Knowledge And Beliefs Of Parents Of Young Athletes Regarding Sports-Related Overuse Injuries

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KNOWLEDGE AND BELIEFS OF PARENTS OF YOUNG ATHLETES REGARDING SPORTS-RELATED OVERUSE INJURIES

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A Clinical Research Project
Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science in Nursing, College of Nursing and Speech Language Pathology Mississippi University for Women

COLUMBUS, MISSISSIPPI

August 2017
Graduate Committee Approval

The Graduate Committee of
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hereby approves their research project as meeting
partial fulfillment of the requirements for the Degree of

Master of Science in Nursing

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Finally, to our families who have loved and supported us throughout this journey, we thank you.
KNOWLEDGE AND BELIEFS OF PARENTS OF YOUNG ATHLETES
REGARDING SPORTS-RELATED OVERUSE INJURIES

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Abstract

Overuse injuries in the pediatric population constitute a substantial healthcare problem. Approximately 50% of pediatric sports-related injuries occur from overuse (McLeod et al., 2011). Although overuse injuries are not associated with direct mortality, the morbidity of these injuries is significant (Laker, Strum, & Sullivan, 2015). Research has shown that these injuries can be prevented by early recognition and diligent efforts by those that influence a child’s health (McLeod et al., 2011). Parental knowledge and intentionality are vital to the prevention of overuse injuries in children. Researchers administered a descriptive, quantitative survey to parents of young athletes ages 5 to 18 years. Survey results from 204 respondents found that parents had a general understanding and seeming awareness of signs and symptoms, risks factors, and prevention strategies for overuse injuries. Results revealed a lack of proper screening for overuse injuries by healthcare providers. The study found that a majority of parents do
not believe that their child athlete is at risk for injury. Some deficits were recognized, particularly related to safe amounts of practice and performance, sports-specialization, and specific signs and symptoms of overuse injuries. The researchers recommend that healthcare providers focus more diligently on providing healthcare to young athletes in clinical settings, educating the parents, and implementing standardized questionnaire and assessment tools to the young athletes.
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CHAPTER I

Dimensions of the Problem

Participation of the pediatric population in sports has increased remarkably over the years. According to the Aspen Institute (2015), approximately 3.5 million children 14 years and younger receive medical treatment for sports injuries every year. Over half of these sports injuries are preventable. Due to heightened emphasis on elite competition and achieving college scholarships, children are participating in athletics at younger ages. Consequently, these young athletes are suffering injury from overuse. Overuse sports-related injuries now account for approximately 50% of all pediatric sports-related injuries. In addition, these children may eventually experience burnout and long-term physical and psychological effects (DiFiori et al., 2014). McLeod et al. (2011) concluded that athletes, parents, and coaches should be aware of the general signs and symptoms of an overuse injury,

... including but not limited to a gradual onset of pain, pain presenting as an ache, no history of direct injury, stiffness or aching after or during training or competition, increasing periods of time for pain to resolve, point tenderness, visible swelling, missed training sessions as a result of the pain or injury, and a problem that persists. (p. 212)

The researchers further asserted that only through educating parents, athletes, officials, and coaches of these signs and symptoms and the guidelines recommended through the National Athletic Trainers’ Association can overuse injuries be prevented. Healthcare providers, including nurse practitioners, must increase their understanding of parents’ knowledge and beliefs of sports injuries in order to intervene effectively.
**Problem Statement**

The occurrence of overuse injuries among child and adolescent athletes is a growing problem in the United States. Several prominent sports and healthcare organizations have advocated through the National Athletic Trainers’ Association a multidimensional approach. Dimensions, including “improved injury surveillance, identifying risk factors for injury, thorough pre-participation exams, proper supervision and education of patients, sports alterations, improved training and conditioning programs, and delayed specialization” (McLeod et al., 2011, p. 209), can prevent an estimated 50% of overuse injuries. Partial responsibility for prevention lies on primary care providers to (a) implement routine pre-participation physical exams during sports physicals of at-risk youth populations and (b) identify risk factors for overuse injuries, such as muscle or joint pain, fatigue, and decreased performance.

However, parental involvement, advocacy, and awareness of risk factors are vital to the success of efforts put forth by the National Athletic Trainers’ Association. The Aspen Institute (2015) reported that parents were more concerned about injuries than coaching, cost, time commitment, winning, and having fun (Aspen Institute, 2015), but little research has been done to explore parental knowledge and beliefs regarding the potential and occurrence of overuse injuries of young athletes. Due to the fact that parents carry a great deal of responsibility in the health of their children, it is becoming increasingly important to ascertain parents’ beliefs and determine if parents have adequate information about the growing risk factors associated with overuse injuries and how to prevent these injuries from occurring.
Statement of Purpose

The purpose of this study was to identify the knowledge and beliefs of parents of young athletes regarding overuse injuries.

Significance of Study

Approximately 60 million children between the ages of 6 and 18 years participate in some form of organized sports (DiFiori et al., 2014). According to the American Academy of Pediatrics (2015), half of all sports-related injuries in children and teenagers occur due to overuse. Overuse injuries are not associated with direct mortality, but the morbidity of these injuries is significant. The extent of overuse injuries varies from occasional annoyance to complete loss of function. The direct impact of these overuse injuries is monumental, and the indirect impact is incalculable when considering the number of healthcare dollars involved (Laker, Strum, & Sullivan, 2015).

The current research will help primary care providers to identify beliefs that impact the lack of action and involvement of parents in the prevention of sports-related overuse injuries in youth athletes. The findings of this study may benefit coaches, athletes, parents of young athletes, and healthcare providers in anticipating risks and filling gaps of knowledge needed in the prevention of sports-related overuse injuries. Nurse practitioners and physicians, as integral members in the prevention of overuse, would have a better understanding of parental involvement in relation to risk factors and could direct teaching toward parents who have a low level of perceived susceptibility and do not believe their child is at risk for an overuse injury.
Theoretical Framework

The Health Belief Model (HBM) is a widely used framework in healthcare research. A group of U.S. Public Health Service social psychologists originally developed the HBM in the 1950s to explain why few people were participating in programs constructed to detect and prevent disease (Rosenstock, 1974). The model proposed that health-seeking behavior is influenced by a person’s perception of susceptibility and severity of a potential illness and also by his or her perception of the benefits and barriers to taking preventative action (Polit & Beck, 2012). In this model, “a cue to action or stimulus must occur to trigger the appropriate behavior by making the person consciously aware of his feelings about the health threat” (Becker et al., 1978, p. 269). The Health Belief Model addresses the relationship between a person’s beliefs and behaviors in order to predict patients’ behaviors regarding their health and their compliance with therapy (Rosenstock, 1974).

The developers of the HBM hypothesized that there are four critical areas that drive a person’s health beliefs: (a) the severity of a potential illness, (b) the person’s susceptibility to the illness, (c) the benefits of taking preventative action, and (d) the barriers to taking preventative action (“Current Nursing,” 2012). Perceived susceptibility is the perception of the chance of being injured or in danger of acquiring a disease or illness. Perceived severity is the belief of the level of impact that the injury or disease would have on that person’s condition. Perceived benefit is the possibility or result of taking action toward improving health. Barriers to taking action include the reasons why action may not take place. Motivation, or cues to action, involves strategies that lead to readiness and action and, therefore, a desired outcome. The
relationship between each of these variables demonstrates how health behavior is the result of the perception of the threat of the health problem combined with the value of the actions composed to reduce the threat. Polit and Beck (2012) perceived this model as a tool to approach patient compliance and disease prevention.

The HBM served as the conceptual framework for the current study regarding the knowledge and beliefs of parents of young athletes regarding overuse injuries. Perceived susceptibility reflected the extent to which the parents believed that their child was at risk for an overuse injury. Perceived severity and perceived seriousness were indicated by the parents’ belief of how seriously the threat of an overuse injury would be for the overall or long-term health of their child. Perceived benefits of taking action were represented by the parents’ perception of the value of the outcome that could have resulted from action taken to prevent an overuse injury or further injury. Perceived barriers included elements that could have deterred the parents from supporting overuse injury prevention, such as level of knowledge about the issue, fear of not being able to participate in sports, or fear of lost future athletic opportunity. Upon completion of the study, health education by nurse practitioners regarding parents’ perceptions could have served as powerful cues to action needed to prevent overuse injury.

The current researchers sought to determine whether there was a perception gap among parents and if there was a particular category that needed to be addressed as a central cause to the lack of action. If discovered that parents had been surrounded by barriers that prevent action, further research to explore those barriers would have been necessary. If found that parents had had a low level of perceived susceptibility and had
not believed their children had been at risk for an overuse injury, an intervention to educate parents on that risk would have been necessary. To measure level of understanding, pre- and post-intervention surveys based on the HBM could have been administered. The HBM was chosen to serve as a guideline in developing a survey for the current study so that the results could be presented within the confines of a well-established model and recommendations expressed through the same scope of reference.

Research Questions

Research for the current study was based on the following questions:

1. What is the knowledge of parents of youth athletes regarding overuse injuries?

2. What are the beliefs of parents of youth athletes regarding overuse injuries?

Definitions of Terms

Several terms within the research questions were defined theoretically and operationally as follows:

Knowledge

Theoretical: the fact or condition of knowing something with familiarity gained through experience or association; the sum of what is known (“Knowledge,” 2016),

Operational: information that parents already possess about overuse injuries as measured by Questions 1-8 on the MUW Parent’s Perception Survey of Overuse Injuries in Student Athletes.
Parent(s)

Theoretical: a person who is father or mother, step-parent, or legal guardian to a child (“Parent(s),” 2016)

Operational: parents or guardians of youth athletes between the ages of 6 and 18 years who completed the MUW Parent’s Perception Survey of Overuse Injuries in Student Athletes for this study.

Athlete(s)

Theoretical: a person who is trained or skilled in exercises, sports, or games requiring physical strength, agility, or stamina (“Athlete(s),” 2016)

Operational: children and adolescents between the ages of 6 and 18 years who participate in competitive or recreational sports whose parents completed the MUW Parent’s Perception Survey of Overuse Injuries in Student Athletes for this study.

Overuse injuries

Theoretical: injuries that occur “when repetitive stress is applied to a muscle, tendon, or bone, resulting in microtraumatic damage when adequate time to heal or repair has not been allotted” (Kriz, 2011, p. 203).

Operational: injuries that are the subject matter of the MUW Parent’s Perception Survey of Overuse Injuries in Student Athletes that will be completed by parents for this study.

Belief(s)

Theoretical: a state or habit of mind in which trust or confidence is placed in some person or thing (“Belief(s),” 2016).

Assumptions

The following assumptions were made by the current researchers regarding this study:

1. They were willing survey participants.
2. Participants responded honestly to items on the survey.
3. Parental knowledge and beliefs regarding overuse injuries impact youth athlete health outcomes.

Summary

Youth sports participation carries an inherent risk of injury. Sports-related overuse injuries, accounting for approximately half of all sports injuries in middle school and high school students, may ultimately lead to lifelong complications and discomfort. More than half of these injuries are preventable (“Youth Sports Injuries Statistics,” n.d.). Parents play an important role in preventing sports-related overuse injuries and the associated long-term effects. The researchers of this study used the Health Belief Model as the theoretical framework to design a survey to evaluate parents’ knowledge and beliefs regarding sports-related overuse injuries. Results will help to provide greater understanding of the occurrence of overuse injuries among young athletes. Primary care providers, athletic trainers, coaches, parents, and players will benefit from this information and gain insight into the growing problem of overuse injuries in young athletes.
CHAPTER II

Review of Literature

Participation in organized sports is on the rise among the pediatric population. According to the Centers for Disease Control and Prevention (CDC) (2013), over 2.6 million children 0-19 years old are seen in the emergency department each year for sports- and recreation-related injuries. Sports and exercise provide many physical, mental, and social benefits to young athletes; however, sports safety strategies should not be taken lightly. Though research in this area is limited, researchers have investigated the impact of overuse injuries in pediatrics and parents. In Chapter II, a review of literature regarding overuse injuries as well as literature about the conceptual framework for this study will be presented.

The researchers used academic databases, including Academic Search Complete, Cinahl, Medline, and PubMed, to find a pertinent literature base for this study. The researchers used keywords such as overuse injuries, pediatrics, and parental beliefs. The following research focusing on risk factors, prevention strategies, and parental knowledge in regard to pediatric sports-related overuse injuries were examined for purposes of this study. Out of the 19 research studies reviewed, 11 studies were utilized in the literature review section of this research project.

Health Belief Model in Relation to Overuse Injuries of Pediatric Sports Participation

Zhang, Dalai, and Wang (2013) conducted a study using the Health Belief Model (HBM) to survey and explain students’ health risk behaviors with the goal of providing information for development of future unintentional injury prevention
strategies for adolescents. The HBM, a major theoretical framework for guiding health behavior change in individuals, has been widely adopted in explaining, predicting, and intervening in health-related actions in clinical practice. The model was used as the theoretical framework for the questionnaires distributed in Shanghai, China, during the study. Zhang et al. (2013) aimed to increase overuse injury prevention awareness by exploring the relationship between the HBM and unintentional injury risk behavior among children and adolescents.

Zhang et al. (2013) designed a self-administered questionnaire to investigate risk behaviors and health beliefs of 3rd- and 4th-grade students at 5 different schools. The questionnaire was composed of 3 sections, including (a) injury-related health risk behaviors, (b) health beliefs, and (c) self-efficacy. The first section of the questionnaire addressed the risk behavior status of the students over the past 30 days. Questions regarding jaywalking, playing in the street, warming up prior to sports activities, playing with knives or other dangerous items, being bullied, and stress due to academic performance were included in the section. The second portion of the questionnaire assessed the students’ perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action surrounding health beliefs. The final section of the questionnaire used the General Self-Efficacy Scale (GSES) to determine whether or not subjects possessed confidence in controlling internal and external factors and succeeding in eventually adopting healthy behaviors. The higher the student scored on this portion, the more likely that student was to adopt healthy behaviors.

Zhang et al. (2013) found that reported prevalence of injury-related risk behaviors of the primary students in this community were not positive. Of the 932
participants, 22.4% admitted to jaywalking and 23.8% admitted to not using seatbelts or helmets when riding in vehicles. The numbers of red light violators exceeded the national average of 12.2%. Even though appropriate warm-up exercises and use of protective equipment have been proven successful in reducing the risk of sports-related injury, 45.1% denied using it. In general, boys were found to be more exposed to injury-related risks behaviors than girls. A full 47.9% of students reported they had been bullied/unfriendly teased during the study. There were differences in almost all scores of the HBM factors; however, a substantial difference was only detected in the self-efficacy section. Zhang et al. concluded that the HBM was best used in explaining the former types of risk behaviors, while acceptable for the latter. Zhang et al. (2013) recommended that future researchers utilize their findings and experiences to perform studies at a regional or national level.

Cao, Chen, and Wang (2014) acknowledged the global problem of injury among children ages 10-19 years old as not only leading to death but also long-term disability, psychological stress, and financial burden. Cao et al. used a HBM based questionnaire to determine risk behavior before and after a community-wide intervention aimed at preventing unintentional injuries among youth. The researchers specifically sought to examine the effectiveness of HBM-based health education as an agent to improve the health beliefs of students and also the reliability and validity of a HBM-based questionnaire.

Cao et al. (2014) conducted an initial survey of 843 students of high schools, primary schools, and kindergartens of a Shanghai community. For 2 years, injury-related health education workshops based on the 5 dimensions of HBM were
implemented on 3 different levels including communities, schools, and families. Students were required to participate in the activities, and parents were encouraged to attend educational events. Once the intervention was complete, researchers applied the post-intervention survey to students \(N = 1,267\). Scores to determine health beliefs were formulated using a simple sum score method and the confirmatory factor analysis weighted score method. The health belief scores were calculated for the initial and final surveys and were compared using a \(t\) test. Results showed important differences from the initial survey to the final survey suggesting the effectiveness of the HBM in the promotion of healthy behavior and injury prevention. Due to the small scale population being investigated, the researchers recommended future studies to verify the validity of the HBM on a larger scale of health promotion and education (Cao et al., 2014).

**Pediatric Sports-related Overuse Injuries: Risk Factors and Prevention**

McLeod et al. (2011) conducted a systematic review of literature with the objective of “providing athletic trainers, physicians, and other health-care professionals with recommendations on best practices for the prevention of overuse sport injuries in pediatric athletes” (p. 206). The study was conducted on the premise that overuse injuries account for approximately 50% of all pediatric sports-related injuries and result in loss of participation time, numerous medical costs, multiple physician visits, and extensive rehabilitation. Athletes who are affected by overuse injuries may also stop participating in sports activities—leading to more sedentary lifestyles and adding to the current obesity epidemic (McLeod et al., 2011).
McLeod et al. (2011) speculated that more than half of all pediatric overuse injuries are preventable with proper approaches. The purpose of this position statement was to provide recommendations, based on current evidence, regarding identification of risk factors and determining steps to prevent overuse injuries in pediatric athletes ages 6-18 years. The population for the study consisted of children (ages 6-12 years) and adolescents (ages 13-18 years) who participated in some form of sports-related activity. McLeod et al. compiled results from analyzed studies that included the following: (a) 12 studies of baseball pitchers (3 case series, 9 case studies) with acute or chronic physical injuries related to organized sport; (b) a study consisting of 196 stress fractures (125 males, 71 females) among 10,726 patients over a 10-year period; (c) a systematic review of repetitive loading gymnastics; (d) a retrospective study of stress fractures among 25 juveniles, ages 3–17 years; and (e) 16 studies of lower extremity injuries (McLeod et al., 2011).

Findings by McLeod et al. (2011) suggested that approximately 50% of overuse injuries in children and adolescents may be preventable with the use of a comprehensive and multidimensional approach. Some preventative measures include the following: (a) improving injury observations, (b) identifying overuse injury risk factors, (c) head-to-toe physical examinations, (d) appropriate administration and education among coaching staff and healthcare providers, (e) enhanced training and conditioning plans, and (f) delayed specialization in sports. McLeod et al. recommended that future researchers focus on improving aspects of the musculoskeletal history, validating the general 14-point musculoskeletal screening examination, and incorporating additional
screening tests as possible predictors of overuse injuries into the pre-participation exam (McLeod et al., 2011).

Overuse injury risk factors concluded by McLeod et al. (2011) were as follows: previous injury, inflexibility, muscle weakness, muscle imbalances, instability, level of play, training and recovery, training errors, equipment, poor technique, malalignment, menstrual cycle, psychological issues, age, height, sex, tanner stage, laxity experience, environment, sport-acquired deficiencies, and conditioning. The researchers also suggested, although minimal data were currently available about overuse injuries, the more than 7.5 million young people who participate in interscholastic sports and millions of others who participate in youth sports programs across the country represent a very large at-risk population worthy of the expenditure of time, effort, money, and improved surveillance by clinicians and researchers alike (McLeod et al., 2011).

DiFiori et al. (2014) performed a systematic and evidence-based review to assist healthcare providers in recognizing youth athletes that are at increased risk for overuse injuries, while demonstrating the importance of overuse injury prevention strategies. The researchers found that the rising competitiveness of youth sports has led to higher intensity training, specialization in a single sport, and increased rates of sports participation among younger ages. In return, overuse injuries have become more common. DiFiori et al. posed many questions related to overuse injuries and burnout in young athletes. Some of these questions included the following: Do clinicians recognize young athletes at risk for overuse injuries and burnout? Are these providers aware of recommendations for overuse injury prevention? Are there specific high-risk
overuse injuries that can possibly lead to long-term health challenges? (DiFiori et al., 2014).

DiFiori et al. (2014) compiled information from 208 chosen articles to form tables. The tables included search methodology, categorization of risk factors for overuse injury, high-risk versus low-risk overuse injuries, location of pain for high-risk stress fractures, symptoms of overtraining syndrome or burnout, factors related to burnout in young athletes, and strength of recommendation taxonomy (DiFiori et al., 2014).

DiFiori et al. (2014) reported 27 million children and adolescents between the ages of 6 and 17 years regularly participated in team sports in the United States. The prevalence of overuse injuries varied according to the sport being played at 63% for swimmers, 33% for gymnasts and tennis players, and 15% for soccer players. The researchers further found that playing sports can have a positive effect on youth by increasing their self-esteem, providing them with peer socialization, and improving their overall fitness. However, continuously playing sports without proper screening, rest, and training can lead to overuse injuries, fractures, and potential long-term complications (DiFiori et al., 2014).

Leppanen, Pasanen, Kujala, and Parkkari (2015) observed the “occurrence, nature, and severity of overuse injuries in youth basketball and floorball participants” (p. 173). The authors found increased popularity of organized sports within youth populations. However, due to the high impact training that is necessary to develop the athletic skills of young populations, children are placed at greater risk for overuse injuries. The researchers looked at how many hours per day on a weekly basis youth
were training for and playing in games, how often injuries were acquired during basketball and floorball practices and games, and the location, severity, nature, context, and recovery time of each injury? (Leppanen et al., 2015).

Participants of the study spanned across 18 teams (9 basketball and 9 floorball teams) for a total of 401 male and female participants (207 basketball players and 194 floorball players) ranging in ages 12-20 years old. A detailed questionnaire was developed to identify the occurrence of injury as well as the amount of time spent weekly playing his or her respective sport. The independent variable of the study was the amount of time spent training and playing the respective sport; the dependent variable was the rate and character of injuries sustained during practice and game time (Leppanen et al., 2015).

Leppanen et al. (2015) determined that among the teams surveyed 629 total injuries occurred over the 3-year study. Of those 629 injuries, 190 of the injuries were overuse injuries. The researchers concluded that overuse injuries occurred at a rate of 1 injury per 1,000 hours of practice and game play in both sports. Those who had sustained overuse injuries included 60% male players and 40% female players—with basketball teams accounting for 53% of those injuries and floorball 45% of injuries. Out of the 207 basketball players that took part in the study, the overuse injury rate per athlete per year was 0.47. Of these overuse injuries in basketball players, 66% of cases involved lower extremities—the most common site being the knee (45% of cases). These injuries benched athletes anywhere from 26 to 50 days. Among floorball participants, there was a 0.48 overuse injury rate per athlete per year. Floorball participants had a higher occurrence of lower back and pelvis injuries, making up 39%
of injuries. Subsequently, the second highest area of overuse injuries in floorball participants involved the knee, making up 34% of injuries. Overuse injuries sustained during floorball practices and games resulted in average time loss of participation of 16-37 days.

Implications of the study were to correlate the amount of time spent practicing and playing a single sport to the occurrence of overuse injuries in youth populations. Athletes that are injured from overuse are encouraged to take long rest periods. However, because athletes want to continue participation, a large number of overuse injuries go unreported. Recommendations for future research included developing studies to analyze risk factors for overuse injuries in youth as well as developing monitoring systems for youth sports to reduce training overload and injuries (Leppanen et al., 2015).

Jayanthi, LaBella, Fischer, Pasulka, and Dugas (2015) conducted a clinical case-control study to demonstrate the effects of sports specialization, weekly straining volumes, and growth rates on risk for injury and serious overuse injury in young athletes. The intensity of sports training among young athletes is increasing along with the risk for overuse injuries, which presents a problem among healthcare professionals. Sports specialization and year-long training have become popular trends among athletes within a younger generation. The American Academy of Pediatrics and the American Medical Society for Sports Medicine have determined single-sport specialization before adolescence should be discouraged due to the physical, physiological, and psychological demands from high-intensity training (Jayanthi et al., 2015).
According to Jayanthi et al. (2015), the aims of the case-control, designed study were to provide a standardized framework for quantifying sports specialization and to identify the independent risks of sports specialization and growth rate on sports-related injuries overall, specifically on serious overuse injuries in young athletes. Participant recruitment consisted of inviting children and adolescents, ages 7-18 years old, who were involved in an organized sport and had been seen at one of two selected university hospital-based sports medicine clinics for a previous sports-related injury or had been referred to a primary care or pediatric setting for pre-season physical examination. Each participant’s height, weight, body mass, and annual growth rates were measured at enrollment by registered nurses, medical assistants, athletic trainers, or research assistants. The two surveys completed at enrollment by all participants included a demographic and current sports specialization survey and a tanner staging self-assessment of pubertal maturation (Jayanthi et al., 2015).

Independent variables consisted of age, hours per week of recreational activity, hours per week of physical education class, degree of sports specialization, type of sports, and growth rate. Of the 1,214 enrolled subjects, 1,190 (98%) had complete data and were included in the analysis. There were 822 injured participants (69.1%; unique injuries, n = 846) and 368 uninjured participants. Injuries were more significant in older athletes who spent more total hours per week involved in physical activities and had higher sports specialization scores. Jayanthi et al. (2015) concluded that athletes with a serious overuse injury were 1.90 times more likely to be highly specialized than athletes with a non-serious overuse injury, CI [1.16-3.10], p < .01. Injured athletes endured more total physical activity than uninjured athletes. There were no significant
distinctions between growth rates and overuse injuries or between genders. The most common injury location was the knee, and patellofemoral pain was the most common diagnosis. Spondylolysis and pars stress injuries to the spine, osteochondritis dissecans, overuse elbow/ligament injuries, and all other ankle, foot, leg, and knee stress fractures were considered serious overuse injuries. The authors asserted that future researchers might be able to use their findings to develop guidelines for young athletes who are increasing their training volume without significantly increasing the risk of injury by keeping average weekly training volume lower than their age years (Jayanthi et al., 2015).

Roeland et al. (1989) performed a one-year prospective study to develop accident-prone and overuse-prone profiles of college freshman and physical education students of the same age. The study adopted several evaluation methods to analyze how the intrinsic risk factors, such as physical characteristics, anthropometric data, physical fitness, flexibility indices, and malalignment of the lower extremities, affect the criterion variables of acute injuries and overuse injuries. The researchers hypothesized that either dynamic strength or psychological factors interrelate with sports accidents and overuse injuries in different genders.

During this study, the students had the same workout programs for 30 weeks including 60 hours of track and field, 75 hours of gymnastics, 37.5 hours each of soccer, handball, basketball, and volleyball, 60 hours of swimming, and 15 hours of dance. A medical examination was performed initially. Any previous injuries had to be completely rehabilitated, and all injuries that occurred during the study period were registered. Roeland et al. (1989) utilized 6 personality tests to collect intrinsic data, the
Spielberger State-Trait Anxiety Inventory, the Bell Adjustment Inventory, the Amsterdamse biografische Vragenlijst, the Gordon Personal Profile, and the Gordon Personal Inventory. Anthropometric data were collected using the Heath-Carter and Durnin methods. The researchers recorded data of flexibility indices by using the Lysent method, data of physical fitness by using Plate tapping methods, and data of mal-alignment of the lower extremities by using radiography methods. Accident percentages were divided into three subgroups: Group 1, < 25%; Group 2, > 25%, < 75%; and Group 3, > 75%. Gender, physical, and psychological characteristics were studied separately (Roeland et al., 1989).

Results of this study demonstrated that 185 participants sustained 315 sports injuries, which included 137 accidents and 178 overuse injuries. Previous injuries, certain lesions, and stress injuries were at greatest risk of recurrence. Roeland et al. (1989) applied various evaluation methods to demonstrate the complex relationship between physical versus psychological characteristics and accidents versus overuse injuries in young male and female sports participants. Roeland et al. (1989) also offered screening and prevention strategies for accidents and overuse sports injuries.

Schroeder et al. (2015) conducted a study that discussed overuse injury assessments among pediatric patients, ages 13 to 17 years old. The researchers hypothesized that the incidence of overuse injuries increases with a higher rate of sports participation. The aim of the study was to identify and evaluate the rate and pattern of overuse injuries and compare differences among genders, sports being played, and types of environmental exposures among young athletes who may not be aware of the signs of overuse injuries.
The research questions were as follows: Do the data collected by ATs (medically-trained athletic trainers) have a bias that excludes data from schools without ATs? And is it possible that athletes did not report the injuries to ATs? (Schroeder et al., 2015). The study population was segmented into 5 high schools in northeast Ohio. The sample included high schools that have one or more National Athletic Trainers’ Association-affiliated, certified athletic trainers and offer 9 sports in the original high school RIO study; and high schools that provide an additional 11 sports in the expansion of the high school RIO study. Data were analyzed using SPSS software. Frequencies were calculated and missing data were reported as unknown. All rates and rate comparisons were calculated using unweighted case counts (Schroeder et al., 2015).

Schroeder et al. (2015) reviewed exposure types, sex differences, sites injured, and participation time losses associated with overuse injuries. Across 5 years the researchers noted that 2,834 overuse injuries were reported during athletic exposures (1.50 per 10,000 athletic exposures). Girls had greater rates of overuse injury (1.88) than boys (1.26) (rate ratio 1.50, 95% CI [.39 - 1.61]. The highest rates of injury were in girls’ track and field (3.82) and girls’ field hockey (2.93).

Overuse injuries represented 7.7% of all injuries, ranging from a low of 1.4% of all boys’ ice hockey injuries to a high of 55.7% of all boys’ swimming and diving injuries. Overall, overuse injuries were evenly distributed across athletes in each year of high school (freshman, 25.6%; sophomore, 25.3%; junior, 24.9%; senior, 24.3%). However, there were distinct differences by sex. The most frequent site of injury was the lower leg (21.8%). Injuries most frequently
resulted in time loss of less than 1 week (50.0%), with only 7.6% resulting in
time loss greater than 3 weeks. (Schroeder et al. 2015, p. 600)

Schroeder et al. (2015) concluded that females not only have greater overuse
injury rates than males, but a greater proportion of their overuse injuries occurred earlier
in their high school careers. Early-sustained injuries in female athletes compared with
male athletes who experience growth spurts later in life may affect consistency in the
further training. A greater majority of overuse injuries were found in sports with long
training sessions that require repetitive movements, such as swimming and diving.

**Pediatric Sports-related Overuse Injuries:**

**Parental Knowledge and Beliefs**

Telford, Finch, Barnett, Abbott, and Salmon (2012) examined how concerns
about injury risk of parents and children relate to children’s participation in physical
activity. Telford et al. aimed to examine three factors: (a) both parents’ and children’s
existing concern of the risk of developing sports injuries, (b) the relationship between
the parent and the child’s concerns about the risk of injury related to the child’s physical
activity, and (c) any influence of the child’s sex on the occurrence of injuries from
physical activity. The study was based on the idea that both parents’ and children’s
perceptions of sports-related injuries play a major role in whether a child continues to
participate in or drops out of certain sports. The following 3 research questions were
proposed in the study: (1) What percentage of parents believe their child is afraid of
getting injured while participating in physical activity? (2) What percentage of parents
believe their child is at risk for injury when the child participates in organized sports?
(3) What percentage of children are afraid participating in organized sports will injure them?

Participants included families of children ages 5 to 6 years old and 10 to 12 years old from 19 elementary schools. A stratified random sampling provided a sample of 162 of the 5- to 6-year-old children and 259 of the 10- to 12-year-old children. Also, 156 parents of children ages 10 to 12 years old and 97 parents of children ages 5 to 6 years old were integrated into the study. For the parents of the 5- to 6-year-old children, a detailed questionnaire was developed that assessed the parents’ demographics while asking them to rate on a scale of 1 to 6 (1 = Strongly agree, 2 = Agree, 3 = Neither, 4 = Disagree, 5 = Strongly disagree, and 6 = Don’t know) whether they agreed with the statements, “My child is scared that he or she will get hurt or injured,” and “My child would be at risk of injury if he or she played an organized sport.” Children ages 10 to 12 years old were asked to complete a rating survey that asked them to rate, using the same 6-point scale, the statement, “I am scared that I might get hurt if I played sports.”

Telford et al. (2012) determined that there was a negative association between parental and child perception of injury fear. Risk and physical activity appeared to be more important among children ages 9 to 11 years old. Despite an overall decrease in parental concern for children between the ages of 6 and 9 years old, there was an inverse relationship between parent concern and participation in physical activity at age 9 years old. This demonstrated that regardless of parental concern, amount of physical activity and participation in organized sports varied between age groups. Additionally, parents perceived their children as more afraid of getting injured from physical activity at a young age. However, parents of children ages 9 to 12 years old were more likely to
be concerned about their children being injured during physical activity or organized sports participation. Telford et al. assumed that this relationship was due to the idea that at the age of 5 years old children are just beginning to participate in organized sports; therefore, the perceived risk of injury starting out is lower among parents. Overall, the results of the research implied that both children and parents had the need for education about what injuries children are at risk for developing based on the type of sports participation and about appropriate safety measures necessary to carry out to reduce risk of injury during participation in specific sports. This ultimately would lead to a more positive outlook on sports participation—leading to lifelong participation (Telford et al., 2012).

Makhni et al. (2014) examined the frequency, quality, and effects of arm pain in healthy youth baseball players. Makhni et al. noted the prevalence of shoulder and elbow pain among these athletes as well as the rate of surgery for overuse injury. Number, type, and velocity of pitches have been associated with overuse. Even though researchers are promoting proper rest and better management of playing on multiple sports teams, these overuse injuries are still occurring; and identifying at-risk youth athletes is becoming more important in order to prevent overuse injury. Makhni et al. wanted to determine baseline rates of arm pain in active adolescent baseball players and also how the athletes are affected psychologically from this arm pain. The researchers hypothesized that the youth baseball players would report significantly high rates of arm pain during play. No psychological effects from the arm pain were predicted.

The methods involved a survey that was designed for including input from coaches, athletic trainers, and clinicians and distributed to players of Little League
teams at a local match competition in New York and New Jersey. Surveys were given to the players during warm-up sessions and were completed without parental or coach assistance. Surveys with input from coaches or parents were discarded from the sample. The survey consisted of two sections. The first section contained questions regarding demographics and questions about age, positions played, sports played, and injury history. The second section involved questions related to pain in the throwing arm, and responses were rated on the 5-point scale of never, rarely, sometimes, often, and always.

Of 218 surveys administered, 203 were reviewed. The average age of the responder was 15.2 years. Of these players, only 26% reported no arm pain during play. Of those with arm pain, many reported being limited by this pain. Players seemed to experience a psychological effect of pain on performance and enjoyment of playing baseball. Pitchers were more affected by pain than non-pitchers. Almost 23% of players had concerning overuse injury history as well as reported feelings of being encouraged to play through pain. The results of the study are pertinent to understanding what youth baseball players are undergoing involving overuse of the throwing arm and the psychological effects playing with and through that pain. Makhni et al. (2014) did not provide future recommendations for research to build upon these findings.

Although the survey was directed toward players (not parents or coaches), the effectiveness of the tool was apparent, especially in regard to determining psychosocial effects from arm pain. Many players (31%) reported feeling that their parents and coaches became frustrated at least sometimes with the way they played. This identifies the need to look at how parents and coaches are involved in players’ performance
related to arm pain and an even deeper look into how outside influences affect the occurrence and prevalence of overuse injury (Makhni et al., 2014).

In a meta-analysis, LaPrade et al. (2016) reviewed recent studies on the impact of early sports specialization in young children. The researchers hypothesized that young athletes would not benefit from early specialization in long-term performance by discussing the early sports specialization, detrimental factors, elite performance, and current studies in four sections. Instead, the early sports specialization increases risks for overuse injuries, burnout, social isolation, and chronic stress. Practitioners, trainers, parents, coaches, and athletes should be aware that sports participation at the level of children’s physical and psychological abilities and interests should be encouraged. Moreover, athlete development should not be largely influenced by parents’ and coaches’ expectations, the social pressure of sports culture, or obsession with individual performance.

LaPrade et al. (2016) included children younger than 12 years old that participated in intensive training or competition > 8 months per year and focused on only one sport. Researchers analyzed the available evidence in early sports specialization, such as definition of early single-sport specialization, factors of overuse injury in physical and psychological perspective, and the relationship between early specialization and elite performance. The research generated the think-tank to explain the most common beliefs widely accepted by parents, coaches, and children who participate in sports (LaPrade et al., 2016).

The compilation of studies reviewed for the analysis revealed no evidence that young children benefit from early sports specialization. On the contrary, early sports
specialization may lead to overuse injuries and burnout. Parents and coaches with hopes of sending their young athletes into college or professional competition may sometimes underestimate the physical and psychological needs during different developmental phases of a child’s life. Athletes who came from high median incomes (> US $70,000 per year) and who had private insurance had an increased incidence of early sports specialization. Moreover, athletes who utilized private facilities were often encouraged to participate year-round because those facilities are businesses that require income (LaPrade et al., 2016).

The study offered clear criteria in defining early single sports specialization and listed both physical and psychological risk factors for children involved in early training and sports competition. Researchers implied the need for caution from parents and coaches, as instructional patterns and behaviors can have both positive and negative effects on a child’s sporting experience. A limitation of the study was that there was insufficient evidence linking youth sports specialization to psychosocial outcomes (LaPrade et al., 2016).

Summary

The review of literature included studies about the Health Belief Model, risk factors and prevention of pediatric sports-related overuse injuries, and parental knowledge and beliefs of pediatric sports-related overuse injuries. The preponderance of the literature indicated that early specialization and long hours of participation leads to an increase in overuse injuries among young athletes. At least one study was found that pointed to a lack of parental knowledge and understanding regarding this risk of injury.
CHAPTER III

Methodology

The purpose of this study was to identify the knowledge and beliefs of parents of youth athletes regarding overuse injuries. Physical activity provides a healthy lifestyle, increased self-esteem, and peer socialization opportunities. Although increased physical activity is beneficial to children and adolescents, moderation of activity and education concerning injury prevention is necessary. This study was conducted to gain information pertaining to parents’ knowledge and beliefs about overuse sports injuries.

In this section, the population, methods of data collection, and setting will be discussed. The data collection tool (survey) will also be presented.

Design of Study

The researchers utilized a descriptive, quantitative survey design to examine parents’ knowledge and beliefs of overuse injuries in young athletes. Data for this research project were collected from a convenience sample of parents of children and adolescents ages 6-18 years old who played sports including basketball, baseball, football, soccer, tennis, and other sports that put students at risk for overuse injuries. Data were gathered via surveys. After collecting these surveys, the researchers were able to analyze the general knowledge base and beliefs of parents regarding sports-related overuse injuries in youth athletes. This design study was appropriate given the limited time to collect data, participant accessibility, and the possibility of gaining relevant information through a survey method.
Setting

This survey research design was conducted at several public pediatric sports events in urban and rural areas of Mississippi and Alabama. Surveys were hand-delivered by each of the 6 members of the research group. The surveys were distributed at parent-teacher association meetings and various sporting events. The surveys were also available on SurveyMonkey. Researchers made the survey available to family members and personal associates on social media in order to gain more participation. Surveys were given to participants who met the research criteria. Surveys were also distributed via email to parents with children involved in recreation sports leagues across the southeastern states.

Population and Sample

This research study included regions of the southeastern United States. The researchers targeted parents of children between the ages of 6 and 18 years old that were actively involved in school and community sports activities. A convenience sample of the targeted population was selected to participate in taking the survey questionnaire.

Protection of Subjects

Permission to conduct the study was first acquired from the Institutional Review Board at Mississippi University for Women (see Appendix A). In-person recruitment was conducted by the 6 researchers utilizing a standardized introduction to the research and consent to participate that included assurance of confidentiality (see Appendix B). No identifying information was included on any data collection forms. All handwritten data forms were collected and kept on the person of the researcher until
they could be stored in a locked drawer or cabinet. Data collected from participants who were recruited by email were submitted via SurveyMonkey, and no identifiers were used. Therefore, computer-collected data remained anonymous. Participants were asked about previous participation in this study before being given a survey. Participants did not sign consent forms since submission of the survey in writing or by computer indicated consent to participate. Once all of data were compiled, even the researchers did not know which data belonged to which participant.

Data collected by each researcher were transferred and stored on a spreadsheet created in Excel and saved on each researcher’s respective password-protected jump drive. No data were saved on computer hard drives. Once all of the data collected by each researcher were compiled for analysis, all individual written data or jump drives were destroyed. Collapsed data were kept on a solitary password-protected jump drive. Only group data were reported in the findings.

Data Collection

Each of the 6 research group members was responsible for distributing at least 30 surveys across the southeastern United States at various public pediatric sporting events and meetings. Each researcher introduced himself or herself and explained the need for obtaining information from each participant stating contents in the letter. A letter was provided to all online participants prior to participation. After the group members distributed the surveys, they gave the participants time to fill out the survey completely. The group members collected the surveys at the time of completion from the parents. The survey was made available online through SurveyMonkey for participants who preferred to complete the survey electronically and at their
convenience. Surveys were also sent to participants via email. See Appendix C for the letter to recruit participants via SurveyMonkey.

**Instrumentation**

Data were collected using a researcher-designed survey that contained demographic questions which sought information regarding age of child, type of sport the child played, time spent in practice and games, past injuries sustained, and recreational sports involvement requiring a physical exam (see Appendix D). The second portion of the survey contained 8 declarative items regarding knowledge and 12 items regarding beliefs held by parents of young athletes. Response options were limited to *Agree* and *Disagree*. Participants were asked to mark the response that most closely corresponded to their beliefs about each statement on the survey.

Scores for knowledge items were summed to form a total score. The higher the sum, the higher the level of parental knowledge existed regarding sports overuse injuries. Items regarding parental beliefs were examined individually and reported in terms of total number of participants who agreed or disagreed with the statements.

**Methods of Data Analysis**

Data were collected and organized in Microsoft Word and analyzed using descriptive statistics, including frequency distribution and measures of central tendency.
CHAPTER IV
Presentation of Findings

The occurrence of overuse injuries among child and adolescent athletes is a growing problem in the United States. Parental knowledge is a vital element in the prevention of overuse injuries among youth athletes. In response to minimal research gleaned to gain a more profound understanding of parental perception and level of awareness about overuse injuries, the researchers conducted this study to specifically explore the knowledge and beliefs of parents regarding this topic. The results of the study may lead to greater parental attentiveness and parent-centered health promotion and prevention efforts toward sports-related overuse injuries in children. The researchers collected data on 204 respondents, all of whom were parents of young athletes between the ages of 5 and 18 years old. Data were first compiled in Microsoft Excel, and subsequent analyses were performed using IBM SPSS statistical software, version 22. Specific findings for each research question will be addressed individually. The data collected and analyzed for this study will be described first, followed by outcomes of data analysis related to the research questions, including significant findings.

Profile of Study Participants

Data were collected by 6 different researchers using hand-delivered surveys and SurveyMonkey. The surveys were completed by respondents (N = 204) from various regions of the southeastern United States with child athletes ranging in age from 5 to 18 years old (M = 12.10, SD = 3.473) who participate in school and community league
sports. The respondents reported their children participating in sports on average of 3.95 days per week ($SD = 1.342$). When asked to cite amount of participation on a weekly basis, 9 parents reported that their child participated 1 day, 25 participated 2 days, 40 participated 3 days, 41 participated 4 days, 72 participated 5 days, 16 participated 6 days, and 1 participated all 7 days. Regarding sports participation, 88 respondents (43.1%) reported that their child participated in 1 sport, 66 (32.4%) played in 2 sports, 38 (18.6%) played in 3 sports, and 12 (5.9%) played in 4 or more sports. In regard to sports being played, respondents reported 121 in baseball/softball, 86 in basketball, 45 in football, 41 in soccer, 22 in track/cross country, 15 in cheer/dance, 13 in tennis, 10 in swimming, 8 in golf, 7 in gymnastics, 6 in weights/powerlifting, 3 in archery, 2 in volleyball, 2 in karate, 1 in bowling, and 1 in fishing.

**Statistical Outcomes Regarding Research Questions**

**Knowledge regarding overuse injuries.** The first research question was as follows: What is the knowledge of parents of youth athletes regarding overuse injuries? Knowledge of parents in regard to youth overuse injuries was assessed using survey Questions 1-8, which were answered as *Agree* or *Disagree*. The most common response on Questions 1, 3, 4, 5, 6, 7, and 8 was Agree. A complete account of parental responses regarding knowledge questions can be found in Table 1.
Table 1

**Summary of Responses to Knowledge Questions**

<table>
<thead>
<tr>
<th>Question</th>
<th>Agree</th>
<th></th>
<th>Disagree</th>
<th></th>
<th>No response</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
<td>$f$</td>
<td>%</td>
<td>$f$</td>
<td>%</td>
<td>$f$</td>
<td>%</td>
</tr>
<tr>
<td>1. Sports that require repetitive movements such as baseball or tennis may cause overuse injuries in young athletes.</td>
<td>187</td>
<td>91.7</td>
<td>13</td>
<td>6.4</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>2. My child continuing to play when he/she is experiencing pain is harmless.</td>
<td>15</td>
<td>7.4</td>
<td>185</td>
<td>90.7</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>3. A sports-related overuse injury could cause long-term effects of my child’s health.</td>
<td>185</td>
<td>90.7</td>
<td>15</td>
<td>7.4</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>4. Youth athletes, ages 6-28, should be required to take 1-2 days off from practice and training each week.</td>
<td>174</td>
<td>85.3</td>
<td>26</td>
<td>12.7</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>5. Jogging short distances and stretching before and after every practice, game, meet, or match would decrease the risk of overuse injury.</td>
<td>182</td>
<td>89.2</td>
<td>18</td>
<td>8.8</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>6. Children and adolescents should play different types of sports to prevent overuse injuries.</td>
<td>118</td>
<td>57.8</td>
<td>82</td>
<td>40.2</td>
<td>4</td>
<td>2.0</td>
</tr>
</tbody>
</table>

(continued)
Beliefs regarding overuse injuries. The second research question was as follows: What are the beliefs of parents of youth athletes regarding overuse injuries? Survey questions 9-20 assessed the beliefs of parents in regard to youth overuse injuries, and respondents answered by selecting Agree or Disagree. The most common

<table>
<thead>
<tr>
<th>Question</th>
<th>Agree</th>
<th>Disagree</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. My child’s level of sports participation should be determined by his/her current stage of physical and psychological development.</td>
<td>179</td>
<td>21</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>87.7</td>
<td>10.3</td>
<td>2.0</td>
</tr>
<tr>
<td>8. Fatigue and decreased performance are symptoms of a potential overuse injury.</td>
<td>156</td>
<td>42</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>76.5</td>
<td>20.6</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Percentage of parental agreement was highest for Question 1, “Sports that require repetitive movements such as baseball or tennis may cause overuse injuries in young athletes” (91.7% Agree) and lowest for Question 6, “Children and adolescents should play different types of sports to prevent overuse injuries” (57.8% Agree). The fact that the vast majority of respondents replied correctly to the knowledge questions appears to reflect that most parents have a good knowledge base regarding overuse injuries.
response on Questions 10, 11, 12, 17, 19, and 20 was Agree. Strength of agreement in responses was highest for Question 19, “My child is participating in a safe number of practice hours per week,” (94.1% Agree) and lowest for Question 18, “A parent should be able to determine whether his/her child continues to play even if a health care provider advises against playing” (58.3% Disagree). A summary of responses to all questions regarding parental beliefs can be found in Table 2.

Table 2

Summary of Responses to Belief Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Agree</th>
<th>Disagree</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. My child is screened for the risk of overuse sports injuries every time they have a sport’s physical or a doctor’s appointment.</td>
<td>73</td>
<td>126</td>
<td>5</td>
</tr>
<tr>
<td>10. If guidelines were available to help prevent sports-related overuse injuries, I would follow those guidelines regardless of the impact on my child’s playing time.</td>
<td>178</td>
<td>20</td>
<td>6</td>
</tr>
<tr>
<td>11. Prior to this survey, I had a general understanding of overuse injury.</td>
<td>177</td>
<td>22</td>
<td>5</td>
</tr>
<tr>
<td>12. My child’s athletic participation is a high priority to me.</td>
<td>130</td>
<td>69</td>
<td>5</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Question</th>
<th>Agree</th>
<th>%</th>
<th>Disagree</th>
<th>%</th>
<th>No response</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. It is important to me that my child continues on to be a collegiate</td>
<td>44</td>
<td>21.6</td>
<td>155</td>
<td>76.0</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>or professional athlete.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. My child often complaints of pain after participating in a game or</td>
<td>32</td>
<td>15.7</td>
<td>167</td>
<td>81.9</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>practice.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. My child is at risk for acquiring a sports-related overuse injury.</td>
<td>70</td>
<td>34.3</td>
<td>128</td>
<td>62.7</td>
<td>6</td>
<td>2.9</td>
</tr>
<tr>
<td>16. It is important that my child continues to play through pain in</td>
<td>19</td>
<td>9.3</td>
<td>179</td>
<td>87.7</td>
<td>6</td>
<td>2.9</td>
</tr>
<tr>
<td>order to do what is best for the team.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. My child’s coach knows the risk factors of overuse injury and</td>
<td>137</td>
<td>67.2</td>
<td>61</td>
<td>29.9</td>
<td>6</td>
<td>2.9</td>
</tr>
<tr>
<td>educates my child on how to prevent the occurrence of overuse injury.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. A parent should be able to determine whether his/her child continues</td>
<td>79</td>
<td>38.7</td>
<td>119</td>
<td>58.3</td>
<td>6</td>
<td>2.9</td>
</tr>
<tr>
<td>to play even if a healthcare provider advises against playing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. My child is participating in a safe number of practice hours per</td>
<td>192</td>
<td>94.1</td>
<td>7</td>
<td>3.4</td>
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<td>week.</td>
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<td>20. Sports participation provides my child with opportunities for peer</td>
<td>183</td>
<td>89.7</td>
<td>16</td>
<td>7.8</td>
<td>5</td>
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<td>socialization and physical activity that otherwise would not be provided.</td>
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Additional Findings

**Physical examination requirements.** Respondents were asked whether a proof of physical examination was required for their child prior to participating in a sports league outside of school. A total of 59 respondents (28.9%) reported yes, 125 (61.3%) reported no, and 20 (9.8%) reported that their child did not participate in an out-of-school league. This finding indicates that a great number of young athletes may participate in sports without a health clearance to do so.

**Responses regarding sports injuries.** Various responses did not correlate with a select subset of survey questions among respondents who reported that their child had previously been injured \( n = 49, 24.0\% \). Respondents whose children had been previously injured were less likely to agree with Question 5, “Jogging short distances and stretching before and after every practice and game/match would decrease the risk of overuse injury” \( 81.6\% \) agree) compared to those whose children had not been injured \( 91.6\% \) agree)—a difference that is statistically significant, \( \chi^2(2, N = 204) = 8.337, p = .015 \). This implies that parents with children who have been injured do not believe that jogging short distances and stretching will decrease the risk of sports-related injuries.

Responses whose children had been previously injured were more likely to agree with Question 14, “My child often complains of pain after participating in a game or practice” \( 40.8\% \) agree) compared to those whose children had not been injured \( 7.7\% \) agree)—a difference that is statistically significant, \( \chi^2(2, N = 204) = 30.822, p < .001 \). This may indicate that parents whose children have been previously injured have a heightened awareness of their children’s physical complaints, or it may indicate that
children who have previously sustained a sports injury are more inclined to have pain when they continue to participate in athletics.

Those parents whose children had been previously injured were more likely to agree with Question 15, “My child is at risk for acquiring a sports-related overuse injury” (61.2% agree), compared to those whose children had not been injured (25.8% agree)—a difference that is statistically significant, \( \chi^2(2, N = 204) = 20.742, p < .001 \). This finding indicates that parents whose children have sustained an injury are more aware of the risk for future injuries.

**Responses related to number of sports played.** The number of sports a child played was significantly correlated with responses to certain survey questions. There was a significant difference in responses to Question 3, “A sports-related overuse injury could cause long-term effects on my child’s health,” based on number of sports played, \( \chi^2(6, N = 204) = 14.447, p = .025 \). The highest agreement came from respondents whose child played 2 sports (95.5% agree), followed by 3 sports (92.1% agree), 1 sport (89.8% agree), and 4+ sports (66.7% agree). The dramatic difference occurred between those that play 4 or more different sports to all others. This finding indicates that parents whose children participate in 4 or more different sports, which is a substantial amount of participation, are less likely to understand that overuse injuries can cause a significant and protracted impact on a young athlete’s health.

In total, 204 surveys were collected. Participants responded to a survey that assessed for knowledge and beliefs of overuse injury. Results showed that, in general, surveyed parents were more knowledgeable of overuse injuries and that their beliefs were more aligned with the current recommendations used to help identify at-risk
athletes and prevent new and recurrent overuse injuries. The researchers identified
significant differences in question responses between parents whose children had been
previously injured and those whose children had not been previously injured.
Significant differences were found between the number of sports played and Question
3, “A sports-related overuse injury could cause long-term effects on my child’s health,”
pertaining to parents’ awareness of the long-term effects of overuse injuries.
Additionally, only 28.9% reported that their children were required to provide proof of
a physical examination to participate in out-of-school sports leagues.
CHAPTER V

Summary, Conclusions, and Recommendations

Sports-related overuse injuries among the pediatric population represent a significant healthcare concern. Approximately 50% of all pediatric sports-related injuries are secondary to overuse (McLeod et al., 2011). It is also estimated that 50% of overuse injuries are preventable through a multidimensional approach including, but not limited to, injury surveillance, identification of risk factors, pre-participation exams conducted by a medical provider, supervision and education of patients and their caregivers, improved training and conditioning programs, and delayed specialization (McLeod et al., 2011). With the risk that this population could eventually experience burnout and long-term physical and psychological effects, awareness and involvement of parents in their child’s health are vital to the success of preventing overuse injuries (DiFiori et al., 2014). The researchers sought to examine the knowledge and beliefs of parents regarding sports-related overuse injuries among youth athletes.

This chapter will include a discussion of the findings from the survey conducted to evaluate parental knowledge and beliefs of sports-related overuse injuries in youth athletes in correlation with previous research. Limitations were addressed. The researchers identified how providers, as well as parents, can use the knowledge gaps identified in this study to bring awareness to and prevent overuse injuries in the future. Recommendations for future research were made.
Summary and Discussion of Findings

The researchers found that there is a knowledge gap between parental knowledge and their beliefs of sports-related overuse injuries in their children. Of the parents surveyed, 88.8% agreed that prior to the survey they had a general understanding of overuse injuries. Parents also generally responded knowledgeably to knowledge-based questions and had an apparent understanding based on the following:

1. Repetitive movements in sports may cause overuse injuries in young athletes (91.7%).
2. Playing through pain is harmful (90.7%).
3. An overuse injury can cause long-term effects on a child’s health (90.7%).
4. Taking 1-2 days off from training and performance each week (85.3%), warming up beforehand (89.2%), and playing different types of sports (57.8%) helps prevent overuse injuries.
5. A child’s level of sports participation needs to be determined by stage of physical and psychological development (87.7%).
6. Fatigue and decreased performance are symptoms of overuse injuries (76.5%).

Even with perceived knowledge of understanding of overuse injuries and potential risk, 62.7% of parents whose children had the potential for developing overuse injuries did not feel that their child was actually at risk. Telford et al. (2012) concluded that parents needed education on (a) certain injuries children are at risk for developing based on the type of sport participation and (b) appropriate safety measures helpful in reducing risk of injury during participation in specific sports. Findings from the current study appeared to validate that parental action about overuse injuries is still lacking. As long as
even a small percentage of parents do not acknowledge the pitfalls of athletic overuse, then a significant number of youth are at risk.

Of the respondents \((N = 84)\) whose children participated in a sports league outside school, 61.3\% reported that a pre-participation physical was not required. According to the guidelines published by the National Athletic Trainers’ Association (NATA) regarding sports-related overuse injuries, a pre-participation physical evaluation (PPE) should be used on each athlete to screen for potential risk factors—a process important in the prevention of injuries (McLeod et al., 2011).

Previous researchers, including DiFiori et al. (2014), recommended no more than 16 to 20 hours per week of training due to a significant increase in injuries requiring medical care in athletes training for more than 16 hours per week (DiFiori et al., 2014). Specific recommendations have not been determined for particular age ranges or sports activities for the prevention of overuse injuries (McLeod et al., 2011). The current researchers determined that young athletes whose parents responded to the survey participated in sports on an average of 3.95 days per week, but 12.7\% reported that they disagreed with the need for required 1 to 2 days off per week. This finding indicates that although most students whose parents participated in the survey are not at significant risk based on current number of days of participation, lack of parental understanding of risk of a small number could lead some to injury at a later time.

Jayanthi et al. (2015) concluded that athletes with a serious overuse injury were 1.90 times more likely to be highly specialized than athletes with a non-serious overuse injury. The current researchers discovered a knowledge deficit among a small percentage of parents concerning the risk of overuse injury in children and adolescents. However,
57.8% of parents agreed that playing different types of sports prevents overuse injuries—suggesting parental recognition of the dangers of specialization. This finding could be considered encouraging. However, the fact that so many parents reported that their children participated in as many as 3 or 4 different sports could also indicate a higher risk of injury from overall participation. Again, caution, screening, and parent education are strongly indicated.

LaPrade et al. (2016) suggested that early specialization in young athletes increases the risk of overuse injuries, social isolation, burnout, and chronic stress. By making coaches, parents, and care providers aware of the implications and long-term complications of sports specialization, LaPrade et al. encouraged the need for precautions to be taken to prevent overuse injuries. This included limiting the age of the child from participating in organized sports and ensuring each child is physically and psychosocially well before participating in sports. The current study found that 87.7% of survey respondents agreed that a child’s level of sports participation should be determined by his or her current stage of physical and psychological development, thereby implying alignment of beliefs between parents and researchers. Guidelines are needed to ensure that children who are not developmentally ready for high levels of sports participation do not pursue sports specialization and intense training programs that would put too much physical and psychological stress on underdeveloped young athletes.

McLeod et al. (2011) stated that arm pain, fatigue, and decreased throwing performance should be recognized by athletes, coaches, parents, and medical personnel as early warning signs of potential overuse injuries in pediatric athletes. Makhni et al. (2014) focused on the need to observe how parents and coaches influenced young
athletes’ expression of pain. According to the study, surveyed youth athletes reported that they continued to play through pain even if it might have been detrimental to their overall long-term physical and psychosocial health. Thirty-one percent believed both parents and coaches would become frustrated with them if their level of performance suffered due to pain. Of the respondents in the current study, 76.5% agreed that fatigue and decreased performance are symptoms of potential overuse injuries, indicating that parents are starting to recognize the early warning signs of a potential overuse injury. This finding seems to be encouraging in terms of parental beliefs. However, the belief is incongruent with the fact that so many of the parents in this survey continued to allow their student athletes to participate at an early age and in a substantial number of sports and that a portion of the survey respondents still believed that playing through pain is harmless and that fatigue and decreased performance are not signs of overuse.

Of the surveyed parents, 61.8% disagreed with the question asking if their child was screened for risk of overuse sports injuries each time they have a sports physical or a doctor’s appointment, although the literature shows that proper screening and assessment lead to an awareness of potential risk, diagnosis of injury, and steps toward prevention of sports overuse injuries (McLeod et al., 2011). The NATA places such emphasis on proper history-taking and physical examinations such as the PPE. The history and musculoskeletal examination are important in detecting and possibly preventing overuse injuries. The history portion of the PPE should be used to recognize previous injuries and other possible signs of overtraining (McLeod et al., 2011). Current findings reveal that parents are not seeing their children’s physicians screening specifically for overuse injuries. Guidelines by the NATA need to be emphasized at conferences and other
learning circles of pediatricians and practitioners performing sports physicals. These providers must also communicate with parents and provide education on the necessity of a proper PPE physical and help to create awareness among parents of the risks factors related to overuse injuries.

Of the respondents in the current study, 62.7% agreed that their child’s coach is aware of the risk factors of overuse injuries and educates their child on how to prevent an occurrence. These data correlate with the guidelines published by the NATA that youth coaches should be certified in identifying areas related to sports safety, sports techniques and skills, psychosocial aspects of childhood and adolescence, growth and development, and common health and medical concerns (McLeod et al., 2011). However, all coaches should be educated and aware of the NATA guidelines.

The compilation of the findings and interpretations regarding outcomes of this study indicated the pronounced need for education of parents in order to keep young athletes safe.

Limitations

A number of limitations to the study were identified. Although some of these limitations could be anticipated prospectively, but not controlled, some could only be identified in retrospect. The limitations identified for this study were as follows:

1. The sample for this study was limited to small, convenient geographic locations within the southeastern United States that were relatively rural which does not provide the researchers with adequate representation of the many sports cultures throughout the region. Therefore, the ability to generalize the findings was limited.
2. Due to lack of previous research regarding parental views on sports-related overuse injuries, there was minimal research to use for comparison.

3. Time constraints of the research limited the ability to ensure that parents of each age group and all sports were represented in the sample.

4. Demographic information was not obtained about the survey participants. Since all parents participating in the survey were not of the same educational and cultural background, ambiguity of the questionnaire itself could have limited responses. The questionnaire designed by the researchers had never been used or undergone statistical testing.

Conclusions

Parental responses to knowledge-based questions showed a general understanding and seeming awareness of signs and symptoms, risks of, and prevention strategies for overuse injuries. Certain response percentages, however, revealed some knowledge deficits pertaining to the number of days young athletes should take off each week (Question 4), the risk of participating in only one sport, otherwise known as sports-specialization, as opposed to different types of sports (Question 6), and symptoms of fatigue and decreased performance as being signs of potential overuse injury (Question 8).

A percentage (12.7%) of parents disagreed with the need for a requirement of young athletes to take 1-2 days off per week. This response may be a result of lack of knowledge of recommended time spent practicing or playing per week, or it may be a response to the word requirement that may or may not suggest a loss of control of parents—instead giving the right to a larger scale decision-maker.
The deficit revealed through Question 6 shows that 40.2% of parents were unaware of the risk of specializing in one type of sport. Young athletes may be encouraged by coaches and parents to focus on one sport in order to gain expertise more efficiently; however, due to continued repetitive movements, the risk of overuse injury is greater. Young athletes may benefit from a more diverse set of physical movements.

The knowledge of parents regarding the signs and symptoms of overuse injuries, such as fatigue and decreased performance, was concerning considering the fact that 20.6% of parents did not recognize those symptoms as indicators of potential overuse injuries. Parents may attribute these symptoms to other causes, such as lack of effort, inadequate nutrition or hydration, or normal fluctuations in performance.

Parents’ responses to belief-based questions revealed generally appropriate perceptions beneficial to the prevention of overuse injuries. A high percentage (61.8%) of parents identified inadequate overuse injury screening by healthcare providers, and 29.9% of parents disagreed that their child’s coach was aware of overuse injury risk factors and educated them on prevention strategies. Nonetheless, the survey results did expose a group of parents that have misperceptions or ill-awareness that may contribute to a child’s risk for injury. Among respondents, 21.6% agreed that it was important to them that their child continue on to be a collegiate or professional athlete, 62.7% did not believe that their own child was at risk for overuse injury, and 38.7% agreed that the parent should be able to decide whether or not the child could continue to play even if a healthcare provider advises against playing.

A correlation was drawn between parents of children who had been previously injured and parents of children who had not been previously injured when responding to
Question 5 regarding warming up as a means to decrease the risk of overuse injury. Children who have had overuse injuries may have been injured regardless of diligence in warm-ups before and after sports events. Also, parents of young athletes that had been injured previously were more likely to believe that their child was at risk for overuse injuries.

A correlation was determined between parents of children that play 4 or more sports and all others in regard to Question 3. Those parents whose children played 4 or more sports were less likely to agree that a sports-related overuse injury could cause long-term effects on their child’s health. These parents may have a greater understanding that sports diversity has a lower risk of overuse injury or this result may indicate a knowledge deficit in parents of highly involved young athletes.

Implications

The Health Belief Model (HBM) was utilized in this study to help in identifying parents’ perceptions regarding overuse injury risks in their children. The HBM suggests that a person’s perception of the possibility of illness greatly drives the decision to seek care. The HBM also emphasized the relationship between a person’s beliefs and behaviors. The current researchers discovered that many of the parents did not view their child’s perceived susceptibility of overuse injuries as a relevant health concern or problem. A lack of concern for this potential problem leads to poor behavior and practices. The poor perception of the parents regarding the possibility of overuse injuries in their own children demonstrates a knowledge deficit in the prevention of overuse injuries in their children. The HBM implies that primary caregivers are held responsible to step in and determine what exactly parents consider overuse injuries while promoting
education as to what leads to overuse injuries in children in order to adequately prevent injury from occurring.

Overuse injuries have become increasingly more common in pediatric athlete populations. Besides determining what perceptions parents have regarding the risk of overuse injury in their children, the study determined areas of limited and inadequate health prevention services pertaining to children being appropriately screened for overuse injuries before participating in sporting events. A majority of parents surveyed believed they understood what placed children at risk for overuse injuries, but they did not believe their child in particular was at risk—suggesting an element of denial and/or knowledge deficit regarding a parent’s perception of their child’s potential risk of overuse injury. Based on the results of the study, it was implied that parents truly need to be educated regarding the following: (a) the actual risk of injury in their children, (b) strategies to prevent overuse injury, and (c) the importance of rest periods from year-round sports.

Communication among physicians, coaches, and parents regarding this information is essential to the athlete’s health. Educators can seek different avenues to bring knowledge to parents through booster club meetings, community or school newsletters, flyers, and other promotional resources.

Survey responses also indicated that young athletes are not assessed adequately before participating in recreational and school leagues. Educating primary care providers in thorough screening techniques is necessary to ensure consistent and persistent assessments of pediatric athletes. By developing opportunities for continuing education on overuse injuries, primary care providers could be better prepared to address the growing problem of overuse injuries among their pediatric patients. Also, educating
primary care providers on the importance of monitoring their pediatric patients’ activities year-round would be an important way of identifying at-risk individuals. There is also a need for compliance among healthcare providers, trainers, and coaches as it relates to proper assessment, recognizing key signs of burnout, and time spent participating in games and practices. The health concern surrounding pediatric overuse injuries led the researchers to conduct this study. Parents must be aware of the potential risk of overuse injuries in order for prevention to occur. An increase in knowledge of parents will ultimately lead to better outcomes. Education related to overuse injuries in children could be presented to parents through educational seminars and at local booster club meetings.

By creating opportunities for advanced practice nurses to work in conjunction with one another to implement an effective screening tool, parents, coaches, and healthcare providers can be reassured that their child, student, and patient, respectively, can be cared for in an appropriate and safe manner to reduce the risk of overuse injury. An in-depth questionnaire can also be developed in order to identify teaching that is necessary for the parent to ensure the safe care and prevention of overuse injuries in their children.

**Recommendations**

The number of overuse injuries in the pediatric population in the U.S. is significant—yet often overlooked by providers, caregivers, and coaches. The results of the study indicated a need for further research targeting knowledge deficits and associated beliefs of parents. This study should be extended to coaches in order to gain a better understanding of their knowledge base and need for education.
Research is also needed to determine if the occurrence of overuse injuries relates to particular knowledge and beliefs surrounding signs and symptoms of overuse injuries (i.e., fatigue and decreased performance), sports specialization, screening practices by physicians, and parental expectations, all of which were associated in the study as potential knowledge deficits and/or particular beliefs. The current researchers did not ask about demographics and basic information of the participating parent, such as location and setting of sports participation or differentiation between public, private, or recreational leagues. Doing so might have identified specific populations at increased risk for overuse injury.

This study should also be conducted for a longer period of time with a larger number of participants. Further recommendations were that research should be conducted focusing on the effectiveness of integrating screenings tools in clinics to gauge knowledge and beliefs of parents and athletes upon sports physicals. This would enhance communication between the provider and the parent and athlete and help the provider to identify knowledge deficits and/or beliefs that may jeopardize a child’s sports health.

The current researchers also recommended more diligent efforts to educate parents on not only the risk of overuse injuries in young athletes as a whole but more importantly helping each parent understand that the risk factors also pertain to their child as well and that risk should be taken seriously. Thorough education highlighting the recommendations by NATA is vital in preparing parents to advocate for their children participating in sports. Parents must be informed of what to expect from physician screenings and recognize if their child is not being screened adequately. They should also have awareness of coach involvement in helping to prevent overuse injuries.
Educational opportunities can be offered through community and school-supported events and promoted through newsletters and promotional tools.

The development of regulations for recreational sports leagues will lead to stronger compliance, thus reducing overuse injuries. Requiring routine physical assessments for these athletes will help to identify at-risk children. The current researchers recommend that a standardized questionnaire and assessment tool, such as the PPE acknowledged by the NATA, be implemented in clinical settings. Utilizing this method consistently and efficiently would help to ensure that young athletes are screened adequately. Using this assessment tool would bring the provider and parent insight regarding a child’s risk for overuse injury. Creating continuing education hours for care providers related to appropriate screening of youth athletes will provide continued awareness of the severity of sports-related overuse injuries. By encouraging coaches to adopt a coaching style that promotes the safety of children by providing adequate rest time and limitations on repetitive movement, young athletes will have a decreased risk for acquiring overuse sports injuries. Finally, determining a safe and standard amount of practice time based on age and number and types of sports played could greatly reduce the risk of developing an overuse injury. Determining a need for legislation to regulate and monitor the amount of time a child spends playing their respective sports may be indicated if the occurrence of overuse injuries continues to rise among young athletes.

Summary

Overuse injuries involving children and adolescents present a major health concern. With the increasing amounts of reported injuries, there is a significant need for awareness, prevention, and management of this health concern. Some reports indicate
that 50% of pediatric patients present to sports medicine clinics for chronic injuries (McLeod et al., 2011). Overuse injuries can lead to remarkable pain, growth-related disorders, and ultimately lifelong disability. It is believed that overuse injuries are preventable which means that there is a need for proper education concerning prevention. The health concern surrounding pediatric overuse injuries led the researchers to conduct this study. Parents must be aware of the potential risk of overuse injuries in order for prevention to occur. After conducting a survey regarding parental beliefs and perceptions related to sports overuse injuries, the current research concluded that 88.8% of respondents agreed that they had a general understanding of overuse injuries prior to taking the survey, but the majority of the respondents (62.7%) felt that their child was not at risk for overuse sports-related injuries. The parents of children that had previously acquired a sports-related injury were more likely to agree that their children were at risk for overuse sports-related injuries. The educational background of each survey participant was not known, and no prior research about parental knowledge and beliefs related to sports overuse injuries was conducted. Although the current researchers lacked previous research to use for comparison, the survey revealed a knowledge deficit concerning the potential for acquiring overuse sports-related injuries in the pediatric population. Further research, implementation of regulations, increased awareness, and proper assessment and screening are all needed in order to see a decline in sports-related overuse injuries involving the pediatric population.
REFERENCES


APPENDIX A

Approval of Institutional Review Board

Mississippi University for Women
A Tradition of Excellence for Women and Men

February 17, 2017

Alena Lester, Ph. D.
Mississippi University for Women
College of Nursing and Speech Language Pathology
1100 College Street, MUW-910
Columbus, Mississippi 39701-5800

Dear Dr. Lester:

I am pleased to inform you that the members of the Institutional Review Board (IRB) have reviewed the following proposed research and have approved it as submitted:

Name of Study: Knowledge and Beliefs of Parents of Young Athletes Regarding Sports-related Overuse Injuries.
Investigator(s): Kathryn Carroll, Maegan Flynn, Marian Hickmon, Amanda Hill, Carly Mahon, and Lina Zhu
Research Faculty/Advisor: Alena Lester

I wish you much success in your research.

Sincerely,

Thomas C. Richardson, Ph.D.
Provost and Vice President for Academic Affairs

TCR/tc

pc: Tammie McCoy, Institutional Review Board Chairman
APPENDIX B

Letter to Committee Members

November 21, 2016

Committee Member
Mississippi University for Women
1100 College Street MUW-910
Columbus, MS 39701

Dear Committee Member,

The Lester Research Group requests you as a committee member for our MSN research project for the 2016-2017 school year. By accepting this position, you are agreeing to supervise and monitor the progression of our research project and attend all committee meetings for the project. We welcome any recommendations to improve the project. Each member of the committee will receive a hard copy of the initial proposal after being approved by Dr. Alena Lester. Once the committee is selected, there will be a proposal defense meeting. The purpose of the defense meeting is to allow input from all committee members and to amend the proposal in preparation for review by the MUW IRB. Committee members will be provided a copy of the final research proposal for review, approval, and signature.

The title of our research project is Knowledge and Beliefs of Parents of Young Athletes Regarding Sports-related Overuse Injuries.

Please indicate your acceptance to serve as a committee member by signing below. You may contact our Principal Investigator, Kathryn Carroll (601-212-8455), or Dr. Alena Lester, Chair (662-299-2985) for any additional information. We thank you for your time and consideration in this matter.

Sincerely,

Kathryn Carroll, Principal Investigator, Graduate Student
Maegan Flynn, Investigator, Graduate Student
Marian Hickmon, Investigator, Graduate Student
Amanda Hill, Investigator, Graduate Student
Carly Mahon, Investigator, Graduate Student
Lina Zhu, Investigator, Graduate Student
Dear Potential Participants,

We are a group of graduate students from Mississippi University for Women, and we are in need of your help. We are conducting research regarding parental knowledge and beliefs about sports-related overuse injuries among young athletes between the ages of 6 and 18 years. It would be a great help to us if you could provide us with a moment of your time to fill out a survey. All of the responses and participants will remain anonymous. This survey will take approximately 5 minutes to complete. There is no right or wrong answer. We are simply interested in your responses on this topic of concern. If you have already been asked to fill out this survey, please disregard this request.

If you have any questions regarding the survey or our research, please contact our Principal Investigator, Kathryn Carroll (601-212-8455) or Dr. Alena Lester, Chair (662-299-2985). Thank you for your participation.

Sincerely,

MS University for Women Graduate Students:
Kathryn Carroll
Maegan Flynn
Marian Hickmon
Amanda Hill
Carly Mahon
Lina Zhu
APPENDIX D

MUW Parent’s Perception Survey of Overuse Injuries in Student Athletes

An overuse injury is defined as an injury sustained from repeated action (such as repetitive strain injury) as opposed to acute injuries which occur in an instant (such as a sprained ankle).

1. What is the age of your child?
2. What sport/sports does your child participate in?
3. How many days a week does your child spend practicing or playing in a game?
4. Has your child ever suffered an overuse injury related to sport participation? If so, what type?
5. If your child plays in a sporting league outside of school, were they required to provide proof of a physical examination before participating?

Select the response that is MOST CLOSELY in line with your beliefs about the following statements:

1. Sports that require repetitive movements such as baseball or tennis may cause overuse injuries in young athletes.
   AGREE          DISAGREE

2. My child continuing to play when he/she is experiencing pain is harmless.
   AGREE          DISAGREE

3. A sports-related overuse injury could cause long-term effects on my child’s health.
   AGREE          DISAGREE

4. Youth athletes, ages 6-18, should be required to take 1-2 days off from practice and training each week.
   AGREE          DISAGREE

5. Jogging short distances and stretching before and after every practice and game/match decrease the risk of overuse injury.
   AGREE          DISAGREE

6. Children and adolescents should play different types of sports to prevent overuse injuries.
   AGREE          DISAGREE

7. My child’s level of sports participation should be determined by his/her current stage of physical and psychological development.
   AGREE          DISAGREE
8. Fatigue and decreased performance are symptoms of a potential overuse injury.  
   **AGREE**  **DISAGREE**

9. My child is screened for the risk of overuse sports injuries every time they have a sport’s physical or a doctor’s appointment.  
   **AGREE**  **DISAGREE**

10. If guidelines were available to help prevent sports-related overuse injuries, I would follow those guidelines regardless of the impact on my child’s playing time.  
   **AGREE**  **DISAGREE**

11. Prior to this survey, I had a general understanding of what an overuse injury is.  
   **AGREE**  **DISAGREE**

12. My child’s athletic participation is a high priority to me.  
   **AGREE**  **DISAGREE**

13. It is important to me that my child continues on to be a collegiate or professional athlete.  
   **AGREE**  **DISAGREE**

14. My child often complains of pain after participating in a game or practice.  
   **AGREE**  **DISAGREE**

15. My child is at risk for acquiring a sports-related overuse injury.  
   **AGREE**  **DISAGREE**

16. It is important that my child continues to play through pain in order to do what is best for the team.  
   **AGREE**  **DISAGREE**

17. My child’s coach knows the risk factors of overuse injury and educates my child on how to prevent the occurrence of overuse injury.  
   **AGREE**  **DISAGREE**

18. A parent should be able to determine whether his/her child continues to play even if a healthcare provider advises against playing.  
   **AGREE**  **DISAGREE**

19. My child is participating in a safe number of practice hours per week.  
   **AGREE**  **DISAGREE**

20. Sports participation provides my child with opportunities for peer socialization and physical activity that otherwise would not be provided.  
   **AGREE**  **DISAGREE**