Investigating the Prevalence of Traumatic Brain Injury and Post-Traumatic Stress Disorder in a Sample of South African Women Who Have Experienced Intimate Partner Violence

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COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

Signature: Signed by candidate Date: 17 February 2025

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Abstract

Intimate partner violence (IPV) is extensively acknowledged as a major public health issue, resulting in substantial physical and psychological harm, particularly among women. IPV refers to abuse occurring within intimate relationships and is linked to a range of neurological injuries, such as traumatic brain injuries (TBIs), as well as negative mental health effects such as post-traumatic stress disorder (PTSD). Although IPV and its effects have been extensively studied, there remains a gap in research both globally and within South Africa exploring the overlap between IPV, general and IPV-specific TBIs, and PTSD outcomes. Specifically, the literature lacks a thorough understanding of the prevalence of, and mechanisms for IPV-related TBIs, their severity and their link to PTSD.

This study employed a cross-sectional, quantitative approach to examine IPV exposure, TBIs (both general and IPV-specific) and PTSD outcomes in a sample of South African women ($N = 81$) using self-report measures, including a Demographic Questionnaire and Asset Index, Primary Care PTSD Screen for DSM-5, Life Events Checklist for DSM-5, Women Abuse Screening Tool, and Brain Injury Screening Questionnaire. The results demonstrated a high prevalence of IPV within the sample, with physical and emotional abuse being the most frequently co-occurring forms thereof. IPV-related TBIs were also commonly reported. Simple regression analyses indicated that IPV-related TBIs were a significant predictor ($p = 0.009$) of PTSD outcomes, highlighting the important role of these injuries in psychological distress. However, multiple regression analyses indicated that, collectively, no single variable stood out as the strongest predictor of PTSD outcomes.

The findings of this study are largely aligned with existing research regarding the prevalence and effects of IPV. However, there is a clear need for further research to enhance the understanding of the intersection between IPV, TBIs and PTSD. Given the widespread and debilitating nature of IPV, examining its neurological and psychological effects is

essential for informing trauma-sensitive interventions, practices, and policies to better support survivors experiencing IPV-related TBIs and associated mental health challenges.

Keywords: intimate partner violence; traumatic brain injury; post-traumatic stress disorder.

List of Abbreviations

IPV	Intimate Partner Violence
BI	Brain Injury
ABI	Acquired Brain Injury
TBI	Traumatic Brain Injury
PTSD	Post-Traumatic Stress Disorder
GBV	Gender-Based Violence
HIC	High Income Country
LMIC	Low-and Middle-Income Country
MVA	Motor Vehicle Accident
LoC	Loss of Consciousness
SSA	Sub-Saharan Africa

Contents

List of Figures

List of Tables

Introduction

The World Health Organization (WHO) recognizes intimate partner violence (IPV) as a major public health concern impacting thousands of individuals globally. IPV is described as an ongoing type of violence that persists in time resulting in devastating consequences (Braamcamp de Mancellos, 2021). It is important to note that women are disproportionately affected by IPV (Campbell et al., 2022). IPV and TBI are each associated with a range of outcomes independently, but recent literature reveals the intersection of these public health issues, especially considering the nature of injuries to the face and neck that often occur during IPV (Anto-Ocrah et al., 2022; Esopenko et al., 2021; Ivany et al., 2018; Kwako et al., 2011; Smith & Holmes., 2018).

IPV is reported to affect up to one in six women globally (George et al., 2019). IPV against women is a global health issue linked to numerous long-term consequences. Some of these consequences encompass traumatic brain injury (TBI), post-traumatic stress disorder (PTSD), depression, and autoimmune disorders (Daugherty et al., 2022) alongside a range of other psychological, physical, social and economic consequences (Anto-Ocrah et al., 2022; Ivany et al., 2018; Smith & Holmes, 2018; Toccalino et al., 2023; White et al., 2024).

In South Africa, half of murdered women are killed by their intimate partners (Abrahams et al., 2024). Previous literature has also reported South Africa as having one of the highest prevalence rates of interpersonal trauma in the world (Gordon 2016; Joyner & Honikman, 2015; Mthembu et al., 2021; Naidoo, 2013). IPV specifically, was reported as the second leading cause of TBI in South Africa (Naidoo, 2013). Furthermore, IPV represents the second-largest burden of disease, following HIV/AIDS (Sere et al.,2021)

Correspondingly, the country reports some of the highest femicide rates worldwide, with a rate four times the global average (Abrahams et al., 2013; Gordon, 2016; Sere et al., 2021). In addition, a 2022 national study by the Human Sciences Research Council (HSRC)

on gender-based violence (GBV) and IPV across South Africa's 9 provinces, involving 5,603 women, found that 22.4% had experienced physical violence, 7.9% had experienced sexual violence, 13.1% had faced economic abuse, 57.6% had reported controlling behaviours, and 25.1% had experienced emotional abuse in their lifetime from an intimate partner. Moreover, 41.6% of women who endured physical or sexual IPV reported sustaining injuries as a consequence (Zungu et al., 2024).

There is a dearth of local papers on IPV and it is difficult to discern the exact prevalence of IPV and its repercussions in the survivors in South Africa as many cases go unreported for several reasons. For one, IPV is a complex issue and many survivors fear the stigma and shame attached to it which makes it difficult for them to report the abuse and receive the necessary care (Monahan, 2018). Further, it has been reported that up to 75% of women who have been abused by their intimate partners do not seek help for a suspected brain injury. Survivors of IPV are frequently not aware that they have sustained a brain injury which results in the unlikelihood of them pursuing medical care (Acquired Brain Injury Research Lab [ABIRL], 2022). Also, those who sustain a TBI during an IPV incident are at increased risk for developing PTSD (Farley et al., 2018).

Majority of research on IPV is derived from high-income countries (HICs). Valera et al. (2003, 2019, 2020, 2021, 2022) has generated a vast amount of literature on IPV specifically highlighting the prevalence of TBI resulting from IPV. However, the research was conducted on populations abroad, with similar local research lacking. Local research is crucial because the South African and global South context presents unique social, economic, and healthcare challenges that shape the intersection of IPV and TBI differently from HICs. Factors like high rates of severe IPV, limited access to healthcare, underreporting, and the compounded effects of poverty, structural violence, and social norms (Alessandrino et al., 2020; Costello & Greenwald, 2022; Esopenko et al., 2021; Monahan, 2018; Naidoo, 2013;

Nicol et al., 2021) make it essential to understand how TBI manifests in IPV survivors in local contexts. Without context-specific research, the full scope of IPV, including its long-term impacts on health and well-being on survivors, remains overlooked.

The prevalence of IPV in vulnerable communities in South Africa have been emphasized by local researchers (e.g., Abahams et al., 2024; Bolarinwa et al., 2023; Boonzaier et al., 2005, 2011, 2016, 2019, 2023; Buqa, 2022; Gass et al., 2010; Gordon, 2016; Govender, 2023; Joyner & Honikman, 2015; Mthembu et al., 2021; Ndlovu et al., 2022; Russell et al., 2014; Sere et al., 2021; Van Niekerk & Boonzaier, 2019; Zungu et al., 2024), however, there is a lack of literature on IPV-related TBI in women within the South African context. Further, both TBI and IPV are associated with PTSD (Farley et al., 2018; Kwako et al., 2011) and yet, literature investigating both IPV and TBI in relation to PTSD is lacking.

It is thus crucial to generate literature to create awareness of the outcomes of the survivors of an IPV-related TBI and PTSD which could be used to increase the quality of life for the affected women. In the literature review that follows, IPV, TBI, and IPV-related TBI and the associated outcomes will be discussed. The relationships between these factors will be highlighted through the use of literature from global and local sources and will also include the significant gaps in the literature related to these phenomena.

Literature Review: IPV, TBI and Associated PTSD Outcomes

This literature review explores the intersection of IPV, TBI, and PTSD, examining global, Sub-Saharan and South African perspectives. It begins with an examination of IPV, including its definition, classification, risk factors, and sequelae, followed by a review of TBI, covering its definition, classifications, mechanisms, severity, neuroanatomical implications and outcomes of brain injury. The intersection of IPV and TBI is explored, focusing on the occurrence of TBI among IPV survivors, its sequelae, and the barriers survivors face in accessing appropriate healthcare and support. The review then explores PTSD, its connection to both IPV and TBI, and specifically how these two factors contribute to mental health outcomes in women who have experienced IPV. Finally, the review identifies important research gaps in the understanding of IPV, TBI, and PTSD, with a particular emphasis on the South African context.

Intimate Partner Violence (IPV)

Definition of IPV

IPV is described as ongoing and manipulative verbal, emotional, and physical abuse directed at a current or former partner (Monahan, 2018). IPV is carried out with an intention to exert power and control over the victim (Ivany et al., 2018). IPV is carried out by a current or former intimate partner, which refers to anyone with whom a person shares a close relationship, identifies or identified as a couple, and shares an emotional connection, such as a spouse, ex-spouse, sexual partner, boyfriend or girlfriend (Smith & Holmes, 2018).

IPV is a significant public health issue with potentially fatal consequences (Alessandrino et al., 2020). Although IPV affects both men and women, research consistently shows that women are more likely to experience IPV (Campbell et al., 2022), and being a woman is associated with a higher rate of abuse and a greater risk of

sustaining injuries, especially in cases of physical violence (Pines, 2017). In instances of physical IPV, there is deliberate application of force which can result in injury, disability, or even death of the victim (Smith & Holmes, 2018).

Survivors of IPV are primarily heterosexual women, with the most common location of abuse being the residence shared by the victim and the perpetrator (Braamcamp de Mancellos, 2021). However, IPV also occurs in same-sex relationships, as explored by Kimmes et al. (2019) and Baker et al. (2013), who examined the dynamics of IPV within same-sex relationships. Additionally, transgender women might face different rates and unique types of IPV compared to cisgender individuals (Garthe et al., 2018). Recent studies suggest that approximately 44% of women will experience IPV in their lifetime (Toccalino et al., 2023), while a global survey on intimate partner and sexual violence indicates that over 33% of women will face IPV at some point in their lives (Ivany et al., 2018).

IPV Globally and in South Africa. IPV is not confined to specific regions; it is more common in areas with heightened gender inequality and high poverty rates. Despite this, IPV remains widespread across all races, religions, and socioeconomic backgrounds, impacting both developed and developing nations (Bonomi & Glass, 2008; Devries et al., 2013).

Global data indicates that around 38% of female murders are committed by a current or former intimate partner. The impact of IPV has been further exacerbated by the COVID-19 pandemic, which has resulted in a substantial rise in both the frequency of IPV incidents and the severity of violence during each encounter (Toccalino et al., 2023). Additionally, Keynejad et al. (2020) report that IPV is particularly prevalent in LMICs.

South Africa has some of the highest rates of IPV globally (Gordon, 2016; Joyner & Honikman, 2015; Mthembu et al., 2021; Naidoo, 2013). Women in South Africa are

killed by intimate partners at a rate five times greater than the global average (Govender, 2023). The South African Medical Research Council (SAMRC) has been tracking femicide in South Africa for over two decades. Their findings show that in 1999, an average of four women per day were killed by an intimate partner, with this number dropping to three per day by 2009. However, their 2017 study revealed that this rate has remained unchanged. In 2020/21, they found that 60% of female homicides were committed by intimate partners, and the rate of intimate partner femicide in South Africa remains five times higher than the global average (Abrahams et al., 2024).

A 2022 study by the HSRC on GBV and IPV conducted across all nine provinces of South Africa, surveying 5,603 women, highlighted the widespread occurrence of IPV. A total of 1,255 women (22.4%) reported experiencing physical violence, while 443 (7.9%) had been subjected to sexual violence, and 734 (13.1%) reported economic abuse. Controlling behaviours from partners were reported by 3,229 women (57.6%), and 1,407 (25.1%) experienced emotional abuse. Among those who had endured physical or sexual IPV, 1,170 (41.6%) suffered injuries, with 454 (38.8%) reporting a single incident, 417 (35.6%) experiencing between two and five incidents, and 299 (25.7%) sustaining injuries more than five times (Zungu et al., 2024).

Further emphasizing the prevalence of IPV, Bolarinwa et al. (2023) conducted a study with 2,410 women, uncovering a significant prevalence of IPV in the Western Cape, Free State, and Eastern Cape provinces. Machisa et al. (2017) conducted a survey of 511 women in Gauteng, South Africa, and discovered that 50% had experienced IPV at some point in their lives, with 18% reporting IPV in the 12 months prior to the survey.

Additionally, a systematic review conducted by Stockl et al. (2013) examining female homicides in South Africa, through national mortuary data from 1999 to 2009, revealed that intimate partners were responsible for about half of these murders.

The pervasive prevalence of violence against women in South Africa stands as one of the most severe manifestations of discrimination and dehumanization affecting women with contributing factors inclusive of patriarchal cultural practices, religious influences, entrenched gender norms, the impact of the COVID-19 lockdown, and the broader context of violence within South African society (Buqa, 2022).

The COVID-19 pandemic exacerbated this crisis, as highlighted by Ndlovu et al. (2022), who reported that during the initial phase of South Africa's lockdown in March 2020, 87,000 cases of GBV and IPV were recorded which is a significant increase compared to the pre-pandemic period. In that same study, in a COVID-19 progress update, President Ramaphosa highlighted the gravity of GBV and femicide in the country, stating that a woman is killed due to GBV every three hours (Ndlovu et al., 2022). However, the administrative data provided by the South African Police Service (SAPS) may not fully capture the true extent of violence against women in South Africa, as many survivors may not report their experiences (Ndlovu et al., 2022).

Classification of IPV

The acts of violence within IPV encompasses physical harm, controlling behaviours, psychological aggression, sexual violence and stalking, as well as verbal, emotional and financial/economic abuse (Anto-Ocrah et al., 2022; Ivany et al., 2018; Smith & Holmes, 2018; Toccalino et al., 2023; White et al., 2024). Physical abuse involves using force to hurt or injure the other person. This includes slapping, hitting, kicking, pinching, biting, shoving, stabbing, or using weapons like guns or knives. It can also involve behaviours such as burning, choking, or threatening harm (García-Moreno et al., 2005). When it comes to sexual abuse in IPV, this often means forcing a partner into sex against their will, coercing them into degrading or humiliating acts, and forcing them to engage in sex without protection (García- Moreno et al., 2005; WHO, 2014).

Psychological abuse includes behaviours that manipulate, control, and degrade someone, both in public and in private. This may be constant verbal insults, name-calling, or emotional blackmail. The abuser might also try to embarrass the victim, threaten harm, track their movements, or stop them from seeing family and friends, accessing financial resources, or getting the help they need (Follingstad & DeHart, 2000).

Coercive and controlling violence is a particularly damaging pattern, combining emotional abuse, manipulation, and intimidation. It is a form of control where one partner manipulates everything, from their partner's actions to their relationships and daily activities. The abuser keeps a close watch on the victim and punishes them if they do not comply with the rules set by them (Kelly & Johnson, 2008).

Economic abuse involves actions that limit a victim's ability to access, use, or manage their financial resources, undermining their financial security and independence (Adams et al., 2008). It can manifest as the abuser exercising total control over the victim's finances, dictating their spending, and restricting their access to money, which makes it difficult for the victim to support themselves or break free from the abusive relationship (Fawole, 2008).

Risk Factors for IPV

Various risk factors contribute to an individual's vulnerability to IPV, including young age, lower socioeconomic status, substance abuse, involvement in other forms of violence, association with cultural or religious practices that condone violence, a history of domestic abuse or childhood exposure to violence, early marriage and limited educational opportunities (Farrer et al., 2012; Stubbs & Szoeke, 2022; Yakubovich et al., 2018). In addition, Boonzaier & Schalkwyk (2011) reported that poverty, low educational attainment, and unemployment are also significant risk factors for violent victimization among women.

Sequelae of IPV

The effects of IPV often extend far beyond immediate physical harm, and have been linked to a wide range of negative outcomes for affected women. Women who experience IPV seem to have a higher prevalence of various medical conditions, potentially due to multifactorial causes. These may include chronic stress, reduced access to healthcare, socioeconomic hardship, and other life adversities that can compound the impact of IPV (World Health Organization, 2013).

Studies suggest that women who experience IPV are at an increased risk of developing various health issues including gastrointestinal problems, substance abuse, sexually transmitted infections, HIV, and gynaecological or pregnancy complications requiring hospitalization (Govender, 2023; Liu et al., 2020; Pines, 2017). Some evidence also associates IPV with more severe menopause symptoms, and a higher prevalence of chronic conditions such as diabetes and persistent pain (Stubbs & Szoeke, 2022). Similarly, IPV has been associated with adverse pregnancy outcomes, including preterm birth, low birth weight, preeclampsia, complications during childbirth, and foetal or neonatal mortality (Berhanie et al., 2019; Ezeudu et al., 2019; Martin-de-Las-Heras et al., 2019; Yu et al., 2018).

Psychologically, IPV is closely linked to increased rates of PTSD, anxiety, depression, and suicide attempts, all of which can contribute to a perpetuating cycle of violence. The presence of these mental health conditions may not only increase vulnerability to further IPV, but may also heighten the psychological distress and impact of IPV (Keynejad et al., 2020). Liu et al. (2020) also noted that abused women often use alcohol and drugs as coping mechanisms following IPV, which may further their vulnerability to continued abuse.

Women in abusive relationships are often economically, psychologically, or physically trapped in a harmful situation where they have been threatened with death if

they attempt to leave (Valera et al., 2019). Economic hardship is closely tied to IPV, with financial abuse often serving as a tool of control. IPV survivors often encounter barriers to employment, education, essential resources, and financial autonomy, which may increase their vulnerability to continued abuse (Adams et al., 2008).

The trauma associated with IPV has the potential to affect both the internal and external aspects of a woman's life. Internally, IPV-related trauma may alter thoughts, emotions, beliefs, and values, which could lead to long-term psychological distress and disability. Many women may begin to view the world as unsafe and struggle to trust others. Externally, the trauma can interfere with relationships and behaviours, making it difficult for women to maintain healthy connections with family, friends, and intimate partners (Pines, 2017; Smith & Holmes, 2018).

Traumatic Brain Injury (TBI)

Definition of TBI

TBI is a disturbance in brain function resulting from an external force, including blunt trauma, rapid acceleration, or sudden deceleration (Martin, 2013). It can be either acute or cumulative, developing over months or years, and may be intentional or unintentional, often resulting from violent acts such as assault (Gagnon & De Prince, 2017). Any type of violence that subjects the brain to sudden acceleration, deceleration, or rotational forces can lead to a TBI (Campbell et al., 2022). However, it is indicated that not all impacts to the head, face, or neck necessarily lead to a TBI (Iverson et al., 2017). Therefore, while external forces are a cause, the way these forces interact with the brain's structures is important for determining whether TBI occurs.

Brain Injury (BI) Globally, in SSA (Sub-Saharan Africa) and in South Africa.

Each year, approximately 69 million individuals sustain a TBI (Dewan et al., 2018; Naik et al., 2022), with around 75% suffering from mild injuries, while moderate

and severe injuries account for 22% and 3%, respectively (Orr et al., 2024). Jackson et al. (2020) highlighted that adults with non-traumatic BIs exhibit a higher prevalence of comorbidities (76%) and multimorbidities (40%) compared to those with TBIs. In addition, Virani et al. (2020) emphasized that strokes, which is a significant form of non-traumatic BI, has a high prevalence, with incidence rates ranging from 30 to 120 per 100,000 individuals annually and escalating to 670 to 970 per 100,000 individuals in older populations. Moreover, non- traumatic BI's are associated with higher direct healthcare costs compared to TBIs (Chen et al., 2012) and play a substantial role in hospital admissions (Goldman et al., 2022).

Naidoo (2013) previously reported that TBI is a leading cause of mortality and morbidity in HICs, and in the Western Hemisphere, it stands as the primary cause of death among individuals under the age of 45. Hyder et al. (2007) reported that TBI rates were higher in LMICs compared to HICs, primarily due to contextual factors such as increased violence and motor vehicle accidents (MVAs).

In LMICs, the incidence of TBI is around 3.2 million annually, projected to rise 3.5- fold in SSA, reaching 14 million per year by 2050 (Adegboyega et al., 2021).

In SSA, the estimated TBI incidence is 801 per 100,000 people, reflecting a high burden of injury. Despite this, most research on TBI management focuses on HICs, with limited attention given to the specific challenges within SSA's healthcare systems (Muili et al., 2024).

Adegboyega (2021) identified road traffic accidents, falls, assaults, and gunshot wounds as significant contributors to BIs in SSA while Naidoo (2013) reported road traffic accidents, falls, and violence as common causes of BI in South Africa. Similar findings have been reported in other LMICs, including the research by Maas et al. (2022).

In South Africa, BI occurs at a high rate, primarily due to road traffic accidents,

with interpersonal violence also contributing significantly to both BI and mortality (Naidoo, 2013). The country also has one of the highest incidences of BI in SSA, and intentional injuries occur at a rate seven times higher than the global average, alongside a high prevalence of road traffic accidents at twice the global rate. This heavy burden places significant strain on the healthcare system. (Owolabi et al., 2023). Despite the high incidence, South Africa lacks a comprehensive BI databank, and research on national incidence and prevalence remains limited. This gap in data can be attributed to several challenges, including incomplete and inconsistent hospital records, limited funding for research and epidemiological studies, and the strain on overcrowded, under-resourced public hospitals (Naidoo, 2013).

Classification of TBI

TBIs are part of the broader category of acquired brain injuries (ABIs), which refer to injuries sustained after birth that impact the physical structure, metabolic processes, or functioning of neurons in the brain (Camm et al., 2021).

Traumatic versus Non-Traumatic BIs. ABIs can be traumatic or non-traumatic. TBIs result from external forces acting on the brain, such as car accidents, assaults, or falls, which can cause the brain to be torn, stretched, bruised, penetrated, or swollen, affecting various brain areas (Giustini et al., 2013; Orr et al., 2024). In contrast, non-traumatic brain injuries occur due to internal factors, without necessarily experiencing external physical force to the head, as in the case of infections or lack of oxygen to the brain and body (Giustini et al., 2013). In terms of further subcategories/classifications, this study focuses on TBIs.

Open versus Closed TBIs. Open and closed TBIs represent two distinct types of TBIs. Open brain injuries, also referred to as penetrating TBIs, occur when an external object, such as a bullet or shrapnel, breaks through the skull and damages the brain tissue.

Closed brain injuries, or non-penetrating TBIs, result from blunt force impact that causes the brain to shift within the confines of the skull, while the skull itself remains intact. These injuries often result from falls, motor vehicle accidents, sports injuries, or being struck by an object (Brain Injury Law Center, n.d.; National Institute of Neurological Disorders and Stroke [NINDS], 2024). Closed brain injuries are often associated with two types of brain contusions: coup and contrecoup injuries. The coup injury occurs at the site of initial impact, and although it is significant, it is usually less severe than the contrecoup injury. In contrast, contrecoup injuries occur on the opposite side of the impact and are typically more severe, as they result from the brain being jolted and striking the skull on the opposite side of the blow (Campbell et al., 2022).

BI Severity. Injury severity in BIs can range from mild, involving transient alterations to consciousness, to moderate or severe, often marked by an extended period of unconsciousness (Iverson et al., 2017). BIs are classified by the Glasgow Coma Scale (GCS), a 15-point scale that categorizes BIs as mild (13–15), moderate (9–12), and severe (<8; Costello & Greenwald, 2022) and measures the degree of impaired consciousness in an individual following a BI (Brainline, 2022).

Mild BI is characterised by a loss of consciousness lasting 30 minutes or less, a GCS score of 13–15 thirty minutes post-injury, and a post-traumatic amnesia (PTA) duration of no more than 24 hours. Moderate and severe BI involves a loss of consciousness lasting from a few minutes to several hours, confusion persisting for days to weeks, and physical, cognitive, or behavioural impairments that can last for months or become permanent (Giustini et al., 2013).

Mechanisms of BI

Mechanisms of TBI. TBI commonly results from falls, road traffic accidents, vehicle collisions, violence (e.g., gunshot wounds and domestic abuse), sports injuries,

explosive blasts, penetrating wounds, being struck with or against an object and severe head impacts (Mayo Clinic, 2025).

The mechanisms of TBI are varied and involve external forces that cause rapid acceleration, deceleration, or rotational movement of the brain. In the context of IPV, these external forces can result from violent actions such as shaking, slapping, punches to the head or face, or being struck with an object, hand, or fist. Additionally, they can occur when the head is forcibly shoved into surfaces like furniture, walls, or cars (Campbell et al., 2022; Martin, 2013).

Mechanisms of Non-Traumatic BI. Non traumatic BIs results from internal physiological disruptions rather than external force. These mechanisms may include cerebral hypoxia following cardiac or respiratory arrest, metabolic disorders, strokes (ischemic or haemorrhagic), tumours, near-drowning incidents, and exposure to neurotoxic substances such as lead poisoning (Giustini et al., 2013).

Strangulation is also a mechanism of non-TBI, as it can cause cerebral hypoxia due to restricted oxygen supply, leading to brain damage. Strangulation is a form of asphyxia that involves obstruction of the airway and compression of the neck vessels, particularly the carotid artery. This restriction in blood flow can lead to hypoxia, cerebral ischemia, and, in some cases, cardiac arrest. These injuries restrict oxygen and nutrient delivery to the brain, which can result in increased intracranial pressure, further damaging or even killing brain cells (Campbell et al., 2022).

Neuroanatomical Implications of BI

BI can affect several key brain regions, leading to a range of cognitive, emotional, and behavioural consequences (Campbell et al., 2018). Notably, the frontal lobes, which play a central role in cognition, personality, and decision-making, are commonly impacted. Injury to this area can result in changes in behaviour, cognitive impairments, and emotional

regulation difficulties. The prefrontal cortex, involved in impulse control and decision-making, may also be affected (Torregross et al., 2023). Other significant regions include the hypothalamus, which regulates hormones and autonomic functions; the amygdala, responsible for processing emotions like fear, and the hippocampus, which is crucial for memory formation. Additionally, the corpus callosum can be impacted, often leading to diffuse axonal injury (DAI), which disrupts communication between the brain's hemispheres and causes widespread cognitive and motor dysfunction (Zheng et al., 2022).

BI Outcomes

The traumatic alterations from TBI can lead to a wide range of short- and long-term neuropsychological, behavioural, emotional, and physical challenges (Martin, 2013; Wilson et al., 2017).

Considering the severity of the injury, a mild BI can lead to a loss of consciousness or memory, changes in mental status, and possible temporary neurological and neuropsychological deficits (Levin & Diaz-Arrastia, 2015). Moderate and severe BIs can lead to disability, with consequences ranging from temporary to permanent neurological and neuropsychiatric issues. These can include motor impairments, cognitive deficits, balance and visual problems, as well as psychological impacts like depression, anxiety, personality changes and psychotic symptoms. The severity of the injury increases the likelihood of widespread cognitive impairments, notably in attention, memory, and processing speed, and may significantly impact the individual’s ability to resume normal activities (Iverson & Lange, 2011).

Neuropsychological symptoms following BI often include difficulties with concentration, attention, perception, memory, processing speed, mood regulation, and decision-making. Physical consequences may manifest as headaches, fatigue, balance issues, dizziness, sensitivity to light or sound, sleep disturbances, nausea, and sexual

dysfunction.

Behavioural symptoms commonly include physical and verbal aggression, irritability, heightened anger responses, and increased substance use. Social impacts frequently involve financial strain, employment difficulties, increased suicide risk, higher susceptibility to divorce, and chronic unemployment, while mental health consequences can include PTSD, depression, and anxiety (Costello & Greenwald, 2022; Kwako et al., 2011; Marsh & Martinovich, 2006; Martin, 2013; Mateo & Glod, 2003; Smith & Holmes, 2018).

Additionally, sensorimotor deficits can present as facial or limb paralysis or weakness, numbness, loss of sensation, muscle spasms, facial drooping, or unilateral weakness (Adhikari et al., 2024; Patch et al., 2018). Repeated brain trauma can also lead to a range of secondary health issues, such as seizures, sleep disturbances, neurodegenerative disorders, neuroendocrine imbalances, and psychiatric conditions (Bramlett & Dietrich, 2015).

The Intersection Between IPV and TBI

International Research

Head and brain injuries are more common in IPV-related assaults than in other forms of violence, with the head and face frequently targeted due to their accessibility and vulnerability, as shown in a United States (US)-based study by Alessandrino et al. (2020). Further, such injuries are often caused by mechanisms such as blunt force trauma, strangulation, or being violently thrown against walls, as demonstrated by previous research from the US and Canada (Campbell et al., 2022; Haag, 2023). As a result, US researchers suggest that IPV-related injuries are likely to include TBIs and non-traumatic BIs (Liu et al., 2020). In another US study, Costello and Greenwald (2022) estimated that women who sustain BIs due to IPV may outnumber the combined total of BIs in military

personnel and athletes by 11–12 times.

Smirl et al. (2019), drawing on data from Canada, the US, Spain, and Colombia, investigated the symptoms of BI in survivors of IPV, identifying cognitive and emotional symptoms such as fatigue, anxiety, difficulty concentrating, and memory issues. While these symptoms were associated with BI severity in IPV survivors, the study also noted that these symptoms are commonly seen in other populations with BI, including those with sport-related concussions.

This intersection between IPV and BI reveals significantly high rates of BI among women experiencing IPV (Esopenko et al., 2021). US research shows that 60% to 92% of women subjected to IPV may sustain BIs directly linked to these abusive encounters. BI represents one of the most severe but least researched outcomes among individuals exposed to IPV (Iverson et al., 2017; Smith & Holmes, 2018) and the findings on the exact prevalence of BI within IPV cases remain inconsistent (Ivany & Schminkey, 2016).

Haag et al. (2019), in a Canadian study, reported that approximately 33.3% of women worldwide experience physical IPV, with up to 92% suffering injuries to the head, face, or neck, placing them at substantial risk for BI-related morbidity. Other data derived from studies across the US and Canada indicate that over 80% of IPV assault victims in hospital emergency departments sought treatment for facial injuries, and 50% had associated facial fractures (Alessandrino et al., 2020). In another US sample, about 14.6% of women (roughly 6.2 million) reported being "knocked out" due to IPV, which included being hit, slammed, or choked during violent encounters with intimate partners (Campbell et al., 2022). Further, other studies from the US also show that IPV is a substantial risk factor for BI, with IPV survivors seven times more likely to sustain BIs than non-IPV survivors (Ivany et al., 2018). Despite these high numbers, the link between IPV and BI is often overlooked in research, policy, and practice (Haag, 2023; Hunnicutt

et al., 2017). The repetitive and violent nature of IPV often leads to more severe BIs (Haag, 2023).

Karakurt et al. (2021) note that BIs resulting from IPV typically worsen over time and can vary in severity which increases the likelihood of long-term effects (Giarratana et al., 2020; Kim et al., 2023). However, the long-term impacts of these BIs have not been systematically studied (Valera & Kucyi, 2017).

According to a study by Wallace et al. (2024), women with greater exposure to IPV- related BIs exhibited a less effective neurovascular coupling (NVC) response, the process by which blood flow to the brain adjusts during brain activity. This was especially evident following non-fatal strangulation (NFS) during IPV episodes. The study, conducted in Canada, also found that women who experienced NFS displayed chronic symptoms such as depression, anxiety, and PTSD. Additionally, head impacts alone contributed to these effects, which were closely associated with higher levels of comorbid depression and anxiety. Similarly, survivors of IPV- related strangulation-associated alterations in consciousness and/or BIs often experience psychological distress, including depression, anxiety, and post-traumatic stress (Adhikari et al., 2024).

Cognitive dysfunction, PTSD, anxiety and depression are common among IPV survivors, and a few studies from the US, Canada and Spain (e.g., Campbell et al., 2018; Daugherty et al., 2024; Davis, 2014; Esopenko et al., 2021; Ivany & Schminky, 2016; Iverson et al., 2017; Toccalino et al., 2023; Woods et al., 2008) have attempted to explore the role of BI in the onset and progression of these disorders. Survivors of IPV who present symptoms such as anxiety, depression, dizziness, and headaches often experience post-concussive syndrome or lingering mild TBI symptoms (Liu et al., 2020).

IPV and BI in SSA and South Africa

In SSA, research from countries like South Africa, Ghana, Uganda, and Cameroon

show that IPV rates are among the highest globally, yet little is understood about the link between IPV and TBI in this context (Anto-Ocrah et al., 2022). Gxolo (2021) has emphasized that although South Africa ranks among the highest globally for TBI incidences, research on the intersection of IPV and TBI remains minimal.

Barriers to Accessing Medical Care and Support for IPV Survivors with TBI

Barriers Within the Healthcare System. Research on the intersection between IPV and TBI remains limited due to challenges in accessing and recruiting participants, insufficient research funding, lack of resources in public healthcare, and poorly maintained hospital records (Esopenko et al., 2021; Naidoo, 2013; Nicol et al., 2021). Iverson et al. (2017) and Tocallino et al. (2023) highlight that BIs often go undetected in healthcare settings, with many women lacking access to essential cognitive, neurological, and mental health support. Factors contributing to this include the gradual recovery from mild BI symptoms, limited inquiry about IPV-related injuries, and survivors' reluctance to disclose injuries due to safety concerns. Additionally, IPV-related BI is often misdiagnosed as various other physical, social, or mental health conditions, making it challenging for survivors to receive the necessary support from healthcare and community providers (Monahan, 2018).

By failing to connect common issues faced by IPV survivors, such as memory loss, headaches, and functional impairments to BI, can result in incorrect diagnoses, inadequate intervention, and insufficient treatment. This oversight can lead to significant consequences, including job loss or underemployment, increased abuse severity due to impaired judgment from TBIs, and a higher risk of permanent brain damage if a second injury happens before the first has healed[1] potentially leading to death (Ivany & Schminkey, 2016).

[1] Second Impact Syndrome (SIS) occurs when an individual sustains a second brain injury before fully recovering from the first (Cobb & Battin, 2004).

Social and Systemic Barriers. Survivors of IPV-related TBI are often neglected due to limited awareness among the public, women's shelters, and healthcare providers, compounded by the stigma surrounding IPV (Nicol et al., 2021; Yoshioka et al., 2003). As a result, IPV prevalence is also likely underestimated, particularly among marginalized groups, such as the homeless, incarcerated, or economically disadvantaged, who often go unreported in studies. Many IPV survivors also avoid reporting abuse out of fear, shame, or other social and economic pressures, which compounds the underreporting of IPV and TBI (Smith & Holmes, 2018). In some cases, survivors may refrain from reporting IPV to protect themselves or even their partners (Iverson et al., 2017).

The barriers to accessing medical care for survivors therefore include fear of retaliation, embarrassment, financial and economic dependence on the abuser, distrust of healthcare providers, cost of care, lack of transportation, or abuser interference (Alessandrino et al., 2020; Costello & Greenwald, 2022; Monahan, 2018). Additionally, the lack of a comprehensive understanding of IPV-related TBI, limited resources as well as the gaps in literature and research relating to the phenomena creates a barrier in identifying the needs and unique situations of the survivors which hinders the identification and support of IPV-related TBI of such survivors, especially in South Africa, where both issues remain under-researched (Haag, 2023).

Post-Traumatic Stress Disorder (PTSD)

Definition of PTSD

PTSD is a mental health disorder that can arise following exposure to a traumatic or life-threatening event. A diagnosis of PTSD, according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), is made when an individual exhibits symptoms such as: intrusive thoughts or flashbacks of the traumatic event, efforts to avoid trauma-related reminders, negative shifts in cognition and mood, and alterations in reactivity,

such as hypervigilance or hyperarousal (Smith & Holmes, 2018; Van Praag et al., 2019).

Additionally, Iverson and Golovski (2018) describe other symptoms, including nightmares, emotional distress, detachment, amnesia, and insomnia. A key feature of PTSD is the experience of flashbacks, during which individuals may dissociate from their surroundings, reliving the traumatic event as though it is occurring in the present. PTSD symptoms may present immediately after the traumatic event or develop gradually, sometimes appearing up to six months later (Smith & Holmes, 2018). PTSD can lead to significant distress and functional impairment, impacting an individual's capacity to function in personal, professional, and social spheres (Vasterling et al., 2018).

PTSD and IPV

IPV is strongly linked to symptoms of various mental health disorders (Spencer et al., 2019), with PTSD being one of the most prevalent (Perez et al., 2012; Yalch & Rickman, 2022). Research has consistently shown a clear connection between IPV and an increased risk of developing PTSD, with an average prevalence of 64% among abused women, and that PTSD severity increases with the intensity of abuse and can persist long after the abusive relationship has ended (Pico-Alfonso, 2005). A previous study suggests that IPV is more likely to result in PTSD than other forms of trauma, for example, based on their report, 55% of rape victims develop PTSD, while 7.5% of accident victims experience the same (Bryant, 2011).

A meta-analysis found that PTSD symptoms were present in 31% to 84.4% of women exposed to IPV (Dokkedahl et al., 2022). IPV may be particularly associated with PTSD symptoms compared to other traumatic stressors due to the intense interpersonal betrayal it involves, as well as its often chronic and repetitive nature (Levendosky et al., 2012). The strong relationship between IPV severity and PTSD symptoms further highlights the serious mental health impact of IPV (Bargai et al., 2007).

PTSD and BI

PTSD is also a common consequence of BI, with even mild BI linked to an increased risk of developing PTSD (Iljazi et al., 2020; Loignan et al., 2020). The intersection between PTSD and BI has garnered increasing attention over the years (Bryant, 2011). According to Van Praag et al. (2019), meta-analyses have shown that PTSD is more prevalent in patients who have sustained BIs. This finding supports the idea that certain factors specific to BI, like disruptions in brain circuitry, could contribute to the co-occurrence of BI and PTSD. Both conditions exhibit a range of shared symptoms, including headaches, fatigue, depression, irritability, nausea, sleep disturbances, slowed cognitive processing, memory deficits and concentration difficulties. Therefore, the authors suggest that the symptoms of BI and PTSD can interact with each other, possibly amplifying the overall impact.

Research by Loignan et al. (2020) indicates that, compared to other physical injuries, BI increases the risk of developing PTSD, leads to more severe symptoms, delays PTSD recovery, and suggests that certain injury mechanisms, such as assault, are more psychologically distressing or violent than others, making them more likely to trigger PTSD.

PTSD and TBI in Women Affected by IPV

As noted, IPV is linked to a range of physical and mental health consequences, including BI and PTSD (Kwako et al., 2011), and that women who experience IPV are at an elevated risk of developing PTSD (Iverson et al., 2017). Sustaining a TBI during IPV-related trauma further increases the likelihood of PTSD (Farley et al., 2018). The repeated physical trauma, chronic stress and physiological disruptions that often accompany IPV contribute to the development of PTSD, with BI exacerbating this process by affecting brain regions involved in memory, emotional regulation, and self-regulation (Kwako et

al., 2011).

PTSD may develop after BI due to several factors, including the implicit encoding of sensory and affective experiences related to trauma, the influence of family and others in reconstructing the traumatic memory, and the memory of the circumstances surrounding the traumatic event (Vasterling et al., 2018). Furthermore, the severity of PTSD symptoms may be heightened by greater physical violence and an increased number of traumatic experiences (Costello & Greenwald, 2022).

Vasterling et al.'s (2018) epidemiological study found that PTSD certainly develops following BI, and when BI and psychological trauma such as IPV co-occur, PTSD may develop or be exacerbated if it was present previously. Farley et al. (2018) reported that those who sustain an IPV-related BI are more likely to develop PTSD than those with BI from other causes and that individuals exposed to repeated IPV-related BIs may face difficulties with cognitive functions such as memory and executive function, further complicating PTSD recovery.

The overlap of common symptoms shared between BI and PTSD often leads to challenges in differentiating between the two disorders, with some clinicians misinterpreting or failing to distinguish between the symptoms of BI and PTSD (Monahan, 2018). As a result, there is an increased risk of misdiagnosis, particularly in cases where individuals have experienced both physical trauma and psychological distress, such as in IPV survivors. Symptoms like sleep disturbances, memory problems, irritability, and dizziness are common to both PTSD and mild BI, which complicates the diagnostic process (Ivany & Schminkey, 2016).

Research Gaps in the Intersection of IPV, TBI, and PTSD: Global Perspectives and the South African Context

Recent studies have emphasized the lasting effects of PTSD, depression and cognitive dysfunction in women who have experienced IPV; however, the role of BI in the development and progression of these disorders is often overlooked and underexplored (Anto-Ocrah et al., 2022).

Valera et al. (2003, 2019, 2020, 2021, 2022) brought attention to the prevalence of BIs associated with IPV and its impact on the survivor's cognitive and psychological functioning, by using an inclusive approach to understanding the neuropsychological, psychological, and neural consequences of such injuries. Valera's and others' (e.g., Adhikari et al., 2024; Alessandrino et al., 2020; Bramlett & Dietrich, 2015; Campbell et al., 2018; Costello & Greenwald, 2022; Dams-O'Connor, 2014; Daugherty et al., 2022) work have paved the way for interventions in legal, social and educational platforms for abused women who live abroad (Massachusetts General Hospital [MGH], 2021).

As such, much of this work is focused on Western populations, and the intersection of TBI, PTSD, and IPV in marginalized communities, particularly in South Africa, remains underexplored. While South African researchers, (e.g., Abrahams et al., 2024; Bolarinwa et al., 2023; Boonzaier et al., 2005, 2011, 2016, 2019, 2023; Buqa, 2022; Gass et al., 2010; Gordon, 2016; Govender, 2023; Joyner & Honikman, 2015; Mthembu et al., 2021; Ndlovu et al., 2022; Russell et al., 2014; Sere et al., 2021; Van Niekerk & Boonzaier, 2019; Zungu et al., 2024) have provided valuable insight into the prevalence and dynamics of IPV in high-risk communities, the intersection between IPV, TBI, and PTSD remains an underexplored area.

Tocallino et al. (2023) notes that the overlap of BI and mental health disorders in IPV survivors is an area that warrants more attention. The scarcity of research on the

intersection of BI and PTSD in IPV survivors (the "triple intersection") highlights the need for further investigation to understand the complex ways in which these factors interact and affect the well-being of survivors.

Much of the research to date has focused on these conditions in global settings, with limited attention given to survivors in marginalized communities. A recent study conducted in Turkey also explored the neuropsychological effects of domestic violence, IPV and its link to TBI, which adds to the growing body of work calling for more research in underrepresented populations (Yousuf, 2024). In conclusion, while existing literature has explored the individual impacts of IPV, TBI, and PTSD, there remains a significant gap in understanding how these factors intersect, particularly in South African contexts.

The current study aims to bridge this gap by focusing on the co-occurrence of IPV, TBI, and PTSD, exploring how these interconnected factors contribute to mental and cognitive health challenges in women. By addressing these intersections, this study will offer valuable insights that can assist with more effective, targeted interventions and support for IPV survivors, particularly in South Africa.

Rationale

South Africa is known to have high rates of IPV and BIs (Abrahams et al., 2019; Gordon 2016; Joyner & Honikman, 2015; Mthembu et al., 2021; Naidoo, 2013), both of which are significant public health concerns. Research suggests that women who experience IPV may be at risk of sustaining BIs (Esopenko et al., 2021; Iverson et al., 2017; Smith & Holmes, 2018), highlighting a potential intersection between these factors. IPV and BI have been associated with mental health challenges, such as PTSD (Iverson et al., 2017; Kwako et al., 2011), but the extent to which these experiences contribute to PTSD remains unclear. As noted, although the focus on research on IPV and BIs has increased in recent years, research of this nature in South Africa, remain scarce. This

study seeks to explore the relationship between IPV, TBI, IPV-related TBI, and PTSD, aiming to contribute to a growing understanding of these issues and their implications for mental health.

Aims and Hypotheses

The research aimed to investigate rates of reported symptoms of probable PTSD in a sample of South African women who have and have not experienced IPV and who may/may not have experienced TBI. The current study, given the specific measures employed, will make reference to TBIs, rather than BIs generally. Further, the research also aimed to investigate whether IPV and/or TBI independently or together better predicted probable PTSD outcomes in the sample.

I hypothesized that:

Women in the sample that were exposed to IPV, TBI, or both would exhibit higher rates of probable PTSD symptoms compared to those women in the sample without such experiences; with the combination of IPV and TBI expected to be the strongest predictor of PTSD outcomes.

Method

This study formed part of an ongoing larger research project that aims to investigate the prevalence of TBI in a sample of South African women who have/have not experienced IPV and have/have not sustained TBIs, associated neuropsychological and mental health outcomes, and the lived experiences of some of the participants.

Research Design and Setting

The research design for the current study was quantitative and cross-sectional which investigated whether group membership (women who have experienced IPV [referred to as the IPV group] vs women who have not experienced IPV [referred to as the no-IPV group] and those who did or did not report sustaining a TBI [TBI vs no TBI

groups, respectively]) predicted outcomes on a PTSD screening measure. The independent variables were IPV and TBI and the dependent variables were PTSD and trauma. A quantitative cross-sectional design was chosen as it allows for the examination of relationships between variables at a single point in time (Watson, 2015). Data was collected from women at the Saartjie Baartman Centre for Women and Children, the Phillipi Village Community Centre, the Delft Community Health Centre, and Saint Vincents Community Health Clinic in Cape Town in the Western Cape province.

Participants

The final sample consisted of 81 women aged 18 years and older, who were English and/or Afrikaans speaking and from low to middle income socioeconomic status (SES) backgrounds. Of the 81 women, 58 participants self-reported experiencing IPV and were classified into the IPV group, while 23 participants reported not experiencing IPV and were classified into the no IPV group. A full breakdown of the sample's demographic characteristics is provided in Table 1 in the Results section. Participants were recruited using purposive and snowball sampling methods.

An a priori power analysis, using G*Power software (Version 3.1.9.4), with linear multiple regression analysis parameters set at effect size Cohen's f=.15 (medium effect size), 4 predictors, and a =.05, suggested that a sample size of 85 would be adequate to achieve statistical power of .80. Hence, a minimum of 85 participants was the target sample size. Individuals were excluded from participating in the study if they were: (a) of male sex, (b) under the age of 18 years, (c) and were not English and/or Afrikaans speaking.

Measures

Screening Measures

Demographic Questionnaire and Asset Index. The demographic and asset index questionnaire is a measure that asks about an individual participant's basic demographic information and their socio-economic environment. This is done on two levels. On the first level, information is gathered on the participants' education level, their occupation, and income. On the second level, it assesses the extent of access that the participant and their family have to material assets such as running water and electricity in their homes. The purpose of this latter component is to determine if the participant possesses a high, medium or low ownership of assets (Harling et al., 2008).

The Primary Care PTSD Screen for DSM-5 (PC-PTSD-5). The PC-PTSD-5 is a 5- item questionnaire used to assess individuals in primary health care settings for probable PTSD. The PC-PTSD-5 was found to have an efficiency score of 85% in being diagnostically accurate (Cameron et al., 2003). A study investigating the effectiveness of screening tools for common mental health disorders and suicide risk in primary care settings in South Africa noted that the PC-PTSD-5 had good internal consistency and criterion validity (0.80–0.89; Stockton et al., 2024).

The Life Events Checklist for DSM-5 (LEC-5). The LEC-5 is a 17-item self-report measure which screens for potential traumatic events (PTEs) during an individual's lifetime. The LEC-5 contains 16 events which are known to be associated with PTSD or distress and one extraordinarily stressful event. There is no formal scoring or interpretation required for this tool. Respondents only have to indicate the varying level of exposure to each type of PTE on a 6-point nominal scale and includes the following response categories: "happened to me, witnessed it, learned about it, part of my job, not sure, and doesn't apply". For the purposes of analysis, responses were grouped into four

categories based on the nature of exposure: (1) directly experienced the event, (2) witnessed the event, (3) learned about the event from another person/source, and (4) exposed to the event as part of their job. These categories were treated as distinct variables in the analysis, allowing for a comparison of trauma exposure types across the sample. The LEC-5 is seen as a reliable measure with sound psychometric properties (Grey et al., 2004). The LEC-5 supports cross-cultural generalizability of traumatic exposure in a variety of contexts including South Africa, which made this measure appropriate for the use in this study (Nortje, 2018).

The Women Abuse Screening Tool (WAST). The WAST is employed to assess whether a woman is involved in an abusive relationship (Brown et al., 1996). The WAST is an 8-item assessment tool which is administered through self-reporting (Basile et al., 2007). The WAST is an efficient tool to identify physical, emotional and sexual abuse with a smaller number of items and easy implementation (Salahi et al., 2018). The WAST is typically used in women's shelters and health clinics to assess women who have experienced abuse as well as those who have not. Each item is rated on the following scale: a lot, some, none, often, sometimes or never (Basile et al., 2007). The WAST was assessed in terms of its reliability and validity and the co-efficient alpha was found to be around 0.95, which indicated that it was a reliable measure to use in this study (Brown et al., 1996). Use of the WAST to detect IPV has not been extensively explored in healthcare settings in South Africa.

The Brain Injury Screening Questionnaire (BISQ). The BISQ is a structured questionnaire that measures the history of TBI across the lifespan, including specific incidences and the severity thereof. The latest version of the BISQ was employed, which includes a dedicated section for evaluating TBI resulting from IPV (Dams-O' Connor et al., 2014). The BISQ can be completed independently as a self-report or administered in

an interview style. In the current study, TBI was primarily assessed using the BISQ, which was administered in an interview style.

The BISQ examines brain injuries across several areas, including participation in organized sports, injuries sustained due to IPV, and other potential causes such as head injury-related hospitalizations, neuroimaging, history of skull fractures or brain surgeries. The participants responses are recorded as either 'yes', 'no' or ‘multiple’. The specificity of these questions aids in enhancing the accuracy of injury recall. Additionally, all participants who responded ‘yes’ or ‘multiple’ to a type of brain injury are then asked to report if they ever ‘lost consciousness’ and/or felt ‘dazed’ or ‘confused’ after the injury, which is recorded in minutes, hours, days or weeks. This allows for the assessment of the severity of the brain injury. The BISQ is a clinically relevant and widely used tool to document a TBI event or detect possible chronic TBI (Dams-O’Connor et al., 2014). Although research on the BISQ in South Africa is limited, it is recognized for its high test-retest reliability concerning a lifelong history of head trauma and its good criterion validity for repeated brain injuries (Diamond et al., 2007).

Statistical Analyses

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 25.0, with significance determined at a threshold of $p < .05$. Prior to the analyses, the data was cleaned and verified to ensure accuracy. Some of the SPSS-generated data was exported to Microsoft Excel 2019 (Build 2412) to generate the visual representations of the data used in the study.

To address the research objectives comprehensively, I organised the analyses into distinct themes, each focusing on a key variable of interest: IPV, TBI, history of trauma, and PTSD. I then explored the relationships between the core variables, before running the regression analyses. This initial thematic approach allowed for in-depth examination

of each factor, ensuring that the analyses of the relationships between them which followed were thoroughly explored and understood before integrating the findings across the different themes into predictive models.

The first section of the analysis began with an examination of the participants' background and socioeconomic contexts using the Asset and Demographic Questionnaire. This initial step provided a comprehensive understanding of the women who comprised the study. The participants were divided into two groups based on their experiences: those who had experienced IPV (IPV-group) and those who had not (no-IPV group). The data was systematically organized into a table, divided into the two groups and included percentage distributions. A Chi-square analysis followed to ascertain any differences between the two groups.

In the second analytical section, the focus was on IPV. Descriptive statistics were generated to summarize the types and frequency of abuse and the ages of the women as reported through the WAST.

The third section shifted focus to TBI, both non-specific and IPV-specific, using data collected from the BISQ. Chi-square tests were employed to compare categorical variables, while descriptive statistics provided insights into the frequency, context, and severity of TBIs within the sample.

In the fourth section, a comprehensive screening for a lifetime history of trauma was conducted across the entire sample, with particular emphasis on the IPV group. Data from the LEC-5 was used to assess trauma exposure, which was then graphically presented. To further control for trauma-related factors, I then created distinct groups (IPV vs. no-IPV, TBI vs. no- TBI, and IPV-related TBI vs. no-IPV-related TBI). The exposure to trauma (directly experienced, witnessed, or learned about) was analysed within these groups, and the data was arranged and presented in graphs.

In the fifth section, the focus shifted to PTSD. PTSD prevalence was assessed using the PC-PTSD 5 measure. Chi-square analyses were conducted to compare PTSD outcomes between the different groups (IPV vs. no-IPV, TBI vs. no-TBI, and IPV-related TBI vs. no- IPV-related TBI). In instances where the expected cell counts were less than 5, Fisher's Exact Test was used to ensure statistical validity. The results of these analyses were presented through graphical presentations.

The final section of the analysis, informed by all of the previous analyses, aimed to address the study's primary hypothesis: whether IPV and/or TBI independently or jointly predict probable PTSD outcomes through the use of two regressions. Simple regression analyses were run first, to examine the individual effects of IPV, TBI, and IPV-related TBI with probable PTSD. A multiple regression analysis was then used to examine the combined effect of IPV, TBI, and IPV-related TBI with probable PTSD. Both regressions were presented in table format and assisted with investigating the study's hypothesis.

Procedure

Once ethical approval was granted from the Department of Psychology's Research Ethics Committee (REC) at the University of Cape Town (UCT) (reference number: PSY2020-020; see Appendix A), advertisements (see Appendices B and C) were created by myself and a team of postgraduate psychology students (involved in the larger study) at the Department of Psychology at UCT. Thereafter, various women's shelters and health clinics around the city of Cape Town were contacted telephonically and via email, and meetings with the centre's representatives were arranged in person to discuss the nature and purpose of the study.

Two organisations and two health centres granted permission and agreed to distribute the advertisements amongst the women who resided at and visited the centres

(those who had experienced IPV and those who had not), namely the Saartjie Baartman Centre for Women and Children, the Phillipi Village, the Delft Community Health Centre, and Saint Vincents Community Health Clinic. At the Saartjie Baartman Centre, the centre's representative notified me of all the women who were interested in taking part in the study and then arranged for rooms where interviews could take place, and scheduled times and dates where each participant could be seen.

At the Phillipi village, the research team and I received phone calls and messages from women interested in participating in the study via the Whatsapp social media platform. We then scheduled times and dates for interviews after confirming the availability of rooms at the Phillipi village. At both of the health clinics, the interested participants also messaged via Whatsapp and interviews were then scheduled and conducted for these participants by one of the research members on the team. The research measures described were then administered by myself and the other research team members.

Firstly, a consent form (see Appendix D) was given to the participants which included a detailed outline stating the nature and purpose of the study and what participating in the study would entail for participants. The information within the consent form was explained to each participant before the commencement of any activity related to the research, allowing them to raise any concerns or questions they had pertaining to any part of the interview process and to provide them with time to make an informed decision regarding participation.

The other postgraduate researchers and I were trained in the administration and scoring of the measures to ensure standardized testing procedures. The interviews and administration of the measures took place in secluded rooms and quiet areas within these centres; this was done to create a safe space for the participants and to

maintain confidentiality. The interviews took approximately 2 hours each and were conducted on a one-on-one basis.

The participants received refreshments during the process (a juice box and chips) to cater for potential hunger and fatigue during the interview process. The participants also received a R100 food shopping voucher from Checkers/ Pick and Pay as a token of thanks for their contribution and time. Once the interviews were concluded, participants were provided with debriefing and resource letters, should they seek follow-up services (see Appendices E and F).

Ethical Considerations

Ethical approval for this study was granted by the REC of UCT's Department of Psychology (refer to Appendix A). The broader study, of which this study is a component, also obtained ethical clearance from the same committee (reference number: PSY2022-037). The research was conducted in compliance with UCT's Ethics Code for Research Involving Human Subjects.

Informed Consent

After ethical approval was sought from the REC of UCT's Department of Psychology, consent forms (see Appendix D) containing information regarding the nature and processes of the study were given to the participants. As noted, the participants were given time to themselves to decide if they wanted to continue with the process or not or if they had any questions, issues, or concerns that they wanted to discuss. The consent forms also emphasised that the participant could withdraw from the study at any point in time for any reason and without any penalties. After dealing with any concerns that arose, the participants were then asked to sign the consent forms.

Confidentiality

The research team and I explained to the participants that all data collected in the

study would remain confidential and that no identifying information would be used during the data analysis or in the final write-up of the study. They were assured that their names and personal details would not be entered into the database; instead, each participant would be assigned a numerical code to maintain anonymity. Additionally, it was explained that the data would be stored on a password-protected file and device, and all hardcopies of the data collected would be stored in a locked cabinet in the supervisor's office in the Department of Psychology at UCT and that the data was only accessible to the research team, myself, and our supervisors, who are all working on different aspects of the same study. Participants were also assured that the data would be used exclusively for the purposes of this study.

Benefits and Risks

The study dealt with sensitive issues which had the potential to trigger previous trauma in the participants and could possibly cause emotional distress and psychological trauma; to combat this, the possible risks were explained to participants beforehand, and they were then given the opportunity to decide if they wanted to proceed or discontinue the interviews. If participants chose to continue, given these vulnerabilities, they were provided with debriefing and resource letters containing emergency contact numbers for myself, the supervisors, and relevant organizations to reach out to if they needed assistance after the session in the event of any distress. Also, the sessions lasted approximately 2 hours and to manage participant fatigue, breaks were offered whenever requested.

Although there were no direct benefits to participants through taking part in this study, the researchers explained to participants how their contribution to the study aids in increasing knowledge and awareness around IPV, TBI and trauma outcomes, and may play a role in assisting and understanding women who may experience similar events in

the future.

The study was conducted under the guidance of two supervisors who have extensive expertise in IPV and TBI. Both the primary and co-supervisor have conducted significant research in these areas, offering valuable insights throughout the study. If needed, I was able to consult them directly for guidance and support, ensuring the research was well-informed and aligned with current practices in the field.

Debriefing

Once the interviews were concluded, participants then received a debriefing form (see Appendix E). The debriefing form contained the contact information for myself and my primary supervisor and it explained that if the participant had any concerns regarding their participation in the study, or if they felt anxious or unsettled about their participation, then they could contact me or my primary supervisor. The contact numbers and email addresses for myself and my primary supervisor were provided in the debriefing letter.

Referrals

Once the debriefing was concluded, participants were then given resource letters (see Appendix F) containing the names, contact numbers, and email addresses of various women centres and organizations around the city of Cape Town who provide free services to women who have experienced gendered abuse and sexual violence. Researchers then explained to participants that if they felt the need to seek help regarding their circumstances, then they could contact these centres or organizations for assistance, or they could contact me to arrange and facilitate communication/contact with these centres.

Results

This work forms part of a larger project titled *"Investigating the Prevalence of TBI in a Sample of South African Women Who Have Experienced IPV in a South African Context"*, led by Professor Floretta Boonzaier and Associate Professor Leigh Schrieff Brown, with contributions from a master's level researcher, Caron Zimri and honours-level researchers Gemma Sutherland and Oona Fraser, who explored the intersections between IPV and TBI with different related outcomes. This current project specifically focused on the association with PTSD whereas others explored the lived experiences of women who experienced IPV and a possible TBI.

Section I: Sample Sociodemographics

The final sample included 81 participants, all of whom were female and aged 18 years and older. Table 1 presents the sociodemographic variables including age, home language, highest level of education, yearly household income, employment status, past job history, and the results of the asset index. The ages of the women in the study ranged from 20 to 59 years, with just over half of the sample aged between 20-29 years (51.85%). Most participants reported isiXhosa as their home language (66.66%). Notably, all participants could converse and complete all questionnaires in English. Many participants had completed matric (38.27%), while 34.56% attended some secondary grades (grades 8-11), but did not complete high school. At the time of the study, more than half of the participants in the study were in a relationship (55.55%) and 74.01% of participants reported being unemployed. Further, almost 26% of participants reported having done past unskilled jobs, and almost 25% reported being students or having no previous occupational history. A significant portion of participants reported an annual household income ranging from R25,000 to R100,000. Regarding financial and material resources, 53% of the women were classified within the medium asset index category,

indicating moderate access to resources. Regarding areas of residence, almost half of the participants were from Phillipi (48,14%), and the remaining participants were from various neighbourhoods and townships within the greater Cape Town area.

Table 1

Sociodemographic Characteristics of Women in the: IPV Group (n=58), No-IPV Group (n=28), and Total Sample (N=81)

Variable	*IPV (n=58)*	*No-IPV (n=23)*	*N (%)*
Age Groups			
20-29	27 (46.55%)	15 (65.21%)	42 (51.85%)
30-39	21 (36.20%)	6 (26.08%)	27 (33.33%)
40-49	6 (10.34%)	1 (4.34%)	7 (8.64%)
50-59	4 (6.89%)	1 (4.34%)	5 (6.17%)
Home Language			
isiXhosa	37 (63.79%)	17 (73.91%)	54 (66.66%)
Afrikaans	12 (20.68%)	2 (8.69%)	14 (17.28%)
English	7 (12.06%)	4 (17.39%)	11 (13.58%)
Shona	1 (1.72%)	0 (0%)	1 (1.23%)
Swahili	1 (1.72%)	0 (0%)	1 (1.23%)
Relationship status			
In a relationship	29 (50%)	15 (65.21%)	44 (54.32%)
Single	28 (48.27%)	8 (34.78%)	36 (44.44%)
Unknown	1 (1.72%)	0 (0%)	1 (1.23%)
Highest level of Education			
Grade 1-6 (did not complete primary school)	2 (3.44%)	0 (0%)	2 (2.46%)
Grade 7 (completed primary school)	4 (6.89%)	1 (4.34%)	5 (6.17%)
Grade 8-11 (did not complete high school)	21 (36.20%)	7 (30.43%)	28 (34.56%)
Matric (completed high school)	23 (39.65%)	8 (34.78%)	31 (38.27%)
Tertiary education	8 (13.79%)	7 (30.43%)	15 (18.51%)
Yearly Household Income			
R0	4 (6.89%)	2 (8.69%)	6 (7.40%)
R1000-R5000	6 (10.34%)	2 (8.69%)	8 (9.87%)
R5001-R25 000	17 (29.31%)	6 (26.08%)	23 (28.39%)
R25 000- R100 000	28 (48.27%)	9 (39.13%)	37 (45.67%)
R100 000 +	3 (5.17%)	2 (8.69%)	5 (6.17%)
Unknown	0 (0%)	2 (8.69%)	2 (2.46%)
Current Employment Status			
Employed	15 (25.86%)	6 (26.08%)	21 (25.92%)
Not employed	43 (74.13%)	17 (73.91%)	60 (74.07%)
Past Employment			
Business managers of medium sized businesses	1 (1.72%)	2 (8.69%)	3 (3.70%)
Minor professionals	2 (3.44%)	1 (4.34%)	3 (3.70%)
Clerks, technicians	12 (20.68%)	0 (0%)	12 (14.81%)
Skilled manual – usually had training	3 (5.17%)	3 (13.04%)	6 (7.40%)
Semi-skilled	13 (22.41%)	3 (13.04%)	16 (19.75%)
Unskilled	16 (27.58%)	5 (21.73%)	21 (25.92%)
Student, disabled, no occupation	11 (18.96%)	9 (39.13%)	20 (24.69%)
Asset Ownership			
Low	18 (31.03%)	1 (4.34%)	19 (23.45%)
Medium	30 (51.72%)	13 (56.52%)	43 (53.08%)
High	10 (17.24%)	9 (39.13%)	19 (23.45%)

Note. Frequencies are reported. Percentages are reported in parentheses.

In my investigation of the relationship between demographic characteristics and experiences of IPV, I sought to identify any significant differences in the demographics between the two groups of women (those who had experienced IPV and those who had not experienced IPV). To achieve this, several Chi-square tests were performed. Table 2 includes the findings which revealed no statistically significant differences between the two groups with most demographic variables, including age, home language, relationship status, highest level of education, yearly household income, and employment status.

The descriptive data indicate that women in the IPV group seem to have a higher frequency of past employment in semi-skilled (22.41%) and unskilled (27.58%) jobs compared to the no-IPV group (13.04% and 21.73%, respectively). However, the statistical comparison shows that this difference is not statistically significant ($\chi^2 = 11.995$, $p = 0.062$).

Importantly, the comparison of asset ownership between the IPV and no-IPV groups was significant ($\chi^2 = 8.436$, $p = 0.015$), indicating that women in the no-IPV group had higher levels of asset ownership. Specifically, a larger proportion of women in the no-IPV group reported medium (56.52%) and high (39.13%) asset ownership, compared to the IPV group, where the proportions were 51.72% and 17.24%, respectively.

Table 2

Chi-square Analysis of Sociodemographic Variables: Women in the IPV Group (n=58) vs No-IPV Group (n=28)

Demographic Variable	χ^2	*df*	*p*
Age Groups	2.760	4	0.599
Home language	2.471	3	0.481
Relationship Status	1.773	2	0.412
Highest Level of Education	3.690	4	0.450
Yearly Household Income	5.854	5	0.321
Current Employment Status	0.000	1	0.983
Past Employment	11.995	6	0.62
Asset Ownership	8.436	2	0.015

Note. χ^2 = Chi-square; *df*= Degrees of freedom; *p*=p-value.

[a]For several demographic variables, some cells in the Chi-square tests had expected counts less than 5, which may affect the validity of the results. Specifically, Highest Level of Education: 5 cells (50.0%) had expected counts below 5, with a minimum expected count of 0.57; Yearly Household Income: 7 cells (58.3%) had expected counts below 5, with a minimum expected count of 0.57; Past Employment Jobs: 8 cells (57.1%) had expected counts below 5, with a minimum expected count of 0.85.

[b]For the Employment Status variable, a Fisher's Exact Test was employed instead of the Chi-square test with no cells having expected counts below 5 (minimum expected count = 5.96).

[c]The "Age Groups" variable was categorized as follows: 20-29, 30-39, 40-49, and 50-59 years. These groups were treated as categorical variables in the Chi-square analysis.

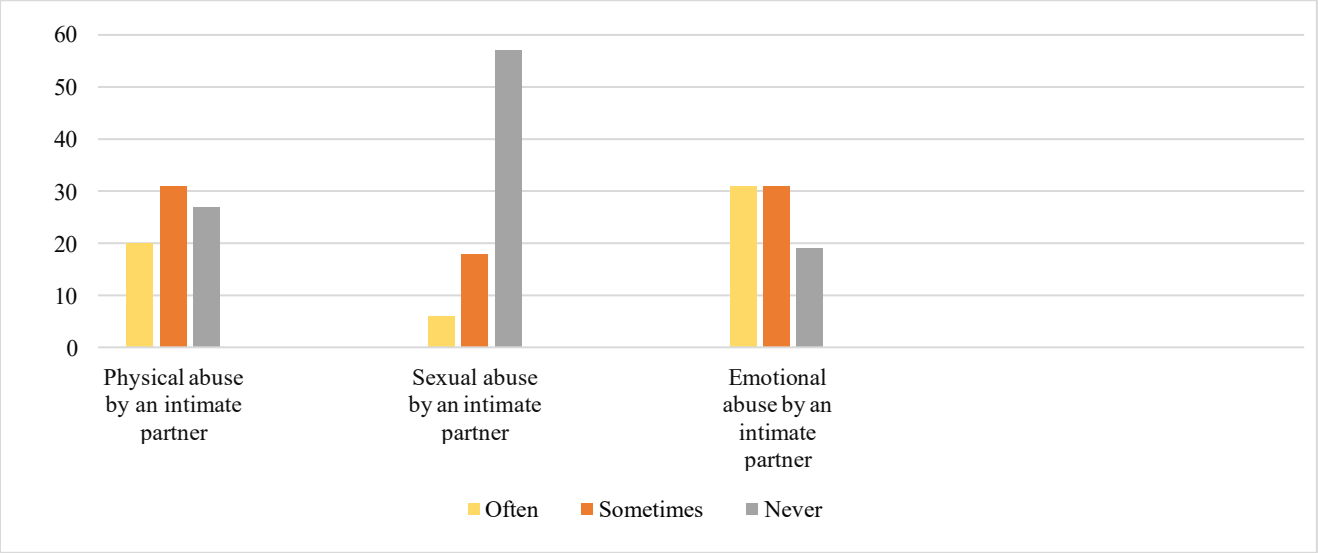
Section II: IPV

Of the 81 women who participated, 58 (71.60%) self-reported that they had experienced IPV and 23 (28.39%) self-reported that they had not experienced IPV.

Figure 1 shows findings from the WAST indicating that physical and emotional abuse inflicted by intimate partners were the most common forms of reported abuse among the participants in the study. Some participants reported more than one form of abuse.

Figure 1

Frequency of Reported Physical, Emotional and Sexual Abuse in the Entire Sample (N=81)

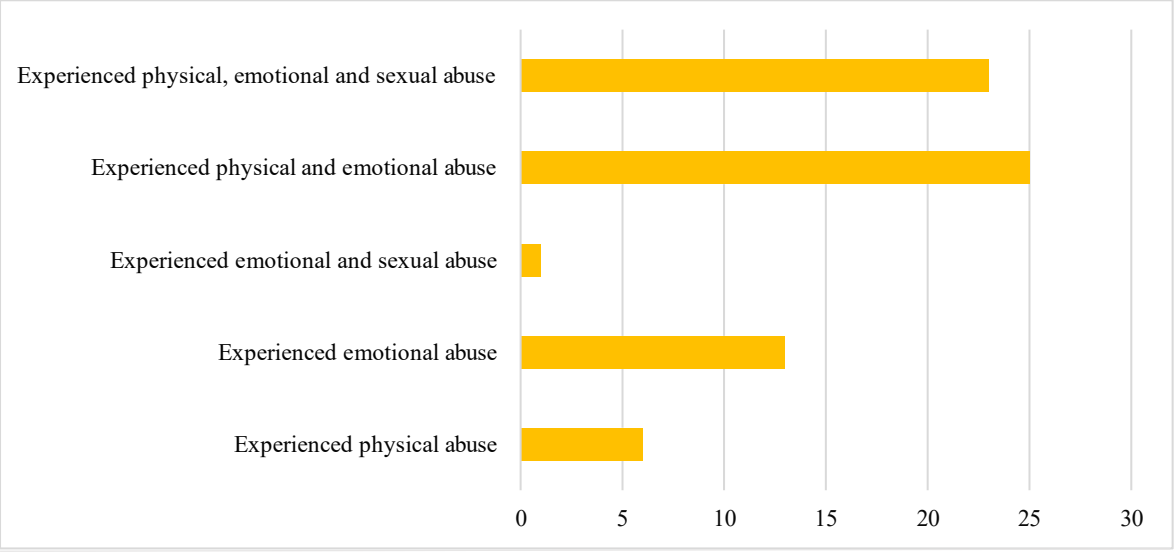


Note. Data presented are actual counts within each category.

Figure 2 shows that 23 out of the 81 women (28.39%) self-reported experiencing all three forms of abuse. Among all reported cases, the combination of physical and emotional abuse was the most common, experienced by 25/81 women (30.86%) in the study.

Figure 2

Prevalence of Participants Reports of One or More Forms of Abuse (N=81)

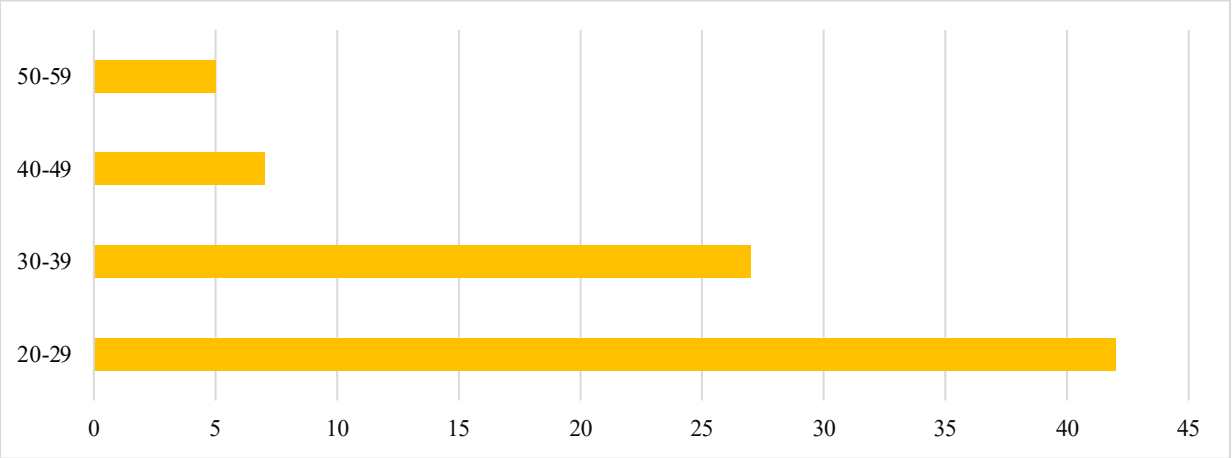


Note. Data presented are actual counts within each category.

Figure 3 shows the age distribution of women in the IPV group within the sample. The majority of participants were aged 20-29 years (51.85%) and 30-39 years (33.33%), with fewer participants in the 40–49-year (8.64%) and 50–59-year (6.17%) age groups.

Figure 3

Distribution of IPV by Age Among Women in the IPV Group (n=58)



Note. Data represented are actual counts of women in each age group within the IPV group.

In examining the relationship between age groups and experiences of IPV, a Chi-square test was run to determine if there were significant differences in IPV reporting between the age groups. The results indicated no significant differences in reports of IPV across the age groups (χ^2 =2.760, in Table 2).

Section III: TBI

Non-IPV Specific TBI

Regarding the complete sample of women, 70/81 (86.42%) participants across the IPV and no-IPV groups reported experiencing a brain injury, through various mechanisms of injury. Among the 70 women who had reported sustaining a TBI, 56 participants were from the IPV group, and 14 were from the no-IPV group. In the no-IPV group, 7/14 participants reported sustaining one TBI, 2/14 reported sustaining two TBIs, and 5/14 reported sustaining multiple (more than three) TBIs. In contrast, the IPV group exhibited a higher frequency and range of TBIs whereby 9/56 reported sustaining one TBI, 8/56 reported two TBIs, 3/56

reported three TBIs and 36/56 participants reported multiple TBIs. Table 3 displays the frequency of reported TBIs as obtained using the BISQ across the two study groups, the difference of which was statistically significant. Almost all participants in the IPV group reported sustaining a TBI (96.55%) vs almost 61% in the no-IPV group. The significant *p*-value indicates that women in the IPV group were significantly more likely to report experiencing a TBI compared to the women in the no-IPV group.

Table 3

Frequencies of TBI: IPV Group Versus No-IPV Group (N=81)

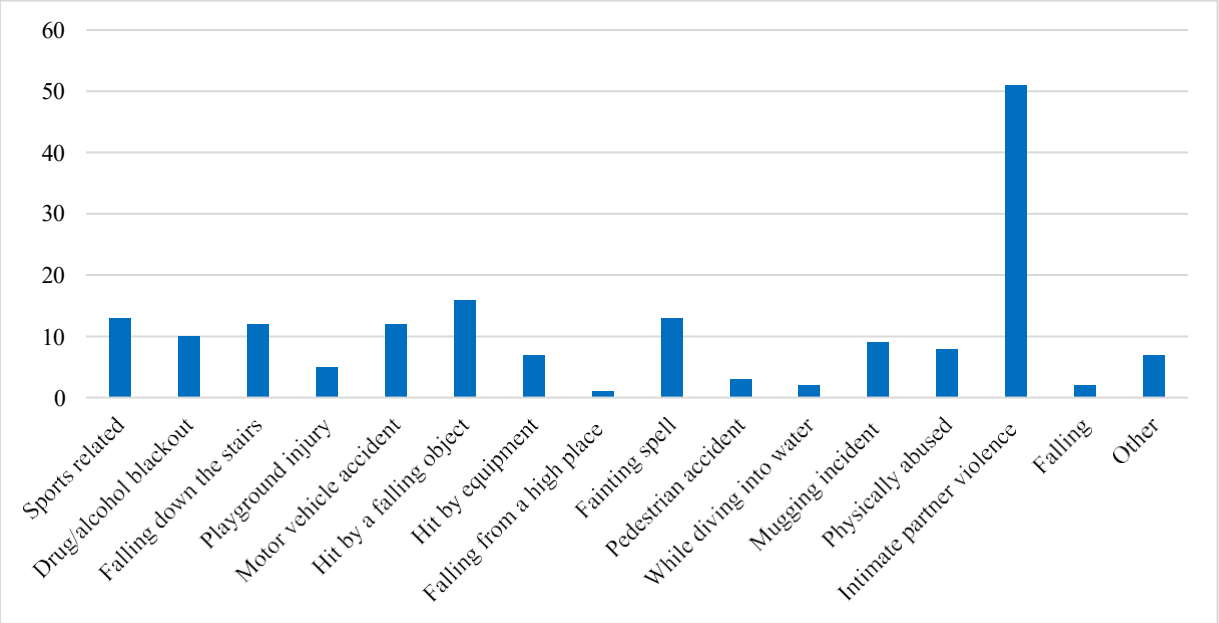
	Group				Test Statistic	
	IPV (n=58)		No IPV (n=23)			
TBI	Y	N	Y	N	χ^2	*p*
	56 (96.55%)	2 (3.44%)	14 (60.86%)	9 (39.13%)	17.876	<.001

Note. IPV= Intimate Partner Violence; TBI= Traumatic Brain Injury; Y=Yes; N=No; χ^2= Chi-square; *p*=p-value. Frequencies are reported. Percentages are reported in parentheses.

Figure 4 illustrates the various mechanisms of TBI reported among the women who experienced and reported such injuries (70/81). Each mechanism is visually depicted alongside its corresponding frequency of occurrence / report. Figure 4 shows that the majority of reported TBIs occurred in the context of IPV in the study sample.

Figure 4

Frequency of TBIs Across Different Contexts (n=70)



Note. Data represented are actual counts. TBI= Traumatic Brain Injury.
[a]The specific incidents that might be included in the "other" category are not explicitly defined in the BISQ itself, but it may be attributed but not limited to: Uncommon causes such as injuries resulting from less common situations that aren't explicitly listed, such as rare accidents or unique circumstance, unspecified incidents where participants might have a brain injury but are unsure of the exact cause or it doesn't fit into standard categories or emergent situations such as new or emerging causes of brain injury that are not yet covered by existing categories.

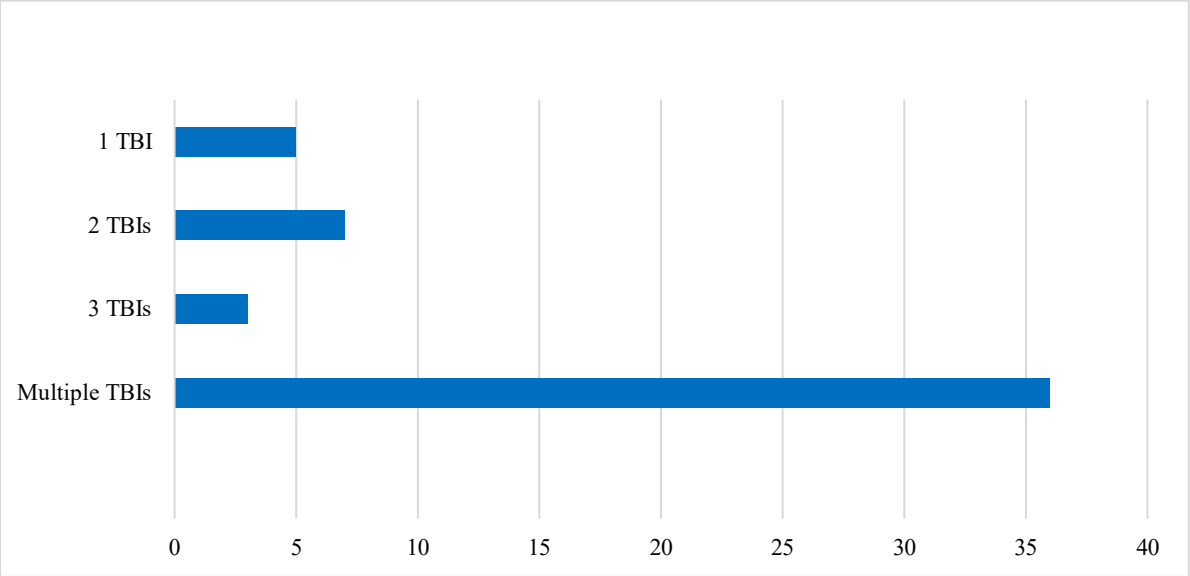
IPV-Specific TBI

In this section, the focus shifts towards TBIs specifically attributed to IPV, as reported by participants. Among the women in the IPV group, 51 out of 58 (87.93%) reported experiencing TBIs resulting from IPV-related incidents.

The analysis further aimed to illustrate the frequency distribution of TBIs specifically attributed to IPV incidents within the IPV group. Figure 5 demonstrates that a significant proportion of women 36/58 (62.06%) who reported experiencing IPV, also reported multiple TBIs occurring in an IPV-related context.

Figure 5

Frequencies of IPV-Related TBIs Reported in the IPV Group (n=58)



Note. Data represented are actual counts. IPV=Intimate Partner Violence; TBI=Traumatic Brain Injury.

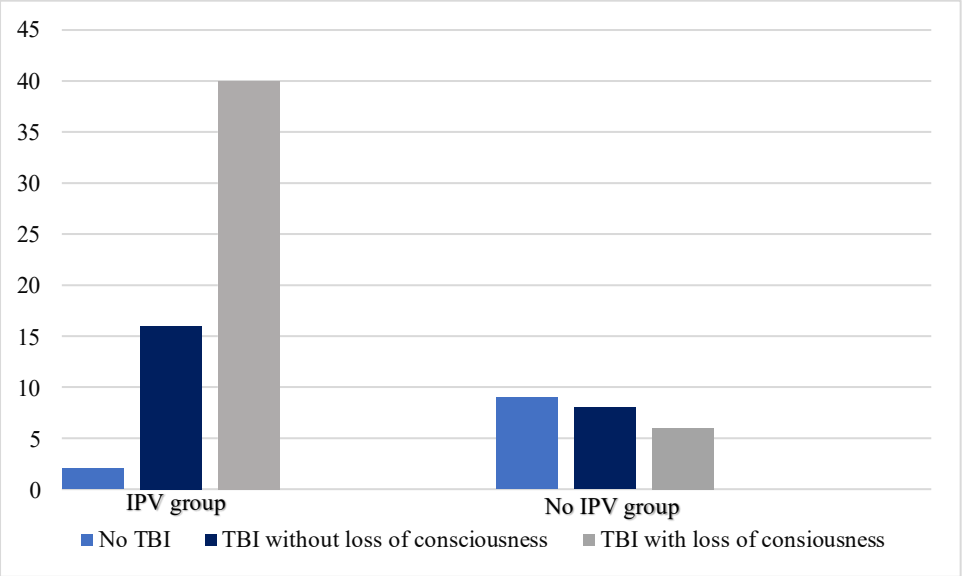
Frequency and Severity of TBIs in the IPV and No-IPV Groups

Severity of such injuries was then explored through investigating reports of loss of consciousness (LoC) and milder injuries (e.g., through reports of feelings of being dazed and confused) amongst all of the women who had reported a TBI (*n*=70). Among all the women with TBIs in the sample, 46/70 women (65.71%) reported experiencing a TBI with LoC.

Figure 6 illustrates the prevalence of TBI with LoC among women in the IPV and no-IPV groups. Of the participants who reported TBI with LoC (46/70; 65.71%), 40 women (86.95%) were part of the group who had reported experiencing IPV, while 6 (13.04%) were part of the no-IPV group. This disparity highlights a significantly higher prevalence of TBI with LoC among women in the IPV group compared to those in the no-IPV group.

Figure 6

Frequency of TBI, With and Without LoC: IPV Group Versus No-IPV Group (N=81)

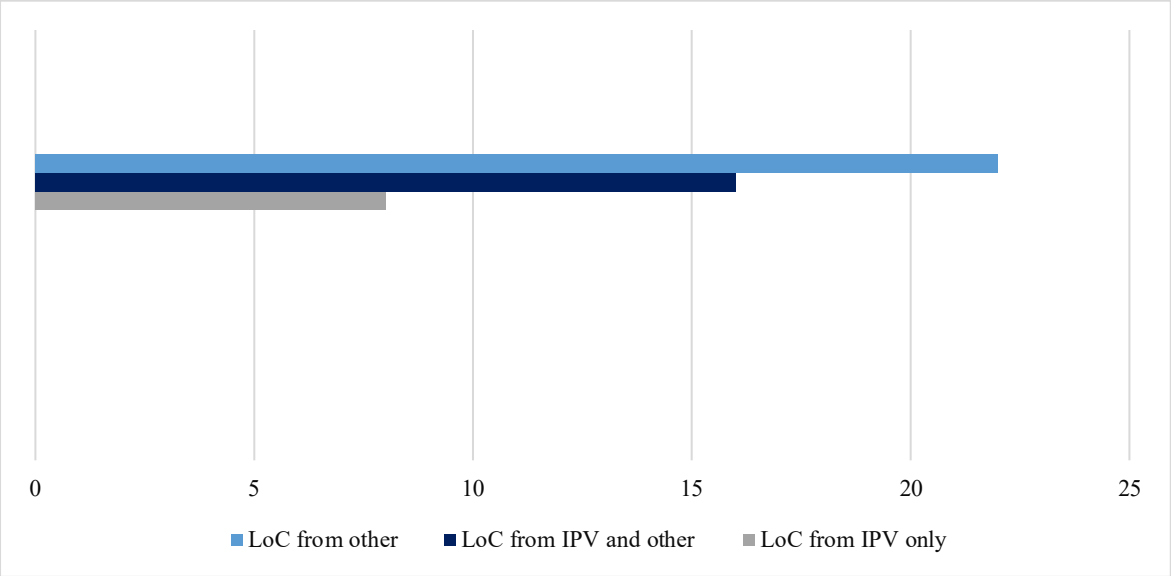


Note. Data represented are actual counts within each group. IPV=Intimate Partner Violence; No IPV=No Intimate Partner Violence.

Figure 7 visually illustrates the distribution of TBIs with and without LoC across different contexts (IPV-related context only, IPV and other contexts, and other contexts only), shedding light on the severity in terms of loss of consciousness and occurrence of TBI among women who have reported TBIs associated with LoC (*n*=46). Specifically, the findings indicate that a significant number of women reported TBIs with LoC resulting from IPV-related incidents, either exclusively or in conjunction with other incidents.

Figure 7

Prevalence of LoC with Reported TBIs Across Contexts (n=46)

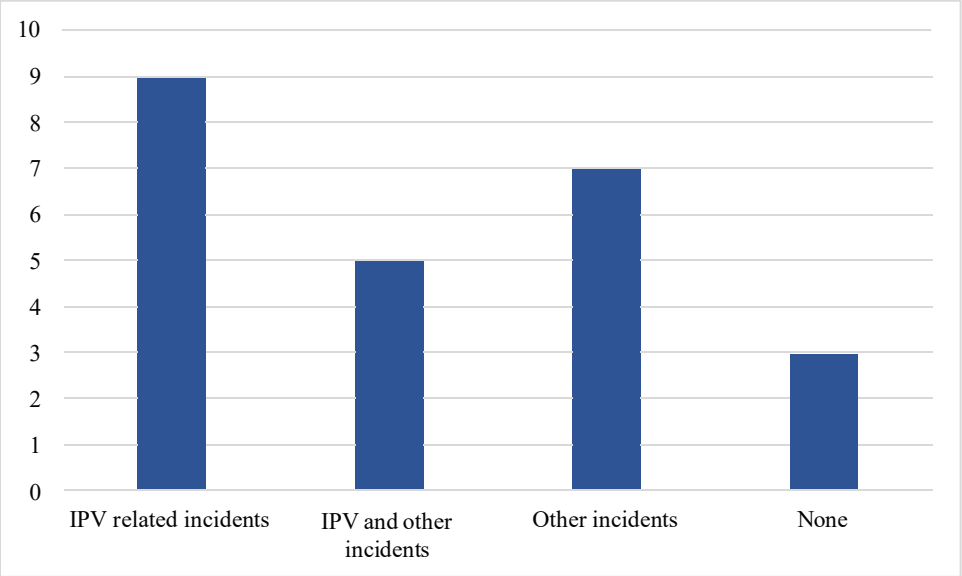


Note. Data represented are actual counts. LoC=Loss of Consciousness; IPV=Intimate Partner Violence.
[a]The figure presents prevalence of TBIs with associated LoC, categorized into three groups: LoC from other causes, LoC from IPV and other causes, and LoC from IPV only.
[b]The "other" context refer to events including accidental falls, transportation accidents (e.g., car crashes), sports injuries, workplace accidents, non-IPV assault or violence, military service (e.g., combat-related injuries), childhood accidents (e.g., falls or bicycle accidents), and recreational activities (e.g., hiking or climbing).
[c]LoC from other" refers to TBIs with associated LoC that occurred in incidents due to a variety of factors. "LoC from IPV and other" refers to TBIs with associated LoC that occurred from both IPV-related incidents and other incidents. "LoC from IPV only" refers to TBIs with associated LoC that occurred solely from IPV-related incidents.

Figure 8 illustrates the distribution of reports of feeling dazed and confused among the subset of women who experienced TBIs without accompanying LoC (*n*=24), categorized by the context in which the injuries occurred (i.e., IPV-related incidents only, IPV and other incidents, and other incidents only). It was found that a significant proportion of the TBIs without associated LoC but feeling dazed and confused also occurred in IPV-related incidents.

Figure 8

Participants Reports of Feeling Dazed and Confused Post Injury to the Head (n=24)



Note. Data represented are actual counts; IPV=Intimate Partner Violence; LoC=Loss of Consciousness.
[a]The figure displays reports of feeling dazed and confused with no LoC post a TBI, divided into 4 categories: IPV related incidents, IPV and other incidents, other incidents and none.
[b]The "other" context refer to events including accidental falls, transportation accidents (e.g., car crashes), sports injuries, workplace accidents, non-IPV assault or violence, military service (e.g., combat-related injuries), childhood accidents (e.g., falls or bicycle accidents), and recreational activities (e.g., hiking or climbing).
[c]"IPV related incidents" refer to the number of women from this subgroup who reported feeling dazed and confused post a TBI in incidents specifically related to IPV. "IPV and other incidents" refer to the number of women from this subgroup who reported feeling dazed and confused post a TBI in incidents involving both IPV and other contexts, including various other factors. "Other related incidents" refer to the number of women from this subgroup who reported feeling dazed and confused post a TBI in contexts unrelated to IPV, but still involving various other factors. "None" refers to the number of women from this subgroup who reported not feeling dazed or confused post a TBI.

Section IV: History of Trauma

Analysing Events of Trauma Exposure in the Entire Sample (N=81)

In this section, I report on the history of traumatic experiences and exposure to various traumatic events within the entire sample and then within the IPV group only. Figure 9 presents the prevalence of traumatic events among the entire sample (*N*=81).

The most frequently reported types of traumas directly experienced by participants included physical assault, assault with a weapon, sexual assault, and severe human suffering. Incidents witnessed by participants predominantly involved severe human suffering, sudden accidental death and sudden violent death. Participants were most commonly informed about incidents of sudden accidental death and natural disasters through external sources. Exposure

to traumatic events through their different forms of work was less frequently reported across all categories.

Analysing Events of Trauma Exposure in the IPV Group Only (n=58)

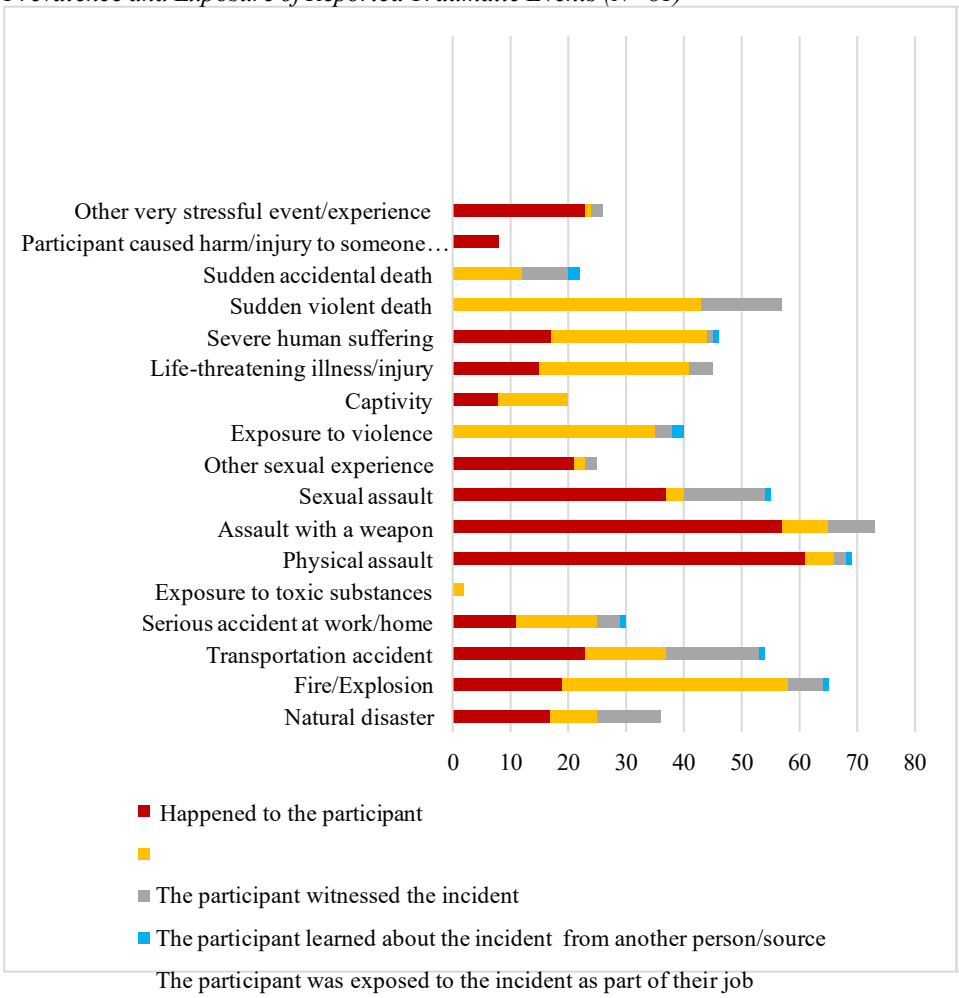
Figure 10 includes the analysis of trauma exposure within the IPV group only (*n*=58). Physical assault was the most commonly experienced trauma, with many participants indicating direct exposure. Sexual assault and assault with a weapon were also prominent, with significant reports of direct exposure. In contrast, severe human suffering and sudden violent death were often experienced indirectly, with participants learning about these events from others. Life-threatening illness or injury followed, showing both significant direct and indirect exposure. Lastly, serious accidents and transportation accidents were witnessed or heard about less frequently, while traumas like natural disasters had lower overall exposure rates.

Comparison of Traumatic Events Between the Entire Sample and the IPV Group with Sample Sizes of (N=81) and (n=58) Respectively

The comparison between Figure 9 and Figure 10 (entire sample and the IPV group) reveals differences in the prevalence and types of traumas experienced. In the IPV group, physical assault and sexual assault are significantly more prevalent as direct experiences compared to the entire sample. Assault with a weapon is also notably higher in the IPV group than in the entire sample. While sudden violent death is the most witnessed event in both groups, it appears more prominently in the entire sample. Life-threatening illness or injury shows a similar pattern in both groups, with a slightly higher incidence of witnessing these events in the entire sample. Other less common traumas, such as captivity, natural disasters and exposure to toxic substances are reported infrequently in both groups. Overall, the IPV group demonstrates a higher concentration of direct physical and sexual trauma.

Figure 9

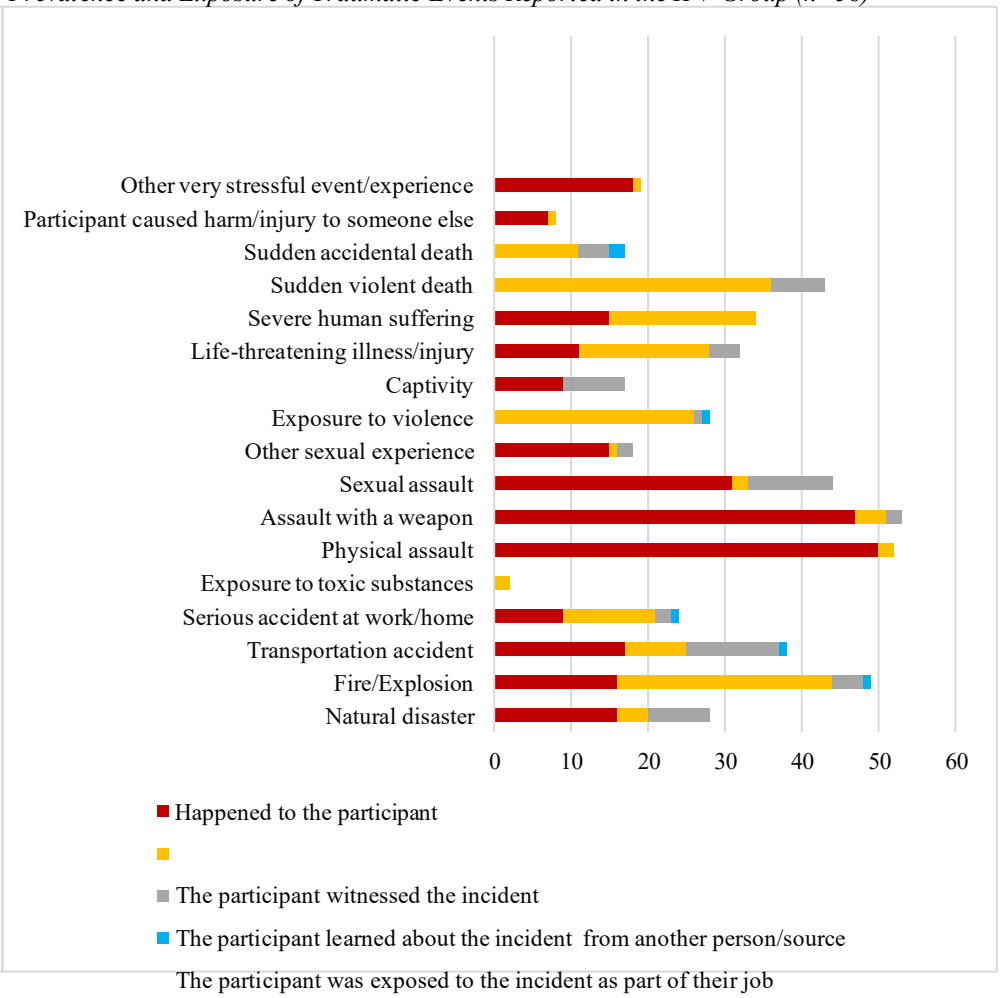
Prevalence and Exposure of Reported Traumatic Events (N=81)



Note. Data represented are actual counts.
[a]According to the LEC-5, the "other" category of events can include, but is not limited to, other natural disasters, medical events, acts of terrorism or mass violence.
[b]Participants in the study who chose the "other very stressful event/experience" attributed it to stress due to finances, health or relationships, suicidal thoughts and medical events.
[c]Participants in the study who chose the "severe human suffering" item attributed it to events such as witnessing or experiencing prolonged illness or injury (e.g., terminal illness, chronic debilitating conditions), exposure to extreme poverty, hunger, or deprivation (e.g., living in conditions of severe neglect or inhumane environments), being subjected to or witnessing intense emotional or psychological abuse that causes deep mental or emotional anguish.
[d]Serious accidents refer to any kind of accident that results in significant physical injury, damage, or danger to one's life. This can include accidents that occur at home, work, or other locations, such as falls, industrial accidents, or accidents involving machinery.

Figure 10

Prevalence and Exposure of Traumatic Events Reported in the IPV Group (n=58)



Note. Data represented are actual counts.
[a]According to the LEC-5, the "other" category of events can include, but is not limited to, other natural disasters, medical events, acts of terrorism or mass violence.
[b]Participants in the study who chose the "other very stressful event/experience" attributed it to stress due to finances, health or relationships, suicidal thoughts and medical events.
[c]Participants in the study who chose the "severe human suffering" item attributed it to events such as witnessing or experiencing prolonged illness or injury (e.g., terminal illness, chronic debilitating conditions), exposure to extreme poverty, hunger, or deprivation (e.g., living in conditions of severe neglect or inhumane environments), being subjected to or witnessing intense emotional or psychological abuse that causes deep mental or emotional anguish.
[d]Serious accidents refer to any kind of accident that results in significant physical injury, damage, or danger to one's life. This can include accidents that occur at home, work, or other locations, such as falls, industrial accidents, or accidents involving machinery.

Trauma Exposure Across IPV Versus No-IPV Groups, TBI Versus No-TBI Groups, and IPV-Related TBI Versus No-IPV-Related TBI Groups

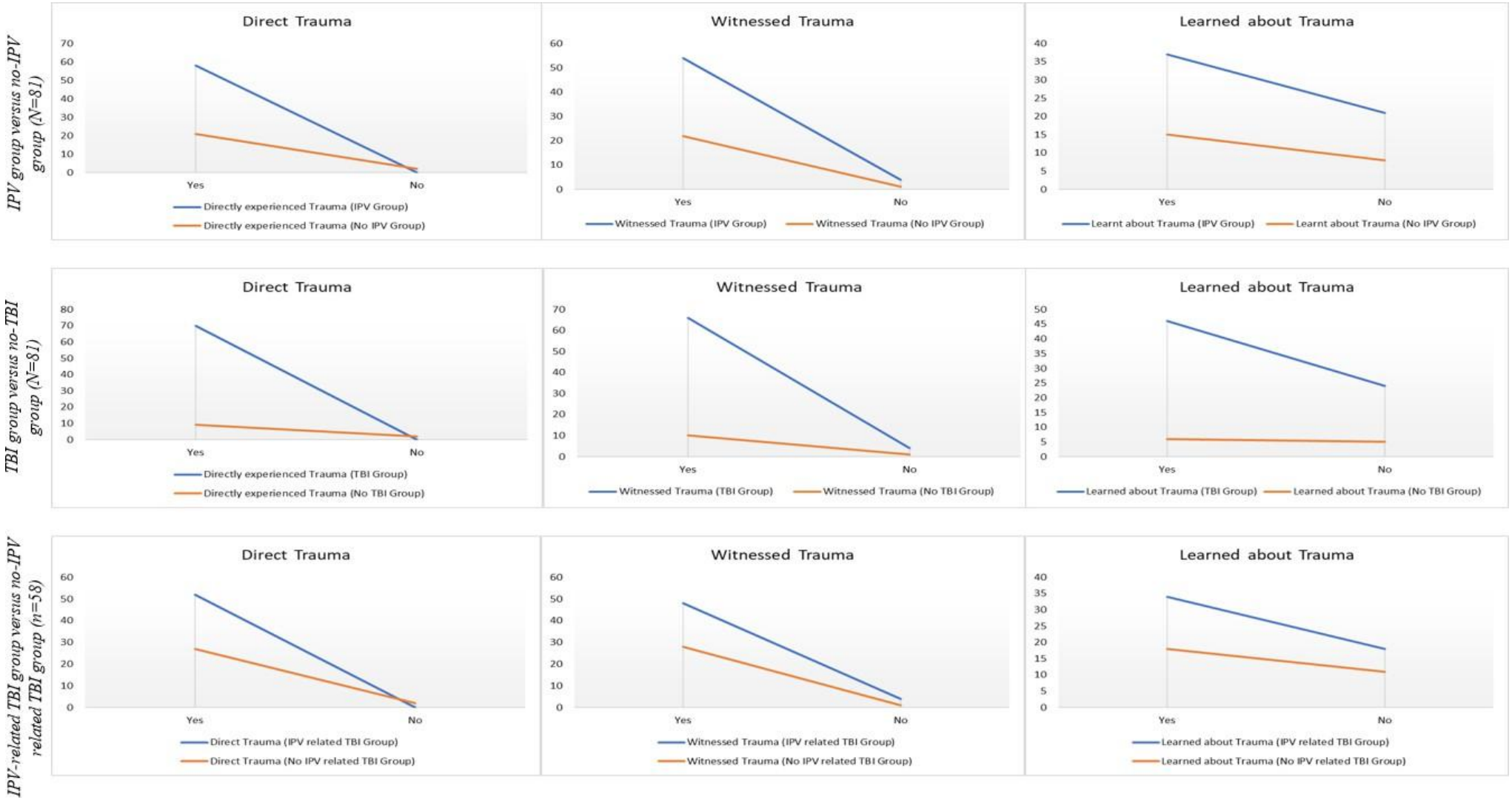
I further aimed to analyse the different types of trauma exposure (directly exposed to trauma, witnessed the trauma or learned about the trauma) across different groups: those participants who did and did not report IPV, TBI, and IPV-related TBIs. The findings are visually depicted in Figure 11 and show that participants in the IPV group consistently show higher levels of trauma exposure compared to those in the no-IPV group, whether the trauma was directly experienced, witnessed, or learned about. Similarly, participants in the TBI group reported greater trauma exposure in all three forms compared to those without TBIs. This pattern is also evident in the IPV-related TBI group, where participants have encountered trauma across all forms in comparison to those without IPV-related TBIs.

Among the three groups (IPV versus no-IPV, TBI versus no-TBI, and IPV-related TBI versus no-IPV related TBI), the IPV-related TBI group exhibits the highest levels of trauma exposure (direct and witnessed). Specifically, this group reported a 100% rate for directly experiencing trauma, with all 52 participants indicating direct exposure. In terms of witnessing trauma, 92.3% of the IPV-related TBI group (48 out of 52 participants) reported witnessing traumatic events. Additionally, 65.4% of the IPV-related TBI group (34 out of 52 participants) reported learning about traumatic events.

Overall, the IPV-related TBI group demonstrates higher trauma exposure specifically in terms of directly experiencing and witnessing trauma, at least descriptively. The TBI group shows higher trauma levels compared to the IPV group, but not as high as the IPV-related TBI and no-IPV related group. The IPV group, while having elevated trauma levels, generally reports less trauma exposure when compared to the TBI and IPV-related TBI groups.

Figure 11

Comparative Analysis of Trauma Exposure Across the IPV Versus No-IPV Group (N=81), TBI Versus No-TBI Group (N=81) and IPV-Related TBI Versus No-IPV Related TBI Group (n=58)



Note. Data presented are actual counts. IPV=Intimate Partner Violence; TBI=Traumatic Brain Injury; IPV-related TBI=Traumatic Brain Injury occurring from Intimate Partner Violence.

[a]The first row represents data from the IPV versus no-IPV group, the second row represents data from the TBI versus no-TBI group and the third row represents data from the IPV related TBI versus no-IPV related TBI group.

[b]The data in the IPV versus no-IPV group is only based on reports of IPV; the data in the TBI versus no-TBI group is only based on reports of TBI and does not take any IPV into account; the data in the IPV related TBI versus no-IPV related TBI is based on reports of both IPV and TBI.

Section V: PTSD

Within the total sample of 81 women, 61/81 (75.30%) screened positive for probable PTSD as assessed by the PC-PTSD screening measure. I conducted analyses to examine the prevalence of probable PTSD outcomes in relation to IPV, TBI, and IPV-related TBI with the aim of determining whether probable PTSD is more prevalent in the IPV group, the TBI group, or among those who have experienced both IPV and TBI. The findings are included in Figures 12, 13, 14, 15 and 16.

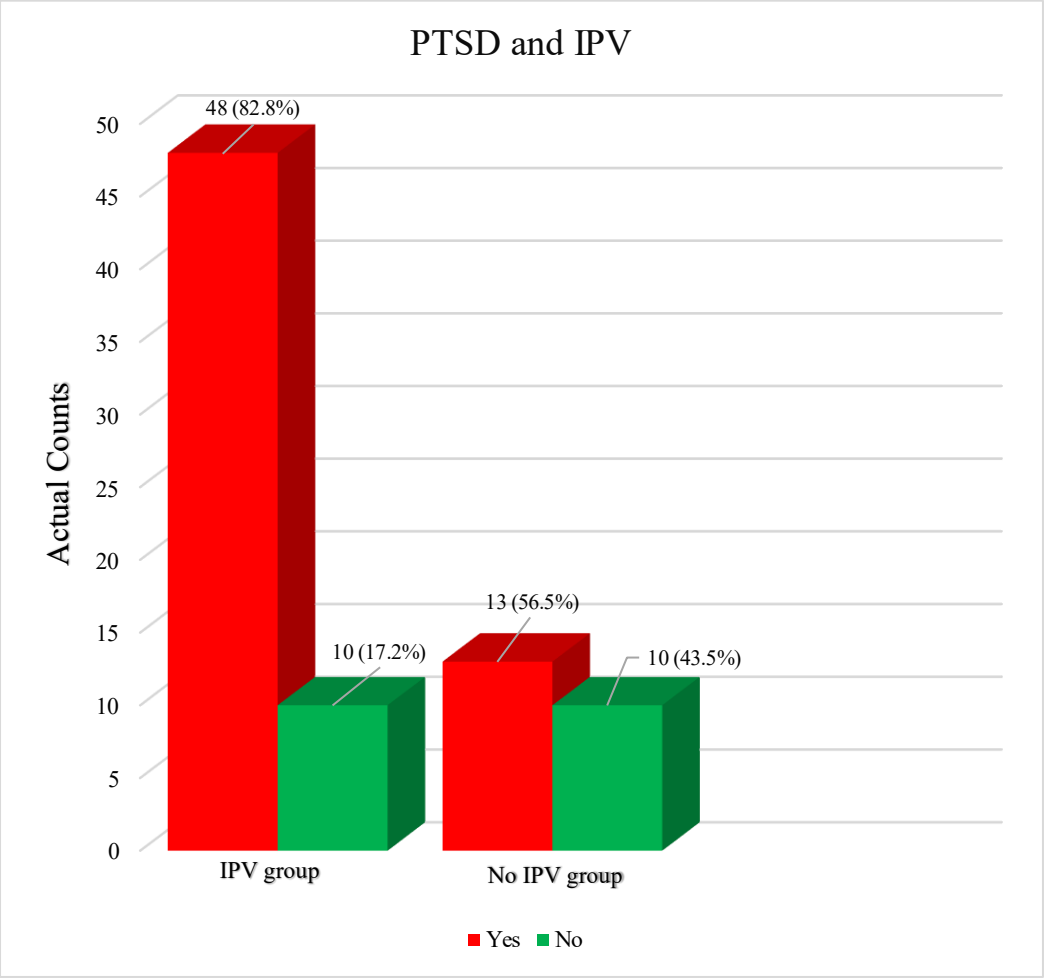
Analysis Showing the Prevalence of Probable PTSD Among the:

IPV Group and No-IPV Group in the Entire Sample (N=81)

In Figure 12, the Chi-square analysis (χ^2 6.097[a], *p*-value = 0.016, *df* = 1) revealed a statistically significant association between probable PTSD and IPV. The prevalence of probable PTSD was notably higher in individuals who had reported experiencing IPV (48/58;82.8%) compared to those who had not. This finding suggests that probable PTSD is significantly more common among those exposed to IPV.

Figure 12

PTSD and IPV Crosstabulation Results: Bar Graph (N=81)



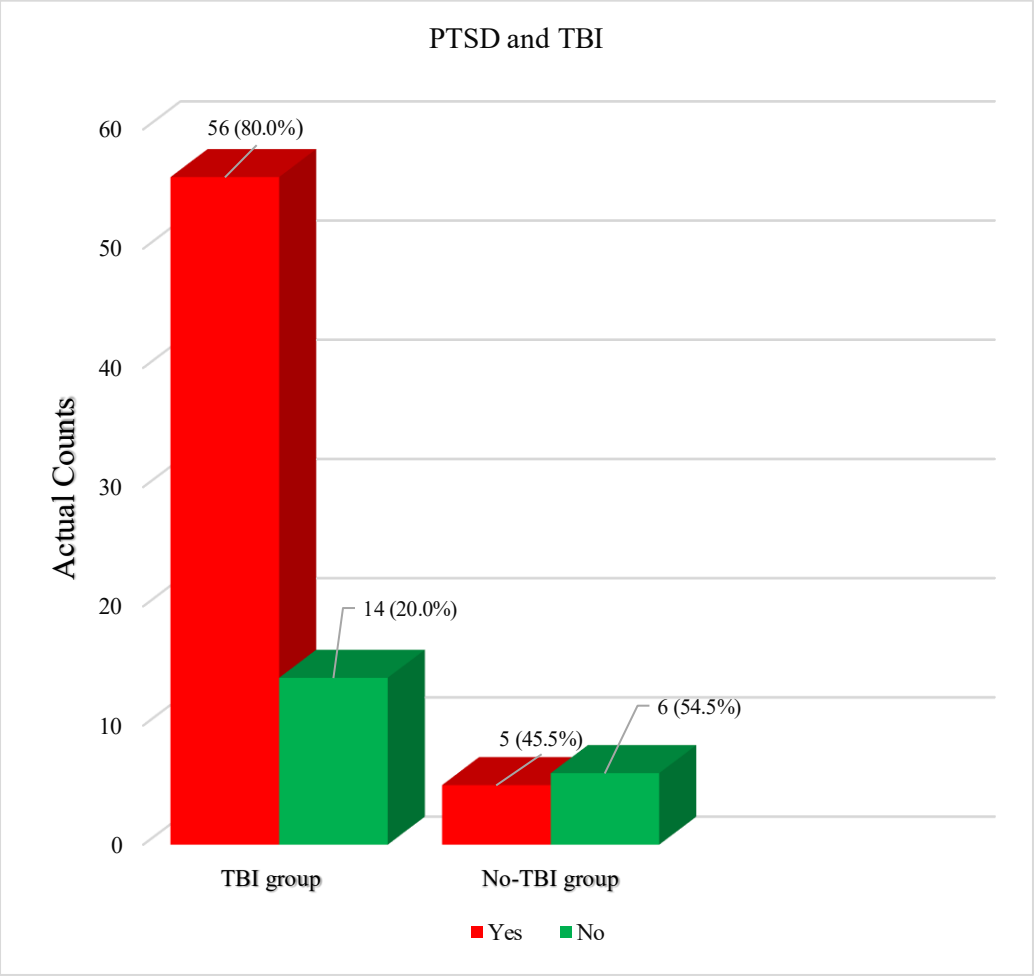
Note. Data presented are actual counts. PTSD=Post Traumatic Stress Disorder; IPV= Intimate Partner Violence; No IPV= No Intimate Partner Violence; Percentages are reported in parentheses.
[a]The listed percentages relate to within subgroup counts.
[b] The data in the IPV group versus no-IPV group is based on reports of IPV only.

TBI Group and No-TBI Group in the Entire Sample (N=81)

In Figure 13, the Chi-square analysis (χ^2= 6.101[a], *p*-value = 0.023, *df* = 1) indicated a statistically significant association between probable PTSD and experiencing TBI. A significant number (56/70; 80.0%) of women who reported sustaining a TBI have reported probable PTSD, compared to women in the no-TBI group. This demonstrates a higher prevalence of probable PTSD among those who reported sustaining a TBI.

Figure 13

PTSD and TBI Crosstabulation Results: Bar Graph (N=81)



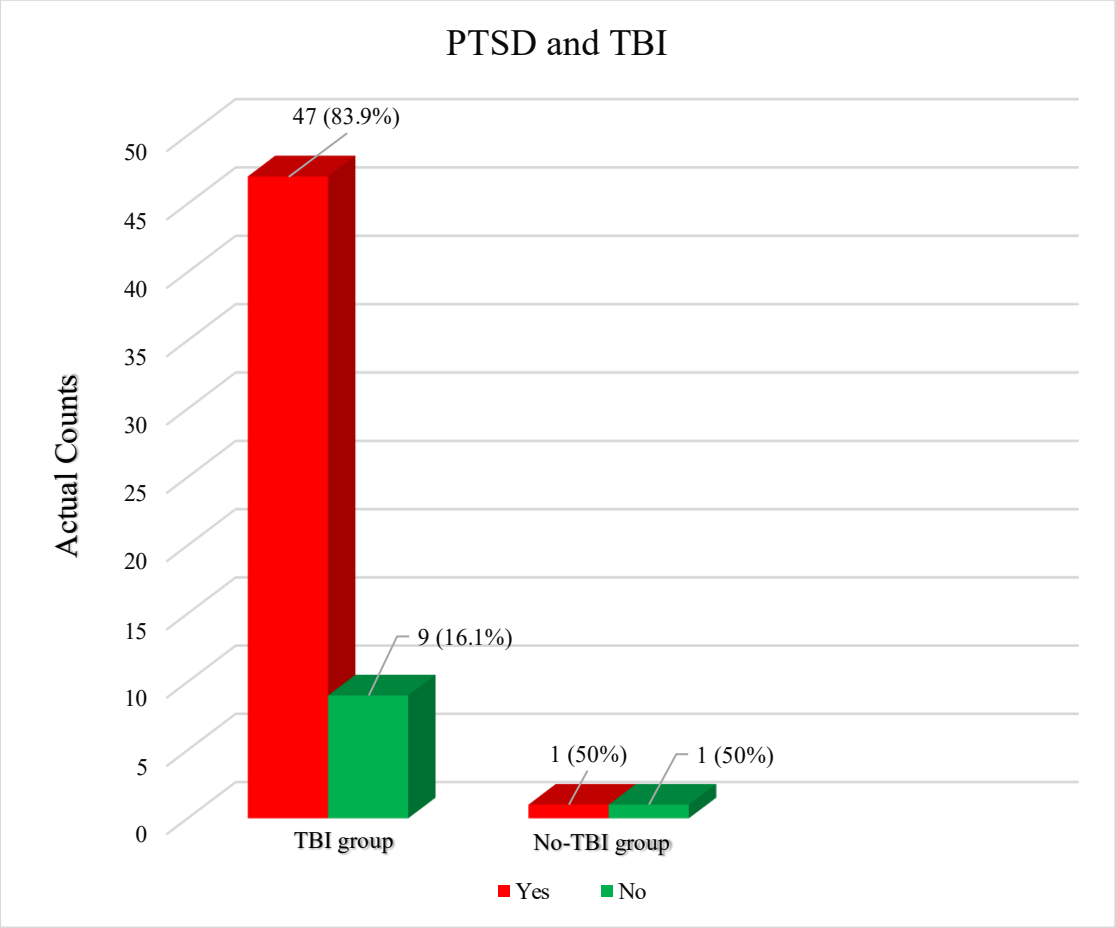
Note. Data presented are actual counts. PTSD=Post Traumatic Stress Disorder; TBI=Traumatic Brain Injury; No TBI=No Traumatic Brain Injury; Percentages are reported in parentheses.
[a]The listed percentages relate to within subgroup counts.
[b]The data in the TBI group versus no-TBI group is only based on reports of TBI and does not take any IPV into account.

TBI Group and No-TBI Group in the IPV Sample Only (n=58)

In Figure 14, the same data was analysed specifically within the IPV group. The analysis (Fisher's exact test; *p*-value = 0.318, *df* = 1) showed that a significant number of women (47/56; 83.9%) reported experiencing IPV and sustaining a TBI also reported probable PTSD, compared to women in the no-TBI group. Although there is a higher prevalence of probable PTSD among those with TBI, the result is not statistically significant, likely due to the small sample size in the no TBI group.

Figure 14

PTSD and TBI Crosstabulation Results in the IPV Group: Bar Graph (n=58)



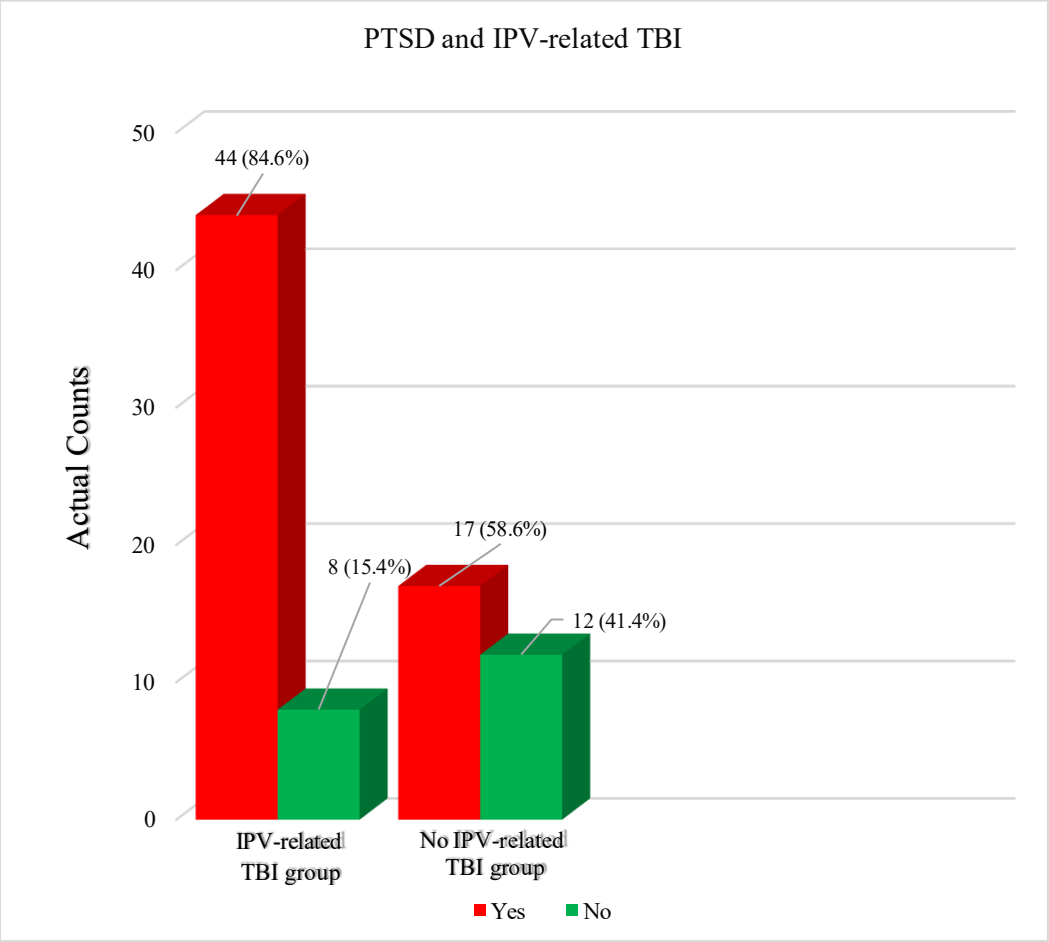
Note. Data represented are actual counts. PTSD=Post-Traumatic Stress Disorder, TBI=Traumatic Brain Injury; No TBI=No Traumatic Brain Injury; Percentages are reported in parentheses.
[a]The listed percentages relate to within group counts.
[b]The data in the TBI group versus no-TBI group is only based on reports of TBI and does not take any IPV into account.

IPV-Related TBI Group and No-IPV Related TBI Group in the Entire Sample (N=81)

In Figure 15, the chi-square analysis ($\chi^2 = 6.765^a$, p-value = 0.011, $df = 1$) revealed a statistically significant association between probable PTSD and IPV-related TBI. A substantial majority (44/52; 84.6%) of women with IPV and TBI have reported probable PTSD, compared to women in the no IPV-related TBI group. This significant difference highlights that probable PTSD is more prevalent among those with IPV-related TBI.

Figure 15

PTSD and IPV-Related TBI Crosstabulation Results: Bar Graph (N=81)



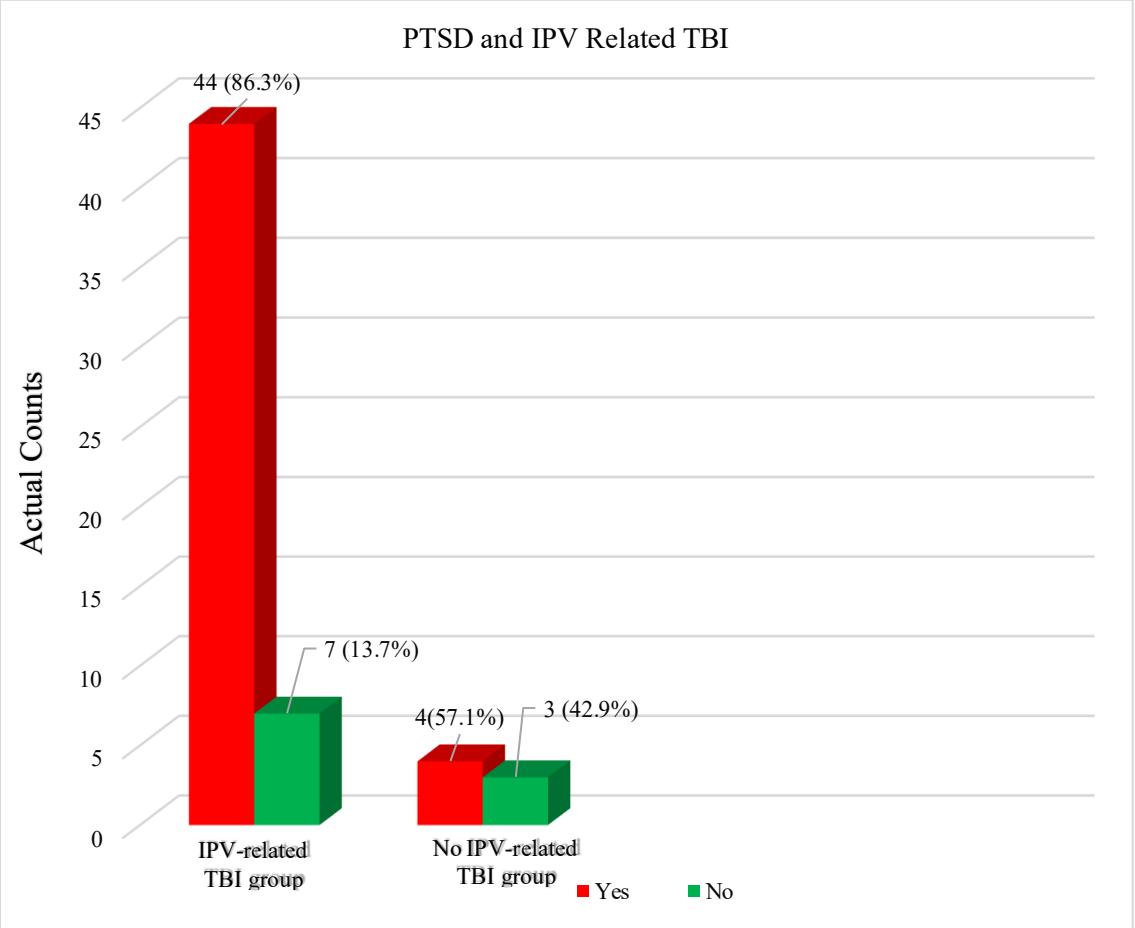
Note. Data presented are actual counts. PTSD=Post Traumatic Stress Disorder; IPV related TBI=Traumatic Brain Injury occurring from Intimate Partner Violence. Non-IPV related TBI= Traumatic Brain Injury that did not occur from Intimate Partner Violence; Percentages are reported in parentheses.
[a]The listed percentages relate to within subgroup counts.
[b]The data in the IPV related TBI versus no-IPV related TBI is based on reports of both IPV and TBI.

IPV-Related TBI Group and No-IPV Related TBI Group in the IPV Sample Only (n=58)

In Figure 16, the same data was analysed for probable PTSD and IPV-related TBI specifically within the IPV group. The analysis (Fisher's exact test; p-value = 0.091, df = 1) revealed that a significant number of women (44/48; 86.3%) with IPV-related TBI have reported probable PTSD. Although probable PTSD is more prevalent among individuals with IPV-related TBI, the association is not statistically significant, likely due to the smaller sample size in this group.

Figure 16

PTSD and IPV Related TBI Crosstabulation Results in the IPV Group: Bar Graph (n=58)



Note. Data represented are actual counts. PTSD=Post-Traumatic Stress Disorder, IPV related TBI=Traumatic Brain Injury occurring from Intimate Partner Violence; Non-IPV related TBI= Traumatic Brain Injury not occurring from Intimate Partner Violence; Percentages are reported in parentheses.
[a]The listed percentages relate to within group counts.
[b]The data in the IPV related TBI versus no-IPV related TBI is based on reports of both IPV and TBI.

Section VI: Factors Influencing PTSD - Regression Analyses

Table 4 shows results from a simple regression analysis which aimed to investigate the individual relationships of IPV, TBI and IPV-related TBI to probable PTSD. A statistically significant relationship was observed between IPV and probable PTSD, (p-value= 0.013) suggesting that IPV is a significant factor in predicting probable PTSD. The R^2 value of 0.075 indicates that IPV explains 7.5% of the variance in probable PTSD outcomes, indicating a modest effect size.

Similarly, a statistically significant relationship was observed between TBI and probable PTSD (p-value = 0.013), suggesting that TBI is also a significant factor in predicting probable PTSD. The R^2 value of 0.075 indicates that TBI also explains 7.5% of the variance in probable PTSD outcomes, indicating a modest effect size.

The analysis of IPV-related TBI with probable PTSD showed the strongest significant multiple R^2 value of 0.084 (p = 0.009), suggesting that IPV-related TBI accounts for approximately 8.4% of the variance in probable PTSD. This represents a small-to-moderate effect size, indicating that IPV-related TBI is a slightly stronger predictor of probable PTSD compared to IPV or TBI alone.

The findings of the simple regression analyses support the hypothesis that IPV-related TBI is significantly associated with an increased likelihood of probable PTSD. Among the three factors analysed, IPV-related TBI emerged as the strongest predictor of probable PTSD. Although the effect sizes are relatively small, the results suggest that women who experience IPV-related TBI may be at a heightened risk for developing probable PTSD compared to women who experience IPV without TBI or those with TBI but with no IPV history.

Table 4

Simple Regression Analysis Examining the Individual Effects of IPV, TBI, and IPV-Related TBI with Probable PTSD

Relationship	*p*-value	R^2
IPV and PTSD	0.013	0.075
TBI and PTSD	0.013	0.075
IPV-related-TBI and PTSD	0.009	0.084

Note. R^2= Multiple R squared.

[a]This table summarizes the *p*-values and *R*-squared values for each of the simple regressions conducted between IPV, TBI, and IPV-related TBI and probable PTSD.

Table 5 shows the results of the multiple regression analysis with PTSD as the dependent variable, and IPV, TBI, and IPV-related TBI as the independent variables. The purpose of this analysis was to determine whether these variables, when considered together,

could predict probable PTSD outcomes and by how much, given that they overlap significantly.

The residual standard error (*SE*) of the model was 0.418, and the multiple R^2 value was 0.108, indicating that approximately 10.8% of the variance in probable PTSD was explained by the three predictors, when included in one model. Although the overall model was statistically significant ($F = 3.101$, p-value = 0.032), the individual predictors did not reach statistical significance at the 0.05 level in this particular model.

The multiple R^2 value of 0.108 indicates that a relatively small proportion (10.8%) of the variance in probable PTSD is explained by IPV, TBI, and IPV-related TBI. The results suggest that, although the regression model as a whole was significant, the individual variables did not significantly contribute to the prediction of probable PTSD when considered together. Specifically, the *p*-values for IPV, TBI, and IPV-related TBI indicate that none of these variables, on their own, were strong predictors of probable PTSD outcomes, even though the individual regression analyses suggested otherwise.

The examination of Variance Inflation Factor (VIF) values revealed moderate collinearity between IPV (*VIF* = 2.64) and IPV-related TBI (*VIF* = 2.87), while TBI showed lower collinearity (*VIF* = 1.41), all within acceptable limits (*VIF* < 5). This suggests that while these factors are distinct, they also overlap to some degree, but the *VIF* values indicate that the overlap is not due to problematic multicollinearity. The results suggest that while each factor is individually associated with probable PTSD, their combined effects are interrelated, which may obscure the independent contribution of each predictor in a multiple regression model.

Table 5

Multiple Regression Analysis Examining the Combined Effect of IPV, TBI, and IPV-Related TBI with Probable PTSD

Statistics	**IPV**	**TBI**	**IPV-related TBI**	**Model Fit Metrics**
Coefficient	0.097	0.203	0.111	
p-value	0.564	0.211	0.050	
Residual *SE*				0.418
Multiple R^2				0.108
F				3.101
p-value (*F*)				0.032

Note. Residual *SE*= Residual Standard Error; Multiple R^2= Multiple R-squared value; *F*= F-value.

[a]This table presents the multiple regression analysis examining the combined effect of IPV, TBI, and IPV-related TBI on probable PTSD.

Discussion

Extensive literature shows that IPV is a significant and global health issue (Alessandrino et al., 2020; Braamcamp de Mancellos, 2021). Women who experience IPV often face numerous physical and psychological consequences, including the potential for TBIs and severe emotional trauma, which may contribute to conditions such as PTSD (Farley et al., 2018; Iverson et al., 2017; Keynejad et al., 2020; Smith & Holmes, 2018). In South Africa, the rates of IPV are among the highest in the world (Gordon 2016; Joyner & Honikman, 2015; Mthembu et al., 2021; Naidoo, 2013), and the country has one of the highest femicide rates globally, with a figure that is four times greater than the worldwide average (Sere et al., 2021). IPV is a major contributor of morbidity and mortality among women in the country (Abrahams et al., 2013; Gass et al., 2010; Gordon, 2016), previously reported as the second-largest cause of disease burden in South Africa, after HIV/AIDS (Sere et al., 2021). However, the intersection between IPV and outcomes such as TBI, and their overlapping contributions to PTSD, remains underexplored, particularly in local contexts (Kwako et al., 2011; Toccalino et al., 2023).

This study therefore aimed to bridge this gap by investigating the prevalence of, and interplay between, IPV, TBI, and probable PTSD in a sample of South African women. Specifically, the study sought to determine whether IPV and TBI, individually or in combination, were stronger predictors of probable PTSD outcomes. I hypothesized that women exposed to IPV and/or TBI, would exhibit higher rates of probable PTSD symptoms compared to those women without such experiences, with those women who experienced both IPV and TBI expected to report higher rates of probable PTSD. By examining these relationships, this study set out to contribute to a deeper understanding of the neuropsychological and mental health impacts of IPV, and the role of IPV-related TBI, and to highlight the complex effects of IPV on survivors.

Summary of Results

The key findings of this study reveal a complex relationship between IPV, TBI and probable

PTSD. While both IPV and TBI were associated with increased probable PTSD risk, as reported by participants, the results did not definitively pinpoint one factor as the strongest predictor, and thus, the hypothesis of this study was only partially supported. These findings suggest that IPV and TBI may independently contribute to probable PTSD, but their interaction is more nuanced.

In this discussion, I explore the sociodemographic characteristics of the sample, highlighting key characteristics that provide context for an understanding of the women who participated in the study. I then interpret the findings in the context of existing literature, addressing each predictor of probable PTSD explored in the current study, that is, IPV and TBI, individually, both in terms of prevalence of these factors and their possible contribution to probable PTSD.

Sociodemographic Background

The sample included 81 women. More than half of the participants were in relationships at the time of the study, with most women (51.85%) aged in their twenties. Previous studies indicate that IPV often begins from 15 years (De Vries et al., 2013). The WHO found that female adolescents and women aged 18 and above were at a heightened risk of IPV victimization in 12 of the 14 study sites (Peterman et al., 2015). Globally, 27% of women and girls aged 15 and older have endured physical or sexual violence from an intimate partner, with rates in South Africa alarmingly higher, ranging from one-third to as much as 50% (Brits, 2022). National surveys on youth risk behaviour further indicate that IPV often begins during adolescence, with adolescent girls and young women particularly affected (Mthembu et al., 2021; Russell et al., 2014). These findings align with the current study, where nearly half of the participants were in their twenties, suggesting that IPV often coincides with early adulthood. Studies have found that IPV is more common in younger women compared to older women (Rennison & Rand, 2003; Thompson et al., 2006).

Research suggests that adolescence and early adulthood, characterised by rapid physical, psychological, and cognitive changes, are periods of heightened vulnerability to IPV. Young individuals may be more likely to engage in risky behaviours such as substance abuse, early pregnancy, school dropout, eating disorders, and high-risk sexual activities, these behaviours can

increase their exposure to situations where IPV might occur, as they may lead to unhealthy relationship dynamics, a lack of emotional coping skills, or interactions with partners who perpetuate violence (Stockl et al., 2014). Rivara et al. (2009) suggested that younger women may be at higher risk for IPV due to the vulnerabilities associated with adolescence and early adulthood. They also noted that the risk of IPV declines significantly after the age of 50, which may be explained by a shift in relationship dynamics or a reduction in violence as women grow older. Additionally, Sanz-Barbero et al. (2019) suggested that the lower prevalence of IPV in adult women, compared to younger women, may be due to older women's greater ability to utilize strategies for leaving violent relationships.

Most participants identified isiXhosa as their home language, which aligns with the linguistic profile of the Western Cape, where isiXhosa is one of the most widely spoken languages alongside Afrikaans and English (Claasen et al., 2017), this is consistent with the language distribution seen in the broader population of the region. Furthermore, all participants were able to engage in English with the researchers, indicating that language barriers were unlikely to have been a significant challenge in the context of this research.

The levels of education varied in the sample, with a notable number of participants completing matric (38.27%) or not finishing high school (34.56%). There was a high unemployment rate in the sample (74.07%) and many participants who were employed/previously employed, reported that they had done unskilled work (25.92%). A relevant point on unemployment and unskilled work among women in South Africa can be supported by a recent Statistics South Africa (2023) report, which posits that South Africa has a high unemployment rate, with nearly half of the women being out of the labour force. Many women in the workforce are engaged in unskilled or precarious jobs, highlighting economic vulnerability and limited opportunities for stable employment. These challenges can exacerbate women's vulnerabilities and lead to financial dependency on an abusive partner (Stylianou, 2018; Voth Schrag et al., 2018).

Over half of the study participants resided in Philippi, a severely under-resourced area (Van

Breda, 2021, p. 4). Participants also came from other neighbouring areas with similar socioeconomic challenges. Most participants in the study came from households with relatively low income, and together with the high unemployment rates reported in the sample, this emphasizes significant financial constraints. Additionally, most participants reported moderate levels of asset ownership, suggesting that many were living in disadvantaged economic conditions. These reflect a picture of women facing economic hardship and limited opportunities, which could create barriers to seeking help, escaping abusive situations and achieving financial independence.

Previous research (e.g., Farrer et al., 2012; Yakubovich et al., 2018) shows several risk factors for IPV, including a younger age, having lower socioeconomic status, and limited education. Most of the women in this study share these risk factors, suggesting they are particularly vulnerable to experiencing IPV. Recent research (e.g., Alessandrino et al., 2020; Costello & Greenwald, 2022; Monahan, 2018) shows that financial and economic dependence can often trap women in abusive relationships. Many women experience significant economic disempowerment, as they depend on their partners for financial support (Gordon, 2016). IPV and financial hardship are often interconnected, as economic abuse within abusive relationships can restrict a survivor's ability to work, pursue education, access resources, and build financial skills, knowledge, and security (Adams et al., 2008). Sociodemographic factors highlight how structural inequalities shape the lives of the women involved in this study and contribute to their experiences of abuse, trauma and mental health challenges.

Intimate Partner Violence

The findings from this study showed that 72% of women self-reported experiencing IPV in their current and/or previous relationships, highlighting the significant prevalence of abuse in this sample. This is consistent with national trends in South Africa. Available data from South Africa indicates that one in two women experience physical violence (Brits, 2022). A nationally representative study found that 19% of female respondents reported experiencing victimization by intimate partners at some point in their lifetime (Gass et al., 2010). Machisa et al. (2017) found that

50% of women in Gauteng had experienced IPV in their lifetime. A national study done in 2022 by the HSRC highlighted the high prevalence of various forms of IPV across the 9 provinces in South Africa, with many women experiencing physical, sexual, emotional, and economic abuse, as well as controlling behaviours. Notably, a significant proportion of those subjected to physical or sexual IPV reported sustaining injuries, often multiple times (Zungu et al., 2024). Additionally, Bolarinwa et al. (2023) collected data from 2,410 women, highlighting the widespread occurrence of IPV among women living in the Western Cape, Free State, and Eastern Cape provinces of South Africa. This finding reinforces the widespread nature of IPV in South Africa and the broader issue of GBV in the country, of which IPV forms part.

Many participants (23/81 women; 28.39%) reported experiencing multiple forms of abuse, with physical and emotional abuse being the most common combination (25/81 women; 30.86%). Gondolf et al. (2002) reported that there is a strong association between physical and emotional abuse among populations of individuals who perpetrate abuse. In addition, previous research has shown a strong positive correlation between psychological and physical abuse perpetrated by abusers and findings from the National Intimate Partner and Sexual Violence Survey (NISVS) indicated that physical violence often co-occurs with psychological aggression (Hacıaliefendioğlu et al., 2020). This suggests that IPV is often compounded, where survivors often face overlapping types of violence rather than isolated incidents, and the harm they endure goes beyond physical injury.

Given the physical nature of IPV, particularly the high rates of reported physical abuse in the sample, it is crucial to examine the prevalence and impact of TBI specifically, a core variable in the current research.

Traumatic Brain Injury

In this study, 70/81 participants (86.41%) reported sustaining a TBI in their lifetime. The high proportion of TBIs reported in the current study generally, corresponds with global findings, such as those reported by Orr et al. (2024), who estimated that 69 million people experience a TBI each year, showing the widespread nature of these injuries. Hyder et al. (2007) also reported that

rates of TBI are higher in LMICs/ developing countries than HICs due to contextual vulnerabilities like higher rates of violence and MVAs. Relatedly, Muili et al. (2024) reported that in SSA, TBI incidence is estimated at 801 per 100,000 people, highlighting the heavy burden of TBI in the region.

Among the 70 participants in the sample who reported a TBI, 56 (69.13%) were women who reported experiencing IPV. The highest number of TBIs were linked to IPV as the mechanism of injury, suggesting a strong association between IPV and TBI prevalence.

Other mechanisms of injury in the current study were MVAs, pedestrian accidents, being hit by equipment, drug/alcohol blackouts, mugging incidents and fainting spells which aligns with contextual vulnerabilities in South Africa. These findings correspond with existing literature which report that road traffic accidents, falls, and violence are frequently cited as leading causes of TBI in South Africa (Naidoo, 2013). Similarly, Adegboyega (2021) identified road traffic incidents, falls, assaults, and gunshot wounds as significant contributors to TBIs in SSA. These are further supported by research in other LMICs, such as the work by Maas et al. (2022).

Having explored the prevalence of TBI in the sample, it is evident that IPV plays a significant role in the occurrence of these injuries. The next section will delve deeper into the intersection of these two factors and will further examine how IPV contributes to the risk and severity of TBI.

The Intersection Between IPV and TBI

The fact that IPV was the most common mechanism of injury among participants who reported sustaining TBIs, highlights its critical role in the occurrence of these injuries. Ivany and Schminkey's (2016) study support this outcome, showing that 60 to 92% of women who experienced IPV sustained TBIs directly linked to abusive encounters. This finding is also in line with the findings of Ivany et al. (2018), who noted that IPV is a substantial risk factor for TBI, with IPV survivors being seven times more likely to experience BIs than those who have not been exposed to IPV.

Among the women in the IPV group, many (62.06%) had reported experiencing multiple

TBIs, and a substantial number (68.96%) reported at least one injury involving LoC, reflecting the high prevalence of severe TBIs in IPV contexts. These outcomes also bring to the fore the repetitive and forceful nature of these assaults, respectively. Karakurt et al. (2021) also report that TBIs resulting from IPV typically occur over a period of time and vary in severity. While most injuries may be mild, the repetitive nature of such injuries may increase the cumulative risk for long-term sequelae (Giarratana et al., 2020; Kim et al., 2023). Moreover, TBIs with LoC could be associated with more severe injuries and worse long-term outcomes, which aligns with the dose-response relationship frequently reported between TBI severity and outcomes (Jackson et al., 2002; Rohling et al., 2003).

Additionally, some women reported milder brain injuries (in IPV-related contexts), in which they described feeling dazed or confused after incidents, consistent with concussions or mild TBIs. These findings highlight the importance of recognizing concussions and mild TBIs in the context of IPV. While this study did not directly assess long-term effects, research indicates that there is a need for increased awareness of all levels of brain injury to ensure survivors receive appropriate care and support (Haag, 2023), as milder injuries can lead to persistent post-concussive symptoms, often misattributed to other conditions, like PTSD (Ivany & Schminkey, 2016; Liu et al., 2020). Further, the cumulative effect of repetitive, and often untreated, mild injuries over time can lead to significant impairments in cognition, mental well-being, and overall health for survivors (Valera, 2019).

Previous research postulates that assaults in the context of IPV often target the head, face, and neck which are areas highly vulnerable to injury (Liu et al., 2020; Smith & Holmes, 2018). The recurrence and severity of such injuries reported in the current study reflect the intentional infliction of harm during IPV episodes, consistent with findings that the head is frequently targeted due to its vulnerability and accessibility (Alessandrino et al., 2020).

Blunt force trauma, choking, or being slammed into walls are common mechanisms of injury in IPV contexts, as shown in other studies (Campbell et al., 2022; Haag, 2023), and women in the current study reported experiencing these kinds of assault. These violent events often lead to TBIs,

with LoC in some cases, as observed in findings from the current study. Yet, many of these (and often milder) injuries often go unrecognized, in both research and practice.

Anto-Ocrah et al. (2022) note that IPV-related TBIs are under-researched globally, particularly in regions like SSA, where IPV rates are among the highest in the world. In South Africa, TBIs are often underreported due to resource constraints and inconsistent record-keeping (Naidoo, 2013). The absence of centralized data on TBIs makes it difficult to determine the true prevalence and overlooks mechanisms like IPV that may contribute to these injuries. While IPV is well-documented as a public health issue in South Africa, research on its intersection with TBI remains limited (Gxolo, 2021). This is particularly concerning as it suggests that women in abusive relationships are not only subjected to various forms of violence but are also at risk of sustaining a TBI as a result of being in that relationship. The importance of addressing this gap is clear, as it highlights the urgent need to better understand and address the full range of risks that IPV survivors face. The current study reveals a significant link between IPV and TBI, calling for further investigation into this intersection.

While the current study did not directly explore barriers to care, the high prevalence of IPV-related TBIs in the sample highlights the potential need for screening measures, improved support and intervention for survivors. Previous research shows that IPV survivors frequently encounter obstacles in accessing care, such as financial constraints, fear of retaliation, and a lack of awareness among healthcare providers (Alessandrino et al., 2020; Haag, 2023). These barriers may be especially prominent in the South African context, where under-resourced public healthcare systems and social stigma surrounding IPV can contribute to underdiagnosis and inadequate treatment in survivors (Naidoo, 2013; Nicol et al., 2021).

While the current study highlights the extent of the problem, it also reveals how underexplored this issue remains in research and practice. These findings contribute to the growing body of evidence on the pervasive and violent impact of IPV on brain health, stressing the need for a more nuanced understanding of the relationship between IPV and TBI.

Trauma and PTSD Reported by Participants

South Africa's apartheid history suggests a high level of trauma exposure across the population, with trauma and PTSD patterns differing from those in other countries (Atwoli et al., 2013). Hence, the widespread exposure to trauma in South Africa may be influenced by the country's political and social context (Harriman et al., 2021). This highlights the importance of understanding these factors in shaping the patterns of PTSD prevalence in the population. Population-based research in South Africa indicates that over 70% of individuals have encountered a minimum of one traumatic event at some point in their lives, which has been linked to higher prevalence rates of PTSD, mood disorders and anxiety (Atwoli et al., 2015).

Trauma exposure in the current study was assessed using the LEC-5 checklist. Results show that such exposure was widespread across the entire sample, with significant variations between the IPV and no-IPV groups. The IPV group, in particular, demonstrated a notably higher prevalence of direct physical and sexual trauma, as compared to the no-IPV group. This finding highlights the elevated risk of trauma for IPV survivors, who reported substantially higher rates of physical assault, sexual assault, and assaults involving weapons.

When looking at trauma exposure across the different groups (IPV group, TBI group and IPV-related TBI group), it became clear that the IPV-related TBI group had the highest levels of trauma exposure. Notably, all of the IPV-related TBI group participants reported direct exposure to trauma, highlighting the severity and pervasiveness of trauma in this group. In addition to direct trauma exposure, a large proportion of participants in that IPV- related TBI group (92%) also reported witnessing traumatic events, and 65% reported learning about traumatic events, additional trauma exposure that can be experienced vicariously. These findings suggest that the combination of IPV and TBI contributes to an intensified trauma burden, with both direct and secondary trauma exposure being more prevalent among those who have experienced both IPV and TBI, at least in the current study.

However, and supporting this association, while the IPV-only (i.e., those who experienced

IPV but who did not report sustaining a TBI) group also reported high levels of trauma, their exposure generally did not reach the same magnitude as that of the IPV-related TBI group. This highlights the added burden of IPV and TBI, which is further intensified by the socioeconomic challenges faced by many women in this study. The intersecting effects of violence, trauma, and poverty create multiple layers of vulnerability, which not only affect their immediate well-being but also have long-lasting consequences for their overall quality of life. This interplay between physical injury and mental health highlights the compounded risk faced by IPV survivors, and particularly those who also experience TBI.

In this study, 75% of the participants screened positive for probable PTSD, as measured by the PC-PTSD screening tool. This shows a notably high prevalence of psychological distress within the sample. Among those who screened positive for PTSD, 57% of the participants were from the group of women who had reported experiencing IPV. These results correlate with previous research by Iverson et al. (2017) and Kwako et al. (2011) where they reported that IPV was strongly linked to various mental health conditions, with women who experience IPV being at a significantly higher risk of developing PTSD.

The following section will explore how IPV-related trauma and BIs may mutually reinforce reports of probable PTSD symptoms, highlighting the intricate relationship between physical injury and mental health in survivors.

The Intersection of IPV, TBI, and PTSD

When each of the three variables, IPV, TBI, and IPV-related TBI was analysed individually in relation to probable PTSD, the results revealed clear associations between both IPV and probable PTSD, as well as TBI and probable PTSD. However, IPV-related TBI emerged as the strongest predictor of probable PTSD. This finding suggests that individuals who experienced both IPV and TBI were more likely to report probable PTSD than those who had experienced either IPV or TBI alone. These findings are aligned with and support existing literature, which has shown that IPV is associated with a broad spectrum of physical and mental health outcomes, including TBI and PTSD.

Women who experience IPV are at a higher risk of developing PTSD (Iverson et al., 2017; Kwako et al., 2011), and the results suggest that such risk can be compounded by sustaining TBIs.

PTSD is a common psychological consequence of TBI, and when TBI and psychological trauma, such as IPV, co-occur, the risk of PTSD is heightened, or it may be worsened if already present (Vasterling, 2018). The findings of the current study show that IPV, particularly when experienced with TBI, contributes to elevated trauma in these survivors and reiterates what previous research has reported, that sustaining a TBI during IPV-related trauma further increases the likelihood of developing PTSD (Farley et al., 2018). The repeated physical trauma, chronic stress, and physiological disruptions often experienced in IPV contribute to the onset of PTSD, with TBI exacerbating this process.

The finding that the strongest individual predictor of probable PTSD in the current study was IPV-related TBI, corroborates the findings of Farley et al. (2018), who reported that TBIs sustained in the context of IPV are more likely to result in PTSD compared to TBI from other causes. This finding also supports those reported by Toccalino et al. (2023), who stress the importance of considering both physical and emotional abuse in understanding PTSD outcomes in IPV survivors, particularly in the context of the intersection between BI and mental health disorders. This further reinforces IPV-related TBI as a significant predictor of probable PTSD in the current study.

The findings related to the intersection of IPV, TBI, and IPV-related TBI revealed a more complex relationship. Although the hypothesis predicted a stronger association between both IPV and TBI with probable PTSD, the results do not fully align, as weaker correlations than expected were observed. When these variables were analysed collectively, the individual predictors did not reach statistical significance, suggesting that while IPV, TBI, and IPV- related TBI are each associated with probable PTSD, their combined effect on probable PTSD outcomes may be weaker than initially expected.

Moreover, although IPV-related TBI appeared to be the strongest individual predictor of probable PTSD, the effect size was relatively small, and the combined model, which included all three

factors, explained only a modest portion of the variance in probable PTSD outcomes. This outcome suggests that while IPV-related TBI is an important predictor, other factors not examined in this study may also play a significant role in probable PTSD development within this sample. In IPV populations, factors such as the severity and chronicity of violence, emotional coping mechanisms, immune system function, attachment anxiety, depression, fear, childhood maltreatment (Wilson et al., 2011) and exposure to community violence, effects of poverty and its association to trauma exposure (Golin et al., 2017) have all been implicated in the onset of PTSD symptoms. Further, and as noted, South Africans generally have heightened trauma exposure due to historical injustices, socioeconomic disparities, and high rates of violence, all of which contribute to the country's distinct PTSD patterns (Atwoli et al., 2013; Harriman et al., 2021). Consequently, while the hypothesis was partially supported, the complexity of these relationships warrants further investigation.

The current study found significant associations between IPV, TBI and probable PTSD which is in line with previous research, such as the work of Valera (2003, 2019, 2020, 2021, 2022), who also highlighted the relationships between these variables. However, research in South African communities, specifically in marginalized populations, has yet to fully explore these connections. As noted, research by South African researchers (e.g., Bolarinwa et al., 2023; Boonzaier et al., 2005, 2011, 2016, 2019, 2023; Buqa, 2022; Gass et al., 2010; Gordon, 2016; Govender, 2023; Joyner & Honikman, 2015; Mthembu et al., 2021; Ndlovu et al., 2022; Russell et al., 2014; Sere et al., 2021; Van Niekerk & Boonzaier, 2019; Zungu et al., 2024) has well documented the impact of IPV in these communities, but its relationship with TBI and PTSD remains underexplored.

The current study's findings indicate that IPV, TBI and PTSD are prevalent and that this gap in the literature requires investigation in these contexts. Moreover, Toccalino et al. (2023) also highlights the need for more research into the intersection of brain injury and mental health disorders in IPV survivors, emphasizing the compounded effects of IPV, TBI, and PTSD, particularly in marginalized populations like those in South Africa.

While previous research has often focused on the separate impacts of these factors, fewer studies have explored their intersection. Therefore, while this research partially supports the hypothesis by identifying IPV-related TBI as a significant predictor of probable PTSD, it also highlights the complexity of these interactions and the need for future research to explore how multiple, interrelated factors influence probable PTSD outcomes in IPV survivors.

Limitations and Future Directions

The current study has a few limitations that should be considered when interpreting the findings. One limitation of this study is that the sample size was slightly smaller than initially planned. An a-priori power analysis suggested that 85 participants would be needed, but the final sample included 81 participants. While the sample size is still reasonable for the analysis, this slight difference could have impacted the statistical power, potentially affecting the generalizability and precision of the results (Fitzner & Heckinger, 2010). Additionally, the sample size was too small to generalize across the broader South African population, limiting the external validity of the results (McEwan, 2020).

Regarding the participants' first language, although participants could converse in English, being able to converse in their mother tongue could have facilitated richer information (Squires, 2009). The study was also geographically limited, focusing only on participants from specific areas of the Cape Town region, which may not reflect the diversity of experiences of survivors in other parts of the country (Yom et al., 2022). Moreover, the sample was exclusively focused on women, which excludes the experiences of men and non-binary individuals, and gender differences in the experience and impact of IPV and TBI (Jain et al., 2024; Scott-Storey et al., 2023).

The cross-sectional design also restricts the ability to draw causal conclusions, as it only captures relationships at one point in time (Spector, 2019). Furthermore, the reliance on self-reported data could have potential recall bias, where participants may have misremembered or omitted details of their experiences (Khare & Vadel, 2019), especially with sensitive topics like IPV and TBI.

Regarding self- reports of PTSD symptoms without further follow-up meant that I could only

report on probable PTSD in the sample (Boyd et al., 2022). Additionally, social desirability bias could have influenced responses leading participants to present themselves in a more favourable light (Stodel, 2015).

Lastly, other potential confounding variables, such as pre-existing mental health conditions were not controlled for. This may have influenced the observed relationships between IPV, TBI and probable PTSD, limiting the ability to draw definitive conclusions about causality in the study (Jager et al., 2007).

Future research

This study highlights the complex and intertwined relationships between IPV, TBI, and probable PTSD, providing valuable insights into how these factors interact in vulnerable populations. However, several gaps remain that future research should aim to address. Future studies should focus on recruiting larger and more diverse samples to improve generalizability, a suggestion also emphasised by Campbell et al. (2022), particularly in underrepresented regions of South Africa and other LMICs. The larger sample size would not only enhance the reliability of findings, but also enable more robust statistical analyses, reducing limitations such as low expected cell counts.

Future research should also adopt longitudinal designs, as advocated by Costello and Greenwald (2022), and Valera et al. (2019), to better understand the long-term effects of IPV- related TBI on mental health outcomes, including PTSD, depression, and anxiety (Wallace et al., 2024). This approach would help clarify the temporal relationship between IPV, TBI, and probable PTSD, as well as how different severities and types of BIs may uniquely affect the mental health of survivors over time. Additionally, examining the cumulative effects of IPV and TBI alongside other forms of trauma, such as childhood abuse or community violence, could provide a more holistic view of how these experiences shape survivors mental health.

Qualitative research should also be a key focus in future studies to complement quantitative findings. By exploring the lived experiences of women affected by IPV and TBI, researchers can gain valuable insights into their experiences related to how these injuries were sustained, as well as how

the resulting trauma impacts their daily functioning, relationships, and access to care.

Another important avenue for future research is the refinement of tools and measures used to assess TBI severity in IPV contexts, as suggested by Ivany and Schminky (2016), and Valera et al. (2019). Further development of IPV-specific screening tools for BIs (e.g., the BISQ) could improve the accuracy of diagnoses and ensure that survivors with mild or unrecognized injuries receive the care they need. Furthermore, integrating advanced methodologies such as neuroimaging techniques could enhance the understanding of the neurological impacts of IPV-related TBI and its contributions to psychological outcomes, although the limitations of such approaches, especially in low-resourced contexts, is recognised.

Finally, there is a pressing need to evaluate and develop interdisciplinary intervention programs tailored to the unique needs of survivors who experience IPV and TBI. Such programs should address both the physical and psychological sequelae of IPV-related TBI, with a focus on mental health support, legal protection, and rehabilitation, as highlighted by Adhikari et al. (2023). Programs that integrate prevention and recovery approaches could be instrumental in breaking the cycle of violence and mitigating its consequences. By addressing these gaps, future research can contribute to building comprehensive care frameworks that empower survivors and improve their long-term well-being.

Implications for Policy and Practice

The findings of this study highlight key implications for policy and practice. Given the high rates of both IPV and TBI in this sample, it is crucial that healthcare providers are trained to identify the signs of IPV in TBI survivors. Many TBIs, especially mild ones, may go unnoticed, yet they can have lasting effects on both physical and psychological well- being.

Policymakers should prioritize integrating TBI assessments into IPV support programs, ensuring that survivors are provided with appropriate care for both their physical and psychological injuries. This integration will help identify TBIs early, improving treatment and recovery outcomes.

Social workers, neuropsychologists, and healthcare providers more widely, should

collaborate to create comprehensive intervention programs that address both the psychological and physical consequences of IPV. By working together, these professionals can offer more holistic care, addressing the full spectrum of trauma experienced by survivors.

Furthermore, an interdisciplinary approach that combines healthcare, social services, and legal support will ensure more effective care and support for IPV survivors. Screening for both IPV and TBI at primary healthcare facilities is essential, as these programs can ensure early identification and intervention, addressing the ongoing need for routine screening. This is particularly important given the study's findings, which highlight the need to explicitly screen for IPV and BIs when women present at clinics. By doing so, these programs can help mitigate the long-term impact of IPV and TBI on mental health, particularly PTSD. This approach will not only help survivors heal but will also prevent the ongoing cycles of violence and trauma.

Conclusion and Study Significance

This study highlights the complex relationships between IPV, TBI, and probable PTSD, shedding light on the significant physical and psychological toll these experiences take on survivors. The findings revealed alarmingly high rates of IPV among participants, with many participants facing multiple forms of abuse, most commonly physical and emotional, Moreover, the high prevalence of TBI within the IPV group emphasizes the extent of physical injuries sustained in abusive relationships, injuries that often go undetected or untreated, worsening their long-term effects.

The connection between IPV and TBI presents a significant public health concern that demands urgent attention. Women in abusive relationships face not only the risks of ongoing violence but also the potential for serious BIs with long-lasting effects. It is thus crucial to view IPV not only as a social and public health issue, but also as a medical and neurological one.

While this study aimed to determine whether IPV, TBI, or their intersection is a significant predictor of probable PTSD, the findings only partially support this hypothesis. Both IPV and TBI were associated with increased probable PTSD risk, but the evidence did not definitively establish

which factor is the strongest predictor when considered together. This suggests that further research is needed to better understand the mechanisms driving these relationships. These findings also point to broader systemic challenges.

Many women in the study came from low- to middle-income backgrounds, experiencing socio-economic hardships, including limited access to healthcare, which may exacerbate the impact of IPV and TBI.

The study's focus on a South African population provides valuable context-specific insights, which are vital for tailoring interventions and policies to the unique socio-economic and cultural challenges faced by survivors in this region. This work thus contributes to the broader goals of violence prevention and the empowerment of vulnerable women, while aiming to advance interdisciplinary research and clinical practice.

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Appendix A

Ethical Clearance Form

UNIVERSITY OF CAPE TOWN

Department of Psychology

University of Cape Town Rondebosch 7701 South Africa
Telephone (021) 650 3417
Fax No. (021) 650 4104

24 June 2022

Khadija Haniff
Department of
Psychology
University of Cape
Town Rondebosch
7701

Dear Khadija

I am pleased to inform you that ethical clearance has been given by an Ethics Review Committee of the Faculty of Humanities for your study, *Investigating the prevalence of TBI and PTSD in a sample of women who have experienced IPV in a South African context.* The reference number is PSY2020-020.

I wish you all the best for your

study. Yours sincerely

Lauren Wild (PhD)
Associate Professor
Chair: Ethics Review Committee

Appendix B

Advertisement for Women who has Experienced Intimate Partner Violence and with or without Traumatic Brain Injury

RESEARCH PARTICIPANT RECRUITMENT

The study is investigating brain injuries in women who have also been exposed to physical violence by a partner.

****Your safety, privacy and wellbeing will be respected during the study****

If you are interested in participating, or have any questions regarding participation, please contact:

Khadija Haniff (Researcher)

Email:HNFKHA002@myuct.ac.za

Contact number: 0792254500

DETAILS

We are looking for adult women 18 years and older, that are or have been in a relationship, married or divorced and who have been physically abused.

For this study, participants will complete 5 questionnaires during the research which will take about 2 to 2.5 hours to complete.

If you agree to participate in this study and complete the data collection process, we will offer you a R100 food voucher as a token of appreciation for your time.

Finally, this study seeks to understand and increase awareness of how intimate partner violence and possible injury to the head as a result can forever change the life of a woman.

Appendix C

Advertisement for Women without Intimate Partner Violence and with or without Traumatic Brain Injury

RESEARCH PARTICIPANT RECRUITMENT

The study is investigating brain injuries in women who have not been exposed to physical violence by a partner.

****Your safety, privacy and wellbeing will be respected during the study****

DETAILS

We are looking for adult women 18 years and older, that are or have been in a relationship, married or divorced and who have not been physically abused.

For this study, participants will complete 5 questionnaires during the research which will take about 2 to 2.5 hours to complete.

If you agree to participate in this study and complete the data collection process, we will offer you a R100 food voucher as a token of appreciation for your time.

Finally, this study seeks to understand and increase awareness of how intimate partner violence and possible injury to the head as a result can forever change the life of a woman.

If you are interested in participating, or have any questions regarding participation, please contact:

Khadija Haniff (Researcher)

Email:HNFKHA002@myuct.ac.za

Contact number: 0792254500

Appendix D

UCT Department of Psychology

Participant Consent Form

Informed Consent to Participate in Research and Authorization for Collection, Use, and Disclosure of Questionnaire and Other Personal Data

You are invited to take part in a research study. This form provides you with information about the study and asks for your permission to collect data from you. The Principal Investigator (the person in charge of this research) or a representative of the Principal Investigator will describe this study to you and answer all your questions before you sign this consent form. Your participation is entirely voluntary, and you may leave any time during the research. Before you decide whether to take part, read the information below and ask questions about anything you do not understand. You will not be punished in any way by not participating in this study.

1. Title of Research Study

Investigating the prevalence of traumatic brain injury and post-traumatic stress disorder in a sample of South African women who have experienced intimate partner violence.

2. Principal Investigators and Contact Numbers

Khadija Haniff

MA in Neuropsychology (student)

Department of Psychology

University of Cape Town

Email: HNFKHA002@myuct.ac.za
Contact number: 079 225 4500
Associate Professor: Leigh Schrieff
Supervisor
Department of Psychology
University of Cape Town
Email: leigh.schrieff-brown@uct.ac.za
Contact number: 021 650 3708
Professor: Floretta Boonzaier
Co-Supervisor
Department of Psychology
University of Cape Town
Email: Floretta.boonzaier@uct.ac.za
Contact number: 021 650 3429

3. **What is the purpose of this research study?**

The aim of this study is to find out how many women in a sample of South African women have developed post-traumatic stress disorder after they have experienced a brain injury which was caused by intimate partner violence. This will be compared to a sample of South African women who have not experienced intimate partner violence or have not experienced a brain injury.

4. **What will happen if you take part in this research study?**

You will complete 5 questionnaires for this study which will take place in a quiet, secluded area at a women's shelter or community centre. Each questionnaire will have a special focus. One questionnaire will focus on intimate partner violence, one questionnaire on brain injury, one questionnaire on post-traumatic stress disorder, one on a history of trauma and one questionnaire will be a general screening measure which asks general questions about your background and living conditions.

5. **If you choose to participate in this study, how much time will it involve?**

Completing the questionnaires will take place during one session, which should not last longer than 2 and a half hours. If at any time during the session you wish to stop participating for any reason, you are free to do so.

6. How many people are expected to participate in the research?

A total of 85 women are expected to participate in the research.

7. What are the possible discomforts and risks?

There are possible known risks associated with participation in this study, as completing the questionnaire and talking about traumatic experiences can be very difficult and bring about a lot of emotional discomfort. Should you get tired during the study, you will be allowed to rest. If you wish to discuss the information above or any discomforts you may experience, you may ask questions now or call the Principal Investigators listed in point 2 of this form. You do not have to answer particular questions or complete a measure if you do not want to.

8a. What are the possible benefits to you?

You will not benefit from participating in this study. If you are feeling any psychological discomfort during the process of the research sessions, you will be referred to services and organizations that can assist you.

8b. What are the possible benefits to others?

The information gained from this research study will help improve our understanding of the extent of post-traumatic stress disorder in women and how it is related to intimate partner violence and traumatic brain injury.

9. If you choose to take part in this research study, will it cost you anything?

Participating in this study will not cost you anything.

10. Will you receive compensation for taking part in this research study?

You will receive a R100 food voucher if you complete the study.

11a. Can you withdraw from this research study?

You are free to withdraw your consent and to stop participating in this research study at any time. If you do withdraw your consent, there will be no penalty, however you will only receive the R100 food voucher if you have completed the entire study.

11b. If you withdraw, can information about you still be used and/or collected?

Information already collected during the research process may be used.

12. Once personal and performance information is collected, how will it be kept secret (confidential) in order to protect your privacy?

Only certain people have the right to review these research records. These people include the researchers for this study and certain University of Cape Town officials. Your research records will not be released without your permission unless required by law or a court order. Your identity will not be revealed and all the information you give will be strictly confidential. Any information collected during data collection will have your name attached. However, you will not be able to be identified in the written report.

13. What information about you may be collected, used and shared with others?

The information gathered from you will include general information such as your name, gender, date of birth, occupation, income, education, home language and what personal assets you have. If you agree to be in this research study, it is possible that some of the information collected might be copied into a "limited data set" to be used for other research purposes. If so, the limited data set may only include information that does not directly identify you. For example, the limited data set cannot include your name, address, telephone number, ID number, or any other numbers or codes that link you to the information in the limited data set.

If you have any questions regarding your rights in this research, you may contact the Psychology Department Research Ethics Committee via Mrs Rosalind Adams.
Her email address is rosalind.adams@uct.ac.za or you may contact her via telephone – 021 650 3417.

14. Signatures

As a representative of this study, I have explained to the participant the purpose, the procedures, the possible benefits, and the risks of this research study; and how the participant's performance and other data will be collected, used, and shared with others:

_____ _____

Signature of Person Obtaining Consent and Authorization **Date**

You have been informed about this study's purpose, procedures, possible benefits, and risks and how your performance and other data will be collected, used and shared with others. You have received a copy of this form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time.
You voluntarily agree to participate in this study. You hereby authorize the collection, use and sharing of your data. By signing this form, you are not giving away any of your legal rights.

_____ _____

Signature of Person Consenting and Authorizing **Date**

Please indicate below if you would like to be notified of future research projects conducted by our research group:

_____(initial) Yes, I would like to be added to your research participation pool and be notified of research projects in which I might participate in the future.

Method of contact:

Phone number: _____

E-mail address: _____

Mailing address: _____

Appendix E

Participant Debriefing Letter

Thank you for partaking in the study titled:

"Investigating the Prevalence of Traumatic Brain Injury and Post-Traumatic Stress Disorder in a Sample of South African Women Who Have Experienced Intimate Partner Violence"

Your participation and answers to questionnaires and interviews are appreciated.

Should you have any worries or concerns regarding your participation in this study or feel anxious or unsettled in relation to your participation, you may contact the researcher or her

Supervisor: Dr. Leigh Schrieff (leigh.schrieff-elson@uct.ac.za; Tel:021 650 3708)

Researcher: Khadija Haniff (HNFKHA002@myuct.ac.za).

Appendix F

Resource list

ORGANISATIONS DEALING WITH GENDERED AND SEXUAL VIOLENCE

1. The National Institute for Crime Prevention and Reintegration of Offenders (NICRO):

Mitchell's Plain: 021-397 3782

Cape Town: 021-422 1690

Bellville: 021-944 3980 or visit their website on: www.nicro.org.za

2. Family and Marriage Society of South Africa (FAMSA):

Observatory: 021 447 7951 or visit their website on: www.famsa.org.za

3. Mosaic Training, Service and Healing Centre for Women:

Wynberg: 021 761 7585 or visit their website on: www.mosaic.org.za

4. Saartjie Baartman Centre for Women and Children:

Manenberg: 27 21 633 5287

or visit their website on: http://www.saartjiebaartmancentre.org.za/

5. Rape Crisis Observatory (Head office):

23 Trill Road, Observatory, 7925, Cape Town P O Box 46 Observatory 7935

Email: communications@rapecrisis.org.za

Athlone- 335a Klipfontein Road, Athlone Telephone: 021 684 1180 Khayelitsha-89 Msobomvu Drive, Khayelitsha Telephone: 021 361 9228