the US Military Health System Since 2000. *Public health reports (Washington, D.C. : 1974)*, *132*(2), 251-259. doi:10.1177/0033354916687748
- Technology Safety. (2020). RU Safe? Retrieved from <https://www.techsafety.org/rusafe>
- Todahl, J., & Walters, E. (2011). Universal screening for intimate partner violence: a systematic review. *J Marital Fam Ther*, *37*(3), 355-369. doi:10.1111/j.1752-0606.2009.00179.x
- University of Pittsburgh Department of Orthopaedic Surgery. (2020). Concussion Research Laboratory. Retrieved from <https://www.orthonet.pitt.edu/research/research-centers-and-labs/concussion-research-laboratory>
- University of Pittsburgh School of Medicine Neurological Surgery. (2020). Brain Trauma Research Center. Retrieved from <https://www.neurosurgery.pitt.edu/centers/brain-and-spine-injury/brain-trauma-research-center>
- UPMC Sports Medicine. (2020). UPMC Sports Medicine Concussion Program. Retrieved from <https://www.upmc.com/services/sports-medicine/services/concussion>
- USPSTF. (2018). Screening for Intimate Partner Violence, Elder Abuse, and Abuse of Vulnerable Adults: US Preventive Services Task Force Final Recommendation Statement. *JAMA*. Retrieved from <https://doi.org/10.1001/jama.2018.14741>

- Vranda, M. N., Kumar, C. N., Muralidhar, D., Janardhana, N., & Sivakumar, P. T. (2018). Barriers to Disclosure of Intimate Partner Violence among Female Patients Availing Services at Tertiary Care Psychiatric Hospitals: A Qualitative Study. *Journal of neurosciences in rural practice*, 9(3), 326-330. doi:10.4103/jnrp.jnrp_14_18
- Wahab, S., & Olson, L. (2004). Intimate Partner Violence and Sexual Assault in Native American Communities. *Trauma, Violence, & Abuse*, 5(4), 353-366. doi:10.1177/1524838004269489
- Walker, L. E. (1979). *The Battered Woman*: Harper & Row.
- WCS. (2020a). What We Do. Retrieved from <https://www.wcspittsburgh.org/what-we-do/>
- WCS. (2020b). Who We Are. Retrieved from <https://www.wcspittsburgh.org/who-we-are/>
- WHO. (2006). Reproductive Health Indicators: Guidelines for their generation, interpretation, and analysis for global monitoring. Retrieved from <http://www.ossyr.org.ar/pdf/bibliografia/2.22.pdf>
- WHO. (2010, F07.2). International Statistical Classification of Diseases and Related Health Problems. Retrieved from <https://icd.who.int/browse10/2010/en>
- WHO. (2012). *Understanding and Addressing Violence Against Women Overview*. Retrieved from http://www.who.int/reproductivehealth/publications/violence/rhr12_35/en/
- WHO. (2013). *Global and regional estimates of violence against women: prevalence and health effects of intimate partner violence and non-partner sexual violence*: World Health Organization.
- Wilbur, L., Higley, M., Hatfield, J., Surprenant, Z., Taliaferro, E., Smith, D. J., Jr., & Paolo, A. (2001). Survey results of women who have been strangled while in an abusive relationship. *The Journal of emergency medicine*, 21(3), 297-302. doi:10.1016/s0736-4679(01)00398-5
- Wong, J., & Mellor, D. (2014). Intimate partner violence and women's health and wellbeing: impacts, risk factors and responses. *Contemp Nurse*, 46(2), 170-179. doi:10.5172/conu.2014.46.2.170