

Concussion Protocols for Youth Sport in Tennessee

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Declaration by Student

I, Corinne Oliphant, hereby declare that the work presented herein is original work done by me and has not been published or submitted elsewhere for the requirement of a degree program. Any literature data or work done by other and cited within this thesis has given due acknowledgement and listed in the reference section.

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Abstract

Nearly 4 million people experience Concussions and Chronic Traumatic Encephalopathy (CTE) each year in the United States (TBI: Get the Facts, 2017). The focus of this research is to examine the Tennessee State Concussion Statute and compare it to existing and the most current literature regarding the implementation and effectiveness of the statutes of other states. Concussion standard of laws exist in nearly every state with the intention of regulating public and private protocol. Most existing research points to the inadequacies of certain state laws; however, this study will specifically focus on where the Tennessee State Concussion Statute succeeds or fails in preventing concussion occurrence. The research methodology consists of a review of the Tennessee State Concussion Statute, a comparison of other state concussion laws, existing law reviews and case analyses regarding the implementation and effectiveness of the statutes.

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A Comparison & Discussion of Concussion Protocols for Youth in Tennessee

I. Introduction

Concussions are a major topic in the sports industry. As little as 10 years ago, concussions were not considered a major injury for a several reasons, e.g. that the injury is unseen, difficult to recognize, and hard to diagnose quickly. Aside from these reasons, however, are the many lawsuits that brought the unseen injury into the public eye. The most prominent case that many know is the National Football League (NFL) concussion crisis that began in August 2011 when Former Atlanta Falcons safety Ray Easterling filed a lawsuit against the NFL for denial and mismanagement of brain trauma in the sport. 4,500 other former players joined Easterling claiming the same misdemeanors. In April 2012, Ray Easterling committed suicide and, upon examining his brain, was diagnosed with Chronic Traumatic Encephalopathy (CTE), which is caused by repetitive concussions. By April 2013, over one-third of retired NFL players had come forth stating that the NFL deceptively hid the danger of brain trauma from the players for the sake of exalting the game (Ezell, 2013).

Because of the drama that ensued in this particular lawsuit, the issue of repetitive concussions became a household discussion in America and around the world. The awareness was heightened, and average Americans began to seek answers more aggressively. For years prior to the lawsuit, researchers had come forth with evidence of the danger of brain trauma and how it could lead to CTE if not handled correctly. The NFL continually claimed the research was flawed or false, however. It was not until 2013, 2 years after Easterling sued the NFL and thousands of others openly voiced their experiences, that the NFL announced new safety measures such as a neurologist being on the sidelines for every game, a symptom checklist, cognitive evaluation, and a balance

assessment (Ezell, 2013). Even though new safety measures were taken, the NFL continued to deny responsibility for the deterioration of health and, in some cases, death of former players. In August 2013, there was surprisingly a settlement for the lawsuit. However, a stipulation of the settlement was that the NFL stood their ground in claiming no wrongdoing.

Concussions

Concussions are caused by a physical jolt to the head resulting in brain movement inside the skull. This movement disturbs regular physiological processes in the brain, which in turn can affect other functions of the body. In essence, a concussion temporarily causes the brain to lose normal function, which can be seen through numerous symptoms such as loss of speech, vision, headaches, concentration issues, and more. The message has become loud and clear from scientists – that these jolts to the head are more alarming than anyone had previously predicted, especially in a culture that celebrates hard knocks to the brain as a rite of passage (Carroll and Rosner, 2011). Carroll and Rosner (2011) state “the most frightening research [is] in children – especially those playing contact sports. Kids’ brains... [are] exquisitely sensitive to repeated jolting” (p. 1). They even go on to say “concussions, if [not] managed properly, could derail a kid’s life. Thinking could slow, attention dulled, judgment impaired, memory muddled” (Carroll & Rosner, 2011, p. 1). It’s not hard to imagine the effect those symptoms could have on a child in school much less the trajectory of his or her life.

Additionally, the Center for Disease Control and Prevention cites that this injury plagues the sports industry with 1.6 million to 3.8 million sports-related concussions annually reported in the United States alone, and even then, many more concussions are

unreported due to lack of education on the injury by coaches, parents, coaching staff, and the athletes themselves (Bryan, Rowhani-Rahbar, Comstock & Rivara, 2016). Further, concussions are a contributing factor in 30.5% of all injury-related deaths, and cause 52,000 deaths annually (Wiebe, Comstock & Nance, 2011). Manley et al. (2017) reported that in former athletes in boxing and the NFL, “multiple concussions appear to be a risk for cognitive impairment and mental health problems in some individuals” (Manley et al., 2017, 1). The study also reported increased risk for Alzheimer’s disease and CTE after receiving multiple concussions (Manley et al., 2017, 1). The American Association for Neurological Surgeons, in a treatment study about concussions, concluded, “In most cases, a single concussion should not cause permanent damage. [However,] a second concussion soon after the first one does not have to be very strong for its effects to be permanently disabling or deadly” (“Concussion,” n.d.). They also found that “athletes who suffered a concussion were four to six times more likely to suffer a second concussion” (“Concussion,” n.d.). An even more concerning statistic that drives the importance of concussion education and regulated protocol was found by Carroll and Rosner (2011) in a 2010 study:

Just 8% of parents felt they had a good background on the dangers of repeat concussions. More than a third said they knew virtually nothing about concussion risks, while fully half said they didn’t even know whether their children’s [facility] had a policy detailing when a student-athlete could return to play after a concussion (p. 1).

Alongside these findings, Carroll and Rosner (2011) explained that trips to the emergency room for head injuries in the age group 8- to 13-years-old had doubled from 2001-2011, and tripled for the age group 14- to 19-years-old.

If concussions affect so many, it begs the question – what exactly does the Tennessee State Concussion Statute say, and how does it affect public and private facilities? Is there an educational program requirement for all coaches and athletes by law? Does this educational program include a protocol for when a potential concussion happens in play? If an athlete is injured, who can clear him or her to return to play? In what way does the Tennessee Statute differ from the other state laws? Does it have stricter or more relaxed regulations in comparison to other states? These questions do not only apply to major sports organizations but also to youth sports as well as sports facilities. Analyzing the Tennessee State Statute in comparison to others will bring to light the weaknesses and strengths of the Tennessee State Concussion Law. That is the focus of this research.

This thesis will focus on the following question. How does the Tennessee State Concussion Statute compare to other states laws, and does it have structural inadequacies in comparison to other state statutes? If the danger of an athlete sustaining a second concussion is that great, it proves to be in the athletes', the coaches', and the sports facilities' best interest to prevent concussions in the most efficient way possible. In essence, this epidemic must be thoughtfully acknowledged, which evokes the analyses of state concussion laws across the nation and how they might be improved in this emerging field of study.

The story of Austin Trenem is a perfect example of the issue of concussions in youth. In September 2010, Austin, a high school student and athlete, committed suicide because his concussions were not diagnosed or treated properly. In 2006, Zackery Lystedt suffered a brain injury due to sports that resulted in catastrophic and life-altering symptoms. His father, Victor Lystedt, said, "He was on life support for seven days; he couldn't speak for

nine months; after thirteen months, he could move his left arm a little; it took two years to get rid of the feeding tube and four years before he could move his right leg purposefully” (Mickool, 2016, p. 1). In 2013, Zackery stood from his wheelchair and walked across the stage with a cane to graduate from high school with his classmates. Zackery is a walking miracle and a rare case in comparison to many others who have died from the same injury. Lystedt was the inspiration for the first state concussion law passed in 2009 by Washington State, named the “Lystedt Law.” This law consists of concussion education, removal from play after sustaining a blow to the head, and medical clearance to return to play; being the first of its kind, it was revolutionary in concussion legislation. 49 states followed suit in the years following (Mickool, 2016).

The state laws, though a necessary move to encourage concussion prevention, are not adequate for the epidemic that has risen over the last decade. The laws have inconsistent protocols and requirements for each state in terms of youth concussion care. They also lack important information about additional care and injury management strategies, not to mention that the laws apply to an extremely vague population of “youth athletes.” Without more definition, this excludes athletes playing in recreational sports and private schools.

These laws, however, are essential in furthering prevention of concussions in youth. Advocacy from the NFL and the Center for Disease Control and Prevention (CDC) has put many states in a good position to work innovatively and thoroughly in matters regarding concussion prevention and care. This is why the focus of this research is centered on whether or not the Tennessee State Concussion Statute, in addition to other states, is structured well enough to prevent concussions and where it could potentially improve.

Part II of this thesis discusses data collection and methodology. Part III discusses where this thesis will be presented. Part IV summarizes the Tennessee State Concussion Statute and analyzes each piece of it. Part V discusses existing literature pertaining to state concussion laws and where they may fall short. Other laws will be talked about in comparison in this section. Part VI focuses on if the Tennessee Law genuinely has initiatives in place to prevent concussions and where loopholes may be as well as weaknesses. Part VII concludes this study with recommendations, and part VIII discusses follow-up studies that could occur in the future in response to this study.

Topic Relevance

The practical implications are boundless. The purpose of this study is to compare and contrast the Tennessee State Concussion Statute with other state laws and use existing law reviews and cases to determine the specific inadequacies of these laws. The study will examine in-depth the Tennessee State Concussion Law and its strength and weaknesses. In addition, it will bring to light the issues of the Tennessee Law by comparing to other state laws and referring to existing research. The recent emergence of this field into the public eye has brought much controversy; however, its emergence has also stimulated the need for a better understanding of the topic to create and continually implement differing solutions to the issues concussions cause. These injuries harm so many annually that it must be more thoroughly addressed.

These findings will not only bring to light the inadequacies and strengths of the law but could pave the way for refined legislation regarding concussion care in the public and private sectors. The purpose of the results is to make recommendations for how the laws could be more structurally sound and effective in preventing concussions in youth. This

could decrease the amount of severe injuries in youth and deaths that concussions cause annually as well as prevent diseases such as Alzheimer's disease and CTE for athletes later in life.

Research Question

What strengths and weaknesses does the Tennessee State Concussion Law exhibit in comparison to other state laws, and how could it be improved to prevent concussions further?

Purpose Statement

The purpose of these results is to raise awareness about the dangers of concussions as well as make potential recommendations to improve implementation and effectiveness of the Tennessee State Concussion Law in comparison to other state laws.

II. Data Collection & Methodology

I intend to collect data by using appropriate, certified search engines such as Nexus Uni, Hein Online, and Google Scholar to find the literature pertaining to this topic. In addition, I will access the Tennessee State Concussion Law as well as the other state laws via government websites to analyze them. Once a sufficient amount of literature has been collected, I intend to analyze the literature for themes to do with weaknesses and strengths of a state concussion law in relation to the Tennessee State Concussion Statute.

After this, I intend to do a legal case study and literature review of existing articles on this topic as well as using the Tennessee State Concussion Law as a primary document. In addition, other state laws will be considered in comparison to the Tennessee State Concussion Law to determine similarities, differences, and the implications that they have

on the standard of care for facilities and athletes. Existing literature will be discussed in relation to the potential structural inadequacies and strengths in the Tennessee State Concussion Law with certain, vital case studies and law reviews as supporting documents. My sample, therefore, will be the Tennessee State Concussion Law and existing literature regarding this issue and how the Tennessee Statute may or may not be adequate and clear.

III. Presentation of Work

1. Eureka: Undergraduate Research Fair
2. Master's in Sports Management Presentation
3. Public Presentation in Haslam College of Business
4. Undergraduate Research Symposium

IV. Tennessee State Concussion Statute

First, the statute went into effect on January 1st, 2014 after passing the State Senate in Nashville, TN. The state was a little behind the curve in passing concussion legislation unfortunately as Washington State was the first to do so in May of 2009. Tennessee was the 42nd out of 49 states to pass this type of legislation.

The statute opens with 68-55-501 that says:

‘Community-based youth athletic activity’ or ‘youth athletic activity’ means an athletic activity organized by a city, county, business, or nonprofit organization where the majority of the participants are under eighteen (18) years of age, and are engaging in an organized athletic game or competition against another team, club, or entity or in practice or preparation for an organized game or competition against

another team, club, or entity. 'Community-based youth athletic activity' does not include college or university activities or an activity which is entered into for instructional purposes only, an athletic activity that is incidental to a nonathletic program or a lesson (Tennessee Sports Concussion Bill, 2013).

Even with just that opening paragraph, questions can be raised. For instance, it references competition between teams, entities, or clubs, but what about individual sports? To just name a few sports that would be considered individual – figure skating, boxing, bowling, golf, skiing, and wrestling hardly scratch the surface. While all of these sports hold competitions, each competitive event is between one athlete against another. The law doesn't seem to specify whether these sports and others like them qualify under this law or not. In a later section, this observation is discussed in-depth. That to say, in the opening paragraph of this statute, confusion arises from the wording.

The section continues to define what a department, health care provider, and a school youth athletic event is for reference. Then, 68-55-502 pertains specifically to schools that have sports and how the department of health and department of education have created guideline for them at minimum. In short, subsection A says schools must first implement guidelines and forms with appropriate information to educate parents and/or guardians, athletes, educators, and school administrators about the dangers of concussions, injury prevention practices, injury care, and more. Subsection B then says all coaches and athletic directors, whether employed or volunteer, must annually complete "a concussion recognition and head injury safety education course program approved by the department" (Tennessee Sports Concussion Bill, 2013). Third, every year additionally according to subsection C, coaches and athletic directors must re-read and sign a concussion

information form to turn into the department prior to the start of practice or competition. In this subset of requirements, it also references having a chosen licensed health professional for nonpublic schools and the lead administrator of a public schools sign the same form as well as all parents and/or guardians and young athletes as stated in subsection D. The information sheet must include the following: written information about the recognition of symptoms, the biology, short- and long-term costs of a concussion to a human in layman's terms, a summary of the state-board education rules and regulations, and the medical standard of care. Fourth, according to subsection E, documentation must exist for all the forms and education course completions for 3 years. In subsection F and G, a policy for immediate removal from play is outlined as well as how athletes can only return to play after being released by a health care professional. The only reason they would be able to return to play in the same event they received the injury is if there was a "legitimate explanation other than a concussion for the signs, symptoms, or behaviors observed" (Tennessee Sport Concussion Bill, 2013).

Section 2, 3, and 4 of 68-55-502 discusses how the school, after the athlete has been cleared by a health care professional to return to play, may allow a specialized health professional to manage the athlete's gradual return to practice and competition. If the specialized professional in charge of managing return to play is not the same health care professional who cleared the athlete, then he or she will provide the health care professional with updates on the athletes progress. The third section clearly states that no licensed health professional or other persons will "be liable on account of any act or omission in good faith while so engaged...shall not include willful misconduct, gross negligence, or reckless disregard" (Tennessee Sports Concussion Bill, 2013). The fourth

and final section of 68-52-502 states that all medical professionals must complete education and management courses pertaining to concussion care such as the National Federation of State High School Association's training course and the CDC's Concussion Toolkit for Physicians.

68-55-503 section 1 applies directly to community-based athletic youth activity. It incorporates pay-for-play facilities almost immediately by saying the law applies to "any city, county, business, or nonprofit organization that organizes a community-based youth athletic activity for which an activity fee is charged..." (Tennessee Sports Concussion Bill, 2013). Regulation in the private sector of sports facilities pertaining to concussion protocols remains an open question, so this piece of verbiage proves extremely important as more leeway is made in terms of regulating the private sector with concern for athlete injury prevention.

The subsection A goes on to talk about how these facilities must implement guidelines, just like schools, to educate their youth athletic director, coaches, young athletes, and parents about concussion risks, symptoms, and care. According to subsection B, the youth athletic director of the facility, all coaches, and the licensed healthcare professional, if appointed, must complete an annual education course that is developed by the department. In this education course, they may use any material they wish; however, it is a requirement to use the Center for Disease Control and Prevention's concussion signs and symptoms checklist to determine if an athlete has a concussion. Some of the wording in this subsection is questionable in that it does not assign who can determine if the athlete is concussed. It says the concussion checklist must be used "by a licensed healthcare professional, coach, or other designated person making a determination as to whether a

young athlete exhibits signs, symptoms, or behaviors consistent with a concussion” (Tennessee Sports Concussion Bill, 2013). Because this could be contradictory with later subsections, this piece of wording could be clearer. The section continues to describe and outline what must be included in the education course and how it must be available free of charge on the facilities website for a city, county, business, or nonprofit organization to access. The requirements include current training in recognizing the signs and symptoms of concussions, other head injuries, or any hit to head that could result in second impact syndrome, stressing the importance of acquiring medical attention after a blow to the head, the understanding of the dangers and risks of concussions, continuation of play after sustaining said injury, and the process of acquiring clearance to return to play. All of these educational requirements seemingly cover everything a facility director, coach, employee, athlete, and parent might need to know if a concussion was sustained during play.

Subsection C requires coaches to sign a concussion information sheet and return to the director of youth athletic activity before the start of practices or competition, which is extremely similar to subsection C of 68-55-502. Also with similarity, subsection D has the young athletes and parents and/or guardians sign the same concussion information sheet. The information sheet is required to include all the same information it includes in 68-55-502, Section 1, Subsection D. 68-55-503 subsections E, F, and G follow the exact guidelines and verbiage used in 68-55-502 about documentation of signed concussion information sheets, policy for removal of athlete from play after potential injury, and protocol for clearance to return to play by a healthcare professional.

Section 2 speaks of how a licensed healthcare professional, once the athlete is cleared, may manage the athlete’s gradual return to practice and competition with

approval of the youth athletic director. Just like 68-55-502 Sections 3 and 4, no healthcare professionals are liable on account of any act or omission in good faith; they also must undergo training and evaluation under the National Federation of High School Association's as well as the CDC's Concussion Toolkit for Physicians training. Both of these trainings provide physicians with a better understanding of the environment they are stepping into with youth athletes as well as what they must check for with head injuries.

This concludes the summary of the Tennessee State Concussion Statute. Speaker of the state senate at the time, Ron Ramsey, signed the law as well as speaker of the state House of Representatives, Beth Harwell. It was passed on March 21, 2013, approved on the April 12, 2013, and put into effect on January 1, 2014. The only other signature on the document is Governor Bill Haslam.

V. Discussion

Many studies have been done previously in relation to the state laws and the major issues regarding concussion legislation. In these differing reviews, the authors have outlined varying ideas about what the best solution is to sports-related concussions with much debate and disagreement. One article touches on how education and awareness of concussions is the most important piece to prevention and reducing second-impact syndrome (Amberg, 2012). Amberg (2012) says specifically, "The best way to reduce second-impact syndrome in children is through education and awareness of the dangers of concussions" (p. 174). The discussion rages on about how many coaches, parents, athletes, administrators, and facility directors are not educated and how dangerous that can be for the athletes. Before any state laws went into affect, the Center for Disease Control and Prevention (CDC) launched their Heads Up program in 2003, which outlines guidelines for

prevention and response as well as information and suggestions for health care professionals, coaches, and parents. This includes information sheets and online learning modules that are available to the public (Sports Concussion Policies and Laws, 2015). In addition, the National Federation of State High School Association (NFHS) also put concussion guidelines into affect; however, they did not require all states to implement these guidelines. Nonetheless, some states implemented them into their high schools with success. The NFHS guidelines were among the first of its kind to implement guidelines specific to recognizing symptoms, requiring clearance by a licensed healthcare professional or athletic trainer, and not allowing athletes to return to play on the same day they sustain a head injury. These were groundbreaking in retrospect, but because implementation was not required, they largely flew under the radar in terms of effectiveness unfortunately (Amberg, 2012).

Other researchers tend to disagree that education and awareness is the most important piece because most don't believe that education of concussions will prevent the injury completely. Most are in agreement that education and awareness will prevent second-impact syndrome, but preventing concussions entirely is another conversation. France-Wilson (2010) provides some perspective on this issue by discussing

While measures aimed at preventing the incidence or sports-related concussions in young athletes are a positive development and are to be encouraged, they are not the complete answer to the problem because at best, these measures can only reduce, not eliminate, sports related concussions (p. 242).

She goes on to speak about the background of concussions, and specifically brings up the unfortunate topic of how concussions can be fatal or cause great consequence in one's life. In most existing literature on this topic, Zackery Lystedt, of Washington, is mentioned.

As mentioned earlier, Zackery Lystedt was a middle-school football player who on October 21, 2006 sustained a severe concussion in the first half of the football game. However, because nothing yet existed on guidelines for return to play (RTP), Lystedt was sent back into the game 15 minutes later. With minutes left in the second half of the game, he sustained a second concussion, technically known as second-impact syndrome. A video shows Lystedt lying on his back on the field clutching either side of his helmet (Lau, 2017). Research has revealed years after Lystedt's concussions that this could have killed him based on where the blow to his head was. His father recalled that Zackery ran to him, said his head hurt, and that he had no vision. Within seconds of that statement, Zackery collapsed and had to be airlifted to Seattle. Doctors executed a tedious and difficult emergency brain surgery, which saved Zackery's life. The surgery consisted of removal of parts of Zackery's skull to relieve the pressure from his hemorrhaging brain. The doctors had to label the parts of his brain that were unprotected post-surgery due to lack of bone so that another concussion or damaging injury would not occur while he was recovering (Lau, 2017). Lystedt experienced multiple strokes and was on a ventilator for seven days. He also was in a coma for three months, and he could not speak for nine. He wasn't able to move any part of his body for thirteen months. It took nearly three years before he was able to stand with assistance on his own two feet (CDC). Amberg (2012) references something his father observed while Zackery was in recovery. She summarizes, "Lystedt's father, Victor, looked into his son's eyes and described him as not being there" (p. 175). This reflects upon

the severity of Zackery's injury because for many, concussions can cause a "foggy" feeling where one cannot concentrate or think clearly. For Zackery's eyes to have no recognition of his father or register what was happening speaks to how severe Zackery's injuries were. His neurosurgeon, prior to the surgery, said that Zackery was minutes, maybe hours, away from dying if they had not relieved his brain. To this day, Zackery has disabilities that force him to live with assistance. He carries the burden of not being able to live a fully independent life due in part to lack of policy and regulation of this injury in sports (Amberg, 2012).

The Lystedt Law was drafted as a result of Zackery's tragic injury. It was the first of its kind in legislation regarding concussion prevention and management; it was passed on May 14, 2009 and enacted on July 26, 2009. It focuses on a few different points that, at the time, were groundbreaking and became the model for most state concussion legislation. It contains three elements:

- (2) Each school district's board of directors shall work in concert with the Washington interscholastic activities association to develop the guidelines and other pertinent information and forms to inform and educate coaches, youth athletes, and their parents and/or guardians of the nature and risk of concussion and head injury including continuing to play after concussion or head injury. On a yearly basis, a concussion and head injury information sheet shall be signed and returned by the youth athlete and the athlete's parent and/or guardian prior to the youth athlete's initiating practice or competition.
- (3) A youth athlete who is suspected of sustaining a concussion or head injury in a practice or game shall be removed from competition at that time.

(4) A youth athlete who has been removed from play may not return to play until the athlete is evaluated by a licensed health care provider trained in the evaluation and management of concussion and receives written clearance to return to play from that health care provider. The health care provider may be a volunteer. A volunteer who authorizes a youth athlete to return to play is not liable for civil damages resulting from any act or omission in the rendering of such care, other than acts or omissions constituting gross negligence or willful or wanton misconduct (Washington State Concussion Bill, 2009).

Because of this law, healthcare professionals now determine when an athlete might to return to play rather than the coaches, parents, or others having to make the difficult RTP decision. In addition, the Washington legislature ordered that the Washington Interscholastic Activities Association (WIAAWA) establish guidelines and other information pertinent to concussion prevention, response, and management. The WIAAWA requires, in addition to the law, that the licensed healthcare professional clearing the athlete to RTP must give written clearance. They also only allow medical doctors, advanced registered nurse practitioners, physician assistants, doctors of osteopathy, and licensed certified athletic trainers to clear players. The Washington State law states that a volunteer who may clear an athlete to RTP is not liable for civil damages unless “willful or wanton misconduct” or “gross negligence” is involved (Amberg, 2012, p. 176).

As mentioned, the Lystedt Law has been a model for other states to pass similar legislation. To date, forty-nine states, the District of Columbia, and the City of Chicago have passed concussion legislation similar to the Lystedt Law. The similarities lie in that they all revolve around (1) education, (2) removal from play, and (3) medical clearance to return to

play. Most of these laws also follow that volunteer medical professionals receive immunity if they clear an athlete to return to play.

While most are similar, a few state laws differ from the Lystedt Law. The most debated issue and discrepancy is who has the authority to give clearance for an athlete to RTP. While most state a licensed healthcare physician or athletic trainer must clear the player, according to a research study on all concussion statutes by Kim et al. (2017), some only give as much detail as, “an appropriate healthcare professional” (p. 164). This places the burden of deciphering what healthcare professional is appropriate for the players on coaches and parents, which the Lystedt Law aimed to alleviate.

Another area of discrepancy seems to be that some states don’t require the institutions to adopt the law, and they only focus on the education piece at that. Wyoming and Idaho are included in this category. Idaho’s Representative Brent Cane argued in 2010, according to Amberg (2012), that the second and third amendments in the Lystedt Law should not be enacted due to the fear of liability, which will be discussed in further detail later. In 2010, however, Idaho did finally pass a law that included the same three pieces of the Lystedt Law as well as a new guideline that requires “referees, game officials, game judges, and athletic trainers” to review the concussion guidelines biannually (Amberg, 2012). Idaho can be an example to many other states on how to improve their concussion law as more research surfaces.

Colorado is another state that goes beyond the education component. The law declares:

- (1) (a) Each public and private middle school, junior high school, and high school shall require each coach of a youth athletic activity that involves interscholastic play to complete an annual concussion recognition education course.

(b) Each private club or public recreation facility and each athletic league that sponsors youth athletic activities shall require each volunteer coach for a youth athletic activity and each coach with whom the club, facility, or league directly contracts, formally engages, or employs who coaches a youth athletic activity to complete an annual concussion recognition education course.

While this legislation does not require anything from the parents and kids like the Washington State law does, it does enact more standards that include private schools as well as regulation for coaches. This law mandates that all coaches from private and public schools as well as volunteer coaches must take a concussion class and attend annual trainings, which other state laws do not mandate. Many other states have one-time concussion trainings and do not include private schools or volunteers (Amberg, 2012).

As compared to the Tennessee State Concussion Statute, the laws have some similarities and differences. Tennessee carries the same general model as the Lystedt Law in that it covers (1) education, (2) removal from play, and (3) medical clearance for RTP. However, the details regarding these sections differ from the Lystedt Law in Tennessee. First, Tennessee requires all coaches and employees of the schools and other facilities to complete an annual education course. Most states do not require education of employees. However, the Tennessee law does not specify which employees this law pertains to. Second, the Tennessee law requires coaches, athletic directors, medical professionals, parents, athletes, and school administrators to sign a concussion information sheet annually, which is unlike any other law known. Third, the law states that a “health care provider” must provide written clearance for the athlete to RTP, and in an amendment states that the same licensed medical professionals as Washington can give clearance to a

player to RTP. Fourth, Tennessee sets itself apart because it does include a section regarding the management of an athlete returning to play and how a licensed healthcare professional, if not the one who cleared the athlete to RTP, may be brought on to manage the athletes gradual return to practice or competition. Fifth, the Tennessee law matches the Washington State law in that there is no liability for healthcare professionals that return an athlete to play (Tennessee Sports Concussion Law, 2013).

In addition, Rhode Island tried to pass a groundbreaking amendment to their state law that included baseline medical testing for their youth athletes prior to joining a sports team; however, the amendment was not passed. If it had been passed, it could have revolutionized the youth concussion legislation model even further. Baseline medical testing is defined as imaging done on a child's brain before any injury occurs, which gives the doctors something to compare another image to. Often, because baseline medical testing is not done, diagnosis can be inaccurate, which can slow down the healing process. Further, baseline testing allows doctors to more objectively diagnose concussions. Without baseline testing, doctors must rely on the child's self-report of his or her symptoms, which depending on the age can be skewed, so having the baseline image creates a setting in which doctors can compare baseline imaging to the images taken after injury. This permits doctors to make a more accurate diagnosis of severity. Baseline testing also allows for the doctors to see if the child is actually symptom free or if he or she is hiding concussion symptoms so that he or she might return to play. (Amberg, 2012, p. 180). In essence, baseline testing puts more control into the doctor's hands, which ultimately increases the chance the athlete will be diagnosed more quickly and accurately. This can even decrease the time an athlete spends away from sport because a quicker diagnosis can help the

athlete focus on healing, which in turn can cause a shorter amount of time away from the sport. No state legislation, other than Rhode Island's attempt, regarding concussions mention baseline testing to date (Amberg, 2012).

Besides the lack of baseline testing, a general lack of detailed policy regarding issues such as if medical professionals being on the sidelines of every game, lack of enforcement, consequences, and liability exists. Lowry (2015) argues that "return-to-play legislation is not likely to change sports culture on its own" (p. 64) and that "there are nuanced differences in outcomes that may not be due to statutory provisions, but differences in how the law was put into practice" (p. 65). The laws uniformly are aimed at RTP guidelines versus focusing on prevention. While prevention should be the long-term goal, the RTP legislation is an important step in the right direction in the discussion about concussion prevention and management. After Washington's state law was passed, a study collected data regarding the effectiveness of the law and found that "high school football and soccer coaches are receiving substantial concussion education and have good concussion knowledge..." (p. 65). However, it found that the education piece for parents and athletes was a bit less thorough and effective. Another positive impact the RTP Washington Lystedt Law had was that within the first and second year after implementation, the number of concussions reported increased (Kim, 2017, p. 164). While these positives are encouraging in the fight to end the epidemic, more must be done in terms of structure and details. Lau (2017) concludes his argument saying that having passive methods of communication will not change the behavior and attitude towards sports-related concussions to which other authors agree. In a study by Harvey (2013) where he analyzed all of the state laws thoroughly, he agrees that:

In this dynamic environment, with public health law interacting with politics, youth sports culture, and an array of public and private interest groups interested in youth TBI policy, questions still remain regarding the fit between these state-level legislative mandates and current public health knowledge and practice (p. 1252-1253).

Even so, Amberg (2012) makes another valid point that “there are no penalties, criminal or civil, for those who do not comply” (p. 183) with the state laws. Without enforcement or consequence, a law cannot be effective. In contrast to most, the City of Chicago, the only city in the United States to have a concussion statute for their school system, does have an enforcement mechanism; although, the severity of it is questionable. Any school who does not implement the concussion law in Chicago will be forced to pay the city water and sewage charges, which the schools are usually exempt from. This is a good example of taking small steps towards enforcing the concussion laws more aggressively.

In terms of liability issues, many come to light regarding immunity, law negligence, cause of action, and more. In the case *Zemke vs Arreola* in 2006, a high-school football player brought a negligence claim against the school district and his coaches. He argued that after a second hit in the game and suffering a subdural hematoma that his coach was liable for his suffering. The court decided the question to ask in that situation was if the injury was foreseeable. Because the player had failed to report the first head injury and no obvious symptoms occurred, the court ruled that the coach was not liable for negligence (France-Wilson, 2010, p. 174). In another example case, *Cerny v. CedarBluffs Junior/SeniorPublicSchool*, another high-school football player claimed his coaches were

negligent in allowing his return-to-play causing his concussion. The court unfortunately ruled that this was reasonable for football coaches due to lack of policy regarding concussion liability (Koller, 2016, p. 696). Both of these cases and countless others bring into question what the state laws declare about liability. In Washington's Lystedt Law, the only mention of liability is the about volunteer medical physicians not being liable for civil damages, but nothing is mentioned about coaches. In the Tennessee State Law, the same section about paid and volunteer medical professionals is written, and nothing about coaches' liability is mentioned. With the coach being the first point of contact when an athlete sustains a head injury, it can be argued that more liability should rest in their hands. Lau (2017) speaks to this point by stating in regards to common law negligence:

In cases where a youth athlete has suffered a TBI, a breach of the duty of care may arise when a coach prematurely allows the athlete to return to play. In addition, plaintiffs often claim that school districts are vicariously liable for the negligence of a coach under their supervision (p. 15).

He goes on to explain the immunity provisions that exist for common law negligence and why many courts do not hold coaches liable for the concussions. For employees of a state agent, which apply directly to public schools, they are immune from liability as long as their actions were made in good faith and in compliance with the law. This seems respectable at first glance but under scrutiny, seems vague in terms of how severe concussions symptoms can be. Nonetheless, liability can be avoided even if a coach returns their player to the game too soon. The debate rages on about liability within the emerging topic of sports-related concussions.

VI. Strengths & Inadequacies

Throughout existing reviews, many themes emerge regarding the inadequacies of the state laws, which were somewhat discussed above. However, this section serves as a summation of all the inadequacies others have discussed but also the strengths and inadequacies of the Tennessee State Concussion Law. In review, the state concussion laws at large lack structure and details regarding having medical professionals on the sidelines at all times, baseline testing for youth, enforcement policy, who has the authority to give clearance for RTP, and specifics about liability for coaches and medical professionals. In addition, the state laws are not necessarily streamlined in terms of policy because some state laws, like Rhode Island and Colorado, differ from the benchmark law, Washington's Lystedt Law.

Tennessee State Concussion Law's strengths lie in how the state requires education for coaches, parents, youth athletes, school administrators, youth athletic directors, and licensed healthcare professionals. Tennessee differs from most in that it requires an annual concussion policy review with signature by the coaches, school directors, athletic directors, parents, and athletes for schools and pay-for-play facilities. It is the only state known that requires an annual review by the parents and athletes. Tennessee is also in the minority of states that speak about the liability limitation for healthcare professionals, paid or volunteer, for sports games. In addition, the state requires concussion training for healthcare professionals and facility employees, which no other state to date requires.

Unfortunately, there are a few inadequacies in the Tennessee state law. The lack of baseline testing proves to be an area of needed improvement. However, no state currently

has baseline testing incorporated into their policies, so Tennessee measures up to other states in this regard. Second, the law references nothing about requiring medical personnel to stand on the sidelines during sports games. Third, it only speaks about limiting liability for healthcare professionals when discussion of liability for coaches is needed. Fourth, no mention of equipment regulation exists within the document. Fifth, the verbiage in general could be less vague in terms of who has the authority to send an athlete back into play.

VII. Conclusion and Recommendations

Concussion laws prove essential to preventing second-impact syndrome and streamlining education for all parties involved. Washington's Lystedt Law provides a vital framework that, for all intents and purposes, inspired how concussion state laws were written. Because of the Lystedt family's efforts and Washington State legislature, 49 states, the District of Columbia, and the City of Chicago have concussion legislation in place. The education piece, policy on removal from play, and medical clearance for return to play are an absolute must in terms of injury management. The education of coaches, parents, athletes, healthcare professionals, schools, and more have increased awareness and the rate at which concussions are reported. Education will hopefully cause this to continually increase and reduce the overall number of second-impact syndrome recipients; further, having a policy in place for removal from play and written medical clearance for return to play provides hope for the future in concussion legislation. However, as many existing reviews already state, more is needed to work towards prevention of this injury. The obvious faults of the legislation were listed above in part VI, and a few recommendations

will now be listed below in response to these weaknesses.

Implementation of baseline concussion could revolution concussion management and the accuracy of diagnosis. Thus, concussion legislation should include baseline testing as a requirement. Many schools and facilities stress about the cost of the baseline testing; however, schools and facilities could solicit parents to pay for the testing versus the program themselves. Those who do not take part in the baseline testing cannot play at that facility as a consequence and protection method for the athletes. In compliance with the law, educating parents and athletes on concussions will show them how important baseline medical testing can be. This recommendation is the most effective but expensive option. The ImPACT Test, that is used currently to diagnose the severity of a concussion, could act as a substitute for baseline testing. The online test is comprised of a series of short tasks like memorizing patterns, recalling words, and redrawing shapes from memory. Having the data from an ImPACT Test could greatly help with diagnosis and save facilities and schools money.

Another step is requiring licensed medical professionals to be on the sidelines of all sports games and on-call for sports practices. Each school should interview and have a licensed, specialized medical professional(s) sign a contract with the school or facility each year to care for the athletes of said school or facility. Third, the law should specify that the contracted, licensed medical professional must be the doctor to clear the athlete to return to play. This simplifies the process and allows the athletes to all see the same doctor for injuries such as concussions. It also ensures that the athletes are seeing a doctor that specializes in neuroscience or sports medicine with a concentration in head injuries.

Fourth, a large fine or repercussion should be implemented for any school or facility that does not comply with the law, which implies that a specialist in this law must check in with schools and facilities frequently. Most schools and facilities do not have the money to spare on such a fine, which would encourage compliance and implementation. The mission of Zackery Lystedt's family was to raise awareness and prevent any other family from going through what they did with Zackery's injuries; implementing a fine would be a step towards honoring their mission. There is no incentive to follow the law if there is no penalty for noncompliance. Right now, the only deterrent for coaches, administrators, schools, and medical professionals to abide by the law is the fear of an increase in frequency of concussions and second-impact syndrome. Also, the threat of litigation proves to be another natural deterrent, but that does not apply to all parties involved due to limited liability for some. This point leads to another recommendation.

The Tennessee State Concussion Statute should also incorporate more specific wording and acknowledgment of who has limited liability besides healthcare professionals who act in good faith. Uncertainty surrounds limited liability for coaches as every lawsuit pertaining to coach liability is dependent solely on the circumstance with no clear standard to abide by. This leaves the decision up to the court, which could differ based on the judge's knowledge of the injury and concussion legislation. If clearer wording and specifications were made in the law, less confusion during sports games would occur meaning fewer lawsuits would be filed.

In the future, state laws will hopefully incorporate more specifics regarding prevention and specific details about education, removal from play, and return to play. As

stated previously, the behavior and attitude of preventing sports-related concussion will not change solely with legislation but only with cooperation from governing bodies and other entities that control the rules surrounding differing sports. With the rise of awareness and education of concussions, state legislation can move forward in implementation of more specific amendments to continue the prevention, response, and management of sports-related concussions.

VIII. Potential Follow-Up Studies

This study's focus was on analyzing the Tennessee State Concussion Law and comparing the implementation and effectiveness to other state laws. In response to the findings of the existing literature and original research, a few potential follow-up studies could be done. First, a further cost-benefit analysis of implementing the above recommendations would be ideal as well as how federal involvement might help with funding and regulation of these concussion statutes. Second, a study on the implementation and effectiveness in private facilities would create a better understanding of how the state legislation is helping the private sector with concussion education, awareness, and prevention. This study could involve interviewing private facility directors about their knowledge of the concussion legislation and how they comply in their facility. Within the study, a comparison of public versus private sector costs, strategies, and implementation could also be done to show the need for regulation. Third, an in-depth study of which type of medical professional should have the authority to give clearance for RTP would be very beneficial for the sports community as it would shed light on what type of doctor, based on their education and experience, would be best in terms of care for the athlete.

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