

An Evaluation of the Effects of Sports Specialization and Diversification on Student Athletes

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ABSTRACT

This research aims to discern correlations between sport specialization, stress levels, and incidence of physical injury among high school student-athletes. Ninety-seven students across various grades and athletic commitments contributed to the finding. The results of stress and injury dynamics varied greatly among student-athletes, with several notable findings emerging. Age and type of sport did not exhibit significant correlations with stress levels or injury rates, displaying that other factors likely have an impact on the two categories. Furthermore, the dedication to sports year-round showed heightened stress levels, proving the harsh psychological toll of prolonged athletic commitment. No discernible connection between academic or financial stress and sports specialization or diversification was found, allowing the researcher to conclude that these categories likely vary by person. Social impacts varied between specialized and diversified athletes, with differing perceptions of interference. Additionally, while sports participation limited vacation time irrespective of specialization, injury rates exhibited nuances based on participation duration and sports focus. The prevalence of physical burnout was notably higher among specialized athletes engaged in year-round sports, displaying the potential physiological strains of prolonged athletic commitment.

Literature Review:

Over time, the achievements of youth athletes have increased dramatically. When compared to their counterparts of the past, today's young athletes are seemingly faster, stronger, and performing at higher levels. This surge in athletic achievement can be attributed to a multitude of factors, one of which being the evolving landscape of youth sports, where specialization has become a prevalent and noticeable trend amongst even the youngest of athletes.

A cultural transformation in youth sports can be traced back to the ever-evolving societal perception of what it means to be a successful athlete. Today, it is common for young athletes to begin striving for financial rewards, such as college scholarships, even before entering middle school. Contemporary youth athletes harbor aspirations of reaching elite levels, often fueled by the expectations and well-intentioned, but often misinformed, guidance of the adults in their lives. This pressure to achieve is reflected in the prevalence of sports specialization, defined as intense, year-round training in a single sport with the exclusion of others (Jayanthi et al.). A wide range of reasons motivate athletes to specialize, including skill level, time constraints, and the allure of potential scholarships. A Likert-style survey conducted among 303 athletes from two NCAA Division I institutions sheds light on the patterns of sports specialization. The study revealed that those who participated in individual sports typically specialized at a younger age and notably, collegiate and professional ambitions are significant driving forces behind early specialization (Swindell et al.). These findings emphasize the financial factors motivating young athletes and the families that influence their athletic choices.

The substantial rise in the financial investment that families are making as it relates to the training of their young athletes indicates a major shift within family dynamics. Monetary costs, reaching upwards of 10 percent of a family's gross income, suggest that many families invest with the optimistic expectation of securing college scholarships for their children. However, the stark reality, as indicated by the research of New York Times journalist Paul

Sullivan, challenges this perception, asserting that "the chances are slim to none of a kid getting a scholarship" (Sullivan). This revelation calls for a closer examination of the motivations behind the willingness to expend significant resources—financial, temporal, emotional, and even a portion of a child's youth—on sports. Past generations viewed the role of sports in childhood development as a way to build bonds between children and their peers as well as teach resilience and collaboration. However, a perceptible increase not only in the financial aspect, but also in the level of parental engagement, particularly among fathers in the middle class, reveals a shift in the mindset and rationale that fuel youth athletics. (Stefansen et. al.).

According to a study performed by Hayley Root, a physician assistant at UW Medical Center involving 131 participants aged 4-12 years old, there is no evidence supporting the benefit of exclusive gymnastics training for enhanced performance (Root et al.). This suggests that sport specialization, particularly among young athletes, does not offer the benefits that some parents and coaches might believe. The demanding schedules imposed on young athletes can leave them with minimal free time and opportunities to explore other interests. This lost time, according to the study, is unnecessary and unreasonable. Even at the college level, it is understood that athletes require a balance between their sport and other things like academics and socialization. An NCAA regulation limits athletes to 20 hours a week dedicated to sports (excluding travel time to games). However, reality reflects a departure from this guideline, as many collegiate athletes admit to surpassing the specified time limit, both during and outside their athletic seasons (Lumpkin).

In addition to its potentially harmful emotional and social impacts, sports specialization also threatens the physical well being of young athletes. This consequence was highlighted in a study done by Marisa Shepherd for the *Journal of Athletic Training* which revealed that athletes who were highly specialized before high school reported greater physical discomfort and dysfunction during daily living activities and recreation. Furthermore, the study group exhibited lower hip and groin-related quality of life compared to those who underwent low-specialization training in high school (Sheppard et al.). These findings emphasize the potentially long lasting ramifications of early and intense sports specialization on the physical health and overall quality of life for athletes. Similarly, a survey conducted between 2015-2017 shed light on the prevalence of injuries among athletes aged 12-17, indicating that 32.6% of 917 injured athletes played a single sport for more than 8 months per year. Alarming, 69.6% of those engaging in high specialization previously abandoned other sports to focus exclusively on one (Miller et al.). These statistics suggest that frequent injury may be a consequence of specialized training.

The researcher identified a compelling gap in the existing research on the physical and emotional impacts of sports specialization on youth athletes. While some studies touch upon the physical consequences of early specialization, there is a noticeable dearth of research related to injury rates and the potential impact on an athlete's mental health. Also, there were very few studies that took the amount of months an athlete participated in their sport into account.

Methods:

The researcher's sample group consisted of male and female student-athletes of varying grade levels in a Long Island high school that offers 17 competitive sports teams, at JV and Varsity levels, over three athletic seasons: fall, winter, and spring. All student athletes were given the opportunity to participate in the study.

Previous research on sports specialization has utilized surveys to collect data on various factors influencing youth sports, including the athletic choices of students and the physical and emotional impact of those choices. The findings of a survey conducted between 2015-2017 identified a potential connection between sports specialization and frequent injury (Miller et al.). Another survey, conducted by two Division I universities, revealed a trend for specialization driven by collegiate and professional ambitions, particularly in individual sports (Swindell et al.). Surveys have proven to be an effective and accessible method for data collection and as such, became the researcher's choice of method.

To begin, a Google Survey of 19 questions was sent out to each faculty member and coach at the Long Island high school. It was requested that these faculty members and coaches forward the questionnaire to their students and athletes via their school provided email addresses. Each student in this high school is provided a Google Chromebook and Gmail account, ensuring that all student athletes could access the Google survey questions easily and efficiently. The survey's participants remain anonymous to ensure that students feel comfortable answering the questions honestly and without fear of backlash from coaches or teammates.

The survey begins by asking the participants their grade level, 9-12, in order to identify an age range. Then, in order to differentiate between different types of student-athletes, participants are asked whether they are involved in individual or team based sports and whether they would describe their involvement in sports as specialized (focused on one sport) or diversified (across multiple sports). Those participants who answered diversified are directed to skip the next two questions as they relate to sports specialization.

Participants who answered specialized are asked whether or not they had to give up or minimize their involvement in other sports in order to specialize in one. This question seeks to uncover the sacrifice that student-athletes must make in order to specialize in their sport of choice. Next, they are asked what specific sport they specialize in. This question seeks to determine whether or not there is a trend to specialize amongst certain types of athletes or particular sports.

Next, all participants are asked how many months a year they spend training and playing their sport(s) and are given five possible choices: In-Season Only; 4-6 months; 7-9 months; 10-11 months; Year Round. This question is asked to evaluate the differing levels of time dedication required amongst specialized student-athletes and diversified student-athletes.

The researcher continues on to questions focused on the mental health and stress levels of all student-athlete participants, both specialized and diversified. Four questions ask participants to rate their stress level on a scale of 1-5, 1 being Very Low and 5 being Very High, as it relates to the following: homework completion and test preparation; college recruitment; financial burden of participation and training; and, social/family life. Each of these questions was crafted in an attempt to better understand the mind of today's student-athlete and uncover the social and emotional benefits and burdens that sports involvement has on student-athletes at this Long Island high school. Additionally, responses will determine whether or not there is a correlation between sports specialization and increased stress levels.

Following the questions related to stress levels, the researcher asks five questions related to the physical implications sports can have on student-athletes, both diversified and specialized. Participants are asked specifically how many sports related injuries they have suffered in the past year, given the following choices: 0; 1-2; 3-4; 5+. Then, students are asked to respond to three Yes or No questions related to the following: whether or not their sport(s) involvement leads to physical burnout; whether or not they would consider themselves injury prone; and the occurrence of re-injury as it relates to their sports involvement. This portion of questions will determine the correlation between athletics and the occurrence of physical injury, particularly whether or not sports specialization leads to a greater number of injuries amongst student athletes.

The survey ends with an opportunity for each participant to share his or her personal opinion as it relates to the overall physical and emotional impact sports involvement has had on his or her life. This is an essential part of the survey as it will provide further insight into the mind of today's student athletes and a personal assessment of participation. However, the researcher decided not to make this final question mandatory in order to not deter possible participants who do not feel compelled to expand upon their thoughts.

Data Evaluation:

The researcher designed the survey to consist of a range of inquiries concerning the stress levels and incidence of injury amongst student-athletes in a public, medium sized, Long Island high school. The survey was made available to all student-athletes in grades 9-12 through various teachers, coaches, and guidance counselors. The aim was to

investigate whether there exists a correlation between sport specialization and stress levels as well as frequency of physical injury. Ninety-seven students of varying grade levels and athletic engagement participated in the survey.

What follows are the results of the survey broken up into pie charts and bar graphs with written explanations of the findings.

Table 1A:

1. What grade are you in?

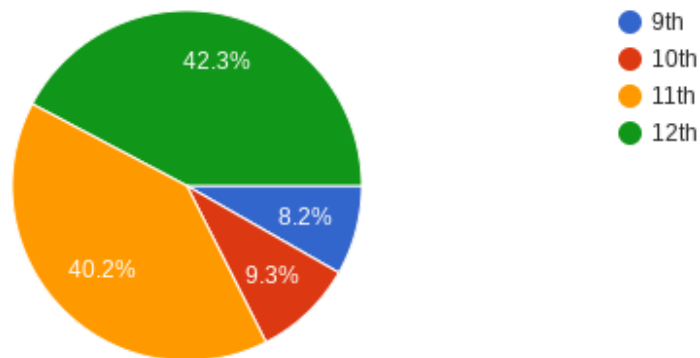
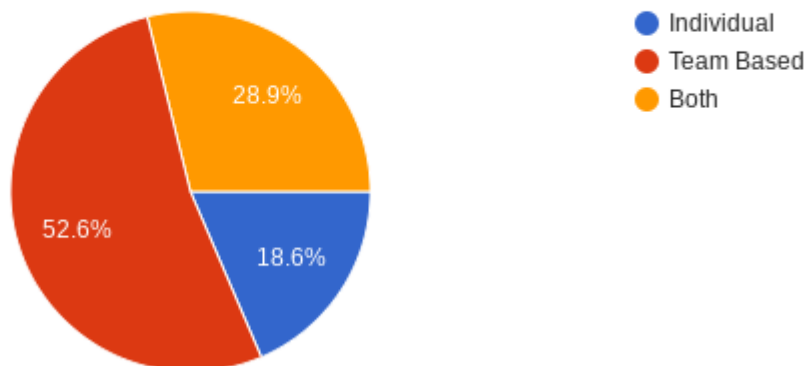


Table 1B:

2. Do you participate in an individual or team based sport?



The participants of the study consisted of student athletes ranging in ages 14-18 with 8.2% of respondents being in 9th grade, 9.3% 10th grade, 40.2% 11th grade and 42.3% 12th grade. The researcher thought age to be of significance in terms of a correlation between age and stress level. However, the diversity of the answers at each age level suggest that there is no correlation between the two. The same could be said for the type of sport the athlete participates in, as it was found that there is no significant relationship between participation in an individual or team sport and stress level/rate of injury.

Table 2A:

How many months a year do you participate in your sport(s)?

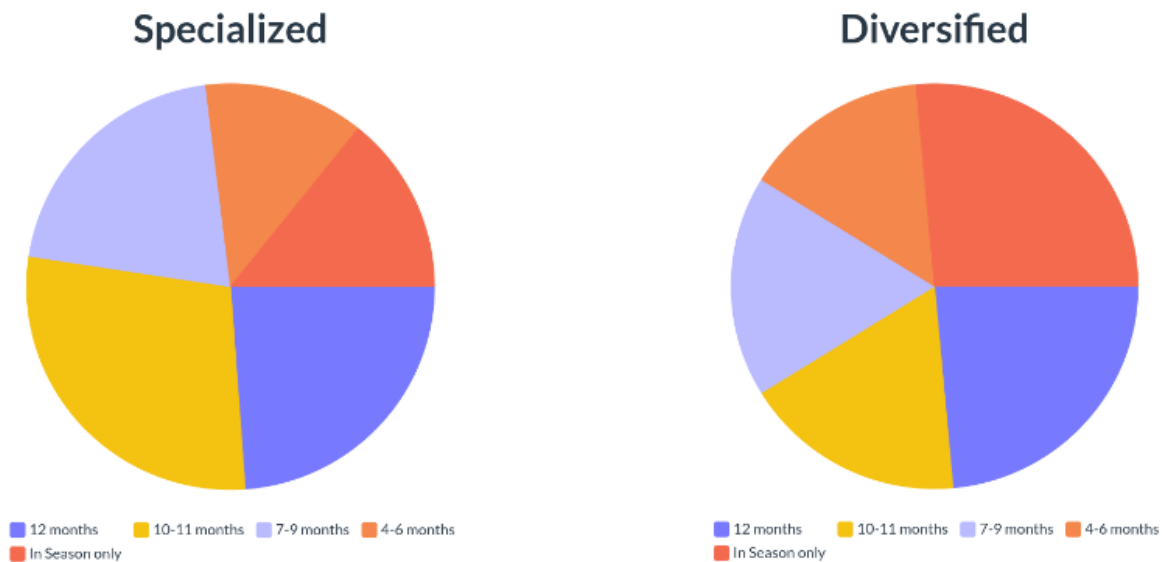
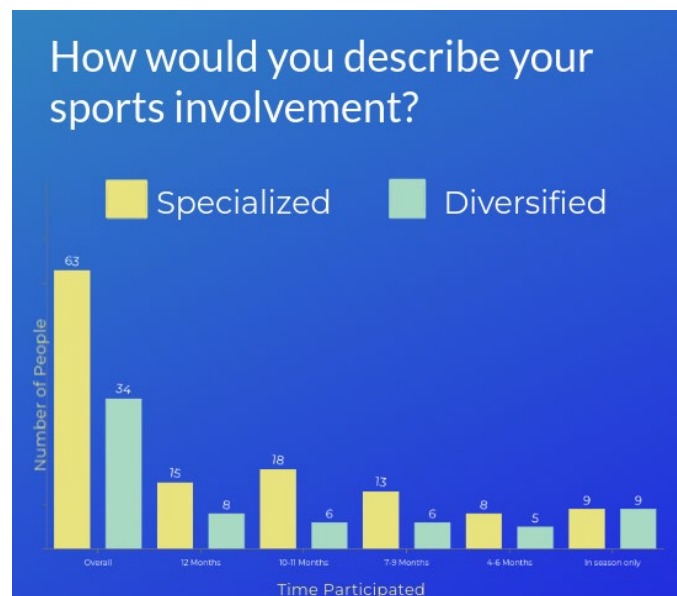


Table 2B:



Participants were asked how many months each year they dedicate to their sport. The researcher broke the choices down into five increments: 12 months a year, 10-11 months a year, 7-9 months a year, 4-6 months a year and in-season only. The researcher organized the data to separate specialized and diversified athletes to observe any similarities or differences in their answers. Of the 63 athletes who claimed they specialized in a sport, 23.8% play their sport year round, 28.5% play 10-11 months of the year, 20.6% participate 7-9 months of the year, 12.7% practice 4-6 months of the year and 14.2% play in season only. The diversified group, containing 34 participants, observed similar results with 23.5% playing year round, 17.6% playing 10-11 months, 17.6% playing 7-9 months, 14.7% playing 4-6 months and 26.4% playing in season only.

Table 3A:

Did you choose to give up or minimize your involvement in other sports in order to specialize in one particular sport?

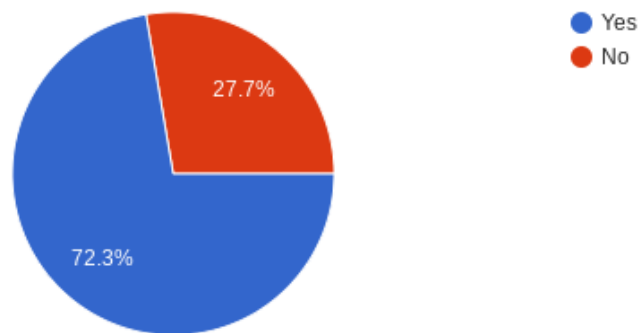
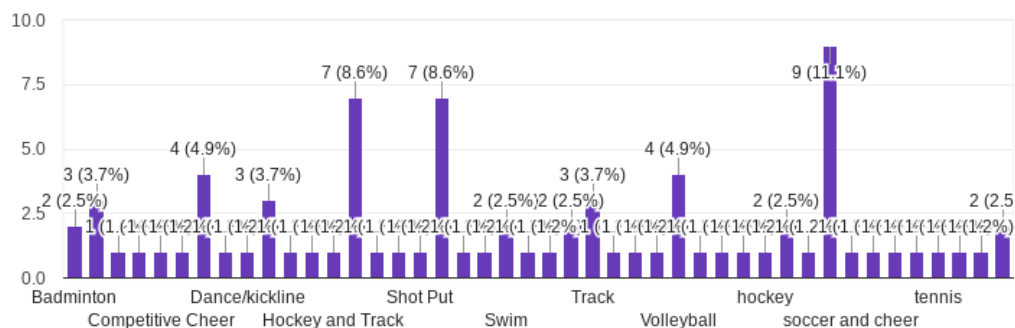


Table 3B:

5. What sport are you specialized in?

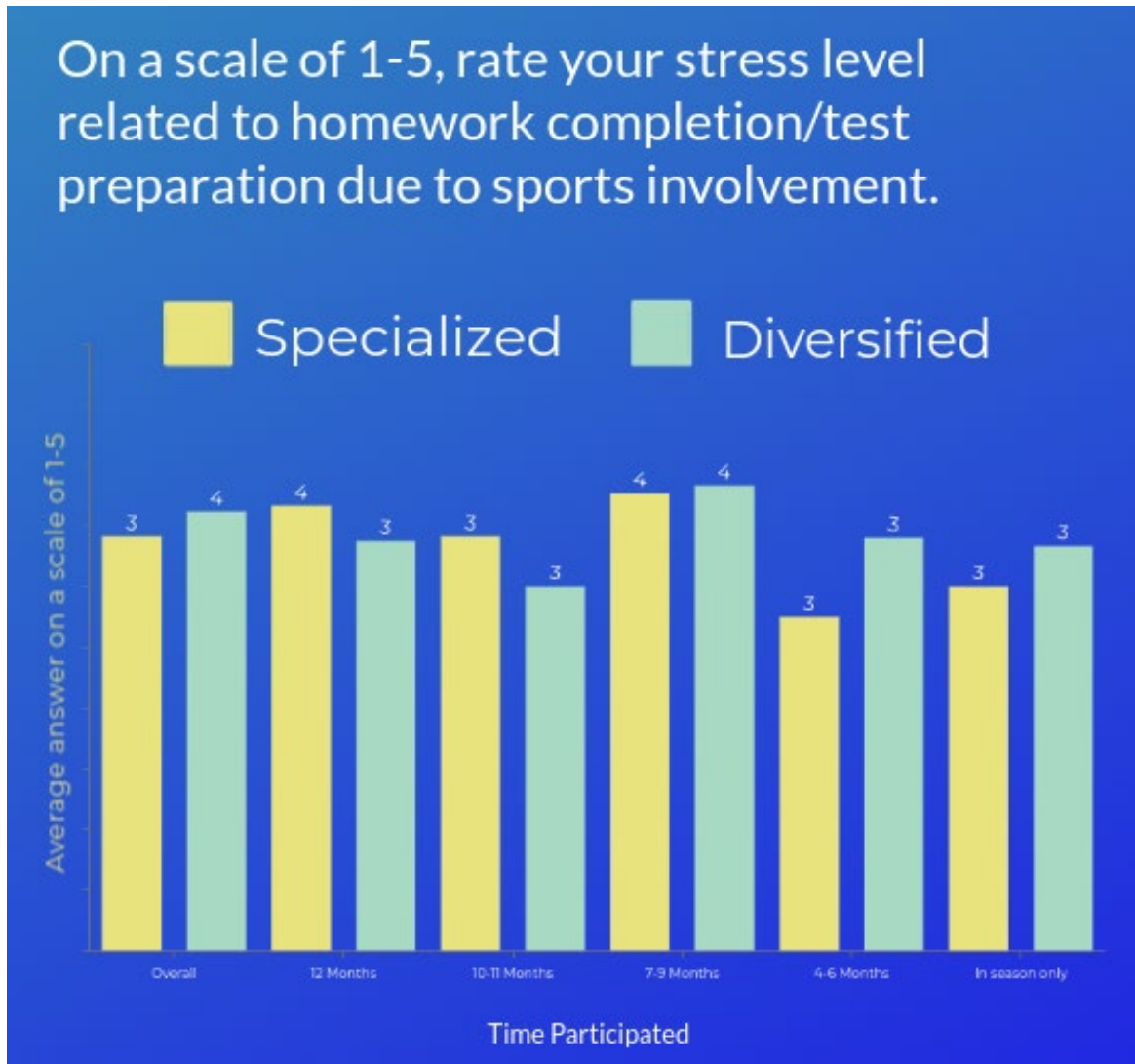
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Two questions were asked specifically to students who specialize in one sport. It was found that survey respondents specialized in nineteen different sports. This differentiation ensures diversity amongst the data; it is not

skewed towards the answers of those who participate in only a few popular sports. Of these sport specialized student-athletes, 72.3% chose to minimize their involvement in other sports to focus on one in particular. Collected data finds that there is no association between this decision and stress level or injury rate.

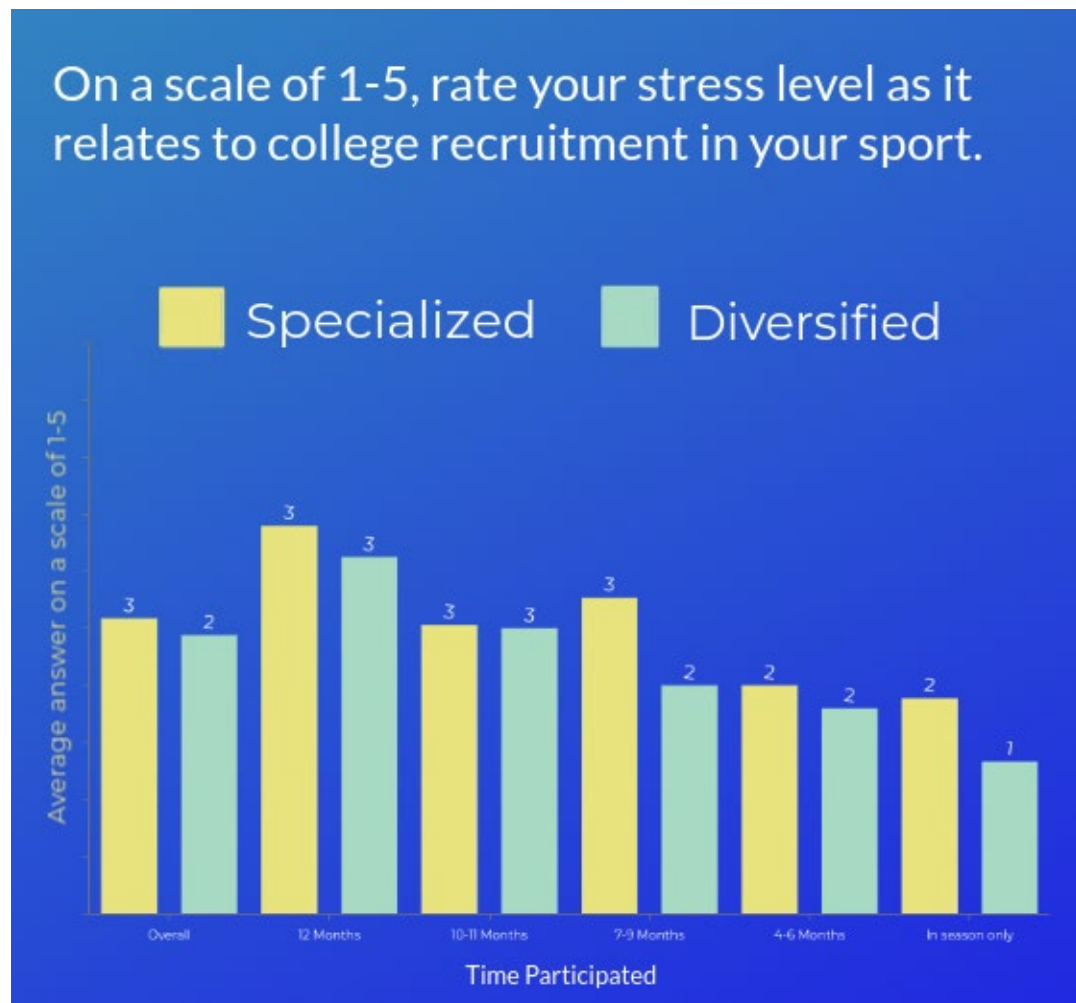
Table 4:



All participants, both specialized and diversified, were asked to rate their stress level related to homework completion and test preparation. The question was asked in order to identify a potential relationship between sport specialization and academic stress level. Despite meticulous examination, the researcher uncovered no discernible correlation between the two variables, as responses remained remarkably consistent across all demographics. This lack of correlation suggests that factors beyond sports specialization significantly influence a student-athlete's stress levels.

Note: All values in Table 4 were rounded to the nearest whole number to clearly display the similarity between the answers.

Table 5:



In addition to the pressures stemming from academic responsibilities, athletes often experience heightened stress levels attributable to the demands of college recruitment. Unsurprisingly, it was found that athletes who dedicate their time year round to their sport had higher average stress levels in this category than all other athletes. This observed pattern underscores the impact of athletic dedication on an adolescent's stress perception, with data indicating a gradual decrease in stress levels related to recruitment corresponding to reduced time investment in the sport. Also, in all groups, those athletes that were specialized had higher stress levels than those who diversified their athletics. This finding displays the potential psychological drawbacks of specialization and demonstrates the importance of considering a different approach to athletic development and well-being.

Table 6:



As shown in table 6, respondents were questioned about their stress levels related to the costs associated with their sport(s). Similar to the averages of stress related to homework completion and test preparation, there seems to be no discernible connection between specialization, diversification, and financial stress. This is likely due to the variety of the costs associated with different sports; while some sports require minimal expenses, others necessitate significant financial investment, with expenses ranging from equipment purchases to training fees, potentially reaching thousands of dollars.

Table 7A:

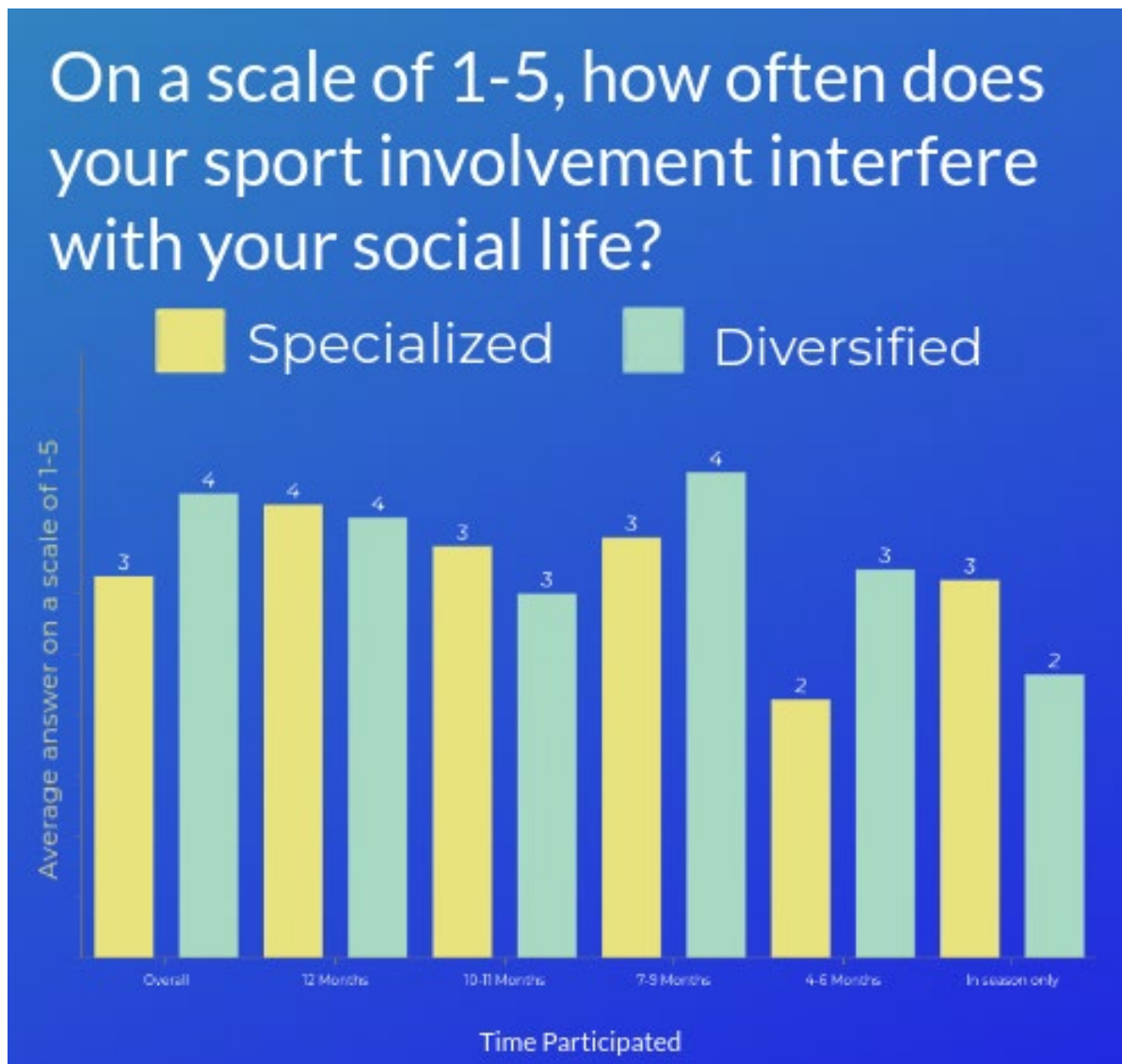
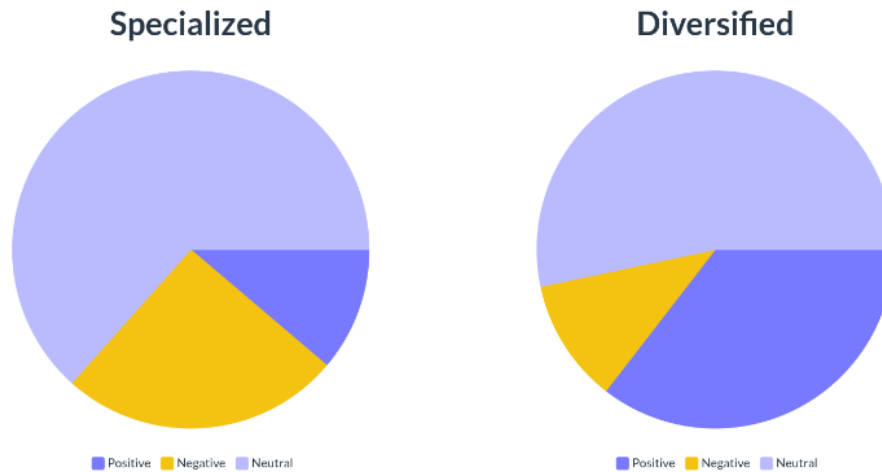


Table 7B:

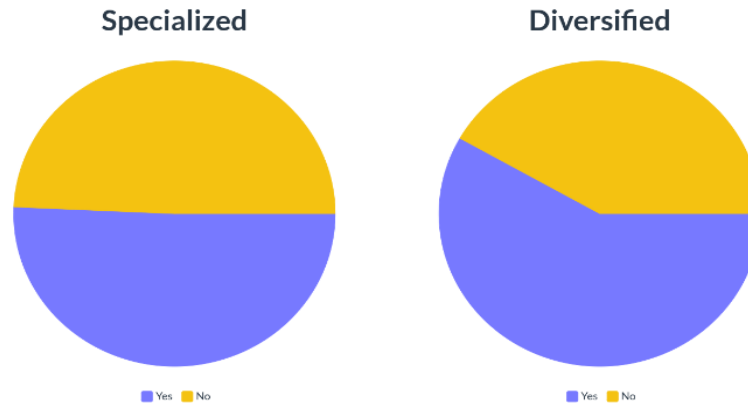
Does this social interference have a positive or negative effect on your stress level?



Having already questioned the student-athletes of their academic and financial stress, the researcher inquired about the social impact of sports on the student. It was found that diversified athletes claimed a higher occurrence of social interference; however, this interference tends to be viewed in a positive light with 35.2% of diversified athletes claiming that the impact of their sports involvement on their social life made a positive impact on their stress levels while only 11.1% claimed it had a negative impact. Specialized student-athletes claim their sport to have a lower overall social impact, but more of these athletes claim the interference to be negative. Specifically, 25.4% of specialized student-athletes regarded the social impact as negative, while only 11.1% viewed it positively. Interestingly, a majority of respondents perceived this impact neutrally, indicating that the social impact of their sport(s) had minimal effect on their overall stress levels.

Table 8:

Do you feel that your sport involvement has limited the amount of family vacations you can go on?



Participants were asked whether or not their participation in sports has limited the number of vacations they have been able to go on. This question was asked to identify a possible correlation between being specialized or diversified in a sport and having little time to rest or spend time with family, both of which are vital to decreasing stress levels and maintaining mental wellness. While table 8 displays a slightly higher percentage of diversified athletes who answered affirmatively, the difference is too minimal to declare a trend, especially with a small sample size. Therefore, the researcher finds that there is no significant relationship between being specialized or diversified in sports involvement and the restriction of family vacation time. However, it can be concluded that participating in sports, regardless of specialization or diversification, limits the amount of vacation time that student-athletes are able to enjoy with their families.

Table 9A

How many sports-related injuries have you experienced in the past year?
(Specialized)

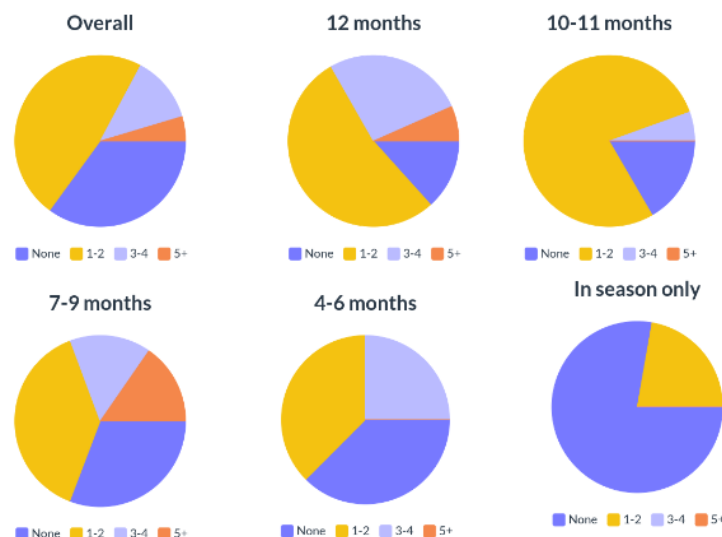
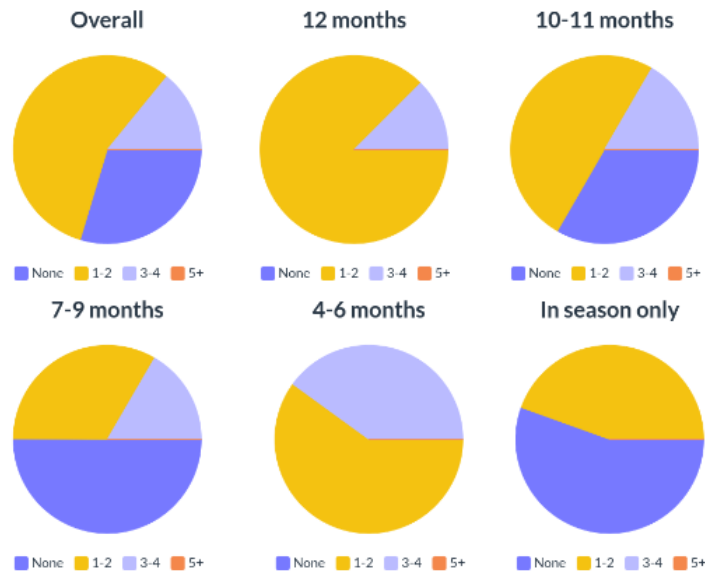


Table 9B:

How many sports-related injuries have you experienced in the past year? (Diversified)



After asking a variety of questions regarding the respondents' stress levels, the researcher went on to question the athletes on their rate of injury. As displayed in tables 9A and 9B, the overall number of injuries are remarkably similar between the specialized and diversified athletes, the only notable difference being between the percentage of athletes that received 5+ injuries in the past year. Another observation that can be made based on tables 9A and 9B is that the rate of injury tends to be drastically higher for athletes who competed in their sports for 10+ months in both categories, with the exception of diversified athletes that participated in sports 4-6 months of the year. It can also be concluded that athletes who specialize in their sport and participate for 10-11 months and 7-9 months had a higher rate of injury than their diversified counterparts. While the diversified athletes that participate in their sport 12 months a year had a higher rate of injury, those that were specialized in their sport 12 months a year had a higher chance of suffering more than 1-2 injuries in a year.

Table 10A:

Have you ever experienced feelings of physical burnout as a result of your involvement in sports? (Specialized)

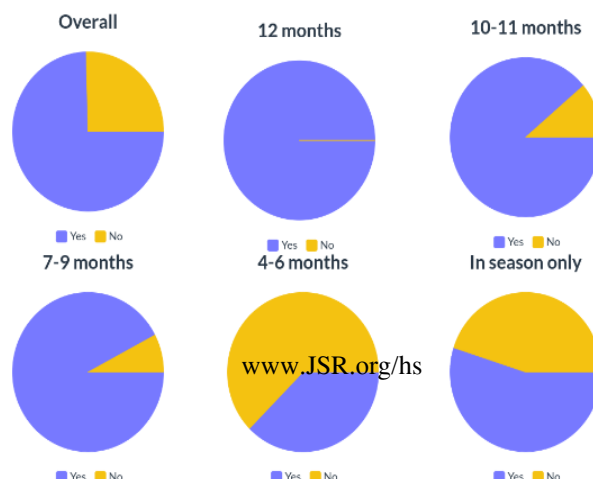
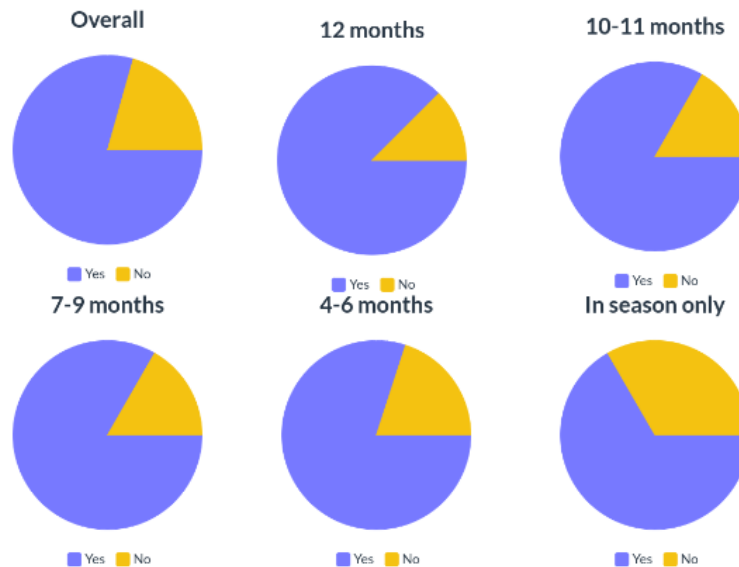


Table 10B:

Have you ever experienced feelings of physical burnout as a result of your involvement in sports? (Diversified)



Following the question regarding physical injury, respondents were asked specifically about the physical burnout they have experienced as a result of their sport(s) involvement. While the overall averages between diversified and specialized athletes were similar, when broken up by months participated, the percentages differ greatly. One notable difference displayed on Tables 10A and 10B is that 100% of specialized athletes who play their sport 12 months a year claimed to have experienced physical burnout compared to 87.5% of diversified athletes. This disparity suggests that training and competing in one sport year-round takes a greater toll on the bodies of athletes. Another significant difference between the specialized and diversified participants can be seen in those that compete in sports 4-6 months a year and in-season only. Those that were specialized and competed in sports in those time periods experienced much less physical burnout than those who were diversified and competed in sports for the same amount of time.

Table 11A:

If you were specialized and had injuries, were these injuries caused by the sport you are specialized in?

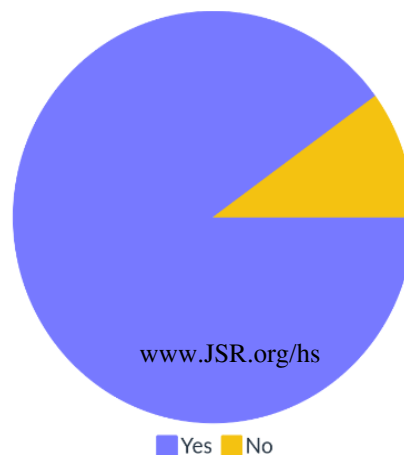
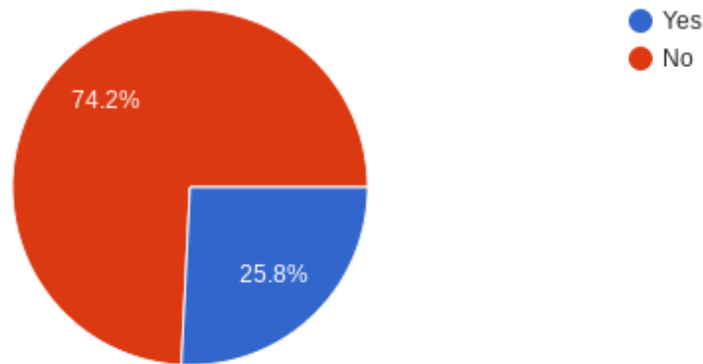


Table 11B

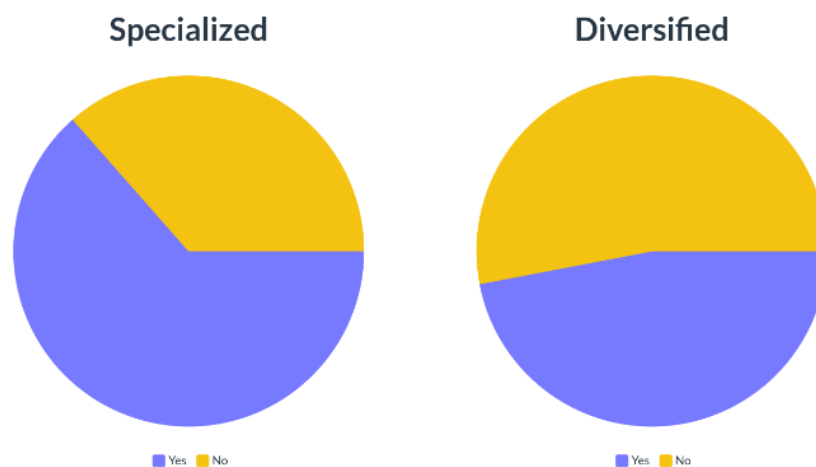
15. Would you consider yourself injury-prone?



Two survey questions sought to find a correlation between specialized sports involvement and physical injury as well as ensure that the injuries identified were due to sports participation and not outside factors. As shown in table 11A, 90% of specialized athletes claimed that their injuries were caused by their participation in their sport. On table 11B however, 74.2% of these athletes claimed that they were not injury prone. Because of this, the researcher can conclude that nearly all of the injuries that the athletes suffered were a result of their sports participation.

Table 12:

Have you ever re-injured/aggravated a previous injury during sports participation?



Conclusion:

The investigation aimed to discern correlations between sport specialization, stress levels, and incidence of physical injury among student-athletes in a medium-sized public high school on Long Island. Ninety-seven students across various grades and athletic engagements contributed to the survey. The results of stress and injury dynamics varied greatly among student-athletes, with several notable findings emerging. Age and type of sport did not exhibit significant correlations with stress levels or injury rates, displaying that other factors likely have an impact on the two categories. Furthermore, the dedication to sports year-round showed heightened stress levels, proving the harsh psychological toll of prolonged athletic commitment. Despite analysis, no discernible connection between academic or financial stress and sport specialization or diversification was found, allowing the researcher to conclude that these categories likely vary by person. Social impacts varied between specialized and diversified athletes, with differing perceptions of interference. Additionally, while sports participation limited vacation time irrespective of specialization, injury rates exhibited nuances based on participation duration and sport focus. The prevalence of physical burnout was notably higher among specialized athletes engaged in year-round sports, displaying the potential physiological strains of prolonged athletic commitment.

The researcher addresses the gap identified previously in the research by researching both the physical and psychological effects of sports participation in youth athletes as well as taking into account how much time the athletes dedicated to their sport.

Limitations and Future Research:

Numerous limitations could have impacted the results of this study. Firstly, the sample size of only 97 participants, each a student at the same Long Island high school, led to a lack of diversity within the data. This could be prevented in the future by distributing the survey across multiple high schools located in various areas; doing so would help broaden the pool of responses and provide more widespread findings. Another limitation of the study was the vast accessibility of the survey which potentially could have been accessed by all students at the high school, including those who do not participate in sports. This may have led to false responses that would have skewed the data and misrepresented the findings. In future studies, it would be beneficial for the researcher to share the questionnaire only with the coaches of high school sports, rather than all faculty members, to minimize potential misinformation. Thirdly, there is an immeasurable number of factors that contribute to stress level, so it is possible that the stress levels athletes recorded on the survey could have been due to events not directly related to their sports participation. This can be resolved in future research by asking participants directly whether or not their stress levels are affected by outside stressors not attributed to their sport.

If this research was to be continued in the future, the person conducting it should try to observe a potential relationship between stress levels and injury rate, as athletes that report a higher overall stress level may also have a higher rate of injury.

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