

Adolescent girls' experiences of mental health and recovery following sport-related concussions

By

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## **Abstract**

**Introduction:** There is a growing body of research linking concussion to subsequent mental health challenges. Although concussion management emphasizes early, gradual return to activity, some adolescents may continue to experience prolonged mental health symptoms despite resolution of physical symptoms. Because literature often conflates sex and gender, there is limited understanding of how gendered expectations and social contexts shape recovery experiences among adolescent girls.

**Objective:** To explore how adolescent girls in Winnipeg experience mental health and recovery following their first sport-related concussion, focusing on their return-to-sport journey.

**Methods:** This qualitative study used an interpretive phenomenological design and semi-structured interviews to explore the experiences of eight adolescent girls from Winnipeg, Manitoba, who had sustained their first sport-related concussion. Interview questions asked how gendered expectations and social contexts shaped emotional responses, coping strategies, and return-to-sport decisions. A reflexive thematic analysis was conducted.

**Results:** Five interconnected themes described the social, emotional, and identity-based complexities of concussion recovery for adolescent girls. First, participants navigated both support and pressure, as coaches and peers offered reassurance yet also conveyed expectations to return. Second, recovery was emotionally challenging, characterized by sadness, frustration, anger, and exhaustion. These feelings shaped participants' experiences and were often intensified by self-comparisons to peers and a sense of social exclusion. Third, concussion disrupted core identities. Because sport shaped their sense of self, losing access to play and routine threatened their identity, even as they sought ways to stay involved. Fourth, participants encountered gendered barriers that undermined the legitimacy of their injuries. Dismissive comments, teasing, and unequal recognition from boys and male coaches contributed to the feeling that girls' concussions were taken less seriously. Finally, recovery was marked by conflicting expectations and uncertainty. Athletes grappled with internal pressure to return, as well as physical limitations, creating tension between their desire to play and the need to prioritize safety.

**Conclusions:** Concussions disrupted girls' athletic identity, emotional well-being, and sense of belonging. Their recovery was shaped by internal pressure to return and gendered perceptions of injury. This highlights the need for concussion care that accounts for the social and gendered contexts of girls' sport participation.

*Keywords:* concussion recovery; adolescent girls; mental health; gender norms; athletic identity; return-to-sport; qualitative phenomenology; interpretive phenomenology

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### **Dedication**

This thesis is dedicated to all girls in sport. Your presence matters. Your participation is valued. I see you, and I hear you.

### **Attestation**

This work was produced by Mason Hollebeke with guidance and supervision from advisors Dr. Kelly Russell and Dr. Kerstin Roger.

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## CHAPTER I: INTRODUCTION

A concussion is a form of mild traumatic brain injury that can impact brain function (1). Concussions occur when a bump or blow to the head or body causes the brain to move rapidly within the skull (2). Concussions are a functional brain injury that can affect brain function and may result in a wide range of physical, cognitive, emotional, and sleep-related symptoms. Concussions can have significant short- and long-term effects on an individual's well-being, especially if not managed properly (3). Early concussion management is primarily supportive, focusing on a gradual return to activity. When treating a concussion, healthcare providers should avoid prescribing complete, extended physical and cognitive rest after a concussion. As of 2022, recovery follows a new approach that encourages initial cognitive rest, along with light-intensity physical and cognitive activity, such as walking and other daily activities, within the first 24–48 hours after a concussion (2,4).

For athletes returning to sport, the return-to-sport strategy includes six progressive steps designed to safely guide individuals back to participating in physical activity. Completing the initial stages of the return-to-sport protocol typically takes at least a week, but full, unrestricted return to sport may require up to a month (5). In Canada, athletes must not return to play until they have completed all steps of the Return-to-School Strategy (if applicable) and the first three stages of the Return-to-Sport Strategy (5). They must also receive medical clearance from a physician or nurse practitioner, confirming they have completed all these steps and are ready to return to activity (5). After receiving a medical clearance letter, athletes may progress through steps 4 to 6 of the sport-specific Return-to-Sport Strategy to gradually return to unrestricted sport activities (5). This aligns with Rowan's Law, which is a concussion safety law designed to promote awareness and management of concussions in competitive sports (6). Rowan's Law mandates concussion education, removal-from-sport protocols, and medical clearance before returning to play (7).

Some adolescent athletes experience persistent symptoms following a concussion, which can delay their return to unrestricted activity (8). Risk factors for persistent symptoms include prior head injury, other brain-related conditions (such as ADHD or learning difficulties) (9), and history of psychiatric conditions, such as depression and anxiety (10). A cohort study conducted at multiple specialty clinics in the United States reported that 70% of adolescents had symptoms lasting longer than 1 month, and 40% were still symptomatic at 3 months (11). Adolescent girls often experience a more prolonged and complex recovery following a sport-related concussion compared to boys. A retrospective descriptive epidemiological study found that adolescent female athletes had significantly longer recovery times than their male

counterparts (75.6 vs. 49.7 days,  $p = 0.002$ ) and were more likely to need additional treatment interventions beyond standard cognitive and physical rest (12). Female athletes were also three times more likely to receive academic accommodations during their return to school, suggesting they may face greater academic, psychological, or social challenges during recovery (12). A separate retrospective cohort study found that female athletes took significantly longer to begin a return-to-play progression following a sport-related concussion compared with age-matched male athletes ( $29.1 \pm 26.3$  days versus  $22.7 \pm 18.3$  days,  $p = 0.002$ ) (13). These findings further support evidence that adolescent female athletes often experience a longer recovery trajectory after concussion. Given that American football accounted for nearly half (49.2%) of sport participation in the sample and is predominantly played by boys, the authors conducted a sub-analysis excluding football players. Even after removing football athletes from the dataset, female athletes continued to take significantly longer to initiate a return-to-play progression than male athletes ( $29.1 \pm 26.3$  days versus  $18.6 \pm 44.7$  days,  $p = 0.040$ ) (13). This suggests that the observed sex/gender differences in concussion recovery cannot be explained solely by differences in sport participation and may reflect underlying psychological or social factors that influence recovery outcomes (13).

Despite growing evidence that adolescent girls experience longer and more complex concussion recoveries than boys, the role of gender in shaping these recovery experiences remains poorly understood. Much of the existing concussion literature focuses on biological differences between females and males, often using the terms “sex” and “gender” interchangeably. For adolescent girls, gender-related factors may include expectations around sport participation, emotional expression and social pressures. These factors may contribute to differences in concussion recovery but are not well captured by research focused primarily on biological sex. Therefore, there is a need for research that specifically examines the role of gender in adolescent girls’ concussion experiences and recovery.

## **CHAPTER II: LITERATURE REVIEW**

When examining adolescent concussions in girls, it is important to acknowledge the challenges posed by terminology in the literature, particularly when comparing concussion outcomes between girls and boys. Studies use the terms “sex” and “gender” interchangeably, despite their distinct meanings (14–17). Sex refers to biological differences, while gender encompasses social and cultural roles, identities, and expectations (18). Terms referring to sex include “male” and “female,” while terms referring to gender include “boys/girls” and “men/women”. Researchers often fail to clarify whether their analyses account for biological sex differences, gendered differences, or both. In reviewing the literature, it is unclear how some authors operationalized these terms, raising concerns about the accuracy and applicability of their findings. For the purposes of this literature review, I will present the background literature using the terms as they appear in the original studies, while remaining mindful of potential inconsistencies and limitations in their usage. However, when interpreting the presented results, I have adopted the term sex/gender, acknowledging that biological and sociocultural factors are deeply entangled (19). Rather than attempting to isolate “sex” as a purely biological variable and “gender” as a purely social one, this framing recognizes that gendered experiences can shape biological processes and that biological differences are often interpreted and reinforced through gendered norms. This approach has been used in other health research studies (20–22).

PubMed was the primary database used to identify literature relevant to each component of this project. Keywords were drawn from the section headings and combined with database filters to refine the search. The specific search terms and the number of records retrieved for each topic are listed in Appendix A – Table S1. Because the initial searches returned a large volume of publications, article titles were screened for relevance and for the presence of multiple key terms. Articles outside the adolescent population were included in this review as some of the relevant topics, such as gender norms and behaviours, are not commonly researched among youth populations. No artificial intelligence tools were used in the preparation of this thesis, with the exception of Grammarly for spelling and punctuation review.

### **2.1. Sport-Related Concussion Epidemiology**

Adolescents are particularly vulnerable to sustaining a sport-related concussion due to greater participation in contact sports compared to children and adults (23). Concussions are common among youth athletes, as they make up 93% of the sports and recreation-related traumatic brain injuries (TBIs) among children and youth who are reported to the Canadian Hospitals Injury Reporting and Prevention Program (24). The incidence of concussion in sport

among high school athletes has been steadily increasing over the past few decades. From 2005–2006 to 2014–2015, there was a significant increase ( $p < 0.05$ ) in the total number of concussions across all sports played by high school students in the United States (25). The overall concussion rate per 10,000 athletes more than doubled from 2.19 (95% CI: 2.04–2.59) in 2005–2006 to 5.03 (95% CI: 4.77–5.12) in 2014–2015. An estimated 200,000 concussions occur annually in Canada, primarily affecting children and youth (26). A systematic review determined that the overall risk of concussion among child and adolescent athletes was 0.23 per 1000 athlete exposures (95% CI: 0.19 to 0.28) (27). However, as many as 50% of concussions may go unreported (28), and the true incidence is likely much greater.

## **2.2. Qualitative Studies on Adolescent Concussion Experiences**

To date, three qualitative studies have focused on individual concussion experiences among adolescents, with only one centred specifically on sport-related concussions. Yet none examine how sex or gender shapes the mental health dimensions of recovery. The first qualitative study explores the experiences of children and youth aged 11 to 18 as they return to daily activities following a concussion (29). Using interviews and reflexive thematic analysis, the researchers identified three key themes that emerged from participants' narratives. Themes included diverse concussion experiences, the importance of knowledge in recovery, and the impact of concussions on occupational engagement. While this study offers insights into the emotional and social dimensions of concussion, it does not consider the influence of gender norms, roles, or identities on concussion experiences. It overlooks the unique ways in which adolescent girls may understand, cope with, and express their symptoms and emotional struggles. Additionally, it does not focus specifically on first-time or sport-related concussions, which may carry distinct mental health implications, including heightened anxiety about reinjury and disruptions to athletic identity.

In a separate qualitative study, the authors examined adolescent perspectives on concussion recovery (30). Through focus groups and interviews with seven adolescents aged 17 to 20, researchers uncovered a range of mental health impacts associated with concussion. Participants described feelings of depression stemming from unmet self-expectations and the realization of potentially irreversible limitations, particularly among those who were previously active in sports. Anxiety emerged as another key theme, fueled by cognitive difficulties, social isolation, and increased financial dependence, which made even routine tasks feel overwhelming. Additionally, many participants expressed persistent fear of reinjury, contributing to a heightened sense of vulnerability during recovery. Although this study highlights important

emotional and psychological challenges, it does not consider how gender norms, roles, or identities shape these experiences. It does not examine the specific ways adolescent girls may interpret or communicate their symptoms or emotional distress. It also does not focus on first-time sport-related concussions.

The third study examined the lived experiences of adolescent athletes following a sport-related concussion (31). Using a semi-structured interview guide, 12 adolescents were interviewed during the subacute phase of recovery (15–30 days post-injury). The authors used reflexive thematic analysis to uncover themes including: perceptions of the social aspects of sport, social perspectives on sport-related concussion, and psychosocial experiences following concussion. Although this study offers valuable insight into adolescents' psychosocial experiences after concussion, it does not allow participants to reflect on their recovery once they have clinically recovered. Evidence suggests that the median time to physician-documented clinical recovery for children and adolescents aged 7 to 19 is approximately 23 days (IQR 15–44) for those with no prior concussion and 25 days (IQR 18–43) for those with a history of concussion ( $p = 0.281$ ) (32). Because participants were interviewed between 15- and 30-days post-injury without the requirement of clinical recovery, this leaves an important gap in understanding how mental health evolves across the full recovery trajectory.

While each of these studies offers insights into the emotional and social dimensions of concussion, they do not consider the influence of gender norms, roles, or identities on concussions experienced by girls. These studies also included predominantly male samples, with males comprising 5 of 8, 4 of 7, and 8 of 12 participants, respectively. My thesis will address these gaps by exploring how gender influences the mental health experiences of adolescent girls as they recover from a first-time sport-related concussion.

### **2.3. Adolescent Mental Health Following a Concussion**

Epidemiological research increasingly demonstrates that concussions in childhood and adolescence are associated with meaningful long-term mental health risks. A retrospective, population-based cohort study followed adolescents aged 10 to 18 with physician-diagnosed concussions (2000–2005), each matched by neighbourhood and age to five control peers without concussion (33). This study found that adolescents with physician-diagnosed concussions face a significantly higher risk of developing new mental health disorders, such as mood disorders, psychosis, substance use, and ADHD (33). Girls were at higher risk for each of these mental health outcomes, with psychosis as the only exception. These risks grew over time, particularly for girls in the first 4–7 years and for boys in the first 9–10 years post-

concussion diagnosis (33). These findings suggest that the concussion itself may contribute to an increased risk of poor mental health outcomes. Building on this evidence, additional research shows that concussions sustained by adolescents can have long-lasting effects on their mental health (34). Multiple studies have shown that following a concussion, adolescents are at a higher risk for anxiety, depression, behavioural issues, and self-injurious behaviours (34–36). A population-based retrospective cohort study examined children and youth aged 5 to 18 who sustained a concussion or orthopedic injury between 2010 and 2020. This study found that children and youth who sustained a concussion had significantly higher risks of self-harm and psychiatric hospitalization compared to those with orthopedic injuries (34). While suicide rates were low and not statistically different between groups, the concussion group had nearly twice the incidence rate, suggesting the need for careful monitoring of suicidality and self-harm after concussion (34). A cross-sectional study revealed that about 1 in 5 physically active high school students experienced a concussion in the past year. Those who had a concussion showed higher odds of depressive symptoms, self-harm, suicide attempts, and injuries from suicide attempts compared to peers without concussion (35). Interestingly, female adolescents appeared more vulnerable to mental health impacts, despite concussions being more common in boys. While the study could not establish causality due to its cross-sectional design, it highlights the importance of monitoring mental health following concussion in adolescents, particularly among girls (35). A systematic review examining mental health outcomes following pediatric concussions indicated that, unlike non-mental health post-concussion symptom recovery, mental health symptoms often persist beyond one month post-injury in children aged 0-18 years old (37). This suggests that concussions can trigger lasting mental health issues, influenced by both biological factors (e.g., fatigue) and psychosocial factors (e.g., fear of re-injury) (37). These findings highlight the significant impact of concussions on adolescent mental health and indicate that concussions can have long-term effects for many adolescents.

Furthermore, a cross-sectional study conducted across Canada revealed that although overall concussion symptom knowledge was high among adults aged 35-54, a gap remains in awareness of mental health symptoms and their relationship to concussion (38). This knowledge gap is significant, and not all parents, coaches, and athletes are likely to consider monitoring for mental health changes following a concussion. The increased risk of anxiety, depression, and behavioural challenges following a concussion suggests that brain injuries may contribute to long-term psychological distress. The association between concussions and neuropsychiatric conditions further emphasizes the potential for lasting cognitive and emotional

consequences (39). These studies show that adolescent concussions are consistently linked to elevated mental health risks, with some being sex/gender specific.

## **2.4. Gender Norms and Concussions**

Gender norms play a significant role in shaping how individuals interpret and respond to concussion recovery, particularly in relation to their mental health, emotional well-being, and coping strategies (40). From an early age, boys are socialized into sports through male-to-male interactions, rarely citing women athletes as influences (41). Within this framework, pain is often downplayed, with athletes adhering to the idea of "no pain, no gain" (42), which may influence their likelihood to report an injury, and this may be especially true for invisible injuries such as concussion. Emotional expression is similarly constrained, as male athletes may equate showing vulnerability with weakness (43). For girls, these dynamics take on a different shape. Female athletes in male-dominated, high-risk sports often face a difficult balance (44). They may feel empowered by competing in these environments, yet also navigate conflicting expectations to be both tough and yet appropriately feminine (44). As a result, girls adapt to the rough and risky aspects in ways that reflect traditional gender expectations, such as downplaying pain, pushing through injury, or avoiding expressions of vulnerability to prove they belong (45). Female athletes represent a distinct population of competitors who face additional structural stressors when compared with male athletes. These challenges include sport and resource inequities, exposure to gendered norms of tolerating and experiencing violence and abuse, and mental health struggles that are influenced by gender expectations and societal norms (46). When combined with sports injuries such as concussions, these deeply ingrained stressors can negatively impact the everyday mental health of female athletes, as well as how they structure and experience their injury recovery and return to sport (46).

A survey of 328 college athletes in the United States found that those who were less influenced by traditional masculine norms of self-reliance and winning were more likely to report concussion symptoms (47). Concussion risk may also be influenced by variations in style of play and aggressiveness in sports. Aggressiveness is often shaped by gender norms, as men are encouraged to play more aggressively than women (48). Male sports (sports played by boys/men) are often considered more aggressive, leading to different safety regulations, such as helmet requirements in male but not female lacrosse (14) (please note, the study used the descriptors of male and female sports despite discussing gender in sport). Boys may face unique pressures related to masculinity norms, potentially influencing how they express or suppress emotional distress post-concussion (49). In contrast, girls may be more likely to report

internalizing symptoms, such as anxiety and sadness, following a concussion (49). However, girls may still feel under-supported in managing these symptoms due to social pressures related to the expectations to be resilient in sports (49). These questions are best answered using a qualitative approach because it allows for a deeper exploration of the social and psychological factors influencing concussion experiences (50). The role of sex/gender remains underexplored in understanding how adolescent girls experience and navigate concussion recovery.

Despite the recognition that girls' experiences in sport are shaped by social and cultural factors, much existing concussion research continues to focus on biological differences, overlooking how these broader influences impact their recovery and mental health. This narrow focus overlooks and diminishes how socialization, identity, and structural inequities influence concussion experiences and recovery, particularly for adolescent girls. Moreover, there is a particular lack of research focusing on adolescent lived experiences following a concussion. Adolescence is an important age group marked by ongoing brain development and evolving social identities (51) that uniquely influence how individuals experience and recover from injuries (52). Without a sociocultural understanding of sex/gender, current concussion management strategies may fail to address the complex ways in which it intersects with injury experiences, highlighting the need to understand and support girls' concussion experiences.

## **2.5. Sport-related Concussion in Female-dominated Sports**

Sport-related concussion research remains grounded in male-dominated samples (e.g., hockey and American football) and assumptions, leaving girls' and women's experiences under-examined. Sport-related concussion guidelines and consensus statements continue to rely on evidence drawn from predominantly male samples. In a review of the literature used across three major concussion statements, 171 distinct studies with human participants were cited, and 80.1% of those participants were male. These studies informed the National Athletic Trainers' Association statement, the International Conference on Concussion in Sport consensus, and the American Medical Society for Sports Medicine joint position paper, meaning the evidence base underpinning these guidelines remains overwhelmingly male (53). This is especially concerning given that artistic sports such as artistic swimming, cheerleading, figure skating, and gymnastics are female-dominated disciplines that remain largely absent from sport-related concussion research despite clear evidence of injury incidence (44). Artistic sports embed gendered expectations that shape concussion experiences, as athletes described a culture that intertwines toughness with grace, creating a dual demand to endure pain while maintaining aesthetic ease (44). Additionally, research shows that clinicians often doubted the

legitimacy of artistic athletes' injuries because artistic sports are widely perceived as low risk (44). Despite the common perception that girls' sports are lower risk, a self-perpetuating cycle can occur in which female-dominated sports are assumed to be "gentler" and therefore less likely to result in injury. In reality, many sports predominantly played by girls carry a substantial risk of concussion. In cheerleading, concussions account for 6.3%–31.1% of all reported injuries. For example, one study recorded 89 validated head impacts in a mixed sex team across practices, averaging  $22.25 \pm 11.90$  impacts per practice, with individual athletes sustaining an average of  $1.93 \pm 3.42$  impacts per practice (54). Ringette, another girl-dominated sport, also demonstrates high concussion incidence. One study reported a suspected concussion incidence rate of 0.74 per 100 team-minutes (95% CI 0.48–1.13), underscoring the significant head-injury risk girls face in these sporting environments (55). A dissertation examining concussions in artistic swimming found that 106 athletes (46%) reported sustaining a diagnosed concussion directly related to the sport. The most common mechanism of injury was athlete-to-athlete contact, accounting for 81.2% of reported concussions (56). Additionally, a cross-sectional survey reported that 24 figure skaters (27%) had experienced at least one concussion, and seven had sustained two concussions (57). Women's gymnastics had the highest preseason concussion rates of all NCAA sports during the 2013-14 through 2018-19 seasons, with gymnasts experiencing concussions at a rate 50% higher than those observed in football players. During the preseason, approximately 9 gymnasts per 10,000 athlete-participations sustained a concussion, compared with about 6 football players per 10,000 athlete-participations, which is defined as a single instance of an athlete taking part in a practice or competition (58). Additionally, a Canadian epidemiological study of youth ice hockey players ages 7–17 found that 7.8% of female players sustained a concussion, compared with 6.4% of male players. The data also showed a clear age-related pattern among girls: concussion and minor head-injury rates increased with age, peaking among 13- to 14-year-old female players (59). This trend shows that concussion risk for girls rises as play becomes faster, more competitive, and more physically demanding, even though girls' leagues do not permit bodychecking. Concussions have unique challenges compared to other sports injuries, as they are an invisible injury. Concussions have fewer objective signs than many other sports injuries, such as radiographic imaging showing a fractured bone resulting in a need for crutches or a cast. Without visible signs of injury, concussed athletes may face additional skepticism, pressure to downplay symptoms, or difficulty receiving adequate support (60).

The widespread assumption that female-dominated sports are low risk reflects broader gendered hierarchies in sport, where girls' disciplines are routinely undervalued and

misunderstood (44). Together, these findings illustrate that women's and girls' sports carry substantial, and often overlooked, concussion risks, yet persistent gendered assumptions continue to minimize the seriousness of their injuries. By overlooking the risks associated with women's and girls' sports and failing to make this evidence visible, the misconception that girls participate primarily in "gentle" or low-risk sports continues to persist. This harmful stereotype can contribute to the under recognition of sport-related concussions in girls, ultimately continuing to harm girls who do not receive appropriate care for their concussions.

## **2.6. Study Rationale**

Adolescent sport-related concussions are common, often under-recognized, and linked to persistent mental health challenges, with girls facing distinct vulnerabilities shaped by gender norms and sport culture (47,61). Despite growing evidence of substantial concussion risk in girl-dominated sports, research and clinical guidelines continue to rely on overwhelmingly male samples, leaving girls' lived experiences and recovery needs underexamined. While there is a growing body of research linking concussion and subsequent mental health challenges, few studies have focused on adolescents' subjective experience (29–31). For many adolescent athletes, returning to their sport after a concussion is an emotionally complex experience, marked by both an eagerness to reconnect with their sport while balancing concerns about the risk of re-injury (31,62). Furthermore, little is known about how adolescent girls uniquely experience mental health challenges during concussion recovery, particularly in relation to their return to sport. This study builds on existing research by focusing specifically on the lived experiences of girls recovering from a sport-related concussion, with particular attention to mental health outcomes and return-to-sport. By centring the voices of adolescent girls, this study examined how gendered social and cultural expectations may shape recovery trajectories and coping strategies. There is a gap in understanding how sex/gender may influence recovery experiences, mental health outcomes, and coping strategies of adolescent girls following a sport-related concussion. By highlighting this evidence, it becomes clear that girls do engage in physical risk and that participation in "girl" sports can result in injury. This may help challenge the misconception that only men's sports are violent or dangerous and promotes greater awareness of the risks faced by girl athletes.

## **2.7. Research Objectives**

The purpose of this study was to explore how adolescent girls in Winnipeg, Manitoba, experience mental health and recovery following a first sport-related concussion, with particular attention to their return-to-sport journey. Using a qualitative, interpretive phenomenological

approach, this study examined the language and narratives these adolescents used to describe their experiences, aiming to uncover how gendered expectations and social contexts influenced their mental health, coping strategies, and return to sport. This research aimed to generate in-depth, contextual insights that are currently lacking in the adolescent concussion literature.

Specifically, this study sought to:

- Examine how adolescent girls perceive and respond to their concussions in relation to social expectations around emotional expression, resilience, and participation in sport.
- Identify patterns in how girls describe challenges such as anxiety, isolation, and frustration, and how these experiences influence their return-to-sport decisions and the type of support they receive.
- Explore how gendered norms and social factors shape girls' mental health outcomes and coping strategies during concussion recovery.
- Examine how contextual factors, such as school, family, sports teams, and peer support systems, influence adolescent girls' recovery experiences and pressures related to returning to sport.
- Generate contextual knowledge about adolescent concussion recovery that can inform the development of more responsive, inclusive, and supportive concussion management practices in youth sport.
- Generate knowledge which dispels typical gendered stereotypes about sport.

## CHAPTER III: METHODOLOGY

### 3.1. Relevant Definitions

#### 3.1.1. Concussion

A form of mild traumatic brain injury caused by a bump, blow, or jolt to the head or body, leading to rapid movement of the brain within the skull. It affects brain function and can result in a range of physical, cognitive and emotional symptoms (1,2).

#### 3.1.2. Sport-related Concussion

“A traumatic brain injury caused by a direct blow to the head, neck or body, resulting in an impulsive force being transmitted to the brain that occurs in sports and exercise-related activities” (2).

#### 3.1.3. Adolescent

Although the World Health Organization defines adolescents as individuals between 10 and 19 years of age (63), the Manitoba provincial educational curriculum introduces students to concepts related to social influences and their effects on gender roles and identities in Grade 7 (64), when students are typically 12 years old. Therefore, the minimum age for inclusion in this study was 12 years, as the study examines topics related to gender and gender identity. Participants under the age of 12 may not have been formally introduced to these topics. As this study was conducted as part of the completion of a master’s program in Pediatrics and Child Health, and the pediatric population is defined as individuals who have not yet reached their 18th birthday (65), participants aged 18 years and older were excluded from the study.

#### 3.1.4. Recovery

“Characterized by a gradual lessening of symptoms, the ability to engage in more intense cognitive and physical activities without symptom exacerbation, and a steady return to one’s pre-injury state” (66).

#### 3.1.5. Recovered

Deemed recovered by a physician or nurse practitioner (32)

#### 3.1.6. Sex

“Set of biological characteristics in humans linked to physical and physiological traits such as chromosomes, gene expression, hormone levels and functions, and reproductive or sexual anatomy” (18).

### *3.1.7. Gender*

“The socially constructed roles, behaviours, expressions and identities of girls, women, boys, men, and gender diverse people. It influences how people perceive themselves and each other, how they act and interact, and the distribution of power and resources in society (18).

### *3.1.8. Gender Identity*

“Each person’s internal and individual experience of gender. It is their sense of being a woman, a man, both, neither, or anywhere along the gender spectrum” (67).

### *3.1.9. Mental Health Outcomes*

Various long-term psychological effects that are present following a concussion that can affect an individual's well-being, functioning, and overall quality of life (68).

### *3.1.10. Athlete Exposure*

“One player participating in any game or practice, regardless of the amount of time spent playing and therefore at risk of sustaining an injury” (27).

### *3.1.11. Socialist Feminist Theory*

Combines the gender politics of women’s liberation with democratic socialist principles, emphasizing patriarchy as a system of power distinct from but intertwined with capitalism, and synthesizing analyses of gender inequality, social reproduction, and economic reproduction (69,70).

### *3.1.12. Constructivism*

An epistemological view that understands knowledge as something actively built by the learner. People develop new ideas by reorganizing and building on what they already know, with each new understanding becoming the foundation for future learning. This perspective sees knowledge as actively constructed rather than received as an objective fact. This makes knowledge personal and shaped by prior experience (71).

### *3.1.13. Saturation*

For the purposes of this study, saturation refers to the point in qualitative data analysis at which no new codes or themes emerge from the data. At this stage, additional data tend to reinforce existing patterns rather than generate new insights, indicating that the analysis has achieved sufficient depth and completeness (72).

### **3.2. Ensuring Methodological Rigour**

There has been extensive discussion regarding how to evaluate rigour in qualitative research. Tracy (2010) proposed eight “big-tent” criteria for excellent qualitative research (73). This research study aimed to ensure methodological rigour by adhering to these criteria for high-quality qualitative research. These criteria are defined as:

- a) Worthy topic: relevant, timely, significant, and interesting (73).
- b) Rich rigour: use of appropriate theoretical frameworks, sufficient and meaningful sampling, and robust data collection and analysis processes (73).
- c) Sincerity: transparency, reflexivity, and honesty about the research process (73).
- d) Credibility: plausibility and trustworthiness of the findings, often achieved through thick description, detailed accounts, and grounding interpretations in participant data (73).
- e) Resonance: ability of research to meaningfully impact or connect with an audience (73).
- f) Significant contribution: extends knowledge, improves practice, or generates new avenues for research (73).
- g) Ethics: considers procedural, situational and culturally specific, relational, and ongoing ethical considerations throughout all stages of the research process (73).
- h) Meaningful coherence: alignment between the study’s research questions, theoretical framework, methods, and findings (73).

### **3.3. Philosophical and Theoretical Approaches**

#### **3.3.1. *Epistemological and Ontological Positions***

This research is grounded in a constructivist epistemology and a relativist ontology. From a constructivist epistemological perspective, knowledge is understood as socially constructed through individuals’ experiences, interactions, and processes of meaning-making (71). Rather than assuming that knowledge represents an objective or universal truth, constructivism recognizes that individuals actively construct understandings of reality through their lived experiences, memories, social interactions, and cultural contexts (71). Accordingly, participants’ accounts in this study were not viewed as objective or factual representations of concussion recovery, but rather as interpretations of their lived experiences. Each participant brought a lifetime of knowledge, memories, and experiences in sport that shaped how she understood her injury, recovery, body, identity, and place within sport. Knowledge was therefore understood as co-constructed through the interaction between researcher and participant, with particular emphasis placed on participants’ own descriptions, interpretations, and narratives of their experiences (71).

This epistemological position is complemented by a relativist ontology, which assumes that there is no single, objective reality, but rather multiple realities shaped by individuals' experiences, relationships, social environments, and interpretations (74). In the context of this study, this meant recognizing that each adolescent girl experienced and understood concussion recovery differently, with her understanding influenced by her sport experiences, identity, relationships, and broader social and cultural contexts. The study therefore did not seek to identify a single or universal "truth" about concussion recovery, but instead aimed to understand the different realities participants constructed through their lived experiences (74). In this sense, concussion recovery was understood as a meaning-making process through which adolescent girls actively developed understandings of their bodies, identities, and experiences within sport.

Methodologically, a constructivist paradigm is closely aligned with qualitative research approaches that prioritize understanding participants' experiences and the meanings they assign to them rather than seeking to establish objective truths or generalize findings to larger populations (71). Such approaches commonly emphasize inductive inquiry, information-rich cases, and researcher reflexivity as important components of the interpretive process (75). Similarly, a relativist ontology is well suited to qualitative research because it acknowledges that individuals may experience and understand the same phenomenon in different ways, making it important to attend to the contextual and subjective nature of participants' realities (74). This ontological position was particularly relevant to this study, as each adolescent girl experienced concussion recovery within her own unique social, cultural, relational, and sporting context. Together, the constructivist epistemology and relativist ontology provided a philosophical foundation for the interpretive phenomenological approach used in this research, allowing participants' lived experiences to be understood as subjective, contextual, and shaped through ongoing processes of interpretation and meaning-making.

### *3.3.2. Theoretical Lens*

This research was guided by socialist feminist theory, which integrates analyses of gender inequality with the dynamics of social and economic reproduction to explain how women's oppression is produced and sustained (69,70). Socialist feminist theory emerged to address the limitations of both Marxist feminism and radical feminism by arguing that women's oppression cannot be explained through a single system of power. While Marxist feminism emphasizes capitalist exploitation and radical feminism centres patriarchy as the primary source of oppression, socialist feminism argues that these systems are mutually reinforcing and must be analyzed together. It rejects the idea that either class or gender should be prioritized over the

other, instead recognizing that both are structural forces that contribute to women's subordination, particularly through the gendered division of labour in paid work and at home. Early socialist feminists critiqued Marxist accounts for being overly "economistic," reducing women's oppression to capitalism alone and assuming gender inequality would disappear with class transformation (76). They also challenged radical feminist approaches for sometimes treating patriarchy as a system that exists independently of historical, social, and economic conditions (77). In response, socialist feminism developed a more integrated framework in which production, reproduction, sexuality, and socialization are seen as interconnected structures shaping women's lives.

Jaggar (1983) further developed socialist feminist theory by arguing that it offers the most comprehensive account of women's oppression because it integrates Marxist concepts such as class and alienation with feminist analysis of gender (78). She also introduced the idea of a feminist epistemology, suggesting that women's lived experiences provide a distinct and valuable standpoint for understanding social reality (78). Hartmann (1997) contributed a structural account of patriarchy as a system that operates alongside capitalism rather than within it. She argued that men benefit materially from the gendered division of labour through both workplace advantages and access to women's unpaid domestic labour, while capitalism simultaneously relies on this unpaid reproductive work to sustain the labour force (79). Together, these systems form a mutually reinforcing political economy in which neither capitalism nor patriarchy can be understood in isolation. Across these perspectives, socialist feminism maintains that neither liberal nor Marxist approaches alone are sufficient. Instead, it calls for addressing both capitalist economic systems and patriarchal social structures, including inequality in paid work, unequal expectations around unpaid care work, and cultural norms that reinforce women's subordination (79).

Socialist feminist theory is well-suited to this study because it examines how patriarchy and material conditions shape girls' experiences of sport-related concussion, situating concussion and recovery within the broader social, cultural, and institutional structures that influence sport participation, injury recognition, and expectations of femininity (69,70). Socialist feminist theory has been previously used to examine sport structures, women's participation in sport, and inequities in the treatment of professional women's sports (80,81), further supporting its use as the theoretical framework for this study.

### **3.4. Reflexive Statement**

In qualitative research, a reflexive statement is important because it allows researchers to acknowledge and critically reflect on their own perspectives and potential influences on the study (82). Within interpretive phenomenology (further described in the next section), lived experience is recognized as valuable for both participants and researchers (83). My interpretations were informed by my own social location and history. As a white, cisgender, able-bodied, heterosexual female, I acknowledge that my perspectives are shaped by my identity and the privileges associated with it. I am aware that these factors influence how I engage with participants and how I interpret their accounts. However, I was careful not to project my own experiences onto the participants, even though their stories often felt familiar and personally resonant. At times, their narratives also validated aspects of what I had experienced myself. Having grown up playing an all-girls sport, I naturally approached the analysis from a feminist perspective, shaped by both my lived experiences and my awareness of sexism in sport. This perspective may have made me more receptive to the participants' accounts than someone without similar experiences. I was not surprised by what they shared, which allowed me to sit more fully with their stories and engage with their experiences in a thoughtful and reflective way. My background as a former competitive athlete who personally experienced a concussion also shaped my analytic lens. This lived experience allowed me to empathize with the emotional and social complexities that the adolescent girls described, and it helped me recognize the pressures young athletes face when navigating expectations to return to sport. My reflexive engagement strengthened the analysis by making visible how my own experiences informed the meanings I constructed while remaining attentive to the girls' voices and the contexts shaping their recovery.

### **3.5. Research Design**

A qualitative approach is appropriate for my research question because it allows for an in-depth exploration of the experiences, perceptions, and contextual factors affecting mental health outcomes post sport-related concussion in adolescent girls (84). Phenomenology centers on understanding participants' subjective experiences, seeking to uncover the essence of what it means for adolescent girls to recover from concussions (85). Interpretive phenomenology builds on this by recognizing that meaning is co-constructed through the interaction between researcher and participant, and that interpretations are shaped by the researcher's history, social location, and theoretical commitments. This approach acknowledges that understanding

adolescent girls' concussion experiences requires attending to both their descriptions and the interpretive processes through which those descriptions are made sense of (86).

Interpretative phenomenology was used to capture the lived experiences of adolescent girls with sport-related concussions. In contrast to basic open-ended interviews, phenomenological research interviews are carefully structured to prompt participants to reflect deeply on their experiences and explore individual perspectives (87). Using an interpretive phenomenological approach, I delved deeply into the lived experiences of adolescent girls who have sustained a sport-related concussion, with a specific focus on how gender norms and social factors might shape their mental health outcomes and recovery process. My research explored contextual factors such as the role of school, family, sports teams, and peer support systems in shaping recovery experiences and pressures related to returning to sport. In addition to highlighting individual perspectives, this method offered an opportunity to observe patterns in how girls describe and make sense of challenges such as anxiety, frustration, or isolation during recovery (87).

### **3.6. Study Population**

#### **3.6.1. *Intended Sample Size***

According to Smith et al. (2009), there is no single correct answer regarding sample size in interpretative phenomenological analysis studies (88). Instead, sample size is guided by the level of commitment to detailed case analysis, the richness of each individual account, and the practical or organizational constraints of the research context (88). Historically, qualitative researchers often employed larger sample sizes in anticipation of critiques from their quantitative colleagues; however, as qualitative methodologies have matured, smaller, more focused samples have become the norm (88). This shift reflects the central aim of interpretative phenomenological analysis: to produce a detailed, in-depth account of individual lived experience, where the emphasis is on quality rather than quantity (88). Given the complexity of human experience, interpretative phenomenological analysis studies typically benefit from a smaller, more concentrated sample. As a general guideline, Smith et al. (2009), suggest that three to six participants may be appropriate for a master's-level interpretative phenomenological analysis study. However, this recommendation is based on work with adult participants, who are often able to engage in longer interviews, typically ranging from 45 to 90 minutes (88). Given that adolescent participants were expected to have shorter attention spans and reduced willingness to participate in extended interviews, the sample size for this study was set at eight

participants to support sufficient depth of data while also increasing the likelihood that adequate richness and saturation would be achieved.

### *3.6.2. Inclusion and Exclusion Criteria*

Participants in this study were adolescent girls aged 12–17 years residing in Winnipeg, Manitoba, or the surrounding area (within 50 kilometres outside of Winnipeg) at the time of recruitment. They must have: (1) sustained their first concussion, (2) concussion must have been sport-related, and (3) recovered within the past 24 months. Those with a history of concussion were excluded because prior concussions may have influenced symptom presentation, recovery trajectories and expectations, and coping strategies (89), making it difficult to isolate the experiences of a first concussion and navigating recovery in unfamiliar territory. Participants could not have had a pre-existing mental health condition, as the goal of this study was to examine how an individual's first concussion impacts their mental health. Further exclusion criterion was an inability to communicate in English.

### *3.6.3. Eligibility Screening*

Recruitment initially took place online through social media and sport organizations. Due to a high number of fraudulent responses, recruitment later shifted to an in-person approach (further described in the next section). For participants recruited via word of mouth, individuals contacted me via email to express interest in study participation and were then sent a brief eligibility screening and demographic form via Google Forms (Appendix B). For participants recruited through in-person tabling events, they were provided with a flyer (Appendix C) containing a QR code that directed them to the same demographic questions. Demographic information collected included age, sex, gender, sport played, and concussion history, and was used to provide context for participants' experiences and confirm eligibility. The form was completed by participants, and those who met the inclusion criteria were subsequently contacted by me to schedule a one-on-one interview. The Post-Concussion Symptom Scale (PCSS) (Appendix D – Figure 1) was administered during the Zoom session, prior to each interview, to assess participants' current symptom severity. This standardized tool included 21 concussion-related symptoms rated on a scale from 0 (none) to 6 (severe), generating a total symptom score (maximum of 126). To ensure that participants were well enough to participate in a reflective interview without exacerbating their symptoms, a plan was established for participants with high PCSS (e.g., 13 or greater (90)) to delay participation until their symptoms had improved. However, no participants had PCSS scores high enough to require implementation of this plan. Although participants were required to be deemed medically

recovered by a physician or nurse practitioner to be eligible for the study, it was recognized that lingering symptoms could persist even after official clearance (91). Medical clearance often signals that an individual is fit to return to play or daily activities, but it does not necessarily mean they are symptom-free (92). Adolescents may continue to experience subtle or fluctuating symptoms such as fatigue, concentration difficulties, or mood changes during this post-clearance period (91,93). For this reason, the Post-Concussion Symptom Scale (PCSS) was used prior to interviews to assess the participants' current symptom profiles.

### **3.7. Data Sources**

#### **3.7.1. Recruitment**

Recruitment initially began using online methods, including targeted outreach through social media platforms used by youth sport organizations (e.g., Sport Manitoba) and advertisements on social media platforms. However, this approach resulted in a high number of fraudulent or ineligible responses, with many individuals not meeting the study's inclusion criteria. As a result, online recruitment was discontinued, and in-person recruitment was implemented. Convenience sampling was used to intentionally recruit adolescent girls who met the specified criteria of girls aged 12-17 and had been diagnosed with and recovered from their first concussion. This involved tabling at various sports tournaments, where study materials were distributed, and potential participants and their families could learn about the study and ask questions directly. Recruitment materials were also distributed at community centres and sports venues. Local sport organizations were asked to share recruitment materials through their communication channels to reach a broader network of adolescent girls who participated in sport and their families. Recruitment also involved a partnership with the River East Transcona School Division (Appendix E) to assist in identifying potential participants. Snowball sampling was additionally used, with participants encouraged to share information about the study with friends and teammates who may have met the eligibility criteria. Phenomenological research typically requires fewer than ten interviews per group (i.e., adolescent girls in the context of this study), as the goal is to explore participants' experiences in depth rather than to generalize findings (84).

#### **3.7.2. Data Collection**

Informed consent was obtained from parents or guardians, and assent was obtained from participants prior to data collection through consent (Appendix F) and assent (Appendix G) forms. Consent and assent forms were sent to participants via email, along with instructions

outlining which form was required for the participant and which was required for their parent or guardian. Participants were instructed to return the completed forms via email. Once both forms were received and confirmed to be complete, an interview was scheduled with the participant. Data were collected through virtual, semi-structured, open-ended, one-on-one interviews with participants. Although the original study plan involved conducting interviews in person, concerns about the in-person format and limited willingness to participate led to a change in the study protocol to offer participants the option of either an in-person or virtual interview. Virtual interviews allowed participants to complete the interview in an environment where they felt comfortable and safe. All participants ultimately chose to participate virtually. A pilot interview was conducted virtually with an adolescent who met the eligibility criteria. Following this interview, the interview guide required no further edits, and a rich description of the girl's concussion experience was obtained. The pilot interview was ultimately included in the data analysis. Interviews lasted approximately 30 to 45 minutes, depending on how much the participant chose to share. Parents were not present during the interviews to help ensure that participants felt comfortable sharing their experiences openly. The interviews were conducted by me via Zoom. The interviews were recorded and transcribed using Zoom's auto-transcription feature. Transcripts were manually reviewed and corrected for accuracy. The interviews explored individual experiences with concussions, mental health symptoms, and perceptions of recovery. See Appendix H for the full interview guide. Example questions included:

- Can you walk me through your experience of getting a concussion?
- What did that feel like? What were your first thoughts or feelings after your concussion happened?
- When you were first injured, how did coaches, trainers, or teammates respond to you?
- Do you think people took your concussion seriously? Why or why not?
- Did you ever feel ignored, dismissed, or passed over during your recovery process? How so?
- Have you ever felt like you were treated unfairly or differently because you're a girl athlete? How so?
- Did anyone say or do anything that made you feel differently because of your sex/gender? What did they say? How did this make you feel?
- Do you think boys and girls are treated differently when they get concussions in your sport? Can you give an example?
- Did you feel pressure to "tough it out" or return to play quickly after injury? Where does that pressure come from?

- Did you feel pressure to hide your feelings, stay strong, or act a certain way around teammates, coaches, or family? Did this affect the way you coped with your symptoms or your return to sport?
- During your recovery, in what ways did your school, family, teammates, or friends help you or make things more difficult?
  - Did any of them influence when you decided to return to your sport? How?
- Did your concussion impact your mental health in any way? Can you share an example from after your concussion that would describe your mental health?
- Did you ever feel isolated or left out during your recovery? How so?
- During your recovery, did you ever feel anxious or frustrated? If so, how did these feelings affect when or how you returned to your sport?
- If you could give a recommendation for concussion safety in your sport, what would it be?

Data were collected through participants' personal narratives about their concussion experiences. To compensate for their time, participants received a \$20 gift card as a thank-you at the end of the interview.

### *3.7.3. Data Management*

Interviews were recorded via Zoom and subsequently transferred to an encrypted USB for secure storage on a password-protected computer at the University of Manitoba. Multiple precautionary measures were in place to safeguard the data. The computer operates on the University of Manitoba network and is housed in a restricted-access office area and floor, accessible only via swipe card. To protect participant anonymity, video recordings were deleted once the transcripts had been verified, and all transcripts were de-identified using pseudonyms.

### *3.7.4. Data Analysis*

The interviews were transcribed verbatim and analyzed using reflexive thematic analysis, with a focus on patterns and themes related to how sociocultural factors influenced mental health outcomes among adolescent girls. Reflexive thematic analysis involves identifying patterns and themes across qualitative data, allowing for a deep understanding of how participants' experiences relate to broader research questions (94). I followed the six-step approach outlined by Braun and Clarke (2019) (94), which offers a systematic framework for identifying, analyzing, and interpreting patterns of meaning within qualitative data. First, I familiarized myself with the data by transcribing the interviews, checking for accuracy, reading and re-reading the transcripts, and noting initial ideas. Next, I generated initial codes by

identifying and systematically coding meaningful segments of the data that aligned with the research objectives. This process involved extracting relevant statements from the interviews, identifying keywords within those statements, and grouping these similar keywords together. I then assigned codes to capture patterns of similarity and organized relevant data under each code, using a reflexive thematic analysis template to guide the process. An inductive approach to coding was employed, allowing patterns and themes to emerge from the data rather than applying predefined frameworks (95). Once coding was complete, I searched for themes by grouping related codes and collating supporting data for each potential theme. These themes were then reviewed to ensure they accurately reflected both the coded extracts and the dataset, often through the development of a thematic map. The process continued with defining and naming themes, refining their scope, and developing clear definitions that captured the overall narrative of the analysis. The final step involved producing the report, which included selecting vivid and compelling data extracts. This stage also served as the final opportunity for interpretation and analysis (94). This approach is well-suited for capturing the complexity of adolescent concussion recovery, particularly as it relates to the gendered experiences of girls. The analysis was informed by socialist feminist theory (described above in section 3.5), which combines analyses of gender inequality, social reproduction, and economic structures, emphasizing patriarchy as a system of power that organizes and constrains women's lives (70). By examining how gender norms, social roles, and relationships with coaches, teammates, peers and parents shape participants' experiences of concussion and recovery, the analysis shows how gendered dynamics influence the conditions under which girls interpret and navigate concussion.

My thesis committee, consisting of four professors from the University of Manitoba, reviewed the emerging themes throughout the data analysis process to support triangulation and enhance the credibility of the findings through peer review. Once the analysis was complete, participants received a summary of the study's findings (Appendix I) via email, allowing them to reflect on the results and ensure their voices were accurately represented. This process of member checking is used to enhance the credibility and validity of the qualitative research. This process involves returning the findings to participants to confirm their accuracy and relevance to their experiences, while also helping to reduce researcher bias through feedback on the interview transcripts (96,97). This fosters trust and transparency and ensures that participants' insights meaningfully contribute to a deeper understanding of adolescent concussion recovery. In line with this, participants were asked whether they felt their experiences and perspectives were accurately represented in the narrative summaries.

### **3.8. Theoretical and Paradigmatic Integration in the Interpretation of Findings**

A socialist feminist lens was applied to the interpretation of the results within a constructivist paradigm. Constructivism informed the study's epistemological stance, emphasizing that knowledge is socially constructed and co-produced through interaction between researcher and participant (71). From this perspective, participants' accounts are understood as reflecting multiple, situated realities rather than a single objective truth, supporting an interpretive approach grounded in meaning-making. Feminist theory is a critical, intersectional approach that examines how systems of power and oppression, such as patriarchy, racism, and heteronormativity, shape lived experiences. It challenges binary thinking, centers marginalized voices, and links personal experiences to broader social and political structures (98). Socialist feminist theory builds on feminist theory by keeping its focus on gender inequality while adding an analysis of the material, economic, relational, and institutional conditions that shape girls' concussion experiences in sport (99). This approach encourages researchers to challenge dominant norms and to consider how power, inequality, and social expectations influence mental health and recovery, and allowed me to "challenge and move beyond socially constructed binary understandings of gender, sexuality, and other social identities" (100,101). In this study, reflexive thematic analysis following Braun and Clarke's approach (102) was conducted within a constructivist paradigm and interpreted through a socialist feminist lens. This approach allows for an in-depth exploration of how multiple social identities, such as gender, age, and sport, interact to shape adolescent girls' experiences of sport-related concussion and recovery. This approach will help reveal how cultural expectations and gender norms may influence concussion recovery.

### **3.9. Ethical Considerations**

Ethical approval to conduct this study was obtained from the CHIPER Health Research Ethics Board (HS26980:H2025:186) at the University of Manitoba (Appendix J). Informed consent was obtained from a parent or guardian, and assent was obtained from participants. This study involved discussions of mental health and potential life-altering injuries, which may have brought up distressing emotions for participants. As such, several ethical safeguards were implemented to ensure their well-being.

#### **3.9.1. *Disclosure of Significant Mental Health Concerns***

If a participant disclosed experiencing severe mental health challenges that may require professional support, I provided them with information on available mental health resources, such as crisis helplines, counselling services, and community-based support organizations.

### *3.9.2. Self-Harm and Suicidality*

If a participant expressed thoughts of self-harm or suicidality during the interview, I had a predetermined response protocol. Although no participant expressed thoughts of self-harm or suicidality during the interview, there was a protocol in place. This protocol included conducting a risk assessment, providing immediate resources, asking if the individual is receiving treatment for their mental health, and providing participants with information about appropriate mental health professional services.

The risk assessment involved asking the participant direct questions from the Columbia-Suicide Severity Rating Scale (C-SSRS) (Appendix D – Figure 2) (103). Before using this instrument, my protocol dictated that I inform participants that I would be asking questions that may be emotionally distressing or triggering. I would emphasize the importance of answering honestly, as their responses would be crucial for ensuring appropriate support. This instrument was only to be administered if a participant disclosed thoughts of suicidality or self-harm during the interview. Given that the study population is at increased risk for mental illness, this instrument was intended to assess immediate risk and guide any necessary follow-up actions. Other research studies have used the C-SSRS and suggest that it is suitable for assessing suicidal ideation among adolescents (104–106). Questions include “Have you been having thoughts about hurting yourself? And have you felt this way before or taken any actions in the past?” These questions would help determine the level of risk and inform the appropriate response (103). If a participant disclosed suicidal thoughts or any serious risk to their safety during the interview, I would immediately consult with my supervisor to arrange appropriate mental health support for the participant. Parents or guardians would be notified as soon as possible. The consent and assent forms clearly outlined this possibility and described the steps in place to manage risk, including parental notification, consultation with mental health professionals, and providing participants and their parents with support resources (107).

### *3.9.3. Emotional Support and Voluntary Participation*

To minimize distress, participants were informed before the interview that sensitive topics might arise, and they were encouraged to take breaks or withdraw from the study at any time without consequence.

## CHAPTER IV: RESULTS

### 4.1. Sample

The sample included eight adolescent girls from Winnipeg and the surrounding area. All participants met the study's inclusion criteria and provided parental consent and adolescent assent. The girls were between 12 and 17 years old and participated in hockey, ringette, basketball, softball, and volleyball. Their PCSS scores ranged between 0 and 7. No participants were excluded based on their PCSS scores. All individuals who met the eligibility criteria based on the demographic questionnaire also had PCSS scores below 13, which is considered the threshold for a high score among adolescent girls (90).

**Table 1.** Participants Characteristics

| <b>Pseudonym</b> | <b>Age</b> | <b>Sport Played at Time of Concussion</b> | <b>Time Since Concussion (Months)</b> |
|------------------|------------|-------------------------------------------|---------------------------------------|
| Jade             | 12         | Ringette*                                 | 11                                    |
| Ella             | 12         | Ringette*                                 | 14                                    |
| Taylor           | 13         | Hockey                                    | 2                                     |
| Maya             | 14         | Hockey                                    | 8                                     |
| Kate             | 14         | Hockey                                    | 8                                     |
| Zoe              | 15         | Basketball                                | 12                                    |
| Olivia           | 17         | Volleyball                                | 5                                     |
| Amber            | 17         | Softball*                                 | 9                                     |

*\*Sports historically played by girls (108)*

Analysis of participants' accounts showed that concussion recovery was a complex and deeply personal process shaped by intertwined emotional, social, cognitive, and identity-based challenges. Through inductive analysis of the eight interview transcripts, themes were developed from close, iterative engagement with girls' narratives. This analytic process revealed five overarching themes that captured how girls made sense of their recovery experiences: (1) balancing support with external pressures, (2) the psychological weight of recovery, (3) disrupted sport identity and the experience of loss, (4) gendered barriers and unequal recognition in sport, and (5) internal struggle of recovery. Within each theme, several subthemes

describe the specific ways girls navigated support and pressure, heightened emotions and frustration during recovery, feelings of isolation, disruptions to identity and routine, efforts to stay connected to their sport environment, and internal conflicts around confidence and fear. Importantly, these experiences unfolded within spaces historically shaped by masculine norms, such as sports that have long been associated with physical toughness, emotional restraint, self-sufficiency, and dominance. These underlying social norms may have influenced the participants' responses and their concussion experiences. Together, these themes show that recovery extended far beyond physical symptoms, unfolding as an emotional and identity-shaping experience.

#### **4.2. Theme 1: Balancing Support with External Pressures**

Theme 1 captures how girls recovering from concussion navigated tension shaped by two competing forces: the stabilizing support that grounded them and the external pressures that shaped their decisions to return to sport and pushed them toward an earlier return. These pressures took different shapes, including expectations from teammates who 'needed' them back, parental hopes tied to sport performance or recruitment opportunities, and coaching demands during high-stakes moments. Their accounts reveal that recovery extended far beyond managing physical symptoms. It was a relational and emotional process shaped by team culture and expectations from others, alongside stabilizing support systems. Across interviews, girls described how encouragement from teammates, friends, family, and coaches offered reassurance and protection, while subtle and overt pressures, whether from peers, parents, or coaches, created a sense of urgency to return before they were fully ready. Together, these dynamics illustrate how concussion recovery unfolded within a complex social environment where support and expectation were constantly in tension.

##### *Subtheme 1: Support as a Stabilizing Force*

Across participants, girls emphasized how meaningful support from their family and friends was in helping them feel less alone and better able to cope with the emotional and cognitive challenges of recovery. Taylor described her broader social circle as "very supportive," noting that "my friends and family were all very supportive. They all checked up on me a lot." Maya echoed this, explaining that at school "my friends would help me out with stuff," offering steady reassurance alongside the check-ins she received from teammates and coaches. Others also felt that friends played an important role in easing the emotional strain of recovery. Kate shared that "my friends really helped me by lightening the mood," while Jade highlighted the comfort she found in her family, saying, "Family was a good support system for me. I talked to

my mom and dad a lot.” Together, these accounts show how friendships and close relationships played an important role in recovery, providing emotional steadiness, practical help, and a sense of connection during a period when many girls felt vulnerable and uncertain. For some girls, peer experiences helped counteract internal pressure. Olivia described how having a friend with a concussion protected her from returning too soon:

I didn’t feel any pressure to go back sooner because my friend, who had a concussion before, told me not to rush it. Honestly, right from the start, I told myself I was going to take it slow because I wanted to come back at 100%. I didn’t want to push myself at 50% and then get set back even longer. If I didn’t have this friend, I probably would have gone back sooner. Having someone else to learn from really helped.

Coaches played a particularly important role in validating symptoms and protecting athletes from premature return. Kate noted that “my coaches took my concussion seriously and they understood I needed time off,” while Maya described how “My coaches were super understanding. It was helpful that one of them is a physiotherapist, so she knew I needed to be pulled off the ice.” Ella similarly described her coaches as “nice” and “worried about me,” reinforcing that coaches were attentive to athlete well-being. For some, this support was expressed through clear boundaries: “My coaches said it’s okay that I’m missing games and told me not to come back until I feel better,” Maya explained. Taylor similarly recalled that “my hockey coaches checked up on me every day. They wouldn’t let me play hockey until I got the letter that said I could go on the ice and do non-contact. They were super open about everything.” Olivia also highlighted the importance of this support, describing how both coaches and teammates helped her feel safe and cared for during recovery: “My coaches and teammates were super understanding about it. My coaches told me not to rush back, and my teammates would text me a lot to check in on me. Overall, I felt like people took my concussion seriously and that I had a lot of support.”

#### *Subtheme 2: Pressure to return and perform*

Despite strong support networks, participants also described significant external pressures that shaped their decisions about returning to sport. Some girls felt that teammates or coaches expected them to come back sooner than was safe. Maya explained, “I felt like my team expected me to come back earlier than I did, because I felt like they didn’t think it was that big of a deal.” Zoe recalled comments from others urging her return: “People made comments saying things like ‘come back, we need you,’ but I didn’t really listen, necessarily. I was mostly, like, ‘You’re joking, right?’”

Family expectations also contributed to this external pressure. Amber described her father as a major influence on her return decisions:

If anyone pushed me to go back to sport sooner, it was probably my dad. He was my biggest push to get recruited, and we both knew it was a very important time for me. He grew up being told, 'You're fine, keep going, it's not that big of a deal,' so I think he expected me to go back sooner.

For Amber, the timing of her injury intensified this pressure: "Last summer was the really important summer, it was the year to get recruited. I couldn't miss out on more, and I needed to keep developing. I kind of made it seem like I wasn't hurt anymore, just so I could keep going." She later reflected on how this shaped her behaviour: "I always try to get back as soon as possible. I told my parents, 'Oh, it's not that bad, I can do this,' even though it really was." Despite medical advice, she still returned early: "The doctor told me I had to give it a couple more weeks, but I still went back to play anyway."

Coaching expectations contributed to external pressure, particularly during high-stakes moments in the season when the girls felt increased demands to perform. Jade described her coach as someone who "just put a lot of pressure on me. She was always telling me to do better, be better." Maya admitted, "I feel like I kind of rushed myself into it because it was playoffs and I didn't want to miss the playoffs." Jade shared a similar experience of being encouraged to play through injury: "Oh, you hurt yourself, it's the gold medal game, we'll give you a Tylenol. After the game, I realized that was a really bad idea."

### *Summary*

Theme 1 illustrates how girls' concussion recovery unfolded at the intersection of grounding support and external pressures to return. Participants described how consistent check-ins, understanding coaches, and encouragement from friends and family provided reassurance during an uncertain time. At the same time, they navigated expectations from teammates, parents and coaches that often made them feel they should return before they were fully ready. Across their accounts, recovery was shaped by relationships and team dynamics, which helped offset the uncertainty and frustration of the process, but also added pressure to return to sport.

### **4.3. Theme 2: Psychological Weight of Recovery**

Theme 2 captures the emotional and psychological strain girls experienced as they navigated concussion recovery. While physical symptoms shaped their day-to-day limitations, participants emphasized that the most challenging aspects were often emotional: the frustration

of stalled progress, the fear of long-term consequences, and the loneliness of feeling disconnected from teammates and friends. Recovery was an emotional process, marked by heightened negative emotions, self-directed frustration, and a deep sense of social disruption. Across interviews, girls described how concussion unsettled their sense of control, identity, and belonging, creating a psychological burden that extended far beyond the injury itself.

#### *Subtheme 1: Heightened negative emotions*

Frustration with their concussion recovery was the most commonly expressed emotional response, often arising from the tension between wanting to return and being unable to do so. Taylor captured this clearly: “I felt frustrated during this time because I just really wanted to be back on the ice, that’s all I wanted, to be back and have fun again with my friends.” Kate echoed this feeling, explaining, “I thought I would have gotten cleared after 2 weeks, but I didn’t, so I was frustrated and not very happy.” For others, frustration showed up as irritation or annoyance. Ella described being “really annoyed at my situation,” while Jade summarized her experience by saying, “If I had to describe my concussion recovery in a few words, I would say scared and frustrated.” Olivia also recalled feeling overwhelmed by frustration, sharing, “Initially, I was really upset and really frustrated because I thought my whole life in sport was over. I thought to myself, ‘I’m never coming back from this.’” Uncertainty about recovery timelines intensified these feelings. Olivia repeatedly searched online for average recovery times, explaining:

I guess it was frustrating at the time because I kept looking up average recovery times online, and when I saw someone say it could take around two and a half months, I remember thinking, ‘Oh my goodness, that’s such a long time. I can’t be out for that long, right?’

This uncertain timeline added to the stigma of concussion as an invisible injury, making it feel less predictable and less legitimate than healing from more visible injuries, where progress is easier to track and explain to others.

Sadness and irritability were other prominent emotional responses, often emerging from the abrupt shift in daily life and the sudden inability to participate in the activities that usually brought joy. Kate shared, “I was always sad during my recovery,” a feeling echoed by several others who described a steady, lingering low mood. Zoe recalled, “I was sad about missing practices and games, and I felt like other people expected me to be sad too,” highlighting how sadness became both an internal experience and a social expectation. For some, sadness surfaced in quieter, more private moments. Kate described how “not being able to be with my friends and stuff for a little while kind of made me sad,” while Taylor explained, “It was hard seeing my friends on the ice, I just wanted to be out there.” Olivia also described feeling “really

upset” as she watched her teammates continue without her, noting that “I definitely had feelings of sadness. I obviously wished I was out there, but watching was better than not being there at all”. One participant described becoming more irritable or reactive than usual. Zoe explained, “As far as emotions go, I was definitely more angry. Little things made me spark,” adding that she was “definitely more irritable.” This emotional strain was distressing for her, culminating in the reflection that “the whole experience was the worst experience I’ve had in my life.” Irritability often appeared without warning, leaving Zoe feeling unlike herself and unsure how to manage her reactions.

Fear and anxiety also influenced the emotional strain experienced by participants, particularly around missing important opportunities or not returning to sport at the same level. Amber described being “mostly anxious because I was worried I was going to miss important stuff and important games,” explaining that “it felt like it happened at the worst possible time.” Olivia echoed this fear, saying she felt “really upset and really frustrated” both during recovery and when returning, because “I should be able to do this, but my body can’t handle it yet.” Jade also named fear directly, describing her recovery as “scary and frustrating,” highlighting how uncertainty about her body and future performance created emotional strain.

#### *Subtheme 2: Frustration with self and their progress*

Alongside heightened emotions, including frustration at the situation itself, many participants described a deep frustration directed toward themselves and their perceived lack of progress. This frustration often stemmed from a mismatch between how they believed recovery should unfold and the reality of a slow, unpredictable healing process. Girls spoke about feeling held back by their bodies, disappointed in their performance, and guilty about how their absence affected their teams.

For one athlete, frustration emerged immediately upon returning to sport, as she became frustrated with her perceived lack of progress in her sport performance during recovery. Taylor described how difficult it was to reconcile her expectations with her actual performance: “My first practice back was not my best. I tried to remind myself that I wasn’t on for three weeks, so of course I’m not playing as good. I just had higher expectations for myself.” She also recalled feeling “super upset about not being able to play,” explaining, “I felt like I was doing super well on the ice, and then my concussion just kind of stopped it all.” When she was not cleared at her first appointment, the disappointment was clear: “I was very upset... I was ready to come back, and then I couldn’t.”

Others directed their frustration onto themselves, believing they were responsible for their injury. Maya shared, “I felt super frustrated with myself when I got hit. I felt like I could have

stopped it from happening.” Amber echoed this self-blame, saying, “I was definitely very frustrated with myself, especially because I’m the type of person where stuff like this always happens to me. I felt like it could have easily been prevented.” Some girls struggled to understand why they were still being held back when their symptoms felt manageable. Ella recalled, “I didn’t understand why I couldn’t play. I just thought, ‘my head hurts, and that’s it, so why can’t I go on?’” This confusion often intensified feelings of impatience and self-directed frustration.

Performance-related concerns also contributed to feelings of self-doubt and guilt about missing important games. Jade described how her confidence declined when others noticed changes in her play: “People noticed that I wasn’t playing the same as I did before. This made me less confident.” Feeling responsible for letting others down further compounded these experiences. Kate described the weight of missing a big tournament: “I felt like I was letting my team down because I couldn’t play in that tournament. I felt bad for letting them not have a goalie to practice with... it was also kind of near playoff time. I felt really bad.”

### *Subtheme 3: Emotional isolation, withdrawal, and social disconnection*

Across interviews, girls described how concussion recovery created a profound sense of emotional and social disconnection. Being removed from practices, games, and everyday school activities left many feeling lonely, left out, and unsure of their place within their team and peer groups. This isolation was not only physical but also emotional, as several girls avoided discussing their injury or avoided sharing their feelings with others.

For many, the shift in team dynamics was one of the most painful aspects of recovery. Jade described how her relationships changed once she was no longer playing at her usual level: “I feel like the dynamics and friendships on the team shifted because I wasn’t playing the same way.” She noticed that “the couple of girls that would play really hard, they became closer and I kind of got a little bit left behind,” adding that her concussion “impacted my relationships with the other girls.” These changes left her feeling “left out, which made me feel kind of isolated, lonely and sad.” Maya experienced similar feelings of exclusion, explaining, “I felt lonely and left out of my team because I had to sit out on a tournament.” Taylor also described moments of social separation at school, sharing, “I felt left out at school sometimes because I would have to sit on the side in gym class.” Watching teammates continue without them intensified these feelings. Taylor recalled, “It was hard seeing my friends on the ice, I just wanted to be out there,” while Olivia shared, “I had some feelings of sadness. Obviously, I wish I were out there, but it was better than just not being there at all.” Some girls also felt disconnected from their teams in more subtle ways. Amber described feeling “a bit isolated and

left out of my team because it was the start of our season, and we were all still getting used to each other.” She explained that in softball, “chemistry is really important, the way you communicate and interact on the field matters a lot,” and missing early games meant that “when I came back, I didn’t feel like I clicked as much during games.” Although her off-field friendships remained strong, she still felt stressed about “messing up that on-field chemistry.”

Emotional withdrawal further deepened this sense of isolation. Several girls chose not to talk about their feelings, either because they did not want to burden others or because they struggled to articulate what they were experiencing. Maya shared, “I did not talk to anyone about my feelings during my recovery. I didn’t want anyone to feel bad for me.” Kate echoed this, saying, “I didn’t talk to my friends about my concussion because it made me disappointed.” Ella described a similar pattern: “I did not talk to anybody about what I was going through, maybe because of a mix of not knowing what I was feeling and not wanting to talk to people about it.” Kate also avoided telling teammates what happened because “I didn’t want to make the girl who hit me feel bad.”

### *Summary*

Concussion recovery intensified girls’ negative emotions in ways that often felt overwhelming, with frustration, sadness, irritability, and fear emerging as interconnected responses to uncertainty and a sudden loss of control. These feelings surfaced when progress was slow or when they watched their teammates continue without them. Recovery left many feeling unable to meet their own expectations and contribute to their teams. Physical separation and shifting group dynamics deepened this strain, creating a layered sense of isolation that many described as one of the most difficult parts of the experience.

## **4.4. Theme 3: Disrupted Sport Identity and the Experience of Loss**

Theme 3 captures how concussion recovery disrupted the foundations of participants’ athletic identities and the sense of stability they derived from sport. Across interviews, girls described concussion as creating a sudden disruption in the routines, roles, and relationships that shaped who they were as athletes. This disruption was experienced not only as the loss of physical participation but also as the loss of structure, belonging, and confidence that sport typically provided. Participants spoke about missing the daily rhythms of practices and games and struggling with the emotional weight of being unable to engage in something that had long been central to their lives. Their accounts reveal how concussion recovery involved a profound sense of loss that extended beyond sport itself, challenging their identity, their connection to others, and their understanding of themselves as athletes.

### *Subtheme 1: Loss of Routine and Opportunity*

Participants described concussion as creating a sudden rupture in the routines and opportunities that sport provided. For many, the injury arrived at key moments of momentum or anticipation, amplifying feelings of disappointment and loss. Kate captured this vividly when she recalled being told she would need to take several weeks off: “I was disappointed when I was told I would have to take 2–3 weeks off sports. I love playing sports. Especially since it was near playoffs, I’d worked so hard to get there, and it just kind of got all thrown away.” Her experience reflected a broader sense among athletes that concussion derailed not only their participation, but the goals and milestones they had been working toward.

Across interviews, sport was described as a central part of everyday life, something routine, structured, and deeply meaningful. Taylor explained that “Sports are a routine that I’ve always had. Come home, go to hockey, and then softball or volleyball or whatever I had going on that night.” Losing this rhythm left her feeling disoriented: “Not being able to do that and having so much free time felt weird.”

For athletes whose identities were deeply tied to their sport, the loss of opportunity was especially painful. Taylor, who attended a hockey academy, described the shock of being told she could not participate: “I was really upset when the doctor told me I had a concussion and couldn’t play hockey or any of my sports. It was very upsetting because I didn’t know what to do.” The shift from daily on-ice training to passive observation was jarring: “I’m so used to always going to hockey. Instead of skating, I had to just watch them practice. It was really tough standing there and seeing all my friends go out on the ice without me.” She later added that “The hardest part about my recovery was seeing all my friends getting better at hockey and being with each other on the ice and having fun. I was just on the side with a headache and not feeling well.”

Other participants echoed the emotional difficulty of watching teammates continue without them. Ella described the frustration of missing games and the emotional toll of spectating: “I missed a lot of games... I also got sad and sometimes mad when I was watching. It was hard watching people play, knowing I could be out there and maybe helping.” Amber similarly shared that “Watching the games but not being able to play was sad. It was a new team, and I was missing the first few games. I just wanted to play.”

For some, the disruption extended beyond sport itself, affecting social routines and a broader sense of normalcy. Olivia described needing to “Put [her] whole life on hold,” explaining: “I couldn’t do everything anymore, and I lost the routine I was used to, like going to volleyball and hanging out with my friends.” She emphasized how disorienting it felt to lose the everyday

patterns that grounded her: “It felt like I lost that whole sense of routine, where I would normally go to volleyball and see my friends, and suddenly I wasn’t doing any of that.” Amber echoed this sentiment, noting that “The hardest part was not being able to play the sport I play every day. It’s part of my routine, and I love it so much. It was hard not being allowed to play.”

### *Subtheme 2: Threats to core identity*

For many participants, sport was not simply an activity they enjoyed but a defining part of who they were. Their identities, routines, and sense of self were deeply intertwined with being an athlete. As Taylor put it plainly, “Sports are just a giant part of who I am.” Maya echoed this sentiment, describing the centrality of sport in her life: “My whole life is sport.” Because sport held such personal significance, being unable to participate during concussion recovery felt like a direct threat to their core identity.

For some athletes, the threat to identity extended beyond the immediate loss of participation and into their return to sport. Jade described feeling diminished when she returned the following season: “When I went back the year after, I just felt that I wasn’t that good anymore, which made me sad and kind of mad.” She also noted that “knowing that I wasn’t playing center, I felt like not good enough,” highlighting how changes in role or performance could further destabilize their sense of self as athletes.

The emotional weight of being unable to engage in sport was also evident in participants’ descriptions of missing the physical experience of play. Ella explained, “I was annoyed because I love being on the ice and playing in general, so I thought it was stupid that I couldn’t go on the ice.” Amber similarly emphasized how central sport was to her identity and daily life, stating, “I can’t imagine not playing sports or not having sport in my life at all. I really love it, and I love being active.” These accounts suggest that girls who identified strongly with sport and athletic participation experienced difficulties when they were unable to participate. Within that context, stepping back because of a concussion carried an added sense of risk, as girls worried that reduced participation could be interpreted as confirming existing doubts about their commitment or capability.

### *Subtheme 3: Attempts to maintain a connection to sport*

Even while sidelined from active play, many athletes described making intentional efforts to stay connected to their sport and their teammates. These strategies helped them cope with the sudden loss of participation and allowed them to maintain a sense of belonging during recovery.

For several participants, simply being present at games or practices offered comfort and continuity. Kate explained that she continued attending games despite her symptoms, sharing, “I

still went to my games and just watched with sunglasses on. To kind of distract myself and still be with my team.” Taylor described a similar approach, noting, “I coped by attending practices and games. I felt like I was with my team, I felt connected with them, I was happy that I could still be with my team.”

One athlete also found ways to engage in small, modified forms of practice that allowed her to feel connected to the physical aspects of her sport. Zoe described continuing to dribble a basketball each day, even in limited amounts: “I still dribbled every day, not much because I couldn't take it. But I still did it.” For her, these moments served both practical and emotional purposes. As she explained, she did it “just to keep my basketball skills up and to do something. It was better than just staring at the wall.”

Watching from the sidelines was another meaningful way athletes stayed involved. Amber shared, “I coped by watching and staying involved. My family, especially my dad, really encouraged me to go to the games, so I often stayed the whole day and watched.” She also reflected on the expectations she felt while doing so, noting, “I felt like I was supposed to keep supporting my team when I watched, because it was kind of an expectation, even though it was tough sometimes.”

For others, reconnecting with the sport environment brought joy and a sense of normalcy. Olivia described how meaningful it was to return to the gym, even as a spectator. “Watching my team play made me really happy. I was so excited to be back in the gym for the first time. Even if I wasn't playing, being with my teammates and cheering them on felt great.” She also watched games online when she could not attend in person, explaining that she wanted “to support them in whatever way I could and to stay in the loop with what was going on.”

### *Summary*

Concussion recovery disrupted far more than girls' athletic performance, unsettling the routines, opportunities, and social environments that structured their daily lives. Sport is central to their identity, and its sudden absence left many feeling disconnected, sidelined, and unsure of how to adjust. Being unable to play was experienced not just as a temporary setback but as a challenge to their identity, competence, and place within their sport communities. At the same time, many sought to stay connected by attending games, watching from home, or participating in modified practice, efforts that helped preserve continuity during a period of interruption.

#### **4.5. Theme 4: Gendered Barriers and Unequal Recognition in Sport**

Girls described navigating concussion recovery within sport environments shaped by gendered hierarchies and unequal recognition. Across their accounts, they detailed how boys were positioned as the default standard in sport, while girls' abilities, knowledge, and legitimacy were routinely questioned or minimized. These dynamics influenced far more than their day-to-day interactions. They shaped how seriously their injuries were taken, how they were coached, and what forms of emotional expression felt acceptable or believable. Together, the girls' narratives show that concussion recovery unfolded within a broader gendered landscape that affected their sense of belonging, the support they received, and the ways they felt able to communicate pain and vulnerability.

Girls' accounts revealed that "emotional expectations" operated on two levels. Externally, they encountered expectations from coaches, peers, and broader sport culture about how girls and boys "should" express emotion. Girls described a broader gendered expectation in which they were expected to appear visibly upset or fragile to be believed and compared this to how they perceived boys as being expected to suppress their emotions to appear tough. These expectations were shaped by gendered norms in their sport environments, reinforced through teasing, coaching behaviours, and unequal treatment of injuries. Internally, girls described adopting these gendered norms themselves, feeling they needed to perform sadness or vulnerability to have their symptoms taken seriously, or comparing their own emotional responses to what they believed boys would be allowed to express. Together, these internalized and externally imposed expectations shaped how girls disclosed pain, interpreted their injuries, and navigated the emotional landscape of concussion recovery.

##### *Subtheme 1: Gendered dismissal and teasing*

Girls described longstanding gendered dynamics in sport that positioned them as less capable, setting the context for how they expected others to respond when they were injured. Participants consistently described boys minimizing their abilities, questioning their legitimacy, or using gender as a basis for teasing and comparison. Taylor explained that "Boys tease me for playing AAA hockey. They compare their AAA to girls' AAA. They think that their AAA is better," highlighting how boys positioned girls' accomplishments as inherently inferior. She also described being scrutinized more harshly: "Boys were critical of me. They would always comment whenever I did something that wasn't right or made a mistake on the ice." Zoe experienced similar dynamics, noting that "The boys always ask me to 1v1 them so they can prove that they are better than me," framing interactions as competitions meant to reinforce male superiority. Jade described how boys dismissed her sport entirely: "Boys always say that

hockey is better than ringette just because it is a girl's sport." Amber also described gendered dismissal in co-ed sport environments, sharing that "I used to play boys baseball for three years, and I found the boys to be rude. They would run in front of me when a ball was hit, or they just wouldn't talk to me as much. I think they did this because they undermined my skills." These experiences signalled to girls that they were already seen by society as less capable within the sport environment, shaping how they anticipated others might respond to their concussion or take their symptoms seriously.

These interactions extended beyond peers to adults in sport environments. Zoe described a male coach who repeatedly undermined her knowledge and skill: "He came in, and he was trying to explain shooting to me. I already knew what shooting was. He was mansplaining it so much." She added that "He knew my name, but when he was explaining shooting and other stuff, he called me Sparky." The differential treatment was clear: "He was explaining to me shooting and all these basic skills I know... but with the boys, he would just pass them the ball and let them shoot." These patterns of routine dismissal signalled to girls that their abilities were already undervalued, shaping how they anticipated others would respond if they were injured.

#### *Subtheme 2: Unequal legitimacy and support in sport*

Participants also described structural inequities in how girls' sports were valued and supported. Zoe highlighted a school tournament that excluded girls entirely: "There's this tournament at our school, but it's only for boys. They don't make one for the girls, even though there are a lot of girls' teams." She also observed stark differences in fan support: "The boys' team definitely has a lot more support. All the bleachers are filled, and everyone is always cheering so loudly. With the girls' team, there is barely anyone in the crowd. When I cheer on the bench, I am the only one cheering." Amber noticed gender inequities not only in softball, but also in her high school's hockey teams. She described persistent inequities in how boys' and girls' teams were treated:

On my high school hockey team, we have both a boys' team and a girls' team, and we're really close with them. But they always seem to get more than we do. I remember when we all got our uniforms, the boys got helmet stickers and new gloves, but we didn't get any of that. It was frustrating. At school, teachers also tend to praise the boys' team more than us, which gets annoying. And when it comes to games, people go watch the boys' games, but they don't really come to ours as much.

She also noted disparities in other sports: "This year, the boys' volleyball team got, like, their own specific backpacks for free, but the girls had to order them." These disparities shaped

how girls understood their place in sport. Zoe summarized the broader sentiment: “I think they don't really believe in girls' sports somehow.”

Participants also described how gendered assumptions shaped the seriousness with which girls' injuries were treated. Amber reflected on how coaches' perceptions differed across genders, explaining, “I think my coaches took my concussion more seriously than a boys' coach would, because they view girls as more fragile and boys as tougher.” She also described how boys faced a different kind of pressure: “I think guys are pressured to get out there faster because people think, ‘I'm a guy, I'm masculine, I'm tough, I need to get out there.’ They don't want to be seen as weak, especially when it's not a visible injury.”

Kate offered a more hopeful perspective, noting that “I think girls' sports have grown over the years, so girl athletes are getting more respect,” but this recognition was described as emerging rather than established. Maya connected these inequities directly to injury recognition, explaining, “I feel like being a girl in sport is kind of hard because people always say that boys are always better at everything and that girls aren't as good. That's why I think boys are treated differently in hockey when they get injured, because I feel like people take their injuries more seriously than girls' injuries.” Her account highlights how gendered assumptions shape not only performance expectations but also the seriousness with which girls' health concerns are treated.

### *Subtheme 3: Gendered emotional expectations*

Participants also described gendered norms around emotional expression and injury disclosure. Maya explained that she felt pressure to express sadness to be believed: “I felt like I kind of had to be sad. I thought that if I was sad, people could tell I was hurting, but if I acted completely fine, they wouldn't know I was not feeling well.” Her account reflects a gendered expectation that girls must visibly demonstrate distress to have their injuries taken seriously and highlights the unique challenges of concussions being an invisible injury compared to, for example, a fractured limb requiring a cast.

Amber similarly described how gender shaped the seriousness with which concussions were treated. She explained, “I think my coaches took my concussion more seriously than I think a boys' coach would. I have guy friends who play sports, and when they get concussed, they're usually told, ‘You're fine, keep playing.’ For us, it was taken much more seriously, which was really nice. I don't think anyone would want to be told to just keep playing when they're not actually okay.” She expanded on this, noting, “I think my coaches took my concussion more seriously than a boys' coach would, because they tend to see girls as more fragile and boys as tougher. But I think everyone should take concussions just as seriously, no matter who it is.”

Participants also reflected on how gender norms shaped boys' emotional expression and their responses to injury. Kate noted, "I don't think guys would talk about concussions the same way girls do. I don't think they would talk about their feelings with each other." Amber echoed this, describing how masculinity shaped boys' return-to-play decisions: "I think boys don't like being seen as weak, especially when the injury isn't visible. Because you can't see a concussion, I think they feel like it's not a big deal, or that other people won't think it's a big deal."

### *Summary*

Girls' accounts showed that concussion recovery unfolded within sport environments where gendered assumptions and unequal recognition were routine. They described being dismissed, teased, or undermined by boys and sometimes by male adults, which positioned them as less knowledgeable, less skilled, and less legitimate athletes. These same norms shaped how seriously their injuries were taken, the resources and support they received, and the emotional expectations placed on them, including their perceptions of boys being expected to hide pain. Together, these experiences reveal that concussion recovery occurred within a broader culture that consistently undervalued girls' sports and influenced the legitimacy and support they felt as young athletes.

## **4.6. Theme 5: Internal Struggle of Recovery**

Participants described concussion recovery as an intensely internal process marked by fear, self-doubt, pressure, and emotional conflict. Even when physical symptoms improved, many continued to grapple with the psychological weight of returning to sport. This internal struggle often involved competing desires: wanting to protect themselves while also wanting to return as quickly as possible, wanting to feel confident while also fearing reinjury, and wanting to reclaim their athletic identity while feeling unsure if they still could. These tensions shaped how athletes navigated their recovery and influenced their decisions and sense of readiness regarding returning to sport.

Maya described this conflict clearly when she reflected on returning too soon: "I feel like I kind of rushed myself into it because it was playoffs and I didn't want to miss playoffs. I kind of knew I shouldn't be playing, but I still wanted to try it. I regretted it because I think it made things worse." Her experience illustrates how internal pressures lead her to push herself before she felt ready.

### *Subtheme 1: Confidence loss and the struggle to return to sport*

A central aspect of this internal struggle involved a profound loss of confidence and fear about returning to play. Many athletes described feeling fundamentally changed by their concussion, unsure of their abilities, and anxious about reinjury. Jade articulated this clearly, stating, "I felt like I lost all my confidence." She described feeling jealous and frustrated as teammates stepped into roles she could no longer fill: "I was mad at the situation. I got jealous, because other girls started to rise into that role that I couldn't fill anymore." Watching others improve while she remained sidelined intensified this sense of falling behind: "That was hard... to see other girls get a lot better, and you weren't getting better." For Jade, rebuilding confidence required distance from old expectations. She explained, "I felt like I needed to be on the ice with a new set of people, so no one had any expectations of how I play to help build my confidence." Even then, the emotional toll persisted: "The hardest part about my concussion was trying to get my confidence back and the anxiety that came with that." Other athletes echoed this struggle. Zoe described a similar tension between longing to return and fearing she would not be the same player: "My confidence also went down from being away from basketball for so long. It was worse when I got back. I wanted to go back so badly, but I knew I wouldn't have the confidence to come back the way I want to. So, I was dreading it and looking forward to it." Maya also felt behind when she returned: "When I came back to hockey, I felt like I was super behind, because everyone's been practicing for a few weeks and I haven't been."

Fear of reinjury was a major contributor to this loss of confidence. Jade described being "scared about playing and getting hurt" and worrying about how long recovery would take. This fear shaped her behaviour on the ice: "I was scared to get hurt again; I was skating away from the ring instead of towards it." She added, "I was really nervous to go into the boards. It still makes me nervous, but not as much." Zoe also recalled moments of fear resurfacing unexpectedly: "I remember one of the first practices back from my concussion, a ball gently hit the back of my head, and I just fell apart, because I was scared that it happened again."

Many participants emphasized that internal, self-imposed pressure was a significant influence on their return-to-sport decisions. Zoe described wanting to return "so badly," explaining, "I put a lot of pressure on myself to go back sooner because I wanted to play. When I play, I am so happy." She later reflected, "It was mostly pressure from myself. I wanted to be back so badly after being away for so long." Maya similarly shared, "I put pressure on myself to return to hockey quickly because I really wanted to go back and play," adding, "I feel like I kind of rushed myself into it because it was playoffs and I didn't want to miss playoffs." Jade stated that she also felt pressure to push through lingering symptoms, explaining, "I felt like I had to

tough it out, especially with my physical symptoms, like my eye symptoms. I tried to push those aside so I could keep going.”

Some athletes pushed themselves despite symptoms or uncertainty. Maya shared, “I went to one of the games when I shouldn’t have, and I played two periods. My mom took me out for the third, she could tell I wasn’t doing well.” Ella described putting pressure on herself “to be tough and to get better quickly,” which made her want to return sooner. Others took the opposite approach, resisting the urge to return prematurely. Zoe explained, “I wanted to go back so badly, but I wasn’t going to. I wanted to wait until I got cleared because I didn’t want it to happen again. I didn’t want to be out for any longer.” Even after returning, she noticed how her recent concussion shaped her split-second decisions: “I do make things, like, decisions where I wouldn’t have done that if I didn’t get concussed. Like, instead of going immediately for the rebound, I hesitate because that’s where it happened.”

#### *Subtheme 2: Being understood through shared experience reduced struggles*

Across interviews, participants described how connecting with someone who had personally experienced a concussion eased the emotional and practical challenges of recovery. Having access to people who “knew how it felt” offered validation, reassurance, and guidance that participants often could not find elsewhere. These shared experiences helped athletes feel less alone and more confident navigating an unfamiliar and often confusing recovery process.

For many, this support came from family members who had previously sustained concussions. Jade explained that her cousin became an important source of comfort: “My cousin has had a concussion before. I talked to her about it because she got hers right before I got mine. She was a good support system for me; she knew how I felt.” Zoe described a similar experience with her father, noting, “My family was really supportive, especially my dad. He’s had concussions before, so he understood what I was going through and took it seriously.” Amber also emphasized the value of this familiarity, sharing, “My dad had concussions when he was a kid, so it was nice that he knew the symptoms and understood what was going on.”

Peers with lived experience played an equally important role. Kate explained that having a friend who was also recovering made the process feel less isolating: “My friend also had a concussion, so we kind of just dealt with it together. It was nice to have someone who understood what I was going through.” Olivia described how meaningful it was to have a friend who could relate to the sensory challenges of recovery: “One of my friends had a concussion before. It was really great having someone who had gone through it before, especially since a lot of the stuff I was going through, she could relate to. We would eat lunch in the hallway

because the cafeteria was too loud. Our principal even started calling it our little concussion corner. It helped so much to have someone who understood.”

For some families, connecting with others who had navigated concussion provided essential guidance. Olivia described how her parents relied on another family’s experience to make sense of her symptoms and recovery needs: “My parents turned to my friend’s parents for support because she had a concussion too. They didn’t really know how to approach it on their own, and it’s not something you can easily find clear information about online. Her parents helped us a lot; they told us what had worked for her, and she would message me saying, ‘If you’re feeling these symptoms, this is what worked for me, but it might be different for you.’” She reflected on how significant this support was:

I feel like we were lucky because our friend group had already been through it, so they kind of knew what to expect. I feel like without this person for my parents to reach out to, they would have expected me to return to sport sooner.

The importance of lived experience became even more apparent when contrasted with situations where families lacked it. Jade noted that her parents’ unfamiliarity with concussion made the early stages of recovery feel uncertain: “My family had no experience with a concussion, so there was a lack of information. This felt unique and like uncharted territory for my parents and me.” Her reflection highlighted why having someone who had “been there before” could make such a meaningful difference.

### *Summary*

Concussion recovery extended well beyond physical healing, challenging girls’ confidence, sense of safety, and trust in their bodies. Returning to sport meant managing fear, pressure, and self-doubt, making the internal work of recovery one of its most enduring elements. At the same time, shared experience offered an important source of support, as family, friends, and other parents helped them feel understood and less alone while navigating the uncertainty of healing.

## CHAPTER V: DISCUSSION

Eight interviews were conducted among adolescent girl athletes, and analysis of their accounts generated five interconnected themes: (1) balancing support with external pressures, (2) psychological weight of recovery, (3) disrupted sport identity and the experience of loss, (4) gender barriers and unequal recognition in sport, and (5) internal struggle of recovery. Consistent with a constructivist approach, these findings were interpreted as participants' subjective understandings of their concussion experiences, which are shaped by their social contexts and interactions (71). The findings were further interpreted through a feminist lens, specifically socialist feminist theory, which highlights how gendered expectations, power relations, and the economic conditions of girls' sport shape their experiences of injury and recovery (69,70).

### 5.1. Broader Sport Culture Through a Feminist Lens

Broader sport culture continues to normalize pain and risk in ways that shape how both boys and girls experience and interpret concussion. Through ongoing social interactions and cultural expectations, this culture contributes to the social construction of gender norms, reinforcing appearance-focused sporting environments in which pain-masking is normalized. Hardwicke et al. (2024) argue that although gender-equity efforts have reduced exclusion and discrimination, celebrating women's entry into sports where their "bodies and brains are often broken down, damaged and sometimes destroyed" cannot be understood as genuine progress. The authors highlight that women are now increasingly embedded in the same "culture of risk" historically documented among men, adopting performance-oriented norms that normalize pain, sacrifice, and playing through injury (109). A separate study demonstrates that journalists rarely frame women's concussion risks as newsworthy. This lack of framing contributes to the broader devaluation of sportswomen and reinforces a media landscape that continues to privilege men's sports and men's health concerns (110). By its very absence, the lack of reporting on women's sport renders the assumption and false view that women's sport is not dangerous or physical. While we can argue that sport should never be dangerous and physically harmful, this combination of gender stereotypes and silence on women's sport results in actual physical harm, as well as cultural and social ceilings (women's sport is seen as gentle and feminine). These broader cultural dynamics form the backdrop against which girls interpret their concussions, shaping how their injuries are recognized, valued, and responded to.

## **5.2. Social Expectations and Concussion Perception**

My findings demonstrate that adolescent girls made sense of their concussions through gendered norms, which too often result in a familiar silence on addressing concussions in girls' sport, where expectations about how they should feel, behave, and return to sport directly influenced their perceptions and responses. Participants described navigating concussion within a gendered emotional environment in which their symptoms were often doubted or minimized because concussion is an invisible injury. This invisibility heightened their awareness of how others interpreted their behaviour, prompting them to strategically manage their emotional expression to have their concussion treated seriously. Participant experiences were further shaped by gendered emotional norms, team cultures and social expectations.

A deeper interpretation of my findings suggests that invisibility reveals how meanings of concussion are socially negotiated through existing gender hierarchies. When symptoms cannot be visually confirmed, the interpretation of injury becomes shaped by social assumptions about whose accounts are reliable and whose bodies are treated as legitimate sites of concern. Expectations that girls must regulate their emotions to be taken seriously reveal a cultural logic that treats certain emotional displays as signs of instability. These expectations position girls as bodies that require monitoring and correction, which reinforces a hierarchy in which some expressions of pain are treated as valid and others as excessive or untrustworthy. Sport environments also carry emotional norms that reward stoicism and uninterrupted performance (111). These norms reflect a masculinized ideal of the athlete that shapes how concussions are recognized and acted upon. When girls must align themselves with these norms to receive appropriate care, concussion becomes entangled with the maintenance of sporting hierarchies that privilege certain bodies and behaviours.

Studies show that girls often feel they must minimize symptoms to appear tough (112), worry that showing distress will be seen as overreacting (113), and stay involved in practices or team events to maintain belonging and avoid disappointing teammates (114). My findings both support and complicate this work. While some girls did minimize symptoms, others described exaggerating emotional aspects of their symptoms to be believed. This contradictory pattern (downplaying some symptoms while amplifying others) reflects the conflicting emotional expectations placed on girls in sport. Socialist feminist theory helps explain this tension by situating girls' experiences within broader structural patterns in which their injuries are taken less seriously, particularly because concussion signs are invisible and easily questioned (115). Girls are not simply expected to "be emotional," but to express emotion in ways that align with socially acceptable femininity: controlled, non-disruptive, and careful not to appear dramatic

(116). Some of my participants reported feeling pressure to act tough and appear resilient. These expectations of resilience also operated as gendered regulatory forces, positioning girls to appear tough enough to stay involved but not so tough that they seemed unfeminine or indifferent to team needs (117). Girls' knowledge of their own bodies is filtered through assumptions about emotional credibility and dependability (118). My findings show that these assumptions were reinforced in their sport environments, where one participant described being believed only when she appeared visibly upset or fragile and contrasted this with their perception that boys were expected to suppress emotion to appear tough. This process reveals how concussion assessment can be shaped by social expectations rather than solely by the injury itself.

Overall, gender norms operate as quiet forms of social control. They shape what kinds of distress are taken seriously, what kinds of toughness are rewarded and what kinds of behaviour are seen as disruptive. Girls are positioned within a narrow emotional corridor (119) where they must demonstrate enough composure to be credible and enough vulnerability to remain aligned with expectations of femininity. This corridor limits the range of acceptable responses to injury and reinforces the idea that girls must manage the comfort of others even while they are hurt. Girls' accounts showed that they navigated this corridor by actively adjusting how they expressed their symptoms, often softening or amplifying their emotions to match what they believed would be seen as appropriate. One participant noted that she felt she needed to appear sad in order for others to believe she was hurt, while others described downplaying their distress in an effort to "tough it out." These findings show that girls' concussion perceptions and responses were shaped by gendered social expectations that constrained how they could express emotion, demonstrate resilience, and participate in sport during recovery.

### **5.3. Emotional Challenges and Return-to-Sport Decisions**

Across the dataset, girls described concussion recovery as marked by recurring anxiety, isolation, and frustration that disrupted their confidence, sense of belonging, and expectations for progress. These emotional challenges shaped how they navigated decisions about returning to sport, often pushing them to hide symptoms or rush their return (or contemplate rushing their return). Existing literature similarly shows that post-concussive symptoms impede daily life, evoke frustration, and disrupt school and social interactions (120). Reduced sport participation can heighten distress by limiting socialization, increasing worry about the future, and disrupting identity formation (120). My findings support this work, as the girls described frustration throughout their recoveries and sadness linked to reduced social interactions with friends,

peers, and teammates. My results also extend this literature by showing how emotional challenges were shaped by the social dynamics of their teams. Girls described feeling responsible for proving their symptoms and managing others' reactions, which aligns with research showing that girls often navigate unequal power relations in youth sport (44). The participants in this study described expectations of resilience that pushed them to hide symptoms, rush return, or stay at practices despite discomfort. They felt they had to appear resilient and push through symptoms. However, a study that examined adolescent resilience in sport found that male adolescent athletes were more resilient than female athletes (121), which contrasts with my results, where girls described performing resilience because of pressure to keep playing and not let others down. A feminist interpretation helps clarify this tension by showing how these emotional pressures are not simply interpersonal but structural. The expectation that girls should manage their own symptoms while also managing the emotional climate of the team reflects a broader pattern in which girls are positioned as caretakers within sport environments. This positioning requires them to prioritize team cohesion, the comfort of coaches, and the needs of teammates over their own safety. This caretaker role is not incidental. It reflects gendered norms that frame girls as responsible for maintaining harmony and preventing disruption (122,123). In the context of concussion, this means girls often absorb the burden of smoothing over tension, minimizing the impact of their injury on others, and ensuring that team routines continue uninterrupted. These expectations shaped the meanings girls attached to their symptoms, influencing how they understood the seriousness of their injury and negotiated decisions about when and how to return to sport. Socialist feminist theory helps clarify these findings by showing how expectations around emotional expression, cooperation, and composure influence how girls interpret isolation, seek support, and manage their recovery in sport settings. Feminist theory also draws attention to how these norms protect existing power structures in sport. When girls are expected to remain composed, cooperative, and non-disruptive, they are positioned to prioritize team needs over their own well-being. This positioning limits their ability to advocate for themselves and reinforces the idea that their primary responsibility is to maintain harmony rather than to recover fully.

#### **5.4. Gendered Norms, Mental Health, and Coping Strategies**

My results reveal that girls actively constructed understandings of their concussion experiences within gendered contexts, shaping how they interpreted symptoms, anticipated disbelief, and managed their emotional expression during recovery. Participants described minimizing symptoms to avoid ridicule, softening emotional responses to appear composed, and

monitoring their behaviour to align with expectations of how they should act. These pressures heightened self-doubt, fear of judgment, and uncertainty about whether their symptoms would be taken seriously. A deeper interpretation suggests that these pressures reflect how girls learn to navigate concussion within systems that privilege certain ways of expressing pain and distress. When girls anticipate that their symptoms may be questioned, they begin to evaluate their own experiences through the same skeptical lens, which shapes how they understand what counts as a legitimate injury. Girls must continually assess how their symptoms will be interpreted by others, which creates an added layer of cognitive and emotional work. This work is not required of all athletes equally. It reflects gendered expectations that shape who is expected to justify their pain and who is assumed to be credible without explanation. Existing literature similarly shows that girls may feel pressure to demonstrate vulnerability to have their injuries recognized (115). That maladaptive coping is more pronounced in student athletes with sport-related concussion (124). My findings both support and refute this work. One participant described exaggerating sadness to be believed, which aligns with research on the need to perform vulnerability (115), while others minimized symptoms and attempted to push through them to appear less vulnerable, contradicting assumptions that girls consistently express more emotion. When girls feel pressure to appear composed or to avoid seeming dramatic, they may reinterpret their own distress as a personal failing rather than a predictable and healthy response to injury. This internalization of 'normal pain' can intensify anxiety and uncertainty because girls are left questioning whether their symptoms reflect concussion or reflect their own perceived inadequacy. Girls described feeling that their injuries mattered less because boys were treated as more valued athletes, and that they needed to perform emotion in ways that aligned with socially acceptable femininity to be believed. This sense of being less valued shaped how girls understood their own vulnerability. When sport environments signal that boys' participation is valued more, girls learn that their injuries create inconvenience rather than concern. This message influences how they interpret pain, how they seek support and how they decide whether to disclose symptoms.

Socialist feminist theory situates these findings within broader gendered power structures that shape girls' experiences in sport. A feminist lens highlights how girls' concussion experiences are shaped by norms that regulate emotional expression, credibility and belonging, and by structural hierarchies that position boys as the default athletes whose injuries are taken more seriously. These norms operate both externally, through the responses girls receive, and internally, through the ways girls learn to monitor, question, and discipline their own emotional expression. Socialist feminist theory makes visible how these gendered expectations shape the

meaning of injury, the legitimacy of distress and the boundaries of acceptable behaviour during recovery.

### **5.5. Economic Structures Shaping Girls' Concussion Experiences**

Girls' concussion experiences unfolded within sport environments shaped by gendered hierarchies and unequal recognition. Across their accounts, girls described navigating systems where boys were positioned as the default athletes and where girls' abilities, knowledge and legitimacy were routinely questioned or minimized. These dynamics were not only interpersonal. They were embedded in the economic and institutional structures that organize youth sport. Participants consistently described material disparities that signalled their lower value within the sport system. Girls noted that boys' teams received more resources, better equipment, greater institutional investment and more visible support from schools and communities. These inequities were not isolated incidents; they reflected a broader pattern in which boys' sport was treated as the primary site of athletic development and girls' sport as secondary. Research shows that financial investments in sport disproportionately favour boys' and men's programs. At the collegiate level, the NCAA's gender-equity audit illustrates this imbalance clearly. In 2018–19, spending per Division I and national championship participant (excluding basketball) was approximately \$1,700 higher for men than for women. The NCAA invested \$4,285 per men's participant compared to \$2,588 per women's participant (125). The gap widens further in the six single-gender sports such as wrestling and beach volleyball, where men's championships received \$2,229 more per athlete than women's (125). Similar patterns appear at the high school level. One report from a U.S. school showed that between July 1, 2013, and March 30, 2014, girls' sports received \$17,933.67 USD in funding, while boys' teams received \$46,815.93 USD (126).

These economic disparities shaped how girls understood their place in sport and how they anticipated others would respond when they were injured. When girls saw fuller bleachers at boys' games and more financial investment in boys' programs, they learned that their well-being was less central to the sport system. This influenced how they interpreted their own symptoms and how seriously they believed their injuries would be taken. Girls described receiving less recognition, fewer opportunities and limited institutional support, which shaped how they communicated pain and how much support they expected to receive. The emotional and cognitive labour girls expended navigating inequity, sexism, and male-designed sport environments mirrors feminist analyses of gendered labour and structural power (127). Coping

strategies such as minimizing symptoms, avoiding conflict, or selectively expressing emotion can therefore be understood as adaptive responses to structural pressures.

A socialist feminist lens clarifies that these dynamics are not simply interpersonal biases or isolated coaching decisions. They are rooted in the economic and institutional organization of youth sport. Funding decisions, facility access, staffing patterns, and resource allocation reproduce the undervaluing of girls' athletic participation. These structural inequalities shape who receives timely care, whose symptoms are taken seriously, and whose recovery is supported. Girls' understandings of their value, legitimacy, and experiences of injury were actively constructed through their interpretations of these gendered sport environments and the messages they received about whose participation and well-being were prioritized. Girls' accounts of unequal legitimacy and support illustrate how concussion recovery is shaped by these broader systems of investment and neglect. Together, these findings demonstrate that girls' concussion recovery is shaped by gendered power structures and reveal how dismissal, emotional expectations, and coping strategies become embedded in the process of healing.

## **5.6. Contextual Influences on Recovery**

Girls' recovery was shaped by the contexts around them, with school, family, sports teams, and peers either offering grounding support or creating pressure to return quickly. Girls actively constructed understandings of their recovery through their experiences within these social contexts, interpreting messages of support, pressure, and expectations to determine what recovery meant and how they should respond to their injury. My results show that supportive coaches, friends, and parents helped ease anxiety and isolation, while performance-focused team cultures, disrupted routines, and family expectations often pushed girls to downplay symptoms. These findings highlight that recovery unfolded within a network of relationships that could either buffer or intensify stress. Existing literature similarly identifies parents, guardians, and peers as central influences on recovery, shaping how girls interpret symptoms and manage pressures to return (128,129). Misunderstandings about the "invisible" injury can heighten anxiety and complicate decisions about readiness (44). My findings support this work, as participants reported their parents, coaches and teammates being both positive and negative influences on their recovery, as some pressured them to return to sport prematurely, and some were very supportive throughout their recovery. For my participants, supportive relationships did more than reduce stress. They created spaces where girls felt permitted to acknowledge pain, uncertainty, and emotional fluctuation without fear of judgment, and allowed girls to express vulnerability without having to perform or justify it. For those who experienced parents, coaches

or teammates as negative influences, these contextual pressures shaped how girls interpreted the legitimacy of their needs. When teammates expressed frustration about their absence, this made the girls question whether rest was justified. These moments reveal how easily girls' needs were reframed as optional or inconvenient, which made it harder for them to trust their own symptoms. Socialist feminist theory helps illuminate how these doubts emerge from social norms that position girls as dependable, self-managing and responsible for maintaining continuity in their roles. Within this framework, girls learn that their value is tied to meeting expectations rather than attending to their own well-being, which makes recovery feel like a disruption they must minimize rather than a health need they are entitled to. Recovery became a negotiation between what their bodies required and what their environments implicitly demanded. In team environments, masculine norms around resilience and performance intensified pressure to return, even when girls felt unready. These contextual dynamics shaped not only the support girls received but also the constrained set of responses available to them during recovery. Overall, these findings illustrate how contextual dynamics across school, family, teams, and peers simultaneously offered support and produced pressure, shaping girls' recovery experiences and return-to-sport decisions.

## **5.7. Methodological Rigour**

As previously mentioned, this study adhered to Tracy's (2010) eight "big-tent" criteria for excellent qualitative research, which include: (a) worthy topic, (b) rich rigour, (c) sincerity, (d) credibility, (e) resonance, (f) significant contribution, (g) ethics, and (h) meaningful coherence (73). The following section outlines how the current study meets each of these criteria.

### **5.7.1. *Worthy Topic***

Examining adolescent girls' experiences of concussion recovery addresses an area that remains underrepresented in both concussion research and youth sport literature. While concussion has received increasing attention, much of the existing research has focused on male/boy athletes and the physiological aspects of injury. Additionally, the frequent use of the terms sex and gender interchangeably in concussion literature creates challenges in interpreting findings and understanding how social factors shape recovery experiences. By focusing on the lived experiences of adolescent girls, this study addresses a clear gap in the literature and responds to the need for research that is gender-sensitive and focuses on adolescent girl athletes.

### 5.7.2. *Rich Rigour*

Rich rigour is demonstrated through the use of an interpretive phenomenological approach, which is well-suited to exploring lived experience in depth. The sample, while small, was appropriate for interpretive phenomenological inquiry and allowed for detailed, in-depth accounts of concussion recovery. Data were generated through semi-structured interviews and analyzed systematically to identify patterns, themes, and shared meanings across participants' experiences. The depth and detail of the data, along with careful engagement with participants' narratives, contribute to the overall richness of the study.

### 5.7.3. *Sincerity*

Ongoing self-reflection regarding my positionality and assumptions demonstrates sincerity. Given my background as a competitive athlete and as a woman who experienced a sport-related concussion as an adolescent, I remained attentive to my perspectives by engaging in ongoing reflexive questioning about when my lived experience offered meaningful insight into participants' accounts and when it risked shaping interpretation too strongly. Rather than treating my history in sport and concussion as a source of bias, I approached it as an interpretive resource that deepened my understanding while I continually checked that participants' meanings, not my own assumptions, guided the analytic process. For example, during interviews, I was intentional about not assuming that girls' experiences mirrored my own. When a participant described a situation that resonated with my history in sport, I asked clarifying and follow-up questions to ensure that my interpretation reflected what she meant rather than what I might have expected based on my background. This practice helped me distinguish between moments where my lived experience offered insight and moments where I needed to bracket my assumptions so that participants' voices remained central. Transparency was maintained through clear documentation of recruitment challenges, methodological decisions, and analytic processes, including the shift from online to in-person recruitment. This openness strengthens the trustworthiness of the research.

### 5.7.4. *Credibility*

Providing rich, detailed descriptions of participants' experiences and incorporating direct quotes to support analytic claims enhances credibility. Rather than simply summarizing findings, the analysis shows how themes were constructed from the data. Attention to consistency across participants' accounts, alongside recognition of variation, further supports the credibility of the findings. Credibility was also strengthened through member checking, where participants were asked whether the narrative summaries accurately reflected their experiences, ensuring that

interpretations aligned with what they intended to convey. One participant responded to the member-checking summary and confirmed that the findings accurately reflected their experience of concussion recovery. Tracy (2010) identifies triangulation and crystallization as important criteria for establishing credibility, as both practices offer ways to deepen and complicate qualitative interpretations (73). Although triangulation and crystallization were not used, incorporating them would have further strengthened the credibility of the findings (details in limitations).

#### *5.7.5. Resonance*

Resonance is fostered through the presentation of participants' experiences in a way that highlights the emotional, social, and identity-related dimensions of concussion recovery. The findings are likely to resonate with athletes, clinicians, coaches, and researchers by offering insight into aspects of recovery that are often overlooked, particularly the invisible and emotionally complex nature of concussion. By emphasizing lived experience, the study encourages empathy and a deeper understanding of adolescent concussion recovery.

#### *5.7.6. Significant contribution*

Centring adolescent girls' voices contributes to the literature by highlighting how concussion recovery is shaped by gendered expectations, social dynamics, and the invisible nature of head injury. It builds on existing research by moving beyond symptom-focused perspectives to consider identity, emotion, and social context. The findings have implications for clinical practice, particularly in supporting more holistic and gender-responsive approaches to concussion management and provide a foundation for future research in this area.

#### *5.7.7. Ethics*

Multiple dimensions of ethical practice were considered throughout the research process. Procedural ethics were addressed through institutional ethics approval, informed parental consent and assent from each participant, measures to ensure confidentiality, and the voluntary nature of participation. Situational and relational ethics were also central, particularly given the sensitive nature of discussing injury and emotional experiences with youth. A supportive interview environment was prioritized, with attention to participants' comfort levels and to representing their voices respectfully and accurately. Ethical considerations also extended to how findings are presented, with attention to avoiding harm, misrepresentation, or unintended consequences.

#### **5.7.8. *Meaningful coherence***

The integration of an interpretive phenomenological approach with a socialist feminist theoretical lens demonstrates coherence, as both centre on lived experience while attending to the social and structural conditions that shape it. The research objectives, methods, and analysis are consistently interconnected, with each element informing the others to ensure alignment between the research questions, methodological approach, analytic process, and interpretation of findings. This coherence ensures the findings provide a contextually grounded understanding of adolescent girls' concussion recovery within broader gendered structures.

### **5.8. *Strengths***

This study demonstrates several notable strengths, including its originality, its strong alignment with established criteria for methodological rigour, and the appropriateness of its qualitative methodology.

#### **5.8.1. *Original Contribution***

This study offers a distinctive contribution to the body of concussion evidence by providing the first in-depth examination of adolescent girls' concussion experiences through a socialist feminist lens. By centring girls' perspectives and analyzing how gendered expectations shaped their interpretations of injury, the study addresses a population and perspective that have been largely overlooked in existing literature.

#### **5.8.2. *Methodological Rigour***

Methodologically, the study is robust and aligns closely with Tracy's (2010) criteria for high-quality qualitative research. It demonstrates a worthy topic, addressing an urgent gap in gendered concussion research; rich rigour, through systematic coding, iterative theme development and sustained engagement with the data; and credibility, supported by thick description, participant-centred interpretation and the use of direct quotations to ground analytic claims. The study also reflects sincerity and transparency, with clear articulation of positionality and reflexive decision-making throughout the research process.

#### **5.8.3. *Sample Size***

The sample size and the interpretive nature of qualitative research may be perceived as limitations of this study. Unlike quantitative research, qualitative methodologies do not rely on statistical formulas to determine sample size. Instead, participant recruitment is guided by the depth, richness, and relevance of the data collected (130). Within an interpretive

phenomenological framework, the aim is not to achieve a large number of participants, but to generate a detailed understanding of a particular lived experience and the meanings individuals assign to that experience (131). As such, a smaller sample is both appropriate and consistent with interpretive phenomenological inquiry, which prioritizes depth over breadth. In this study, the final sample size was determined by the richness and consistency of participants' accounts, allowing for a comprehensive exploration of adolescent girls' concussion experiences. It is also important to note that interpretive phenomenological research does not seek to produce findings that are broadly generalizable in a statistical sense. Rather, interpretive phenomenology aims to translate lived experience into a textual account that captures its essence, allowing readers to both re-engage with the experience and reflect on its meaning in relation to their own lives (131).

#### **5.8.4. *Interpretive Phenomenology***

The use of interpretive phenomenology is another strength, as it enabled a detailed exploration of how girls made meaning of their injuries within gendered sport environments. Interpretive phenomenology is a branch of phenomenology focused on how individuals make sense of their lived experiences within social and relational contexts. It recognizes that researchers also bring their own histories, assumptions and embodied experiences to the interpretive process, and treats this as a resource rather than a bias to eliminate (86). This approach also allowed me, as the researcher, to draw reflexively on my own lived experience with concussion, which supported deeper and more contextually informed interpretations of participants' narratives. Interpretive phenomenology facilitated sustained engagement with girls' accounts and made it possible to identify subtle emotional, relational, and structural dynamics that may have been overlooked if a different methodology was used.

### **5.9. Limitations**

Although this study has several strengths, there are also important limitations, including areas where methodological rigour could have been strengthened, critiques of the guiding philosophical approaches, and challenges encountered during participant recruitment.

#### **5.9.1. *Triangulation and Crystallization***

As discussed above, a key limitation was the absence of broader triangulation and crystallization practices. Tracy (2010) identifies these strategies as important for deepening and complicating qualitative interpretations (73). Triangulation could have been performed by using multiple data sources, such as field notes from practices or games, short participant journals, or

observations of team interactions, which would have allowed for comparison between how girls described gendered dynamics and how these dynamics unfolded in real time. This would have provided another angle on the same phenomenon and supported the coherence of emerging themes. Involving a second qualitative researcher to independently code a subset of transcripts, followed by collaborative discussion, would have added another interpretive lens and crystallized the findings. Convergence or productive disagreement between analysts would have deepened the analysis and strengthened claims about credibility. Together, these strategies would have offered additional layers of evidence and interpretation that could further support the depth and trustworthiness of the findings.

### *5.9.2. Critiques of Constructivism*

Constructivism carries important critiques that limit its usefulness as a philosophical approach. While constructivism offers a valuable way of understanding how people actively build meaning from their experiences, it has been criticized for over-emphasizing individual interpretation in ways that can obscure the broader social, structural, and material forces shaping those experiences (71). This emphasis can make it difficult to account for patterned inequalities or power relations that extend beyond personal meaning-making.

A further critique is that constructivism can blur the distinction between describing how people understand the world and explaining the world itself (71). By centring subjective interpretation, it risks treating all perspectives as equally valid, even when some are shaped by misinformation, unequal power, or constrained social conditions. These critiques highlight the limitations of constructivism as a sole philosophical foundation and underscore why alternative paradigms may foreground different aspects of experience.

Aside from these limitations, I chose constructivism because this philosophical approach recognizes that individuals actively construct meaning through their experiences and interactions with the world. Constructivism aligns with the aims of this research by allowing attention to how adolescent girls interpret and make sense of their concussion recovery experiences within their unique social and cultural contexts. This approach acknowledges that participants' understandings of concussion are shaped by their relationships, identities, and broader social structures, providing a foundation for exploring the complex and context-dependent nature of their experiences.

### *5.9.3. Challenges with Online Recruitment*

This study initially relied on online recruitment strategies to reach the target population. Through partnerships with Sport Manitoba, recruitment materials were distributed across

multiple social media platforms and organizational networks, generating a high volume of study sign-ups. All individuals who appeared to meet eligibility criteria were contacted via email and invited to complete consent and assent procedures. However, a significant limitation emerged in the form of fraudulent or inauthentic responses. A substantial proportion of submissions could not be verified as legitimate, making it difficult to confirm participant eligibility and authenticity at the point of registration. Despite screening efforts, one individual who did not meet eligibility criteria progressed to the interview stage, further highlighting the challenges of ensuring data integrity through online recruitment alone.

The inability to confidently distinguish between legitimate and non-genuine participants introduced concerns regarding the credibility and trustworthiness of the data. This issue ultimately necessitated a shift in recruitment strategy toward exclusively in-person methods, including outreach at local sporting events and within community settings. While this approach improved confidence in participant authenticity and eligibility, it significantly extended the recruitment timeline beyond initial expectations.

This limitation underscores a broader methodological challenge in conducting online research with youth populations, particularly when an honorarium for participation is advertised. Although online platforms were initially selected to efficiently access adolescent girls, who are highly active in digital spaces, this approach also increased exposure to fraudulent or deceptive responses.

### **5.10. Implications**

The findings of this study highlight several important implications for concussion care, education and youth sport environments. First, there is a need to broaden education and awareness efforts around concussion to include not only physical symptom recognition, but also the emotional and psychological challenges that accompany recovery. Increasing awareness among key groups, including parents, athletes, coaches, clinicians, and support networks, may help foster more supportive environments and reduce pressures to return to sport prematurely, and improve recognition of the broader challenges adolescents may experience during recovery. This is particularly important given that concussion recovery may involve social disconnection, disruption to sport-related identity, emotional distress, and pressures associated with maintaining participation in sport. Recognizing these experiences within concussion education and clinical care may promote a more holistic approach to recovery that addresses adolescents' physical, psychological, and social needs.

Second, the findings also highlight the importance of consistent concussion education across youth sport environments. The National Coaching Certification Program (NCCP) concussion training is already available; however, in Manitoba, it is currently mandatory for coaches in only a limited number of sports (132–134). This lack of mandatory training may contribute to inconsistent concussion knowledge and uneven safety practices across sport environments. To ensure that athletes receive a consistent standard of care regardless of the sport in which they participate, NCCP concussion training should be mandatory for coaches and other sport personnel who are responsible for athlete safety across all youth sports. In addition, complementary concussion education should be made available to athletes and parents or caregivers so that they are equipped with consistent information about concussion recognition, recovery, and the emotional and social challenges that may accompany recovery. Greater attention should be given to the common obstacles adolescents face during recovery, including social disconnection, identity disruption, and emotional distress. A more holistic approach to concussion care that acknowledges these experiences may improve support and recovery outcomes. Providing education across these key groups could foster a shared understanding of concussion and create a more supportive network around young athletes, particularly during recovery.

Finally, this study highlights the need for more gender-sensitive approaches to concussion recognition and care. Although existing concussion education provides important information regarding recognition and management, the NCCP concussion training does not currently include a dedicated gender-focused component addressing how gendered expectations and social dynamics may shape concussion experiences and recovery. Incorporating a gender-informed module could help educators, coaches, and athletes better understand how girls may experience and respond to concussion within the context of sport. Similarly, clinician education, including resources such as the Concussion Awareness Training Tool, could incorporate a gender-sensitive perspective to support more responsive clinical care. This could include training healthcare providers to ask about internal pressures, emotional distress, mental health symptoms, social experiences, and concerns related to identity and sport participation, thereby normalizing these experiences and creating opportunities for reassurance and support. Integrating a gender-informed perspective into concussion education, clinical practice, and sport policies may improve the recognition and validation of girls' experiences and support more equitable and responsive care.

### **5.11. Future Research**

Future research should continue to build on these findings by exploring how different sport contexts shape adolescent girls' concussion experiences. Specifically, studies could examine girls who participate in traditionally boy-dominated sports, such as hockey or baseball, especially when they compete on teams with boys. These environments may introduce distinct social dynamics, pressures, and expectations that influence how concussions are experienced, reported, and managed. Additionally, comparative research examining girls in traditionally girl-dominated sports (e.g., ringette) versus those in traditionally male-dominated sports could provide valuable insight into how gendered sport environments shape recovery. Differences in team culture, perceived legitimacy, access to resources, and exposure to gendered norms may influence both the physical and emotional aspects of concussion recovery. Further research in this area would deepen understanding of how context and gender intersect in shaping injury experiences, and could inform more tailored, equitable approaches to concussion care across diverse sport settings.

Future research should also investigate parental decision-making around return-to-sport. Parents play a central role in interpreting symptoms, communicating with coaches, and making return-to-play decisions, yet little is known about how they weigh medical advice, team expectations, and their child's emotional well-being. Studies could explore how parents assess readiness, how they interpret visible and invisible symptoms, and how beliefs about toughness, resilience, or sport commitment shape their decisions. Research should also examine why some parents encourage early return, including concerns about missed opportunities and financial investment, maintaining team roles, or minimizing the seriousness of concussion. Understanding these processes would clarify the social forces surrounding recovery and support more family-centred concussion care. This could be further expanded to explore how adolescent athletes make sense of mixed parental messages during recovery. Amber's experience, in which a parent understood concussion risk yet still encouraged early return for scouting opportunities, illustrates a complex tension that warrants deeper exploration. Future work could investigate how young athletes interpret these contradictions and how they reconcile recovery with pressure. Building on this, research should also explore how gender politics within families shape parental involvement. One question worth pursuing is whether some fathers may simultaneously support and push their daughters because they see themselves as advocates for girls in sport. This possibility raises important questions about how fathers navigate gendered sport structures, how they understand their role in promoting girls' athletic opportunities, and whether these intentions unintentionally contribute to pressure around

concussion recovery. Investigating these dynamics could illuminate how gender politics within families intersect with concussion management.

Research should also explore how girls understand concussion in relation to identity and cognitive performance. Participants described fear of losing their athletic identity, but future studies could examine whether girls also worry about long-term cognitive changes, academic impacts, or threats to their sense of self beyond sport. This work could clarify how gendered expectations around emotional regulation, achievement, and resilience shape girls' interpretations of brain injury.

## **CHAPTER VI: CONCLUSION**

This qualitative, interpretive phenomenological study demonstrated that adolescent girls experience concussion recovery as a socially and emotionally complex process shaped by gendered expectations, disrupted athletic identity, and the invisible nature of head injury. Their accounts showed that recovery extended far beyond symptom resolution, involving frustration, fear, isolation, and pressure to return to sport, while also revealing how supportive relationships buffered these challenges. Girls navigated concussion within sport environments where their injuries were often minimized, their legitimacy questioned, and their emotional expression shaped by gendered norms, underscoring how broader sociocultural forces influence how they interpret, disclose, and cope with their symptoms. These findings highlight the need for concussion care that recognizes the emotional, social, and identity-based dimensions of recovery and attends to the gendered contexts in which adolescent girls participate in sport. By centring girls' voices, this study contributes contextual knowledge on the sport environments that girl athletes have to navigate during their concussion recovery.

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## APPENDICES

### Appendix A: Literature Review Search Strategy

Using the keywords from the headings of each section, along with filtering, PubMed was used to find publications on each component of the research project. The search was performed in February 2025. The specific search terms for each subject and number of results are displayed in Table S1. Due to the large number of papers found in the search process, article titles were screened for relevance and appearance of numerous keywords. Articles outside the adolescent population were included in this review as some of the relevant topics, such as gender norms and behaviours, are not commonly researched among youth populations.

**Table S1.** Literature review search terms and results

| Search term                                                       | Results |
|-------------------------------------------------------------------|---------|
| Concussion AND “mental health” AND youth                          | 282     |
| Concussion AND “mental health” AND pediatric*                     | 148     |
| “Brain injury” AND “mental health outcome”                        | 76      |
| Concussion AND “mental health” (then filtered for age 0-18 years) | 243     |
| Concussion AND youth AND qualitative                              | 114     |
| Adolescent AND "mental health" AND concussion                     | 232     |
| Concussion AND “gender norms”                                     | 2       |
| Concussion AND girl                                               | 814     |
| Gender AND aggression AND sport*                                  | 295     |
| Concussion AND cheerlead*                                         | 46      |
| Concussion AND “figure skat**”                                    | 2       |
| Concussion AND gymnastic*                                         | 47      |
| Concussion AND ringette                                           | 8       |

## Appendix B: Demographic Questionnaire

Age: \_\_\_\_\_ years old

Pseudonym: \_\_\_\_\_

What pronouns do you use?

- ☐ She/her
- ☐ He/him
- ☐ They/them
- ☐ Other (please specify): \_\_\_\_\_
- ☐ Prefer not to answer

What sex were you assigned at birth?

- ☐ Female
- ☐ Male
- ☐ Intersex
- ☐ Please specify: \_\_\_\_\_
- ☐ Prefer not to answer

Where do you currently live?

- ☐ Winnipeg
- ☐ Other (please specify): \_\_\_\_\_

What sport(s) were you playing at the time of your concussion?

Have you experienced any previous concussions or other head injuries before this one?

- ☐ Yes
- ☐ No

If yes, please describe briefly: \_\_\_\_\_

How old were you when you got your concussion?

Do you have any pre-existing mental health conditions?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

## Appendix C: Recruitment Flyer

This flyer was shared with interested participants during in-person tabling sessions. Local sport organizations were also asked to distribute it to their members. Additionally, the flyer was posted in community centres across Winnipeg, Manitoba, and the surrounding area.

# Participants Needed

For a study exploring youth concussion experiences



**Title:** Adolescent Girls' Experiences of Mental Health and Recovery Following Sports-related Concussions.

**Description:** This study is part of a Master's thesis. It explores how teenage girls experience sport-related concussions, with a focus on mental health and returning to play. By speaking with teens who've had a concussion, the study aims to understand how gender norms and social pressures shape recovery.

### WHO?

- Adolescent girls aged 12–17
- Living in Winnipeg, Manitoba or the surrounding area
- Recovered from a sport-related concussion within the past 24 months
- Must be fully recovered (discharged from physician or nurse practitioner care)
- First diagnosed concussion only

### SCREENING

- Demographic information will be collected before the interview to confirm participant eligibility
- Collected through a structured questionnaire via Google forms

### WHAT TO EXPECT

- One-on-one 45-minute interview about your concussion experience
- You'll be asked about your feelings and experiences after your concussion
- Topics include daily life, mental health, returning to school or sports, and managing recovery
- You can skip any questions you're uncomfortable with
- You can take a break or stop the interview at any time
- Parking costs will be reimbursed if needed
- Participants will receive a small gift card after completing the interview as a thank you

### INTERESTED?

**CONTACT:**

**Principal Investigator:**  
Mason Hollebeke | MSc Student  
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Scan to view screening form and more information

## Appendix D: Figures

**Figure 1.** Post-Concussion Symptom Scale (PCSS). Adapted from Intermountain Health (135).

**Post-Concussion Symptom Scale (PCSS)**

Name: \_\_\_\_\_ DOB: \_\_\_\_\_ Date: \_\_\_\_\_

Instructions: For each item, indicate how much the symptom has bothered you over the past 2 days.

| Symptoms          |                             | None | Mild | Moderate | Severe |   |   |   |
|-------------------|-----------------------------|------|------|----------|--------|---|---|---|
| <b>Physical</b>   | 1 Headache                  | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 2 Nausea                    | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 3 Vomiting                  | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 4 Balance problems          | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 5 Dizziness                 | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 6 Fatigue                   | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 7 Sensitivity to light      | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 8 Sensitivity to noise      | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 9 Numbness / Tingling       | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
| <b>Thinking</b>   | 10 Feeling mentally foggy   | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 11 Feeling slowed down      | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 12 Difficulty concentrating | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 13 Difficulty remembering   | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
| <b>Sleep</b>      | 14 Drowsiness               | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 15 Sleeping less than usual | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 16 Sleeping more than usual | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 17 Trouble falling asleep   | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
| <b>Emotional</b>  | 18 Irritability             | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 19 Sadness                  | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 20 Nervousness              | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
|                   | 21 Feeling more emotional   | 0    | 1    | 2        | 3      | 4 | 5 | 6 |
| TOTAL _____ / 126 |                             |      |      |          |        |   |   |   |

**Do you have any visual problems?**                      + Yes      + No

**Do these symptoms worsen with:**

- Physical Activity                      + Yes      + No      + Not applicable

- Thinking/Cognitive Activity                      + Yes      + No      + Not applicable

Over the past 2 days, my daily activity level has been \_\_\_\_ % of normal.

The Post-Concussion Symptom Scale (PCSS) is a commonly used 22-item questionnaire that helps assess the severity of symptoms following a concussion. This standardized, 22-item self-report tool is widely used in concussion research and clinical practice due to its ease of use and ability to track symptom changes throughout recovery (136).

**Figure 2.** Columbia-Suicide Severity Rating Scale (C-SSRS). Adapted from the Columbia Lighthouse Project (103).

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <p><b>SUICIDAL IDEATION</b></p> <p><i>Ask questions 1 and 2. If both are negative, proceed to “Suicidal Behavior” section. If the answer to question 2 is “yes”, ask questions 3, 4 and 5. If the answer to question 1 and/or 2 is “yes”, complete “Intensity of Ideation” section below.</i></p>                                                                                                                                                                          | <p><b>Since Last Visit</b></p>                                                              |
| <p><b>1. Wish to be Dead</b></p> <p>Subject endorses thoughts about a wish to be dead or not alive anymore or wish to fall asleep and not wake up.</p> <p><b><i>Have you thought about being dead or what it would be like to be dead?</i></b></p> <p><b><i>Have you wished you were dead or wished you could go to sleep and never wake up? Do you wish you weren’t alive anymore?</i></b></p> <p>If yes, describe:</p>                                                   | <p><b>Yes</b></p> <p><b>No</b></p> <p><input type="checkbox"/> <input type="checkbox"/></p> |
| <p><b>2. Non-Specific Active Suicidal Thoughts</b></p> <p>General, non-specific thoughts of wanting to end one’s life/commit suicide (e.g., “I’ve thought about killing myself”) without thoughts of ways to kill oneself/associated methods, intent, or plan during the assessment period.</p> <p><b><i>Have you thought about doing something to make yourself not alive anymore? Have you had any thoughts about killing yourself?</i></b></p> <p>If yes, describe:</p> | <p><b>Yes</b></p> <p><b>No</b></p> <p><input type="checkbox"/> <input type="checkbox"/></p> |
| <p><b>3. Active Suicidal Ideation with Any Methods (Not Plan) without Intent to Act</b></p> <p>Subject endorses thoughts of suicide and has thought of at least one method during the assessment period. This is different than a specific plan with time, place or method details worked out (e.g., thought of method to kill self but not a specific plan).</p>                                                                                                          | <p><b>Yes</b></p> <p><b>No</b></p> <p><input type="checkbox"/> <input type="checkbox"/></p> |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <p>Includes person who would say, <i>“I thought about taking an overdose, but I never made a specific plan as to when, where or how I would actually do it...and I would never go through with it.”</i></p> <p><b><i>Have you thought about how you would do that or how you would make yourself not alive anymore (kill yourself)? What did you think about?</i></b></p> <p>If yes, describe:</p>                                                                                                                                                                                                                                |                                                                                             |
| <p><b>4. Active Suicidal Ideation with Some Intent to Act, without Specific Plan</b></p> <p>Active suicidal thoughts of killing oneself and subject reports having <u>some intent to act on such thoughts</u>, as opposed to <i>“I have the thoughts, but I definitely will not do anything about them.”</i></p> <p><b><i>When you thought about making yourself not alive anymore (or killing yourself), did you think that this was something you might do?</i></b></p> <p><b><i>This is different from (as opposed to) having the thoughts but knowing you wouldn’t do anything about it.</i></b></p> <p>If yes, describe:</p> | <p><b>Yes</b></p> <p><b>No</b></p> <p><input type="checkbox"/> <input type="checkbox"/></p> |
| <p><b>5. Active Suicidal Ideation with Specific Plan and Intent</b></p> <p>Thoughts of killing oneself with details of plan fully or partially worked out and subject has some intent to carry it out.</p> <p><b><i>Have you decided how or when you would make yourself not alive anymore/kill yourself? Have you planned out (worked out the details of) how you would do it?</i></b></p> <p><b><i>What was your plan?</i></b></p> <p><b><i>When you made this plan (or worked out these details), was any part of you thinking about doing it?</i></b></p> <p>If yes, describe:</p>                                            | <p><b>Yes</b></p> <p><b>No</b></p> <p><input type="checkbox"/> <input type="checkbox"/></p> |
| <p><b>INTENSITY OF IDEATION</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                             |

|                                                                                                                                                                                                                                                                                                                                            |  |                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------|
| <p><i>The following feature should be rated with respect to the most severe type of ideation (i.e., 1-5 from above, with 1 being the least severe and 5 being the most severe).</i></p> <p><b>Most Severe Ideation:</b> _____</p> <p>_____</p> <p style="text-align: right;"><b>Type # (1-5)</b></p> <p><b>Description of Ideation</b></p> |  | <p>Most Severe</p> |
| <p><b>Frequency</b></p> <p><b>How many times have you had these thoughts?</b></p> <p><b>response</b> _____</p> <p>(1) Only one time (2) A few times (3) A lot (4) All the time (0) Don't know/Not applicable</p>                                                                                                                           |  | <p>Write _____</p> |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <p><b>SUICIDAL BEHAVIOR</b></p> <p><i>(Check all that apply, so long as these are separate events; must ask about all types)</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p><b>Since Last Visit</b></p>                                                                                                    |
| <p><b>Actual Attempt:</b></p> <p>A potentially self-injurious act committed with at least some wish to die, as a <i>result of act</i>. Behavior was in part thought of as method to kill oneself. Intent does not have to be 100%. If there is <b>any</b> intent/desire to die associated with the act, then it can be considered an actual suicide attempt. <b>There does not have to be any injury or harm</b>, just the potential for injury or harm. If person pulls trigger while gun is in mouth, but gun is broken so no injury results, this is considered an attempt.</p> <p>Inferring Intent: Even if an individual denies intent/wish to die, it may be inferred clinically from the behavior or circumstances. For example, a highly lethal act that is clearly not an accident so no other intent, but suicide can be inferred (e.g., gunshot to head, jumping from window of a high floor/story). Also, if someone denies intent to die, but they thought that what they did could be lethal, intent may be inferred.</p> <p><b>Did you <u>do anything</u> to try to kill yourself or make yourself not alive anymore? What did you do? Did</b></p> | <p><b>Yes    No</b></p> <p><input type="checkbox"/>   <input type="checkbox"/></p> <p><b>Total # of Attempts</b></p> <p>_____</p> |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b><i>you hurt yourself on purpose? Why did you do that?</i></b></p> <p><b><i>Did you _____ as a way to end your life?</i></b></p> <p><b><i>Did you want to die (even a little) when you _____?</i></b></p> <p><b><i>Were you trying to make yourself not alive anymore when you _____? Or did you think it was possible you could have died from _____?</i></b></p> <p><b><i>Or did you do it purely for other reasons, <u>not at all</u> to end your life or kill yourself (like to make yourself feel better, or get something else to happen)?</i></b> (Self-Injurious Behavior without suicidal intent) If yes, describe:</p> <p><b>Has subject engaged in Non-Suicidal Self-Injurious Behavior?</b></p> <p><b>Has subject engaged in Self-Injurious Behavior, intent unknown?</b></p>                                                                                                                                                                                                                                                   | <p><b>Yes    No</b></p> <p><input type="checkbox"/>   <input type="checkbox"/></p> <p><b>Yes    No</b></p> <p><input type="checkbox"/>   <input type="checkbox"/></p> |
| <p><b>Interrupted Attempt:</b></p> <p>When the person is interrupted (by an outside circumstance) from starting the potentially self-injurious act (<i>if not for that, actual attempt would have occurred</i>).<br/> Overdose: Person has pills in hand but is stopped from ingesting. Once they ingest any pills, this becomes an attempt rather than an interrupted attempt.<br/> Shooting: Person has gun pointed toward self, gun is taken away by someone else, or is somehow prevented from pulling trigger. Once they pull the trigger, even if the gun fails to fire, it is an attempt. Jumping: Person is poised to jump, is grabbed and taken down from ledge. Hanging: Person has noose around neck but has not yet started to hang - is stopped from doing so.</p> <p><b><i>Has there been a time when you started to do something to make yourself not alive anymore (end your life or kill yourself) but someone or something stopped you before you actually did anything? What did you do?</i></b></p> <p>If yes, describe:</p> | <p><b>Yes    No</b></p> <p><input type="checkbox"/>   <input type="checkbox"/></p> <p><b>Total # of interrupted</b></p> <p>_____</p>                                  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Aborted Attempt or Self-Interrupted Attempt:</b></p> <p>When person begins to take steps toward making a suicide attempt, but stops themselves before they actually have engaged in any self-destructive behavior. Examples are similar to interrupted attempts, except that the individual stops him/herself, instead of being stopped by something else.</p> <p><b><i>Has there been a time when you started to do something to make yourself not alive anymore (end your life or kill yourself) but you changed your mind (stopped yourself) before you actually did anything? What did you do?</i></b></p> <p>If yes, describe:</p> | <p><b>Yes    No</b></p> <p><input type="checkbox"/> <input type="checkbox"/></p> <p>Total # of aborted or self-interrupted</p> <p>_____</p> |
| <p><b>Preparatory Acts or Behavior:</b></p> <p>Acts or preparation towards imminently making a suicide attempt. This can include anything beyond a verbalization or thought, such as assembling a specific method (e.g., buying pills, purchasing a gun) or preparing for one's death by suicide (e.g., giving things away, writing a suicide note).</p> <p><b><i>Have you done anything to get ready to make yourself not alive anymore (to end your life or kill yourself)- like giving things away, writing a goodbye note, getting things you need to kill yourself?</i></b></p> <p>If yes, describe:</p>                                 | <p><b>Yes    No</b></p> <p><input type="checkbox"/> <input type="checkbox"/></p> <p>Total # of preparatory acts</p> <p>_____</p>            |
| <p><b>Suicide:</b></p> <p>Death by suicide occurred since last assessment.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p><b>Yes    No</b> <input type="checkbox"/></p> <p><input type="checkbox"/></p>                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>Most Lethal Attempt Date:</p>                                                                                                            |
| <p><b>Actual Lethality/Medical Damage:</b></p> <p>0. No physical damage or very minor physical damage (e.g., surface scratches).</p> <p>1. Minor physical damage (e.g., lethargic speech; first-degree burns; mild bleeding; sprains).</p> <p>2. Moderate physical damage: medical attention needed (e.g., conscious but sleepy, somewhat responsive; second-degree burns; bleeding of major vessel).</p>                                                                                                                                                                                                                                     | <p><i>Enter Code</i></p> <p>_____</p>                                                                                                       |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| <p>3. Moderately severe physical damage: <i>medical</i> hospitalization and likely intensive care required (e.g., comatose with reflexes intact; third-degree burns less than 20% of body; extensive blood loss but can recover; major fractures).</p> <p>4. Severe physical damage: <i>medical</i> hospitalization with intensive care required (e.g., comatose without reflexes; third-degree burns over 20% of body; extensive blood loss with unstable vital signs; major damage to a vital area).</p> <p>5. Death</p>                                                                                              |                                           |
| <p><b>Potential Lethality: Only Answer if Actual Lethality=0</b></p> <p>Likely lethality of actual attempt if no medical damage (the following examples, while having no actual medical damage, had potential for very serious lethality: put gun in mouth and pulled the trigger but gun fails to fire so no medical damage; laying on train tracks with oncoming train but pulled away before run over).</p> <p>0 = Behavior not likely to result in injury<br/> 1 = Behavior likely to result in injury but not likely to cause death<br/> 2 = Behavior likely to result in death despite available medical care</p> | <p><i>Enter<br/>Code</i></p> <p>_____</p> |

The Columbia-Suicide Severity Rating Scale (C-SSRS) is a validated tool used to assess suicidal ideation and behaviour. Responses are used to categorize risk as low, moderate, or high, guiding decisions about immediate safety planning and referral to mental health services (103).

## Appendix E. River East Transcona School Division Partnership Permission



creating student success

November 3, 2025

Mason Hollebeke  
hollebem@myumanitoba.ca

Dear Mason:

Thank you for your interest in conducting research with staff and students in RETSD.

Your research request is approved for your study: *Adolescent Girls' Experiences of Mental Health and Recovery Following Sports-related Concussions*. Permission has been granted for you to contact the division's middle and senior year schools regarding your research study. Note that approval by the division does not obligate the school, its staff, or students to participate in a study.

Please note: As you begin your research in the division, please be aware that in RETSD gender diverse students participate on the sports teams for the gender that they express/identify with.

Any personnel who will be in direct contact with students will be required to have a cleared Child Abuse Registry check (CAR) and a Criminal Record Check (CRC) with a vulnerable sector search dated within one year. These are to be presented to the school administrator prior to being granted access to the students.

All external research is to be conducted in accordance with our *External Research Guidelines*, available online at <https://www.retsd.mb.ca/page/76/external-research>.

The Research Guidelines are: <https://www.retsd.mb.ca/page/11292/external-research-project-guidelines>

Please contact the school division at [research@retsdb.ca](mailto:research@retsdb.ca) if you have any questions.

Once your research is complete, we would appreciate a copy of the research report for our records. An electronic version of the report can be emailed to [research@retsdb.ca](mailto:research@retsdb.ca).

All the best with your research study.

Sincerely,



Jason Drysdale  
Assistant Superintendent – Educational Services and Planning

cc. Divisional Research Review Committee  
Middle and Senior Year School Principals  
Tim Au, Consultant – Physical Education/Health  
Karen Boyd, Assistant Superintendent – Educational Programming

## Appendix F. Consent Form



### RESEARCH PARTICIPANT INFORMATION AND CONSENT FORM Parent

**Title of Study: “Adolescent Girls’ Experiences of Mental Health and Recovery Following Sport-related Concussions” — MSc Thesis**

**Principal Investigator:** Mason Hollebeke  
MSc Student - Pediatrics and Child Health  
University of Manitoba, Winnipeg, MB  
Email: [hollebem@myumanitoba.ca](mailto:hollebem@myumanitoba.ca)  
Phone: [REDACTED]

**Supervisor:** Dr. Kelly Russell

Your child is being asked to participate in a research study. Please take your time to review this consent form and discuss any questions you may have with the research staff. You may take your time to decide to participate in this study, and you are welcome to discuss it with your friends or family before making a decision. This consent form may contain words that you do not understand. Please ask the research staff to explain any words or information that you do not clearly understand.

#### **Purpose of Study**

Your child is being invited to participate in a research study as part of a Master of Science thesis focused on sport-related concussions in adolescent girls. This study aims to better understand how adolescent girls experience sport-related concussions, with a specific focus on gender norms, mental health and returning to sport. By interviewing adolescents who have experienced a sport-related concussion, this research aims to investigate how girls perceived their recovery, including the impact of social pressures and gender expectations on their coping strategies and readiness to return to sport. Your child’s participation will help fill a gap in current research and may contribute to improving support systems and recovery practices for young athletes in the future.

#### **Study Procedures**

This research study involves participating in one interview. Data will be collected through in-person, open-ended, one-on-one interviews with participants after they have recovered from their concussion. The interviews will be about 45 minutes long and conducted in person at the Children’s Hospital Research Institute of Manitoba in a private conference room. Virtual interviews will be offered if preferred. These will be conducted on a secure device and in a private location to ensure privacy is maintained. All information received during the interviews will be stored on secure servers, accessible only by the research staff. Parental consent may be done via email. Communications and reminders will be sent via email, phone call, or text to the email addresses and cell phone numbers provided on the consent and assent forms.

A research staff member will ask if your child has read and understood this consent document, and if they have any questions about participating. Your child can stop participating at any time. There will be no consequences if your child decides to withdraw from the study suddenly.

### **Risks and Discomforts**

This study involves discussions of mental health and potential life-altering injuries, which may bring up distressing emotions for participants.

### **Benefits**

Your child's participation is valuable and may contribute to a better understanding of how adolescent athletes experience and recover from sport-related concussions. Your child's experiences may help researchers, healthcare providers, coaches, and families better support other young athletes who are going through similar experiences. Talking about their recovery gives your child an opportunity to reflect on their experience, which some participants find meaningful or helpful. Your child's insights may help improve concussion education, mental health support, and return-to-sport practices in the future, especially by highlighting how these experiences may differ for boys and girls.

Once the analysis is complete, your child will receive a summary of the study's findings at the email address provided on the consent form. They will be asked if they feel anything they said was misunderstood by research staff, to ensure the accuracy of the study's findings.

### **Costs**

There will be no cost for participation.

### **Payment for Participation**

Your child will receive no payment for your participation in this study. However, parking charges will be reimbursed if applicable. To thank your child for their participation, they will receive a small gift card upon completing their interview.

### **Confidentiality**

Information gathered in this research study will be published and presented in public forums; however, your name and other identifying information will not be disclosed. All study-related documents will contain only your assigned study number. Despite efforts to keep you and your personal information confidential, absolute confidentiality cannot be guaranteed. Your personal information may be disclosed as required by law. CHIPER Research Ethics Board may review records related to the study for quality assurance purposes.

Your research information may be shared outside the University of Manitoba with researchers, other organizations, and/or made publicly available. The information is being shared for further analysis or testing, as part of the research study, and/or because it is required by a funder or journal.

All electronic records will be stored on secure servers, and any paper records will be kept in a secure area. Only research staff will have access to these records. If any of your research records need to be copied to any of the above, your name and all identifying information will be removed. No information revealing any personal information, such as your name, address or telephone number, will leave the University of Manitoba.

Your child's safety is very important to us. During this study, your child may be asked questions about their experiences, feelings, or mental health. If at any point your child discloses thoughts of harming themselves, feeling suicidal, or anything that raises concern for their safety, the interview will be paused, and I will speak with my research supervisor to ensure appropriate

mental support is provided. This may include making a referral to psychiatric services. You, as the parent or guardian, will be notified as soon as possible. We can also provide contact information for local crisis lines and counselling services. Normally, everything your child shares in the study is confidential, but if there is a serious risk to their safety, we are required to inform a parent/guardian or a qualified mental health professional to ensure your child receives help.

### **Voluntary Participation/Withdrawal from the Study**

Your child's decision to take part in this study is voluntary. Your child may refuse to participate or withdraw from the study at any time. If the study staff feel that it is in your child's best interest to withdraw you from the study, they will do so without your consent.

### **Questions**

You are free to ask any questions that you may have about your rights as a research participant. If any questions come up during or after the study, contact the study staff: Mason Hollebeke, [REDACTED] or [hollebem@myumanitoba.ca](mailto:hollebem@myumanitoba.ca)

For questions about your rights as a research participant, you may contact the CHIPER Research Ethics Board at 204-775-1096 / 1-866-248-4375 (toll-free)

Do not sign this consent form unless you have had a chance to ask questions and have received satisfactory answers to all your questions.

### **Statement of Consent**

I have read this consent form. I have had the opportunity to discuss this research study with Mason Hollebeke. I have had my questions answered sufficiently. The risks and benefits have been explained to me. I believe that I have not been unduly influenced by any study team members to participate in the research study by any statements or implied statements. I have no relationships (such as employer or family member) with the research team that may have influenced my decision to participate. I understand that my participation in this study is voluntary and that I may choose to withdraw at any time. I freely agree to participate in this research study. I understand that information regarding my personal identity will be kept confidential. But that confidentiality is not guaranteed.

By signing this consent form, I acknowledge that I have not waived any of my legal rights as a participant in this research study.

Participants may receive results of the study. Please note, you or your child's email address will not be linked to any results and no names or other identifying information will appear in the results.

I would like a copy of the results forwarded to me

Yes \_\_\_ No \_\_\_

---

Parent/legal guardian's signature: \_\_\_\_\_ Date: \_\_\_\_\_  
(mm/dd/yyyy)

Parent/legal guardian's printed name: \_\_\_\_\_

Parent email address:

\_\_\_\_\_

Parent cell phone number: \_\_\_\_\_

Child's printed name: \_\_\_\_\_

\_\_\_\_\_

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and has knowingly given their consent.

Printed name: \_\_\_\_\_ Date: \_\_\_\_\_  
(mm/dd/yyyy)

Signature: \_\_\_\_\_

Relationship (if any) to study team members: \_\_\_\_\_

## Appendix G: Assent Form



### RESEARCH PARTICIPANT INFORMATION AND CONSENT FORM Assent Form

**Title of Study: “Adolescent Girls’ Experiences of Mental Health and Recovery Following Sport-related Concussions” — MSc Thesis**

**Principal Investigator:** Mason Hollebeke  
MSc Student - Pediatrics and Child Health  
University of Manitoba, Winnipeg, MB  
Email: [hollebem@myumanitoba.ca](mailto:hollebem@myumanitoba.ca)  
Phone: [REDACTED]

---

#### **Why are you here?**

We would like to tell you about a study involving teenaged girls who participate in sports. We would like to invite you to participate in this study. This form tells you about the study. If there is anything you do not understand, please ask your parents, your guardian or the study staff.

#### **Why are we doing this study?**

We want to learn more about teenage girls and sport-related concussions. We want to learn about how they felt when they had a concussion and how their recovery went.

#### **What will happen to you?**

If you decide to participate in this study, you will answer some questions from the study staff about your concussion. This will happen in a one-on-one interview, either in person or online, depending on what works best for you. The interview will take about 45 minutes. You’ll be asked about things like how you felt after your concussion, how it affected your day-to-day life, how you felt about going back to school or sports, and how you managed your recovery. You don’t have to answer any questions you’re not comfortable with, and you can take a break or stop the interview at any time.

#### **What if you have any questions?**

You can ask questions any time, now or later. You can talk to your family, friends, or someone else. You can also contact the study leader, Mason Hollebeke, at [REDACTED] or at [hollebem@myumanitoba.ca](mailto:hollebem@myumanitoba.ca)

#### **Who will know what I said in the study?**

Any information you give to the study staff will be kept private. Your name will not appear on any study papers, and only the study staff will know it was you who participated in the study.

#### **Do you have to be in the study?**

You do not have to be in the study. No one will be mad at you if you do not want to do this. If you do not wish to participate in this study, just say so. We will also ask your parents if they would

like you to participate in this study via their email address or phone number that you provide below. Even if your parents want you to be in the study, you can still say no. Even if you say yes now, you can change your mind later. It is up to you.

### **Confidentiality Notice**

Your safety is important. If you say something that makes us worried about your safety, like thinking about hurting yourself, we will pause the interview and get help. We will also let your parent or guardian know. Most of what you share is private, but if you are at serious risk, we must tell a parent or professional, so you stay safe.

### **Do you have any questions?**

### **What questions do you have?**

---

I would like to participate in this study. I know I can change my mind at any time.

---

Signature of Child

---

Age

---

Date (mm/dd/yyyy)

Child's email: \_\_\_\_\_

Child's cell phone number: \_\_\_\_\_

Parent's email: \_\_\_\_\_

Parent's phone number: \_\_\_\_\_

**I confirm that I have explained the study to the participant to the extent compatible with their understanding, and that the participant has agreed to participate in this study.**

---

Printed name of person  
obtaining assent

---

Signature of person  
obtaining assent

---

Date (mm/dd/yyyy)

## **Appendix H: Interview Guide**

Hi, thank you for your time. I appreciate you being willing to talk to me about a very personal experience. I am going to have a recording device. The recording will be typed up into a transcript, and your name will be removed so no one can identify you. Everything you share will be kept confidential and will only be used for this research project. Only my research supervisor and I will have access to the recordings and transcripts. You don't have to answer any question you don't want to, and you can take a break or stop the interview at any time without giving a reason. I will guide you through each section and will let you know when we are on the last section.

### **Opening / Rapport Building**

- Can you tell me a little about yourself? What things do you enjoy doing, hobbies, sports you've played, and how long you've been involved in them? What is your favourite part about living in Winnipeg? What school do you go to?
- What is it like being a girl in your sport?
- When did you get your concussion?
- How would you assess your overall concussion experience?
  - 1 – Very negative
  - 2 – Negative
  - 3 – Neutral / Mixed
  - 4 – Positive
  - 5 – Very positive

### **Section 1: Injury Experience**

**We're going to begin by talking about your overall concussion experience.**

- Can you walk me through your experience of getting a concussion? What did that feel like? What was it like for you?
  - (Is there anything else you want to tell me about that first moment?)
  - What happened and what came next?
- What were your first thoughts or feelings after your concussion happened?
- I'm now going to move into questions which refer to your concussion experience in sport and with other people. When you were first injured, how did coaches, trainers, or teammates respond to you?
- Do you think people took your concussion seriously? Why or why not?
- Did you ever feel ignored, dismissed, or passed over during your recovery process?
  - (Did you feel especially supported, cared for or understood by others?)

### **Section 2: Gender Norms**

We're now going to talk about gender and issues related to being a girl.

- What is it like being a girl in sport?
- Have you ever felt like you were treated unfairly or differently because you're a girl athlete?
- Did anyone say or do anything that made you feel good or bad during your concussion experience? What did they say? Do you think those comments were related to you being a girl?

- How do you think being a girl influenced your mental health during your concussion?
- Do you think boys and girls are treated differently when they get concussions in your sport? Can you give an example?

### **Section 3: Expectations & Peer Dynamics**

- What do people around you say about concussions?
- Among your teammates, what kinds of things are said about injuries or concussions?
- Are there any expectations about how you're "supposed to" deal with being injured in your sport?
  - Examples:
    - Not continuing in your sport
    - Missing days of practice due to your concussion
    - Expressing fear or anxiety about continuing, for yourself or fear of letting your team members down
    - Pressure to be back on the field the next day
    - Deep regret of missing out (big tournament, games, etc.)
      - Did you experience any of these or any others?
- Did you feel pressure to "tough it out" or return to play quickly after injury? Where does that pressure come from?
- How did you feel you were "supposed to" show your emotions after your concussion? Did you feel pressure to hide your feelings, stay strong, or act a certain way around teammates, coaches, or family?
  - Did this affect the way you coped with your symptoms or your return to sport?
- During your recovery, in what ways did your school, family, teammates, or friends help you?
  - In what ways did they make things more difficult?
- Did any of them influence when you decided to return to your sport? How?

### **Section 4: Recovery & Mental Health**

In this section, I want to specifically focus on your mental health during your recovery. By mental health, I am going to ask you questions about your emotions, mood and your thought process.

- Tell me about your concussion recovery.
- Did your concussion impact your mental health in any way (e.g., mood, anxiety, motivation)? (Can you share an example from after your concussion that would describe your mental health?)
- What kind of support did you receive for your mental health?
  - Did you talk to anyone about your mental health? Who did you talk to? How did they help or make things worse?
- Did you ever feel isolated or left out during your recovery?
- During your recovery, did you ever feel anxious or frustrated? If so, how did these feelings affect when or how you returned to your sport?
- How do you think being a girl impacted your recovery?
- Did you use any coping strategies? How did you come up with them?
- What was the hardest part of your recovery?

### **Section 5: Looking Forward**

This is our last section. I have a few final questions about looking forward.

- If you could give a recommendation for concussion safety in your sport, what would it be?
- What advice would you give to another girl athlete who just got their first concussion?
- What do coaches need to know about supporting girl athletes during a concussion?
- Is there anything I missed? Is there anything you want to add?

\*The interview guide may require individualized questions acting as a probe or follow-up on the above questions.

## **Appendix I: Member Checking Summary**

The following document was emailed to all participants on May 25, 2026, once the data analysis was completed.

Thank you again for participating in this study.

This document summarizes what I learned from all eight interviews. It is designed for member checking, which means I want to ensure the findings accurately reflect your experiences.

As you read, please consider:

- Does this sound true to your experience
- Is anything missing or described in a way that doesn't fit
- What should be changed so your experience is represented accurately

Your feedback will help strengthen the final results.

### **Theme 1: Balancing Support and Pressure**

#### *Support During Recovery*

- Participants described strong support from friends, family, and coaches. This support helped reduce feelings of loneliness and made recovery feel safer.

Examples included:

- "My friends and family were all very supportive. They all checked up on me a lot."
- "My coaches took my concussion seriously, and they understood I needed time off."

Summary: Support often came through check-ins, reassurance, and coaches protecting athletes from returning too early.

#### *Pressure to Return*

- Alongside support, many participants felt pressure to return to sport sooner than they were ready. This pressure came from teammates, parents, coaches, or internal expectations.

Examples included:

- "People made comments saying things like 'come back, we need you.'"
- "I felt like my team expected me to come back earlier than I did."

Summary: Pressure was especially strong during playoffs, recruitment periods, or high-stakes games.

### **Theme 2: Psychological Weight of Recovery**

#### *Heightened Emotions*

- Recovery involved strong emotional reactions, including:
  - Frustration
  - Sadness
  - Irritability
  - Fear or anxiety

Examples:

- "I just really wanted to be back on the ice."
- "I was always sad during my recovery."
- "Little things made me spark."

Summary: Uncertainty about recovery timelines intensified these feelings.

### *Isolation and Disconnection*

- Many participants felt socially disconnected from teammates, friends, and school activities.

Examples:

- “I felt left out... it made me feel kind of isolated, lonely and sad.”
- “It was hard seeing my friends on the ice. I just wanted to be out there.”

Summary: Some chose not to talk about their feelings because they didn’t want to burden others or didn’t know how to explain what they were experiencing.

## **Theme 3: Disrupted Sport Identity and the Experience of Loss**

### *Loss of Routine and Opportunity*

- Sport was a major part of daily life. Being unable to participate disrupted routines and created a sense of loss.

Example:

- “Sports are a routine that I’ve always had... Not being able to do that felt weird.”

Summary: Some were injured during important times (playoffs, early season games, recruitment), making the loss feel heavier.

### *Threats to Identity*

- Sport was central to many participants’ identities. Being unable to play felt like losing part of themselves.

Examples:

- “Sports are just a giant part of who I am.”
- “I felt like I wasn’t that good anymore.”

### *Staying Connected*

- Participants used strategies to stay connected to their teams, such as attending practices or games, or doing small modified activities.

Examples:

- “I still went to my games and just watched with sunglasses on.”
- “I felt like I was with my team.”

## **Theme 4: Gendered Barriers and Unequal Recognition in Sport**

Participants described experiences where girls’ sports were treated as less important than boys’ sports.

Examples included:

- Boys teasing or doubting girls’ abilities
- Girls’ teams receiving fewer resources
- Feeling like girls’ injuries weren’t taken as seriously
- Coaches explaining things differently to girls
- “Boys tease me for playing AAA hockey... They think their AAA is better.”
- “The boys’ team definitely has a lot more support.”
- “I feel like people take boys’ injuries more seriously.”

Summary: Some felt they had to “prove” their injury was real because concussions are invisible.

## **Theme 5: Internal Struggles: Confidence, Fear, and Pressure**

- Participants described internal challenges that continued even after symptoms improved.
- Common struggles included:
  - Fear of re-injury

- Worry about falling behind
- Loss of confidence
- Pressure to return quickly

Examples:

“I felt like I lost all my confidence.”

“I wanted to go back so badly, but I knew I wouldn’t have the confidence.”

“I kind of rushed myself into it because it was playoffs.”

Summary: Rebuilding confidence was one of the hardest parts of recovery.

### *Feeling Understood Through Shared Experience*

- Talking to someone who had also experienced a concussion helped many participants feel understood and less alone.

Examples:

- “She knew how I felt.”
- “My dad has had concussions before, so he understood.”
- “It helped so much to have someone who understood.”

Please send me an email and share your thoughts on:

- What feels accurate
- What feels inaccurate or missing
- What should be changed

## Appendix J: Ethical Approval



Research Improvements Through  
Harmonization in Manitoba  
A201 Chown Building  
753 McDermot Avenue  
Winnipeg, MB R3E 0T6

### CHIPER HEALTH RESEARCH ETHICS BOARD (HREB) CERTIFICATE OF FINAL APPROVAL FOR NEW STUDIES Delegated Review

|                                                                                    |                                                                                                        |                                         |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <b>PRINCIPAL INVESTIGATOR:</b><br>Miss Mason Hollebeke                             | <b>AFFILIATED<br/>INSTITUTION/DEPARTMENT:</b><br>University of Manitoba/Pediatrics and<br>Child Health | <b>ETHICS #:</b><br>HS26980 (H2025:186) |
| <b>APPROVAL DATE:</b><br>July 17, 2025                                             | <b>EXPIRY DATE:</b><br>July 17, 2026                                                                   |                                         |
| <b>STUDENT PRINCIPAL INVESTIGATOR SUPERVISOR (If applicable):</b><br>Kelly Russell |                                                                                                        |                                         |

|                                                                                        |                                                                                                                                     |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>PROTOCOL NUMBER:</b>                                                                | <b>PROJECT OR PROTOCOL TITLE:</b><br>Gender Differences in Pediatric Mental Health Outcomes Following Sports-related<br>Concussions |
| <b>SPONSORING AGENCIES, FUNDING AGENCIES AND/OR COORDINATING GROUPS:</b><br>No funding |                                                                                                                                     |

|                                                                                                         |                                                                                       |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Submission Date of Investigator Documents:</b><br>February 28, 2025, June 16, 2025 and July 16, 2025 | <b>REB Receipt Date of Documents:</b><br>May 5, 2025, June 23, 2025 and July 16, 2025 |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|

#### THE FOLLOWING ARE APPROVED FOR USE:

| Document Name                                                                                                                                                                                                   | Version (if applicable) | Date                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------|
| <b>Protocol:</b><br>REVISED protocol along with proposal as outlined in the REVISED University of Manitoba Bannatyne<br>Campus Research Ethics Board Submission Form and Letter of Response dated June 16, 2025 |                         |                                                                      |
| <b>Consent and Assent Form(s):</b><br>RESEARCH PARTICIPANT INFORMATION AND CONSENT FORM Parent                                                                                                                  |                         |                                                                      |
| RESEARCH PARTICIPANT INFORMATION AND CONSENT FORM Assent Form                                                                                                                                                   | V. 3                    | July 16, 2025                                                        |
|                                                                                                                                                                                                                 | V. 2                    | May 26, 2025                                                         |
| <b>Other:</b><br>REVISED Recruitment Poster (undated)                                                                                                                                                           |                         |                                                                      |
| Master List                                                                                                                                                                                                     |                         |                                                                      |
| REVISED Demographic Questionnaire (undated)                                                                                                                                                                     | V. 2                    | submitted June 23, 2025<br>May 26, 2025<br>submitted June 3 23, 2025 |
| Interview Guide (undated)                                                                                                                                                                                       |                         | Submitted May 5, 2025<br>Submitted May 5, 2025<br>6/23/10            |
| Post-Concussion Symptom Scale ( PCSS )                                                                                                                                                                          |                         |                                                                      |
| COLUMBIA-SUICIDE SEVERITY RATING SCALE C-SSRS)                                                                                                                                                                  |                         |                                                                      |

#### CERTIFICATION

The above-named research study/project has been reviewed in a **delegated manner** by CHIPER HREB and was found to be acceptable on ethical grounds for research involving human participants. The study/project and documents listed above was granted final approval by the Chair or Acting Chair, CHIPER HREB.

#### HREB ATTESTATION

CHIPER is organized and operates according to Health Canada/ICH Good Clinical Practices, Tri-Council Policy Statement 2, and the applicable laws and regulations of Manitoba. In respect to clinical trials, CHIPER complies with the membership requirements for Research Ethics Boards defined in Division 5 of the Food and Drug Regulations of Canada and carries out its functions in a manner consistent with Good Clinical Practices.