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Barriers to Musculoskeletal Injury Reporting in High School Athletes: A Qualitative Study

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BARRIERS TO MUSCULOSKELETAL INJURY REPORTING IN HIGH SCHOOL ATHLETES: A QUALITATIVE STUDY

by

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(Under the Direction of Charles H. Wilson, Jr.)

ABSTRACT

INTRODUCTION: There are a substantial amount of sport related injuries recorded at the high school age and it has been recorded as a public health concern in a vast amount of health literature. Although participating in sports has a risk of injury associated with it, it is common for high school athletes to underreport injuries. But there is no known literature on injury reporting behaviors of musculoskeletal injuries in the high school athletic population. Therefore, the purpose of this study is to explore the barriers and facilitators to musculoskeletal injury reporting and towards playing injured in athletes that attend a rural, Title I high school. METHODS: A qualitative study was conducted utilizing a purposeful, convenience sample to form four focus groups with athletes from American football, girls' basketball, boys' basketball, and girls' soccer. A semi-structured interview guide was used to interview participants and was audio recorded via Zoom. Focus group responses were transcribed verbatim as part of a thematic analysis and the Theory of Planned Behavior (TPB) lens was used to guide the discussion. RESULTS: Five themes emerged from the focus group responses including healthcare trust and mistrust, social pressures, internal pressures, injury attitudes, and desire to play. Barriers including a poor coaching dynamic, professional sports, mistrust in healthcare, emphasis on winning, and poor injury attitudes were significant predictors of low intention to injury reporting. The primary facilitator of injury reporting found in this study resulting as a strong predictor for high intention to musculoskeletal injury reporting was a good relationship with the athletic trainer. CONCLUSION: The current findings suggest that there are more barriers to injury reporting than there are facilitators, resulting in the behavior to play through pain and injury. The TPB can be extended to musculoskeletal injury reporting behaviors to determine the intention to report an injury which will determine the likelihood to report a musculoskeletal injury. The predictors of the TPB should be used to educate stakeholders to help protect the health and safety of high school athletes.

INDEX WORDS: Injury reporting, Musculoskeletal injury, High school athletes, Rural, Theory of planned behavior.

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DEDICATION

This thesis is dedicated to my supportive family and friends. This project was made possible with your encouragement and reassurance. Thank you for always believing in me, even when my vision was clouded with doubt.

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CHAPTER 1

INTRODUCTION

Starting at six years old, one can typically begin participating in organized sports. At this very young age and continuing through the high school age, sport participation is strongly encouraged in the youth population due to its many benefits. Benefits include maintaining a healthy lifestyle through physical activity, developing skills, and engaging in challenging tasks. Making friends and creating social skills are also benefits gained from sport participation. Additionally, the primary reason youth athletes play sports is for enjoyment and to have fun.[1-4] For reasons such as these, approximately 7.9 million adolescents, ages 13-18 years old, participated in high school sports in the 2018-2019 school year.[5,6]

However, for the first time in 30 years, high school sport participation declined.[5] There is no particular reason to explain the decreasing participation in high school sports, but one factor may be due to the concern for risk of injury. There is such a high prevalence of sports related injuries sustained in youth sports that it has become the primary reason for youth athletes to seek medical attention. Approximately, 1.3 million sports related injuries occur during the school year in high school athletics.[6] Additionally, the CDC reports high school athletics results in 500,000 doctor visits, 30,000 hospitalizations, and 2.6 million emergency department treatments annually.[7] This has resulted in approximately $700 are spent per injury, roughly estimating to $910 million spent in yearly costs to treat high school athletic injuries.[8] Tragically, more than 600 catastrophic injury and 200 sports-related deaths have occurred in the United States between 2010 and 2020.[9] Because there are a substantial amount of sport related injuries, the cost, and even deaths, high school sports been recorded as a health concern in a vast amount of health

literature.[10-14] Despite the benefits sport participation may offer, the literature demonstrates that sport participation can also negatively impact this population's health.

Specific to high school athletes, the most common injuries sustained are musculoskeletal or soft tissue injuries, especially those that are from overuse.[7, 14-16] Contributing to the large number of injuries are injury type, sport, and setting. For example, injury type such as sprains and strains make up the majority of this population's musculoskeletal injuries and most frequently affect the lower extremity. Also, the type of sport can affect injury incidence as the highest incidence of injuries result from contact and jumping sports such as American football, soccer, and basketball. More so, high injury incidence has been reported to occur during competition and in rural settings.[7,14] Therefore, the type of injury, sport, and setting can add to the prevalence of injury and partly explain why sport participation is declining.

Although risk of injury may help explain overall participation decline, lack of resources may perhaps explain decline specifically in high schools located in rural areas. Rural is defined by the U.S. Census Bureau as any territory not located in urban areas or urban clusters with a population less than 2,500 residents.[17,18] Rural areas are often populated with a greater residence of minority groups, high poverty rates, and are medically underserved.[18,19] Rural high schools are often classified as Title I high schools in which financial assistance, such as free and reduced lunch, is provided to schools with 35% of students from low-income families. Schools with 40% of students or greater that are from low-income families are considered a Title I Schoolwide School.[20] Based on these statistics, it is evident that rural, Title I high schools have limited resources.

Unlike the general population, rural high schools experience sport participation declines mainly due to the lack of resources and lack of personnel in addition to high injury rates.[21,22] The

limited population in these areas can lower the participation outcome. A limited participation pool contributes to athletes playing multiple sports in a given school year to field a team which may increase injury risk, particularly overuse injury risk, due to improper rest from sports. Meanwhile, there is minimal personnel such as coaches due to relocation to urban areas and there is limited monetary resources that can result in cancellation of individual sports programs in rural high schools as compared to their urban and suburban counterparts.[18,21] Furthermore, rural high school athletes are at greater risk for injury primarily due to lack of medical access. Injuries sustained by these athletes cannot be attended to properly when medical personnel such as athletic trainers are not available or minimally available.[18,19,22-26]

According to the literature, athletic trainers are the most qualified medical professional to treat high school athletes as they play a valuable role in injury prevention and injury education to both athletes and coaches.[22-26] Athletic trainers are certified and licensed to treat athletic injuries and provide emergency care during athletic events, outside of the traditional clinic setting. Also, athletic trainers act as first responders during athletic events and refer athletes to physician and other healthcare providers, giving athletes an avenue to seek medical services. However, more than 78% of schools across the nation with low athletic trainer availability are located in rural and inner-city areas.[19] Rural high schools lacking proper medical personnel may contribute to the high incidence of overuse injuries and potential underreporting of injuries in this population.

Although the number of injuries sustained in high school athletes are alarming, the true incidence may be higher as research suggests that underreporting is common in youth athletes, particularly in ages 13-18 years old. Underreporting occurs for various reasons including the interpretation of a reportable injury, who is responsible for reporting, barriers, personal attitudes,

and social norms. Research related to underreporting in high school athletes has been primarily conducted assessing reporting of concussive injuries.[7,13,14,23,26-32] Athletes underreport concussions at an estimated rate of 50%–75% of all injury incidence and about 20-60% of athletes refrain from reporting concussions to an authority figure.[23,28-30] Generally speaking, the underreporting of an injury can result in worsening injury or permanent damage to the body. From the concussion literature, there is a relatively large number of athletes that refrain from reporting injuries, increasing the chance for long-term health consequences. Previous literature on underreporting primarily focuses on concussions; however, there is no known literature on the injury incidence or reporting behaviors of musculoskeletal injuries in the high school athletic population.

Although the literature records some facilitators of concussion reporting, underreporting may be explained by various barriers that discourage athletes to report. The most common barriers in the published research involve internal and external pressures such as fear of losing playing time or letting someone down. Lack of knowledge has also been reported as a common barrier to injury reporting but has been debated in previous research.[30] Barriers have been studied in concussion literature using the Theory of Planned Behavior (TPB) to understand intention to injury reporting through attitudes, subjective norms, and perceived behavioral control.[32-35] From the TPB, barriers can shape attitudes that affect the climate of sport, moral judgements, and socially constructed rules that influence behaviors associated with injury. However, there are limited studies that record the attitudes of high school athletes regarding sports injuries. From the findings of these few studies, some attitudes adopted by high school athletes are competing through pain and injury as well as failing to disclose injuries. Therefore, the current study is looking to understand factors that influence athletes' injury reporting and reasons why some

athletes continue to play while injured. The purpose of this research is to explore barriers and facilitators to musculoskeletal injury reporting and towards playing while injured in athletes that attend a rural, Title I high school.

CHAPTER 2

METHODS

Participants

Participants were athletes recruited from a rural, Title I Schoolwide high school in southeast Georgia with 97% of students eligible for free lunch.[36] Participants of the study participated in contact sports that are separated by biological sex according to the Georgia High School Association including American football, boys' basketball, girls' basketball, or girls' soccer. Contact sports were examined in this study due to the high incidence of injuries that occur in this sport type specified in previous epidemiology literature.[7,14] The primary investigator invited all athletes from each individual sport to participate in the study by reading a scripted introduction of the study during team meetings or huddles. Also, flyers were placed in the athletic training room with an introduction of the study and information to contact the primary investigator for participation. After initial interest was expressed, participants were given a parental consent form and minor assent form that explains the study in a written format to take home to their parent(s)/guardian(s) for signature and completion. The lead researcher provided snacks during the focus groups as an incentive to encourage participation in the focus groups. All completed parental consent and minor assent forms were returned to the primary investigator prior to data collection.

Inclusion Criteria

Participants were included in the study if they were: in the 9th-12th grade; currently on a high school athletics team at the specified high school; and had a previous or current sports related injury occurring while in high school.

Exclusion Criteria

Participants were excluded from the study if they: did not return the parental consent and/or assent forms and did not have a previous history of injury while in high school.

Instrumentation

Demographic Questionnaire

An eight - item demographic questionnaire was given to study participants at the conclusion of the interview to obtain information regarding participants' age, grade level, race, current sport, high school injury status, and years of playing sports. Also, a space on the form was provided for participants to disclose barriers to reporting injuries if the participant felt uncomfortable sharing in the open discussion.

Interview Guide

A semi-structured interview guide served as the primary instrumentation for this study. Utilization of a semi-structured format was selected to allow for probing questions, allow participants to elaborate on responses, and to give researchers a greater understanding of the topic.[37] The interview questions were designed to explore factors that influence athletes' injury reporting of musculoskeletal injuries and explore reasons why some athletes continue to play while injured. A comprehensive literature review was conducted, and questions for the interview guide were adapted from a seminal study by Chrisman, Quitiquit, and Rivara[32] on qualitative research regarding barriers to concussive symptom reporting.

A pilot study was conducted to examine and validate the interview guide as well as gain practice in qualitative research using the semi-structured question format.[38] The pilot study was intended to replicate the methodology as accurately as possible. The lead researcher interviewed 3 former high school athletes that were beyond 18 years of age. The data obtained from the

participants used for the pilot was not used for the final data analysis. Additionally, experts in coaching, athletic training, motivational changes in athletes, and adolescents reviewed the interview guide to ensure questions were interpreted the way they were intended and answered the research questions; thus, establishing content validity.[38]

Researcher as an Instrument

The lead researcher is an athletic trainer employed at the sample high school and has personal and professional experiences with the topic. Prior to data collection, the lead researcher completed formal training through introspective reflection and a bracketing interview in attempt to acknowledge her biases on the topic. Introspective reflection has been shown to aid in researchers' awareness and strengthen the trustworthiness of research.[39] This allowed the lead researcher to explore and understand her personal identities and expectations for the study. Bracketing interviews are a method used in qualitative research to understand preconceived ideas and acknowledge biases that may discredit the research process.[40] Therefore, the lead researcher completed a bracketing interview using the interview guide. The bracketing interview allowed the lead researcher to reflect on the interview guide questions and how she would answer the questions to gain insight into her biases. The researcher acknowledges her biases associated with working with her current athletes and her own personal experiences. The primary investigator's personal and professional experiences provide opportunities for the researcher to have rapport with the athletes, relate to the participants' experiences, and understand their points of view regarding injury reporting and barriers to it. However, the lead researcher put forth all efforts to interview from a neutral position, engage with an open mind, and interpret responses from the perspectives of the participants rather than the researcher.

Procedures

Prior to recruitment, the administration at the sample high school was contacted for permission to recruit participants. Permission was obtained and the study was approved by the Institutional Review Board (IRB) of Georgia Southern University. Data collection ran from January to March. The primary investigator conducted interviews through in-person focus groups categorized by sport. Focus groups were chosen by sport to create a more comfortable environment with familiar faces and shared experiences to create a natural discussion instead of a forced response to the lead researcher.[41] Separation by sport and sex was intentional with the idea that current teammates are aware of injuries on the team, decreasing the risk of disclosing an injury or breach of confidentiality during the focus groups.[41] The focus group consisted of four participants for each sport, totaling 16 participants. Traditionally, full focus groups consist of 10-12 participants; however, smaller focus groups have been recommended for a greater likelihood for interaction by participants and easier for the moderator to facilitate discussion.[41,42] The groups were homogeneous by sport, sex, and high school age to generate a deeper discussion.[41] The lead researcher recorded the audio of the interviews with a personal laptop via Zoom to assist with transcription and to keep the identity of the participants confidential. Interviews were also recorded on the lead researcher's phone due to poor internet connection at the sample high school. Prior to recording, the lead researcher prompted the participants to choose an appropriate pseudonym to protect the identity of the participants. Focus group duration was between 37 minutes and 65 minutes.

Data Analysis

Recordings were transcribed verbatim and coded independently. Open coding was used for first level coding to identify similar words or phrases from the participants to build codes.[43]

Codes were then analyzed for similarities and combined to form categories to prepare for creating themes. During the coding process, the lead researcher made analytical memos to aid in thematic analysis and determine examples that answer the research questions.[44,45] Thematic analysis was used to develop themes that emerged consistent with the research questions and purpose statement. Thematic analysis allows for an in-depth approach to explain data as it organizes and describes the data set in great detail.[44,45] From this, a code book was developed based on the emerging themes and designed to identify barriers and facilitators of musculoskeletal injury reporting and reasons to why athletes' play injured. An expert in qualitative research reviewed the code book to condense codes, establish validity, and establish triangulation.[38] In qualitative research, data saturation is commonly used to determine adequacy. Data saturation occurs when themes are redundant and new information is not reported; however, saturation was not achieved in the current study. Although data was not saturated, experts Braun and Clark, encourage reflexivity and critical thinking to determine the richness of the data instead of saturation.[45] Reflexivity and critical thinking skills were practiced through bias training such as bracketing interview and introspective reflection and through analytical memos that were taken during multi-level coding.

To help explain the data and guide the discussion, the researcher used the lens of the Theory of Planned Behavior (TPB). The TPB states that one's intentions to perform a behavior can be predicted by one's attitudes towards the behavior, subjective norms, and perceived behavioral control.[46] The TPB has been previously used to understand concussion reporting behaviors; therefore, TPB was used to aid the understanding of attitudes and behaviors related to musculoskeletal reporting.[32-35] The TPB can be applied to musculoskeletal reporting to predict athletes' intention to report musculoskeletal injuries. For the current study, attitudes are defined

as, the athletes' beliefs about consequence of reporting musculoskeletal injury. Subjective norms are defined as, the perceived pressure from external influences such as coaches, teammates, or parents to report or not to report musculoskeletal injuries. Lastly, perceived behavior control is defined as, the degree to which athletes believe they can perform a behavior as in the ease to report a musculoskeletal injury.

CHAPTER 3
RESULTS

Participants

A purposeful, convenience sample of 16 high school varsity athletes (8 males; 8 females) that attend a rural, Title I Schoolwide high school in southeast Georgia participated in the current study. Study participants currently participated in either American football, boys' basketball, girls' basketball, or girls' soccer. Four participants were allocated to each sport. The mean age of participants was 16.94 ± 1.12. A majority of participants were in the 11th and 12th grades with no 9th grade participants due to a lack of volunteers in that grade. Most participants identified as Black/African American with 43.7% while 31.3% identified as Hispanic/Latino, and 25% identified as White/Caucasian. The demographic by race is representative of the high school's population considering 57% of the sample high school is minority students.[36] The most common injuries experienced amongst the participants were lower extremity injuries, specifically ankle sprains and knee injuries. Female athletes in this study reported a higher incidence of knee injuries that were also more severe compared to the male athletes. For example, two of the four female basketball participants reported sustaining ACL tears. There were no other differences in injury type or severity across the sport, sex, grade level, or competition level. A majority of athletes in this study were multi-sport athletes in the 2021- 2022 school year. Specifically, all male athletes were multi-sport athletes, while three of the eight female athletes were specialized to their specific sport. Also, all athletes in this study had varsity experience with only two male athletes that played both varsity and junior varsity (JV). No participant disclosed barriers on the free response question on the questionnaire. Detailed demographics of the participants can be found in Table 1.

Themes

Focus group responses have confirmed that athletes from the sample high school have various barriers and facilitators to injury reporting and all athletes have continued competition through pain and injury before. Upon completion of coding, five major themes were developed from the data that helped answer the research questions. Themes included healthcare trust and mistrust, social pressures, internal pressures, injury attitudes, and desire to play. Participant responses were chosen to represent each theme and subtheme based on the salience of the information provided and to show variation of responses across all focus groups.

Theme 1: Healthcare Trust and Mistrust

Participants in all focus groups identified having trust or mistrust in medical personnel as being a reason whether they report an injury or not. Participants primarily spoke about the athletic trainer or the emergency room when discussing healthcare professionals. On one hand, some participants found it to be a barrier to report to an athletic trainer because they believed the only outcome to result from disclosing an injury was to be removed from sport by the athletic trainer. This is represented by the following quotes by Kyrie and Chadwick. However, overall, the athletic trainer was primarily seen as a facilitator because all athletes discussed having a comfortable and trustworthy relationship with their athletic trainer where they could report an injury a majority of the time. Additionally, participants expressed trust in the athletic trainer because of their educational background, their listening skills, their ability to return the athlete to play in a better physical condition, and their familiarity with the athletes' physical capabilities that can assist in clearance of the athletes' injury. Some examples of the athletic trainer being seen as a facilitator is expressed by Flor and Kyrie. The doctor and emergency room were also

seen as barriers of reporting. Athletes claimed that they had mistrust in the doctor or emergency room because of exaggerated severity of injury and timeline to return to sport. The mistrust in the emergency room or doctor was exemplified by athletes' Jewels, Joseph Williams, and Bobby. Trust in the doctor was only seen when it was the participant's primary doctor as expressed by Jewels. However, American football athletes were more likely to bring up their negative experiences with their past athletic trainers and a majority of the females expressed not having a relationship with their past athletic trainer or not being injured during that timeframe. Also, only one female from girls' basketball considered the doctor to be a facilitator to injury reporting on occasion.

- Athletic Trainer:

  Barrier:

  "The reason why athletes really don't tell nobody when they injured is so the trainer won't sit them out so they can't play no more. Well, I won't say they can't play no more, but they can't play that moment." (Kyrie – boys' basketball)

  "[I feel least comfortable reporting to] our trainer because she's going to take us out." (Chadwick – American football)

  Facilitator:

  "We're more comfortable around [the athletic trainer] more than we would be with somebody we probably see twice a year, probably not even know." (Flor - girls' soccer)

  "*The trainer should be able to clear [injuries] because the trainer sees how they play in every game, how they move, their movement, they pay attention to all that.*

And if they not moving the same while they're still hurt, then they shouldn't be cleared, but if the trainer sees they're getting back to them old selves, then the trainer should be able to clear them." (Kyrie – boys' basketball)

- Doctor/Emergency Room:

  Barrier:

  "So, I was playing this sport and I had dislocated my finger, right? And they told me that I was never going to be able to move my finger again. But then I come to [the athletic trainer], you helped me kind of move it again and it came back to normal. So, a doctor can over-exaggerate like bad." (Jewels - girls' basketball)

  "*Like say you sit out two weeks, but the doctor will be like, oh two years or something.*" (Joseph Williams – American football)

  "*Because the emergency room, even if it's not something real bad they will still sit you out and tell you, you won't play. Instead of going to the trainer, when the trainer going to do something probably slight, like do a little rehab and get ice and you'll be fine. But you go to the emergency room…they going to sit you out a lot, like they going to sit you for a long time, if not the whole season.*" (Bobby – boys' basketball)

  Facilitator:

  "Okay, you know everybody got their own doctor and everything. I trust my specific doctor. But say I need to go somewhere else, and this person tells me

something, I'm not going to believe them until I go back to my doctor..." (Jewels – girls' basketball)

Theme 2: Social Pressures

Social pressures are influences on a behavior from external parties. For the purpose of this study, social pressures are the effect of external influence on injury reporting behaviors of the high school athlete. Participants identified stakeholders including coaches, teammates, and family as people that influence them on whether to report an injury. Although all focus groups identified each stakeholder as both a barrier and facilitator depending on the situation, girls' soccer was the only group to identify the coach as a frequent facilitator to injury reporting and family as a primary barrier to injury reporting. Additionally, three of the four focus groups identified the coach as a primary barrier to injury reporting. Lastly, professional sports were identified as social pressures as three of the four focus groups discussed looking up to professional athletes and being influenced by watching them play thorough multiple serious injuries. The influence of professional sports was primarily seen as a barrier and encouraged most male participants to continue playing through injury. Social pressures that the participants experienced, whether a barrier or facilitator, varied by sport and by participant.

- Coach:

  Barrier:

  "Sometimes with coach, he would just be like "oh you're fine" and not worry about it. But like you're actually hurt, and he don't know." (Sarah – girls' basketball)

"…I just don't need to tell the coaches; I just don't understand the need…They be thinking you lying or something" (George – boys' basketball)

"*I was thinking like it depends on the person. Like with my former coach, he was a tough coach like very tough. He would think you were soft, like there were certain injuries you could play through, so he would tell you like you soft*" (Robert – boys' basketball)

Facilitator:

"I told my coaches about it and they advised me to come to [the athletic trainer]" (Vanessa – girls' soccer)

"*But I wanted to play, but the coaching staff was like no, she not playing [because] what if you hurt it worse…*" (Brooklyn – girls' basketball)

- Teammates:

Barrier:

"Yeah, because if my arm hurts, Hayden is going to tell me I'm being a ...I need to a suck it up. And I'm being a girl. So, then I am going to try to make Hayden happy and don't complain about it and then suck it up." (Chadwick - American football)

"*I feel like I let the team down because as a senior, a lot of people are saying that they depend on me a lot, not just me, but on Flor and it just made me feel bad for my team..."* (Maria – girls' soccer)

Facilitator:

"Yeah, I agree with them too…if you feel like something ain't right, I advise just go to the trainer before you even go to the doctor to get it seen about [and] see what's up." (Bobby – boys' basketball)

- Family:

Barrier:

"I would say my brothers. I feel like my brothers have influenced me so much on saying that things are no big deal. Because they usually, my brothers are like suck it up. Suck it up." (Vanessa – girls' soccer)

"*Like say they don't feel the injury is that important, [parents] can also influence you to suck it up like a coach*" (Jimmy – American football)

Facilitator:

"But [my mom] seen my ankle was swollen and they said I should get it checked out." (Maria - girls' soccer)

"[Family] tells you to talk to the trainer" (Jimmy – American football)

- Professional Sports:

Barrier:

"*I mean like Klay Thompson tore his Achilles and he still played.*" (American football - Leonardo DiCaprio)

"*Like you see Lebron, this man rolled his ankle plenty of times, tied his shoes up, and go back to work. But then you see other people roll their ankle and they might*

> *have to sit out for a couple of weeks or something, like KD, that man stay injured. Like Kobe, this man broke plenty of bones, like knees and all that, this man stayed in the game*." (Robert – boys' basketball)
>
> Facilitator:
>
> "*I think seeing NBA players [play] with it. Yeah, watching it and stuff. Like real severe ankle injuries, something wrong with your knee or something like that [influences my thinking on what big deal injuries are]*. (Miracle – girls' basketball)

Theme 3: Internal Pressures

Internal pressures are stress that one puts on themselves to fulfill a self-expectation. For this study, internal pressures are the expectations athletes put on themselves to continue playing their sport even if that means playing through pain and injury. Participants also identified internal pressures that discouraged them from reporting an injury. One reason is that athletes want to avoid being told bad news including being informed of having a serious injury that may be season or career ending. Quotes given by Sarah and Kyrie give insight to the subtheme of avoid bad news. Also, athletes do not want to lose their spot on the team including normal playing time and starting position as represented by Jimmy, Miracle, and Natalia. Lastly, some athletes felt they were letting the team down if they reported an injury instead of playing as expressed by Brooklyn and Flor. Each of these are reasons athletes put pressure on themselves to play with pain or injury resulting in a barrier to injury reporting.

- Avoid bad news:

  "Yeah, like the information you get back. Because you don't want to be told that heart dropping information. Like that information that be like [dang]. The one that's going to hit you deep, like if you can't play no more or like you got to sit out for a whole year." (Kyrie – boys' basketball)

  "*Yeah, because I don't want to find out…Like I knew I probably wouldn't be able to finish the season but when I really found out, it just…it was sad."* (Sarah – girls' basketball)

- Lose spot:

  "Like fear of taking your spot if you don't [have] a locked spot." (Jimmy - American football)

  "*But still, it's like do you want to take the risk of going and reporting it and having to sit out the rest of your season…*" (Miracle – girls' basketball)

  "*I felt like it made me lose somewhat of my position on the field*." (Natalia – girls' soccer)

- Let team down:

  "… I don't know only because I don't be wanting to let my teammates down." (Brooklyn – girls' basketball)

  "*…I could have avoided that injury if I properly used the equipment in the weight room. So, I felt that I let the team down a little.*" (Flor – girls' soccer)

Theme 4: Injury Attitudes

Participants of this study have developed attitudes about injury through factors such as experiences, instincts, injury severity, sport culture, and injury knowledge. All participants acknowledged knowing when an injury was severe or not by their previous experiences with injury. For example, an athlete who has sustained multiple ankle sprains expressed experience as a facilitator to reporting that injury and would rather sit out of competition until the ankle was healed. In contrast, another athlete who has also sustained multiple ankle sprains, expressed experience as a barrier and continues to play on the injury because they feel their performance is not affected. The contrast of injury experience being a barrier and facilitator is represented by quotes by George and Joseph Williams. Similarly, all participants have made decisions whether to play on an injury based on injury severity. In this instance, a barrier to injury reporting is seen when an athlete sustains an injury, but the pain is not significant enough or no apparent, visual symptoms of a major injury are present. Injury severity being a barrier or facilitator is evident by the following statements said by athletes' Leonardo DiCaprio, Chadwick, and Sarah. Athletes also decide whether to report an injury based on their instincts or self-awareness of their body such as pain tolerance. This is made clear by the insight given by Leonardo DiCaprio, Miracle, and Robert. Additionally, all athletes in the focus groups understood they chose to play a contact sport and with that comes pain, discomfort, and minor injury. Therefore, if the injury is common in their sport and considered minor, it was a barrier to injury reporting. For example, participants noted that you may get cleated in soccer, a jammed finger in basketball, or a headache in football due to the nature of the sport as mentioned by Flor, Chadwick, and Brooklyn. In this case, athletes believe you should "suck it up" and keep playing because it does not cause severe pain and should not affect your performance. Lastly, participants of this study displayed knowledge of

injury, but knowledge did not always result in reporting of an injury. Participants differentiated major and minor injuries and recognized signs and symptoms associated with them. For example, common minor injuries that participants identified were contusions, jammed fingers, and ankle sprains depending on the severity. Also, participants identified major injuries as broken bones, head/neck injuries, torn ligaments especially of the knee such as an anterior cruciate ligament (ACL) tear. Most participants understood that major injuries could affect them long-term and cause permanent damage. Participants recognized that you should not play with a major injury, nor does it matter your position or the type of athletic event when these injuries occur. Despite that however, majority of the participants expect athletes to play through discomfort and minor injuries, especially their teammates that are starters or most talented Evidence of injury knowledge can be shown by statements given by Maria and Kyrie. Overall, factors including experiences, instincts, injury severity, sport culture, and injury knowledge can be both barriers and facilitators to reporting musculoskeletal injury symptoms and can explain why athletes may choose to continue competition with discomfort.

- Experiences:

  > *"Well, when I sprained my ankle, they go away in like a day. Like next day, I'll be alright, that's why I say."* (George – boys' basketball)

  > "*I had too many ankle sprains, high ankle sprains. [I'm] not getting back into the game."* (Joseph Williams – American football)

- Instinct:

  "*You know when you have an injury. Like you know deep down. You know whenever it's bad [and] whenever its good*." (Leonardo DiCaprio – American Football)

  "*I feel like our natural instincts can tell. Like whether like you can take a certain amount of pain."* (Miracle – girls 'basketball)

  "*It's like basically how you are feeling. You going to know if you can play through it or not because of pain tolerance. Different people have different pain tolerance… You will know like when it's like a big deal or a small*." (Robert – boys' basketball)

- Injury Severity:

  "Hmmm I guess, alright, so the abnormal scale. So, a sprained ankle is like a 2, a torn ACL is like a 10. It's different between the two. So, I would say about a 6 plus you just need to wrap it up about a month. Like 1 to 4 is more like stop being a you know what." (Leonardo DiCaprio – American football)

  "*Like if you're, if you have cramps or like soreness you got to work through it sometimes…But if it's like an injury, then you need to sit out*" (Chadwick – American football)

  "*If I can get up and walk on it too than I know it's not that bad*" (Sarah – girls' basketball)

- Sport Culture:

  "Like one should know, especially in soccer, there's a lot of contact so don't be complaining about it… you got to understand it's soccer, there's going to be contact, you just got to deal with it. I mean you chose to play the sport." (Flor – girls' soccer)

  "*Football is a physical sport, so like you're going to get hurt and you're going to get banged up so depending on how bad a bang is, is whether you get sit out or not."* (Chadwick – American football)

  "*A jammed finger is like, that's normal about in any sports. So, if you can't [play] with a jammed finger, I don't know*." (Brooklyn – girls' basketball)

- Injury Knowledge:

  "*I feel like these injuries typically lead you to the hospital, not just coming to the trainer's room. But you can end up in the ambulance too*." (Maria – Girls' Soccer)

  "*It don't matter who you are, if you got big deal injuries you need to go get them seen about because them injuries are nothing to play with. That can really scar your body for the rest of your life. Especially with neck injuries. Because you get into a spot where you might get paralyzed from the neck down or the legs down*." (Kyrie – Boys' Basketball)

<u>Theme 5: Desire to Play</u>

Athletes would rather play injured for various reasons than not be able to participate in their sport. The participants of this study expressed true desire to play their sport, independent

from the expectations of others. The two common reasons for wanting to play even while injured were winning and enjoyment for the sport. Focus group responses by Kyrie and Leonardo DiCaprio show winning as a reason for continuing to play through pain and injury while responses by Brooklyn, Maria, and Natalia exemplify enjoyment as a reason for playing through pain and injury. A difference in sex was found regarding the barriers of winning and enjoyment. Female athletes emphasized their passion, dedication, and overall enjoyment of the sport as a reason they would not report an injury, while male athletes emphasized wanting to win. Although, there is a decline in high school sport participation nationwide, the data shows that athletes still want to play despite the risk of injury.

- Winning:

  "See if it's a win or go home game he going to have to stay in the game. As a teammate, I want the best people, I want to be playing with the most experienced people, that knows what they are doing on the court or on the field." (Kyrie - boys basketball)

  "*Because I don't want to lose, I want to win*." (Kyrie – boys' basketball)

  "*Nobody likes second place*." (Leonardo DiCaprio – American Football)

- Enjoyment:

  "That's why when it comes to certain injuries like I just won't say nothing because I do want to keep playing" (Brooklyn - girls' basketball)

  "*Because I care about the sport so much and having to miss out games, not just games, practices, I enjoy being so much with my team, I wouldn't want to be on*

the side just watching them practice and me feeling excluded for a small injury that I would consider." (Maria – girls' soccer)

"*Because I felt like I could push through it and I was able to you know, keep going, keep fighting and I wasn't going to let the injury stop me from playing the game that I love, because like I have the passion for it and I still do to this day*." (Natalia – girls' soccer)

Table 1: Participant Demographics

Sport	Participant Pseudonyms	Grade Level	Age (Years old)	Race	Previous History of Injury	Competition Level (Varsity or JV)	Multi-sport athlete (School year 2021-2022)
American Football	Leonardo Dicaprio	12th	17	White	Ankle sprain, unspecified shoulder injury, unreported concussion	Varsity	Yes
	Chadwick	12th	17	White	Patella injury, broken finger, unspecified thumb injury	Varsity	Yes
	Joseph Williams	12th	19	Hispanic	Ankle sprain, wrist sprain, unspecified shoulder injury	Varsity	Yes
	Jimmy	10th	15	White	Unspecified knee injury	Both	Yes
Boys' Basketball	Kyrie	12th	18	Black	Ankle sprain, unspecified hip injury, arm laceration requiring stitches	Varsity	Yes
	George	12th	18	Black	Ankle sprain, hip pointer,	Varsity	Yes
	Bobby	11th	17	Black	Ankle sprain, jammed finger, torn ligaments of the elbow	Varsity	Yes
	Robert	10th	15	Black	Broken ankle, dislocated finger	Both	Yes
Girls' Basketball	Brooklyn	11th	17	Black	ACL & meniscus tear, bruised ribs	Varsity	Yes
	Miracle	11th	16	Black	Ankle sprain, unspecified knee injury	Varsity	Yes
	Sarah	12th	18	White	ACL tear, un-reported ankle injury	Varsity	No
	Jewels	11th	16	Black	Ankle sprain, broken finger	Varsity	Yes
Girls' Soccer	Flor	12th	18	Hispanic	Unspecified knee injury, concussion	Varsity	Yes
	Maria	12th	17	Hispanic	Ankle sprain, unreported knee injury	Varsity	Yes
	Vanessa	10th	16	Hispanic	IT-band injury, concussion	Varsity	No
	Natalia	11th	17	Hispanic	Ankle sprain, leg pain, unspecified knee pain, large open wound on torso	Varsity	No

CHAPTER 4
DISCUSSION

Injuries are inevitably going to occur in sports, but the large number of injuries sustained by high school athletes poses a threat to this population and previous research has found it to be a health concern.[10-14] Although literature has reported a high incidence of athletic injuries in high school athletes, it is assumed that many are not being reported. Additionally, coupled with the underreporting of athletic injuries, is the behavior to play through pain and injury. Therefore, this study was intended to further understand factors that influence athletes' injury reporting and why some athletes continue to play while injured. The purpose of this study was to explore the barriers and facilitators to musculoskeletal injury reporting and towards playing injured in athletes that attend a rural, Title I high school. This is the first known study to examine barriers to reporting musculoskeletal injuries in high school athletes in this setting. The barriers and facilitators of this study are predictors of intention to report injury based on the Theory of Planned Behavior (TPB).

The TPB believes that the intentions to perform a behavior such as injury reporting can be predicted by one's attitudes towards the behavior, subjective norms, and perceived behavioral control.[46] Although some literature did not find all constructs of the TPB to be useful in understanding concussion reporting,[32-34] the results of this study did find each construct of the TPB to be significant in providing insight into intention of injury reporting and reporting behaviors for musculoskeletal injuries.

One construct of the TPB that was a predictor of musculoskeletal injury reporting is perceived behavioral control. Perceived behavioral control in this study was represented by the

athletes' ease to report an injury. This study found that the athletic trainer was the primary facilitator to injury reporting behavior in theme one of the results. In this case, athletes felt more comfortable reporting an injury if there was a good relationship with the athletic trainer. In context to the TPB, the trustworthy athletic trainer-athlete relationship showed greater perceived behavioral control or self-efficacy, increasing both reporting intention and reporting behavior. This is not surprising as previous research has identified the psychological needs athletes require from athletic trainers.[47,48] These needs include someone to talk to especially when injured as athletes need reality confirmation. Also, athletes require someone to acknowledge their efforts; therefore, rehabilitation results in task appreciation. Therefore, most participants in this study expressed that their current athletic trainer fulfills their needs which in turn facilitates injury reporting.

On the other hand, some athletes spoke about prior instances where the athletic trainer was someone they did not feel comfortable reporting to. This occurred when the sample high school did not have access to an athletic trainer, when athletes did not have a good relationship with the athletic trainer, or when the athletes felt the athletic trainer was unsatisfactory at their job. In this case, there is no health care professional to report to or no health care professional that athletes felt comfortable reporting to. For these reasons, athletes had low self-efficacy to reporting an injury and the athletic trainer was seen as a barrier to injury reporting. Furthermore, because participants from all focus groups expressed mistrust in the emergency room and doctor, there was low self-efficacy to reporting injuries to all health care providers resulting in no intention to report. Unfortunately, lack of medical access and low athletic trainer availability has been found to be common in rural areas and at one point was the case for the high school examined in this study.[18,19,22-26] When this occurs, athletes typically have no other options but to

report injury to their coach during athletic events. Ironically, the coach was seen as the primary barrier to injury reporting in this study.

Another construct of the TPB that was found significant in predicating intention to injury reporting was subjective norms. This study found in theme two of the results, that athletes are influenced by external or social pressures when it comes to injury reporting. This can be explained by the subjective norms construct of the TBP as it is defined as, "perceived pressures of others to perform a behavior". There were multiple social pressures mentioned by participants that affected their injury reporting behaviors; however, the coach was seen to be the most influential and the most significant barrier to injury reporting. This finding is not unexpected as prior literature has explored the coach-athlete power dynamic, showing that the coach is someone athletes look up to as a role model and the adult figure that athletes spend a majority of their time around. [4,15,16, 32]

Athletes discussed not wanting to report an injury to a coach because the coach would not believe them, think they were scared to play, or think the athlete was looking for an excuse to get out of practice. Also, often when athletes of this study tried to report an injury to a coach, they would receive responses such as, "rub some dirt on it", "suck it up", or "you're being soft", warranting hesitation to report an injury to a coach. Previous literature has also mentioned athletes wanting to avoid being labeled as "weak," therefore, resulting in low intention to report an injury.[30] Some participants also expressed fearing disappointing the coach and fearing the coach's ability to remove them from competition as some coaches threaten to replace the athlete's spot with another player when voicing they have pain. This may explain the findings found in theme three of this study as to why athletes internally pressure themselves to continue to play injured in order to not lose their spot or position on the team. Repercussions from coaches

when reporting an injury have been found in the prior literature and have been suggested as a barrier to concussive symptom reporting.[13,15,16,30,32] The findings of the current study on the coach are consistent with previous research and a fear of communication or a disconnect in the coach-athlete relationship has been shown to contribute to overuse injuries in the high school population.[15,16] In contrast, one focus group identified their coach as a facilitator as they often advocate for them to see the athletic trainer. However, those athletes still chose not to report injuries at times because they did not want to cause their coach any stress or disappointment, ultimately, being a barrier to reporting injury to a health care professional. Also, at times coaches would remove an athlete from competition for the betterment of the athlete's health, but athletes want to avoid that outcome because they want to play. Overall, the coach contributes to low intention to report an injury and underreporting of injuries in the high school setting

Another major social pressure found in theme three was teammates. Teammates were shown as both a barrier and a facilitator to injury reporting in this study. Sometimes participants would go to their teammates when an injury occurred to get advice from those who already had experience with the injury. Some athletes did not feel the need to report their injuries to a healthcare professional because they trusted what their teammates told them to do for their injury. Trusting in experienced teammates with injury agrees with research on professional soccer athletes. As seen in this study, some professional soccer athletes go to older players that are familiar with reoccurring injuries instead of using medical resources.[49] Athletes have personal experiences or hear about their teammates' experiences regarding injuries and develop a socially constructed injury timeline to track their own progress. This has become a normative behavior in sport and more common in younger players. Some athletes chose not to report injuries to avoid their teammates calling them "soft". A majority of the time, being called "soft"

gave athletes motivation to prove their teammates wrong which contributing to playing with injury. Being labeled as "soft" was found to be a barrier in professional athletes, but this study shows that it also occurs in high school athletes.[49] In contrast, some athletes would encourage their teammates to see a health care professional because they were valued on the team and knew they could not contribute to the team's success while being injured. This encouragement from teammates increased injury reporting behavior and was a facilitator of injury reporting to a health care provider.

Finally, professional sports were also shown as a dominant social pressure in the data. Three focus groups mentioned multiple NBA and NFL players having ligament tears, sprains, broken bones, and dislocations and still played in the game they were injured in. Participants of this study obviously looked up to professional athletes and justified playing through pain and injury with the actions of professional athletes. Therefore, professional athletes may be unintentionally portraying to the younger audience that playing through injuries in order to win is okay and is a testament to your character and drive. Also, media outlets illustrate professional athletes playing through injury as heroic and exemplars of being a team player or having a good work ethic. For this reason, younger athletes may adopt the ideal to play through injury and risk further complications because they want to follow in the footsteps of their favorite professional athlete. Furthermore, coaches may reinforce the idea to be tough like a professional athlete and unintentionally influence high school athletes to play through injury. Male athletes in this study admired professional athletes the most and used them as an example to justify their mindset for playing through injury. This may contribute to the findings of theme five of the current study where males emphasized winning more than females. The culture of winning contributes to playing through pain and injury and often results in worsening injury or overuse injury as

described previously.[12,13] Therefore, the professional sport culture of playing through injury is a barrier to injury reporting and a justification for playing through injury in the high school setting.

Lastly, the attitudes construct of the TPB was an important predictor of injury reporting in this study. Attitudes refer to the athletes' beliefs regarding consequences of reporting musculoskeletal injury. Athletes in this study had more unfavorable attitudes toward injuries, resulting in multiple barriers to injury reporting. The most common consequence that athletes associated with reporting an injury and was seen across multiple themes in this study, was being removed from sport in any way. This may be due to the risk-reward tradeoff that individual athletes contemplate as stated in previous research. Barriers that resulted in possible removal from sport were predictors of low intention to reporting and high intention to playing with injury.

In theme three, internal pressures including fear of losing one's spot or position and avoiding bad news of injury revolved around removal of sport. Therefore, these reasons were used as justification for some athletes to play through injury and not report injuries. To our knowledge, the barrier of avoiding bad news of injury has not been recorded in the literature regarding high school athletes but has been mentioned with professional athletes due to the risk of negatively affecting their employment.[49] The internal pressures athletes discussed including fear of letting the team down or losing one's spot may be explain by barriers seen in theme five including winning and enjoyment of the sport. Athletes truly desire to play their sport even if that means playing through pain and injury which is agreeance with previous literature.[12,13,30,32] Therefore, the desire to play increases the likelihood that some athletes will play with pain and discomfort and decreases the intention to report an injury despite their knowledge of injury.

In theme four, athletes describe their definition of injury through instincts, severity, experience, and sport culture. Each of these factors help understand the injury knowledge of athletes in this study. Some literature reports underreporting to be a result of lack of knowledge, however, this study found that to be untrue.[28,50] Again, relating back to theme five, athletes' desire to play or win, outweighs their health. This is similar in previous concussion literature, but concussion has more severe consequences when competition is continued compared to some of the minor injuries' athletes discussed playing with in this study.[13,28-32] However, that does not justify playing with injury nor does that mean those injuries could not become worse. Although, athletes of this study expressed adequate knowledge of injury, some athletes still expect that their starters or best players should play with pain or minor injury. This is a common practice that is seen in all ages of the youth athlete, with similar practices occurring overseas as well.[13,31,49] This attitude may explain the social pressures of teammates seen in theme three, as previous research has shown that an athlete that holds a higher player position such as a starter may have more pressure to continue to play through injury than other, lower positions such as a bench player. Unfortunately, that portrays that some athletes are held to a standard that they are better injured than the next player up and may contribute to internal pressures. From this study, we can assume that underreporting and playing injured may not be from a lack of knowledge, but more from athletes' experiences and influences.

There were some limitations present in this study. It was assumed that all participants answered the interview questions honestly and kept focus group information confidential. However, participants may have answered with the socially desirable answer due to their athletic trainer acting as the lead researcher. Additionally, participants may have had peer-influence on responses due to the homogeneous grouping of focus groups. The current study may not be

generalizable because all participants were from a rural, Title I high school in southeast Georgia. Also, participants were not chosen at random in this study. Therefore, responses to interview questions may not be representative of all high school athletes.

CHAPTER V
CONCLUSION

The purpose of this study was to analyze the barriers and facilitators associated with musculoskeletal injury reporting as well as understand why some athletes choose to play injured in a rural, Title I high school setting. The current findings suggest that there are more barriers to injury reporting than there are facilitators, resulting in the behavior to play through pain and injury. Barriers including a poor coaching dynamic, portrayal of professional sports, mistrust in healthcare, emphasis on winning, and poor injury attitudes were significant predictors of low intention to injury reporting. The primary facilitator of injury reporting found in this study resulting as a strong predictor for high intention to musculoskeletal injury reporting was a good relationship with the athletic trainer. The TPB can be extended to musculoskeletal injury reporting behaviors to determine the intention to report an injury which will determine the likelihood an athlete would report a musculoskeletal injury. The predictors of the TPB should be used to educate stakeholders to help protect the health and safety of high school athletes. Future research still needs to be done on reporting behaviors of musculoskeletal injuries in other settings. In the future, studies should explore sex and racial differences regarding reporting of musculoskeletal injuries. Also, future research should be done on the coach-athlete relationship and the athletic trainer-athlete relationship and their effect on injury reporting. Lastly, this topic should be studied using heterogeneous focus groups in the future to explore commonalities with diverse experiences and point of views.

CHAPTER 6
PRACTICAL IMPLICATIONS

The current study adds to the limited knowledge on reporting behaviors of musculoskeletal injuries amongst high school athletes. The results of this study provide insight on the various barriers and facilitators that are associated with musculoskeletal injury reporting and reasons why athletes choose to play injured. It is undeniable that winning and passion are a part of the sport culture, but stakeholders and even athletes must adopt behaviors that put health and safety first. All parties must remember that athletes are not capable of performing at their best when choosing to play with injury. Therefore, not only is the individual athlete at risk for long-term health consequences, but the school and the team are at a disadvantage possibly limiting championship and exposure opportunities.

Changing the culture around injury reporting starts with stakeholders as they are looked up to as an exemplar for good behaviors. Therefore, it is recommended that all stakeholders including high school administration, coaches, family members, and athletic trainers are educated on these barriers and facilitators to help combat underreporting. Additionally, it is recommended that stakeholders, especially coaches and parents, are educated on how to identify signs and symptoms of injuries and how to respond to athletic injuries to encourage injury reporting. However, as literature mentions, knowledge does not always result in change of behavior. Therefore, it is important that stakeholders, especially coaches because of their power dynamic, adopt behaviors that encourages athletes to report injuries. It is strongly recommended that a holistic approach is taken with athletes, keeping in mind they are human first and not just athletes.

Although it is expected of adults to lead by example, from this study and others, athletes are knowledgeable about injuries. Therefore, athletes need to advocate for themselves as well as for their teammates to better health culture. Athletes learning how to advocate for themselves at a young age is a strong quality to have that prepares them for the overall challenges of life.

In addition to education and behavioral changes, employment of athletic trainers in more rural high schools and low-income areas is strongly encouraged. Although high schools in this setting typically have less resources and funding, allocating funds to an athletic trainer are highly beneficial to athletes. Research has shown that athletic trainers are the most qualified personnel to cater to sports injuries compared to a coach or any other stakeholder. The current study has found that athletes feel most comfortable going to the athletic trainer to report injuries due the trustworthy nature of the relationship. Additionally, athletic trainers prevent visits to the doctors or emergency rooms in which most athletes' dislike. Due to this, athletic trainers can also help limit how many sports related injuries that emergency rooms treat each year.

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APPENDIX A

EXTENDED INTRODUCTION

Problem Statement:

The general population is well aware of the high incidence of sports related injuries in high school sports, but there has yet to be a decline in these injuries. It is also known that some high school athletes choose to continue competition when injury is sustained. Research has shown that there are a variety of barriers to reporting an injury that contributes to both these behaviors. However, minimal research has been on concussion reporting behaviors and no literature has been found on musculoskeletal injury reporting.

Purpose:

The purpose of this research is to explore barriers and facilitators to musculoskeletal injury reporting and towards playing injured in athletes that attend a rural, Title I high school.

Research Questions:

1. What factors influence athletes' injury reporting?
2. Why do some athletes continue to play while injured?

Assumptions:

1. Participants will answer honestly
2. Participants will keep focus group information confidential

Limitations:

1. Participants may have answered with the socially desirable answer as their athletic trainer was the lead researcher.
2. Participants may have had peer-influence on responses due to the nature of focus groups.

Delimitations:

1. The data presented may not be generalizable due to the convenience sampling.

Operational Definitions:

1. Rural – Territory not in an urban area or urban cluster.
2. Title I - Financial assistance to local educational agencies and schools with over 30% of children from low-income families.
3. Injury - Damage to the body that may result in new or increased pain, decreased athletic performance, time loss from sport, and/or desire to seek medical attention.

APPENDIX B

REVIEW OF LITERATURE

High School/ Youth Sports

The youth athlete is referred to as ages 6-17 [1,2] years old or 11-17 years old [3] in the literature. Specifically, the high school or adolescent athlete is defined as ages 13-18 years old.[4] Approximately 44 million children in the United States participated in at least one youth sports team between the years of 2018 and 2019.[5] According to the National Federation of State High School Associations (NFHS), 7.9 million total high school sport participants in the United States during this time.[6] This was the first time in 30 years that a decline in high school sports participation had occurred, decreasing by approximately 43,000 participants.[6] The decline seen is primarily due to a decrease in participation in American football potentially due to the fear of serious injury.[6]

More specifically, high schools located in rural areas have seen a major decline in sports participation. Rural is defined by the U.S. Census Bureau as any territory not located in urban areas or urban clusters with a population less than 2,500 residents.[7,8] Rural areas are occupied by very few Americans with only 19% living in these areas.[8] These unurbanized areas are often populated with minority groups living in regions with high poverty and designated as medically underserved.[8,9] Similar to some urban areas, rural high schools are often classified as Title I high schools in which financial assistance, such as free and reduced lunch, is provided to schools with a high percentage of students from low-income families. Eligible Title I schools are those with 35% of students from low-income families. Schools with 40% of students or greater that are from low-income families are considered a Title I Schoolwide School.[10]

Unlike the general population, rural high schools experience participation declines mainly due to the limited population, lack of resources, and lack of personnel in addition to high injury rates.[11,12] The limited population in these areas contributes to more athletes playing multiple sports in a given school year which may increase injury risk. Meanwhile, the minimal personnel due to relocation to urban areas and the limited monetary resources results in cancellation of sports programs in rural high schools as compared to their urban and suburban counterparts.[8,11] Overall, there is still a substantial amount of the high school aged population involved in sports for various reasons despite the reduction in participation.

Sport participation allows for multiple benefits in the younger population. One of the main reasons young athletes participate in sports is for enjoyment or to have fun.[1,2,13,14] Other benefits include improving health by maintaining physical activity, skill development, and engaging in a challenging task. Also, making friends and creating social skills are benefits gained from youth sport participation.[1,2,13,14] Consequently, participation in athletics does not come without risk. Sports related injury is unavoidable in youth and high school athletics. There has been a consistent increase in sports related injuries observed in the youth sport and high school populations for many years. For this reason, youth sports have been viewed as a health concern in a plethora of literature and continue to be a critical topic due to the potential for chronic pain and disability in adulthood.[15-19]

Injury Definition

Although sports injuries are common, there is no one definition in the literature to describe it. Some definitions are vague to allow for interpretation of the complex nature of injury. For example, Chalmers et al[20] defines a sport injury as “any unintentional or intentional

damage to the body resulting from participation in sport" while Cumps et al[21] defines it as "physical damage to the sports participants due to an accident that is caused during and as a result of sports activities organized by the sports federation or sports club". These definitions have no quantifiable measure of severity, leaving it up to interpretation.

However, there are more specific injury definitions across the literature that explicitly quantify the severity of injury. Severity of injury can be described by time loss from practice or game, decreased level of activity, and/or need for medical attention.[22,23] Powell & Barber-Foss[24] classified severity of injuries into three timeframes. Time loss from sport that is less than eight days is considered a minor injury, between 8-21 days lost is a moderate injury, and more than 21 days lost is a major injury. Another injury definition that includes time loss from athletic participation is a reportable injury, which is described by the Centers for Disease and Control (CDC),[25] National Collegiate Athletic Association (NCAA) Injury Surveillance Program (ISP),[26] and High School Reporting Information Online (HS RIO).[27] A reportable injury is, "an injury that occurred as a result of participation in an organized practice or competition, requiring medical attention by a certified athletic trainer or physician, and resulting in restriction of the student-athlete's participation for 1 or more days beyond the day of injury".[23,25-27] The definition of a reportable injury is perhaps one of the most frequently used definitions throughout research and commonly used clinically. However, this definition does not account for injuries that do not have time loss from sport and excludes injuries that do not fit that criterion. Injuries do not need to result in time-loss or restriction to be considered important. For instance, a non–time-loss injury is defined as "any injury that was evaluated and/or treated by an athletic trainer or physician but did not result in restriction from participation beyond the day of injury".[26] The non-time-loss injury definition does not have as many quantifiable variables as the reportable

injury definition but is still more specific than the vaguer definitions. In summary, the definition of sports injury is ambiguous and individual interpretations should be considered. For this reason, the variables seen in the literature will be adapted into the definition used in the current study. The current study defines injury as, “damage to the body that may result in new or increased pain, decreased athletic performance, time loss from sport, and/or desire to seek medical attention”.

Injury Epidemiology

Injuries related to sport do not typically have a precise pattern or cause, instead they are associated with multiple risk factors occurring at any given time.[22-24] Injuries sustained during sport are remarkably high at the high school level and the number one reason for youth to seek medical attention.[16,17]

The safety of youth sports can be called into question when looking at the epidemiological statistics. According to the CDC, more than 2.6 million children under 19 years old are treated in the emergency department each year for sports and recreation-related injuries.[23,28] This amounts to about 8,000 children per day being seen in emergency departments for sports related injuries as recorded by the 2011 Youth Sport Safety Statistics Report.[29] In addition to emergency department treatments, high school athletes endure about 2 million injuries, 500,000 doctor visits, and 30,000 hospitalizations annually.[29] This accumulates to approximately $910 billion dollars spent annually to cover the costs to treat high school aged athletes.[30] However, this dollar amount does not include funeral costs or rectifies the grief of families losing a young athlete to catastrophic injury. Nevertheless, more than 600 catastrophic

injuries and 200 sports-related deaths of high school athletes have occurred in the United States between 2010 and 2020.[31]

Injury rates that occur in high school athletics are affected by multiple factors including age, competition, sport type, and school setting. Updated statistics have shown that the highest rate of sports-related injuries appears in older athletes between ages 15 and 17 years old, which is the high school level.[23,28] According to the 2018-2019 HS RIO National High School Sports-Related Injury Surveillance Study, there was an estimated 1.3 million sports related injuries during the high school year.[27] Also, injury rates are higher in competition compared to practice.[23,28] This may be due to the increase in intensity, physical contact, and high-risk activity that is typically seen in competition compared to practice. Rechel, Yard, & Comstock [28] found rates of injury to be 4.63 per 1,000 athletic exposures (AE) in competition versus 1.69 per 1,000 AE during practice. A more recent study by Comstock & Pierpoint [27] had similar results with competition injury rate being 4.61 per 1,000 AE versus practice being 1.38 per 1,000 AE. This is equivalent to about 545 more injuries occurring in competition than in practice during the school year. Along with competition, more physical sports such as American football contributes to high injury rates. The overall injury rate in all high school sports was 2.29 per 1,000 AE with American football having the highest injury rate of 3.85 per 1,000 AE.[17, 22, 23] American football alone accounted for about 455,000 injuries in the 2018-2019 school year. The sport with the second highest number of injuries is girls' soccer, but American football experiences substantially more injuries with approximately 250,000 more injuries than the total amount girls' soccer experiences. Lastly, higher injury incidence is seen in high schools located in rural settings compared to urban settings. [21] Rural high schools are at greater risk for injury primarily due to lack of medical access.[8-12,32-34] Athletic trainers are the most qualified medical

professional to service high school athletics as they play a valuable role in injury prevention and injury education to both athletes and coaches.[12,32,35] However, more than 78% of schools across the nation with low athletic trainer availability are located in rural and inner-city areas.[9] This can help explain why rural high school athletes have higher injury rates and according to the National Athletic Trainers' Association, are 50% more likely to sustain a sports related concussion.[34] From this, one can conclude that special attention needs to be given during competition and in rural high schools considering their high injury incidence. Greater attention should also be given to American high school football as it can be seen to have a greater risk for injury than any other sport. This is also shown to be true as a youth sport safety statistic report specifies that the highest rate of sports-related injuries is from participating in high school American football. [29]

Among the injuries sustained by high school athletes, musculoskeletal or soft tissue injuries are the most common type of injury and most treated in the emergency room.[16, 17] Of these injuries 92% were reported as new injuries and 94% of them resulted in at least one day or more time loss from competition.[22] One can assume that high school athletes are consequently missing out on the benefits of sport participation due to fresh injuries. Sprains and strains and lower extremity injuries account for majority of injuries in this population.[16,17,23] Likewise, growth plate injuries[17] and overuse injuries in this population are common and a cause for concern.[12,13,16,17, 24] An overuse injury is when normal musculoskeletal tissue fails to adapt to repetitive and excessive stress from physical activity.[17] Associated factors that contribute to overuse injuries are sudden increase in intensity, duration, or volume of activity, poor conditioning, poor training techniques, insufficient sport specific training, and inappropriate equipment for sport.[17] Additionally, literature has also found that overuse injury patterns can be

affected by age due to the growth process, sex, and sport type. Rosendahl and Strouse[26] found that acute or repetitive stress fractures are frequently seen more in pre-pubertal years indicative of overuse injury while skeletally mature individuals experience ligamentous injuries more frequently. Along with age, there are sex differences with injuries. Stracciolini, et al[27] found that females tend to experience more overuse injuries while male tend to experience more acute injuries primarily due to differences in the nature of the sports and competition. Also, males tend to endure greater severity of injury.[26] Furthermore, overuse injuries are regularly seen in the lower extremity with females while males experience it more in the upper extremity.[27] Lastly, sport type affects injury type. According to Rosendahl and Strouse[26], the highest incidence of musculoskeletal injuries was reported in contact and jumping sports. Such sports include American football, basketball, and soccer. Therefore, the current study will examine musculoskeletal injury reporting in sports that are available at the rural, Title I high school which includes American football, girls' soccer, girls' basketball, and boys' basketball

There are a substantial amount of injuries in youth athletes, creating serious concern for the potential of long-term chronic pain and disability in adulthood. [16,18] As mentioned previously, participation in youth sports bring about many benefits; however, these statistics display the risk associated with participating in sports at this age potentially explaining the decline in high school sport participation.

Reporting Behaviors

Underreporting. The injury statistics in high school athletics are concerning but the true incidence may be higher due to underreporting as suggested in the literature. Underreporting occurs for various reasons including interpretation of a reportable injury, who is responsible for

reporting, barriers, personal attitudes, and social norms. The definition of injury plays a major role on what injuries get reported. Injury definitions that include time loss or restriction of play to be considered reportable may not encompass all injuries and therefore "less severe" injuries may not be recorded.[22-27] Injury surveillance is dependent on self -reporting by athletes.[26,38] Athletes under report concussions at an estimated rate of 50%–75% of all injury incidence.[39-42] Both a seminal study done by McCrea et al[39] and Register-Mihalik et al[40] suggest that approximately 50% of high school athletes report a concussion to an authority figure such as a parent, coach, or athletic trainer; however, there is still an estimated 20-60% of athletes with concussive symptoms that do not report them. Wallace et al[32] found that there were a total of 1817 underreported bell-ringer events with the majority of them occurring during the game. Although these articles discuss concussion which is well known for being a serious injury, this may be used to predict underreporting for musculoskeletal injuries. Most injury epidemiology is based on reporting by an athletic trainer or an emergency department, but due to the subjective beliefs of what is reportable and their reporting habits, there is suggestion of underreporting in these statistics.[26,38] Also, emergency departments tend to overestimate the severity of injury knowing that injuries that require immediate medical attention would take priority and in turn less severe injuries or those with a delayed effect would likely be underreported.[38] Furthermore, there are still a great number of high schools without access to athletic trainers, who are medically trained to report injuries.[9,11,12, 32-35] Athletes who do not have access to or have inconsistent access to an athletic trainer are commonly seen in rural, remote areas.[9,22] Typically, in rural areas, athletes must report an injury to their coaches.[32,35] Reporting to coaches, however, may not be the best option especially because they are not medical personnel. A study done by Yard, Collins, and Cornstock[35] found that coaches had substantially lower reporting of expected

exposure reports, injury reports, and correct reporting of athlete exposures compared to athletic trainers. Also, coaches were less likely to report correct injury information such as diagnosis, body site, and need for surgery because of lack of training.[35] Therefore, coaches may not be a reliable source for injury identification or injury reporting. Also, it can be assumed that high schools in rural areas are more at risk for sustaining overuse injuries due to not having proper medical assistance nor coaches being able to identify injuries. Therefore, for the purpose of this study, a rural, Title I high school will be examined to understand underreporting in this population.

Barriers. Other reasons why underreporting occurs in athletics is due to barriers that stem from personal attitudes and social norms. Many of the barriers that athletes face is based on fear. According to Roderick[43], professional football athletes mainly dread injury due to potential consequences on their career. Professional athletes fear losing their place on the team, uncertainty of regaining position once recovered, how their manager and other players may react to their injury, the manager replacing them with buying another player or promoting a player from the reserves if they suffer a severe injury requiring long-term treatment/rehab, and uncertainty regarding future contracts at present and future clubs. Also, anxiety arises about being diagnosed correctly, not knowing how long recovery or returning to full athletic capability will take and gaining a reputation of being injury prone. These athletes do not want to be stigmatized as malingerers, being "soft", "cheats", or stretching the truth. Nor do they want to let down their teammates, managers, coaches, supporters, and families. Injury can be emotionally difficult for professional athletes and is associated with financial loss, job security, and strained relationships. Lastly, with football being their career, professional athletes do not want to be left "always wondering whether you'll ever be the same again" as one athlete stated in this study.[43]

Similar barriers are seen for high school athletes, however, there are some differences as they do not rely on their sport as a source of income. Underreporting behaviors have been shown to be especially common in high school athletes.[39-42] The literature focuses on reporting behaviors of concussion but generalizes it to all injuries collectively. This creates a gap in the literature where barriers to musculoskeletal injury reporting have not been specifically recorded and hence why the current study will examine this topic.

A systematic review by Clark and Stanfill[42] looked across multiple studies and found that the most common reason for high school athletes refraining from reporting injuries is because of their fear of losing current or future playing time.[18,42] This may be explained by athletes not wanting to be removed from the sport they enjoy which is the primary reason why young athletes participate in athletics. [1,2,13,14] Another barrier athletes face is the desire to win, which may contribute to the fear of losing playing time as well.[18,42] Both barriers may be due to the internal pressure of the athlete to lead their team to victory and/or satisfy personal goals.[44,45] Similar barriers to reporting injury that is based on internal pressure includes fear of one's team standing being affected, fear of jeopardizing one's athletic career and/or athletic scholarships and having a strong athletic identity.[18,42] From this, one can analyze that each of these barriers revolve around a risk-reward tradeoff for the individual. On the other hand, some barriers associated with high school athletes, specifically those who are involved in team sports, are centered around the team. Not wanting to let the team down, fear of isolation from teammates, and limited players resulting in no substitutions are examples of why athletes would hesitate to report injuries for the sake of the team.[18,42] These barriers are also a form of internal pressure, but instead with others in mind and not just the athlete themselves. Therefore, barriers associated with internal pressure can contribute to the lack of injury reporting.

In contrast, external pressures can also create barriers to reporting injuries. For the high school athlete, the expectations of others can influence reporting. This may include direct pressure from teammates, coaches, parents, or fans, to not report injury.[42] Additionally, athletes may not want to upset family members or be viewed as "weak" by stakeholders and thus refraining from disclosing injury. Of the stakeholders, high school athletes most often look to coaches as an exemplar on how to behave because of the amount of time training under a coach and relating to non-parental adults.[13] Therefore, coaches' attitudes including becoming upset or disappointed in the athlete influences underreporting behavior. Additionally, a disconnect in the coach-athlete relationship can be a major barrier in this setting. Some athletes continue to compete with impeded performance, in fear of telling a coach about an injury due to the possible repercussions of losing their position on the team.[42,44,45] Both coaches and athletes have suggested that communication problems between each other is a contributing factor to overuse injuries.[42,45] For this reason, strain from stakeholders should be considered when examining underreporting behaviors.

In addition to internal and external pressures, some barriers are more injury specific in nature. Some athletes believe that the injury sustained was bearable or not serious; therefore, there was no intent to communicate it to someone.[18,42,46] This is especially true for concussions where some high school athletes do not report due to uncertainty of the injury being a concussion, felt embarrassed to report a concussive injury, or the timing of sustaining the concussion was inconvenient such as during a championship game.[39-42,46] The uncertainty of an injury may be because some athletes and coaches lack knowledge of injuries. It is not fully understood if coaches truly lack knowledge or if it is a failure to translate knowledge into appropriate behavior. For instance, one study found that two-thirds of coaches reported having a

coaching qualification and/or injury prevention course, but positive injury behaviors were not aligning.[47] However, it is possible that the referred course did not prepare coaches for injury. Also, literature has found that knowledge and change in behavior are not always linked.[39,40,46,48] Therefore, knowledge and the lack there of can both be barriers. Along with the knowledge barrier, is the misconception that playing injured has no risk. [39,42] This dangerous misconception also gives reason to why some athletes choose to sandbag diagnostic testing for concussions and underreport symptoms when injury is sustained.[42] Lastly, some athletes avoid disclosing injury due to the concern that she/he cannot return to play when ready. [39,42] Injuries are subjective and can leave athletes anxious when a set return to play time is not established. The uncertainty of not knowing when an athlete may return to sport contributes to hiding injuries and non-disclosure of injuries. [35]

Finally, there are some barriers associated with medical access. Some athletes struggle with not wanting to go to the doctor possibly due to mistrust in medical care, lacking health insurance due to financial strain, and not having an athletic trainer on site due to the institutions' financial status. [32,32,42] If an athlete does not have medical access, the athletes' only option to report an injury is to unqualified individuals such as coaching staff or guardians.[32,35] Medical access can be a concern for any athlete; however, this has been documented to be a common concern in low income or rural areas.[8-12,32-34]

Facilitators. In contrast to barriers, there are factors that contribute to good reporting behaviors such as specific demographic characteristics. Similar to barriers, the literature aims attention at concussion for facilitator data. The female sex was the most common facilitator for reporting symptoms of concussion to athletic staff.[42] Also, younger age and soccer athletes was seen to have better reporting behaviors.[42]These demographics may be facilitators because it may

be their first time injured, have yet to adopt poor injury behavior from older counterparts, and because soccer athletes receive more concussion information due to the nature of the sport. [43] Although some authors suggest that the lack of reporting is due to inadequate concussion knowledge, Register-Mihalik and colleagues[40] revealed that an increase in concussion knowledge does positively affect reporting, but it does not necessarily equate to a change in behavior. Similarly, three studies were found in a systematic review indicating that increased knowledge of potential long-term effects of untreated concussion to increase reporting.[42] Lastly, having a medical professional present at the time of injury was found to increase reporting behavior in two studies.[42] It can be assumed that having adequate medical access and trust can improve disclosure intent.

Attitudes

The fears and barriers that athletes experience withholds them from disclosing injuries. Consequently, these barriers frame certain attitudes about injury that affect the climate of sport, moral judgements, and socially constructed rules that influence behaviors associated with injury.[43]

There is a lack of literature reporting on the attitudes of youth and high school athletes on injury in sport. Regardless of the limited literature, one topic that is highlighted is high school athletes' attitudes to continue competing through pain and injury. This is a common practice that is seen in all ages of the youth athlete, with similar practices occurring overseas as well.[1, 17,18] At the high school age, it is believed that the best players should continue playing even when they are hurt.[18] Due to this attitude, a higher player position such as a starter may have more pressure to continue to play through injury than other, lower positions such as a bench

player. In a New Zealand study conducted by Whatman, Walters, and Schluter[18] a vast majority of secondary school athletes reported hiding or downplaying an injury during a game and approximately 30% reported doing this often. Also, in a Safe Kids Worldwide survey[17], many young athletes reporting playing through injury where almost half of 1,000 youth athletes reported downplaying injuries to continue playing or felt pressure to do so. Thus, some athletes may perceive games as a higher importance compared to a practice contributing to the attitude to hide injuries during a game. Also, a small percentage of these athletes disclosed that they continued playing with an unknown fracture, spinal injury, or concussion which is assumed to be due to lack of knowledge.[18] However, playing through this type of injury could lead to severe, long-term consequences. In addition, most coaches and other athletes from this study, reported witnessing athletes playing injured when they should not have.[18] This may unintentionally reinforce athletes' attitudes to continue to play while hurt if coaches and teammates witnessed players doing so and chose to ignore it.

In an attempt to potentially explain high school athletes' attitudes on playing injured, there may be insight in profession sports. In professional football it is also common for athletes to play through pain. Most injuries in professional football athletes can be seen immediately by medical staff unlike the general population; however, thinking that one is injured does not equate to the utilization of available medical services.[43] If an athlete can compete without significant restriction in speed or mobility, they may choose to hide the injury from others despite the discomfort they may experience. Additionally, without obvious, observable deformity or signs, nobody can detect the discomfort of an athlete unless communicated. This can also be true for the high school athletes and may explain why these athletes hide or downplay injuries often or choose to underreport because the injury in bearable.[17,18,42] This may also explain why coaches

and teammates may delay removing an athlete from play when showing signs of an injury, chalking it up to pain tolerance. Instead of using medical resources, sometimes teammates rely on each other. Older players become familiar with certain recurring injuries and tell younger players the process.[43] Athletes have personal experiences or hear about their teammates' experiences regarding injuries and develop a socially constructed injury timeline to track their own progress. This has become a normative behavior in sport and more common in younger players.[43] Therefore, this may justify why older or talented athletes have more pressure to play injured at the high school level because of their experience.

Hiding injury at the professional level is also due to avoiding being stigmatized as "soft" or be discredited of their pain due to accusations of avoiding difficult workouts. These athletes can be labeled with poor work ethic and stakeholders such as managers, coaches, and even medical personnel will criticize them. More so, teammates will discourage injured athletes and insinuate suspicion through jokes and snide comments.[43] This avoidance results in primarily playing through pain and injury sometimes against their better judgement. Secrecy becomes an essential aspect of those experiencing chronic pain.[43] The nature of this may explain why high school athletes underreport due to avoiding being called "weak" and feeling like they are letting people down.

Discernibly, playing through pain and injury has become the culture of sport both in professional and high school athletes. Therefore, the current study will examine attitudes associated with playing through pain and injury in high school athletes.

Intention

In effort to explain underreporting behaviors, studies have been done to explore athletes' intention to report and factors that influence it. Intentions are indicative of the motivational factors that influence behavior. Therefore, the greater the intention, the more likely one is to perform a behavior. The Theory of Planned Behavior (TPB) is one model that helps explain intention to a behavior. The TPB states that one's intentions to perform a behavior can be predicted by one's attitudes towards the behavior, subjective norms, and perceived behavioral control.[49] In greater detail, attitudes are one's beliefs of the outcomes of a behavior, subjective norms are the perceived social pressures to perform the behavior, and perceived behavioral control is self-efficacy or one's perceived ability that they can perform the behavior.

Prior literature has examined intention of reporting behaviors with concussions and with the use of the TPB. In terms of the TPB and concussion reporting, attitudes are athletes' beliefs of the outcome of reporting concussion symptoms, social norms are social pressures from coaches, teammates, and/or parents on whether to report concussion symptoms, and perceived behavioral control is the athletes' belief in the ease to report concussion symptoms. Two studies examining concussion reporting behaviors in high school athletes found that the strongest predictor of the TPB on reporting behaviors was perceived behavioral control. Carpenter, Lininger, and Craig[50] found that athletes with high self-efficacy are more than three times likely to report concussion symptoms. Similarly, Sullivan, Pursell, and Molcho[51] also found perceived behavioral control to be the strongest predictor of concussion reporting behavior. The researchers of this study observed that self-efficacy gives insight to athletes' barriers to report, and resources those athletes' have to report. Additionally, the fewer barriers' athletes had to reporting, indicated a stronger sense of self-efficacy indicating an increase in reporting. A study done by

Kroshus et al[53], found that all components of the TPB to be positively associated with intention to report. Intention in this study, was also significantly correlated with behavior, indicating that the athletes in this study with intention to report followed through with that behavior. In contrast, Chrisman, Quitiquit, and Rivara[46] found intention to report was associated with social norms especially by coach influence. Athletes in this study would follow social norms against their personal knowledge. Knowledge of concussion symptoms have been found to positively influence reporting behavior. For instance, knowledge and attitudes positively influenced reporting behavior in a study conducted by Register-Mihalik et al. However, knowledge has been recognized to not always translate into reporting behavior; therefore, that should not be the only intervention to aid reporting. All studies indicated that although the TPB gives good insight into reporting behaviors, it does not capture everything, and a multi-factorial approach should be used to help examine reporting behaviors. For the current study, however, TPB is believed to aid the understanding of musculoskeletal reporting behaviors.

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APPENDIX C

DEMOGRAPHICS QUESTIONNAIRE

1. The fake name I used during the interview is _____.
2. My current age is _____years old.
3. My current grade level is _____.
    a. 9th grade
    b. 10th grade
    c. 11th grade
    d. 12th grade

4. My race is _____. (Please circle all that apply)
    a. American Indian or Alaska Native
    b. Asian
    c. Black or African American
    d. Native Hawaiian or Other Pacific Islander
    e. Hispanic or Latino
    f. White or Caucasian
    g. Prefer not to answer

5. The sport I participate in is _____.
    a. American Football
    b. Boys' Basketball
    c. Girls' Basketball
    d. Girls' Soccer

6. Definition of Injury: Damage to the body that may result in new or increased pain, decreased athletic performance, time loss from sport, and/or desire to seek medical attention.

    I have been injured during high school athletics before.
    a. Yes
    b. No

7. I have been playing sports for _____ years.
8. Are there any barriers to reporting your injuries that you were unable to share during the focus group?

_____

_____

APPENDIX D

INTERVIEW GUIDE

Reminder: Please be advised that although the researchers will take every precaution to maintain confidentiality of the data, the nature of focus groups prevents the researchers from guaranteeing confidentiality. The researchers would like to remind participants to respect the privacy of your fellow participants and not repeat what is said in the focus group to others.

1. How many of you have been injured playing your sport?
    a. Probes:
        i. What kind of injuries have you had?
        ii. Did these injuries occur during high school?
        iii. Did the injuries impact your athletic performance?
            1. How?
        iv. Did the injuries cause a new or increased pain?
        v. desire to seek medical attention
        vi. Did you tell anyone about the injuries?
            1. Why or why not?
            2. Who did you tell? (Coaches, teammates, athletic trainers, doctors, parents, etc.)

2. Have you ever been injured and kept playing?
    a. Probes:
        i. Can you describe that experience?
        ii. Why did you make that decision to keep playing?
        iii. Did you tell anyone about the injury?
            1. Why or why not?
            2. Who did you tell? (Coaches, teammates, athletic trainers, doctors, parents, etc.)

3. Have you ever been injured and had to miss a practice or a game?
    a. Probes:
        i. Can you describe that experience?
        ii. Did you tell anyone about the injury?
            1. Why or why not?
            2. Who did you tell? (Coaches, teammates, athletic trainers, doctors, parents, etc.)

4. What kind of injuries are “no big deal” and you should “suck it up” and keep playing?
    a. Probes:
        i. Why do you think that?

1. Were you influenced by someone? (Coaches, teammates, athletic trainers, doctors, parents, etc.
   ii. Does your standing on the team matter? (Captain, starter, substitute, second string)
   iii. Are these injuries different for practice versus a game?
      1. Happened at the beginning vs the end of a game?
      2. You were winning vs losing a game?
      3. It was the first game of the season versus a playoff game versus senior night?

5. What kind of injuries are such a "big deal" that you should come out of a practice or a game?
   a. Probes:
      i. Why do you think that?
         1. Were you influenced by someone? (Coaches, teammates, athletic trainers, doctors, parents, etc.)
      ii. Does your standing on the team matter? (Captain, starter, substitute, second string)
      iii. Are these injuries different for practice versus a game?
         4. Happened at the beginning vs the end of a game?
         5. You were winning vs losing a game?
         6. It was the first game of the season versus a playoff game versus senior night?
6. How do you know the difference between a "big deal" injury and a "no big deal injury"?

7. Has there been a time you did not know if an injury was a big deal or not?
   a. Probes:
      i. How did you handle it?
         1. Would you handle it differently now?
      ii. Did you tell anyone about the injury?
         1. Why or why not?
         2. Who did you tell? (Coaches, teammates, athletic trainers, doctors, parents, etc.)
      iii. Do you wish someone pulled you out from competition?
         1. Why or why not?
8. Are there types of injuries that you would reports versus others?
   a. Probes:
      i. Why do you think that?
9. What are some things that encourages you to report an injury?
   a. Probes:
      i. Why do you think that?
10. What are some things that discourages you to report an injury?
    a. Probes:
       i. Why do you think that?

11. If you wanted to report an injury, who do you feel most comfortable reporting it to?
    a. Probes:
        i. Why?
12. If you wanted to report an injury, who would you feel least comfortable reporting it to?
    a. Probes:
        i. Why?
13. Do others' expectations of you influence whether you report an injury or not?
    a. Probes:
        i. Whose expectation?
        ii. Why do you feel this way?
        iii. What do they expect from you?
        iv. What happens if you meet their expectations?
        v. What happens if you do not meet their expectations?
14. Let's try a scenario and see what you think. You are playing a game and you step wrong, where you feel your ankle twist, and you fall to the ground. You get up and have pain in your ankle with a slight limp.
    a. Probes:
        i. What would you do?
            1. Why?
        ii. Is this a "no big deal suck it up" injury or a "big deal scenario" injury?
            1. Why?
        iii. When would you keep playing?
            1. Why?
        iv. When would you stop playing?
            1. Why?
        v. What if….
            7. It happened at a practice.
            8. Happened at the beginning vs the end of a game?
            9. You were winning vs losing a game?
            10. It was the first game of the season versus a playoff game versus senior night?
            11. If no one noticed, would you tell someone?
                a. Who would you tell? Coaches, teammates, athletic trainers, doctors, parents, etc.)
                b. How do you decide who to tell?
            12. What would the downside/harm/risk of reporting this injury to someone?
            13. What would be the downfall/harm/risk of NOT reporting this injury to someone?
            14. What is the negative side or risk(s), if any, of coming out a game?
                a. How would your decision affect others? Coaches, teammates, athletic trainers, doctors, parents, etc.)
                b. What is the risk(s), if any, of staying in a game?

15. On a scale 1 to 5 (1 is No way would I tell and 5 is I would have no problem telling), how comfortable would you feel telling your coach about this injury?
    a. Why this score?
16. Do you have an athletic trainer? On a scale 1 to 5, how comfortable do you feel telling your athletic trainer about this injury?
    a. Why this score?
17. What if your coach or athletic trainer specifically asked you if you were okay? Would that change your comfort level?

ii. How soon should you be able to come back to playing after having this injury?
iii. Who or what should decide when a player can return to play?
    1. Why do you think that?

15. Another scenario: It is mid-season and for a few practices now you have been experiencing pain in the front portion of your lower leg. It typically only hurts when running but stops at rest. After working out, you feel soreness in your lower leg that doesn't seem to go away.
    a. Probes:
        i. What would you do?
            1. Why?
        ii. Would you tell someone about this injury?
            1. Why or why not?
            2. Who would you tell? (Coaches, teammates, athletic trainers, doctors, parents, etc.)
        iii. Would you play in a game that day?
            1. Why?
        iv. What would be best- and worst-case scenarios if you played in a game?
        v. What would be best- and worst-case scenarios if you did NOT play in a game?
        vi. Are there any risk(s) to returning to play with this injury?
        vii. How soon should you be able to come back to playing after having this injury?
        viii. Who or what should decide when a player can return to play?
            1. Why do you think that?
16. Yesterday at practice, the team was doing cone drills and working on planting and cutting. As you participated in this drill, you felt a pop in your knee, a sharp pain, and fell to the ground. You got up and tried to walk it off, but your knee felt like it was "giving out" and you noticed swelling already.
    a. Probes:
        i. What would you do?

    1. Why?
ii. Would you tell someone about this injury?
    1. Why or why not?
    2. Who would you tell? (Coaches, teammates, athletic trainers, doctors, parents, etc.)
iii. Would you play in a game that day?
    1. Why?
iv. What would be best- and worst-case scenarios if you played in a game?
v. What would be best- and worst-case scenarios if you did NOT play in a game?
vi. Are there any risk(s) to returning to play with this injury?
vii. How soon should you be able to come back to playing after having this injury?
viii. Who or what should decide when a player can return to play?
    1. Why do you think that?

17. Is there anything we did not cover that you would like to share on this topic?

APPENDIX E

PARENTAL/GUARDIAN INFORMED CONSENT FORM

COLLEGE OF HEALTH PROFESSIONS

DEPARTMENT OF HEALTH SCIENCES & KINESIOLOGY

Informed Consent

for

Barriers to Musculoskeletal Injury Reporting in High School Athletes: A Qualitative Study

I am Mikayla Talak a graduate student at Georgia Southern University, and I am conducting a qualitative study on barriers to musculoskeletal injury reporting in high school athletics.

1. Purpose of the Study: The purpose of this research is to explore the attitudes towards barriers and facilitators to musculoskeletal injury reporting and towards playing while injured in athletes that attend a rural, Title I high school.

2. Procedures to be followed: Your child's participation in this research will include completion of a demographic's questionnaire, consent/assent forms, and a 45–90-minute interview that will be conducted in focus groups consisting of 3-5 participants. Interviews will be audio recorded. For your child to be included in this study, participants must be: in 9th-12th grade; currently on a high school athletics team at the sample high school; had a previous or current sports related injury occurring while in high school. Your child will be excluded if they are: without parental consent and/or assent forms; without previous history of injury while in high school.

3. Discomforts and Risks: We believe there are minimal risks associated with this research study; however, a risk of breach of confidentiality always exists and we have taken the steps to minimize this risk as outlined in section 6 below. However, the potential for a breach in confidentiality may lead to minor distress with disclosing a hidden injury amongst athletic peers and being outed. Grouping focus groups by sport was intentional with the idea that current teammates are already aware of injuries on the team, and no one

is outed. Also, the use of focus groups by sport was intended to create a more comfortable environment with familiar faces and shared experiences instead of participants just talking to an authority figure one on one. In the case someone does not feel comfortable sharing an experience, there is a space on the demographics questionnaire for participants to share anonymously. Lastly, other possible risks may include minor issues such as embarrassment or dealing with sensitive issues such as past/current injury experiences. I understand that the researcher is a healthcare provider and is available to assist in the case of an emergency, but no financial compensation will be provided. In the case that this study does provoke distress on your child, the Georgia Southern Psychology Clinic is a resource, and their information is listed below.

Georgia Southern Psychology Clinic

Address: Parrish Dr, Statesboro, GA 30458

Phone: 912-478-1685

COVID-19: Precautions will be taken in accordance with current Georgia Southern policies to reduce the risk of the spread of communicable diseases (including COVID-19). However, consenting to allowing your child to participate in this research indicates your acknowledgement of the risk of disease transmission. You also acknowledge your requirement to notify the researchers in the event that your child is symptomatic prior to or at the time of participation. Contact information and appointment information may be held by the researcher and provided to health officials for the purpose of contact tracing in the event the research team is notified of a positive exposure to COVID-19. We encourage non-vaccinated participants to wear a mask or face covering while participating in the research. The researcher will provide disposable masks if participants would like one. Your child will be participating in research in a group setting; thus, please keep in mind that we cannot guarantee the vaccination status of other participants. The CDC has provided a graphic explanation for Choosing Safer Activities based on vaccination status. The research environment will be similar to attending a small, indoor gathering of fully vaccinated and unvaccinated people from multiple households as indicated on the Choosing Safer Activities graphic. https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/participate-in-activities.html

4. Benefits: The participant may not directly benefit from this research; however, we hope that your child's participation in this study will bring about societal benefits. This research may provide advancement of knowledge that will help decrease risk of injury and increase injury reporting in high school athletics. Also, this research may bring about change associated with the nature of sport and social norms of athletics and injury such as increasing education on health and safety in sport and injury prevention strategies.
5. Duration/Time required from the participant: 45-90 minutes

6. Statement of Confidentiality: Your child's confidentiality is important to us. Your child will only be audio recorded to protect their physical identity. Also, each participant will use an appropriate pseudonym (fake name) of their choosing to be referred to as while the interviews are being conducted to protect their anonymity. All consent forms will only be handled by affiliated researchers and will be kept in a secure location at the primary investigator's office. The researchers will keep all audio records, including any codes to the data, on a password protected flash drive in a password protected e-file that will be kept at a secure, locked location at the primary investigator's office. All research records will be labeled with a code that does not contain any identifiable information. A master key that links names and codes will be maintained on a separate password protected e-file on the same password protected flash drive and also stored in a secure, locked location in the primary investigator's office. The master key and audio records will be destroyed 3 years after the conclusion of the study. All electronic files containing identifiable information will be password protected. Any computer used to access electronic files will be up to date on spyware. The information gained from the interview will only be heard by the members of the research staff. At the conclusion of this study, the researchers may publish their findings and information will be presented in a summary format where participants will not be identified in any publications or presentations.

Also, the researchers will take every precaution to maintain confidentiality of your child's data; however, the nature of focus groups prevents the researchers from guaranteeing confidentiality. The researcher will have a confidentially agreement included in the minor assent from and will verbally remind participants to respect the privacy of fellow participants and not repeat what is said in the focus group to others.

7. Future use of data: Coded data from this study may be placed in a publicly available repository for study validation and further research. Your child will not be identified by name in the data set or any reports using information obtained from this study, and your child's confidentiality as a participant in this study will remain secure. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals and institutions.

8. Right to Ask Questions: Participants have the right to ask questions and have those questions answered. If you have questions about this study, please contact the researcher named above or the researcher's faculty advisor, whose contact information is located at the end of the informed consent. For questions concerning your rights as a research participant, contact Georgia Southern University Institutional Review Board at 912-478-5465 or irb@georgiasouthern.edu.

9. Compensation: Your child will receive food consisting of donuts and Gatorade after the interview as a thank you for participating in the study. If your child has any food allergies or food restrictions to the items listed, please notify me prior to the day of the injury and he/she will be given another food item as an accommodation.

10. Voluntary Participation: Your child does not have to participate in this research. They may end their participation at any time by telling the researcher and they do not have to answer any questions they do not want to answer. At any point in time that your child may decide to stop answering questions, they may raise their hand and tell the researcher. At that point, the researcher will inform the participant to exit the room and return to practice or call their parent/guardian to pick them up.

11. Penalty: There is no penalty for deciding not to allow your child to participate in this study. You, the parent or guardian and your child, may decide at any time to not participate further and may withdraw without penalty or retribution. Participants who decide to withdrawal from the project during the interview process, may still receive food after the interview if they would like.

12. All information will be treated confidentially. There is one exception to confidentiality that we need to make you aware of. As a mandatory reporter, it is my ethical responsibility to report situations of child or elder abuse, child or elder neglect, or any life-threatening situation to appropriate authorities. However, I am not seeking this type of information in this study, nor will you be asked questions about these issues.

13. I am asking your permission for your child to participate in this study and will provide him/her with a simplified “assent” letter before enrolling them in this study.

You will be given a copy of this consent form to keep for your records. This project has been reviewed and approved by the GS Institutional Review Board under tracking number H22124.

Title of Project: Barriers to Musculoskeletal Injury Reporting in High School Athletes: A Qualitative Study

Principal Investigator:

Mikayla Talak- Phone: (757) 580-2020; Email: mt17673@georgiasouthern.edu

Other Investigator(s):

Tamerah Hunt - Phone: (912) 478-8620; Email: thunt@georgiasouthern.edu

Christina Gipson – Phone: (912) 478-1101; Email: cgipson@georgiasouthern.edu

Research Advisor:

Charles H. Wilson – Phone: (912) 478-5882; Email: charleswilson@georgiasouthern.edu

If you consent to allow your child to participate in this research study and to the terms above, please sign your name and indicate the date below:

_____ _____

Parent/Guardian Signature Date

APPENDIX F
MINOR ASSENT FORM

COLLEGE OF HEALTH PROFESSIONS

DEPARTMENT OF HEALTH SCIENCES & KINESIOLOGY

MINOR'S ASSENT

Hello,

I am Mikayla Talak a graduate student at Georgia Southern University, and I am conducting a project on the barriers to musculoskeletal injury reporting in high school athletics.

You are being asked to participate in a project that will be used to learn about why you may or may not report an injury and why you may or may not continue to play when injured. If you agree to be part of the project, you will be interviewed, and audio recorded. This will take about 45- 90 minutes. After we have completed the interview questions, you will receive food consisting of donuts and Gatorade after the interview as a thank you for participating in the study. If you have any food allergies or food restrictions to the items listed, please notify me before the day of the interview and you will be given another food item as an accommodation.

You do not have to do this project. You can stop whenever you want. If you do not want to answer some or any of the questions, it is ok, raise your hand and tell me, and nothing bad will happen. If you choose not to continue with the questions, you may exit the room and return to practice or call your parent(s)/guardian(s) to pick you up. You can refuse to do the project even if your parent(s)/guardian(s) say you can participate.

I ask that you respect and keep private other participants' answers. What we talk about during the interview is confidential meaning it is not to be discussed anywhere else and please do not judge anyone for their answers. Breaking confidentiality includes but are not limited to posting about the interview on social media, writing about the interview, and/or talking about the interview with peers, coaches, parents, other faculty, or anyone. None of the coaches, faculty, or students at your school will hear the answers you give to the questions that I ask you. All answers that you give me will be kept on a password protected e-file on a password protected flash drive and only I and my project's research team from Georgia Southern University will hear your answers. We are not going to put your name on the answers that you give us, so no one will be able to know which answers were yours.

You should know that there is some, but unlikely risk by participating in this study. Although we believe there are minimal risks associated with this research study, a risk of breach of confidentiality always exists and we have taken the steps to minimize this risk. However, the

potential for a breach in confidentiality may lead to minor distress with disclosing a hidden injury amongst athletic peers and being outed. Grouping focus groups by sport was intentional with the idea that current teammates are already aware of injuries on the team, and no one is outed. Also, the use of focus groups by sport was intended to create a more comfortable environment with familiar faces and shared experiences instead of participants just talking to an authority figure one on one. In the case someone does not feel comfortable sharing an experience, there is a space on the demographics questionnaire for participants to share anonymously. Lastly, other possible risks may include minor issues such as embarrassment or dealing with sensitive issues such as past/current injury experiences. I understand that the researcher is a healthcare provider and is available to assist in the case of an emergency, but no financial compensation will be provided. In the case that this study does provoke distress on your child, the Georgia Southern Psychology Clinic is a resource, and their information is listed below.

Georgia Southern Psychology Clinic
Address: Parrish Dr, Statesboro, GA 30458
Phone: 912-478-1685

If you or your parent(s)/guardian(s) have any questions about this form or the project, please call me at (757) 580-2020 or my advisor, Dr. Wilson at (912) 478-5882. Thank you!

If you understand the information above and want to do the project, please sign your name on the line below:

Yes, I will participate in this project:
_____

_____I agree to maintain the confidentiality of the information discussed by all participants and researchers during the focus group session.

Participant's Name:
_____

Date: _____