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Exploring the Cognitive, Environmental, and Behavioral Factors That Impact Concussion Reporting Behavior in Division III Football Players

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EXPLORING THE COGNITIVE, ENVIROMENTAL, AND BEHAVIORAL FACTORS THAT IMPACT CONCUSSION REPORTING BEHAVIOR IN DIVISION III FOOTBALL PLAYERS

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EXPLORING THE COGNITIVE, ENVIRONMENTAL, AND BEHAVIORAL FACTORS THAT IMPACT CONCUSSION REPORTING BEHAVIOR IN DIVISION III FOOTBALL PLAYERS

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ABSTRACT

Purpose: This dissertation applies Social Cognitive Theory (SCT) to understand concussion reporting behavior in D-III football players and explores the culture of concussion reporting through qualitative ethnography. Using the SCT constructs, the study investigates the cognitive, environmental, and behavioral factors influencing concussion reporting in D-III football players. The lack of research on how reciprocal determinism affects concussion reporting at the most vulnerable level of competition provides an opportunity to examine the cultural context of concussion reporting. The goal is to develop theoretically-based interventions that increase concussion reporting and change cultural narratives concerning concussion reporting behavior in under-resourced institutions.

Methods: This study used SCT constructs through an ethnographic qualitative approach to explore how concussion reporting behavior is shaped in D-III student-athletes. Fourteen male football players from a private university in the Southeastern US were interviewed via Zoom. The data was analyzed using the SCT framework through semi-structured interviews and reviewed to identify high-frequency words, phrases, and statements. Four themes emerged from the transcripts, including concussion impact, reporting and managing concussions on the team, consequences of reporting a concussion, and ensuring well-being and avoiding complications from concussions.

Analysis/Results: The study offered insights into concussion reporting behavior among D-III football players. Four themes indicated that players struggle to report concussions due to a desire to keep playing. Creating supportive environments promoting open communication between coaches, players, and training staff, and providing resources to eliminate reporting barriers is crucial. A comprehensive approach involving cognitive, behavioral, and environmental aspects is needed to foster a reporting culture in D-III football players.

Conclusion: The findings highlight the importance of creating a supportive and safe environment for athletes and provide valuable insights into concussion reporting behavior in D-III football players, with implications for both research and practice. By addressing the complex and multi-faceted nature of concussion reporting behavior, this study contributes to ongoing efforts to promote the health and well-being of athletes in sports. The study serves as a call to action for continued efforts to address the issue of concussions in D-III Football.

Keywords: concussions, student-athletes, football, social cognitive theory, culture, D-III

DEDICATION

I humbly dedicate this work to Jesus Christ, our LORD and Savior. Without His unfailing love and grace, none of this would have been possible. Thank you for providing me with everything I need and guiding me every step of the way. I also dedicate this work to my beloved Mich, my beautiful children Trinity and Bray. Your love and support have been my anchor throughout this journey. No more sneaking into the closet to work on my dissertation! We made it. Mich, thank you for your unwavering sacrifice and encouragement, you are truly my best friend. I would like to extend my heartfelt appreciation to my parents, who have always believed in me and supported me in all my endeavors. Thank you for instilling in me the values of hard work, perseverance, and excellence. Dad, thank you for not giving up on me, and Mom, thank you for signing me up for flag football, which was a life-changing experience. Thank you, Uncle Ralph, for seeing more in me than a football player and always exposing me to more. To all those who have contributed to my success, I am forever grateful. I stand on the shoulders of giants, and I am inspired by your passion, dedication, and generosity. Lastly, I dedicate this work to the day in 2008 when I woke up strapped to a stretcher in a CT Scan machine. This life-altering event reminded me of the fragility of life and the importance of cherishing every moment. Thank you, God, for opening my eyes and for giving me the courage and work ethic to pursue my goals.

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LIST OF ABBREVIATIONS

AT	athletic trainer
CDC	Centers for Disease Control and Prevention
CTE	chronic traumatic encephalopathy
D-III	Division III
DB	defensive back
DL	defensive lineman
FR	freshman
HBM	health belief model
IRB	Institutional Review Board
JR	junior
MTBI	mild traumatic brain injury
NCAA	National Collegiate Athletic Association
NFL	National Football League
OL	offensive lineman
QB	quarterback
RB	running back
SCT	social cognitive theory
SO	sophomore
SR	senior

TE	tight end
TPB	theory of planned behavior

CHAPTER 1

INTRODUCTION

Sport-Related Concussions

Approximately 1.6 to 3.8 million sports-related concussions occur annually in the United States (Langlois et al., 2006; McCrory et al., 2005). Concussions occur in high-impact sports both at the high school and collegiate levels. For example, a national representative sample of high school athletes of both genders from 20 sports revealed that 2.5 diagnosed concussions occurred for every 10,000 athletes exposed to a game or practice (Marar et al., 2012). This same study found that sports-related concussions were most likely to have occurred in males participating in football and ice hockey, while females were at increased odds of concussions playing soccer, lacrosse, and basketball. At the collegiate level, a national representative sample across 25 sports played by males and females revealed that 4.47 concussions occurred per 10,000 athlete exposures resulting in an estimated 10,560 SRCs reported annually (Zuckerman et al., 2015). Furthermore, Daneshvar et al. (2011) reviewed data from the National Collegiate Athletic Association (NCAA) Injury Surveillance System from 1988-1989 through 2003-2004 and found that concussion rates doubled from 0.17 to 0.34 of 1,000 athlete exposures, with the highest rates being in football and ice hockey.

A concussion is defined as

> a type of Mild Traumatic Brain Injury (MTBI) caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move rapidly

> back and forth. This sudden movement can cause the brain to bounce around or twist in the skull, creating chemical changes in the brain and sometimes stretching and damaging brain cells. (CDC, n.d.)

In addition, if left untreated, sport-related concussions are clinically associated with irritability, impulsivity, aggression, depression, short-term memory loss, heightened suicidality, personality changes, parkinsonism, and gait abnormalities known to begin 8-10 years after repetitive MTBIs (McKee et al., 2009).

Omalu et al. (2005) published the landmark study titled "Chronic Traumatic Encephalopathy (CTE) in a National Football League Player," suggesting that long-term repetitive blows to the head revealed harmful neuropathological changes to the brain resulting in CTE. The study caused quite a stir defining CTE as a progressive neurodegenerative syndrome triggered by a single, episodic, or continuous blunt force impact to the head (Omalu et al., 2011). Unfortunately, one cannot be diagnosed with CTE until death due to the various signs and symptoms. Nevertheless, Omalu et al. (2011) confirmed CTE in (10 out of 14) 71% of professional athletes and 1 in 3 high school athletes after performing autopsies. In addition, those diagnosed with CTE were overrepresented in alcohol- and drug-related deaths, suicides, and accidental deaths. These findings forced the NCAA to focus on concussion treatment and prevention, resulting in annual concussion education for athletes, fast removal from play if a concussion is implicit, removal of same-day return-to-play in concussed athletes, and implementation of a process from clearance by a medical professional (Baugh, Kroshus, et al., 2015).

Concussion Reporting Behavior

Understanding the factors influencing concussion reporting behavior is essential but elusive. The concussive signs and symptoms are not always readily identifiable, and the medical professional, coach, or trainer must rely on the athlete to communicate truthfully to make the proper diagnosis. Unfortunately, many researchers suggest that more than 50-75% of concussions go unreported (Delaney et al., 2002; Echlin, Tator, Cusimano, Cantu, Taunton, Upshur, Hall, et al., 2010; Z. Kerr et al., 2018; McCrea et al., 2005). Researchers suggest that the desire for peer acceptance, fear of losing scholarships, lack of coach support, and a robust athletic identity may influence concussion reporting behavior in college athletes (Kroshus et al., 2015; Malinauskas, 2008). Knowledge is essential, but unaided has not been adequate in increasing the odds of concussion reporting behavior (Chinn & Porter, 2016; Kroshus et al., 2014). Attitudes toward concussion reporting behavior are a powerful predictor of concussion reporting (Cook & Hunt, 2020; Register-Mihalik, Guskiewicz, Mihalik, et al., 2013). In addition, the attitudes of parents toward concussion reporting are influential in concussion reporting behavior (Kerr et al., 2021; Register-Mihalik et al., 2018). These factors are essential, but individual factors in isolation, such as increases in knowledge and changes in attitude and subjective norms towards concussion reporting behavior, are not significantly associated with increased concussion reporting (Carpenter et al., 2020). Baugh et al. (2019) reported that the odds of reporting a concussion diminish as concussions increase.

Levels of Collegiate Competition

There are three levels of competition within the NCAA, including Division I, II, and III. At the D-I level, many of the student-athletes aspire to play professionally. These institutions are more prominent on average when compared to D-II and D-III schools. D-II schools offer athletic scholarships, but they are rarely full scholarships. It is common at the D-II level to receive a partial football scholarship (NCAA, 2014a). The most profound difference between divisions is related to the athletic department's budget. Data suggest that most athletic departments do not earn a profit; the average net loss per institution was $19.3 million for D-I compared to $3.9 million for D-III (NCAA, 2021b).

Budgets are generally larger at D-I institutions, providing them with more resources to operate and protect their players. More than 480,000 student-athletes compete in the NCAA. As of 2020, 73,712 student-athletes participated in football, with 254 drafted to the National Football League (NFL) (NCAA, 2022a). That is a 1.6% conversion rate from the NCAA to the professional level. In 2019, only six D-III football players were on NFL rosters (Marinofsky, 2021).

Furthermore, NCAA reported that although D-III student-athletes do not receive athletic scholarships, 80% of D-III athletes have some form of financial assistance from academic grants or need-based scholarships. D-III student-athletes have a graduation rate that is 5% higher than non-athletic peers (NCAA, 2022b). On average, student-athletes playing football at the D-III play in front of 1,762 fans compared to their peers at the D-I level at 26,377 fans (NCAA, 2019a). These are two completely different playing environments with varying expectations and skill sets. Many coaches at the D-I level make millions, while coaches at the D-III level hold teaching assignments.

Guskiewicz et al. (2000) suggested that D-III (5.5%) student-athletes engaged in football have a greater incidence of concussion when compared to Division I (4.4%) and II (4.5%). The researchers theorized that this is likely due to playing both offense and defense, which is more common at the D-III level. Meehan et al. (2016) explored the impact of MTBI's sustained during NCAA competition in their cross-sectional study of 2,132 alumni from four D-III institutions between 40 and 70 years. Their findings revealed a significant relationship between prior concussions and poor self-reported health. Individuals with a history of concussions sustained in college athletics also had higher odds of alcohol use later in life, greater risk of severe depression, and higher levels of impulsivity and aggression (Kerr, Evenson, et al., 2014). Henceforth, with D-III players making up such a large portion of the NCAA, it is crucial to explore how their concussion experience reporting behavior differs from that of their peers at the D-I and D-II level. It is unclear whether D-III football players have the same affinity and goals as their peers at the different levels. D-I and D-II programs possess a larger budget, which includes a more significant margin for error, compared to D-III institutions making it vital to focus on this matter to protect the short- and long-term health of D-III student-athletes. D-I institutions possess fiscal resources to provide adequate support for concussion prevention and management. However, D-III schools do not have that privilege, creating a sense of urgency to find a theory-based intervention that can be applied to under-resourced institutions.

Concussions are unreported 50-75% of the time (Kerr et al., 2018; Kerr et al., 2016; Register-Mihalik, Guskiewicz, Valovich McLeod, et al., 2013; Torres et al., 2013). Research supports the association of attitudes, self-efficacy, subjective norms, and

perceived behavior control on concussion reporting behavior (Carpenter et al., 2020; Kroshus et al., 2014; Milroy et al., 2020). Reasons for non-disclosure include not wanting to leave the game, letting the team down, poor understanding of concussion signs and symptoms, and low perceived severity (Beidler et al., 2018; Clark & Stanfill, 2019; Kerr et al., 2018; Kerr et al., 2016). In addition, athletes are much less likely to report a concussion to a medical professional than other injuries (Baugh et al., 2019).

Statement of the Problem

Much is known about D-I and D-II student-athletes, but there has been limited research focused on D-III student-athletes. Because they have varying reasons and aspirations for playing football at smaller schools, are their outcome expectation, social norms, self-efficacy, social support, and behavioral skills different as well? Studies have demonstrated the various reasons why student-athletes do not report concussions, but these studies focus on D-I and D-II student-athletes (Baugh, Kiernan, et al., 2015; Davies & Bird, 2015; Kroshus, Baugh, et al., 2015; Lempke, Rawlins, et al., 2020). However, this study explores this topic for the D-III football player. Reasons for non-disclosure differ, but researchers have not explored concussion reporting behavior through social cognitive theory (SCT) application focused on D-III players. It is unknown whether these players are participating with the same fears and concerns as their peers at higher levels of competitions with larger audiences. Regardless of the level of play, concussions are a grave concern and, if left untreated, can have detrimental short- and long-term health effects. The lack of resources may hinder D-III players' reporting of concussions, but this is not certain because the research does not exist.

Furthermore, because the NCAA leaves concussion education up to the institution, it is unclear if concussion education is sufficient at the D-III level to create a culture of concussion reporting. Concussions are serious, and if administrators at D-III schools understand their concussion culture better, they may be able to create an environment that promotes concussion disclosure. Little is known about the complex interplay between the SCT tenets in D-III football players concerning concussion reporting behavior. This gap in the literature exists because most researchers have examined non-disclosure by applying the Theory of Planned Behavior, the Health Belief Model, and the Socio-ecological framework (Kerr, Register-Mihalik, et al., 2014; Kroshus et al., 2014; Register-Mihalik, Guskiewicz, Mihalik, et al., 2013; Weber Rawlins et al., 2020).

Researchers also have spent most of their time focusing on larger, resource-rich institutions while ignoring the smaller schools. Researchers have identified this population as high-risk for concussion, but scant research considers D-III culture. Applying SCT to the concussion reporting behavior explores the unique interaction of cognitive, environmental, and behavioral influences on D-III athletes' concussion-reporting behavior. Reciprocal determinism enables researchers to understand how past experiences shape D-III athletes' non-disclosure and the reasons surrounding that decision. An athlete's environment may influence concussion reporting behavior by observing outcomes after a teammate reports a concussion. As outlined by the tenets of SCT, the setting could influence the athlete's behavior. D-III athletes are in a unique position within the world of sports and studying this unique population may uncover

what can be done to increase concussion reporting behaviors of student-athletes at smaller, under-resourced institutions.

Theory Guiding the Study

Bandura (1977a) proposed the Social Learning Theory in 1963 and renamed it the Social Cognitive Theory (SCT) in 1986. The SCT allows the researcher to examine concussion reporting behavior in D-III athletes through an interactional, triadic, reciprocal relationship. Figure 1 shows the model of SCT. Applying SCT to concussion reporting behavior explores the unique interaction of cognitive, environmental, and behavioral influences on D-III athletes' concussion reporting behavior. Reciprocal determinism enables researchers to understand how past experiences shape whether D-III athletes decide to report a concussion and the reasons surrounding that decision. Cognitive stimuli on behavior are one's ability to process information, apply knowledge, and change preferences, including the following four constructs: (a) self-efficacy, (b) collective efficacy, (c) outcome expectations, and (d) knowledge. Environmental influences on behaviors are an individual's physical and social factors in the environment that influence behaviors, including the following primary constructs: Observational Learning, Normative Beliefs, Social Support, and Opportunities and Barriers. Lastly, the behavioral factors concern the actions taken as either health-enhancing or health-compromising, including three primary constructs: Behavior skills, Intentions, and Reinforcement and punishment. The constructs included in the current study are outlined in Table 1.

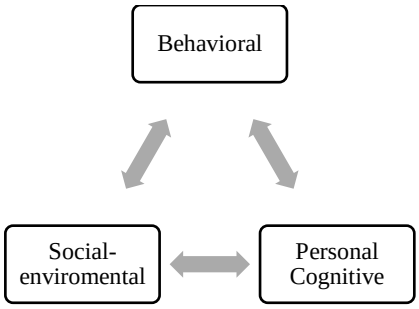

Figure 1. Model of Theoretical Framework – Social Cognitive Theory: Reciprocal Determinism.

Table 1

Key Constructs and Definition of the Social Cognitive Theory

Construct	Definition
Outcome Expectation	Expectancy of the plausible outcomes that would follow because of engaging in the behavior
Self-Efficacy	Self-assurance is one's capacity to pursue a behavior
Normative Beliefs	Cultural norms and beliefs about the social acceptability and perceived prevalence of a behavior
Social Support	Perception of encouragement and support a person receives from their social network
Behavioral Skills	An individual's understanding of the significance of the behavior and understanding of how to perform the behavior

Adapted from "Self-Efficacy: Toward a Unifying Theory of Behavioral Change" by A. Bandura, 1977, *Psychological Review, 84*(2), 191-215, and from M. Sharma and J. A. Romas, 2012, *Theoretical Foundations of Health Education and Health Promotion* (2nd ed.). Copyright by A. Bandura, M. Sharma, and J. A. Romas. Adapted with permission.

An athlete's environment may affect concussion reporting behavior by influencing how he observes outcomes after reporting a concussion. Researchers have used the SCT to understand behavior concerning physical activity, weight loss, and breastfeeding (Carlson, 2010; Edwards et al., 2018; Liebl et al., 2016; Michalsen et al., 2020). As outlined by the tenets of SCT, the environment could influence the athlete's behavior. For example, an athlete can witness a teammate reporting a concussion and

receiving isolation or rejection from social support networks, swaying the probability of that athlete reporting a concussion. Media adds complexity to the athlete's situation. Athletes can access personal experiences and teammates' experiences with concussions, but professional athletes' actions also may influence their attitudes and behaviors.

Thus, it is possible that environmental factors can contribute to the shame connected to concussion reporting. Researchers understand the need to apply other health behavior models to understanding concussion reporting behavior and try to understand the gaps in the literature (Kerr, Register-Mihalik, et al., 2014; Emily Kroshus et al., 2014; Register-Mihalik, Guskiewicz, Mihalik, et al., 2013; Weber Rawlins et al., 2020). Players, coaches, and athletic administrators operate with a smaller budget at the D-III level, increasing the importance of this study to maintain the health and safety of the student-athletes competing at the D-III level. It is essential to explore concussion reporting behavior through reciprocal determinism. With an increased understanding of concussion reporting behavior through the lens of SCT, NCAA coaches, and administrators can create theory-based interventions that positively impact concussion reporting. NCAA players' voices matter in this discussion, and the D-III football player has a unique perspective because they are not on a full scholarship with professional aspirations. Henceforth, factors influencing concussion reporting through the SCT can add to the current literature.

Purpose of the Study

This study aims to add to the previous research on the application of SCT in understanding concussion reporting behavior and explore the culture of concussion-

reporting behavior in D-III football players through the application of SCT. The goal is to apply the qualitative ethnographic approach to examine the cognitive, environmental, and behavioral factors influencing concussion reporting behavior in D-III football student-athletes. What is true for football players at D-I and D-II levels might not be the case for D-III athletes. The constructivism theory applied here will enable the participants to convey their lived experiences and how time and observations have shaped their responses. The culture of D-III includes a unique set of beliefs, values, and behaviors that influence actions. The lack of research aimed at understanding how reciprocal determinism influences D-III athletes' concussion reporting behavior provides an opportunity to examine the cultural context of concussion reporting behavior at the most vulnerable level of competition. The proposed research seeks to utilize the constructs of SCT to study concussion reporting behavior as it relates to D-III football players through observation, interviews, and literature review (Bandura, 1977a). This research aims to support the creation of theoretically based interventions designed to increase concussion reporting behavior in D-III football players and to change the cultural narrative concerning concussion reporting behavior at all under-resourced institutions where student-athletes engage in high-impact collision sports through the application of reciprocal determinism. The researcher will explore concussion culture at the D-III level through one-on-one 45-60 minute interviews, observations, and an exhaustive literature review.

Research Questions

The following questions are based on constructs of the SCT and provide a framework for this qualitative study:

- Question 1: What are D-III football players' outcome expectations (i.e., consequences) about concussion reporting, and how do these expectations affect their behavior?
- Question 2: What are D-III football players' perceptions of self-efficacy about concussion reporting, and how do these perceptions affect their behavior?
- Question 3: What are NCAA D-III football players' perceptions of normative beliefs about concussion reporting behavior, and how do normative beliefs affect their behavior?
- Question 4: What are NCAA D-III football players' perceptions of social support about concussion reporting behavior, and how does social support affect their behavior?
- Question 5: What are NCAA D-III football players' perceptions of behavioral skills about concussion reporting behavior, and how do behavioral skills affect their behavior?

Significance of the Study

D-III football players suffer more concussions than Division I and II football players, yet minimal research experience explains the unique triadic interplay between internal and external factors. This study will explore the cognitive, environmental, and behavioral factors influencing concussion reporting behavior in D-III football players. It

is unclear whether these athletes experience the same pressure from coaches and teammates to stay in the game. Going D-III does not increase the odds of playing professionally. Still, D-III football players are not reporting concussions half of the time. D-III programs are much smaller, and limited training staff could be a reason for non-disclosure, but there is little research concerning this possibility. Many of these programs possibly play with outdated equipment and on the inadequate field with potholes, increasing injury chances.

Additionally, the application of the SCT as a means of better understanding how reciprocal determinism influences and affects concussion disclosure in D-III football players could lead to theory-based interventions to help change the concussion disclosure culture at the D-III level. Thus, this dissertation can help prevent concussions at the D-III level with interventions aimed at the SCT tenets if done correctly. The application of SCT ensures that the research identifies cognitive influences and provides insight into environmental and behavioral factors influencing concussion reporting in D-III football players, ultimately offering researchers and practitioners areas of focus needed to affect behavior change. The findings from this qualitative study will equip the NCAA and D-III administrators with the impediments to concussion reporting behavior, thus empowering policy development to change the culture. The policies and interventions developed can use SCT tenets to create a healthier playing environment and reduce the risk of further head injuries. This study will show the differences in factors influencing concussion disclosure between the mounds of research focused on D-I and D-II athletes and the D-III athlete. Findings from this research can likely be generalized in high schools as well.

Procedures

The aim of this study was to gain a deeper understanding of how cognitive, environmental, and behavioral factors influence the reporting behavior of D-III athletes who have suffered a concussion. This study utilized a focused ethnographic qualitative research method. This approach explored the athletes' cultural context. The goal here was to understand the unique triadic interplay that influenced concussion reporting behavior of D-III athletes by listening to their narratives and immersing oneself, as a researcher, in the social network to understand their true meanings (Roper & Shapira, 2000). Researchers use ethnography to describe concussion culture (McGannon et al., 2013; Wan & Nasr, 2021). Ethnography commonly uses three data collection approaches: observation, interviews, and examining relevant research (Cruz & Higginbottom, 2013). Instead of observing athletes, ethnography attempts to learn from a group of them (Spradley, 2016).

Research Design

The qualitative research method for this study included semi-structured interviews, observation, and a literature review. Merriam and Tisdell (2015) argues that qualitative research utilizes constructed knowledge created through experiencing and developing meaning based on unique experiences and phenomena. Qualitative research was best suited for this study because it allowed participants to communicate their experiences from their cultural perspectives through the SCT application. The ethnographic method is qualitative, inductive, and exploratory. In this study, the researcher was able to describe concussion reporting in D-III football players accurately.

The ethnographic research design included data collection through gaining entrance to the culture, immersion into the culture; interviewing participants; gathering data by direct observation & interaction with participants. Triangulation is essential since one method is rarely reliable on its own. The role of the researcher was of a "participant-observer," which allowed for total immersion as a part of the group (and the group is aware), so one can experience directly what the players were experiencing. The analysis of this data describes characteristics of the culture associated with concussion reporting behavior in D-III football players.

Limitations and Delimitations

1. Due to the small sample size, the results of this study cannot be generalized to other groups.
2. Participants in this study could have had a natural bias towards concussion reporting, thus presenting a personal preference.
3. This study was limited to those willing to participate, resulting in the absence of data from those unwilling to share their perspective.
4. Participants in this study might have been more conscious of their health because of their recent pre-season physical examination, presenting the potential for skewed findings.
5. Self-reported data can be unreliable as the participants interpreted questions from personal experience and education.

Definition of Terms

behavioral factors: the actions taken by individuals that are either health-enhancing or health-compromising.

cognitive factors: an individual's ability to process information, apply knowledge, and change preferences.

concussion: also known as mild traumatic brain injury, a concussion is characterized by an impact (or other application of force) to the head that triggers disruption of normal brain function (Nilsson & Pontén, 1977; Singla et al., 2019; *Traumatic Brain Injury & Concussion*, 2019).

concussion reporting behavior: the act of reporting concussive symptoms.

environmental factors: an individual's physical and social factors in the environment that influence behaviors.

National Collegiate Athletic Association (NCAA): a member-led organizations dedicated to college athletes' well-being and lifelong stress (Gulliver et al., 2012).

Division-III (D-III): the small and generally under-resourced athletic programs.

reciprocal determinism: the dynamic and reciprocal interaction of a person, environment, and behavior.

social cognitive theory (SCT): explores the social influences on internal and external social reinforcements (Bandura, 1977a); also explores cognitive, environmental, and behavioral influences on health behavior.

student-athlete: a full or part-time student of a university or college who is eligible and engaged in intercollegiate sport.

Summary

Student-athletes at the D-III level are subject to higher odds of concussion, but still, 50-75% of concussions go unreported, yet the cultural experience at this level has been uncharted. In addition, football players at this level are participating with different goals than their peers at the D-I and D-II levels. Still, football is a collision sport regardless of the level of play, meaning concussion health is just as important. Therefore, exploring concussion reporting behavior in D-III football players through reciprocal determinism can illuminate the lived experiences of student-athlete health at the most under-resourced level of play in the NCAA. The findings from this qualitative research study will explore the cognitive, environmental, and behavioral factors influencing concussion reporting behavior. In turn, administrators can create theory-based interventions aimed at the impediments of concussion reporting behaviors in D-III football players. Through qualitative research, this study aimed to explore the dynamic, triadic interplay of cognitive, environmental, and behavioral factors that affect concussion reporting behavior in D-III football players.

CHAPTER 2

LITERATURE REVIEW

This chapter aims to provides a thorough analysis of the literature on concussion reporting behavior among college student-athletes and, more specifically, focused on the D-III football players through the application of the SCT. This review explores previous research on sports-related concussions, concussion reporting behavior, NCAA Concussion Education and Management D-III athletics, and the application of theory to understand concussion reporting behavior in D-III college athletes.

Literature Search Strategies

The literature review used the following databases and search engines: PubMed, NATA Online Journals, UAB Lister Hill Library, ScienceDirect, and Google Scholar. In addition to these databases, the NCAA Research website was used to attain information specific to the level of competition. The following keywords were used during this literature review search process: (a) sport-related concussion, (b) concussion, (c) concussion reporting behavior, (d) concussion reporting behavior in athletes, (e) concussion reporting behavior in football players, (f) concussion reporting behavior in division III athletes, (g) Division III football health, (h) Division III health, (i) NCAA Division III player health, (j) theory of planned behavior and concussions, (k) health belief model and concussions, and (l) social cognitive theory (SCT) and health behavior.

Historical Background

History of Concussion

Researchers have examined the short- and long-term implications of head injuries for centuries before major reviews concerning this matter showed up in 1870 (S. T. Casper, 2018). With all its new roads, railroads, noisy factories, gigantic construction zones, and a relatively new understanding of worker protection, the industrial world was a perfect mixture for the accumulation of head injuries. The first studies that examined head injuries focused on the impact of railroad accidents(Erichsen, 1867). Early on, researchers agreed there w a range of temporary and permanent impairments caused by HIs (Page, 1901). Moving forward, World War I and II increased the knowledge of pathophysiology into the mechanisms and results of head injuries because there were thousands of soldiers with a history of chronic head injuries due to proximity to explosions or being buried alive (Shephard, 2001).

Outside the requisite work and war environment, head injuries were also reported in leisure activities. Researchers expressed the brutality of collegiate-level football as early as 1890 ("The Perils of Football," 1891). By the late 19th century, head injury research started showing up in sporting and automobile accidents, grabbing the attention of researchers curious about head injuries sustained in contact sports. American football was a relatively new sport popular on Ivy League campuses. William Harvey, a former football player at Penn, wrote, “The only serious injury I received was in the game with Harvard in 1883 when in a scrimmage behind the goal I was knocked insensible, but recovered in about fifteen minutes” (Harrison, 2014). The game was ruthless, causing some to question the humanity of the game. Harvey went on to say in response to a

survey about the safety and appeal of football that in the following summer, “I was sick with blood gathering in the head and threatened with congestion of the brain, my illness being attributed by the Doctor to the above incident” (Harrison, 2014).

Moving forward, head injuries continued, and the public and players knew the dangers of the new sport, which blended English rugby and soccer. The sport, popular amongst the most elite American colleges, started seeing players die due to injuries sustained due to football. The sport came to be known as America’s most risky pastime. The game got so violent that the Harvard faculty intervened twice in 1885 and again in 1895. Former President of Harvard, Charles Eliot, argued against the moral quality of the game that subjected young men to war-like conditions handing over the weaker to the stronger. Ultimately, it was not enough to eradicate the sport. Football advocates and committees argued that football players assume the same risk that soldiers assume on the battel field (Harrison, 2014). This early concussion crisis was averted through efforts that appealed to Americans' appetite for violence, shifting the attention to reforms that addressed more visible and immediate injuries and legitimizing football within morally reputable institutions.

In the 1950s, boxing's head injury challenges became prominent (Casper, 2018b). During this time, the researcher started using the phrase “punch drunk,” describing the effects frequently suffered by boxers who have taken too many hard blows to the head. These researchers argued that successive blows had a cumulative effect (Gross, 1958). Gross pointed out in his early work that helmets were crucial to protecting against HIs. Thus, football survived its first crisis by getting promoters to make football perceived contributions to society more significant than its risk. As a result, football advocates

focused on rule reform and enhancements to equipment. The helmet transitioned from a leather headgear to a plastic hard-shell helmet, which was first required in 1939, with helmet manufacturers adding the facemask in 1956. The goal early on was the prevention of skull fractures, as opposed to concussion prevention. In the 1970s, air bladders were added to "energy-absorbing helmets," and four-point chin straps were required at the college level in 1976. However, the helmet standards remained unchanged in their focus on preventing skull fractures for nearly five decades. It was not until 2019 that the National Operating Committee on Standards for Athletic Equipment (NOCSAE) required concussion-prevention characteristics to its standards (NOCSAE, 2018a). Still, even NOCSAE declares that no helmet completely prevents concussion (NOCSAE, 2018b).

Sports-Related Concussions

By the mid-1990s, concussions were back in the news again. Leading up to the 1994 Super Bowl, Dallas Cowboys' quarterback Troy Aikman suffered a concussion, again shining a light on the dangers of concussions in the National Football League (NFL) (Litsky, 1994). The concerns revolved around his ability to take the field and play in the Super Bowl. Aikman played, effectively quieting the football critics' fears over the harmful effects of concussions. With time, there have been new regulations, new brain imaging technologies, and more attention to youth sports injury, with Riddel Sports producing a new helmet in 2002 that claimed to reduce concussions. These improvements have indeed led to more protection, but it has not been able to solve the public health problem. In 2010, the NFL placed risk in the hands of the players by requiring all NFL organizations to hang posters in the team lockers that outlined the risk of concussions.

The risk effectively became that of the player and not the organization's liability. By 2011, the new helmets offered no more than impact indicator chin straps which collected data on concussions that continued despite improvements to helmet design (Harrison, 2014).

In the U.S., 1.6 to 3.8 million athletes report suffering from concussions annually (Miyashita et al., 2013). Since concussions are difficult to diagnose, many researchers believe these estimates are severely understated (Langlois et al., 2006). High-impact sports or collisions are prevalent in the U.S. For example, the NCAA reports that over one million high school students and 73,000 college students annually participate in football (NCAA, 2022a). Injuries, including concussions, are commonplace in football, but what makes concussion different is that it is complicated to diagnose and is individually subjective. There are many signs and symptoms, the duration of time one has to cope and recover varies, and the severity level varies from person to person. Concussion side effects include headache, dizziness, fatigue, and light sensitivity, after a head blow (Llewellyn et al., 2014). Multiple systems can also be affected including vision and vestibular, which elicit even more signs and symptoms, but which are often hard to describe (Master et al., 2015; Mucha et al., 2018).

These variables make it challenging for athletic trainers, coaches, and team physicians on the sidelines during football practices, scrimmages, and games to diagnose and manage post-concussive symptoms quickly. Furthermore, concussions are a type of MTBI, which is "the rapid onset of short-lived impairment of neurologic functions that resolve spontaneously and is caused either by a direct blow to the head, face, neck or elsewhere on the body with force transmitted to the head" (Omalu et al., 2005). During a

concussive event, the brain is struck with such force that it shakes within the skull causing neurological changes in the brain. For example, Dr. Omalu communicates the fragility of this occurrence by comparing the brain inside of one's skull to the yoke inside of an egg. The brain's neurons are subsequently stretched, thinned, or torn as part of a neurometabolic cascade where supply and demand do not meet (Giza & Hovda, 2001). Furthermore, a national sample of student-athletes participating in the NCAA estimated the overall concussion rate was 4.47 per 10,000 student-athlete exposures, resulting in 10,560 concussions annually (Zuckerman et al., 2015). NCAA argues that the concussion rate doubled from 0.17 per 1,000 athletic exposures in 1988-1989 to 0.34 per 1,000 in 2003-2004 (Daneshvar et al., 2011).

Concussion Reporting Behavior

Non-disclosure in student-athletes suggests that 50-75% of concussive events are unreported (Llewellyn et al., 2014; McCrea et al., 2005). At the collegiate level, it is common for football student-athletes to continue playing despite concussive signs and symptoms (Kaut et al., 2003). "Bell ringer" and "seeing stars" are brushed off as just a part of the game with many athletes not believing or realizing that these are concussions, and therefore these go unreported (Valovich McLeod et al., 2008). Competition can be a very emotionally gripping experience, so many athletes may recognize concussive signs and symptoms in the heat of competition but still choose non-disclosure to continue participating (Kerr, Register-Mihalik, et al., 2014; McCrea et al., 2005). Research continues to indicate the importance of social support from parents, coaches, and

teammates concerning concussion disclosure (Kneavel et al., 2019; Kroshus et al., 2014; Register-Mihalik et al., 2018).

Concussions are complex and subjective but can be severe and have detrimental short- and long-term health outcomes. More concerning is that the odds of concussion reporting diminishes the more concussions an athlete experiences (Baugh et al., 2019). The struggle revolves around the dynamics of a concussion because the signs and symptoms are often not readily observable. For instance, the team physician cannot diagnose a headache or dizziness without information from the athlete, reinforcing the essential need for concussion disclosure. Unfortunately, some assume football is a gladiator sport, so it would not surprise most people that research argues that football players are the least likely to report a concussion (Delaney et al., 2015). Furthermore, concussions in college football vary by position and are more common in defensive linemen and tight ends (Baugh, Kiernan, et al., 2015).

Reasons for non-disclosure vary, but there are ordinary circumstances for why student-athletes do not disclosure concussions, including fear of missing out on a future opportunity, not wanting to leave the competition, lacking understanding of the severity of a concussion, not wanting to let teammates and coaches down, and not want to be seen as weak or inadequate (Davies & Bird, 2015; Delaney et al., 2018; Kerr, Register-Mihalik, et al., 2014). The following section will explore studies that examined concussion reporting behaviors and their findings.

Kroshus, Garnett, et al. (2015) examined whether perceived team concussion reporting norms would be less supportive of an individual's safe concussion symptom reporting behavior than objective team norms. The researchers created a survey built on

the social norms theory, and 328 male and female collegiate athletes completed it in the spring of 2014. In both gender groups, team concussion reporting norms were significantly misperceived, with athletes tending to think they have safer attitudes about concussion reporting than their teammates. Unfortunately, the authors did not communicate the division but stated that ice hockey and football were not included in the sample.

Kroshus, Baugh, et al. (2015) examined the influence of preseason concussion knowledge and reporting intentions on predicting in-season concussion reporting behavior. The study included 116 men's ice hockey players from one conference at the D-I level. These questionnaires showed no association between preseason concussion knowledge and in-season reporting behavior. Additionally, intention to report concussion symptoms was significantly related to in-season reporting behavior. The researchers suggest that reporting intentions may be more strongly predictive of reporting behavior than concussion knowledge. This study examined the perspectives of D-I men's ice hockey players, not D-III football players.

Kroshus, Chrisman, et al. (2020) used SCT to examine whether athletes with prior concussions were likelier to continue playing with concussive symptoms. Additionally, the researcher sought to explore whether reasons for concussion non-disclosure differed among athletes with a prior concussion compared to athletes without concussions. They collected this data through a cross-sectional survey administered to 328 collegiate athletes. Nonetheless, the findings suggest that athletes with prior concussions diagnosed had higher odds of relative risk of continuing to play with concussive symptoms during the most recent season when compared to their non-concussed peers. Additionally,

researchers noted that reasons for non-disclosure varied significantly. Through the application of SCT, researchers concluded that learning may have occurred due to prior diagnosis, but that was not enough to increase concussion reporting behavior. The researchers concluded that more research is needed to clarify why athletes with a history of concussions are more likely to continue to play while experiencing signs and symptoms. The study's target population included male and female athletes from soccer, lacrosse, baseball, basketball, field hockey, softball, and volleyball, excluding football. The researchers failed to disclose the participants' level of competition, creating a limitation in its applicability to the D-III football player.

Lempke, Rawlins, et al. (2020) aimed to explore the influence of socioeconomic status (SES) and academic achievement (high-school grade point average, American College Testing [ACT] composite score) on athletes' concussion reporting intentions and behaviors. The researchers conducted a cross-sectional study with 191 athletes-49% of participants were female. The findings showed no significant relationship between SES, GPA, or ACT and concussion reporting intentions. The researchers concluded that income status and academic achievement more not influence concussion reporting in college athletes. The study included only D-I athletes and did not consider the impact of these factors on D-III football players.

Davies and Bird (2015) sought to examine motivations for non-disclosure of concussion symptoms in college student-athletes. The researchers created a multiple-choice survey related to self-reporting concussive symptoms and reporting concussive symptoms of teammates. The study's results held that 45% of participants did not report their concussions during the season, and 50% did not report their teammates'

concussions. The participants' top reason for non-disclosure was a lack of perceived injury severity. The study's 193 participants were from an NCAA mid-size D-I institution, which limits its generalizability to the D-III setting, but 36.8% of the respondents were from football, skewing the results towards football players. Additionally, it does not appear that the researchers used a theory-based approach to survey creation.

In 2013, researchers examined the influence of knowledge and attitudes on concussion reporting behavior in athletes at the high school level (Mihalik et al., 2013). A cross-sectional survey was administered to 167 high school athletes via mail, with athletes from football, soccer, lacrosse, and cheerleading. Their findings suggest that only 40% of concussions and 13% of bell-ringers were reported. This study found a positive relationship between knowledge of concussion topic and reporting the prevalence of concussions and bell-ringers in practice, but not games. Additionally, there was a negative association between the athlete's attitude and decreases in the proportion of athletes that stated they participated in games and practices while experiencing concussion symptoms. However, the study cannot generalize the D-III football players due to its small sample size.

Additionally, the study validated survey instrument was not based on theory. Clark and Stanfill (2019) systematically reviewed barriers and facilitators for concussion reporting behavior among student-athletes. This study examined 878 articles finding 24 that met the inclusion criteria. The results revealed that the significant facilitators were female sex and younger age. The major barriers were fear of losing current or future playing time, a misconception that concussive injuries are not severe, a fear of letting the

team down, and a lack of knowledge of concussion signs and symptoms. The review included high school and college athletes, with no indication of a focus on D-III student-athletes. Additionally, the researchers suggested that future researchers include all data collection instruments in the publication. Finally, it is unclear the theoretical context of the 24 articles.

Milroy and colleagues (2020) examined factors associated with collegiate athletes' intentions to (a) self-report concussion, (b) report another athlete's concussion symptoms, and (c) encourage others to report (Milroy et al., 2020). The researchers used the integrated behavioral model to examine perceived norms, attitudes, personal agency, and perceived coach communication. The sample included 1,858 athletes and 254 coaches from 16 universities. Participants completed a web-based survey, and the results showed that bystander descriptive norms, positive reporting expectancies, concussion reporting attitudes, self-efficacy to communicate about concussions, and athlete's perception of their coach's communication were positively associated with all three outcomes. However, most of the respondents in this study were from D-I and D-II institutions, limiting their generalizability to the D-III concussion culture.

Researchers conducted a qualitative study to examine factors contributing to underreporting concussions in adolescent athletes (Cusimano et al., 2017). The study included interviews with 31 minor hockey players, 10 parents, six coaches, four athletic trainers, two managers, and one game official. The researchers found that an overemphasis on winning games and upheld misperceptions about the risk associated with concussions were the main reasons for non-disclosure. Additional factors associated with non-disclosure included players' motivation to win, being about the team, the

coach's motivation to win to further career prospects in the sport, and parents' financial interest or alternative motives. This study focused on hockey culture and not D-III football culture and is subject to response bias in the expressed perspectives of the study participants.

Chinn and Porter (2016) conducted a mixed-method explanatory designed study to examine to what extent collegiate student-athletes are knowledgeable on the topic of concussion, the relationship between concussion knowledge and reporting behavior, and factors contributing to non-disclosure after education has been provided. The researchers administered the Rosenbaum Concussion Knowledge and Attitudes Survey to 986 community college student-athletes representing six sports. As a follow-up, researchers conducted qualitative interviews using purposive sampling. The study concluded that concussion knowledge scores had a positive relationship with the volume of concussion educational sessions received, but there was no impact on concussion reporting. The highest reasons for non-disclosure were being in the game/practice and not realizing concussive symptoms at the time. Again, this study focused on community college student-athletes and may not apply to the D-III culture.

Researchers explored student-athletes' perspectives concerning factors associated with concussion reporting through qualitative study (Weber Rawlins et al., 2021). The researchers conducted 17 semi-structured interviews with student-athletes who had previously sustained at least one or more concussions while attending the university. The study unveiled three critical themes, including participants talking about concussion perception by elaborating on their understanding of concussion, their own injury experience, and their perceptions of symptom severity and duration. In addition, the

participants communicated that short- and long-term health consequences influenced the concussion reporting behavior. A large sample of these qualitative findings comes from female participants. The researchers also suggested that future researchers include individuals without a concussion history.

Delaney et al. (2015) administered a retrospective survey to 469 male and female college athletes at two Canadian universities. They aimed to examine why athletes elected non-disclosure of implicit concussion symptoms during games or practice. The survey's results communicated that 19.6% of the respondents played with concussive symptoms in the last 12 months. Within that group, 78.3% that played with concussion symptoms sought medical attention at least once. Football and ice hockey players were less likely to report their concussion symptoms. This study's main reason for non-disclosure was a lack of perceived injury severity and the belief that one can still play without significant repercussions. This study examined the impact of knowledge on behavior and accounted for external factors like whether a medical professional was present for games and practices. It is possible that medical personnel are not in attendance at every game and practice, hindering the option to report.

Kerr et al. (2016) conducted a cross-sectional study of 797 collegiate athletes, examining the prevalence of, and factors associated with, non-disclosure of recalled concussions in former collegiate athletes. The participants completed an online survey recalling any concussions sustained while playing sports in high school, college, or professionally and whether the concussive events were disclosed to others; over a quarter of respondents reported at least one sports-related concussion, and 33.2% when unreported. Football players were most likely to not report at 68.3%. Non-disclosure was

higher for males compared to females. The top reasons for non-disclosure included the following: not wanting to leave the game/practice (78.9%), not wanting to let the team down (71.8%), not knowing it was a concussion (70.4%), and not thinking it was severe (70.4%). The study focused on former athletes; the mean age was 35. It does not say what level of competition the participants played. This study is not generalizable to other populations due to the small sample size. Participants probably had recall bias in this study.

Lininger et al. (2021) sought to examine the individual- and team-level factors associated with concussion disclosure using a hierarchical linear model. Their multi-site cross-sectional study surveyed 248 D-I football players after the football season, examining self-efficacy, norms, concussion reporting, and negative reporting attitudes. Results found that almost 20% of the variability in concussion reporting intentions was associated with football program membership, and individual-level variables predicted 81% of the variability in concussion reporting intentions. Furthermore, reporting attitudes and self-efficacy of reporting were significant predictors of concussion disclosure intentions. The study focused on D-I football players and not D-III. It is not reasonable to compare D-I athletes to D-III athletes. The culture of football at both levels differs immensely.

Baugh et al. (2014) explored whether perceived support for concussion disclosure from coaches and teammates among college football players would differ by the athlete's year in school. Their second goal was to examine whether perceived support for concussion reporting was associated with concussion reporting behavior. The researchers used the theory of planned behavior to build a survey and administered that survey to 717

D-I athletes from 10 universities. Participants completed the survey in person. Ultimately, the results showed a significant difference in perceived coach support for concussion reporting by school year. In every case, first-year students supported concussion reporting more than their peers who were sophomores, juniors, and seniors through their coaches. There was no difference between athletes from different years in school in perceived teammate support for concussion disclosure. This study focused on D-I players and limited its applicability to D-III football players.

Baugh et al. (2017) examined D-I college football players' perceptions of risk of sustaining a concussion and concussion-related consequences in the future, whether those perceptions changed over time, and how concussion history related to perceived future risk of concussion and concussion-related health consequences. Athletes from 10 teams were surveyed in 2013 and from nine of those teams in 2014. The results showed that 40% of the athletes believed they sustained a concussion in the future. Only a fourth thought a concussion would cause them to miss a game in the future. One in 10 participants predicted dementia, Alzheimer's disease, or CTE would result from a concussion. Over the two years, athletes' perceptions of the risk of concussion and missing games because of concussion dropped significantly. Sadly, many participants believed they would have long-term health consequences due to concussions. Once again, this study focused on D-I players, not D-III players, who are at higher risk.

Baugh et al. (2020) examined college football players' perceptions of trust in their relationship with their sports medicine clinician, coach, and athletic departments and the athletes' perception/knowledge of conflicts of interest among those stakeholders. In all, there were 817 D-I players surveyed. Results indicated that athletes trust their sports

doctor (85%), coach (79%), and athletic department (75%). In addition, first-year students indicated greater trust than their upperclassmen teammates. Ironically, athletes with more trust had greater intentions to report, but more significant perceived conflicts of interest were associated with greater odds of non-disclosure. The findings from this study are not necessarily applicable to D-III players. Additionally, the study failed to identify the factors influencing trust and perceived conflict of interest.

Baugh et al. (2019) examined 296 D-I football players' injury reporting behavior from four universities. This study found that athletes were much less likely to report a concussion to a medical professional than another injury (47% vs. 80%). Additionally, the odds of reporting decreased as the accumulation of injuries and concussions increased, and no athlete reported more than four concussions. Again, this study focused on football players at the most competitive level with constant access to trust-medical professionals. This study is limited in its applicability to the D-III culture.

Kerr and colleagues summarized the factors associated with athletes' concussion reporting behavior within the context of the socio-ecological framework (Kerr, Register-Mihalik, et al., 2014). The systematic review returns 30 diverse studies representing athletes, coaches, high schools, and college-level findings. The intrapersonal factors included lack of knowledge, internal pressure, sex, and concussion history. The interpersonal factors included others' knowledge/attitudes, external pressure, and external support. The policy-level factor was related to concussion policy. The authors did mention that no study examined all four levels. The researchers stated that most studies have focused on the intra- and interpersonal factors, denying the importance of the environment and policies' impact on concussion reporting behavior. Corman et al. (2019)

applied the socio-ecological approach to examine the multiple levels of influence on concussion reporting behavior in 590 athletes. The researchers examined the individual-level vested interest of the athlete in concussion reporting and how these interests influenced the community-level factors, team culture, and interpersonal relationships, and social-level cultural narratives to influence concussion reporting behavior. The findings argued that immediacy, separation of responsibility, and pain-enduring story systems as essential variables. Corman and colleagues concluded that football players at the D-I level valued competing performance over safety, reflected in the cultural narrative and team culture, creating confusion for athletes concerning the importance of concussion reporting. Once more, this study focused on D-I players, limiting its applicability to D-III concussion reporting culture.

Ernst and Kneavel (2020) examined the culture of concussion reporting through a focus group that included eight men's lacrosse and seven women soccer players from the D-II program. This study probed thoughts, barriers, team culture, and what was needed to feel safe reporting concussion symptoms. Themes concerning concussion reporting behavior included being taken out of the game, pushing through, wanting to play, severity influencing reporting, unawareness of symptoms, changes due to the game because of concussion, reporting teammates, deception, wanting someone else to make the call, malingering, and wanting professors to be more understanding. This study examined lacrosse and soccer at the D-II level and therefore is not representative of athletes' perceptions at the D-III level.

The studies above confirmed that various internal and external factors influence concussion reporting behavior in athletes, but what role does the NCAA play in

concussion reporting? The following section will explore the NCAA's management and prevention strategies, scales and measurements, concussion education, and return-to-play protocol. It is important to remember that concussion management is left to the institutions. There is no cookie-cutter approach to concussion management, which creates inconsistencies amongst the various levels of play and within the levels themselves (Baugh et al., 2016). These disparities put D-III football players at even more significant risk of mal-treatment.

National Collegiate Athletic Association (NCAA)

Management and Prevention

The management of concussions within the NCAA has been under question for a while, but researchers can now argue that NCAA ATs are using a multi-faceted assessments approach to concussion management (Kelly et al., 2014; Lempke, Schmidt, et al., 2020). In the cross-sectional study by Kelly and colleagues, 610 NCAA Division I ATs completed an online survey, and the results showed that 71.2% of respondents used concussion-assessment protocol for baseline, 79.2% of respondents used acute concussion management, and 66.9% utilized to return to participation testing (Kelly et al., 2014). Furthermore, Lempke, Schmidt, et al. (2020) conducted a cross-sectional study with a random convenience sample of 1,307 ATs from NCAA institutions. They found AT assessed a median of 12.0 concussions annually, and 95.3% of ATs cited clinical examination as the most utilized concussion assessment tool, followed by symptom assessment at 86.7%. It is worth mentioning that the sample included 92 (7.0%) of AT that worked at the D-III level.

Scales and Measurements

If a student-athlete had a suspected concussion, one of the most common concussion-management protocols was baseline assessment which includes an assessment to evaluate balance, cognitive or mental status, neuropsychological performance, and other systems (Kelly et al., 2014). AT's most common balance assessment was the Balance Error Scoring System (BESS). The Team Physician typically performed neuropsychological performance. Additionally, most ATs reported using a symptoms checklist in the acute assessment of concussion. The most popular type of clinical assessment was cognitive screening questions (Kelly et al., 2014). These are assessments administrated on-site if a concussion is suspected, but it is worth mentioning that student-athletes know the assessments are forthcoming, enabling the preparation of some kind. There are several stories of athletes receiving assistance from teammates to complete these assessments successfully.

Concussion Education

Concussion Education comes in many methods, but in 2010, the NCAA mandated that all member institutions administer annual concussion educational materials to student-athletes (NCAA, 2014b). However, the delivery method is up to each institution, meaning the education curriculum could look different. As a result, Kroshus and Baugh (2015) completed a survey with 789 ATs representing 276 institutions and 325 athletes from four institutions and found that most institutions provided by ATs were through lectures and handouts. To support member institutions NCAA and the Department of Defenses published a consensus statement with 17 recommendations for enhancing

concussion education (Kroshus, Cameron, et al., 2020). In addition, the Centers for Disease Control and Prevention (CDC) and NCAA also partnered to create and disseminate online concussion protocol templates, an online evidence-based curriculum, and resources aimed at student-athletes in their first year of collegiate competition (NCAA, 2021a).

Return-to-Play

ATs and Team Physicians are responsible for the decision to return to participation most of the time (Lempke, Schmidt, et al., 2020). Individuals can recover in 7-14 days (Choe et al., 2012; McCrory et al., 2013). In prior research, professional athletes can return in 5 to 7 business days, but the average time for college student-athletes is 7 to 10 days, and 30 days for high school student-athletes (Collins et al., 2002; Guskiewicz et al., 2003; Pellman et al., 2006). McCrea et al. (2020) suggest that college student-athletes return-to-play has increased to 16.1 days. Baugh et al. (2016) found that D-I players had shorter return-to-play durations when compared to D-III athletes (9.13 vs. 10.31 days). Once again, ATs and Team Physicians are the primary decision-makers concerning an athlete's return-to-play readiness, and decisions are typically made individually. The National Athletic Trainers Association (NATA) requires that a student-athlete shall not return to play until complete remission of previously experienced concussive symptoms, completes a routine clinical examination, and successfully performs at pre-concussion baseline levels on neuropsychological and mental assessments (Broglio et al., 2014). A phased-approached is recommended upon return to play and is at the discretion of the AT and the Team Physician.

Division III (D-III)

To fully understand the ramification of the problem, one must be familiar with how college athletics is structured. The NCAA is divided into Divisions I, II, and III. D-I programs typically have larger student enrollments and athletic budgets. It is suggested that athletes at the D-I level are of the highest skillset and thus have better odds of going professional (NCAA, 2022a). The NCAA instituted D-III athletics in 1973 (Katz et al., 2015). The genesis of D-III came from environmental factors (i.e., increasing size discrepancy between public and private universities) that resulted in a growing disdain of the NCAA's smaller members. The NCAA website communicated the D-III Philosophy statement as follows:

> Colleges and universities in Division III place the highest priority on the overall quality of the educational experience and on the successful completion of all students' academic programs. They seek to establish and maintain an environment in which a student-athlete's athletics activities are conducted as an integral part of the student-athlete's educational experience, and an environment that values cultural diversity and gender equity among their student-athletes and athletics staff. (Division III Philosophy Statement, 2022)

The NCAA has 440 members at the D-III level of competition, including 195,000 student-athletes, making it the most significant division (NCAA, 2022b). The NCAA published findings show GOAL Study, short for Growth, Opportunities, Aspirations, and Learning of Students, that 85 percent of men and 80% of women student-athletes chose their D-III institution based on athletics (NCAA, 2019b). Self-reported data from the study show that football players week 31 hours per week on athletic activities during the season, but D-I football participants reported spending between 37-40 hours on athletic activities per week. With the time spent engaged in sports, researchers have long been curious about the role "athletic identity" might have on athletes. Athletic Identity is the

degree to which an individual identifies with the athlete role (Brewer et al., 1993). Because of this, researchers hypothesized that athletic identity might be more robust at D-I institutions, but research does not always support this claim (Sturm et al., 2011). On the contrary, the results showed that only gender was associated with identity, with females having a stronger student identity and holding lower perceptions of athletic identity than males. One study found that D-III athletes had significantly higher levels of athletic identity when compared to D-I athletes (Griffith & Johnson, 2002).

Guskiewicz et al. (2000) suggested that D-III athletes are at increased risk of concussion exposure. This may be because many players at the D-III level are known to play both offense and defense. This is common in high school but rare at the D-I or D-II level. In addition, increased play time in both games and practice may increase the risk of exposure to impact.

Each division has different rules regarding athletic scholarships. As mentioned, student-athletes at D-I and D-II programs are permitted to receive an athletic scholarship, but D-III football players do not receive an athletic scholarship, but 80% of participants receive some form of academic or need-based scholarship. The lack of financial incentive to participate, combined with increased odds of concussion and adverse long-term health outcomes, increases this study's importance. At the institutional level, finances may play another role in distinguishing D-I from D-III. In D-I, only 20/351 institutions made money off sports. Per NCAA reporting, 351 Division I institutions provided data to the NCAA Financial Information System (NCAA, 2021c). Generated revenues exceeded expenses in 2020 at 20 institutions. The median net positive revenue for those institutions was $7.4 million. For D-I schools, the median institution shows negative revenue of

approximately $19.3 million. In D-III, 191 schools provided data to the NCAA Membership Financial Reporting System (NCAA, 2021b). Generated revenues did not exceed expenses for any school in 2020. The median negative revenue for D-III was even more dismal than D-I at approximately $3.9 million. This suggests that few NCAA institutions profit from sports alone, but D-III may be losing more revenue each year than D-I, which may impact resources available to medical staff monitoring concussion in D-III.

Furthermore, researchers conducted a study examining D-III football players' nutritional knowledge and habits and found that their dietary habits may mitigate and increase the risk of chronic disease (Abbey et al., 2017). The athletes in this study relied heavily on the nutrition education of the athletic team staff. D-III athletes are in highly under-resourced environments leading them to depend on coaches for nutrition information, increasing the likelihood that information about concussions is contrived from an uneducated source.

Public Health Implications of Concussions

According to the CDC, an estimated 1.6-3.8 million reported and unreported traumatic brain injuries occur annually in the United States (*Traumatic Brain Injury & Concussion*, 2019). Langlois et al. (2006) think this number is grossly underestimated as most individuals who suffer mild or moderate traumatic brain injuries (TBIs) do not seek medical attention. CDC estimates the life economic cost of TBI, including direct and indirect medical costs, was estimated to be approximately $76.5 billion (in 2010 dollars) (Seifert, 2007). The mental health implications for individuals with sport-related

concussions are jarring. Rice et al. (2018) concluded through a systematic review of 27 articles a link between sport-related concussions and depression. Gouttebarge and Kerkhoffs (2021) found that retired football players reporting three or more concussions were three times more likely to be diagnosed with depression than those with no concussion history. Multiple concussion appears to be a risk factor for cognitive impairment and mental health challenges (Manley et al., 2017). Participants in one study demonstrated a relationship between sport-related concussions and poor-sleep quality (Raikes & Schaefer, 2016). Concussions can present various physical, psychological, and emotional symptoms (Baugh & Shapiro, 2015). With 70,000 college athletes playing football in the United States, this is the perfect mixture for a looming public health crisis.

Ultimately, the public health issue here revolves around the prevention of CTE, as characterized by McKee and Cantu in 2009, following Omalu's earlier work (McKee et al., 2009). This disease has been linked to collision sports like football and boxing and is represented in the 2015 motion picture "Concussion," starring Will Smith as Omalu. Repetitive blows to the head are believed to be responsible for neurodegenerative changes in the brain resulting in a progressive decline of memory and cognition, as well as depression, suicidal behavior, poor impulse control, aggressiveness, Parkinsonism, and eventually dementia (Omalu et al., 2011; Stern et al., 2011). In a convenience sample of 202 dead football players from a brain donation program, CTE was neuropathologically diagnosed in 177 players across all levels of play, including 110 of 111 former NFL players (Mez et al., 2017). Alosco et al. (2018) found similar results in 2011 out of 246 deceased football players diagnosed with CTE. These findings demonstrate the fragility

of the brain and how exposure to repetitive blows can have adverse long-term effects, not just on the individual but on the social support providing care.

Theory Relevant to Research Question

Social Cognitive Theory (SCT)

The Social Learning Theory, as it was first called, was developed by Albert Bandura in the 1960s and used to describe humans' learning process (Bandura, 1977a). Bandura intended to explain how humans use observation to learn certain behaviors. It was noted that just because learning has occurred equates to behavior adaption. In addition to observation, the learner must change to model the behaviors being observed, and Bandura elicited four conditions required for and in an individual to model another person's behavior: attention, retention, reproduction, and motivation. First, the person must be focused on the behavior without distraction. Second, the individual must be able to recall what was modeled. Third, the person must possess the ability to model the behavior in question. Last, motivation must be present to demonstrate the behavior being modeled.

Then in 1977, Bandura expanded this theory by adding the construct of self-efficacy, renaming it the Social Cognitive Theory (SCT). Self-efficacy revolves around an individual's perception of his or her ability to perform a behavior in question and the level of confidence an individual has in his or her abilities (Bandura, 1977b). Faith in one's ability is excellent but is hardly enough to spark a behavior change. The SCT argues that human behavior combines cognitive, environmental, and behavioral elements. Bandura argues that these three variables are always at work influencing each other,

which is reciprocal determinism. The (SCT) explores the social influences on internal and external social reinforcements. The SCT explores knowledge, outcome expectations, outcome expectancies, situational perception, environment, self-efficacy, self-efficacy in overcoming impediments, goal or self-control, and emotional coping. Within the SCT, these constructs above examine how learning has adapted over time while considering the person, environment, and behavior (Bandura, 1977a). Bandura posits that humans are actively involved in their development and possess agency in their actions. He noted, "what people think, believe, and feel affects how they behave" (Bandura, 1986). SCT has been used in medicine, communication, management, and psychology. Lent and Brown (1996) used SCT to examine career development. Lehr et al. (2005) used it to examine family communication about sexuality. LaRose and Eastin (2002) used SCT to explore online buying behavior. In addition, the SCT has been applied to examine several health behaviors such as physical activity, weight loss, and breastfeeding (Carlson, 2010; Edwards et al., 2018; Liebl et al., 2016; Michalsen et al., 2020).

The targeted SCT constructs that will guide the study include outcome expectations, self-efficacy, normative beliefs, social support, and behavioral skills (Sharma & Romas, 2012). The goal is to understand the D-III football players' experience with concussion reporting behavior and identify opportunities that would increase the probability of concussion reporting through SCT-based questions. The SCT explores the dynamic, triadic interplay of factors that influences football players' concussion reporting experiences, the behavior of coaches, teammates, athletic administrators, and the sports cultures regarding concussion reporting at the D-III level. The targeted SCT constructs that will guide the study include outcome expectations, self-efficacy in overcoming

impediments, environment, goal setting or self-control, and emotional coping. The research questions will focus on the above SCT controls (Kroshus, Chrisman, et al., 2020). The constructs which will serve as the focus of this study are explained more in detail in the following section.

Outcome Expectations

The expectations athletes hold can be both health and non-health related. It is usual for people to accept the outcome of their actions. Bandura (2004) argued there are three types of outcomes: (1) physical (which include positive and negative consequences of the behavior), (2) the outcome of social approval or disapproval of engaging or disengaging in the behavior, and (3) positive and negative self-evaluations. To change outcome expectations, practitioners can create an open dialogue about the potential outcomes of performing the behavior. In this study, football players at the D-III level hold certain expectations for reporting a behavior (i.e., being taken out of the game, missing a future game, and losing the respect of coaches and teammates). These expectations are rooted in what the athlete has seen or experienced in the past. Any combination of these examples could influence concussion reporting in D-III football players. If these outcome expectations are viewed as unfavorable, the likelihood of reporting a concussion is minimal. Research suggests that behavioral beliefs associated with the potential of losing playing time, letting the team data, and missing out on practices caused athletes to underreport concussions.

Self-Efficacy

Bandura (2004) stated that self-efficacy is behavior specific and is present, referring to the student-athletes ability to report a concussion successfully. The student-athlete must possess the proper knowledge to understand how and when to report concussive symptoms. Several researchers have identified self-efficacy as a critical influencer of concussion reporting behavior (Carpenter et al., 2020; Rawlins et al., 2020; Schmidt et al., 2019). The goal is to increase one's confidence or belief in their ability to report through mastery experiences, vicarious experiences, social persuasions, and emotional arousal. Self-efficacy is thought to be the most significant predictor in the SCT. Bandura noted that unless a person believes they can produce the desired changes independently, there will be little motivation to perform that behavior. There are four strategies recommended for increasing a person's self-efficacy, which include (1) breaking down the behavior into practical steps, (2) using a demonstration from credible role models, (3) using persuasion and reassurance, and (4) reducing stress.

Normative Beliefs

Bandura (1998) suggested that normative beliefs manage actions through social sanctions and self-sanctions. Behaviors that generate positive social reactions endorse social norms. On the contract, behaviors that violate social norms bring social censure. Normative beliefs convey the social norms of the group. This refers to one's cultural norms and beliefs about the social acceptability and overall perceived prevalence of the behavior in question. The perception of peers matters and can be used as the standard for all decision-making. For example, much of the research demonstrates that football

players are not reporting behavior of fear of letting down coaches and teammates; some athletes fear reporting because the coach makes them think less of the player, or the player might be seen as weak by peers. The player thinks other teammates suffer concussions too, and there is no need to report it because it is a normal part of the game.

Social Support

Guidance and social support at the onset of behavior change and maintenance enhance one long-term success (Bandura, 2004). Social support only benefits if it raises an individual's confidence in managing their daily situation (Bandura, 2002). Many researchers have indicated the importance of approval or disapproval of social networks (Cook & Hunt, 2020; J. K. Register-Mihalik et al., 2013; Register-Mihalik et al., 2021). Coaches and team members support and encourage concussion reporting, which increases intentions to perform the behavior. There are several ways to be supported: emotional, esteem, informational, and instrumental. A combination of these elements will support behavior change and increase self-efficacy.

Behavioral Skills

Bandura argued that a person must know what to do and how to do it (Bandura, 1989). People learn from the good and bad consequences of their actions, which impacts the environment in which they live. This construct refers to whether the individual understands the significance of the behavior and understands how to perform the behavior (Bk & Glanz, 2005). This can be accomplished through modes of self-monitoring, goal setting, feedback, self-reward, and self-critiquing. Many athletes chose

non-disclosure because of a perceived lack of severity. Unfortunately, student-athletes underestimate the magnitude of their concussive event. Much of this is likely due to the lack of knowledge about a concussion as perceived by the student-athlete. A way to change behavioral capability is by promoting mastery learning through skills training.

Applications of Social Cognitive Theory

Graf et al. (2021) used the SCT to determine the relationship between environment variables (age, gender, and sexual health conversations with practitioners), behavioral variable (self-efficacy), and cognitive variables (importance of sexual wellness) with the outcome variable of sexual risk behavior in a diverse 720 older adults age 50+ years. The results suggest that self-efficacy indirectly affected sexual risk behavior based on sexual wellness goal motivation. Secondly, healthcare provider conversations indirectly and directly impact older adults' sexual risk through sexual wellness goal motivation. Researchers concluded that environmental factors, perceptions, and prioritization of sexual wellness goals were more influential among older adults concerning sexual risk behaviors. This study shows that the unique interaction between environmental and behavioral variables can affect adopting a healthy behavior.

Silveira et al. (2020) used the SCT to conduct a qualitative study to understand exercise status and perceptions among 20 individuals living with Multiple sclerosis (MS) who used wheelchairs for mobility. The study showed that participants that exercised frequently reported high self-efficacy, consistent exercise knowledge, and numerous facilitators. In addition, all participants reported some positive outcome expectations and several barriers and facilitators. The researchers concluded that these findings could be

used to create interventions to increase self-efficacy, impart instructional materials, shape realistic outcome expectations, and provide more tools for overcoming barriers and identifying facilitators to frequent exercise. In this case, the SCT effectively exposed several environmental barriers and how cognitive factors influence exercise routines.

Harris et al. (2021) examined breakfast consumption within two work environments, military, and mining, through SCT. The researcher interviewed 12 military personnel and 12 mining employees to explore their breakfast consumption behavior at work and home and the associated behavioral influences. The interview questions used SCT constructs to explore this topic. The researchers found that cognitive and environmental factors influenced breakfast consumption. Interestingly, a negative stereotype associated with workplace institutional food services emerged as the main barrier to breakfast consumption for those already at work. Therefore, these researchers concluded the need to focus on creating areas where employees want to go and eat nutritious, quality, and appealing foods. The SCT was able to help unveil the environmental and cognitive areas that were impacting this health behavior that went behavior the individual-level factors.

Researchers explored the cultural relevance of SCT in creating physical activity interventions for African American women (Joseph et al., 2017). This qualitative study included nine women in a series of focus groups to examine how behavioral capability, outcome expectations, self-efficacy, self-regulation, and social support can be culturally tailored in creating a physical activity program for African American women. Regarding Behavioral Capabilities, these women were familiar with the among, intensity, and types of physical activity needed for a healthy life, and connected to Outcome Expectations, the

women associated physical activity with more energy, improved health, weight loss, and positive role-modeling behaviors. Women saw themselves as the primary barriers to physical activity, elicited through self-efficacy and self-regulation. All the participants recognized the need for a solid social support network, including friends, family, and other program participants. This study demonstrated how the constructs of SCT can be leveraged in the design of culturally relevant programs.

Application of Other Theories

The Theory of Planned Behavior and Health Belief model has been used to examine concussion reporting behavior. The Theory of Planned Behavior (TPB) has been applied to examine concussion reporting behavior in student-athletes (Carpenter et al., 2020; Emily Kroshus et al., 2014; Johna K. Register-Mihalik et al., 2013). TPB attests that the most important predictor of behavior is the intention to perform that behavior (McLeroy et al., 1988). In addition, Ajzen (1985) argued that behavior is connected to attitudes, subjective norms, and perceived behavior control. Previous researchers applying TPB to understand concussion reporting behavior argued that factors such as perceived behavior control and attitudes are significantly associated with performing the behavior (Lininger et al., 2021; Rawlins et al., 2020; Sullivan et al., 2021). Limitations of TPB include the denial of normative beliefs concerning concussion reporting. In addition, TPB does not account for sports-environmental influences surrounding concussions. Lastly, TPB posits that the decision to perform a report happens in a linear timeline and does not consider changes over time. Weber Rawlins et al. (2020) carried out The Health Belief Model (HBM) application to understanding concussion reporting. Their

convenience sample of student-athletes from three universities sought to understand constructs within the HBM that predict concussion reporting behavior. These constructs included perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (J. K. Register-Mihalik et al., 2013). Of these six, their findings concluded that cues to action predicted symptom reporting intentions, while perceived barriers, perceived benefits, and cues to action predicted concussion reporting intention. Ultimately, the researchers confirmed that the HBM failed at predicting symptoms or concussion reporting behavior. Several limitations exist concerning the HBM, including the inability to account for behaviors performed for non-health-related reasons such as social acceptability (i.e., social approval or disapproval from teammates and coaches). In addition, HBM does not account for environmental influences (i.e., absence of AT, poor equipment).

Current Empirical Literature Relevant to the Research Question

Football players at every level of competition within the NCAA suffer the risk of concussion exposure, but most research to date has focused on the culture and experience of the D-I athlete, although research argues that D-III football players are at a greater risk of concussion when compare to their peers at the D-I and D-II level (Guskiewicz et al., 2000). Still, researchers have not explored this phenomenon further; the risk of concussion exposure has steadily increased over the past couple of decades (Daneshvar et al., 2011). Additionally, researchers have found that former D-III athletes who had experienced a concussion while playing in college self-reported poor health and had higher odds of alcohol use in later life. In the short-term, concussion side effects include

loss of consciousness, feeling dazed or stunned, fogginess, persistent headaches, vertigo, lightheadedness, imbalance, memory loss, drowsiness, and blurred vision (Pellman, 2003). The adverse long-term health outcomes associated with an untreated concussion include irritability, aggression, depression, short-term memory loss, heighten suicidality, personality changes, Parkinsonism, and gait abnormalities with a delayed onset of about 8-10 years after post repetitive blows to the head (McKee et al., 2009). These findings reinforce the need to understand the culture of concussion reporting behavior at the D-III level in football players who are not on a football scholarship. Several studies have applied theories to understand and predict concussion reporting behavior in athletes, but none have applied the SCT to this health behavior to the researcher's knowledge. In response to this gap in the literature, the current student aims to add to the body of literature by providing concussion reporting behavior explored through the SCT, with a focus on D-III football players. The purpose of this study was to use the SCT to examine the concussion reporting behavior through the unique interaction of cognitive, environmental, and behavioral influences on D-III athletes.

Summary

The literature review provided a history of the concussion and how this traumatic brain injury can prominence in the early days of football at Ivy schools. History shows that concussions were a problem from the very beginning of the sport, but the football advocates were able to shift the American value system to endorse the value of the game over the harm. Next was a review of sport-related concussions and the sports world's response. The fan chose to focus on making better helmets and changing rules to make

the game safer, but concussions did not stop. Next, we review the various factors that influence concussion reporting behavior in sports. This review drew findings from the available literature and most research on D-I programs. The research shows that athletes are concerned about cognitive, behavioral, and environmental factors, but researchers have not used the SCT to examine how each element influences the other.

Next, this literature provided an overview of the NCAA's plan for prevention and management. The NCAA has mandated education but gives each institution freedom of interpretation and delivery, creating even more disparities. A brief review of the NCAA return-to-play literature helps confirm the need for this study with varying durations to recovery, possibly compromising the health of the D-III athlete. Then this chapter took a deep dive into the D-III level of play, where discrepancies were uncovered in budgets and scholarships and the level of time spent engaged in athletic activities. Next, there was a review of the public health implication of concussions. Research consistently shows adverse long-term health effects of concussions, negatively impacting the individual and social support.

Additionally, this chapter provided a thorough review of SCT and how its application to examine other health behaviors supports its usage in examining concussion reporting behavior because there has not been a research study to date that has explored reciprocal determinism influence on concussion reporting. The author did note that other theories have primarily been used to examine concussion reporting behavior, and those studies were listed. Finally, most of the research provided in this literature review is focused on D-I athletes, which is good but shows a gap in understanding this behavior in a more at-risk population. With D-III athletes making up most of the NCAA participants,

this research aims to fill a gaping hole in concussion research. Given that D-III athletes do no depend on athletic scholarships for college education, it is possible that findings from this research can be generalized to high school and youth league cultures as well.

The NCAA knows that student-athletes, specifically football players, do not disclose concussions. Each institution is responsible for providing concussion education. Concussion prevention and management of the concussions is left up to the AT and team physician, but D-III institutions are usually smaller, which could mean under-resourced. With the D-III institutions making up the most significant student-athlete percentage in the NCAA, there is a real sense of urgency to understand the concussion reporting behavior of D-III football and develop an intervention to target those influences to increase disclosure of concussive signs and symptoms.

CHAPTER 3

RESEARCH METHODOLOGY

The chapter outlines the methodology of this research study. First, it reviews the study's qualitative research design and rationale. Next, this section will explain the target population, setting, and recruitment strategy of the participants. Then, it will describe the instruments used in the data collection process and the interview protocol. Lastly, the chapter will summarize the description of the procedures for data analysis, including steps to ensure trustworthiness.

Research Design and Rationale

The D-III level makes up the majority of student-athletes competing within the NCAA, with over 195,000 students competing at 440 institutions (NCAA, 2022b). Most D-III male student-athletes decided to attend their institutions based on athletics (NCAA, 2019b). These athletes spend over 31 hours per week focused on athletic activities without any athletic scholarship because no athletic scholarships are at the D-III level. Still, Guskiewicz et al. (2000) reported that D-III student-athletes were at increased risk for concussions compared to the other NCAA competition levels. Despite these increased odds, the NCAA has not examined the culture of concussion reporting behavior at the D-III level.

Research from 191 D-III schools in 2020 showed that no school made a profit. In 2020, D-III schools lost $3.9 million annually (NCAA, 2021b). Their researchers suggest this cost could be construed as the cost to operate a football program. Lacking the finances could result in limited resources and personnel to create a culture conducive to concussion disclosure, but research is limited concerning this prospect.

Research concerning the factors that impact student-athletes concerning reporting behavior shows that many are not reporting concussions because these players fear losing out on future goals, not wanting to leave the game or practice, lacking the perceived severity of concussions, not wanting to let the team or coach down, and not wanting to be seen as weak or inadequate (Davies & Bird, 2015; Delaney et al., 2018; Kerr, Register-Mihalik, et al., 2014). Conversely, research regarding the reasons specific to D-III football players' concussion reporting experience is limited. In addition, most research focused on D-I, D-II, and high school student-athletes. Scant research explored D-III student-athletes' internal and external experiences concerning concussion disclosure.

This study aimed to use five constructs of SCT, outcome expectations, self-efficacy, normative beliefs, social support, and behavioral skills, through an ethnographic qualitative approach to explore how reciprocal determinism influences concussion reporting behavior in D-III student-athletes. The qualitative approach of this study utilized constructed knowledge from the student-athlete crafted based on their experiences and shaping meaning based on their unique experience and concussion reporting behavior (Merriam & Tisdell, 2015). The study was inductive and exploratory, using open-ended interview questions with the D-III student-athletes. The focused ethnographic approach aimed to provide a rich, holistic insight into the D-III athletes,

views, actions, and the environment of concussion reporting through the collection of observations and one-on-one interviews. In addition, the ethnographic approach enabled the researcher to explore the unique differences in how D-III student-athletes view concussion reporting. Qualitative research is conducted to explore a problem or issue that requires investigation. This exploration is necessary when studying a specific group or population, identifying variables that can be measured, and giving voices to previously silenced perspectives. Concussion reporting behavior is a complex experience riddled with emotions and thoughts, reinforcing the need to provide a complex, detailed understanding of this issue at the D-III level (Creswell & Poth, 2016). This study involved a specific target population in increasing knowledge of their lived experience connected to concussion non-disclosure. Ultimately, the study aimed to increase knowledge about why D-III student-athletes choose nondisclosure.

Target Population, Setting, and Recruitment

The target population of this study was a football team of approximately 140 student-athletes participating in football at a private university in the Southeastern United States. This institution was near the researcher, providing easy access to the participants, thus, facilitating multiple interviews and observation sessions necessary for the research design. In addition, the football players were in-season as the study advanced. Therefore, the cohort included 14 out of 140 male student-athletes between 18-24 years of age that were actively on the roster.

Institutional Review Board (IRB) approval was attained, and participant recruitment materialized in fall of 2022 (Appendix A). The researcher contacted the

athletic trainer to recruit participants and provided the IRB approval letter and consent forms for review. Following their review, approval, and agreement, the athletic trainer gave the researcher all the names and email addresses of student-athletes on the football team. The participants received a flyer created by the researcher explaining the details of the study (Appendix B). Additionally, the researcher recruited participants by passing out flyers, and interested participants connected with the researcher to participate in the study.

The researcher deployed a purposeful sampling process during the selection process. Maxwell (2012) argued that researchers use this sampling method in the event activities, individuals, or settings selected to provide data that cannot otherwise be collected. Conversely, it is challenging for the data to appear valid. However, it does not guarantee that participants' opinions and views will be represented. As a result, the researcher cannot form general opinions about the participants selected for the study based on the whole group from which the sample was collected.

Data Collection

The data collection process occurred over three months. The participants met the following requirements: a football student-athlete attending a small private university in the Southeast, age 18-24, and an active participant on the D-III football roster. The researcher provided the IRB approval letter and consent forms to the athletic department for review and pursued permission from the university's IRB. To protect the rights of all participants, personal and identifiable details are not revealed in the study, and all notes and recordings will be eradicated three years after the study's completion.

The researcher scheduled one-on-one semi-structured interviews with the participants. In addition, the researcher requested permission to host remote (virtual) one-on-one interviews via Zoom. Zoom allowed the researcher to record all interviews and review each interview multiple times for all verbal and non-verbal cues from the participants. For inclusion into the study participants had to be 18 and actively on the roster. Candidates who were not 18 or older were not eligible to participate. Informed consent forms were read and signed by each participant. Each interview was scheduled for one hour. The interviewer requested that the participants find an isolated and private location for the interview with low sound disturbance and few distractions to ensure the privacy of communication. After each interview, the participant was compensated with a $25 Visa gift card for their time. In addition, each participant was provided with the researchers' contact information for any questions. Afterward, the interviews were transcribed. To ensure proper representation, the researcher attempted to follow up with each participant with a summary of the interview, a review of the transcript, and a copy for each participant.

Semi-structured one-on-one interviewers over Zoom were the primary means of data collection for this study. Each interview was individual and in-depth, allowing each participant to express internal and external pressures. Each participant answered a set of open-ended question built on the framework of the SCT (Appendix C). In addition, these student-athletes explored their experience as D-III football players concerning the concussion reporting culture by providing answers through the interview protocol. Finally, these individual interviews permitted confidentiality for the participants engaged in this study.

Data Analysis

The data analysis for this study involved the researcher organizing, describing, and interpreting the data. The researcher used transcribed audio Zoom recordings to analyze the data of this study. This ensured that no information would be missing from the study. Merriam and associates (2002) argued that data collection and analysis should happen simultaneously during a qualitative research approach. Additionally, Merriam stated that the research findings can be organized with categories or themes that explain the data. To increase the study's dependability, the researcher utilized the code-recode procedure to analyze the data (Krefting, 1991). The researcher gave each participant a copy of their interview transcript before the analysis. Once the participants approved their transcriptions, the researcher coded the qualitative data. A code is a short phrase or word that illustrates a summative, salient, essence-capturing, or evocative attribute for a portion of language-based or visual data (Saldaña, 2021). The member-checking in this study ensured the credibility and trustworthiness of the study. To assist in the data analysis process, the researcher used a data analysis software, Microsoft Comment Tool, to organize, code, and interpret the data. Yin (2009) suggested that external validity determines a study's generalizability. In addition, the reliability of the studies concerns their ability to repeat similar results if replicated. Validity and reliability concerns are vital in every research and their ability to decide the quality of the study (Yin, 2009).

In the data collection process, it is crucial to address any potential bias of the researcher before the study starts. Including this section allows the researcher to recognize any presumptions from his prior experience and how those experiences might impact him during the data collection and analysis process. For example, the researchers

believed his prior background in college football would improve the study. However, there are validity measures to reduce potential bias.

CHAPTER 4

FINDINGS

This study explored the cognitive, environmental, and behavioral factors influencing behavior in Division III (D-III) football players. Additionally, this study examined reciprocal determinism's role in concussion disclosure behavior. The goal for completing this study was based on an in-depth literature review that revealed most concussion reporting behavior research targeted understanding the experiences of D-I, D-II, and high school participants. However, no research explored this behavior for D-III football players, whom research suggests are at higher risk for concussion exposure than their D-I and D-II peers. Therefore, this research study aimed to illuminate the lived experience of D-III football players regarding concussion reporting behavior through the Social Cognitive Theory (SCT) (Bandura, 1977a). Through an ethnographic qualitative approach, the study focused on five constructs outcome expectations, self-efficacy, normative beliefs, social support, and behavioral skills. The guiding questions for this research are the following:

1. What are D-III football players' outcome expectations (i.e., consequences) about concussion reporting, and how do these expectations affect their behavior?
2. What are D-III football players' perceptions of self-efficacy about concussion reporting, and how do these perceptions affect their behavior?

3. What are NCAA D-III football players' perceptions of normative beliefs about concussion reporting behavior, and how do normative beliefs affect their behavior?
4. What are NCAA D-III football players' perceptions of social support about concussion reporting behavior, and how does social support affect their behavior?
5. What are NCAA D-III football players' perceptions of behavioral skills about concussion reporting behavior, and how do behavioral skills affect their behavior?

This chapter aims to present the findings of the qualitative research study.

Participants

For this study, 14 football players at a D-III university in the southeast were interviewed via Zoom. It is essential to mention that the researcher completed all the interviews. Participants ages ranged from 18-22. All participants were male. The participant's self-reported grade point averages were between 2.9 and 4.0 (and one missing). Eleven (78%) participants identified as White, and 3 (21%) identified as Black. There were six participants from Alabama, five from Georgia, two from Tennessee, and one from Florida. Most of the participants (86%) did not identify as first-generation. Four participants classified themselves as freshmen (FR), five as sophomores (SO), two as juniors (JR), and three as seniors (SR). There was one participant who played on the defensive line (DL), seven participants played on the offensive line (OL), one quarterback (QB), two running backs (RB), one defensive back (DB), and two tight ends (TE). Five participants identified as being second on the depth chart, five identified as third on the depth chart, two identified as starters, and one identified as fifth on the depth

chart. Most of the participants identified as having no aspirations to play football professionally. When asked, "If you ever had a sport-related concussion, did you report it?" eight participants reported "yes," and six stated "no" (See Tables 2 and 3).

Table 2

Participant Socio-Demographic Information: Part One

D3FP Number	Age	Race	Cumulative GPA	Race	First-Gen Status
1	19	White	3.2	White	No
2	20	White	3.28	White	No
3	19	Black	2.9	Black	No
4	22	White	3.25	White	No
5	21	White	3.85	White	No
6	21	White	3.24	White	No
7	19	White	3.2	White	Yes
8	20	White	3.1	White	No
9	22	White	3.84	White	No
10	19	White	3.3	White	Yes
11	18	Black	-*	Black	No
12	18	White	4	White	No
13	20	White	3.32	White	No
14	19	Black	3.9	Black	No

Note: The missing GPA is due to participant 11's inability to recall.

Table 3

Participant Socio-Demographic Information: Part Two

D3FP Number	Classification	Position	Where are you on the depth chart?	Pro Aspiration	If you ever had a sport-related concussion, did you report it?
1	FR	TE	Fifth	No	Yes
2	JR	OL	First	Yes	No
3	SO	RB	First	Yes	Yes
4	SR	TE	Fourth	No	Yes
5	JR	DE	Second	No	No
6	SR	OL	Second	No	Yes
7	SO	OL	Second	No	No

8	SO	QB	Second	No	Yes
9	SR	DB	Second	No	Yes
10	FR	OL	Third	No	No
11	FR	OL	Third	No	Yes
12	FR	OL	Third	Yes	No
13	SO	OL	Third	No	Yes
14	SO	RB	Third	Yes	No

Note: These tables display participant demographic information for the (*n*=14) participants included in the study.

When asked to state the signs of sports-related concussion, dizziness was mentioned 13 times, sensitivity to light was mentioned eight times, headaches were mentioned six times, memory loss, nausea, confusion, and imbalance were all mentioned five times each, and blurred vision was mentioned three times, sensitivity to sound had three mentions. In addition, the following signs were mentioned once: lack of concentration and seeing stars (See Table 4).

Table 4

Frequency of Reported Signs by Participants

Signs Listed by Participants	Total Mentions
Dizziness	13
Sensitivity to Light	8
Headaches	6
Memory Loss	5
Nausea	5
Confusion	5
Imbalance	5
Blurred Vision	3
Sensitivity to Sound	3
Lack of Concentration	1
Head Spinning	1

Note: This table displays the signs reported by participants in the study along with the total number of mentions for each sign.

The study had several metrics that were used to measure its success. First, a total of 14 interviews were conducted as part of the study, yielding 6 hours and 51 minutes (411 minutes) of video (.mp4) and audio (.m4a) recordings with an average interview time of 29 minutes. This resulted in 434 transcript pages, providing a wealth of information for analysis. In addition to the interviews, four observations (one game and three practices) were conducted as part of the study. These observations lasted nine hours, providing additional data for the researcher (See Table 5). The observations provided an opportunity to witness first-hand how injuries were handled in real-time. The interviews and observations provided a thorough understanding of concussion reporting behavior through the lived experience of D-III football players.

Table 5

Qualitative Research Indicators

Qualitative Study Metrics	Total
Number of Interviews Conducted	14
Duration of Interviews	6 hours and 51 minutes
Mean Duration of Interviews	29 minutes
Number of Transcript Pages	434
Number of Observations Conducted	4
Duration of Observations	9 hours

Note: The table above displays the data gathered from the interviews, transcript pages, and observations analyzed in the study.

Concussion Reporting Behavior Defined

Concussion reporting behavior refers to the actions taken by individuals, such as athletes, coaches, and medical professionals, to document and report concussion incidents. This includes identifying and documenting symptoms, seeking appropriate

evaluation and treatment, and reporting the injury to relevant individuals, such as coaches and athletic trainers. This definition was crafted after an intrusive literature review (Delaney et al., 2002; Echlin, Tator, Cusimano, Cantu, Taunton, Upshur, Czarnota, et al., 2010; McCrea et al., 2005; Z. Y. Kerr et al., 2018). Furthermore, this type of literature review is called “intrusive” because the researcher closely examined the existing literature to comprehensively understand the health behavior in question. The researcher then synthesized the information to define concussion reporting behavior clearly and concisely. This process helped to ensure that the definition is based on the latest and relevant information available and accurately reflects the current knowledge in concussion reporting research. In addition, this research study uses concussion reporting behavior interchangeably with disclosure and nondisclosure. Therefore, when interviewing these D-III football players, it was vital to understand whether these candidates knew the signs and symptoms of a sport-related concussion.

Themes and Subthemes

The focus of the research study on D-III football players was to utilize a focused ethnography research method to understand better the athletes' cultural context concerning concussion reporting behavior. This allowed the researcher to explore the triadic interplay between the cognitive, environmental, and behavioral factors influencing the player's behavior. The data for the study was collected from 14 participants out of a pool of approximately 140 active student-athletes on the roster at the institution (10% participation rate). At this point, the researcher determined that no new information was being gained from additional data collection. In a focused ethnography study, the point of

saturation is reached when the researcher comprehends the cultural context of the participants and can adequately answer the research questions.

First, the researcher explored concussion reporting behavior by applying the SCT framework through semi-structured interviews. Each interview was recorded in video and audio. The audio was transcribed through the Microsoft Online Transcribe tool, allowing the user to upload the audio file (.m4a), and the software transcribes the audio. Afterward, the researcher cleaned each transcript by watching and listening to the video while following along with the transcript. Corrections were made to the transcript as needed. It is essential to mention that Microsoft Online Transcibe was not without errors. Therefore, the researcher spent significant time reviewing and cleaning each transcript. Next, the researcher reviewed each transcript multiple times to identify high-frequency words, phrases, and statements from the participants. These codes were labeled using the New Comments tool in Microsoft Word. From here, each of them was funneled into more prominent themes. The four themes that surfaced from the transcripts were as follows: (1) Concussion Impact, (2) Reporting and Managing Concussions on the Team, (3) Consequences of Reporting a Concussion, (4) Ensuring Well-Being and Avoiding Complications from Concussions (See Table 6).

Table 6

Themes and Subthemes

Theme	Subthemes
Concussion Impact	Seriousness and long-term effects Symptoms Difficulty functioning during recovery

Reporting and Managing Concussions on the Team	Team doctor and trainer role in management Athletic identity impact Culture of honesty and support Not all concussions are treated the same Education and support for recognizing and reporting concussions
Consequences of Reporting a Concussion	Not playing Academic consequences Risk of losing a spot on the depth chart (*e.g., If a player is starting, he is 1st string on the depth chart*) Letting the team down
Ensuring Well-Being and Avoiding Complications from Concussions	Ensuring physical and mental well-being Avoiding long-term damage Concerns about CTE effects on future quality of life

Note: The table above presents the four main themes and their respective subthemes that emerged from the research study.

Theme 1: Concussion Impact

The central theme of this section is players' perceived impact of concussions. The section will explore three subthemes: the seriousness and long-term effects of concussions, the symptoms associated with concussions, and the difficulty in functioning during recovery, which emerged from analysis of the D-III Football Players' (D3FP) responses to the interview questions. By examining these subthemes, this section aims to comprehensively understand players' perceived impact of concussions and the importance of proper care and recovery. The participants provided a range of responses when asked about their thoughts when they heard "concussion." They mentioned their thoughts on brain injury, head trauma, and long-term effects. They also mentioned symptoms such as headache, fogginess, difficulty functioning during recovery, and the importance of rest to recover. Overall, it is clear that the participants had a general

understanding of the negative impacts of concussions and the need for proper care and recovery.

Seriousness and Long-Term Effects

Overall, the participants in this study had a nuanced understanding of concussions, recognizing that there are different levels of severity and that their perception of the injury has evolved. They understood the seriousness and long-term effects of concussions and emphasized the importance of proper management to avoid long-term consequences. The participants also highlighted the impact of concussions on daily activities, noting how they can limit the individual's ability to participate in everyday routines. They understood that concussions are a type of injury that cannot be physically fixed and that recovery is a process that takes time.

As a participant, D3FP1 stated, “It's like a mental thing that you can't control. There's nothing physically like you can do like to fix it or anything. It takes time, relaxation, and rest to recover.”

Another participant, D3FP2, added,

> I just think a lot about...how there's different levels to it 'cause for the longest time to me it was either kind of like pregnancy. ‘You either have a concussion or you don't’ and to me that threshold was still kinda high, kinda like those symptoms I said needed to be pretty prevalent for it to be a concussion to me for a while until obviously, a lot more stuff has come out.

Furthermore, participant D3FP9 stated,

> I think for me it's a three to four-week-long injury. Minimum. Head trauma, and I think it's the most serious of all football injuries. When you really break it down. This is one of the things that can be long-term. I mean an ACL-yeah, that's all rehab. But you can't really rehab the brain if it happens too many times. The damage is done, and it's not really anything you can do to repair it if you don't handle it properly.

Lastly, D3FP10 stated,

> I think it was like time getting lost. Like, you can't really do a lot with a concussion. Like usually, depending on the severity of the concussion, you have to miss classes. You can't like workout or train. You can't, like, stay in shape or anything. You're pretty limited.

Symptoms

Participants in this study provided a broad understooding of the symptoms associated with concussions. In addition, the participants expressed concerns about long-term effects, cognitive abilities, overall health, and the importance of taking care of themselves and reporting a concussion if symptoms were present. These responses demonstrate the importance of educating athletes and the general public about the symptoms of concussions and the potential consequences if they are not reported and treated promptly; as participant D3FP4 stated,

> Like a traumatic brain injury or just you know your brain being hurt. I know like especially this year we've had a few concussions on the team, so people sit out. They're wearing sunglasses. They can't really see. Their eyes hurt looking at light, so I know that from it.

Participant D3FP6 added,

> It usually happens by, you know, very strong and fast impact to the head, and like I said, you can't function as usual. I know you can't have any exposure to bright light, loud noises, or things like that. So that's what you know. That's what comes to mind to me. Just a very severe head injury that can cause damage to the brain.

Furthermore, participant D3FP7 stated,

> First thing that comes to mind is potential brain damage, something to take seriously. Yeah, fogginess. Just a little bit of confusion. Your vision can be blurred. Sometimes those are all signs, and that's kind of what I think of when I see a concussion: a big hit or an uncomfortable landing. I feel like that always brings my attention to a head injury.

Participant D3FP8 stated, “For one, I just wanna make sure that I have a really good memory. That I can make really smart decisions. Notice little things. Be very observant. Attentive. Not have anger issues as well.” He also noted that he wanted to maintain his cognitive abilities to ensure he could continue to be observant and attentive. D3FP9 emphasized the importance of overall health and well-being over the short-lived football game. He stated he does not want to risk permanent damage affecting his ability to work and utilize his knowledge. He also emphasized the significance of brain function, which he considered one of their biggest strengths.

Participant D3FP10 responded that he would report a concussion, “If I felt like I thought I had a real bad concussion. If I need to get checked out for possible things getting worse. I'd probably report a concussion if I had trouble doing daily activities and stuff.” He mentioned specific symptoms such as trouble reading and difficulty paying attention as signs that a concussion might be present. D3FP11 reported that his health and wellness would be a driving factor in the decision to report a concussion. He noted the increased media attention surrounding traumatic brain injury and the potential for further harm if a concussion was not reported.

Participant D3FP12 stated,

> Definitely if my head was like in pain, like to the point where I couldn't stand it or to the point where it's not going away, and I feel like something maybe like really wrong other than just like maybe it's little nausea or just like a little hit.

Finally, D3FP14 reported that his primary motivation for reporting a concussion would be to protect his safety and brain. In addition, he emphasized the need to maintain his health and take care of himself.

Difficulty Functioning During Recovery

The participants in this study discussed the difficulties they faced when trying to function during recovery from a concussion. For example, participant D3FP1 stated that when recovering from a concussion, “it's more of like a mental thing that you can't; There's nothing physically like you can do like to fix it or anything. It takes time, relaxation, and rest to recover.” Similarly, participant D3FP2 discussed that he often had trouble thinking and retaining information when recovering from a concussion, noting that “it's gonna be hard to gain like knowledge and everything.”

Participant D3FP3 discussed his difficulties balancing his desire to play football with his need to recover from a concussion as he stated,

> Being at D-III, it's obviously not like they're going to take away your scholarship kind of deal. It's maybe not as much, at least in my opinion, that you know there is a huge consequence for reporting it, other than that we all play D-III solely off the fact that we love football.

Participant D3FP4 discussed the difficulties he faced in balancing his desire to play football with his need to recover from a concussion, with D3FP4 stating, “I mean, I can definitely see people not reporting them just so they can, you know, stay in.” Participant D3FP5 stated,

> Like you have to go through a process of you take these tests to see where you are and like along the concussion protocol. Once you pass that process, you have to go through how long it will take to get through it. Like heal up, and then once you're healed up, you have to go through, not like a conditioning test, but you have to recondition your body to go back into the field of play.

Finally, participant D3FP6 discussed that the consequences of not reporting a concussion could include the inability to play and the possibility of long-term damage to the brain. He noted that “it could be, you know, a couple weeks, it could be a couple months depending on the severity of it.”

In summary, the participants provided a range of responses, highlighting their understanding of concussions' seriousness and long-term effects, the associated symptoms, and the difficulty in functioning during recovery. In addition, the participants understood the importance of proper care and recovery and the negative impacts of concussions on daily activities. The ethnographic approach allowed a deeper understanding of the players' experiences and perspectives. At the same time, the SCT helped to identify how their understanding of concussions evolved.

Theme 2: Reporting and Managing Concussions on the Team

The theme of reporting and managing concussions on a D-III football team emerged from analyzing the participants' responses. The subthemes of the team doctor and trainer's role in concussion management, the impact of athletic identity, honesty, support culture, unequal treatment of concussions, and education and recognition are crucial in understanding concussion reporting and management. Regarding the team doctor and trainer role in management, the participants reported that these individuals played a crucial role in identifying and managing concussions. They emphasized the importance of trust and communication with these professionals and the need for clear protocols and guidelines for managing concussions. The participants also highlighted the need for proper education and training for players and coaches.

Team Doctor and Trainer Role in Management

Overall, the participants in this study understood the importance of proper protocol and procedures in managing concussions. They highlighted the significance of

the cognitive aspect of learning and functioning in daily activities and the need for proper assessment and monitoring of the individual's progress in recovery. The participants placed trust and importance on the team trainer and doctor in managing concussions, recognizing their expertise and role in providing a safe environment for players to report symptoms and seek medical attention. The team trainer is recognized as the players' first point of contact. Their expertise in assessing conditions and making recommendations for further medical attention is emphasized. The importance of proper management to ensure players return safely to the field of play is also highlighted. For example, participant D3FP1 stated, “You're going to sit out for games, I'm guessing. Trouble with school as well, because you're not gonna be able to learn because of your concussion, it's gonna be hard to gain like knowledge and everything.”

Participant D3FP5 stated,

> I mean, I wouldn't say much like a consequence, but you definitely have to go through a test. Like you have to go through a process of you, take these tests to see where you are. Once you're past that process, you have to go through how long it will take to get through it. Like heal up, and then once you're healed up, you have to go through, not like, a conditioning test, but you have to recondition your body to go back into the field of play.

Furthermore, participant D3FP7 stated,

> I want to go talk to my trainer. I've got a relationship with him. I liked him. I would first see what he thought. If he thinks I have a concussion, I would alert my coaching staff, which he would already do anyway. The trainer would already do that, but I would still let my coaches know and see a doctor, and then I would go with whatever the trusted doctor says.

Participant D3FP8 added,

> I would go straight to our trainer and tell him my symptoms and conditions, and I mean, we would start from there. But we'd probably take a concussion test to compare it. You know, a day or a week from now to see if I've improved.

Participant D3FP4 stated, “I can see people not reporting them just so they can, you know, stay in. Not lose their spot really so.”

Lastly, participant D3FP6 noted,

> I could say, you know, I guess you could say the consequences would be you're not going to be able to play. It could, you know, it could just be for, you know, a couple of days. Depending on the severity of it, it could be, you know , you know, a little while.

Athletic Identity Impact

Overall, the participants highlighted athletic identity's impact on concussion management decisions. The desire to continue playing and maintain their spot on the team can outweigh the potential consequences of not reporting a concussion. Team doctors and trainers need to be aware of this dynamic and work to create an environment where athletes feel comfortable reporting concussions without fear of losing their spot on the team or their athletic identity. D3FP2 specifically noted that because they are not on scholarship, they have a different perspective on football and do not want to miss time because they are “paying to do this” and that it is “just a really cool club that we have chosen to be a part of.”

Participant D3FP4 also discussed the potential consequences of not reporting a concussion, such as losing a week or two of playing time and potentially not getting their spot back on the team. D3FP1 said, “You're going to sit out for games, I'm guessing. Trouble with school as well, because you're not gonna be able to learn because of your concussion, it's gonna be hard to gain light knowledge and everything.” Participant D3FP3 mentioned that being at a D-III level, there may not be as much of a consequence for reporting a concussion, as scholarships are not on the line. However, he

acknowledged that reporting a concussion could minimize playing time, which could deter some athletes.

Culture of Honesty and Support

The "Culture of Honesty and Support" sub-theme emerged as an essential aspect of reporting and managing concussions on a D-III football team. The participants emphasized the importance of creating an environment where athletes feel comfortable reporting their injuries, including concussions, without fear of judgment or losing playing time. This culture can prevent the hiding of concussions and ensure that athletes receive proper treatment to prevent long-term negative consequences, as D3FP7 highlighted the adverse outcomes that can result from not reporting concussions and stressed the importance of having a supportive culture. He stated, "Hiding a concussion is not smart as it can have drastic consequences later on, but many athletes do not report it due to fear of missing playing time." D3FP9 also acknowledged the impact of a supportive culture, adding that "having someone who can rationalize and make things better is crucial."

Participant D3FP6 emphasized the importance of considering one's health when reporting concussions. He stated, "true teammates should support each other regardless of the decision." D3FP6 acknowledged that the future of one's health and life should be the primary concern in such situations but also noted that taking a temporary break from playing will not harm the relationship with one's teammates. He reassured that teammates understood that the player would eventually come back and give their full effort when fully recovered. Participant D3FP2 also discussed the importance of this culture in preventing the hiding of concussions. He stated, "I'm fortunate enough to have you know,

a staff and a team and a culture where they're making the right decision for him, and he made the right decision." Participant D3FP2 also discussed the importance of this culture in preventing the hiding of concussions. He stated,

> But in that specific moment I think that I also had a little feeling inside me that football just ended for me 20 minutes ago officially. I'm going; Why are you taking yourself out? Why are you doing this man? In the back of my mind, it's not suppose to end this soon, but I'm done. I'd give anything, like I can't let that stop me right now.

Participant D3FP2 also discussed the importance of this culture in preventing the hiding of concussions. He stated, "I think that's like, you know, kind of is the recurring theme that I have is I'm going to tell myself that it's OK."

Not All Concussions Are Treated the Same

These responses highlight the varying perspectives among the participants on when and how to report a concussion. While some participants emphasized the importance of reporting a concussion immediately after a big hit, others emphasized the importance of reporting a concussion when the symptoms persist for a longer time and are more severe. Regardless of their specific perspectives, all participants agreed that it is essential to report a concussion in some way, shape, or form; as participant D3FP1 stated,

> If the stars stay there for too long, you feel dizzy. That's when I feel like you need to report it because there's a difference between when it just stings for a little bit, and it goes away. Then when it's OK, I feel like this for a little minute. It's been about 10-15 minutes from that hit. I'm still feeling like this. Yeah, I need to go report it.

Participant D3FP3 noted,

> If they're like fairly bad, 'cause I mean everybody has gotten their bell rung before you know, getting hit pretty hard, but I mean if it's like kind of lingering and you know it's worse than usual when you just got hit pretty hard. I'd say that's about the time you should report it.

Participant D3FP5 stated,

> If your initial thought is this a big hit, OK, it's just a big hit. I'm fine like you're probably fine, but if you really have to think about it. Am I hurt or am I fine? If you're battling between that, you should probably go talk about it.

Participant D3FP3 further commented,

> I think it depends on person to person is kind of like what I said earlier about people maybe not knowing how that can affect you long term and stuff? And maybe it's also about the severity of each case. I guess.

Lastly, participant D3FP7 added,

> People since the beginning of football you know, since you were a kid, there's always been a hit where you get up, and you're dizzy, and you're like man, I just got my bell rung. People don't consider that to be concussion symptoms. They think that is all right. This is just football man. Everybody goes through this so.

Participant D3FP11 said,

> If you think it could be more than just a headache, then I think that's when they should report a concussion. Now, is that what I would do? Probably not. But to answer your question, it's probably when they should.

This participant emphasized the importance of reporting a concussion if there is a suspicion that it could be something more serious than just a headache.

Participant D3FP12 said,

> I would like to say right after it occurs, but I know realistically I would probably try to fight it for a couple of steps, but I would like to say right after or soon after it happens. Right after you see what happened. If you feel like you have a concussion after an experience like that, when your head starts hurting, then I guess OK.

Participant D3FP13 said, “If you feel any type of symptom of a concussion, just let somebody know. Maybe don't say it is a concussion but just tell them that you're having those symptoms and that they should be on the lookout.” This participant

emphasized the importance of reporting any symptoms related to a concussion, even if the player is unsure if it is a concussion.

Lastly, participant D3FP14 stated,

> I do believe like immediately after you get that big hit. If you're feeling it, obviously like make sure it just wasn't in the moment kind of thing where you just got knocked up a little bit and that's just part of football. But if it's continuing after a couple of seconds, then definitely go talk to the trainer." This participant emphasizes the importance of reporting a concussion immediately after a big hit, especially if the symptoms persist after a couple of seconds.

Education and Support for Recognizing and Reporting Concussions

The participants in the study emphasized the importance of education and awareness about concussions and their effects on health. They suggested that players should be educated on concussion symptoms and that coaches regularly remind players to report them. They also highlighted the long-term consequences of not reporting concussions and the importance of making players aware of them. They believed that by allowing players to report concussions on their terms, they would be more likely to do so, reducing the risk of long-term consequences. Making players aware of the consequences of not reporting concussions was also emphasized. This section will discuss the responses from the participants on the D-III football team regarding education and support for recognizing and reporting concussions.

Participant D3FP6 stated,

> I realize a lot of guys they don't realize you know that it can impact your life and your health so much, but you know, I've obviously. I've heard a lot about concussions and you know, going through high school and college, you have to do all of the like concussion tests and you know the readings about all of it and all that, and you know it's serious. It's a serious issue that's going on throughout football.

Participant D3FP12 emphasized the importance of communication and understooding between the football team and the administration, stating,

> I would like more communication between the football team and, I guess, or an administrator. Like more understooding of like the severity of the injury, I guess. More accessibility to like accessible schooling. After such an injury that probably will alter their ability to like do school at the time. So just more understooding between the two.

Participant D3FP7 noted the importance of education and awareness in encouraging players to report concussions as he stated,

> If people are educated about it and feel that they understand if they were to come to a trainer or coach, and even a suspicion. Like hey man, I was just really struggling in class today. I just don't feel the same. Right now I feel fine then that needs to be understood and they need to bring that to our attention or to somebody's attention.

Participant D3FP8 also highlighted the importance of education and awareness in encouraging players to report concussions as he stated,

> Whether it be in a team setting as a coach talking to my team or say a parent or even a friend. I would just tell the individual you know. Hey, I'm really excited about you know your college football. You've gotta have a great four years, hopefully, but being a contact sport, we have to talk about concussions, you know, and I would lay out the symptoms and the problems, but I would show them. Yeah, I would really kind of just explain it like OK, well you can play an extra few plays and then have such and such problems for the rest of your life. If you had a concussion and continue doing it.

Participant D3FP10 described the importance of creating a culture where players feel comfortable reporting concussions as he stated,

> As a leader and an administrator. I'd probably have a talk with the player. I'd probably walk up to the player first. Let him know that we kind of notice that we're seeing something different. You gotta report that. I'd go talk to him, let him do it first. I mean let him have the chance to do it on his own terms 'cause nobody wants to report a concussion.

Participant D3FP11 expressed the importance of using scare tactics to educate players on the importance of recognizing and reporting concussions as he stated,

> I want to say that there may be. This may sound bad, but it's just kind of the scare factor of what could happen. Whether that be through a documentary or a show or something that a video or something that catches their attention or like hey this seems so small right now. And so in the moment, but this could have these kinds of effects on you later, whether it be brain injuries or CTE like I mentioned.

Theme 3: Consequences of Reporting a Concussion

The consequences of reporting a concussion on a D-III football team are varied and complex. One potential consequence is not being able to play in games, which can be a significant loss for many players with a robust athletic identity and who consider playing football a central part of their identity. Additionally, there may be academic consequences, as some participants noted that learning and retaining information could be challenging while recovering from a concussion. Furthermore, there is a perception among some players that reporting a concussion may make them appear “soft” or weak to their teammates and coaches, which can be a significant barrier to reporting as they may fear being seen as less tough or less committed to the sport. This perception can stem from the culture surrounding football, where players are often expected to be tough and resilient and where the pressure to play through injury is high. Additionally, there is a risk of losing one's spot on the depth chart if they miss significant playing time due to a concussion, which can be a major concern for some players. Lastly, some participants noted that they would feel like they were letting the team down by not playing, which can be a significant psychological burden for some players.

Not Playing

Participant D3FP1 stated that the consequences of “not playing” due to a concussion include “losing a key player factor” on the field and “not gaining knowledge in the classroom.” Participant D3FP2 discussed the negative and positive consequences of not playing due to a concussion. He mentioned that a negative consequence for those who do not have the proper perspective is “being labeled or seen as someone who isn’t a part of the culture. ‘Ah dude he's being soft.’” He also mentioned that “positive consequences, obviously are you're taking care of yourself and sometimes it's just you also gotta realize it's better to let somebody else give 100% than you give 70.” Participant D3FP3 expressed that he believed the team would treat the situation well. However, he may feel like he is letting the team down by not being available. He mentioned, "I think you would personally, kind of think you're; I guess some people would think that they're letting down the team by not being available or something.”

Participant D3FP4 noted the physical consequences of not playing due to a concussion, such as sitting out and being watched for more concussion-like symptoms. He mentions, “I guess what I hinted out earlier, like just being able to like having to sit out. And then you have to, you know. I guess be watched later on for more concussion-like symptoms.” He also mentions the fear of being unable to play due to the limited time in their college career, stating, “I guess the consequences would be sitting out.” Several participants discussed missing games as a negative consequence of not playing due to a concussion. Specifically, participant D3FP5 stated, “I mean, if we're thinking negative consequences, I would think you know you have to miss a game and you know that could cost a winner or loss.”

Similarly, participant D3FP6 discussed the possibility of losing a spot on the depth chart due to missing games and practices. Participant D3FP7 mentioned, “You miss a good part of your career. They're afraid they won’t be able to play since we're only here for a certain amount of time.”

Academic Consequences

This section demonstrates that concussions can have significant academic consequences for D-III football players, including missing classes and difficulties catching up with schoolwork. The pressure to maintain a tough image and the slim chances of going pro or transferring to a Division I program may also explain why some players do not report concussions. The study highlighted the importance of creating a culture in which student-athletes feel comfortable reporting their injuries without fear of academic repercussions and adequately managing and treating concussions to minimize academic struggles and setbacks. “Like can't really do a lot with a concussion. Like usually depending on the severity of the concussion, you have to miss classes. You can't like workout train. Can't like, stay in shape or anything. You're pretty limited,” said participant D3FP10.

Moreover, many participants reported difficulties catching up with their schoolwork and course materials after missing classes due to a concussion. “In the classroom, consequences are you not gaining knowledge and not you know, being able to be in the presence of the room with the professor and understand what's going on,” said participant D3FP1. Participant D3FP7 also discussed how the pressure to maintain a tough image and the slim chances of going pro or transferring to a D-I institution might

contribute to why some players do not report their concussions. This highlights how the football culture and the pressure to maintain a certain image may contribute to student-athlete's academic struggles.

Additionally, many participants discussed how the decision to report a concussion is weighed against the potential academic consequences, such as missing school. Participant D3FP5 stated,

> When you say like how much does it weigh on you like to make that decision? It doesn't really, per it wouldn't affect my reasoning. Whether I'm D-III or not, you know? I think it weighs on me the same. You know I am taking into consideration that I am going to miss school because of this? you know.. This highlights the importance of creating a culture where student-athletes feel comfortable reporting their injuries without fear of academic repercussions.

Risk of Losing Spot on Depth Chart

Overall, the findings from this research study indicated that D-III football players face significant pressure not to report their concussions to avoid losing their spot on the team and maintain their position on the depth chart. The “next man up” mentality, the fear of losing playing time, and the inability to regain their spot on the team were significant factors in participants' decisions not to report their concussions. Participant D3FP4 discussed the fear of losing playing time and stated, “Some people don't wanna, you know, lose their spot 'cause the next person will fill in. They might not get it back.” This sentiment was echoed by Participant D3FP6, who noted, “if you report a concussion, you're going to be out. You could be out for a long period of time, so that's what I would say, just not being able to play or practice.”

Participants also discussed the pressure to play through concussions to maintain their position on the team. Participant D3FP9 stated, “But people want to play any way

they can if they think they can, they'll do it no matter how hard the injury is." This "next man up" mentality was also noted by Participant D3FP10, who discussed the pressure to not miss meaningful reps, stating, "I mean they miss meaningful reps. I mean, every rep you miss is a chance somebody else is getting better than you. They're liable to take your spot."

Furthermore, participants also reported feeling pressure not to report concussions to protect their position on the team. Participant D3FP6 stated,

> Well, obviously you know, if you love the game, you know a lot of guys are going to say, you know, I love it too much, or I care about this team too much to you know, risk sitting out, especially if they feel like you know that they're a key contributor to the team. Their chances of reporting it. I think, you know, go down. Significantly.

Participants also discussed the pressure not to report concussions because they feared they would not be able to regain their spot on the team once they returned. This pressure was noted by Participant D3FP9, who stated, "And even when I come back, and I'm healthy, you know I won't be getting on the field for the rest of the year because of that."

Letting the Team Down

The participants in the study faced pressure to continue playing despite injury and fear of being perceived as "soft" or not part of the team culture. In addition, they feared missing important games or practice, which could harm their relationships with teammates and make them appear unreliable. These fears were driven by the love for football and the pressure to continue playing for the team. Participant D3FP2 stated,

> Negative consequences like I said for people who don't have the right perspective is being labeled or seen as someone who isn't a part of the culture. Ah, dude, he's

> being soft. He's you know dude we need you. This is the second-best team we're gonna play this year. You can sit out for a week. Just take some Advil.

Participant D3FP3 shared, “Some people would think they're letting down the team by not being available or something.”

Participant D3FP8 stated,

> You know one thing is just joked about is like, hey, don't say the C word. You might miss playing time or practice or whatever, but another thing I think the biggest thing is just. Missing practice, missing games? Not being or, you know, in your mind not being seen as reliable or dependable as you would if you didn't have any problems.

Participant D3FP12 shared,

> I feel some of the teammates would like to look at you differently, like depending on you. Like how bad the hit was in their eyes, I feel like some consequence would be like relationship with teammates and then definitely missing games, which every player hates.

Participant D3FP4 stated,

> I can't really remember like a specific time, most likely in high school making big hits on a linebacker going up to him. You know I hit him instantly, get dizzy, my head spinning. You know, felt like I was the only person in that time. I didn't want to come out 'cause I didn't trust my backup. I guess. You know, just like the love of football. That as well, you know.

Participant D3FP1 shared,

> For me, probably just letting my teammates down. I feel like I'd be letting them down 'cause I'm not gonna be able to play. Other than that? I mean, I gotta get better if I did have a concussion, that's the only challenge I have to swallow not playing it. I feel like I'm leaving my teammates out in the gutter.

Theme 4: Ensuring Well-Being and Avoiding Complications from Concussions

The theme of this section is “Ensuring Well-Being and Avoiding Complications from Concussions” in D-III football players. This theme is paramount as concussions have become a significant concern in football, with increasing awareness of the potential

long-term consequences of these injuries. The sub-themes that will be explored in this section include “Ensuring physical and mental well-being,” “Avoiding long-term damage,” and “Concerns about CTE effects on future quality of life” as they pertain to concussion reporting behavior in D-III football players.

Ensuring Physical and Mental Well-Being

The findings in this section revealed that the culture of the D-III football team promotes a sense of support and care for the physical and mental well-being of the players. This includes a high level of acceptance and support for concussion reporting and management within the program. The importance placed on player safety and long-term health is crucial to preventing complications from concussions. Participant D3FP3 stated, “I think it's more accepted than rejected” when reporting concussions. The participant explained that the team's camaraderie and family culture creates a sense of support for players who need to report a concussion. This sentiment was echoed by participant D3FP4, who stated, “I don't see anybody on the team or coaches or anybody rejecting somebody for reporting a concussion.” Participant D3FP8 added, “I'd be accepted. I mean, all the coaches care about our health, especially with all the studies that have come out. You know the future problems that you might have with multiple concussions. They support that 100%.”

Participant D3FP4 further expressed, “I mean, I don't think anybody would discourage me from reporting one. They'd all be looking out for my own well-being for it.” Participant D3FP6 added,

> Honestly, I can't. I can't think of any. To be honest with you. I mean because everybody that I've been around. Yeah, you know good. They're really good people from what I know of, and they would want what's best for me.

Avoiding Long-Term Damage

The findings from these participants suggested that while D-III football players may have understood the potential long-term consequences of concussions, the importance of playing football at the moment and the love for the sport outweigh the potential future effects. Additionally, some players prioritized their long-term health and well-being by reporting a concussion, despite potential negative impacts on their image or playing time. Coaches, trainers, and medical professionals must continue to educate players on the long-term effects of concussions and support players in prioritizing their health and well-being, even if it means sitting out for some time. Participant D3FP1 shared that he had the confidence to report a concussion because he wants to ensure his body and mental well-being are good, not just during his football career but also in the long term. He acknowledged that a typical running back career in the league is only 5-7 years, and he wants to ensure that he will be fine after the fact.

Participant D3FP6 stated that he believes that many guys do not realize the impact that a concussion can have on their life and health in the long term. He has heard a lot about concussions and done the tests and readings, but he still does not fully understand the long-term consequences. Despite understanding the long-term consequences of concussions, many participants expressed that the importance of playing football now outweighed the potential future effects. For example, D3FP7 stated that “Nobody really cares, at least when they're 20, or care very little about the way they're going to feel when

they're 50 or 60," and said, "That's alot of it. Yes, they understand these issues are a thing, but they just. It's more of a long-term effect."

D3FP1 added, "I have to think after the fact; I have to make sure that my body and mental is gonna be fine. After the fact, when I'm done playing my sport."

Additionally, D3FP7 and D3FP6 acknowledged that many players might sacrifice their future well-being for a career on the field because they love the sport and it has been a big part of their lives. Therefore, they may need to understand the potential long-term consequences fully. Some players may not even live to be old enough to experience them. As a result, they need to prioritize the well-being of their brain over the short-term gain of continuing to play.

Concerns About CTE Effects on Future Quality of Life

These findings suggest that the potential long-term effects of chronic traumatic encephalopathy (CTE) on future quality of life are a significant concern among D-III football players and may influence their decision to report concussions. These concerns may also be mitigated by support and encouragement from coaches, teammates, and family members, who can help players understand the importance of protecting their long-term health and future. Participant D3FP3 stated,

> I don't want the long-lasting effects of having a permanent injury like that, you know. I mean you can fix a broken bone or something but your brain's a different animal in that sense, you know. I think that's why I'd have confidence in reporting it. I mean, it's you know stuff you see on TV and, uh. Seeing how people act after they're done playing their long careers and stuff. Then you see when people die they like they go through their brain and stuff. See other signs of CTE and how their behavior was before they eventually died, you know, and you kind of. I mean, it's scary to me to see some of those things that could happen and it seems as if those people weren't necessarily conscious of them doing those things, you know.

Participant D3FP5 also expressed concerns about the potential long-term effects of CTE, stating,

> I would want to report a concussion because I know football is temporary. I've still got 50 more years. You know, like I've still got to be able to function mentally, so definitely just looking into the future I still want to be able to be relatively normal in my brain, and knowing that, especially with things like CTE, the more concussions that you have, the more likely you are to be susceptible to stuff like that. So definitely just wanting to be healthy or down the road.

Participant D3FP7 also emphasized the importance of protecting his brain to continue to pursue his career goals, stating,

> My motivation would be to protect my brain so I can continue to learn. Like I said, I want to be a lawyer, and I can't be a lawyer if I'm a vegetable because I've had too many concussions or too many injuries or I'm having CTE because of football injuries. But at the end of the day, yes. Football has gotten me here, but I'm on my way out on the football field now I'm getting ready to hang it up. And there's no need to risk my career as a lawyer or historian just so I can play 10 more games.

Participant D3FP1 also acknowledged the importance of protecting his long-term health, stating, “Life is more than just football.” Participant D3FP2 also emphasized the importance of protecting his long-term health and future, stating,

> Just being told it’s OK to slow down like. Hearing my dad, you know, having that conversation with him going into this season. I was fortunate enough not to have anything happen last year, but before I came back for fall camp we were talking about, you know, this is your last ride, and don’t let it stress you out to the point where you’re not taking care of yourself.

These findings suggest that the potential long-term effects of CTE on future quality of life are a significant concern among D-III football players and may influence their decision to report concussions. However, these concerns may also be mitigated by support and encouragement from coaches, teammates, and family members, who can help players understand the importance of protecting their long-term health and future.

Ethnographic Approach

As a former D-II football player, the researcher understands the pressures and challenges of playing the sport at a competitive level. One of the most significant issues during his college career was the risk of concussions. In his experience, reporting a concussion was not always straightforward. Various cognitive, behavioral, and environmental factors influenced it. That is why he conducted a qualitative study to explore the experiences and perceptions of D-III football players regarding concussion reporting. He used an ethnographic approach involving observations and in-depth interviews with 14 players from a single team. The observations collected during the study played a crucial role in shaping the conclusion. First, they provided additional insight and context into the participants' experiences. They helped to validate or challenge the findings obtained through the interviews. During the observations, he was able to observe the players during games and practices and take note of their behaviors, attitudes, and interactions with their coaches, trainers, and teammates. Additionally, ethnographic specific resources were used to to strengthen the quality of the study (Atkinson et al., 2007; O'Reilly, 2012)

During the observations, the researcher attended several team practices, gained access inside the locker room, attended one game, was granted field access, and took detailed notes on the players' behavior, interactions, and communication. He also recorded videos of the interviews, which were later transcribed and analyzed. In addition to observations, the researcher conducted in-depth interviews with each of the 14 participants. These semi-structured interviews focused on the players' experiences, perceptions, and attitudes about concussion reporting. As a result, he can empathize with

these players and understand the complex social dynamics that may influence their decision to report a concussion.

Furthermore, there were plenty of times he would go to practice and talk with the athletic trainer. The athletic trainer would inform him that unidentified players were in concussion protocol. This happened weekly during the Fall football season. Honestly, he was surprised by the limited number of drills that posed a risk of concussion during his observations. There was limited contact among the players, and select players had padded helmet covers to reduce the severity of impact. It is worth noting that not all players had a padded helmet cover, likely due to budget constraints.

Furthermore, these padded helmet covers are not worn during actual games, even though they are designed to address the dangers of head contact. This observation suggests that the culture at D-III football is conscious of concussion risks. However, it also highlights that budget constraints may limit the full implementation of protective measures, such as the lack of helmet covers for all players. The observation that these helmet covers are not worn during actual games raises questions about the priorities of the sport itself, as the covers are designed specifically to mitigate the dangers of head contact. Overall, the observations provided a glimpse into a culture that is aware of concussion risks but may not prioritize the full implementation of safety measures.

A particularly striking moment during one observation occurred during the last 15 minutes of practice. The head coach asked the first- and second-year students to scrimmage, as they had limited playing time during games. He was told this is how the head coach keeps the younger players excited about being out there. During the scrimmage, one of the offensive linemen was injured, and the athletic trainer quickly

tended to the player. The head coach gave a moment of attention to the injured player but quickly returned to facilitating the scrimmage. Unfortunately, the player was later taken to the hospital with a broken leg. This was surprising because, throughout the study, most participants perceived the head coach as creating an environment that prioritizes health and well-being. However, this incident suggests a culture of replacement “next man up” and disregard for injury, which may negatively affect a player's willingness to report a concussion.

Additionally, this research study was conducted when there was a heightened awareness of concussions in football, mainly due to high-profile cases such as Tua Tagovailoa's several concussions on live television. This may have impacted the participants' willingness to agree to participate in the study, as they were more aware of the importance of the topic and the potential implications of their behavior.

Data analysis was conducted using a thematic approach, allowing the researcher to identify the collected data's patterns and themes. These themes were then used to construct a narrative describing the factors influencing concussion reporting behavior among D-III football players. In addition, he considered the observations in conjunction with the interviews to gain a more nuanced understanding of the participants' perspectives. The researcher looked for patterns and trends in the observations and interviews and considered how they related. The observations provided valuable contextual information that helped deepen the researchers' understanding of the participants' experiences and paint a complete picture of the challenges and pressures faced by D-III football players regarding concussion reporting. This study aimed to provide a detailed and nuanced understanding of the cognitive, behavioral, and

environmental factors influencing concussion reporting behavior in D-III football players. As a former player, the researcher knows that deciding to report a concussion is not always easy. However, with a better understanding of the factors that shape this decision, we can develop more effective interventions to promote the safety of football players.

CHAPTER 5

DISCUSSION

This study aimed to examine the cognitive, environmental, and behavioral factors that impact concussion reporting behavior in D-III college football players. Utilizing the SCT, this study explored the lived experiences of D-III football players through a qualitative ethnographic approach, which included one-on-one interviews and observations. The five primary constructs of SCT were used as a framework during this qualitative investigation. As emphasized by SCT, cognitive processes play a crucial role in understanding human behavior, and an individual's thoughts, beliefs, and attitudes shape their behavior and their interpretation of experiences in their environment (Bandura, 1977a, 1986, 2004). Additionally, SCT recognizes the influence of social and environmental factors and highlights the reciprocal relationship between an individual and their environment. Therefore, the guiding research questions were as follows:

1. What are D-III football players' outcome expectations (i.e., consequences) about concussion reporting, and how do these expectations affect their behavior?
2. What are D-III football players' perceptions of self-efficacy about concussion reporting, and how do these perceptions affect their behavior?
3. What are NCAA D-III football players' perceptions of normative beliefs about concussion reporting behavior, and how do normative beliefs affect their behavior?

4. What are NCAA D-III football players' perceptions of social support about concussion reporting behavior, and how does social support affect their behavior?
5. What are NCAA D-III football players' perceptions of behavioral skills about concussion reporting behavior, and how do behavioral skills affect their behavior?

The main themes derived from the data were (1) Concussion Impact, (2) Reporting and Managing Concussions on the Team, (3) Consequences of Reporting a Concussion, and (4) Ensuring Well-being and Avoiding Complications from Concussions. This chapter will examine the study's findings, provide implications connected to the research, outline the limitations, suggest recommendations for further research, and finish with a final summary. The findings of this study will provide valuable insights into concussion reporting behavior in this under-researched population and inform future efforts to improve the management and treatment of concussions in D-III football players.

Summary of the Results

The decision to disclose a concussion remains challenging for D-III football players. The use of the SCT helped to shed light on this behavior. The reasons for not reporting concussions were similar to those of athletes at higher divisions, with a strong desire to continue playing and compete at a high level while also wanting to protect their cognitive health. However, the reality is that the drive to play often outweighs the consideration for long-term health. The lack of a professional football career was not a significant factor in the decision-making process.

Question One: What are D-III football players' outcome expectations (i.e., consequences) about concussion reporting, and how do these expectations affect their behavior?

To increase concussion reporting behavior in D-III football players, it was essential to understand their outcome expectations connected to concussion disclosure. This research question was addressed through the semi-structured interview process, where each participant answered questions from the interview guide. These questions explored perceived consequences for reporting a concussion on their team and motivations for reporting. In sports-related concussions, the reluctance to report such injuries is a pervasive issue well-documented in the literature. Several studies have highlighted the significant barriers that athletes face when it comes to disclosing their concussions. For instance, in a study conducted by Beidler and colleagues (2018), collegiate football players expressed concern that disclosing a concussion would lead to being benched, losing playing time, and potentially losing their spot on the team. Similarly, Kerr and colleagues (2016) found that collegiate athletes were worried about the social stigma associated with reporting a concussion and the potential negative impact it could have on their future athletic careers.

The present study adds to this body of literature by exploring the attitudes and beliefs of D-III football players regarding the consequences of reporting a concussion. The findings suggest that the concerns expressed by participants in this study were consistent with those reported in previous research. Many athletes feared negative consequences such as missing playing time, letting the team down, and losing their spot on the roster. These concerns are particularly salient in competitive sports. Athletes often

feel pressure to push through injuries and perform at their highest level, regardless of the potential risks to their health and well-being.

It is important to note that the reluctance to report concussions is not limited to a particular sport or level of competition. Research has shown that athletes across various sports, including football, soccer, and ice hockey, report similar concerns about the negative consequences of disclosing a concussion (Register-Mihalik, Guskiewicz, Valovich McLeod, et al., 2013). This suggests that addressing these barriers to concussion reporting will require a multi-faceted approach considering the unique challenges athletes face in different sports and levels of competition.

According to SCT, individuals' behavior is influenced not only by personal factors but also by their social environment and the broader cultural context in which they operate. In the case of concussion reporting behavior, social and peer pressure can be particularly influential, especially among collegiate athletes who are still navigating the complex social dynamics of their team and the broader athletic community. The findings of this study highlighted the role that social and peer pressure could play in shaping athletes' decision-making around concussion reporting. Participants in the study described feeling implied pressure from their teammates and coaches to push through injuries and stay on the field, even when experiencing concussion symptoms. This pressure was often reinforced by the belief that athletes who report concussions are letting down their team and jeopardizing their spot on the roster. These findings align with the existing literature that reinforces internal and external pressure's role in concussion disclosure (Kerr, Register-Mihalik, et al., 2014).

In addition to the social pressure to continue playing, participants also discussed the impact of missing class due to a concussion. Many athletes expressed concern that missing class would negatively impact their academic performance and ability to keep up with coursework. Holmes et al. (2020) research suggests that college athletes struggle to concentrate after a concussion, negatively affecting their academic performance. This underscores the importance of having a Return-to-Learn policy to provide academic accommodations and support for athletes who experience concussions in order to mitigate the negative consequences of missing class.

Perhaps most strikingly, participants in this study described the social stigma associated with reporting a concussion. Many athletes expressed concern that they would be seen as "soft" or weak for reporting a concussion and that this label would follow them throughout their athletic career. This is similar to previous research concerning the stigma surrounding reporting a concussion compared to other more easily explained injuries (Abdullah et al., 2015). Additionally, there is a stigma around the “C word,” or concussion, as players feel pressure to be tough and play through the injury. The problem is that the concussion is usually unbeknownst to the spectator, and the treatment is unclear. It is not like seeing someone break a leg or dislocate a shoulder. That is a lot more straightforward and convincing.

This highlights the importance of the attitudes and beliefs of the broader athletic ecosystem in shaping athletes' decision-making around concussion reporting. Coaches, athletic trainers, and teammates all play a role in shaping the culture around concussion reporting. Efforts to promote a culture of safety and support for athletes who experience concussions will need to address these broader social and cultural factors. The decision to

report a concussion weighed heavily on the participants, as they had to weigh the importance of their health against missing important games or practice.

Previous research has confirmed the prevalence of unreported concussions in sports, finding that most concussions go unreported (Delaney et al., 2002; Echlin, Tator, Cusimano, Cantu, Taunton, Upshur, Hall, et al., 2010; McCrea et al., 2005). This is troubling because concussions are a form of traumatic brain injury that can have serious long-term consequences if left untreated or if an athlete returns to play too soon. In D-III football, the pressure to continue playing despite injury is further heightened by the limited time players have to compete. Unlike athletes in higher levels of play, D-III players do not have the opportunity to pursue professional careers, and college football may represent the pinnacle of their athletic experience. As a result, missing playing time due to injury can significantly impact their overall experience.

However, it is essential to recognize that hiding concussions to avoid missing playing time is not a viable solution. Instead, it can exacerbate the problem by delaying diagnosis and treatment, increasing the risk of long-term consequences, and potentially jeopardizing the athlete's health and well-being. Therefore, it is crucial to prioritize athlete safety and well-being over short-term competitive goals and to create an environment that encourages open communication.

The participants' motivation to prioritize their long-term health and well-being aligns with the SCT's emphasis on individual factors such as goals and beliefs. In addition, their decision to report a concussion was influenced not only by their personal experiences but also by the experiences of others, such as a friend who lost a relative to CTE. This aligns with the SCT's emphasis on observational learning, suggesting that

individuals are influenced by the behavior and experiences of those around them. Additionally, the influence of a coach who prioritizes head and neck safety highlights the impact of influential referents on an individual's decision-making. The SCT posits that individuals are influenced not only by direct sources of reinforcement (such as rewards or punishments) but also by influential referents, such as family members, peers, and coaches. In this case, the coach's emphasis on safety likely influenced the participants' decision to report their concussion, highlighting the impact of influential referents on individual behavior.

Question Two: What are D-III football players' perceptions of self-efficacy about concussion reporting, and how do these perceptions affect their behavior?

Several studies have investigated the factors that influence concussion reporting behavior among athletes. The present study aimed to explore the role of self-efficacy in concussion reporting among D-III football players. The study's findings suggest that the participants had confidence in reporting a concussion due to their understanding of protecting their long-term health and well-being. In addition, the participants' trust in their coaches and training staff, who they believe are capable of diagnosing and managing the injury, also contributed to their confidence.

The findings of this study are consistent with previous research that has found a positive relationship between self-efficacy and concussion reporting behavior (Carpenter et al., 2020; Kroshus et al., 2014; Milroy et al., 2020). For instance, a study by Emily Kroshus et al. (2014) found that athletes with higher self-efficacy levels were more likely to report a concussion. Similarly, Carpenter et al. (2020) found that self-efficacy was positively associated with concussion disclosure behavior among D-I athletes. These

findings suggest that self-efficacy plays a crucial role in concussion reporting behavior across different levels of athletic competition.

However, the present study's findings also highlight differences from previous research. For example, a study by Register-Mihalik, Guskiewicz, Valovich McLeod, et al. (2013) found that athletes who had sustained multiple concussions were less likely to report subsequent concussions, which contradicts the present study's findings. Similarly, a study by Register-Mihalik et al. (2017) found that athletes who had a prior concussion were less likely to report a subsequent concussion. Participants in this study suggested reporting signs and symptoms of concussion was highly important to avoid subsequent concussions and brain damage. Their reasoning is based on their knowledge of the injury and attention to their long-term health and well-being. These studies suggest that past experiences with concussions can influence concussion reporting behavior.

One of the most significant challenges faced by the participants in this study when reporting a concussion was feeling like they were letting their teammates down. This finding is consistent with previous research that has identified social norms and pressures as a significant barrier to concussion reporting behavior (Kroshus, Garnett, et al., 2015). For example, Kroshus, Garnett, et al. (2015) found that athletes who perceived higher levels of social support for playing through pain were less likely to report a concussion. These findings suggest that addressing social norms and pressures is crucial for promoting concussion reporting behavior among athletes.

Another challenge the participants in this study faced was the fear of losing their spot on the depth chart. This finding is consistent with previous research that has identified fear of negative consequences as a barrier to concussion reporting behavior

(Clark & Stanfill, 2019). For instance, Baugh et al. (2019) found that athletes who perceived negative consequences for reporting a concussion were less likely to report it. These findings suggest that interventions promoting concussion reporting behavior should address athletes' fears of negative consequences.

The present study's findings suggest that understanding the cultural norms and values that shape athletes' beliefs and behaviors is crucial for promoting safer and healthier athletic practices. The study's ethnographic approach allowed for an in-depth exploration of the cultural norms and beliefs that shape D-III football players' concussion reporting behavior. This approach could help develop targeted interventions to promote concussion reporting behavior among athletes. In conclusion, the present study's findings suggest that self-efficacy plays a crucial role in D-III football players' concussion reporting behavior. The participants' confidence in reporting a concussion was influenced by their understanding of the importance of protecting their long-term health and well-being and their trust in their coaches and athletic trainers.

Question Three: What are NCAA D-III football players' perceptions of normative beliefs about concussion reporting behavior, and how do normative beliefs affect their behavior?

The findings of this study are consistent with previous research that suggests that cultural beliefs and attitudes are crucial factors in concussion reporting behavior in football players. For example, a study by Emily Kroshus et al. (2014) found that cultural norms around toughness and the idea that injuries are part of the game may contribute to a reluctance to report concussions. Similarly, Carpenter et al. (2020) found that perceived norms and culture were critical factors in concussion reporting behavior in college

athletes. These studies suggest that cultural beliefs and attitudes are significant barriers to concussion reporting and that interventions to change these norms may be necessary to promote safer and healthier athletic practices.

However, the findings of this study differ from previous research in that they suggest that cultural beliefs about concussion reporting may vary among football players. For example, Milroy et al. (2020) found that college football players strongly believed in the importance of concussion reporting and that social support was essential in promoting reporting behavior. While the participants in this study also reported a belief in the importance of concussion reporting, they also acknowledged that there are different cultural beliefs about concussion reporting in football. This suggests that interventions to change cultural norms may need to be tailored to specific groups and contexts to be effective.

The findings of this study do not contradict previous research but rather add to our understanding of the complex factors that influence concussion reporting behavior in football players. Focusing on normative beliefs and cultural attitudes provided a more in-depth understanding of the factors shaping concussion reporting behavior than previous studies focusing primarily on individual beliefs and attitudes. By examining cultural beliefs and attitudes, this study provided valuable insights into the cultural barriers to concussion reporting in football players and suggested that interventions to change cultural norms may be necessary to promote safer and healthier athletic practices.

In conclusion, the findings of this section suggested that cultural beliefs and attitudes are crucial factors in concussion reporting behavior in D-III football players. Participants in this study reported different cultural beliefs about concussion reporting,

highlighting the need for tailored interventions that address specific cultural attitudes and norms. However, participants also reported a belief in the importance of concussion reporting. They felt that they would be accepted if they reported a concussion. This suggests that creating a culture of support and prioritizing player well-being may be effective in promoting concussion reporting and promoting safer and healthier athletic practices.

Question Four: What are NCAA D-III football players' perceptions of social support about concussion reporting behavior, and how does social support affect their behavior?

The fourth research question in this study examined the perceptions of social support among D-III football players regarding concussion reporting behavior and how social support affects their behavior. The findings of this study indicate that participants feel supported by their social network, which includes family, friends, and coaches. In addition, none of the participants reported feeling discouraged or unsupported in reporting a concussion. Instead, they reported that their support network would encourage them to prioritize their health and well-being.

Previous research has also highlighted the importance of social support in promoting safe and responsible behavior among athletes and encouraging concussion reporting. For instance, a study by Register-Mihalik, Guskiewicz, Valovich McLeod, et al. (2013) found that high school football players who reported having social support from coaches and trainers were more likely to report concussion symptoms than those who did not have such support. Similarly, a study by Kroshus et al. (2014) found that athletes who reported high levels of social support were more likely to report concussion

symptoms than those who did not have such support. However, while previous research has emphasized the importance of social support in promoting concussion reporting, the findings of this study suggest that the quality and nature of social support also play a crucial role. In particular, the participants in this study indicated that they wanted to hear specific narratives of support from their social network that would increase their likelihood of reporting a concussion.

For instance, participants wanted to hear that their health and well-being were the priority over football and that they would recover. They also expressed concern about letting down their teammates and wanted reassurance that someone else could step in. Moreover, they wanted to hear that they would not be forced to return to the game too early and that the people around them supported their decision to report. These findings suggest that social support must be tailored to individual athletes' specific concerns and needs. It is not enough to provide general messages of support for concussion reporting. Instead, coaches, athletic trainers, and social referents must listen to athletes' specific concerns and needs and provide targeted messages of support to increase the likelihood of concussion reporting.

Furthermore, this study's findings suggest that the football team's culture and norms can also play a crucial role in promoting social support for concussion reporting. For example, participants reported that their coaches and teammates prioritized player health over playing with a concussion. This culture of support and concern for player well-being may have contributed to the participant's willingness to report concussions and their perception of social support in their network.

In conclusion, the findings of this study suggest that social support plays a crucial role in promoting concussion reporting behavior among D-III football players. However, the quality and nature of social support must be tailored to individual athletes' specific concerns and needs. Furthermore, the culture and norms of the football team can also play a crucial role in promoting social support for concussion reporting. These findings contribute to our understanding of the complex factors that influence concussion reporting behavior in athletes and can inform the development of interventions and strategies to promote safe and responsible behavior among athletes.

Question Five: What are NCAA D-III football players' perceptions of behavioral skills about concussion reporting behavior, and how do behavioral skills affect their behavior?

This section focused on exploring D-III football players' perceptions of behavioral skills related to concussion reporting behavior and how these behavioral skills influence their behavior. The final research question explored one critical behavioral capacity: reporting a concussion correctly. The findings from this question suggest that D-III football players believe that the first step towards reporting a concussion correctly is to approach the team's trainer, who will assess their condition and perform a concussion test. In addition, the participants emphasized the importance of having a personal relationship with their trainer and the need to trust their expertise in handling the situation. These findings are similar to previous research suggesting that trust and belief in the medical staff are crucial factors influencing the players' decision to report a concussion (Register-Mihalik, Guskiewicz, Valovich McLeod, et al., 2013).

The participants' views on when a concussion should be reported varied, with some indicating that it should be reported immediately if symptoms persist. In contrast, others suggest reporting it only when the symptoms prevent them from carrying out their daily activities. The participants believe a concussion should be reported when symptoms persist and affect daily activities. These findings are consistent with previous research that suggests that the perception of symptoms and their attitudes toward the importance of reporting them can influence the decision to report a concussion (Kroshus et al., 2014).

The participants' opinions on how to increase the likelihood of an individual reporting a concussion varied, with some suggesting that it starts with the head coach and their attitude toward players' health. Others suggested keeping the conversation about concussions going and not letting it take a back seat to other things. Another participant emphasized the importance of reassurance that reporting a concussion will not result in rejection or losing a spot on the team. These findings are similar to previous research that suggests that the culture within the team and the attitude of those in positions of authority toward concussions significantly impact an individual's decision to report a concussion (Kerr, Register-Mihalik, et al., 2014; Kneavel et al., 2021).

The emphasis on education, keeping the conversation going, and providing a supportive environment is also consistent with the principles of SCT, which suggest that an individual's behavior can be influenced by their knowledge and understanding of the issue, as well as the attitudes and values of the people and environment around them. The decision to report a concussion is a complex issue for D-III football players, who must navigate the desire to continue playing with their need to prioritize their cognitive health.

Question Six: How did Tua Tagovailoa's concussion events impact you as a D-III Football player?

The media coverage surrounding Tua Tagovailoa's concussion events and the ongoing concerns surrounding head injuries in sports prompted exploring this topic in the current study. The results add valuable insight into the decision-making process of D-III football players and contribute to our understanding of the impact of concussion education on reporting behavior at under-resourced institutions. In addition, this qualitative approach provided a deep understanding of the experiences and perceptions of the participants and sheds light on the ongoing challenges faced by D-III football players in reporting concussions.

Asking about Tua's concussion was vital due to its significant media attention during the current research study. It highlights the ongoing concerns and attention surrounding head injuries in sports and the need for continued evaluation and understanding. The participants generally had a similar reaction to Tua's concussion events. They found it shocking and scary because he was a professional player, and the impact of the injury was severe. However, it made them think about the importance of reporting concussion symptoms and not trying to tough it out. The events also made them aware of the seriousness of concussions in football and the need for proper management of symptoms to avoid severe outcomes. Participants also mentioned that these events opened people's eyes to the fact that the players' well-being should come before the need to win the game or produce for the team.

Question Seven: Can you recall receiving any concussion education or training since arrival at a D3 campus? If so, what can you remember about it?

The study results showed that most participants reported receiving concussion education or training. The participants recalled being informed about the symptoms of concussions, such as headaches, dizziness, and spinning sensations. They also remembered being made to take a mandatory concussion test at the beginning of the season. The test walked them through the warning signs of concussions and checked to ensure they had no current or past symptoms. However, one player reported not receiving any concussion education or training. At the same time, another mentioned that their training was inadequate and could be improved. The results suggest that concussion education is essential and that players must be informed about the symptoms and consequences of concussions to encourage reporting and prevent further injury.

Culture

Guskiewicz et al. (2000) argued that D-III football players have a higher incidence of concussions than D-I and D-II athletes. This is believed to be due to playing offense and defense, which is more common in D-III football. Although 50-75% of all concussions go unreported, there is limited research that provides insight into why student-athletes, particularly those in D-III, do not report concussions at a higher rate, even though their odds of playing professionally are significantly lower compared to their peers at the D-I and D-II levels (Z. Kerr et al., 2018; Kerr et al., 2016; Register-Mihalik, Guskiewicz, Valovich McLeod, et al., 2013; Torres et al., 2013). The larger body of research suggests that most athletes choose not to disclose concussions due to a desire to

stay in the game, not wanting to let the team down, poor understanding of concussion signs and symptoms, and low perceived severity (Beidler et al., 2018; Clark & Stanfill, 2019; Z. Kerr et al., 2018; Kerr et al., 2016).

The culture of college football significantly impacts concussion reporting behavior among D-III football players. The outcome expectations of these players regarding concussion reporting include concerns about missing playing time, letting the team down, losing their spot on the roster, and facing social stigma. These expectations are influenced by the attitudes and beliefs of the broader athletic ecosystem and the peer pressure from their teammates and coaches. On the other hand, their perceptions of self-efficacy about concussion reporting are influenced by their understanding of the significance of protecting their long-term health, trust in their training staff and coaches, support from their coaches, and the emphasis on their overall health. The challenges faced by these players in reporting a concussion include interpersonal, intrapersonal, and environmental factors.

The cultural norms and behaviors within the group of D-III football players shape their beliefs and behaviors, leading to a complex decision-making process regarding concussion reporting. The participants expressed confidence in their ability to identify and report a concussion. However, when asked about the appropriate timing for reporting, the answers varied greatly, with some saying it should be reported immediately. Others say it should be reported 12-24 hours later. Additionally, participants demonstrated an understanding of the severity of concussions but still often tried to downplay their injury and self-diagnose without bringing it to the attention of the athletic trainer. Despite a general awareness of the importance of reporting concussions,

the participants were still uncomfortable with being immediately removed from play after a suspected concussion. Lastly, participants expressed trust in the athletic trainers. However, their answers indicated this trust was not always translated into action. This suggests a disconnect between the participant's understanding of concussion harm and willingness to take necessary steps to protect themselves and others.

Limitations

The study exploring the cognitive, environmental, and behavioral factors influencing concussion reporting behavior in D-III football players had several limitations. Firstly, the small sample size of only 14 participants restricted the generalizability of the findings, meaning that they may not be representative of the experiences of all D-III football players. Secondly, the discrepancy between the racial composition of the study participants and the NCAA Demographic Database data could be considered a limitation. In 2022, NCAA reported that 60% of football players at the D-III level identify as White, and 23% identify as Black ("NCAA Demographics Database," 2023). This could suggest that the sample does not represent the population of D-III football players. Therefore, the results of the study, once again, may not be generalizable to the larger population. Furthermore, the self-reported nature of the data could have introduced bias as the participants may have reported what they perceived as socially acceptable or what they thought the researcher wanted to hear.

Moreover, the fact that the researcher conducted all the interviews may have influenced the participants' responses. As a result, the participants may have felt pressure to conform to the researcher's expectations, leading to an altered representation of their

experiences. This type of researcher bias is known as the Hawthorne Effect, where the mere presence of an observer can change the behavior of the participants being observed (McCambridge et al., 2014). Finally, there is potential volunteer bias because most participants are white and offensive players. This could mean that individuals from other ethnic or racial backgrounds and positions in the sport, such as defensive players, are underrepresented in the study. It is worth noting that several attempts, including emails and on-campus visits, were undertaken to recruit a diverse group of participants representative of the studied populations. Unfortunately, many prospective participants tried to avoid all eye contact and engagement with the researcher, making it more challenging to obtain a sample appropriately representative of D-III college football demographics. The results of this study could be skewed based on these limitations.

Despite these limitations, the study provides valuable insights into the lived experiences of D-III football players regarding concussion reporting behavior. The findings should be interpreted with caution and are best viewed as a preliminary exploration of the topic, providing a foundation for future research to build upon. However, it is essential to acknowledge the study's limitations to fully understand the limitations of the findings and be cautious when concluding them.

Recommendation for Future Research

Based on the findings of a recent study, further research is recommended in the area of concussion reporting among D-III football players. This research would help to enhance the current understanding of D-III football players' outcome expectations and self-efficacy towards concussion reporting and its impact on their behavior. To achieve

this goal, four types of research are recommended. First, educational invention studies can be conducted to increase self-efficacy and encourage concussion reporting behaviors among D-III football players. These studies can be done by incorporating educational sessions, coaching education, and peer-led programs that address the importance of concussion reporting, the negative consequences of not reporting, and the resources available for support. Second, longitudinal studies can be conducted to understand the impact of interventional programs and the long-term behavior changes in D-III football players toward concussion reporting. This would help determine the effectiveness of these programs and the factors that influence the persistence of behavior change.

Third, research can be conducted to examine the impact of cultural and environmental factors that shape the beliefs and behaviors of D-III football players toward concussion reporting. This can include the coaching staff's role, peer pressure, and the overall athletic culture. Fourth, comparative studies can be done between D-III and other levels of football (e.g., Division I, II) to determine any differences in players' outcome expectations and self-efficacy towards concussion reporting.

In conclusion, further research in this area would benefit D-III football players' health and well-being and promote a safety culture within the sport. Furthermore, by conducting the recommended research, valuable insights into the outcome expectations and self-efficacy of D-III football players towards concussion reporting can be obtained, which would help to promote concussion reporting behavior and increase awareness about the negative consequences of not reporting concussions.

Implications for Practice

The research study findings suggest that the decision to report a concussion among D-III football players is a complex process influenced by various social, personal, and health factors. For example, outcome expectations, self-efficacy, and cultural norms significantly shape the behavior of D-III football players. In addition, the perceived consequences of reporting a concussion, such as missing playing time, letting the team down, and facing social stigma, are significant factors in the decision-making process. On the other hand, the players' confidence in reporting a concussion is driven by their understanding of the importance of protecting their long-term health and well-being and their trust in their training staff and coaches.

To enhance the concussion reporting behavior among D-III football players, overcoming the various barriers and challenges hindering the reporting of concussions is crucial. One effective way to do this is by educating the players on the significance of reporting a concussion and the potential long-term consequences of not doing so. This education should emphasize the importance of protecting one's health and well-being and highlight the dangers of continuing to play while experiencing concussion symptoms. When asked about the signs and symptoms of a concussion, the participants frequently mentioned dizziness, sensitivity to light, and headaches. However, it is possible that the participants may not fully understand the full range of symptoms associated with a concussion, including memory loss, nausea, confusion, imbalance, sensitivity to sound, and difficulty concentrating. This lack of awareness may hinder the reporting of concussions among this population. To address this issue, future concussion education efforts should aim to increase knowledge about all symptoms associated with a

concussion to improve reporting behavior. Creating a supportive environment that promotes open communication between players, coaches, and training staff is another crucial step toward increasing the players' confidence in reporting a concussion. This can be done by encouraging players to speak up and ensuring they are listened to and taken seriously. The coaching and training staff should also be trained to recognize the signs and symptoms of a concussion and take appropriate action when a player is suspected of having a concussion.

In addition to education and creating a supportive environment, removing any practical barriers that may prevent players from reporting a concussion is crucial. This could involve providing players with resources and support, such as easy, confidential access to medical professionals trained to diagnose and treat concussions and ensuring that players have adequate time to recover before returning to play. The coaching and training staff should also be aware of any resources available to help players recover, such as rehabilitation and mental health services, and should be able to provide guidance and support in accessing these resources.

Overall, addressing the barriers and challenges to concussion reporting among D-III football players requires a multi-faceted approach that involves education, creating a supportive environment, and removing practical barriers. By taking these steps, it is possible to increase the number of reported concussions, which will help reduce the risk of long-term harm to the players and improve the overall safety of the sport.

Conclusion

I started playing football in the fourth grade. I remember getting struck during my first tackle football practice when my glass fell off, and I got teary-eyed. Fast forward, I earned a football scholarship to play football at D-II school. It was here that I vividly remember experiencing my first concussion. Then in 2008, we played a team in Missouri, and I went to make a tackle. My next memory was waking up strapped to a stretcher in a CT scan machine. I was unconscious for three hours. I was diagnosed with a mild concussion. I had to sit out for a week while I experienced constant sensitivity to light, dizziness, and short-term memory loss. After that event, I suffered multiple concussions.

However, I never reported them because I wanted to go to the NFL without risking it. I remember waking face down on the turf once, not knowing what had happened to me. I remember my teammates helping me to my feet and playing the next play. I look at those times fondly, but now I understand the danger in my decisions as an undergraduate student-athlete. We had an excellent athlete training staff, but I did not want to be seen in the training facility. I remember a coach saying he was recruiting someone better than me every year and that if I did not produce, I would not play because he had to feed his children.

These experiences shaped my non-disclosure decision as a D-II football player with pro aspirations. As I aspire to develop a research agenda in higher education, I want to provide athletic administrators, coaches, and athletes with more information and practical solutions to increasing concussion reporting behavior. Unfortunately, not everyone is as fortunate as I am to have had those experiences. I can now research that area to change the concussion-reporting culture.

In conclusion, the study aimed to investigate the cognitive, environmental, and behavioral factors influencing concussion reporting behavior in D-III football players. The research was conducted using a qualitative ethnographic approach, and 14 D-III football players were interviewed and observed to better understand their perceptions and experiences with concussions. The Social Cognitive Theory served as the theoretical framework for the study. The findings were organized into the following four main themes: (1) Concussion Impact, (2) Reporting and Managing Concussions on the Team, (3) Consequences of Reporting a Concussion, and (4) Ensuring Well-being and Avoiding Complications from Concussions.

The findings from this study showed that D-III football players are aware of the importance of reporting concussions but often struggle with the strong urge to continue playing. This struggle is not limited to D-III football players, as athletes at all levels can experience similar challenges. The participants could list several signs and symptoms of concussions but often attempted to rationalize or minimize their significance. Despite their understanding of the risks associated with concussions, they were still willing to take these risks for the love of the game and the identity and pride it gives them.

This study underscores the importance of creating supportive environments that promote open and transparent communication between coaches, players, and training staff. In addition, it is essential to provide relevant resources and support to players that remove barriers to reporting a concussion. A multi-faceted approach that includes cognitive, behavioral, and environmental elements is necessary to increase reporting and create a reporting culture in D-III football players. The good news is that D-III football players felt they had a supportive culture that encouraged and welcomed concussion

reporting. However, D-III players will still choose not to report based on outcome expectations, self-efficacy, and cultural norms associated with the football culture. The findings from this study highlight the importance of creating a supportive and safe environment for athletes and the need for continued education and resources for players to make informed decisions about their health and well-being.

In conclusion, the study provided valuable insights into concussion reporting behavior's complex and multi-faceted nature with D-III football players. The results have implications for both research and practice. They suggest that a multi-faceted approach is necessary to increase reporting and promote the health and well-being of athletes. This study serves as a call to action for continued efforts to address the issue of concussions in sports and ensure that athletes at small, under-resourced institutions have the support they need to make informed decisions about their health and well-being.

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APPENDIX A

IRB DOCUMENTS

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Office of the Institutional Review Board for Human Use

470 Administration Building
701 20th Street South
Birmingham, AL 35294-0104
205.934.3789 | Fax 205.934.1301 |
irb@uab.edu

APPROVAL LETTER

TO: Wright, Brandon T

FROM: University of Alabama at Birmingham Institutional Review Board
Federalwide Assurance # FWA00005960
IORG Registration # IRB00000196 (IRB 01)
IORG Registration # IRB00000726 (IRB 02)
IORG Registration # IRB00012550 (IRB 03)

DATE: 19-Sep-2022

RE: IRB-300009752
IRB-300009752-003
Exploring the Cognitive, Environmental, and Behavioral Factors That Impact Concussion Reporting Behavior in Division III Football Players

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The IRB reviewed and approved the Initial Application submitted on 07-Sep-2022 for the above referenced project. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services.

Type of Review: Exempt
Exempt Categories: 2
Determination: Exempt
Approval Date: 19-Sep-2022
Approval Period: No Continuing Review

Documents Included in Review:

- IRB EPORTFOLIO
- IRB PERSONNEL EFORM

To access stamped consent/assent forms (full and expedited protocols only) and/or other approved documents:

1. Open your protocol in IRAP.
2. On the Submissions page, open the submission corresponding to this approval letter. NOTE: The Determination for the submission will be "Approved."
3. In the list of documents, select and download the desired approved documents. The stamped consent/assent form(s) will be listed with a category of Consent/Assent Document (CF, AF, Info Sheet, Phone Script, etc.)

APPENDIX B

INFORMATION SHEET TO BE PART OF A RESEARCH STUDY

Title of Research: Exploring the Cognitive, Environmental, and Behavioral Factors That Impact Concussion Reporting Behavior in Division III Football Players

UAB IRB Protocol #: IRB-300009752

Principal Investigator: Brandon Wright

Hello. My name is Brandon Wright, and I am a former football player at Arkansas Tech University. I am now pursuing a Doctor of Philosophy degree at the University of Alabama at Birmingham.

You are being asked to participate in a research study entitled "Exploring the Cognitive, Environmental, and Behavioral Factors That Impact Concussion Reporting Behavior in Division III Football Players." This research study aims to apply the qualitative ethnographic approach to examine the cognitive, environmental, and behavioral factors influencing concussion reporting behavior in Division III (D-III) football student-athletes. Recent research indicates that D-III athletes are at higher risk for sports-related concussions. Still, this population has limited research concerning concussion reporting behavior. We hope to learn more about why D-III football players are not reporting concussions to provide smaller programs with theory-based intervention to improve concussion reporting behavior. Your perspective at the D-III level is paramount in exploring the feelings and thoughts concerning concussion culture. Your participation is requested because you are a student-athlete on the football roster at a D-III school with concussion culture experience.

If you agree to join the study, you will be asked to complete a 1-hour, face-to-face interview via Zoom regarding cognitive, environmental, and behavioral factors influencing concussion reporting behavior at the D-III level. You may turn off the video during the study if you wish. This interview will contain questions about outcome expectations, normative beliefs, self-efficacy, social support, and behavioral skills concerning concussion reporting behavior. I will audio record the interview and transcribe it later. I will call you back once I have transcribed the interview to clarify a few items, but this should only take 15-30 minutes. You will be paid $25 at the end of your first interview—the method of payment used for this study is a Visa Thank You eGift Card, based on your participation in the study. You will receive the eGift Card via preferred email preference. In addition, I will observe you, the participant, at practice and games over the study.

Participation in this research is strictly voluntary, and you can end the interview at any time. You can use a pseudonym during your interview, and I will keep your data confidential. All data will be stored on password-protected computers. I destroy it as soon as it is no longer needed. Again, your data will be kept confidential.

By agreeing to be interviewed and observed, you consent to allow your response to be used in this research study.

Suppose you have a question about your rights as a research participant or concerns or complaints about the research. In that case, you may contact the UAB Institutional Review Board Monday through Friday (8 am to 5 pm CST) at 205.934.3789 or toll-free at 1.855.860.3789.

If you have any research questions, please get in touch with Brandon Wright at 601.402.3218, or if you are willing to participate, schedule an interview.

Respectfully,

Brandon Wright
Ph.D. Candidate, Health Education, and Health Promotions
The University of Alabama at Birmingham

APPENDIX C

SEMI-STRUCTURED INTERVIEW GUIDE

Introduction: Hi, my name is Brandon Wright, and I am a doctoral student at the University of Alabama at Birmingham. Thank you for agreeing to participate in the study.

Discuss the purpose of the study: This study aims to learn more about you and your experience with concussion reporting at Division III. In addition, I hope to inform under-resourced and smaller institutions with theory-based findings to create an environment conducive to concussion disclosure. Participation in the study is voluntary, and you may stop anytime.

Discuss the structure of the semi-structured interview: I will conduct one interview and follow-up to verify the information collected. This interview will be recorded and transcribed; only I will have access to your interview. You are free to use pseudonyms to protect your identity throughout this study. Also, I will be taking notes during the interview for inclusion in the study. Your experience and perspective are fundamental to my research, and I would encourage you to share your experience to the best of your remembrance. Again, thank you.

Ask if the participant has any questions.

Are you ready to begin? [If yes, start recording]

Rapport/Ice Breaker question: What comes to mind you hear the word "concussion?"

Research question 1: What are D-III football players' outcome expectations (i.e., consequences) about concussion reporting, and how do these expectations affect their behavior?

1. What do you think will happen on your team if you report a concussion?
2. If you were to begin to report a concussion, what would be your motivation?
3. What do you believe are the benefits of reporting a concussion?
4. What do you believe will be the consequences of reporting a concussion?

Research question 2: What are D-III football players' perceptions of self-efficacy about concussion reporting, and how do these perceptions affect their behavior?

1. Do you believe you have the confidence to report a concussion, and if so, why? If not, why not?
2. Can you explain an experience with reporting or not reporting a concussion on your team?
3. Tell me about some of the biggest challenges you face with reporting a concussion on your team.
4. Can you talk to me about ways to overcome those challenges?

Research question 3: What are NCAA D-III football players' perceptions of normative beliefs about concussion reporting behavior, and how do normative beliefs affect their behavior?

1. Many people think concussions come with the game, and there is no need to report a concussion. What do you believe are the cultural beliefs concerning reporting a concussion?
2. Do you think you would be accepted or rejected for reporting a concussion?

Research question 4: What are NCAA D-III football players' perceptions of social support about concussion reporting behavior, and how does social support affect their behavior?

1. Thinking about people in your life, who are the individuals in your life that would discourage you from reporting a concussion, and what are some ways you could overcome this discouragement or lack of support?
2. Can you tell me about the people in your life who will undoubtedly encourage you to report a concussion?
3. What would you want them to say if someone were to encourage you to report a concussion?

Research question 5: What are NCAA D-III football players' perceptions of behavioral skills about concussion reporting behavior, and how do behavioral skills affect their behavior?

1. If you wanted to report a concussion effectively, what would you do?
2. In your opinion, when should you report a concussion?
3. What would you do if you wanted to increase the odds of an individual like yourself reporting a concussion?

Conclusion question: Is there anything that we have not discussed today or anything else you would like to share before we end the interview today?