

What are the Differences in Stress among High School and Collegiate Cross Country Athletes?

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Abstract

There is a lack of research regarding the life stressors which male high school and collegiate cross country runners encounter. The Collegiate Student Athlete Life Stress Scale (CSALSS) assess eight life stressor subscales consisting of: performance demands, coach relationships, training adaptations, family relationships, romantic relationships, academic requirements, intrapersonal relationships, and sports injuries. Having an understanding of how these life stressors impact male high school and collegiate cross country runners may provide athletes, parents, and coaches with insight regarding the nature of how these athletes perceive their current life challenges. **Purpose:** The current study attempted to measure the life stressors which male high school and collegiate cross country runners encounter as assessed by the CSALSS and to determine if differences in the CSALSS subscales exist between the high school and collegiate athletes. It was hypothesized that college cross country runners would have significantly higher scores in the subscales of sports injury, performance demand, coach relationships, and training adaptations. Additionally, it was hypothesized that college student cross country runners' scores on the subscales of academic requirements, intrapersonal relationships, romantic relationships, and family relationships would be similar to high school cross country runners. **Methods:** Male high school (n=14) and college cross country runners (n=14) completed the CSALSS questionnaire. Independent t-tests were used to compare CSALSS subscales between the high school and collegiate runners ($\alpha \leq 0.05$). **Results:** No differences were found between the high school and collegiate athletes for any of the CSALSS subscales ($p < 0.05$). The high school and collegiate cross country runners found the subscales concerning sports injuries and academic requirements to be most stressful respectively. Coaching relationships, training adaptations, and interpersonal relationships were the least stressful subscales for these athletes. **Conclusion:** Within the parameters of this study, male high school and collegiate cross country runners report similar life stressors.

Key words: Stress, CSALSS, Cross Country.

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INTRODUCTION

Students and athletes often find themselves in stressful situations. Tests, accumulation of schoolwork, workouts, diets, and performances are broad areas that are sources of stress for these types of individuals (Cosh & Tulley, 2015). When these regular activities are combined on a daily, weekly, monthly, and annual basis, they can often be too much to handle individually.

A study was performed to narrow down the areas that are most common to produce stress in student athletes. The areas that were pinpointed consisted of family relationships, coaching relationships, intrapersonal relationships, performance demand, training adaptation, romantic relationships, sports

injuries, and academic requirements. Through reliability and validity testing, these sub-topics have been suggested to be the most common among student athletes and is accessible with the College Student-Athletes' Life Stress Scale (Lu *et al.*, 2012).

The relationship between family and the student athlete is a key component to the stress spectrum. With the schedule of student athletes, a lot of time is given to academics and athletics. Few moments are left to preserve a relationship among family. This may be even more so for college athletes that are further away from home. One athlete described it as difficult to fit in studying and sport with family (Salmea-Aro, *et al.*, n.d.). In a study of 541 division one athletes, the parental family of the athlete and athletic engagement

had a strong association with athletic satisfaction (Dorch *et al.*, 2016). It seems that when parents are involved, athletes typically feel confident in their performance. However, more parental involvement increases the chances of a dominating voice that leads to negative comments. Receiving negative comments from coaches and parents were the most common sources of stress for 13 to 18-year-old student athletes (Puente-Díaz & Anshel, 2005).

Student athlete's relationship with their coach plays a critical part in elevating or eliminating stress. High expectations are set by coaches and some may do this inadvertently. Overall, the likeability of the coach is a major factor in the increase or decrease of stress experienced by an athlete (Stoa *et al.*, 2020).

Comments made by coaches, inflexibility, effect on resiliency, and approachability were the main areas highlighted through research which cause coaches to be more or less of a stressor to student athletes (Puente-Díaz & Anshel, 2005; Barker *et al.*, 2000; Gearity & Murraray, 2011). As previously stated, the most stressful events for Mexican and American tennis players were negative comments by family and coaches (Puente-Díaz & Anshel, 2005). Barker *et al.* (2000) state that all four forms of sport anxiety were positively related to a negative personal rapport with the coaches, which supports the importance of positive rapport between student athlete and coach. Additionally, Gearity and Murray (2011) report that athletes who find their coaches as uncaring were more strongly associated with burnout.

Personal relationships are critical to our mental wellbeing. Jeon *et al.* (2016) studied 333 high school and college Korean elite student athletes. This study concerned social support and well-being. It was determined that an increase in social support increased the factor of self-support (having objective and fair judgement of yourself). The authors found that the variables of tangible support, informational support, estimate support, self-kindness, common humanity, mindfulness, positive emotion, and life satisfaction all correlated positively with one another; and correlated inversely with negative emotion. The results of the study suggest that personal relationships can have significant effects on an athlete's perception of stress which is linked to their athletic performance and mindset.

Performance is the end all be all in the sports world. When an athlete performs poorly, they can have a tendency to think poorly about themselves. Winning is a major source of pressure (Humphrey *et al.*, 2000). College athletes are often treated as professional athletes without the motivation of pay or the lack of academic distraction. At the high school level, stress may come from internal motivations and expectations to win in addition to maintaining scholastic standards.

Performance and academic work are entangled in every aspect of student athlete stress. Student athletes must compete with fatigue combined with additional schoolwork at the end of the day. Twenty Australian college aged students discussed the harsh reality of trying to perform while keeping up with studying (Cosh & Tully, 2015). The end of a work day often signals the beginning of relaxation. However, this is a struggle for student athletes. Student athletes often go to classes throughout the day with homework sprinkled in free time. Afterwards they will go to their sports practice which entails 2-3 hours of training. At this point it can be around 5-6 in the afternoon. Around this time, athletes will go on to dinner to take part in post workout recovery meals. Once they finish, they will be off to finish any homework they may have or study for an upcoming test. There is a lot of pressure with the time after practice because the student athlete will want adequate sleep for the next day of training and classes. In addition, the student athlete may have a practice in the morning. This schedule allows for little time to de-stress.

The ability to adapt to a training program can play a critical role in the amount of stress an individual experiences. Training programs often follow similar patterns to help an athlete adapt to training and then peak at a certain time of year. This entails the off-season (base phase), preseason (increased intensity) in-season (competitions and adequate rest), and postseason (active rest/recovery from injuries) (Baechle & Earle, 2008). However, in the increased intensity phase, non-functional overreaching and burnout can occur if this phase is maintained for an extended period of time or there is a lack of recovery. Piacentini and Meeusen (2015) performed a study with a 41-year-old master's female athlete. The athlete was observed through a diary and POMS (Profile of Mood States). Based on the athlete's feelings that were expressed in the diary, parts of their training were modified. A critical finding in this study was that the athlete began experiencing non-function overreaching without increasing the training load. During the period of non-functional overreaching, the athlete experienced a 168% increase in fatigue, 38% decrease in vigor, and a 62% increase in depression, and 22% increase in total mood. It was cited that balancing work life, travel, and athletics could be a contributing factor to this finding (Piacentini & Meeusen, 2015).

The demands of performing academically make adapting to training more stressful for college athletes. Humphrey *et al.* (2000) report that 50% of male collegiate athletes in their study recounted this specific factor as stress inducing. Just as the previous study discussed a masters athlete that did not become over trained due to her training load, other athletes also become overwhelmed by outside sources (such as academics).

At certain times training loads can be the major contributor to overtraining. Female D-1 hockey players were interviewed about several topics concerning the stress they felt as collegiate athletes. They reported that the training load in college was surprising to them due to the amount of time they devoted to training in high school (Heller *et al.*, 2005).

Adapting to training can be physically exhausting. Many college athletes are performing two a day workouts. Over time this can play a significant role in the stress of the athlete. Judge *et al.* (2012) found that Junior college male athletes are the most stressed out of all groups of collegiate athletes. While the authors did not mention an explanation for this outcome, there are a few reasons that may have aided in this result. The accumulation of physically taxing exercise can build up stress over time, the constant battle of balancing academics, home life, athletics, and overuse injuries are just a few of the reasons that Juniors might have been recorded as the most stressed of all collegiate groups. As time goes on these areas have a tendency to build on one another. Oftentimes collegiate athletes don't get to take a break from any of them. Later, as student athletes matriculate to be seniors, it is possible that they have learned how to more effectively manage the stressors they encounter.

As young men and women move into high school and college age groups, romantic relationships become common. A study was done to compare non-athlete and athletes to see what stressors were more prominent. Concerning romantic relationships, athletes were observed to be more likely to have issues with the family within their romantic relationship (Pitchard *et al.*, 2007). This means that mothers, fathers, and other members of the opposing family can cause stress within relationships. The desire to have a romantic relationship in addition to relationships outside of the team is a healthy idea. However, differences of opinions in the romantic relationship and the family may cause additional stress to the athlete.

It comes as no surprise that couples, who spend more time apart and have less shared free time, report less relationship satisfaction (Bahun & Huić, 2017). Student athletes often spend their free time performing athletic or student duties. Student athletes that do not have fully funded tuition through scholarships, also spend time working to pay for college. These factors may limit the satisfaction of the romantic relationships that a student athlete would pursue and ultimately cause additional overall stress.

Injury can be an extremely stressful event for athletes. Lichtenstein *et al.* (2019) studied recreational and high-volume exercisers (31-35 years of age) that attended a sports clinic. Twelve percent of the athletes that were injured had symptoms of depression while 5% of those who were uninjured had symptoms of

depression. In addition, 30% of injured exercisers reported symptoms of clinical stress (Lichtenstein *et al.*, 2019).

Injuries are common in all age groups; however high school and college athletes may have greater chances at exposure as they spend more time in their prospective sports. Clifton and colleagues (2018) performed a study with female basketball players at the high school and college level. The two groups were compared over time to see which group had a higher injury rate given the number of exposures to injury. The study showed that HS athletes had an injury 1.82 times for every 1000 exposures while college athletes had 4.96 injuries per 1000 exposures (Clifton *et al.*, 2018). In this instance, the college athletes had a higher propensity to become injured. Considering the previous information on injured vs non injured individuals (Lichtenstein *et al.*, 2019), college athletes may have more overall stress regarding injuries than high school athletes. In 71 Swedish soccer players aged 15 to 31 years, stress was found to increase the chance of injury (Clement *et al.*, 2018).

Education is an opportunity to obtain knowledge for future preparation and job readiness. Regardless of age, students must balance their academic and athletic lives simultaneously. In a previous study regarding Australian college athletes, several concerns were expressed through an interview about managing athletics and academics (Cosh & Tully, 2015). Topics that were discussed among the student athletes were the stress in scheduling classes around athletics and missing classes for competition. The majority of these athletes did not participate in full-time study. Additional pressure may be experienced as the student will face a prolonged duration of time to complete their degree, hence, further adding to an already stressful environment.

Cutler and Dwyer (2020) performed a questionnaire based investigation that had several questions concerning the areas of academics, coach to athlete relationship, and social experiences. One hundred and fifty D-1 athletes were gathered from multiple universities to answer these questions. One question asked the athletes, if they had lost their scholarship, would they be able to continue attending their current university? Forty percent of the respondents said they felt like they could, implying that 60% would have to drop out (Cutler & Dwyer, 2020). A scholarship that athletes receive in college is a blessing for many individuals. However, a scholarship can be perceived as a binding pressure filled contract, a stressor felt from the moment a letter of intent is signed.

High school athletics are a time when young athletes develop physical abilities and sport specific skills that provide a pathway to collegiate scholarships. One such sport is cross country running. Given the

aforementioned, having an understanding of how these life stressors impact male high school and collegiate cross country runners may provide athletes, parents, and coaches with insight regarding the nature of how these athletes perceive their current life challenges.

The current study attempted to measure the life stressors which male high school and collegiate cross country runners encounter as assessed by the CSALSS and to determine if differences in the CSALSS subscales exist between the high school and collegiate athletes. It was hypothesized that college cross country runners would have significantly higher scores in the subscales of sports injury, performance demand, coach relationships, and training adaptations. Additionally, it was hypothesized that college student cross country runners' scores on the subscales of academic requirements, intrapersonal relationships, romantic relationships, and family relationships would be similar to high school cross country runners.

METHODS

Participants

The participants were division II male cross country athletes from Southwest Baptist University and male high school cross country athletes from Bolivar and Crane High School. The student athletes from Southwest Baptist University range from 18-23 years old while the high school students will be from 15-18 years old. Permission was requested of the coaches, athletes, and parents (at the high school level). Likewise, a University Institutional Review Board reviewed and approved the study protocol and consent/assent forms. Athletes were assured that their participation was voluntary, and they were able to drop out of the study at any point.



Fig-1: Cross country running is a sport enjoyed at the High School and Collegiate levels.

Instruments and Apparatus

The questionnaire that was provided to participants is called the College Student-Athletes' Life Stress Scale (CSALSS). The CSALSS is a common test that assesses what student athletes find stressful (Lu, *et al.*, 2012). There are 24 questions, and 8 sub-scales are linked to three questions each. The sub-scales are sports injuries, performance demands, coach

relationships, training adaptations, interpersonal relationships, romantic relationships, family relationships, and academic requirements.

Each participant was responsible for answering each question on their own without assistance from other participants or administrators. Each question was answered on a Likert scale from 1 to 6. 1 represents "Never", 2 represents "Rarely", 3 represents "Sometimes", 4 represents "Quite Often", 5 represents "Very Often", and 6 represents "Always". Answers on each question reflected how often the participant experiences each question. Prior research regarding the reliability of the CSALSS yielded Cronbach's coefficients ranging from 0.72-0.86 across the subscales, considered as reliable (Lu, Hsu, Chan, Cheen, and Kao, 2012).

Procedures

Two high school teams were asked to participate in the study. Each school's athletic director and coach provided consent via email to utilize their school and student athletes in the study. Coaches sent assent/consent forms home with each athlete that would be a candidate to participate in the study. Upon the returned signed assent/consent forms, the student athletes were sent the link to the questionnaire (CSALSS) from their respective coach. The participant responses to the CSALSS were collected via Google Forms.

The college coach from Southwest Baptist University was contacted and asked for permission to perform the present study concerning their athletes. The college coach provided permission to utilize their athletes for the study. In addition, the athletic director from the college granted permission for the University to be involved in the study. After permission was granted, the questionnaire was sent to the athlete's email address. The first page of the questionnaire regarded informed consent. After reading and agreeing to participate, the athletes then completed the CSALSS. The questions were presented the same as on the high school questionnaire. Following the completion of the questionnaire, each student athlete submitted it via Google Forms.

DESIGN AND ANALYSIS

Independent t-tests were used to compare CSALSS sub scales between the HS and Collegiate runners. Significance for the study was set $\alpha \leq 0.05$. Statistical analyses were completed in MS Excel 2013. The Excel spread sheet was peer reviewed for accuracy as described by Al Tarawneh and Thorne (2017).

RESULTS

Male high school (n=14) and male collegiate cross country runners (n=14) completed the study and the full results can be found below in Tables 1 and 2. There were no significant differences between high

school and collegiate runners among any of the CSALSS subscale scores ($p>0.05$). The high school and collegiate cross country runners found the subscales concerning sports injuries and academic requirements to

be most stressful respectively. Coaching relationships, training adaptations, and interpersonal relationships were the least stressful subscales for these athletes.

Table-1: College Student Athlete Life Stress Scale Scores

| | Sports Injuries | Performance Demands | Coach Relationships | Training Adaptations |
|--------------------|-----------------|---------------------|---------------------|----------------------|
| High School (n=14) | 3.5±1.5 | 2.8±0.8 | 1.4±0.9 | 1.8±0.8 |
| College (n=14) | 3.5±1.2 | 2.9±1.2 | 1.8±0.9 | 2.1±1.1 |

*mean±standard deviation

Table-2: College Student Athlete Life Stress Scale Scores

| | Interpersonal Relationships | Romantic Relationships | Family Relationships | Academic Requirements |
|--------------------|-----------------------------|------------------------|----------------------|-----------------------|
| High School (n=14) | 1.8±0.7 | 2.3±1.0 | 2.4±0.8 | 3.1±0.8 |
| College (n=14) | 1.9±1.1 | 2.6±1.2 | 2.3±1.2 | 3.0±1.0 |

*mean±standard deviation

DISCUSSION

The current study attempted to measure the life stressors which male high school and collegiate cross country runners encounter as assessed by the CSALSS and to determine if differences in the CSALSS subscales exist between the high school and collegiate athletes. It was hypothesized that college student cross country runners scores on the sub-topics of sports injury, performance demand, coach relationships, and training adaptations would be higher than high school student cross country runners. In addition, it was hypothesized that college student cross country runners' scores on the sub-topics of academic requirements, intrapersonal relationships, romantic relationships, and family relationships would be similar to high school cross country runners. The data did not support the hypothesis that college student cross country runners would have higher scores in the subscales of sports injury, performance demand, coach relationships, and training adaptation. The data did support the hypothesis that college cross country runners and high school cross country runners would score similarly of the subscales of academic requirements, intrapersonal relationships, romantic relationships, and family relationships.

Prior research regarding stress among student athletes has primarily focused on college athletes (Cosh & Tully, 2015; Dorch *et al.*, 2016; Heller *et al.*, 2005; Humphrey *et al.*, 2000; & Piacentini and Meeusen, 2015). As such, it may be difficult to compare previous research directly to this study considering the inclusion of high school student athletes. However, some conclusions may be drawn given high school athletes and collegiate athletes scored very similarly in this study. McGee and DeFreeze (2019) discuss the connection between positive athlete engagement and

positive variables within coaching relationships. In this study, the stress associated with coach relationships was very low. Therefore, the coach relationship could have played a role in these athletes maintaining lower levels of stress in the areas of training adaptations and performance demands.

Cosh and Tolly (2015) highlight the level of importance athletics has in the college athlete's life. Athletics play such an important role but student athletes relative to the many areas demanding their attention. As such, it is not surprising that higher stress scores in college athletes in the current study were in the areas of sports injuries and academics. Academics is a factor that diverts focus from competition. Also, injuries hinder the athlete from competing and may in fact cause stress simply because the athlete can't compete at all or compete at the level they would desire. Clifton and colleagues (2018) found that female college basketball players were injured at dramatically higher rates than female high school basketball players. In addition, it was found in soccer players that reported more stress were associated with higher injury rates among individuals 15-31 years of age (Clement *et al.*, 2018). The aforementioned may suggest that high school athletes may not feel the same stress because they don't have as much wear and tear on their bodies and their academics may not provoke the level of mental strain as college students. However, in the current study, sports injuries and academic stress appear to be as prevalent in male high school cross country runners as college cross country runners.

Some college athletes are surprised at the amount of training that is expected compared to the amount of training that is performed at the high school level (Heller *et al.*, 2005). This would leave you to

believe that college athletes might feel more stress in the area of training adaptations. However, the training adaptation subscale score was very similar between male high school and collegiate runners. The coach relationship could be a possible factor that limits this score for each group of athletes in this study. While injuries and academics are clearly areas of stress, the ability to maintain a good relationship with the coach may offset the stress those areas would place on adapting to the training. If a larger cross-section of athletes were chosen for this study, it is possible that certain teams (as well as high school vs. college) may in fact find more stress (i.e. training adaptations) due to an increased training load, relationship with their respective coach, and more challenging academic load.

This study neither confirms nor disagrees with previous research. Most research that has been performed in the area of stress has not been performed specifically with cross country runners (Clement *et al.*, 2018; Clifton *et al.* 2018; & Puente-Díaz & Anshel, 2005). The research that has been gathered involves multiple sports, female and male participants, and a range in age (Clement *et al.*, 2018; Clifton *et al.*, 2018; Heller *et al.*, 2005; & Piacentini and Meeusen, 2015). Therefore, prior research can only try to provide some insight regarding what might be expected in this study.

Prior research confirms the data collected in this study. It was often pointed out that each of the CSALSS eight subscales that were tested would be a source of stress for college athletes (Lu *et al.*, 2012). These subscales showed varied levels of stress for the participants in the current study. Prior research pointed out that stress from one area can bleed over into another area (Dorch *et al.*, 2016; Jeon *et al.*, 2016; Salmea-Aro, *et al.*, n.d.; Cosh & Tully, 2015). This could have been the case with academics, injuries, and performance demands as these three areas that proved to be the most stressful categories for high school and college runners.

Overall, there was a lack of available research at the high school level on the topic of stress in student athletes. Therefore, it would be premature to say that the data confirms previous research or not. This study should act as more of a springboard for additional research to be gathered on high school student athletes regarding sources of stress.

The current premise preceding this study was that there were different variables that would be more stressful for college student athletes than high school athletes (vice versa). This notion was constructed on the basis of college student athletes increasing their training demands, academic demands, and leaving their families (living on their own). In addition, high school athletes live close to their families, compete at a lower level, and have lower training demands. However, a new line of enquiry may have developed from this study. College runners and high school runners scored very similarly

regarding sources of stress as there were not any significant differences reported. Therefore, it might be appropriate to operate under the assumption that all athletes deal with these subscales of stress similarly no matter what level of competition they are competing (i.e. high school and college).

An important limitation to this study regards the number of participants. The study had 14 participants from one college team and 14 other participants from two high school teams. If a bigger participation base would be utilized, conclusions may be clearer for practical application. However, an *a priori* power analysis suggests that a statistical power of $1-\beta=0.70$ could be achieved with an $n=16$ per group (G*POWER 3.1.9.2: Universitat Kiel, Germany: effect size=0.80, $\alpha=0.05$, one-tail). Another possible limitation to the study was the specificity of gender. Many cross country coaches have both male and female athletes. However, this data only represents male participants. If data were collected on both genders, the results of the current study might provide additional direction for coaches and athletes.

There are some practical applications that can be drawn from this study. Some studies show that men show less anxiety or stress than women (Gačić *et al.*, 2021), however, that may not be the case in all situations. This study reveals that there are areas of stress male student cross country runners may feel more than others. Sports injuries, academic requirements, and performance were the top three areas of stress identified among college and high school runners in the current study. While not completely surprising, these needs are now identified and should be addressed by coaches, athletes, and parents. It's important that all individuals involved within the sport are aware of the specific challenges around the athletes. Understanding these challenges will help coaches and parents provide for the needs of their athletes and children. Additionally, there were not any significant differences between college and high school runners regarding perceived sources of stress as assessed by the CSALSS.

Within the parameters of this study, male high school and collegiate cross country runners report similar life stressors. This information provides insight regarding how life stressors impact male high school and collegiate cross country runners and may provide athletes, parents, and coaches with insight regarding the nature of how these athletes perceive their current life challenges.

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