

**MILD TRAUMATIC BRAIN INJURIES: WHAT FRONT-LINE DOMESTIC
VIOLENCE WORKERS NEED TO KNOW**

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DEDICATION

I would like to dedicate this final project to my parents and sister. They motivated and believed in me when I grew tired. Their generosity in giving me unconditional love, support, and encouragement made it possible for me to not only complete this project but to also get through an entire graduate degree amidst a world pandemic. This is also dedicated to all survivors of domestic violence and traumatic brain injuries, and to the heroic front-line workers supporting them in these frantic times.

ABSTRACT

Women accessing domestic violence shelter services may have mild traumatic brain injuries (mTBI) which require front-line workers to adapt their assistance given these women may be suffering from many debilitating psychological symptoms.

However, there is scarce evidence-based informative material for DV workers about the signs of an mTBI. To that end, a comprehensive review of the research and literature on mTBI outcomes was completed resulting in the applied element of this being twofold:

(a) a list of three practical and screenings considerations for shelter supervisors to use as learning objectives to review with their staff and, (b) a manuscript for publication in a Canadian peer-reviewed journal that integrates research into practice, by consolidating research in this area into three up-to-date recommendations for DV front-line workers with no specialization in brain injuries, to refer to when working with individuals showing signs of mTBI.

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CHEPTER 1: INTRODUCTION

This final project intends to address the gap in the literature regarding the occurrence of mild traumatic brain injuries (mTBIs) in the context of domestic violence (DV) and to generate practical resources for DV front-line works. While there is increased awareness of the occurrence of mTBI (also referred to as concussions) in the context of combat and high-impact sports, not enough research exists on mTBI caused by physical abuse and domestic violence. The focus of this final project is to fill this gap, analyze the little literature available and provide practical considerations for DV workers working closely with potential mTBI survivors. In this chapter, I will introduce and discuss the issue, present key definitions used in this project, and provide a statement of the problem. I will then close the chapter with a summary.

Along with the definitions, I will also provide a rationale for choosing these terms and how they apply to the context of this final project. I will then provide a foundation for the topic and introduction to the existing problem, and present the objective of this project. Lastly, I will present the intended practical contributions of this final project: a manuscript identifying the three key domains about DV-related mTBIs for the practical use of DV shelters workers.

1.1 INTRODUCTION TO THE ISSUE

Amidst a world pandemic, front-line workers have played a crucial role in protecting and supporting Canada's populations most at risk for harm during these times of crisis and uncertainty (e.g., DV victims seeking services and support). As with most large-scale disasters, women are disproportionately affected. Even before the current pandemic, emergency and second-stage family violence shelters have required much-

needed support to meet the growing demand for services by Canada's most vulnerable women (Government of Canada, 2020). There is pressure on women's shelters, and the need to provide more training opportunities to front-line workers to better equip them to deal with crises and meet the unique needs of DV victims accessing services at these shelters (Global Network of Women's Shelters and Asian Network of Women's Shelters, 2020).

Amongst other health-related concerns disproportionately real for this population is the higher risk for mTBI (Haag, Jones, et al., 2019). The research on mTBIs in the context of DV remains scarce, so much so that Valera (2018) coined DV-related mTBIs as an imperceptible public health epidemic, as it is barely recognized and understudied. Mild TBIs are too often missed among this population for several reasons including misattributing symptoms, limitations expected of client's self-reporting (Corrigan & Bogner, 2007; Hux et al., 2009; Smirl et al., 2019), lack of resources such as screening tools (Haag, Jones, et al., 2019), symptom overlap between DV-related and sport-related mTBIs (Smirl et al., 2019), and overlap of mTBI symptoms and psychological sequel of DV, such as trauma, and depression (Valera et al., 2019).

1.2 STATEMENT OF THE PROBLEM

Most of the brain injuries resulting from DV are mild, reoccurring, untreated, and undetected, thus, many women risk living with debilitating post-mTBI symptoms (Valera, 2018). I believe an underlying factor contributing to this unfortunate reality is the limited awareness, knowledge, and understanding of this problem among front-line workers. Often, front-line workers are the first service providers to interact with DV victims shortly after having been physically abused. With the right resources, front-line

workers have a winning chance against the battle with increasing rates and occurrences of undetected mTBIs (World Health Organization, 2017). DV workers are in the right place, at the right time to complete appropriate initial mTBI-screening and refer victims to appropriate treatment services (Banks, 2007). To do so, front-line workers must know how to ask about physical assault incidents that lead to mTBIs and accurately identify mTBI signs and symptoms (Hux et al., 2009). Early mTBI identification is a pivotal practice to decrease the victim's risk for the second-impact syndrome (i.e., sustaining a second brain injury before symptoms from the first have subsided) and lifetime suffering (Banks, 2007; Hux et al., 2009).

Research on the prevalence of mTBIs among DV victims concluded concerningly high rates of mTBI among this population (Kwako et al., 2011; Murray et al., 2016; Smirl et al., 2019). Corrigan and Bogner (2007), confirmed the value of interviews to screen and identify traumatic brain injuries (TBIs), namely, that face-to-face interviews conducted by informed professionals were the gold standard for determining a history of TBIs. This interview process included asking the client about any history of past violent incidents and administering screeners for head injury and mTBI symptoms (Banks, 2007). Therefore, the starting point to increase the identification of mTBIs is to enhance front-line workers' knowledge on mTBI and their outcomes (Hux et al., 2009). World Health Organization (WHO, 2017) recommended providing ongoing support and training to staff at women's shelters to be better equipped in their work with DV victims. Yet, in a recent study by Haag, Sokoloff, et al. (2019) they found DV support service providers lacked awareness and understanding about TBIs, the DV and TBI connection, and the psychological outcomes associated with TBIs among DV victims. Furthermore, these DV

support services workers were unprepared to identify the signs and symptoms of TBIs, and the vast majority (84%) of the participants did not have education or training concerning TBIs in the context of DV (Haag, Sokoloff, et al., 2019).

1.3 DEFINITIONS

In this section, I define various terms and concepts relevant to mTBIs resulting from DV, including hypoxic-ischemic brain injuries. It is essential to define these clinical terms as there is an ongoing debate in the literature on what constitutes an mTBI as I explore next.

1.3.1 MILD TRAUMATIC BRAIN INJURIES

The definition of an mTBI varies widely across the literature available to date. The term is often used synonymously with a concussion and is more commonly used in medical contexts (Lefevre-Dognin et al., 2020; Levin & Diaz-Arrastia, 2015). I have chosen to use the term mTBI as opposed to concussion because concussions often refer to milder forms of mTBIs associated with acute disturbances and temporary effects (Kristman et al., 2014).

The Mild Traumatic Brain Injury Committee of the Head Injury Interdisciplinary Special Interest Group of the American Congress of Rehabilitation Medicine ACRM (1993) provided a comprehensive definition, which was more recently revised and adopted by the WHO Task Force (Carroll et al., 2004). The same continues to be widely used and approved by researchers and clinicians in the field (Lefevre-Dognin et al., 2020). It describes an mTBI as “an acute brain injury resulting from mechanical energy to the head from external physical forces” (Carroll et al., 2004, p. 115). In addition, the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric*

Association [APA], 2013) and the ACRM (1993), use the following diagnostic criteria thresholds to classify a mild TBI, at the time of the injury or initial assessment: loss of consciousness for no more than 30 minutes, posttraumatic amnesia (PTA) for less than 24 hours, diminished mental awareness at the time of the incident (disorientation, confusion, etc.), momentary neurological deficits, and a Glasgow Coma Scale between 12 and 15 (Kristman et al., 2014). Although the mechanical factors of an mTBI proposed by the ACRM (1993) are widely accepted and used in medical and academic contexts, it excludes facial injuries as an mTBI onset. However, many brain injuries meet the diagnostic criteria proposed by ACRM and the *DSM-5* and are caused by facial injuries and asphyxiation (Campbell et al., 2018; Cullen & Weisz, 2011; Haag, Jones, et al., 2019). Thus, this project will include facial injuries and suffocation as onsets of mTBIs in the context of physical abuse. This assumption has been made in the past by DV-mTBI experts (e.g., Haag, Jones, et al., 2019 and Valera and Berenbaum, 2003).

1.3.2 HYPOXIC-ISCHEMIC BRAIN INJURIES

These are brain injuries caused by oxygen deprivation. Although not considered traditional mTBIs, the outcomes of asphyxiation overlap with those of mTBIs resulting from direct impact to the head (Campbell et al., 2018; Cullen & Weisz, 2011; Haag, Jones, et al., 2019). Like experts in the field of brain injuries and DV (Haag, Jones, et al., 2019; Valera & Berenbaum, 2003), I will include hypoxic-schematic brain injuries with traditional mTBI.

1.3.3 DOMESTIC VIOLENCE

This term is used interchangeably with intimate partner violence and domestic abuse. According to the United Nations (n.d.), DV is any pattern of behaviour or actions

used to have power over an intimate partner. DV also encompasses abuse happening in the victim's household by any member of the home (WHO, 2017).

1.3.4 PHYSICAL ABUSE

The one form of abuse that is most detectable by people outside the household is physical abuse. Although in many cases, it may not be the prominent form of DV for the individual (e.g., verbal, emotional, financial etc.), it instills fear of reoccurrence and enhances the abuser's control over the victim (United Nations, n.d.). This form of DV involves physical force that hurts an individual such as grabbing, choking, burning, hitting, or slapping. In this project, I will explore physical abuse injuries as possible onsets to mTBIs.

1.4 PURPOSE OF THE PROJECT

Research on mTBIs caused by DV is gaining ground, but inquiries into the implication of this relationship for front-line workers at women's shelters continue to be limited (Haag, Sokoloff, et al., 2019). As a result of Haag, Sokoloff, et al.'s (2019) work identifying a lack of perceived preparedness among DV support services workers to identify mTBIs, and Murray et al.'s (2016) call for up-to-date practice guidelines for professionals working with individuals at risk for DV-related TBIs, I intend to address this gap in the literature and practices. I will analyze and consolidate the literature relevant to mTBI in the context of DV, identify the implications for front-line DV workers, and provide a summary for shelter workers on what I deem to be the top must-know domains relevant to mTBI identification and practices.

To my knowledge, no previous TBI projects or initiatives have focused on the prevalence of DV-related mTBIs, mTBI identification challenges, and DV and mTBI

symptom overlap. The occurrence of mTBI in the contexts of domestic violence, and the implications for DV shelter workers will be central in the development of this project and production of the manuscript (see Appendix 1).

1.5 CONTRIBUTION OF THIS PROJECT

Although violence against women is considered an urgent public health priority worldwide (Garcia-Moreno et al., 2011; Struchen et al., 2009), and addressing it is pivotal to the success of women's empowerment and gender equality (WHO, 2005), there is limited knowledge on the connection of mTBIs to DV and what DV front-line shelter workers need to know about this issue. There remains an existing gap in the level of knowledge among DV shelter workers, namely around the identification, screening, and proper interventions to support DV victims with mTBIs (Haag, Sokoloff, et al., 2019).

My proposed manuscript based on this final project has the potential to address the gap in the literature, and inform stakeholders' process designing, developing, and implementing evidence-based best practices informed by the implications of mTBI among DV victims for front-line workers. I hope this final project will promote the expansion and development of new screening and referral practices to improve the overall care provided to mTBI survivors and enhance their quality of life. Overall, I intend to provide an educational resource and potential guidelines for shelter supervisors to present to their staff and improvement front-line worker's confidence to identify mTBI among their clients.

1.6 CHAPTER SUMMARY

Researchers seemed to have overlooked mTBIs within the context of DV, thus information on this topic is rarely available and accessible to DV-TBI to professionals

working with DV victims. The need to aid front-line workers and to focus on initiatives to prevent and respond to DV has been identified by the WHO (2017) and ACRM (1993). The researchers from the literature reviewed supported addressing a knowledge gap on TBI, particularly on the existence of mTBI among DV victims. I hope that my final project will help to fill the gap on the implications of mTBIs among abused women for front-line domestic violence shelter workers, by thoroughly studying the literature on DV-related mTBIs. Furthermore, a manuscript outlining key domains relevant to increased understanding and knowledge of mTBIs will come out of this project's findings from the literature. Chapter 2 will outline how the literature compiled in chapter 3 was searched and obtained, and provide an overview of the structure of this project and a statement of ethical conduct. In Chapter 3, I will review the current literature on this final project's topic. Chapter 4 of this project will deliver a list of practical recommendations and learning objectives, identify the strengths and limitations of this project, and suggest areas for future research. Lastly, Appendix 1, the applied portion of this project, is a manuscript describing three key recommendations about mTBI identification and the provision of supportive services to DV victims at risk or experiencing the negative impacts of mTBIs.

CHAPTER 2: METHODS

In this chapter, I will outline how the articles, studies, and practices referenced in the expert chapter were researched and obtained. I will also identify the search terms and search engines used in the literature search of this final project. The chapter also includes a statement of ethical conduct and specifies the structure of this project.

2.1 RESEARCH PROCESS

Between September 2019 and July 2021, I accessed online academic databases to complete a comprehensive review of available research and literature on mTBI, the occurrence of mTBI caused by DV, and implications for front-line workers at women's shelters. The search was centred around peer-reviewed articles about the identification of psychosocial factors of DV-related mTBI (inc. mTBI signs and symptoms, onsets, recovery, and misconceptions) and considerations relevant to working with brain-injured DV victims. Because of the little research on the link between DV and mTBI, the search was broadened to include interchangeably used terms such as concussions, IPV, and post-concussion symptoms. This helped me discover the contrast in terms and diagnostic criteria used across various contexts (i.e., high impact sports, combat, research, or clinical). Overall, the following search terms were used in various combinations to acquire an overview of the available literature: acute TBI, signs and symptoms of mTBI, post-concussion symptoms, TBI screening and identification, screening for concussions in DV, concussions and DV, DV-related mTBI, TBI knowledge among women shelter workers, and effects of TBI among IPV victims.

Only a few references on this research topic were published in the early 2000s; instead, a focus was placed on scanning the literature for primary articles published in

approximately the last decade, 2009 to 2021, to obtain emerging information about DV-related TBI. A preference for newer literature to use in the development of Appendix 1 supports the delivery of best possible care by DV front-line workers to their clients.

Google Scholar Search and Summon via The University of Lethbridge online library are the two search engines used to obtain the peer-reviewed articles. Some of the databases accessed through Summon were PsycINFO, PubMed, and EBSCO. In addition, articles were located from article recommendations by journals based on my article search history, and the reference lists of already obtained articles were reviewed and used to expand the pool of resources for this project.

2.2 STATEMENT OF ETHICAL CONDUCT

This project did not involve the use of human subjects; thus, an ethics application was not commanded. Nevertheless, during the development of this project, I was bound by the Canadian Code of Ethics for Psychologists (Canadian Psychological Association, 2000) and the University of Lethbridge's Standards of Professional Conduct for MEd (Counselling psychology) Students. The writing format, structure and style of this project followed the Publication Manual of the American Psychological Association 7th Edition (*Publication manual of the american psychological association*, 2020) standards.

2.3 PROJECT STRUCTURE

This final project was composed of a thorough exploration and comprehensive compilation of relevant literature and research on the DV-related mTBIs, and a summary of practical considerations for front-line DV staff with no professional training on mTBI screening and practices. The last section of this final project was a manuscript from the first portion of this project (see Appendix 1), to highlight what I considered the most

important things from the literature for front-line workers to know about DV-mTBI, to increase their overall mTBI knowledge and confidence recognizing DV-related mTBIs among their clients. The contribution of this project to the field of psychology is important given its focus on mTBI-related negative psychological outcomes such as mild to moderate mental health concerns (i.e., depression, anxiety, and trauma), and negative behavioural, cognitive, and emotional outcomes common among mTBI and DV survivors.

2.4 CHAPTER SUMMARY

This project was developed to address an identified gap in the literature about mTBI caused by DV, and a lack of knowledge and confidence on this topic among professionals supporting DV victims exposed to physical abuse. This project and literature search also supports the expansion and update of the little relevant practical information available to inform service delivery practices by front-line workers and program design at women's shelters.

CHAPTER 3: LITERATURE REVIEW ON MILD TRAUMATIC BRAIN INJURIES AND ITS INTERSECTION WITH DOMESTIC VIOLENCE

TBIs are a public health issue worldwide, yet many mTBIs likely go unreported, missed, or not assessed (Struchen et al., 2009). Given its prevalence and the nature of mTBI outcomes, I believe it is very likely that DV support services providers will encounter a client with an mTBI. The consequences on various domains of a person's life after a brain injury are experienced among survivors of a brain injury, depending on the severity and location of the injury on the brain (Struchen et al., 2009). As I will outline in this chapter, no two brain injuries are the same; they vary in the degree of decreased cognitive, behavioural, and emotional functioning, overall quality of life, and other essential factors for brain-injured survivors' former life. This proposes considerable challenges for the client and those helping the client in terms of what to expect following an mTBI. The presence of these negative outcomes requires workers serving brain-injured individuals to make adaptations to the assessment techniques and service plan to meet the client's needs and consider the client's abilities.

In this chapter, I will provide an overview of the current literature on mTBI associated with DV. I will begin by providing a basic understanding of mTBI, its prevalence, signs and symptoms, and recovery. Then, I will introduce DV-related mTBI, provide insight into what unidentified mTBI may look like amongst DV victims, and the challenges of spotting indicators of an mTBI within this, I believe, underdiagnosed population. Lastly, I will explore the nuances of this mTBI-DV relationship in the applied field with front-line shelter workers.

In this section, I will address basic terminology relevant to the understanding of this final project, general mTBI prevalence, signs and symptoms (e.g., biopsychosocial), and recovery. I will then proceed to more DV-specific mTBI onsets, cooccurring conditions, identification, and the implications for frontline DV support services workers. Next, I will begin by exploring the nuance of no universally agreed-upon definition of an mTBI.

3.1 TERMINOLOGY

The public and individuals with a sustained brain injury may be unclear on how mTBI can occur. To start, while medical professionals and scholars may use the terms concussions and mTBI interchangeably (McCrea et al., 2014; Struchen et al., 2009), based on my review of recently published work, the criteria to identify and define an mTBI varies, as does the name assigned to the condition (e.g., concussion, minor brain injury, and mTBI). I used the term mTBI because concussions refer to milder forms of an mTBI, associated with an acute disturbance of consciousness and temporary effect, neglecting long-term functioning issues and brain damage (Kristman et al., 2014). In addition, mTBIs are more commonly used in medical contexts (Lefevre-Dognin et al., 2020; Levin & Diaz-Arrastia, 2015). In the next paragraph, I will define mTBI.

There is ample inconsistency in the literature around mTBI because there are currently no universal criteria to define an mTBI (Kristman et al., 2014). This inconsistency and ambiguity among professionals and the public about what constitutes an mTBI may contribute to the high prevalence of mTBIs and an astonishing number of mTBIs going unreported, which I will explore in later sections.

I will define an mTBI according to the operational definition provided by the Mild Traumatic Brain Injury Committee of the Head Injury Interdisciplinary Special Interest Group of the ACRM (1993) and the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013)*.

The definition provided by the ACRM was revised and has been used by the WHO Task Force (Carroll et al., 2004), and reads as follows:

An acute brain injury resulting from mechanical energy to the head from external physical forces. Operational criteria for clinical identification include (i) 1 or more of the following: confusion or disorientation; loss of consciousness for 30 minutes or less, post-traumatic amnesia for less than 24 hours; and/or other transient neurological abnormalities such as focal signs, seizure, and intracranial lesion not requiring surgery; (ii) Glasgow Coma Scale score of 13–15 after 30 minutes post-injury or later upon presentation for healthcare. (p. 115)

The ACRM list the following as criteria for the event resulting in acquiring an acute brain injury:

These manifestations of MTBI must not be due to drugs, alcohol, medications, caused by other injuries or treatment for other injuries (e.g., systemic injuries, facial injuries or intubation), caused by other problems (e.g., psychological trauma, language barrier or coexisting medical conditions) or caused by penetrating craniocerebral injury. (Carroll et al., 2004, p. 115)

External physical forces to the brain causing injury include a strike to the head or from the brain undergoing sudden acceleration or deceleration (i.e., whiplash) and the outcomes are widely diverse. Following published definitions of an mTBI such as the

ones mentioned above (ACRM, 1993; Carroll et al., 2004), hypoxic-ischemic brain injuries caused by oxygen deprivation from strangulation are typically not considered an mTBI (Carroll et al., 2004) because they do not have qualities such as “mechanical energy to the head from external physical forces” (Carroll et al., 2004, p. 115) nor necessarily involve “loss of consciousness” (p. 115) for a brain injury to happen. However, the outcomes of hypoxic-ischemic brain injuries and mTBIs overlap (Campbell et al., 2018; Cullen & Weisz, 2011; Haag, Jones, et al., 2019), therefore, this final project will include hypoxic-ischemic brain injuries under the umbrella of mTBI. This assumption was made before by mTBI and DV experts Haag, Jones, et al. (2019) and Valera and Berenbaum (2003) within their research of DV-related mTBIs.

The *DSM-5* (APA, 2013) uses measures like the diagnostic criteria specified by the ACRM, at the time of injury or initial assessment as thresholds to rate the severity of the TBI. These are loss of consciousness for less than 30 minutes; posttraumatic amnesia for less than 24 hours; and disorientation and confusion at a Glasgow Coma Scale Score between 13 and 15 (APA, 2013). Regardless of the inconsistency of the term used across literature and in clinical settings, there is a high prevalence of mTBI and an astonishing number of mTBI going unreported, which I will explore below.

3.2 PREVALENCE

TBIs are a public health issue worldwide (Struchen et al., 2009), given at least 10 million TBIs result in death or hospitalization every year (McCrea et al., 2014). In the United States, there are approximately 1.7 million new TBIs every year (APA, 2013). Approximately 40% of trauma-related deaths are due to a brain injury, and TBIs are among the leading causes of fatality in the US (McCrea et al., 2014). Although I was

unable to find Canadian statistics regarding TBIs, a recent study by Rao et al. (2017) examined and assessed the data from the annual cycles of the Canadian Community Health Survey (years 2005, 2009, and 2014), to estimate TBI incidences among the Canadians reporting any type of injury in the previous year and the annual percent change in the occurrence of TBI. In 2005, 1.4% of participants reported having a TBI, and in 2014, 3.2% reported having a TBI (Rao et al., 2017). In a population of 30 million, this would mean that in 2014, approximately 155,000 individuals sustained a TBI. Globally, TBIs are the leading cause of long-term disabilities in physical, emotional, cognitive, and social functioning (Arango-Lasprilla, 2012; Rosenfeld et al., 2012). Repeated mTBIs may have cumulative enduring consequences (APA, 2013). The outcomes of an mTBI, regardless of their injury of origin, may look somewhat similar across this large population of brain-injured individuals. The common signs and symptoms of mTBI will be explored next. It is important to note that the following symptoms may cooccur with neurological (e.g., neuropsychological abnormalities due to illness or condition) and physical symptoms (e.g., headaches, fatigue, sleep disturbances), overlap mental health disorders (e.g., depression, post-traumatic stress, anxiety), and trigger additional diagnosis from possible subsequent deterioration (APA, 2013). The following simply list reported symptoms that should be considered within context (of having a brain injury) and assume that a differential diagnosis will be conducted before assuming an mTBI.

3.3 SIGNS AND SYMPTOMS

Despite the word mild in mTBI, its sequel is guaranteed to impact a person's life; for some, it can have overwhelming lifelong consequences, including decreased quality of life (Struchen et al., 2009; van Ierssel et al., 2018) and permanent post-mTBI

symptoms or postconcussion syndrome (PCS; Hiploylee et al., 2017). While the intensity and duration of symptoms postinjury may provide insight into the probable severity of the injury and overall expected outcomes (Maucieri, 2012; McCrea et al., 2014), there is no relationship between the severity of the brain injury and the severity of resulting neurocognitive disorders (NCDs; APA, 2013).

Most post-mTBI symptoms are somatic, mental or cognitive (e.g., concentration, memory, or executive functioning), behavioural, and emotional (irritability, anxiety-related disorders, or disinhibition; Kay et al., 1993; Maucieri, 2012). The five most common self-reported symptoms following an mTBI are fatigue, headache, dizziness, forgetfulness, and irritability (Bergman, 2011; Dean et al., 2012; Fourtassi et al., 2011; Ingebrigtsen et al., 1998; Kashluba et al., 2004; Paniak et al., 2002; Savola & Hillbom, 2003). Generally, individuals with a sustained brain injury suffer from impairments to or, at minimum, a decrease in all dimensions of quality of life (QoL) following a brain injury (Hunt et al., 2019; Weber et al., 2019). QoL is a broad concept, generally defined as a person's subjective opinion of their life about their expectations, hopes, concerns, and standards of life (World Health Organization [WHO], 1997, 2012). QoL also encompasses a person's sense of well-being and satisfaction with life within physical, psychological, and social functioning; subjective perceptions of self-efficacy; independence; social support; and self-concept (Bullinger, 2002; Dijkers, 2004).

Banks (2007) reported from her review of the research and scant literature available on injuries sustained by athletes, equivalent to DV-related injuries (e.g., facial injuries and brain injuries) practical domains of symptoms relevant to recovery from a TBI. The following three domains of neuropsychological function and dysfunction are

often of concern among victims with possible undiagnosed mTBIs. Thus, understanding and awareness of these key post-mTBI signs by professionals and service providers are strongly encouraged to be used as flags to identify a possible mTBI among clients.

3.3.1 SOMATIC SYMPTOMS

Banks (2007) advised that if the client has visible bruises or injuries, it is unavoidable to ask the client about the source of the injury. For example, burn marks attained while cooking may be associated with tremors and limited motor coordination skills experienced by individuals with mTBI (Banks, 2007). Other sensorimotor symptoms include headaches lasting from a couple of days to long-term, or migraines, which are most chronic among individuals who have sustained a DV-related mTBI than any other TBI severity or onset (Blume et al., 2012; Nampiaparampil, 2008; Smirl et al., 2019; Struchen et al., 2009). Dizziness, nausea, fatigue, blurred or double vision, noise and light sensitivity, difficulty hearing, and sleep disturbances are common outcomes of mTBI as well (Kitrungrote, 2014; Struchen et al., 2009). Other signs that may alert professionals to consider the presence of an mTBI among their clients are changes in speech or gate. In some cases, clients who used to speak clearly and later begin to have disrupted speech (e.g., slurring, misused words), have a lack of symmetry in their face, walking and balance difficulties or paralysis may be showing a symptom of mTBI worth further investigating (Banks, 2007; Jackson et al., 2002).

3.3.2 COGNITIVE SYMPTOMS

Cognitive confusion is one of the most typical characteristics following an mTBI and is associated with resulting unemployment and poverty (Andelic et al., 2013). Cognitive difficulties are often a barrier to resuming former expected levels of

community involvement, employment, and relationships (Jackson et al., 2002). Some of the signs of cognitive difficulties are decreased attention and concentration, memory issues, slowed information processing speed, and organizational difficulties (Struchen et al., 2009). Clients may also have difficulty problem solving, evidenced by an inability to generalize experiences or learned material (Banks, 2007). Practical signs of a decline in intellectual processing and memory include forgetting material from previous appointments and difficulty reading, handling finances, or filling out forms (Banks, 2007). Overall, regression or halted progression toward their service goals can be a clue to the support worker to assess the client's alertness, memory, or ability to communicate effectively (e.g., initiating or maintaining a discussion; Banks, 2007; Valera & Berenbaum, 2003).

3.3.3 BEHAVIOURAL AND AFFECT SYMPTOMS

Behavioural symptoms may range from beginning to struggle with spatial orientation, such as finding it difficult to read maps and understand directions (Jackson et al., 2002), to exaggerated or limited expression of emotions, often due to damage to neurological components (Banks, 2007). Other affect factors that may change are emotional reactions, ranging from minimal facial expressions, monotone voice, and limited words to exaggerated emotional inhibited expressions of emotion (Banks, 2007). While these behavioural and emotional symptoms affect a person's life and the way they express their emotions, the most notorious behavioural and emotional outcomes among this population are associated with new mental health issues (Andelic et al., 2013). Often mTBI survivors experience increased anxiety and impulsivity, which can be evident by actions such as rushing to move ahead too early (i.e., impatience) or jumping to

unreasonable conclusions (i.e., cognitive distortions; Banks, 2007; Valera & Berenbaum, 2003).

3.4 RECOVERY

Under ideal circumstances such as getting rest at the right time, proper nutrition, implementing compensatory strategies, and experiencing overall improved QoL, the brain may recover on its own following a brain injury (Banks, 2007; Jackson et al., 2002). However, Berger (2019) stated medical consultation is necessary for recovery and problems can be avoided if the client is referred to treatment within a couple of weeks of the injury. In addition, treatment will likely take longer for individuals who have had multiple mTBIs or have been experiencing symptoms persistently (Berger, 2019).

In this section, I will provide an overview of the literature regarding general recovery rates and timelines. Like other types of recovery and rehabilitation, the healing process depends on various factors (i.e., personal, physical, psychological, environmental, etc.) and looks different from person to person, yet in most cases follows an average trajectory. The following timeline includes contrasting and complementing research and literature on the recovery process from a TBI (e.g., mTBI), including factors that may affect the recovery rate.

According to the *Guidebook for Psychologists Working with Clients with Traumatic Brain Injury* (Struchen et al., 2009), most individuals return to their preinjury “normal” within the first months following the mild TBI, although recovery rates may be longer for individuals with a history of brain injuries or people who are older (Struchen et al., 2009). McCrea et al. (2014) further claimed an evident explosion of research on mild TBIs (e.g., mainly sports-related) suggested most individuals recover within the first 3

months following the injury, and most times the symptoms gradually subside over time (McCrea et al., 2014; Struchen et al., 2009). Next, I will explore a more detailed recovery timeline, including severity, prevalence, and pattern of post-mTBI symptoms up to 3 months post-injury, up to 5 months post-injury and afterwards.

3.4.1 UP TO 3 MONTHS AFTER INJURY

According to the *DMS-5* (APA, 2013), neurocognitive symptoms typically resolve within a few days or weeks after the injury and completely resolve by the end of 3 months after the injury. Recent literature supported this, with research reporting that most mTBI survivors do not typically have persistent cognitive, socioemotional, or physical symptoms past the first few days and weeks after the incident or accident (Maucieri, 2012). Symptoms experienced past 3 months after the injury span a wide range, yet research studies reported a set of common symptoms based on their results. For example, Hiploylee et al. (2017) identified headaches, fatigue, and difficulty concentrating as the most common symptoms among their population sample, while also stating that these differ to an extent from symptoms reported in other studies (see e.g., Voormolen et al., 2019; Schwab et al., 2019) and that these symptom profiles change over time.

Symptoms do not present the same for all individuals following an mTBI. Within 1 month postinjury, the symptom endorsement and severity may be heterogeneous across individuals with an mTBI. For example, a quantitative study by Paniak et al. (2002) involving 118 Canadian patients with mTBIs within 1 month postinjury found a high variability of symptom incidence and severity ranging from moderate to severe for a minority of the patients, and most patients reporting symptoms in the low range. This

suggests that symptoms can not be exclusively relied on for diagnosis or identification of an mTBI. Nevertheless, in most cases, Paniak et al. (2002) found the symptoms most experienced during the first month postinjury were headaches, fatigue, forgetfulness, doing things slowly, and disturbed sleep. In 80–100% of the cases, individuals experience at least one symptom over the first month, and these were generally most severe over the first few days and weeks following the injury (Paniak et al., 2002; Struchen et al., 2009). There may also be a noticeable difference in the number and type of symptoms present between 3 weeks and 3 months after the injury. For instance, Emanuelson et al. (2003) assessed the extent of post-mTBI symptoms 3 weeks and 3 months postinjury using a 21-item checklist of existing and nonexisting postconcussion symptoms (a modified version of the Comprehensive Psychopathological Rating Scale) with 173 patients and found that significantly more symptoms were reported at 3 months than at 3 weeks after the injury. At the time of injury, 66% of patients presented with neurologic disturbances, amnesia, and/or unconsciousness, while at 3 weeks after the injury the most commonly reported symptoms for 89 participants (51%) were tiredness, neck pain, irritability, headaches, and increased sleep. Lastly, at 3 months postinjury, visual impairment, anxiety and depression were present in 24–36% of the participants (for 64 participants). Essentially, the results indicate a higher rate of post-mTBI symptoms at 3 months after the injury than at 3 weeks postinjury. More phenomena associated with a longer recovery exceeding 3 months postinjury will be explored next.

3.4.2 UP TO 6 MONTHS AFTER INJURY

Literature supported that 10–20% of individuals with mTBI continue to experience negative outcomes, including post-mTBI symptoms, past the 3 months and

suggested this long recovery is associated with contributing factors, including neurological or psychological variables (e.g., the sequel of physical abuse; Struchen et al., 2009). For example, in a quantitative study, 731 patients diagnosed with an mTBI were assessed for the severity and existence of postconcussion symptoms at 6 months postinjury using the Rivermead Postconcussion Symptoms Questionnaire (RPQ; Voormolen et al., 2019). Approximately 40% of the participants reported experiencing postconcussion symptoms (Voormolen et al., 2019). Some of these individuals (15-45%) may continue to experience mTBI symptoms (as per DSM-IV or ICD-10 criteria) 6 months post-injury (Struchen et al., 2009; Voormolen et al., 2019)

3.4.3 OVER 6 MONTHS

Not everyone recovers from post-mTBI-related symptoms. In some cases, patients recover within the first year, while others may have permanent symptoms still present past 3 years postinjury. As with the recovery period up to 6 months, how symptoms show up may or may not be predictable. For example, some individuals may continue to experience symptoms up to a year after the injury, and 16% of these may get at least one new symptom not present within the first 3 weeks after the injury (Emanuelson et al., 2003). Hiploylee et al. (2017) conducted a longitudinal follow-up, the first of its kind; their study examined PCS recovery among 110 eligible patients diagnosed with an mTBI (e.g., concussion), with postconcussion symptoms lasting over 3 months, negative computed tomography and/or magnetic resonance imaging results, and negative test of Memory Malinger Test (Tombaugh, 1996) results. They found that only 27% of their participants eventually recovered, and 67% of these recovered within the first 12 months. Meanwhile, they found postconcussion symptoms may be permanent if recovery had not

happened by the end of year 3 postinjury ($n = 80$). Hiploylee et al. (2017) further noted symptoms presented in a predictable order and the more symptoms reported the longer the time to recovery, that is, each additional symptom reduced the rate of recovery by 20%. Lastly, they performed a multivariate analysis of demographics, comorbidities, and symptomology in patients with persisting symptoms and found no significant demographic (e.g., age or sex) differences between their recovered and not recovered participants. However, there was a relationship between females and older participants to persisting post-mTBI symptoms. The most common symptoms reported 1 year after the injury by the participants in the study by Emanuelson et al. (2003) were tiredness, headache, neck pain, irritability, and depression.

Research exploratory analyses have been used to examine associations of mTBI survivors' variables (demographics, comorbidities, and symptoms) with recovery time. These associations cannot be used as prognostic models due to confounding variables (i.e., independent variables measured at varying times), but can be useful for better understanding risk at early stages of injury recovery (Hiploylee et al., 2017). However, these analyses of individual variables have not shown a significant association with recovery time (Lingsma et al., 2015; Silverberg et al., 2015; Wäljas et al., 2015).

It can be concluded from the research and literature discussed above that there is a level of difficulty diagnosing and confidently predicting recovery and proper treatment for post-mTBI symptoms, which would be of great frustration for both individuals consciously struggling with mTBI symptoms and their support network (i.e., loved ones, social services, and health care teams). Therefore, it is important to expand the research relevant to increasing understanding and knowledge about mTBIs (e.g., relevant signs

and symptoms of a probable or confirmed mTBI) and how to promote recovery, among people (i.e., service providers, case workers, case managers, or therapists) and places that support populations prone to events with high risk for acquiring an mTBI (e.g., DV shelters).

Next, I will provide evidence for the occurrence of mTBIs in the context of DV. Although there is limited knowledge and research on the connection between the two (Haag, Jones, et al., 2019), recent research has supported an association between TBI and DV and has confirmed the various challenges faced by DV survivors (e.g., biopsychosocial; Haag, Jones, et al., 2019). Thus, I will unpack this association in the following pages.

3.5 MTBI AMONG DV VICTIMS

According to a combination of research and fact sheets from the WHO, approximately one in three women from around the world have experienced some type of physical or sexual assault in their lifetime (Valera, 2018; WHO, 2021). These astonishing statistics come from reliable, controlled research with significant findings. For example, Garcia-Moreno et al. (2006) reported from their qualitative study involving 24,097 interviews with women from across ten countries that 13–49% of the women interviewed reported having experienced physical violence by their partner. DV can affect a person's physical and mental health (i.e., cognition and psychological) directly, through injury (e.g., mTBI). It is evident that DV in partnership is not rare, occurs across all socioeconomic statuses, and is the number one cause of homicide for women (Valera, 2018). In Canada, DV is the leading cause of physical injuries to women between the ages of 15–44 years and is associated with increased rates of mental illness,

unemployment, and poverty (Roberts & Kim, 2006). An incident-based uniform crime reporting survey conducted by Statistics Canada (as cited in Burczycka, 2018) showed that in 2016 the leading type of violence experienced by women was intimate partner violence (IPV).

Another field of study continuously gaining significant attention and rapidly expanding research topic is the life-changing outcomes of repetitively occurring mTBIs among military personnel and high-impact sports athletes such as American football players and boxers. This is evident from news coverage, movies, and documentaries in the public domain. Unfortunately, during a review of the literature of the past decade, I found little research has been done on an even larger population, women, who have been physically abused in their experience with DV.

To explore the connection between mTBI and physical abuse within the context of DV, I will first provide a working definition and brief overview of DV and then introduce the common onsets of an mTBI within the context of physical abuse. Next, I will share statistics around the prevalence of mTBI among women experiencing DV, and I will close this section with some of the impact mTBIs have on women experiencing DV.

3.5.1 DEFINITIONS

The term DV encompasses family violence, IPV, and abuse in a household by any member (WHO, 2016). There are various forms of abuse within DV: emotional abuse, psychological, financial, sexual, physical, and stalking (United Nations, n.d.). Some forms of DV are more easily identifiable than others; for example, physical assaults are the most noticeable forms of DV and often are the actions that allow outsiders to become

aware of the existing, threatening issue (United Nations, n.d.). In their article, Sheridan and Nash (2007) described the types of injuries reported in the literature by survivors of DV. They concluded that most DV injuries are from punches to the face, strangulation, and injuries to the head (Sheridan & Nash, 2007). Injuries to the face, head, and attempted strangulation can result in TBIs (Kwako et al., 2011). In their critical review of the outcomes and mechanisms of TBIs in IPV, Kwako et al. (2011) asserted the nature of DV injuries can onset mTBI-related symptoms, which may put DV victims at higher risk for recurrent TBIs as well as for developing greater illnesses. Their review highlighted the gap in findings on the psychosocial and medical symptoms experienced by IPV survivors that TBIs contribute to (Kwako et al., 2011). This final project will focus on the psychosocial symptoms of mTBIs resulting from physical abuse. Next, I will discuss what type of DV injuries may lead to an mTBI.

3.5.2 THE ONSET OF MTBI

Knowledge about what type of injuries likely lead to an mTBI is not always common sense nor known to the public nor service providers. A starting point to identify the risk for an mTBI is to ask about events that often result in an mTBI and make sense of a client's change in behaviour while considering a single or reoccurring mTBIs as a possible explanation for odd behaviour. Without this information, a victim's behaviour is often misunderstood by service workers (i.e., front-line shelter workers) and misattributed (Banks, 2007). Physical abuse often results in TBI (i.e., mTBI) from a one-time injury or accumulative injury. The onset of DV-related mTBI is typically one or various of the following events, repeated blows to the head, face, or neck with a hard object (e.g., fist), such as hitting the head against a hard surface (e.g., the floor or wall), a

jolt to the brain from violent shaking, or strangulations and oxygen deprivation (choking, drowning, pressure applied to the throat or chest; Jackson et al., 2002; Menon et al., 2010; Valera & Berenbaum, 2003; Valera et al., 2019; WHO, 2016). Identifying the source of the client's injuries is key to understanding the root cause of the challenges reported by the DV victim and providing appropriate support services (Hux et al., 2009). Failure to identify events that may have caused a brain injury and correctly associate the client's impairments with outcomes of an mTBI could lead to overlooking or misattributing signs and symptoms to something other than a brain injury, and implementing inappropriate interventions and strategies (Corrigan & Bogner, 2007; Curry et al., 2011; Hux et al., 2009). Based on a review of the literature and research on equivalent injuries sustained by athletes, Banks (2007) concluded it is unlikely to have serious injuries to the face or head without also injuring the brain. Despite the nature of the violent physical abuse, TBIs are too commonly overlooked as outcomes of the violent physical injuries sustained (Banks, 2007).

3.5.3 PREVALENCE

The high prevalence of DV-related mTBIs may come as a surprise given its small presence in the media and published literature. Often, as many as three in four women with a history of physical abuse sustain at least one partner-related brain injury, and half of these may have sustained multiple partner-related brain injuries. These statistics are found across various research studies, suggesting women victims of DV have higher rates (35–80%) of potential TBI; most of the DV injuries receiving medical care are injuries to the brain; and a fifth of all the brain injuries are diagnosed as mTBIs (Campbell, 2002; Garcia-Moreno et al., 2006; Kwako et al., 2011; Petridou et al., 2002; Sadowski et al.,

2004; WHO, 2001). Kwako et al. (2011) reported the prevalence of women with a TBI among victims seeking services from an emergency shelter or emergency departments range from 30–74%. For example, a study by Valera and Berenbaum (2003) of 99 physically abused women assessed for brain injuries found 74% of the women in their sample had endured at least one type of brain injury by their partner, while 50% sustained multiple brain injuries by their partner. Other commonly reported forms of physical assault are attempted strangulations, which also result in a TBI (e.g., mTBI) and cognitive impairments (e.g., amnesia). From brain severity documentation, Valera and Berenbaum (2003) found 68% of the sample of DV victims (in shelters or not) reported at least one mTBI, and 27% of the sample sustained a choking-induced anoxic event (i.e., the brain completely lost its supply to oxygen by being choked). Furthermore, Jackson et al. (2002) conducted research with a sample of 53 physically abused women and found 92% reported receiving a blow to the face or head during violent events, and 40% reported a loss of consciousness from one of these events, a diagnostic criteria item for TBI. It is evident through the literature described above that mTBIs caused by DV are a tragic reality. While the topic of this final project will be DV-related mTBIs, special focus will be placed on women at DV shelters and the role played by front-line workers at these facilities. The rate of violent events leading to TBIs (e.g., mTBI) are higher among DV victims in women's shelters. For example, in a DV shelter sample, Wilbur et al. (2001) found 68% of these women had experienced choking or attempted strangulation and no other TBI events (see also Kwako et al., 2011), while 54% of DV victims in a community sample who sought emergency shelter or support experienced strangulation or attempts thereof (Kwako et al., 2011; Sutherland et al., 2002).

In short, the researchers referenced above advocated for treatment strategies and routine screening for TBIs and post-mTBI symptoms. Kwako et al. (2011) recommended additional research on IPV-related TBIs, documentation of the chronicity of abuse and TBI, training in rapid assessment of neuropsychological functioning, education, and treatment for front-line workers (e.g., first responders) and other supports (e.g., family members). This final project will address the issue by providing further support and arguments for improved screening practices, training, and education on mTBI identification among women shelters across Alberta.

3.5.4 IMPACT OF MTBI AMONG DV VICTIMS

Various researchers have proposed that the after-effects of DV can persist long after the violence has stopped; the more severe the abuse, including accumulative episodes of physical injuries, the more intense and long-lived the impact on a woman's physical and mental well-being (i.e., posttraumatic stress disorder [PTSD], depression, cognitive dysfunction), including DV-related mTBIs often occurring over time, from accumulative injuries (Kwako et al., 2011; Valera & Berenbaum, 2003). For example, research by Valera and Berenbaum (2003) supported the notion that mTBI and DV abuse independently contribute to psychopathological and negative cognitive outcomes and that the more severe the injury, the greater the impact on the DV victim. In their sample of 99 shelter and nonshelter women, Valera and Berenbaum found an association between partner abuse (i.e., DV) severity measures and brain injury scores (i.e., memory and learning scores), and various psychopathologies. For example, higher brain injury scores meant lower cognitive abilities and more severe psychopathology variables including

general distress, depression, anxious arousal, and PTSD severity of symptoms (Valera & Berenbaum, 2003).

More recently, Valera et al. (2019) further supported this notion by reporting from a review of published research on the sequel and occurrence of DV-related mTBIs among groups, including women in shelters, that TBIs related to DV are associated with negative psychological and cognitive outcomes. As previously mentioned, the relationship between DV and mTBIs is well established within the literature, and knowledge on the biopsychosocial sequel DV victims live with is continuously growing (Campbell et al., 2018; Corrigan et al., 2003; Jackson et al., 2002; Roberts & Kim, 2006; Valera & Kucyi, 2017). Having explored the effects of head injuries among severely physically abused women, Roberts and Kim (2006) highlighted in their recommendation the focal role front-line workers serving physically abused women have in detecting and providing or coordinating services for women with mental disorders and neurological injuries. Next, I will identify some of the possible barriers front-line workers may have to detect mTBIs among DV victims.

3.6 MTBI IDENTIFICATION CHALLENGES BY FRONT-LINE WORKERS

I found various articles and research studies reporting that women victims of DV are among the few populations at high risk for mTBI underidentification. For example, a research review by Banks (2007) on injuries sustained by athletes, equivalent to those sustained by DV victims, highlighted many mTBIs seem to be often missed or misdiagnosed among victims of DV even in cases with an obvious head injury or the woman has lost consciousness following a violent event. Women victims of DV are among the few populations at high risk for mTBI underidentification. Hux et al.'s (2009)

findings supported this; they screened nearly 2,000 clients over a 6-month period at service agencies (e.g., domestic abuse facilities) for a TBI and found 26.6% tested positive, many of those with unidentified TBIs were clients seeking domestic abuse services. Hux et al. (2009) found the high frequency of positive screens for a TBI (52%) among individuals seeking assistance at DV facilities particularly striking. The commonality of undiagnosed mTBIs among this population is worrisome, given that brain injuries are one of the most serious consequences of DV, and approximately 80% of women seeking medical care for violence-related injuries have sustained injuries prone to cause a TBI (Banks, 2007). A lack of assessments and treatment can increase the risk for second-impact syndrome among DV female victims, whereas mTBI identification seems to prevent or decrease lifetime suffering with annoying symptoms that impact their routine activities (Banks, 2007; Hux et al., 2009). In addition, I found three reasons why the prevalence rate may not be accurate and how mTBI symptoms may be missed. In this section, I will review DV and mTBI symptom overlap (e.g., the work of Valera & Berenbaum, 2003), limitations of relying on self-report data from survivors of an mTBI (i.e., limited self-awareness or understanding), screening tools and practices (e.g., the work of Goldin et al. (2006), I will review each one in the following sections.

3.6.1 DV AND mTBI SYMPTOM OVERLAP

One of the main challenges commonly cited in the literature in identifying an mTBI among DV victims is that many physically abused women, regardless of having sustained an mTBI or not, experience emotional and cognitive issues including trauma (e.g., PTSD), depression, or anxiety symptoms. For example, Iverson et al. (2017) screened 224 US women veterans who had experienced DV in their lifetime for DV-

related TBIs and PTSD and found that women with DV-related TBI with existing symptoms were 5.9 times more likely than women with no DV-related TBIs to have DV-related PTSD. Similarly, Roberts and Kim (2006) reported from their qualitative study of 52 chronically physically abused women that severe physical abuse appeared to be associated with brain injuries, insomnia, nightmares, major depression, and flashbacks.

The concern is that these overarching symptoms can mistakenly be attributed solely to psychosocial DV-related outcomes (e.g., PTSD, anxiety, depression), and be missed for the possible indicators of an mTBI that they might be (Valera & Berenbaum, 2003). It is thus important for front-line service providers working with DV victims to be aware of these buried symptoms and the relationship between the severity of mTBI and psychological outcomes such as PTSD, anxiety and depression psychopathologies (Valera et al., 2019).

Valera et al. (2019) supported this overlap of symptoms. In their study that controlled for confounding variables (e.g., abuse severity), Valera et al. (2019) identified the sequel associated with mTBIs within the context of DV, to provide evidence that these were not linked to DV but to the mTBI itself. The mTBI specific sequel was identified from data collected across clinical interviews, tests, surveys, and neuroimaging aimed at understanding DV-related TBIs. Next, I will review some of the mTBI symptoms most often misattributed to DV hardship and psychopathologies, including symptoms consistent with trauma and depression.

3.6.2 TRAUMA

Banks (2007) completed a research and literature review on DV-equivalent injuries sustained by athletes (an extensively studied population for mTBI) and reports

that one of the challenges with identifying or diagnosing mTBI is the overlap of symptoms with those common of PTSD. This is evident by the number of women suffering from the sequel of an mTBI that are often misdiagnosed with PTSD. This may be attributed to this overlap in symptomology or because of the actual presence of the disorder among this population, as suggested by Valera and Berenbaum (2003). It was well discussed across the literature reviewed in this chapter and the aforementioned researchers that it is common for DV victims to experience symptoms consistent with PTSD (APA, 2013; Iverson et al., 2017; Smirl et al., 2019). However, those DV victims experiencing mTBI symptoms are approximately six times more likely to meet DV-related PTSD criteria than women with no DV-related TBI history (Iverson et al., 2017; Smirl et al., 2019). For example, a study by Iverson et al. (2017) with 18 women from community-based women's shelters who had experienced DV showed two in three women with a history of DV-related mTBIs with concurrent symptoms of an mTBI met the DV-related PTSD criteria, and were more likely to meet all four of the *DSM-5* (APA, 2013) PTSD symptom clusters than DV victims with no mTBI. However, while DV victims reported elevated levels of arousal (e.g., hyperarousal and emotional numbing) on the Clinician-Administered PTSD scale (CAPS-5), a PTSD assessment (Weathers et al., 2018), these outcomes were not correlated with Brain Injury Severity Assessment (BISA) scores (Valera & Berenbaum, 1997), a measure of brain injury severity (Smirl et al., 2019). Given the proportion of women with DV-mTBI-related symptoms and its strong association to DV-related PTSD symptoms, service providers working with this population would benefit from education and knowledge about mTBI and PTSD

symptoms. Iverson et al. (2017) also suggested clinicians working with this population assess for both PTSD and TBI.

3.6.3 DEPRESSION

Struchen et al. (2009) commented in the *Guidebook for Psychologists: Working With Clients with Traumatic Brain Injury* that depression is the most common emotional disturbance experiences following a TBI, ranging between 14–46% within the first 12 months following the injury, far exceed depression rates among the average population. These depression symptoms may in turn aggravate cognitive impairments, difficulties with activities of daily living (ADL), and further decreased life satisfaction (Struchen et al., 2009). This is supported by a systematic research scan of studies on the impact of general mTBI on specific mental health outcomes, including six databases and 27 studies meeting the criteria for review, in which Rice et al. (2018) found depression symptoms were the most frequently reported affective symptoms by individuals with an mTBI.

It is common after sustaining an mTBI for individuals to lack insight and awareness of the change in their limitations and try to do more than they really can do with their current abilities. In some cases, depression may arise from their repeated, ongoing frustration with not having the abilities and independence they had before the TBI (Banks, 2007), or occur from the interaction of a history of TBIs, chronic stress, and physiological disruptions associated with physical abuse (Kwako et al., 2011). Furthermore, preexisting factors such as a preinjury psychiatric illness (i.e., depression, anxiety, abuse experiences) history may have health consequences, including an increase in the depression rate among mTBI, and may thus influence the diagnosis of post-mTBI depression (Struchen et al., 2009). In their prospective study of 110 mTBI patients in a

trauma centre, Dischinger et al. (2009) reported individuals with a history of depression preinjury are 3.5 times more likely to experience post-mTBI symptoms than individuals with no history of depression. On the other hand, in their book on *Sports-Related Concussions in Youth*, as reported by Graham et al. (2014) noted research has shown a strong correlation between a history of mTBI and diagnosis of depression. For example, in an anonymous survey of 200 American football players, Pryor et al. (2016) found individuals with a history of three or more mTBI events were 2.4 times more likely to report experiencing moderate-severe depression than those with no mTBI history, and reported significantly higher depression symptoms than individuals with two or fewer mTBI events.

The problem with missing mTBI signs and symptoms is that these may likely then be misidentified by professionals and other service providers as Axis II personality disorders, and thus see no need to assess for a brain injury as a possible contributing or causal factor of the problem (Banks, 2007). Kwako et al. (2011) concluded the consequences for DV women may be reduced health-related QoL and high rates of mTBI-related symptoms among DV women. Only once a potential mTBI is identified, can a service worker provide the best support, make appropriate referrals to treatment, and begin supportive interventions within their scope of practice, including recommending rest, grounding exercises, and other techniques to support the parasympathetic nervous system (Berger, 2019). Next, I will review the limitations of self-report data from DV victims about occurrences of mTBIs as one more reason why mTBI symptoms may be missed.

3.7 MTBI SELF-REPORT DATA FROM VICTIMS OF DV

One barrier to accurate self-reports is situations in which clients exaggerate or underreport their symptoms and challenges. Hux et al. (2009) commented these individuals might have limited self-awareness or are under the belief that doing so may result in gaining access to resources and services or losing opportunities of gain (e.g., lawsuits or employment; Hux et al., 2009). Also, a shared comment and conclusion from the literature reviewed is that the victim's unclarity around what constitutes an mTBI, impaired awareness of their abilities or events possibly leading to a TBI, and inability to distinguish a head, neck, or face injury among the multiple injuries sustained during an event or events of DV, limit the reliability of the data from a self-report (Corrigan & Bogner, 2007; Hux et al., 2009; Smirl et al., 2019).

3.7.1 NUANCES OF SCREENING PRACTICES

Accurate diagnosis of an mTBI is essential for making the right referrals to essential and appropriate treatment for recovery, but no diagnosis can be done until someone screens for it. There are various ways to assess for common mTBI outcomes including RPQ (King et al., 1995), The Sport Concussion Assessment tool 5th edition (SCAT5; Echemendia et al., 2017), and BISA (Valera & Berenbaum, 1997) tool. These screening tools facilitate the identification of mTBI. The RPQ, developed by King et al. (1995), is specific to measuring postconcussion symptoms and accounts for the severity of the 16 most common symptoms experienced after an mTBI (e.g., fatigue, headaches, sleep disturbance, poor concentration, irritability, slowed thinking process, forgetfulness, frustration, dizziness, sensitivity to noise, restlessness, feeling depressed, sensitivity to light, nausea, blurred vision, and double vision). The SCAT5 is the most widely used tool

to assess for a suspected sports-related mTBI; it is composed of a 22 mTBI symptoms checklist (including being more emotional, irritable, sad, nervous or anxious, and issues falling asleep) and with severity ratings for each symptom (Echemendia et al., 2017). Lastly, the BISA was created by Valera and Berenbaum (1997, 2003) to determine if DV victims have experienced a physically violent event that may have resulted in an mTBI. The tool is comprised of a semistructured interview to assess the number, severity, and length of occurrence of potential TBI incidents (e.g., hit, shaken, choked; Valera & Berenbaum, 1997, 2003).

Goldin et al. (2016) found from their evaluation of the existing TBI-screening tools that only two asked about events that could lead to a TBI in the context of DV. Most of these assumed that TBI was caused by accidents (e.g., motor vehicle accidents), do not consider physical assault as a cause for an mTBI, and have minimal, if any, prompting of brain-injury events. Furthermore, common screening tools failed to ask about facial injuries, despite these possibly resulting in TBIs and being so common among DV female victims (Goldin et al., 2016). Kwako et al. (2011), Smirl et al. (2019), and other researchers in this field agreed appropriate identification of mTBI among DV victims is essential, as it is a significant step in the direction toward breaking the cycle of violence against women and a future free of abuse. Yet, not enough DV service providers have access to screening resources. This is evident in the results from a pilot project in which 68 agencies providing DV support services to the community in Toronto, Canada were surveyed about TBI awareness and understanding (Haag, Sokoloff, et al., 2019). Haag, Jones, et al. (2019) reported their participants agreed screening tools can be beneficial to identify a TBI, yet many of them did not have these.

Haag, Sokoloff, et al. (2019) also found a lack of TBI knowledge among DV service providers. Banks (2007) commented a lack of knowledge by DV service providers about mTBIs may result in mistakenly interpreting a client's lack of self-awareness as being resistant, noncompliant, and not in need of advanced diagnosis or treatment (e.g., neuropsychological evaluation and rehabilitation).

3.7.2 KNOWLEDGE LEVEL OF FRONT-LINE WORKERS ON TRAUMATIC BRAIN INJURIES

The little literature on assessing the level of knowledge on TBIs and recovery has explored the existence of misconceptions amongst a variety of populations including correctional health care professionals (Yuhasz, 2013), brain-injured individuals, nonexpert health professionals (Swift & Wilson, 2001), DV support services providers (Haag, Sokoloff, et al., 2019), educational professionals (Linden et al., 2013), and the general public (Hux et al., 2006; Merz, 2017; Schellinger et al., 2018; Swift & Wilson, 2001). Most of these studies used the original (Springer et al., 1997) or modified versions of the Common Misconceptions about TBI questionnaire (CM-TBI_m; Bouvier et al., 1988). While some modified versions obtain their data from true or false responses (i.e., Gouvier et al., 1988) others, such as one created by Linden et al. (2013), use a 5-point scale (e.g., strongly agree [1], agree [2], don't know [3], disagree [4], and strongly disagree [5]) to increase the variability of responses regarding participants' level of agreement with statements about TBIs and provide an opportunity to express lack of knowledge. These statements are about brain damage, brain injury outcomes, recovery, and rehabilitation.

Overall, these studies have provided insight into the nature of held misconceptions about TBI, possible predictive variables of better TBI knowledge, and inconsistencies around the impact of participant variables. Next, I will introduce the most held misconceptions about TBIs (e.g., mTBIs), followed by salient demographic and personal participant variables associated with TBI knowledge.

3.7.3 COMMON MISCONCEPTIONS AND MYTHS ABOUT TBIs AND mTBIs

Researchers across the globe set out to assess current broad TBI-related knowledge, along with other conditions such as PCS using versions of a questionnaire about TBI-related knowledge, namely asking about misconceptions regarding TBIs. There appears to be misinformation about TBI (inc. mTBI) amongst various populations including correctional health care professionals (Yuhasz, 2013), brain-injured individuals, nonexpert health professionals (Swift & Wilson, 2001), DV support services providers (Haag, Sokoloff, et al., 2019), educational professionals (Linden et al., 2013), and the public (Hux et al., 2006; Merz, 2017; Schellinger et al., 2018; Swift & Wilson, 2001). These misconceptions are highly prevalent and often explained by inefficiencies in current TBI-education practices. The following eight statements about TBIs have had the lowest accuracy rate on versions of a questionnaire about TBI-related knowledge.

- 1) Individuals with a history of a brain injury are not more likely to have a second one (false; i.e., Schellinger et al., 2018, and Linden et al., 2013).
- 2) If the individual experiences symptoms immediately following a concussion, they have post-concussion syndrome (false; i.e., Merz et al., 2017).
- 3) People who have survived a brain injury are unable to recognize others and forget who they are, but otherwise function normally (false, i.e., Merz et al., 2017).

- 4) Losing consciousness does not have lasting effects (false, i.e., Linden et al., 2013).
- 5) After an mTBI, a person is likely to experience symptoms, such as headaches, memory loss, and light sensitivity, for 6 months due to brain damage from the concussion (false, i.e., Merz et al., 2017).
- 6) It's a good idea to rest and remaining inactive for at least a week during recovery from an mTBI (false, i.e., Merz et al., 2017).

I believe it is important for front-line workers to be aware of these common mTBI misconceptions, to be better informed and able to challenge these myths about mTBIs. Overall, these studies suggested that training through educational material increased the level of knowledge about TBI and supported the efforts to educate the public. Schellinger et al. (2018) also set out to identify any demographic or personal factors (e.g., gender, age, experience with TBI) that could predict TBI knowledge. Their findings and those of similar studies will be covered next.

3.7.4 AGE AND GENDER

While I did not find much support in this review of the literature proposing age is a significant predictor of TBI knowledge, there appeared to have been instances in research in which there was a significant difference in knowledge when asked about brain injury recovery and general level of knowledge about TBI. For example, Hux et al. (2006) reported in their study, in which 318 individuals from the general public were surveyed about general brain injury knowledge, that when asked about the appropriateness of extended rest during recovery from a TBI, the general middle-aged population showed better understanding (discouraged behaviour) than other age

subgroups (i.e., young, and elderly adults). Similarly, while there is insufficient evidence in support of gender differences in knowledge of TBIs, Hux et al. (2006) were perplexed to find that men were significantly better informed about brain injuries than women. For example, men significantly outperformed women in questions asking brain damage with no direct blow to the head, recovery from a head injury, and the probability of having more brain injuries.

3.7.5 EXPERIENCE

Hux et al. (2006) also reported that individuals who experienced a brain injury or reported acquaintance with at least one survivor of a brain injury can be expected to have greater knowledge and awareness of brain injuries (i.e., mTBI) than those with no personal experience. Under this expectation, researchers may worry if they find that personal experience with TBI was not predictive of TBI knowledge among their participants. For instance, Schellinger et al. (2018) found personal experience was not a demographic or personal variable factor that significantly predicted TBI knowledge. These findings are similar to other researchers' reports of predictive variables. For example, Merz et al. (2017) found in their data collected from 380 individuals via an online survey that those who self-reported having a history of at least one mTBI had a lower accuracy rate on the mTBI knowledge survey than individuals with no mTBI. One of the concerns with this, as identified by Schellinger et al. (2018), is that these individuals should have received education about their injury from healthcare and support service providers once receiving the mTBI diagnosis and during subsequent rehabilitation.

On the other hand, there is research supporting that professional experience may influence the accuracy of knowledge about mTBI. For example, Schellinger et al. (2018) also found the experience working with individuals with a TBI was a significant predictor of TBI knowledge, with individuals with professional experience scoring approximately 2.50 points higher on the CM-TBI compared to those with no professional experience. I also found studies showing no significant accurate response rate differences between more experienced and less experienced workers. For instance, Hooper (2006) noted from a sample of 304 surveyed school psychologists in North Carolina, that education variables (i.e., doctoral degree), previous professional training in TBI, age, and years of experience had little effect on the endorsement rate of misconceptions about TBI. However, the more years of experience they had, the more comfortable they felt with their skills and working with this population (brain-injured individuals) successfully (Hooper, 2006). Researchers and scholars such as Hux et al. (2006) and Swift and Wilson (2001) have noted from their research that the general public and professionals who work with individuals with TBIs complained that unlike them, healthcare professionals without expertise in brain injury have inaccurate knowledge on outcomes of brain damage (Hux et al., 2006; Swift & Wilson, 2001). This concern and claim are supported by reports from studies such as one by Schellinger et al. (2018), in which they noted professionals with no or less professional brain injury experience underperformed on mTBI knowledge surveys when compared to those with professional experience. Furthermore, they found, in addition to professional experience with TBIs, education was the other only demographic and personal variable that predicted TBI knowledge, and that this

knowledge may be attributed to information learned through prior coursework or independently researched (Schellinger et al., 2018).

3.7.6 EDUCATION

While most studies have measured education as a categorical variable (high and low level of education), researchers such as Hux et al. (2006) and Schellinger et al. (2018) measured education level in terms of years of education (at least 1 year of college education vs. no college education), and in turn, were among a few of the researchers to find a relationship between education and TBI knowledge. Hux et al. (2006) found individuals with at least 1 year of a college education are significantly more accurate in their answers on mTBI knowledge assessments. Schellinger et al. (2018) determined from their quantitative study of 392 participants from a state fair that for every 1-year increase in education, participants were anticipated to score roughly 0.60 points higher on the CM-TBI_m. In addition to formal education, training through educational material would increase the level of knowledge about TBI and support the efforts to educate the public.

3.7.7 TRAINING

Training may range from formal in-house information sessions provided by a national brain injury organization to independent training sessions. Schellinger et al. (2018) set out to explore the effect a brief educational video would have in improving TBI knowledge among their participants (e.g., laypeople) by having an experimental group ($n = 197$) watch a short educational video on TBI then complete the CM-TBI_m questionnaire. They found that the educational video effectively and significantly improved participants' TBI knowledge compared to the control group. Schellinger et al.

(2018) noted the special role that service providers and educators have in providing accurate education to their clients with TBIs, their families, and the general public to decrease the number of misconceptions and promote accurate expectations of individuals living with the consequences of a TBI. Researchers agreed training in best practices to identify mTBI needs to be developed and implemented to facilitate earlier identification of TBIs among DV victims, and better support DV victims (Campbell et al., 2018; Haag, Jones, et al., 2019).

Professionals working closely with DV victims do not always have training on brain function and healing treatments (Haag, Sokoloff, et al., 2019), which is problematic because individuals with TBIs and women in abusive relationships use health and support services at higher rates (Campbell, 2002; Shore et al., 2005). Haag, Sokoloff, et al. (2019) explored service providers' current knowledge of TBIs and their impact on DV survivors and found there is a lack of awareness and understanding of TBIs among IPV service providers. Furthermore, all participants in Haag, Sokoloff, et al.'s (2019) study reported feeling completely unprepared to somewhat prepared to identify the signs and symptoms of a TBI among their clients because they lack knowledge about it and relevant, appropriate questions to ask. Similarly, Hooper (2006) found approximately 84% of their participants (school psychologists) reported needing more professional development on working with brain-injured children and adolescents. The vast majority of DV support service providers (84%) in Toronto, Canada, surveyed in a study by Haag, Sokoloff, et al. (2019) reported having no previous training or relevant education on TBI concerning IPV. However, they identified education among stakeholders as key to supporting women victims through early intervention. Murray et al. (2016) identified from their

consolidation of current research on TBI among DV survivors that there is a need for further practice development and research in the realm of TBI among DV victims, and consolidation of current research in this area to provide up-to-date recommendations for professionals working with individuals at risk for DV-related TBIs. Next, I outline how the link between mTBIs and DV relates to front-line workers working with victims and survivors of DV-related mTBIs.

3.8 IMPLICATIONS FOR FRONT-LINE WORKERS AT DOMESTIC VIOLENCE SHELTERS

There is emerging literature on the topic of DV and association to TBIs, yet the implications of this for service providers (e.g., front-line shelter workers) and application to women's shelters are limited despite an exhaustive search. This final project will address this gap of consolidation of current research on mTBIs in the context of DV by diving into the little research and literature on DV-related mTBI and warrant the development of a manuscript highlighting the key domains front-line workers of Alberta's women's shelters must know to improve their understanding of mTBI in the context of DV, enhance their ability to identify mTBI soon after their onset and provide the best care to their clients by making timely referrals to proper treatment.

Given the general prevalence of TBIs and the prevalence of mTBI among DV victims, shelter workers will likely encounter a client who has suffered an mTBI, diagnosed or not. Therefore, front-line service providers have a key role in the early identification of mTBIs among their clients, and in supporting the adaptation of services to better suit the client's needs and abilities. Front-line workers at women's shelters support one of the populations identified to be at high risk for mTBI under-identification;

victims of DV. In their survey of 318 members of the lay public, Hux et al. (2009) found individuals experiencing challenges after a traumatic event (e.g., physical abuse leading to mTBI) are more likely than the general public to need a variety of support services such as those provided at women's shelters. Furthermore, it is well established within the literature and research concerning the occurrence of brain injuries in the context of DV, that brain injuries occur regularly among this population of individuals accessing services at domestic abuse organizations (approximately 52% of clients; Hux et al., 2009; Valera, 2018).

Corrigan and Bogner (2007) argued professionals working with DV victims are advised to interview clients about incidents of hits to the head, loss of consciousness, or medical issues associated with the brain to elicit information to determine the possibility of a TBI to ensure best practice. Researchers such as Hux et al. (2009) supported this recommendation based on their findings on the outcomes of following TBI screening procedures (e.g., using the HELPS Screening tool; Picard et al., 1991) at institutions working with individuals at high-risk for underidentification (e.g., individuals seeking domestic abuse services), confirming the importance of asking clients about their history of incidents that have the potential to cause TBI, and reinforcing that workers need information on TBI and its implications. Banks (2007) also strongly recommended that all DV victims receive a thorough evaluation, including neuropsychological screening, as a common practice of care and that practitioners working with DV victims screen for head injuries and symptoms of mTBIs. This final project responds to the call Banks, researchers, and other scholars have made regarding enhancing TBI knowledge among

front-line workers at sites with clients at high risk for TBIs via training on TBI identification and screening more proactive screening protocols and practices.

Haag, Jones, et al. (2019) noted a lack of knowledge about mTBI-DV may mean that support workers might pressure DV victims to conform to the standards of conduct in relevant contexts (i.e., shelter norms) and to navigate the system, not realizing that struggles or inability to do so may be indicative of deficits caused by an undiagnosed or unidentified mTBI. These recommendations are similar to other researchers and organizations on how to fight DV. For example, among the WHO recommendations for prevention and response to IPV is to improve the services' response by implementing reforms including ongoing support and training for staff to ensure effective delivery of services to women survivors (WHO, 2016). This would increase understanding and education among health care professionals (i.e., front-line workers) on the relationships between DVPV and TBI (Campbell et al., 2018; Corrigan et al., 2003; WHO, 2021).

3.9 SUMMARY

In this chapter, I provided a review of the literature in considerable depth, including an introduction to general mTBI terminology, prevalence, signs and symptoms, and recovery timeline, followed by introducing DV as the context for mTBIs, mTBI onsets, the prevalence of DV-related mTBIs, and the wider description of the effects of mTBIs for DV survivors; the identified potential barrier to accurate identification of TBIs including symptoms overlap, limitations of self-reports from mTBI survivors, and nuances of screening practices. I also investigated available literature and research on TBI (i.e., mTBI) misconceptions and knowledge levels and possible predictive variables of better TBI knowledge across various populations (i.e., educators, clinicians,

psychologists, etc.). Lastly, I explored and highlighted the implications of the DV-mTBI connection for women shelters' front-line staff, working with clients with high risk for mTBI resulting from violent events and physical abuse.

The proposed final project topic was inspired in part by research showing a universal lack of TBI (e.g., mTBI) understanding across various populations and occupations (Hux et al., 2006; Merz et al., 2017; Schellinger et al., 2018; Swift & Wilson, 2001; Yuhasz, 2013), as well claims that education can result in a quick improvement in knowledge about TBIs (Schellinger et al., 2018). Furthermore, the association between DV and mTBI has been widely studied, but to my knowledge, only one empirical study has been published that focused on the existing TBI knowledge among front-line DV workers. Specific to TBI knowledge among professionals working with DV victims, researchers discovered a general lack of understanding and awareness of TBI among the participants, and all survey participants felt unprepared to partially be prepared to identify TBI signs and symptoms among their clients (Haag, Sokoloff, et al., 2019). Future research suggestions by Haag, Sokoloff, et al. (2019) included further research on identification and screening and best practices for TBI intervention and support including shelter design and environment. Lastly, the intended objective of this final project follows future work recommendations highlighted by Murray et al. (2016), from their 2016 practice update on what professionals not specialized in brain injuries need to know about IPV-related TBIs. Namely, the development of resources composed of up-to-date information on the dynamics of DV-related TBIs, for those working with clients with diagnosed or at risk for DV-related TBIs (e.g., mTBI). In short, there is a need for

research-based knowledge among front-line workers on how to address DV-related mTBI (Haag, Sokoloff, et al., 2019; Murray et al., 2016).

As a result of an extensive literature review, I discovered how little there was on the association between DV and mTBIs and its role on the onset of dysfunctions (i.e., cognitive and emotional) and psychological disorders (i.e., symptoms consistent with depression, and trauma), and no studies on the existing level of knowledge of mTBIs among front-line workers at DV shelters. Meanwhile, there were plenty of studies reporting a lack of TBI (e.g., mTBI) understanding across participants of various personal and professional backgrounds (including TBI survivors and front-line workers), supporting the need to increase training among the public and essential workers. Consequently, I decided to embark on a two-year-long final project to investigate the occurrence of mTBI in the context of DV, knowledge and understanding of mTBIs signs and symptoms, and the implications of this connection for front-line workers. The purpose of this chapter is to provide expert knowledge, and the foundation for this final project by identifying and summarizing from the literature what I deem to be the must-knows of DV-related mTBI. This literature review may inform academic and stakeholders' understanding of the probable existing level of general knowledge about mTBI among front-line workers, and areas in which to better serve brain-injured women victims of DV (e.g., training). The information gathered from this final project would also help front-line workers know how to help individuals with mTBIs and join the efforts for earlier identification and referral to appropriate services.

In this final project, I intended to expand the current literature and address the gap in the priority to increase front-line workers' understanding of mTBIs, to better support

recovery of often invisible physical and mental injuries resulting from mTBIs by women victims of DV. As per past research looking at the TBI-specific knowledge among service providers, I believe front-line workers lack enough mTBI knowledge and awareness and for the most part, do not recognize the signs and symptoms related to mTBIs. The following chapter (methodology) outlines the specifics of my research.

CHAPTER 4: DISCUSSION AND CONCLUSION

In this project, I provided ample evidence that there appears to be concerning unpreparedness to identify the signs and symptoms of TBIs by DV supportive services workers (Haag et al., 2019) and a high rate of misconceptions about TBI among the general public (Hux et al., 2006; Merz et al., 2017; Schellinger et al., 2018) and health care professionals (Swift & Wilson, 2001; Yuhasz, 2013). I advocated for the indisputable necessity to increase understanding of TBIs and evidence-based educative initiatives to address this lack of knowledge. It is my hope that my work will contribute to the need to expand the limited available educative resources and information on DV-related mTBI and has addressed the gap of resources written for professionals working on the front line (e.g., DV shelters, psychologists, counsellors, therapists) with brain-injured clients.

In this chapter, I will provide three key recommendations designed to increase access to knowledge on the impact of mTBIs on DV survivors, and to assist front-line workers to make an informed decision as to whether they should refer the client for medical consultation to receive a formal mTBI diagnosis and treatment plan. I expanded upon these recommendations in Appendix 1. It is my hope that these recommendations will be read by shelter staff to help their clients who may have suffered mTBIs. There is research supporting the positive effect educational material has on TBI knowledge assessment performance (i.e., Hux, 2006). For example, Schellinger et al. (2018) reported from their research with 392 adults that knowledge scores from participants who watched a 6-minute video on TBI scored significantly better than the control group. The method

of how to communicate this material to shelter staff in a way that is integrative and engaging is beyond the scope of this project.

To conclude this chapter, I will identify the strengths and limitations of this project and suggest areas for future research. I will conclude with a summary that highlights the role front-line workers have in the above areas of interest.

4.1 SYNTHESIS AND RECOMMENDATIONS

I thoroughly reviewed current research and literature on mTBIs, DV-related mTBIs, TBI screening nuances, and challenges, and I introduced the implications of this understudied topic for DV front-line workers. Consolidating the key practical take-aways from the previous chapters allowed me to integrate research into practice by creating a list of three recommendations for shelter staff when working with someone who may have an mTBI. The list highlights important research-based screening and practice considerations unique to working with likely brain-injured (sustained mTBI), physically abused victims. It is worth reminding the reader that in some cases mTBI survivors may experience slightly different patterns of mTBI-related symptoms. Thus, workers need to be flexible in their approach to supporting their clients and curious in their interpretation of observable possible signs of mTBIs.

The top three list presented in Appendix 1 describes each recommendation in detail, in this section I will present an overview of each recommendation in bullet form. The list is designed for shelter supervisors to review with their staff, so I will present this information in learning objectives.

4.1.1 PRACTICE CONSIDERATIONS

How well can my staff ask clients about the following:

1. Mild traumatic brain injury onsets and criteria.
2. Declining wellbeing, and mTBI symptoms under three categories:
behavioural, mental, and emotional.
3. Trauma and depression symptoms related to mTBI.

The list provided in this chapter and Appendix 1 integrated research into practice by translating the research reviewed in Chapter 3 into considerations for front-line workers at women's shelters who expectedly work with mTBI survivors. Appendix 1 is intended to be used as an educational resource to inform front-line workers, and possibly for front-line workers to educate their clients and the public, and to offer insight to stakeholders implementing educational initiatives. Additionally, this list may serve as a resource that helps improve and increase appropriate mTBI identification practices within women's shelters, while also highlighting variables that are too often missed even by common screening tools (e.g., consideration of DV as a causal factor for mTBIs).

As noted in Appendix 1, it is my hope that shelter directors will share this information with their staff and perhaps they can present this information in a Microsoft PowerPoint presentation or through video. Perhaps they could create a professional development segment at each staff meeting for one recommendation to be discussed with the staff. It would be very encouraging if the information in this project led shelter directors to develop best practices for TBI intervention and support.

Stating the strengths and limitations of this project will allow the reader to create an informed opinion on the outcomes of this project. Both of which I will explore in the next section.

4.2 PROJECT STRENGTHS

I believe the best part of my project is the detailed expert chapter (Chapter 3). I wrote this chapter based on peer-reviewed literature and research that I read and analyzed for approximately two years. In fact, it was approved as the literature review chapter for a thesis proposal. This process allowed me to complete a manuscript that I hope will be of great interest to those who work with DV victims and mTBI survivors (e.g., emergency and second-stage family violence shelters, law enforcement officials, first responders, mental health professionals, or victim advocates) and those who are suffering from mTBIs.

My project also provided insight into public health calls to action relevant to fighting violence against women, increasing training, and advocating for increased overall support for front-line workers. Overall, this project will help to fill the gap in the literature on the implications of the high prevalence of mTBI among DV victims and may inform stakeholders on the design, implementation, and prioritization of research-into-practice initiatives.

4.3 PROJECT LIMITATIONS

The analysis of the literature behind this project was based on limited resources and research findings as it relates to mTBIs among DV victims. Much of the research and literature available on mTBI were studies on concussions, or moderate to severe TBIs caused by high impact sports, car accidents, falls, or military combat. The research participants were often recruited from clinical settings; thus, participants were admitted for treatment or already having received treatment. Research and literature on mTBIs among DV victims were scarce. Similarly, I did not come across any literature on the

implications of DV-related mild TBIs for DV workers, or an indication of how much front-line workers at DV shelters know about mTBIs caused by DV. This limited information and data became a barrier to being able to state what front-line workers at DV shelters lack knowledge of and to develop an educational resource customized to address themes DV front-line workers have the lowest level of mTBI knowledge in.

The three “need-to-know” points of discussion identified in this chapter are based on analysis and interpretation of the limited resources and research findings as it relates to mTBIs cause by DV, rather than on research findings on mTBI knowledge gaps or misconceptions among women’s shelter workers. While I found research assessing TBI knowledge among other populations (i.e., educators, clinicians, psychologists, etc.), I did not find studies assessing front-line women’s shelter workers’ TBI knowledge. This is concerning given this population works closely with individuals at high risk for mTBI.

Another limitation of this project is its focus on mild TBI, excluding other types of TBIs, and mTBI resulting from physical abuse, and omitting other possible onsets of mTBIs. This limits the confidence to generalize this project to clients with other forms of brain injuries. This project also focuses on an educational resource for front-line workers at emergency and second-stage family violence shelters. Thus, there may be a limitation in the relatability and transferability of the information in this project to workers and professionals working in other settings and contexts, other than front-line DV support services with no specialization in brain injuries. As I state next, further research is needed on this topic to garner foundational research and literature on this matter.

4.4 AREAS OF FUTURE RESEARCH

Based on the limitations identified earlier, and to expand the work of Haag et al., 2019 there seems value in inquiring which misconceptions DV front line staff hold about mTBI, what their experiences of working with mTBIs are, and what they would like to learn to feel better equipped to work with clients who present with unique brain injury-related challenges. Stakeholders and shelter administrators could use these findings to create educational initiatives and inform the expansion of research-based mTBI-informed guidelines in shelters. Similar assessments of TBI (including post-concussion syndrome) knowledge and work to improve TBI knowledge have been done in the past for laypeople (Schellinger et al., 2018) and educators in the United Kingdom (Linden et al., 2013). Perhaps some cross-collaboration could occur to help decrease the number of misconceptions and promote accurate expectations of individuals living with the consequences of a TBI.

Perhaps infographics about mTBIs in the context of DV may be a beneficial resource for workers to reference and distribute to their clients. This educational resource can compile information on mTBI signs and symptoms, violent events and injuries that may lead to mTBIs, and list resources and mTBI treatment available. A similar methodology could be used to design mTBI training material for psychologists and other health professionals with no specialization on TBIs, working with individuals prone to sustaining mTBIs.

Another area of needed attention would be DV shelters' intake forms to screen for mTBIs. It is currently unknown to which extent shelters are asking about mTBI and how they are soliciting this information. Perhaps a template intake form could be created using

questions about mild TBI onset and criteria, declining wellbeing, new symptoms or decreased functioning (e.g., behavioural, emotional, or cognitive), and new or heightened psychological disturbances. This intake form could be piloted and shared with various DV organizations such as Alberta Council of Women Shelters.

There is also a need for research on the best methods to communicate mTBI knowledge to shelter staff and how shelter staff would like to receive this training. Training for workers can be done through workshops composed of theory and practice. The curriculum could include a lecture piece on DV and mTBI, compensatory strategies for disabling mTBI symptoms, present case studies, and role-play realistic scenarios involving a DV victim seeking support at a women's shelter. The curriculum could also include recommendations that support the development of a strong therapeutic alliance, and support the success of service plans and goals. This practical training may increase workers' knowledge and skill working with mTBI survivors.

4.5 CONCLUSION

I undertook a project in which there are no educational initiatives on DV-related mTBIs targeting Alberta's DV front-line workers. I believe the information presented in this project has the potential to spark a Canadian-wide initiative to educate front-line workers on the implications of the unfortunate prevalence of DV-related mTBIs, and train them to be more inquisitive upon witnessing seemingly odd behaviour, cognitions, and emotions indicative of probable signs of an mTBI. This project supports the notion that front-line DV workers can have an essential role in helping women quickly access mTBI diagnosis and treatment from a medical professional. I am excited to be involved in further research, education, and training efforts around the implications of DV-related

mTBIs for front-line workers This project is a step in the right direction towards helping increase their knowledge through relevant education and training.

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APPENDIX 1: MILD TRAUMATIC BRAIN INJURIES: WHAT FRONT-LINE DOMESTIC VIOLENCE WORKERS NEED TO KNOW

Preamble

The following is the applied portion of the Master of Education, Counselling Psychology final project. It is a manuscript for the Canadian Journal of Community Mental Health, which will be submitted to the editor of the journal in October 2021, after the University of Lethbridge has approved of the project. The author of the article will be Adriana M Fernandez Parra, and the second author will be my project supervisor, Dawn McBride.¹

The purpose of this manuscript is to provide a valuable educational resource to help fill the gap in the literature on the implications of the high prevalence of mTBI among DV victims and may inform stakeholders on the design, implementation, and prioritization of research-into-practice. The author hopes this manuscript will be of great interest to those who work with DV victims and DV survivors (e.g., emergency and second-stage family violence shelters, law enforcement officials, first responders, mental health professionals, or victim advocates) and those who are suffering from mTBIs. This manuscript describes three must knows about mTBI identification and providing service to individuals experiencing the negative impacts of mTBIs.

Journal's Instructions to All Authors

Appendix 2 contains the manuscript guidelines for preparing and submitting to the Canadian Journal of Community Mental Health. The journal requires manuscripts be approximately 6,000 words including references.

Format Style Requirements

This manuscript is prepared as per the manuscript preparation guidelines, following the Publication Manual of the American Psychological Association, 7th Edition (2019).

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MILD TRAUMATIC BRAIN INJURIES: WHAT FRONT-LINE DOMESTIC VIOLENCE WORKERS NEED TO KNOW

¹ This preamble closely followed the format and structure of *Sense of community online: Self-regulated learning and avoiding the drama triangle* (Master's project), by J. Gerlock, 2012, AB, Canada: University of Lethbridge. Copyright 2012 by J. Gerlock.

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Mild Traumatic Brain Injuries: What Front-line Domestic Violence Workers Need to Know

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Abstract

Women accessing domestic violence shelter services may have mild traumatic brain injuries which require front-line workers to adapt their assistance given these women may be suffering from many debilitating psychological symptoms. However, there is scarce evidence-based informative material for DV workers about the signs of an mTBI and how to respond to clients who report with mTBIs symptoms. To that end, a comprehensive review of the research and literature on mTBI outcomes was completed resulting in sharing up-to-date recommendations for DV front-line workers supporting female victims. These recommendations include asking about mTBIs, declining wellbeing, and trauma and depression-related symptoms.

Keywords: Mild traumatic brain injury, domestic violence, women's shelters, educational resources, recommendations, considerations, front-line workers, screening, wellbeing, depression, trauma.

Les femmes qui accèdent aux services d'hébergement pour les victimes de violence familiale (VF) peuvent avoir des lésions cérébrales traumatiques légères (TTC) et peuvent souffrir de symptômes psychologiques. Cependant, il existe un manque de matériaux fondés sur la recherche factuelle pour les travailleurs de la VF sur les signes d'un **TTC**. Donc, un examen de la littérature sur les résultats des **TCC** a été conduit, et on partage des recommandations avec les travailleurs de la VF. Ces recommandations comprennent des questions sur la baisse du bien-être, et les symptômes liés aux traumatismes et à la dépression.

Mots-clés : Traumatisme crânien léger, violence familiale, refuges pour femmes, ressources éducatives, recommandations, considérations, travailleurs de première ligne, dépistage, bien-être, dépression, traumatisme.

Mild Traumatic Brain Injuries: What Front-line Domestic Violence Workers Need to Know

Mild traumatic brain injuries (mTBIs) are a public health issue worldwide, yet many go unreported, missed, or not assessed. This issue was apparent in Haag, Sokoloff, et al.'s (2019) work who reported domestic violence (DV) workers, from 68 community-based agencies, did not believe they are prepared to identify the signs and symptoms of traumatic brain injuries (TBIs) in their clients who are victims of DV. These DV workers may not be alone in their lack of TBI knowledge as researchers have noted there are many misconceptions about TBIs among the general public (Hux et al., 2006; Merz et al., 2017; Schellinger et al., 2018) and health care professionals (Swift & Wilson, 2001; Yuhasz, 2013). These facts are alarming since professionals working closely with female DV victims will likely come across clients with debilitating mTBI symptoms and need to adapt their work to offer client-centred support. Consequently, this brief article shares up-to-date recommendations for DV front-line workers focusing on asking about mTBIs, noticing the client's declining well-being, and highlighting trauma and depression-related symptoms that interweave with TBI symptoms.

The recommendations present in this article are timely because a recent exhaustive review revealed no educational initiatives designed for DV shelter workers on mTBIs. Unfortunately, in the review of the literature, only one empirical article provided practical recommendations on DV-related TBIs for professionals (i.e., Murray et al., 2016). A lack of knowledge by DV service providers about mTBIs screening may result in mistakenly interpreting a client's lack of self-awareness as being resistant, noncompliant, and not in need of neuropsychological evaluation and rehabilitation (Banks, 2007). In contrast, mTBI assessments, identification, and treatment can prevent or decrease the risk for second-impact syndrome and lifetime suffering from lingering symptoms that impact routine activities for female DV victims (Banks, 2007; Hux et al., 2009).

Unfortunately, diagnosing mTBIs is outside the scope of practice for many front-line workers (Berger, 2019), and mTBI screening resources may not always be available (Haag, Sokoloff, et al., 2019) or appropriate for use within the context of mTBI caused by DV (i.e., the tool does not inquire about DV-related events leading to mTBIs; Goldin et al., 2016). Only once an mTBI is screened can a worker proceed with the best service. The presence of post-mTBI negative outcomes requires front-line workers to consider the client's abilities, make adaptations to the screening procedures, and adjust the service plan to meet the client's needs. With the recommendations presented in this article, front-line workers will better understand how common mTBIs are among DV victims and what may indicate an mTBI when a woman presents with otherwise inexplicable challenges. This acquired knowledge will provide front-line workers insight into the impact of mTBIs on women's life and will assist them to make an informed decision as to whether they should refer the client for medical consultation to receive a formal mTBI diagnosis and treatment plan.

Background

DV victims are one of the highest risk groups for violent events leading to TBIs (Kwako et al., 2011); those accessing support from family violence shelters are often at a proportionately higher risk for mTBIs (Haag, Jones, et al., 2019), and among the few populations with a higher chance for mTBI under-identification (Banks, 2007). In their assessment of 99 physically abused women, Valera and Berenbaum (2003) reported as many as 74% of victims seeking services from an emergency shelter or emergency department may have a TBI. One common form of physical assault is strangulation, which is a prevalent form of assault among women in shelters. Wilbur et al. (2001) found 68% of DV shelter women sampled had experienced choking or attempted strangulation and no other TBI events, while 54% of DV victims in a community sample who sought emergency shelter or support experienced strangulation or attempts thereof (Kwako et al., 2011; Sutherland et al., 2002). Front-line workers need to know the prevalence of mTBI among DV victims to increase their awareness about the likelihood of mTBIs being present in their client caseload.

The public and individuals with a sustained brain injury may be unclear on what constitutes an mTBI. According to the World Health Organization (WHO) Task Force (Carroll et al., 2004), an mTBI is: “an acute brain injury resulting from mechanical energy to the head from external physical forces” (p. 115). According to mTBI and DV experts such as Haag, Jones, et al. (2019) and Valera and Berenbaum (2003), hypoxic-ischemic brain injuries should also be included in this definition because the outcomes of these brain injuries and mTBIs overlap (Campbell et al., 2018; Cullen & Weisz, 2011). The nuances of hypoxic-ischemic brain injuries are explored under the first recommendation of this article. To determine an mTBI, the following diagnostic criteria must be met: loss of consciousness for less than 30 minutes, posttraumatic amnesia for less than 24 hours, and disorientation and confusion after 30 minutes postinjury or later (American Psychiatric Association [APA], 2013).

Haag, Sokoloff, et al. (2019) emphasized the need for increased DV-TBI education among front-line workers. This need was evident by a lack of awareness and understanding about TBIs among DV support service providers in Toronto, Ontario, Canada, as well as confusion around which questions to ask clients to identify the signs of TBIs (Haag, Sokoloff, et al., 2019). In Haag, Sokoloff, et al.’s (2019) study, the vast majority (84%) of the participants surveyed reported having no previous training or relevant education on TBIs concerning DV. Overall, these DV service providers reported feeling completely unprepared to somewhat prepared to identify the signs and symptoms of TBIs among their clients.

Following a comprehensive review of available research and literature on TBI among DV survivors, Murray et al. (2016) identified a need for further practice development in this realm and ongoing consolidation of current research in this area to provide up-to-date recommendations for professionals working with individuals at risk for DV-related TBIs. However, most of the research and literature currently available were studies on concussions, or moderate to severe TBIs caused by high-impact sports, car accidents, falls, or military combat. Meanwhile, the research and literature on mTBIs

caused by DV, the implications of DV-mTBIs for DV workers, and how much front-line workers at DV shelters know about mTBIs were scarce. This is concerning given that this population works closely with individuals at high risk for mTBI.

Methods

Between September 2019 and July 2021, the primary author accessed online academic databases to complete a comprehensive review of available research and literature on mTBI, the occurrence of mTBI caused by DV, and the implications for front-line workers at women's shelters. The search was centred around peer-reviewed articles about the identification of psychosocial factors of DV-related mTBI (including mTBI signs and symptoms, onsets, recovery, and misconceptions) and considerations relevant to working with brain-injured DV victims. Due to little research on the link between DV and mTBI, the search was broadened to include interchangeable terms such as concussions, intimate partner violence (IPV), and postconcussion symptoms. Overall, the following search terms were used in various combinations to acquire an overview of the available literature: acute TBI, signs and symptoms of mTBI, postconcussion symptoms, TBI screening and identification, screening for concussions in DV, concussions and DV, DV-related mTBI, TBI knowledge among women shelter workers, and effects of TBI among IPV victims.

Only a few references on this research topic were published in the early 2000s; instead, a focus was placed on scanning the literature for primary articles published in approximately the last decade, 2009 to 2021. Google Scholar Search and Summon via the University of Lethbridge online library were two search engines used to obtain peer-reviewed, academic articles. Some of the databases accessed through Summon were PsycINFO, PubMed, and EBSCO. In addition, to expand the pool of resources, article recommendations by the databases and the reference lists of already obtained articles were reviewed.

The three main recommendations emerged from categorizing the information collected from the literature review into themes, then into three practical categories. The choice for similar themes was found in assessments of TBI knowledge (i.e., brain damage, brain injury sequel, etc.; e.g., Linden et al., 2013), and Murray et al.'s (2016) article titled "Practice Update" (screening mTBI symptoms, differentiating TBI symptoms, etc.). The authors decided to select recommendations that were most relevant to signs of mTBI that DV front-line workers can identify within the context of their job.

Main Recommendations

Through consolidation of a comprehensive review of the literature, the authors identified themes of mTBI information relevant to the work front-line DV workers. The following recommendations offer a blend of theory and application. The intended audience is shelter supervisors, to review with their staff. These recommendations would best benefit front-line DV workers who have little to no knowledge of brain injuries but wish to enhance their ability to identify mTBIs. It is hoped that shelter directors and supervisors may want to present the material in this article to their staff via delivery

Ask About Mild Traumatic Brain Injuries

The first recommendation is for DV staff to be able to define what an mTBI is. The nuances of hypoxic-ischemic brain injuries, introduced at the start of the article, are explored shortly after examining in more detail what is an mTBI.

An mTBI typically results from one or various events involving a jolt to the brain from violent shaking, strangulation, and oxygen deprivation (i.e., choking, drowning, pressure applied to the throat or chest), or repeated blows to the head, face, or neck with or against a hard object (i.e., fist, the floor or wall; Jackson et al., 2002; Menon et al., 2010; Valera & Berenbaum, 2003; Valera et al., 2019; WHO, 2016). The nature of these and other DV injuries can also put DV victims at higher risk for recurrent TBIs as well as for developing greater illnesses (Kwako et al., 2011).

Granted, physical assaults are the most noticeable form of DV by outsiders (United Nations, n.d.), and can warn front-line workers about the existing, threatening issue. However, determining which physical injuries likely lead to an mTBI requires further investigation. It is important to consider the impact of strangulations, as these are a common form of reported physical assaults and result in a TBI (e.g., mTBI) and cognitive impairments (e.g., amnesia; Valera & Berenbaum, 2003). Other commonly reported injuries by DV victims are from physical forces to the face or head or the brain undergoing sudden acceleration or deceleration (Sheridan & Nash, 2007). In short, it is unlikely to have serious injuries to the face or head without also injuring the brain (Banks, 2007).

A starting point to identify the risk for an mTBI resulting from DV-related incidents is to ask the client details about the nature of the one-time or accumulative injuries and listen for possible mTBI onsets and criteria (i.e., loss of consciousness). The following questions could be asked to determine if the victim has sustained an injury that may have resulted in an mTBI:

- Have you ever sustained any external injuries to your face or head during any of the fights with your spouse or any other time?
- Have you ever experienced choking or attempted strangulation?

If a DV client asks what an mTBI is, the DV worker could share the following diagnostic criteria from the APA (2013): loss of consciousness for less than 30 minutes, posttraumatic amnesia for less than 24 hours, and disorientation and confusion after 30 minutes postinjury or later. Once a DV worker suspects the client was assaulted and is at high risk for an mTBI, the worker could continue to ask what criteria, if any, does the client report. The following are some sample questions that the DV may ask:

- Thinking back to immediately after the physically violent event, up to the next day, do you recall feeling confused, disoriented, or losing consciousness? For how long approximately?

It is our belief that front-line workers have a critical role in asking the victim about the sequel of the assault to flag the possibility of an mTBI. Failure to identify events that may have caused an mTBI could lead to overlooking or misattributing signs and symptoms and implementing inappropriate interventions and strategies (Corrigan & Bogner, 2007; Curry et al., 2011; Hux et al., 2009).

Screening tools can be beneficial to identify an mTBI, yet there are at least two troubling issues with the use of screening tools in shelters: (a) many DV workers do not have access to these at work (Haag, Sokoloff, et al., 2019) and (b) most mTBI screening instruments have minimal prompting about DV-related brain-injury events (e.g., facial injuries, strangulation; Goldin et al., 2016). The only screening tool located that seeks to determine if DV victims have experienced a physically violent event that may have resulted in an mTBI is the Brain Injury Severity Assessment (BISA; Valera & Berenbaum, 1997, 2003). The advantage of this tool, unlike other TBI-screening tools, is that as a semistructured interview, it assesses the number, severity, and length of physical assaults (e.g., hit, shaken, choked; Valera & Berenbaum, 1997, 2003).

In the absence of having the BISA (Valera & Berenbaum, 1997) available, elements of this DV-focused instrument can be implemented by front-line workers at women's shelters. For example, Banks (2007) advised getting curious if the client has visible bruises or injuries, then it is unavoidable to ask the client about the source of the injury and assess if the event was severe enough to possibly cause an mTBI.

Ask About Declining Well-Being and Symptoms of mTBIs

It is important to realize that psychopathological and negative cognitive outcomes resulting from DV become even more daunting when having to cope with the impacts of mTBIs (Valera & Berenbaum, 2003). It is well known that the more brutal the physical abuse, the more intense and long-lived the impact on a woman's physical and mental health and the more severe and longer lasting are the symptoms of mTBIs from accumulative injuries (Kwako et al., 2011; Valera & Berenbaum, 2003).

Most mTBI symptoms can be grouped into three categories: behavioural, mental or cognitive, and emotional (Kay et al., 1993; Maucieri, 2012). These categories are explored further to help DV workers identify key changes in their clients after a client reports a dangerous physical event. Service providers can identify signs of mTBIs by careful observation and asking about mTBI symptoms. Once the DV worker has gathered this type of information, the client could be encouraged to share her signs and symptoms with her medical support team. At no time is the worker encouraged or required to make a diagnosis, but rather it is to help normalize the client's experience with the mTBI symptoms and encourage her to access treatment.

Behavioural Symptoms

Workers are advised to pay attention to their clients when their clients report avoiding or taking on new behaviours. Behavioural changes may include spatial orientation issues evident by the client reporting it difficult to read maps such as public

transportation routes or understand navigation directions such as where the laundry room is in the shelter (Jackson et al., 2002). Clients may also report dizziness, nausea, fatigue, blurred or double vision, noise and light sensitivity, difficulty hearing, and sleep disturbances, which may be outcomes of an mTBI (Kitrungrote, 2014; Struchen et al., 2009). As such, it is recommended the worker ask the women about head injuries and strangulation (as per the previous section). In addition, front-line workers are advised to record these symptoms for the client so she can share them with her medical doctor.

Mental Symptoms

DV survivors suffering from mTBIs typically report experiencing cognitive changes such as compromised executive functioning (Andelic et al., 2013). Workers are advised to inquire about cognitive difficulties when they learn the client is reporting or showing a decrease in attention and concentration or information processing speed and organizational difficulties (Struchen et al., 2009). For example, workers might notice clients have a new difficulty problem solving through familiar tasks, forget material from previous appointments or interactions with staff, have difficulty reading material such as newsletters or notices, or struggle with finances such as staying on budget or filling out forms (Banks, 2007). These changes in cognitive abilities can be a clue to the support worker to further assess the client's alertness, memory, or ability to communicate effectively (Banks, 2007; Valera & Berenbaum, 2003). Cognitive issues may be evident by the client reporting having issues resuming former levels of community involvement or employment (Jackson et al., 2002), such as significantly decreasing their voluntary participation or joining group activities.

Emotional Symptoms

Unique to mTBI survivors is the display or report of irritability or anxiety-related disorders. Workers might notice increased nervousness and impulsivity in their clients that seems to be different in presentation when focusing just on the DV effects. For example, a client might be rushing to confront their partner soon after having left them (i.e., impatience) or jumping to unreasonable conclusions (i.e., cognitive distortions; Banks, 2007; Valera & Berenbaum, 2003), such as thinking the staff are persecuting the client to find her at fault for the abuse. This type of dysfunctional thinking and feelings can cue the workers into the possibility that their client is also experiencing emotional mTBI symptoms. At this point, it might be important to expand inquiry into how else the physical abuse has impacted their well-being. Workers are advised to flag new consistent chronic stress (Kwako et al., 2011) or repeated frustration due to the lack of ability or independence they formerly had, as both are possible signs of emotional distress.

Generally, individuals with a sustained brain injury report they suffer from a decrease in all dimensions of quality of life (QoL; Hunt et al., 2019; Weber et al., 2019). QoL encompasses people's perceptions of their self-efficacy, independence, social, social support, and self-concept (Bullinger, 2002; Dijkers, 2004). Front-line workers could gather information about this by asking the client these types of questions:

- Have you noticed any changes in your satisfaction with your physical, psychological, and social functioning since the physical assault?
- Tell me how the injury has offset your well-being, including your independence, self-efficacy, and self-concept.

The interviewer needs to actively listen for any signs of a change toward a negative opinion or perception about the client's life expectations, hopes, or standards of life (WHO, 1997, 2012) since the assault.

Consider that Trauma and Depression Symptoms Could be Covering up an mTBI

One of the challenges to successfully identifying emotional symptoms related to mTBI among DV victims is the considerable overlap of mTBIs symptoms and psychological disturbances and dreadful experience of being a DV victim, regardless of if there is no reported mTBI. This overlap may lead front-line workers to mistakenly attribute symptoms of concern to psychosocial DV-related outcomes, rather than to mTBI negative outcomes (Iverson et al., 2017; Valera & Berenbaum, 2003). For example, trauma and depression are often misattributed to DV hardship and missed as signs of psychological outcomes of mTBIs.

Trauma Symptoms

It is common for women sufferings from the sequel of an mTBI to be misdiagnosed with posttraumatic stress disorder (PTSD) and overlook the presence of an mTBI (Valera & Berenbaum, 2003). The high rate of PTSD diagnosis among mTBI survivors may be attributed to the actual presence of the disorder or the overlap in symptomology between PTSD and mTBI (Banks, 2007; Valera & Berenbaum, 2003). While it is common for DV victims to report experiencing symptoms consistent with PTSD (APA, 2013; Iverson et al., 2017; Smirl et al., 2019), women experiencing mTBI symptoms can be approximately six times more likely to meet DV-related PTSD criteria than women with no mTBI history (Iverson et al., 2017; Smirl et al., 2019). Given this overlap in symptoms, front-line workers are advised to be familiar with mTBIs and PTSD, consider symptoms linked to PTSD as signs of an underlying mTBIs, be attentive to clients reporting elevated levels of arousal (e.g., hyperarousal and emotional numbing), or screen for both conditions whenever possible and to the best of their ability (Iverson et al., 2017).

Depression Symptoms

Severe physical abuse experienced by DV victims (Roberts & Kim, 2006) and history of mTBIs has been linked to subsequent diagnosis of depression (Graham et al., 2014). Among mTBI survivors, depression appears to be the most common emotional disturbance experienced following the mTBI and far exceeds depression rates among the average population (Struchen et al., 2009). This means front-line service providers may observe higher rates of depression symptoms among their clients when they have also endured an mTBI. The number of mTBIs also impacts the severity of the depression. Women with a history of three or more mTBI events are approximately two times more

likely to experience moderate-severe depression than individuals with no mTBI history, and may experience significantly higher depression symptoms than those with two or fewer mTBI events (Pryor et al., 2016).

Given that the psychological after-effects of DV can persist long after the violence has stopped (Kwako et al., 2011; Valera & Berenbaum, 2003), it might be challenging to determine if the mTBI caused the depression or if it was DV experience or a combination. However, to expand DV workers' knowledge in mTBI, it is strongly recommended workers know mTBI and DV abuse independently contribute to psychopathological outcomes (e.g., depression and PTSD), and the more severe the injury, the greater the impact on the DV victim (Valera & Berenbaum, 2003). Therefore, it is advised workers ask about mTBI symptoms with women who report depression as well as remain vigilant for signs of new mental health issues, in addition to more subtle emotional concerns (Andelic et al., 2013) such as exaggerated or limited expression of emotions (Banks, 2007).

Workers are advised to be aware of these buried symptoms, the relationship between mTBI and symptoms consistent with depression or trauma (Valera et al., 2019), and consider the existence of an mTBI when the above psychopathologies are present.

Discussion and Summary

The analysis of the literature behind these recommendations is based on limited resources and research findings as it relates to mTBIs among DV victims. Scant academic, peer-reviewed research findings on mTBI knowledge among DV workers was a barrier to developing an educational resource customized to address themes DV front-line workers have the lowest level of mTBI knowledge in. DV workers need to be educated to support the public health call to be more aware of mTBI. The considerations presented in this article may also be of great interest to other professionals who work with DV victims and mTBI survivors (e.g., first responders, mental health professionals, or victim advocates) and to the public. Future research may help the DV community advocate for increased training of their staff.

Future Research Suggestions

To expand the work of Haag, Author, et al. (2019), there seems value in inquiring which misconceptions DV front-line staff hold about TBIs, what their experiences of working with mTBIs are, and what they would like to learn to feel better equipped to work with clients who present with unique brain injury-related challenges. Stakeholders and shelter administrators could use these findings to create educational initiatives and inform the expansion of research-based mTBI-informed guidelines in shelters. Similar work to improve TBI knowledge has been done for laypeople (Schellinger et al., 2018) and educators in the United Kingdom (Linden et al., 2013) and perhaps some cross-collaboration could occur to help decrease the number of misconceptions and promote accurate expectations of individuals living with the consequences of a TBI.

Infographics about mTBIs in the context of DV may be a beneficial resource for workers to reference and distribute to their clients. This educational resource can compile information on mTBI signs and symptoms, as violent events and injuries that may lead to mTBIs, and list resources and mTBI treatment available. A similar methodology could be used to design mTBI training material for psychologists and other health professionals with no specialization on TBIs, and those working with individuals prone to sustaining mTBIs.

Another area of needed attention would be intake staff or resources like intake forms at DV shelters. It is currently unknown to which extent shelters are asking about mTBIs and how they are soliciting this information. Perhaps a template intake form could be created using questions about mild TBI onset and criteria, declining well-being, new symptoms, or decreased functioning (e.g., behavioural, emotional, or cognitive), and new or heightened psychological disturbances. This intake form could be piloted and shared with various DV organizations such as Alberta Council of Women Shelters.

There is also a need for research on the best methods to communicate mTBI knowledge to shelter staff and how shelter staff would like to receive this training. Training for workers can be done through workshops composed of theory and practice. The curriculum could include a lecture piece on DV and mTBI, compensatory strategies for disabling mTBI symptoms, present case studies, and role-play realistic scenarios involving a DV victim seeking support at a women's shelter. The curriculum could also include recommendations that support the development of a strong therapeutic alliance, and support the success of service plans and goals. This practical training may increase workers' knowledge and skill working with mTBI survivors.

Conclusion

It is hoped that the information in this article might spark a pan-Canadian initiative to educate front-line workers on the implications of the unfortunate prevalence of DV-related mTBIs and train them to be more inquisitive upon witnessing seemingly odd behaviour, cognitions, and emotions indicative of probable signs of an mTBI. This article supports the notion that front-line DV workers can have an essential role in helping women quickly access mTBI diagnosis and treatment from a medical professional.

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APPENDIX 2: INSTRUCTIONS FOR AUTHORS FROM THE CANADIAN JOURNAL OF COMMUNITY MENTAL HEALTH

The manuscript provided in Appendix 1 will be submitted to the Canadian Journal of Community Mental Health in accordance with the submission preparation guidelines I provide next. The following instructions are extracted directly from the source below:

Focus and Scope

Submissions. (n.d.). Canadian Journal of Community Mental Health. Retrieved July 15, 2021, from <https://ojs.library.ubc.ca/index.php/cjcmh/about/submissions#authorGuidelines>.

The *Canadian Journal of Community Mental Health (CJCMH)* provides an important forum for Canadian scholars and practitioners within the areas of positive mental health and effective, recovery oriented practices and systems. The *Journal* is evolving as a key resource in furthering the transformation of mental health systems and services in Canada.

Accordingly, priority topics for the *Journal* are best and promising, recovery oriented practices including psychosocial rehabilitation (PSR) approaches, mental health reform and transformation to effective, community mental health services and systems, and evaluation and quality improvement.

In addition to original research, the *Journal* publishes high quality literature reviews and meta analyses as well as articles addressing major health and mental health policy issues. The *Journal* also has a Practice/Innovation Section which accepts manuscripts on innovative and promising practices. The *Journal* is interdisciplinary as well as bilingual.

Author Guidelines

Page Charges

There are no page charges for publishing in the Canadian Journal of Community Mental Health.

Manuscript preparation

All submissions should strictly follow guidelines provided in the Publication Manual of the American Psychology Association (sixth edition).

Please indicate the date(s) when the research was conducted.

Journal policy does not permit the use of the term “subjects”. Participants, respondents, informants, or a more specific designation should be used. In addition, all

language within an article must be gender-inclusive, according to the guidelines set by the American Psychological Association (APA).

Authors should prepare two copies of the manuscript: one copy that includes a title page that identifies the authors and a complete set of references; and another copy suitable for a blind review, in which the authors have been removed from the title page and all information in the text and reference list that could identify the authors has been removed.

Authors must provide a 100-word abstract in FRENCH and ENGLISH*.

*It is the responsibility of English-language authors to provide accurate translations of their abstracts. If you are unable to accomplish this yourself, or cannot make suitable arrangements for a high-quality translation, we can arrange to have your abstract translated for you. If you require us to do so, please indicate in additional comments to the editorial team.

Manuscript Content

In addition to the points described above, all research studies will be screened for the following:

- REB review or equivalent.
- Rationale, including description of existing knowledge, that is clearly linked to the study methods.
- Detailed description of methods, including exclusion/inclusion criteria and the rationale behind them, to allow rigor and transparency to be evaluated.
- Discussion of limitations and their potential impact on the study findings and the manuscript's conclusion.

Submissions lacking the above elements will not be advanced to peer review.

The specific way that these elements should be addressed will depend on the type of study. It is recommended that authors consult the following guidelines:

Systematic and scoping reviews: PRISMA, PRISMA-ScR

(etc. other guidelines to be added)

Authorship

Any person listed as an author of a paper or monograph should have contributed substantially to the conception and design, or acquisition of data, or analysis and interpretation of data; should be involved in drafting the paper or monograph or revising it critically for important intellectual content; and should have approved the version to be published. Further, anyone contributing substantially to the research (as outlined above) should appear as an author. Including people who do not meet the criteria for authorship on the list of authors is unethical, as is omission of a person who meets the criteria for authorship.

All authors should be aware of submissions and decisions concerning papers and monographs of which they are authors.

All additional contributions to a paper or monograph should be indicated in Acknowledgements published with the paper.

Any conflicts of interest should be clearly declared in the author's submission.

Reviewers

List the names and e-mail addresses of three persons who are qualified to act as reviewers. Colleagues and co-authors from previously published manuscripts are not ethical suggestions.

Reviewer name(s) and contact information should be provided in 'COMMENTS FOR THE EDITOR' box.

Types of Submission

Potential contributors may submit materials for publication as follows: articles (generally not more than 6,000 words including references) or brief reports (approximately 3,000 words).

Manuscripts – English. Articles (approx. 6,000 words including references) can be submitted to this section.

Manuscripts – Français. Des articles (approx. 6000 mots incluant les références bibliographiques) peuvent être soumis à cette section.

Brief Reports. Brief reports (approx. 3,000 words including references) can be submitted to this section.

Practice Innovations. The Practice Innovations section of the Canadian Journal of Community Mental Health focuses on innovative mental health and/or substance use services. The intent is to rapidly publish innovative practices in the field in order to enhance early knowledge exchange among and between service providers, users, researchers, policy makers, funders and other stakeholders.

Submissions should consist of up to 1500 words with no more than five references and must include

- A title page listing all authors and their organizational affiliations and the contact information (including email) of the corresponding author;
- An introductory paragraph describing the pertinent background, the rationale for the innovation, disclosure of the nature of the authors' involvement with the innovative practice, and identified conflicts of interests (if any);
- A short abstract (50 words or less) written in both English and French.

- One or more paragraphs describing the innovative practice and reported experience with it;
- One paragraph suggesting implications and relevant future directions; and
- List of references (if any).

All submissions will be reviewed, and feedback will be provided to the corresponding author. Submissions will be accepted as is, accepted with minor revisions, returned for resubmission with major revisions, declined, or returned for resubmission to another section of the journal (with explanation).

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