

How Stress Impacts Perceived Burnout in Adolescent Student-Athletes

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Abstract

Previous research has concluded that a correlation exists between stress and burnout within adults in high stress working environments. Stressors such as pressure, performance anxiety, psychological distress, and an intense workload can result in feelings of inadequacy, reduced ideas of accomplishment, and more frequent tendencies to become overwhelmed. However, research is sparse on understanding the relationship between stress and burnout within adolescent student-athletes. As adolescents live majorly different lives than adults, perceived stressors may affect the development of burnout differently than prior research suggests. The current study aimed to investigate the impact of high stress on academic, athletic, and general burnout in student-athletes, and how such burnout can impact overall performance. The current study sought to evaluate the extent to which burnout arises in response to various stressors in student-athletes aged 13-18. Particularly, this study explored the impact that external pressures may contribute to burnout. Adolescent student athletes surveyed (N=11) responded to questions regarding perceived stress and life stress, feelings of inadequacy, varying performance goals, and external pressures. Particularly, this study explored the impact that overworking and external pressures may have on the development of burnout and aims to replicate the association between stress and burnout in adolescents. Findings suggested that increased external stressors, like parental pressure, academic pressure, and athletic pressure, is a significant predictor of academic burnout. Additionally, the study found associations between age and perceived stressors. This work suggested adolescent athletes face unique stressors and more work is needed to understand and intervene to prevent burnout.

Keywords: Stress, Burnout, Adolescent, Student-Athlete

1. Introduction

Over the years, the relationship between stress and consequent burnout has been extensively researched in adults, while literature focusing on adolescents is scarce. In the past several decades, data has been collected regarding the development of burnout in adults in high-stress environments. Often a result of too much work, physical and mental exertion, stress, and pressure, burnout tends to become a prominent feature in the lives of many adults, especially in a work and study environment. Similarly, scientific literature regarding college student-athletes has indicated that the prevalence of burnout syndrome symptoms are rising, and are as high as 55% for symptoms like emotional exhaustion within medical students (Alves et al., 2022). Findings suggest that participating in an organized sports team can also be an added stressor that can contribute to burnout, especially in terms of balancing schoolwork and collegiate athletics (Wilson et al., 2005). Physical and mental health can be reduced in more high- stress scenarios, ultimately affecting the capacities of a college student. As a result of such high amounts of prolonged stress, burnout is common and can be a direct result of a cumulative buildup of stress in both educational and athletic environments. Student-athletes, in particular, are at great risk of facing stress and burnout; however, past research has focused primarily on college students with little research on adolescent student athletes.

1.1 Definition of Stress + Burnout

Because stress and burnout are often cyclical in nature, meaning that they each contribute to the other, it is essential to differentiate between the two within stress-related literature. Stress can be defined as “the body’s response to physical, mental, or emotional pressure,” (National Cancer Institute). The National Cancer Institute indicates that long term exposure to high-stress environments can ultimately lead to “mental and physical health problems,” of which burnout can be included (National Cancer Institute.) Stressors can be referred to as both cognitive and environmental events that trigger stress (Statler and DuBois, 2016). Cognitive events, in relation to this study, may refer to self-inflicted pressure or performance anxiety, whereas environmental events may entail workload, physical work, or an overfilled schedule. According to the World Health Organization, burnout is a “syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed” (WHO, 2019). In short, burnout can be referred to as an issue that originates from an improper amount of anxiety and strain that has failed to be relieved or dealt with.

1.2 Symptoms of Burnout

The majority of research surrounding burnout and its development has been done with adults in the workplace and college students in university, but rarely on high school students or adolescents, where the problem is just as prominent, if not more. Previous literature has found that younger adults in the workplace experience higher levels of perceived occupational stress and burnout than older adults (Rozman, 2019). As such, this could lead to potentially higher levels of stress and burnout in adolescents. Studies on adults and college students have concluded that there are many variables that can contribute to the onset of burnout. Being involved in extracurriculars, like sports for example, can be demanding on time. As such, school and sports can be hard to juggle at the university level, and can ultimately lead to decreased performance, psychological distress, feelings of helplessness or entrapment, and lack of enjoyment (Judge et al., 2012). The limited studies on burnout in adolescents have included symptoms of depression and anxiety, low self-esteem, underachievement, emotional exhaustion, and depersonalization (Farina et al., 2020; Padmini et al., 2021.)

1.3 Categorizing Stress

Although literature has provided us with several categories of burnout, the three categories most relevant for this particular study are: Academic, Athletic, and General. This study addresses the idea that there are many different aspects and variables involved in the development of burnout, but they all play a key role in hindering one’s performance. Research has shown that college and university academics can be a major source of stress for students and may be heightened by an internal pressure to succeed in the classroom. Likewise, combining the stress of a rigorous athletic schedule with the preexisting academic stress form an increased stress-response, with time management complications and life experiences (Lopes Dos Santos et al., 2020).

In another study, it was concluded that life stress, along with negative thoughts and environmental, personal, mental, and physical factors can lead to the development of burnout (Chang et al., 2017). It was also found that familial or parental pressure to play sports was generally associated with a higher fear of negative perception and evaluation, indicating that parental pressure may contribute to stress (Norton et al., 2000). Further, there is a positive association between the degree of parental involvement in school affairs and the amount of stress regarding college applications (Hansell, 1982). As such, stress can generally be categorized between academic, athletic, and general aspects, each of which allow for the study of burnout development.

1.4 Burnout Factors

Burnout is commonly measured across scientific literature using the Maslach Burnout Inventory (MBI), using the definition of burnout from the World Health Organization. The MBI utilizes a Likert scale to determine frequency and

intensity of burnout symptoms and asks questions from three major categories: Emotional Exhaustion, Depersonalization, and Personal Accomplishment (Maslach et al., 1981). Questions used in the present study were modeled after the Maslach Burnout Inventory.

Researchers Gould and Whitley conclude that there are 5 factors that can contribute to burnout: motivation, coping with adversity, responses to training and recovery, the role of significant others, and athlete identity (Gould et al., 2009). While these factors may vary across other studies, the findings are similar in that many factors can influence the development of burnout, especially in high-stress environments. Further, research has shown that long-term, cumulative exposure to stressors may result in an increased susceptibility to injury (Mann et al. 2016). Adolescent student-athletes are often exposed to numerous “life stressors”, which can ultimately have a major impact on their athletic and continued academic performances.

Another common factor of burnout is the varying coaching climate between different students, schools, and sports. Student athletes that were exposed to highly disempowering coaching climates reported higher levels of both sport and school burnout (Into et al., 2020). Thus, the coaching environment that a student-athlete is exposed to can greatly influence the emergence of burnout among adolescents.

As such, the following are burnout risk factors that are utilized in the present study: parental pressure, performance anxiety, intense workloads, and pushing oneself in academics / athletics.

These burnout risk factors were used throughout the data analysis to determine the impacts of stress on the emergence of burnout. These four categories contribute greatly to the amount of stress that a student-athlete endures, and thus are prime components in the development of burnout.

The majority of past research on burnout has included adults and college students and have all come to a similar conclusion that the development of burnout is influenced by many factors. Some of these variables include perfectionism, coaching climate, GPA, injury, motivation, stress, resilience, gender, and level of competition. Therefore, the extent to which high-stress environments, along with other factors, affect younger populations and adolescents, is unclear.

This study investigates the development of burnout in high school student-athletes. While it isn't often discussed in the field of research, high-stress environments are an incredibly prominent issue for many high school students and adolescents. Students of this age group experience incredibly stressful environments, surrounded by college applications, the ACT, the SAT, AP testing, balancing school and sports, intense coaching styles, reaching a high enough GPA, and going through 4 years of intense mental and physical development.

This study advocated five hypotheses. The first one is that there are differences in endorsed variables between younger and older adolescents, and the second hypothesis is that sports-related stress is associated with sports-related burnout. The third hypothesis regards stress, predicting that academic-related stress is associated with academic-related burnout. This study's fourth hypothesis is that general stress is associated with general burnout, and the fifth is that external pressure (parental and athletic) can predict burnout.

Burnout can be an intense consequence of such a high-stress environment early in life. Because of this, it is vital to understand the exact causes of burnout among adolescents and attempt to find solutions to the high stress that they experience. The main purpose of the study is to investigate the association between a high-stress environment among adolescent student-athletes and the emergence of burnout. It is expected that higher levels of perceived stress will ultimately result in more frequent and more intense onsets of burnout.

2. Methods

2.1 Subjects

The research for this study was conducted via survey, distributed to adolescent student-athletes via email and text messages through various cities in the United States. Participants included individuals of any gender who were at least 13 years of age and at most 18 years of age. There was an average age of 15.3 years ($SD=1.87$). The standard deviation of age indicated that the results typically varied 1.87 years from the average age. Of the participants, 81.8% were female and 18.2% were male. To be included in the study, the participants needed to be current middle or high school

students participating in a sport of any kind. The participants were asked to fill out a survey that addressed topics regarding burnout and stress environments.

2.2 Survey

For this survey, questions were formulated based on commonly known burnout symptoms inspired by the Maslach Burnout Inventory, also known as the MBI (Maslach, 1981). The MBI is a questionnaire formulated to determine the extent of burnout in an individual, consisting of 47 questions. These questions were measured on a Likert scale from 0-6 to determine how frequent burnout symptoms were, with 0 (never) and 6 (every day). The questions were broken into 3 categories: Emotional Exhaustion, Personal Accomplishment, and Depersonalization. Following the example of the MBI, this survey utilized questions in three categories and a Likert scale to determine frequency of burnout symptoms and causes.

The survey was created using Google Forms for ease of use and data organization. Consent was received from parents prior to completing the survey. This survey consists of 26 questions, each targeting one of several domains: Fatigue/Lack of Energy, Emotional Exhaustion, Fitness + Physical Performance, Overall Mood + Well Being, Sleep, Pressure, Stress + Anxiety, and Motivation. The questions will be asked using a Likert scale from 0 (never) to 4 (frequently) to determine the frequency of a specific scenario occurring in the past month. While the survey addressed numerous topics, as listed above, the survey was organized into three pages for the participant: Academic, Athletic, and General questions. Academic questions referred to school-related stress and burnout, Athletic questions included topics regarding sports and physical related stress and burnout, and General questions included various mood and lifestyle scenarios.

Table 1: Survey Questions. Note: non-bolded items = stress symptoms; bolded items = burnout symptoms

Athletic	Academic	General
Felt tired to the point of exhaustion?	Felt mentally drained to the point of exhaustion?	Felt irritable?
Felt vulnerable to injuries?	Pushed yourself to over-exhaustion in school?	Didn't get enough sleep? (under 7 hours)
Felt athletic pressure? (from coaches, teammates...)	Felt a sense of overwhelming anxiety?	Felt frustration?
Pushed yourself to the point of exhaustion in sports?	Felt parental pressure?	Been socially exhausted?
Felt a sense of overwhelming performance anxiety?	Felt tired after homework?	Had a good, uninterrupted night's sleep?
Felt physically drained?	Felt unmotivated?	Felt anger?
Felt parental pressure?	Failed to push yourself in school / sports?	Had poor quality sleep? (difficulty falling asleep and maintaining sleep)
Felt unmotivated at practice? In games?	Felt tired or drained after school?	Felt mentally drained?
Felt that you had too much to do that you couldn't accomplish it?	Felt stressed out by your workload?	Felt annoyed?
Felt unnecessarily sore?	Felt academic pressure?	Slept too much? (where sleep interfered with daily activities)
Failed to push yourself in sports?	Felt that you had too much work to do that you couldn't accomplish it?	

2.3 Analysis Plan

First, a descriptive statistical analysis was applied to identify characteristics of our sample and examine frequencies of demographic variables. Then, we sought to identify potential differences between younger and older adolescents within our study. This value was described using a p-value, a number that describes how likely it is to expect a test statistic based on the null hypothesis. A p-value is described as statistically significant when the value is 0.05 or less. We dichotomized levels of age (participants aged 13-15 were considered “younger adolescents” and participants aged 16-18 were considered “older adolescents”) and sought to examine differences in age group against all survey items using an independent samples t-test. A t-test is a statistical test used to compare the means between two groups. The current study aims to evaluate associations between stress items and burnout items of corresponding domains (i.e., athletic, academic, general). Therefore, Spearman rho correlations were performed between each individual stress item and each individual burnout item within each domain. Spearman rho correlations are used to determine the strength of a relationship between two variables. Lastly, simultaneous multiple regression was conducted to investigate if external pressure variables (“felt parental pressure” in school, “felt parental pressure” in sports, “felt academic pressure”, and “felt athletic pressure”) could significantly predict academic burnout, athletic burnout, and/or general burnout. The domain burnout variables were created by averaging individual burnout items within each domain.

3. Results

3.1 Descriptive Statistics

Over the total data collection period, responses from 11 participants were recorded, all of which were viable for use. Participant ages ranged from 13-18 with an average age of 15.3 years (SD =1.87). The sports surveyed involved both contact and no-contact, and included volleyball (36.4%), lacrosse (9.1%), field hockey (9.1%), swim (9.1%), fencing (18.2%), basketball (9.1%), and dance (9.1%). Of the participants, 81.8% were female and 18.2% were male. The level of competition and intensity of athletic training was not recorded by participants.

3.2 Survey Results

The data was cleaned and analyzed following the data collection period. There was no missing data. In our investigation of the difference between older and younger adolescents via independent samples t-test, we found that older adolescents endorsed the item “pushed yourself to the point of exhaustion in sports” more frequently than younger adolescents ($p=0.047$) with a mean difference of -1.233. Contrarily, younger adolescents more frequently endorsed the item “failed to push yourself in sports” than older adolescents ($p=0.005$) with a mean difference of 0.200. Lastly, younger adolescents endorsed the item “felt parental pressure” within the academic domain more frequently than their older counterparts ($p=0.024$) with a mean difference of 1.000. Although not statistically significant, there was a tendency for older adolescents to more frequently endorse the items “Felt tired after homework” ($p=0.050$, mean difference = -1.3000) and “didn’t get enough sleep (under 7 hours)” ($p=0.051$, mean difference=-1.600) than younger adolescents.

To investigate if there was a statistically significant association between variables of sports-related stress and variables of sports-related burnout, a correlation was computed. Due to the low sample size ($n=11$) and highly skewed ordinal variables, there was a violation in the assumption of normality. Thus, the Spearman rho statistic was calculated for each correlation. The sports-related burnout item of “felt tired to the point of exhaustion” was significantly correlated with the sports-related burnout item of “felt physically drained” $r(11)=0.854$, $p<0.001$ and sports-related stress item of “felt that you had too much to do that you couldn’t accomplish it” $r(11)=0.936$, $p<0.001$. The items of “felt physically drained” and “felt that you had too much to do that you couldn’t accomplish it” were also significantly correlated, $r(11)=0.844$, $p=0.00$. The sports-related burnout items of “felt vulnerable to injuries” and “felt unnecessarily sore” were significantly correlated, $r(11)=0.866$, $p<0.001$. Lastly, the sports-related stress items of “felt

athletic pressure (from coaches, teammates...) ” and “felt a sense of overwhelming performance anxiety” were also significantly correlated, $r(11)=0.807$, $p=0.003$. Spearman rho correlations were also calculated for all variables of academic-related stress and academic-related burnout, as well as general stress and general burnout, but they are not reported here as all variables exhibited high multicollinearity.

The combination of external pressure items (“felt parental pressure” in school, “felt parental pressure” in sports, “felt academic pressure”, and “felt athletic pressure”) significantly predicted academic burnout, $F(4, 6) = 10.01$, $p = 0.008$. The adjusted R^2 value was 0.783. This indicates that approximately 78% of the variance in academic burnout was explained by the model. According to Cohen (1988), this is a large effect. However, the combination of these external pressure items did not significantly predict athletic burnout, $F(4,6) = 1.32$, $p = 0.361$, or general burnout, $F(4,6) = 0.662$, $p = 0.641$.

4. Discussion

The primary purpose of this study was to consider the stressors in the lives of adolescent student-athletes and evaluate how frequently they led to consequential burnout symptoms. With this in mind, this study can be utilized to prevent and minimize such stressors, ultimately aiming to reduce burnout in middle and high school students. In response to the initial hypothesis, it was found that some were met, while others were not. The first hypothesis: “There are differences in endorsed variables between younger and older adolescents,” proves true, indicated by the finding that younger adolescents tended to fail in pushing themselves more frequently than older adolescents. In response to the second hypothesis: “Sports-related stress is associated with sports-related burnout,” it was found that athletic pressure suggested a high stress environment, one that could eventually lead to burnout development. The fifth hypothesis, while yielding results that were statistically insignificant, was close to the necessary level of significance. This hypothesis: “external pressure (parental and athletic) can predict burnout,” could suggest that parental pressure does play an important role in the development of stress and burnout in adolescents. The third and fourth hypotheses were not supported: “Academic-related stress is associated with academic-related burnout” and “general stress is associated with general burnout.”

In consideration of the survey responses, conclusions can be drawn that external pressure variables (“felt parental pressure” in school, “felt parental pressure” in sports, “felt academic pressure”, and “felt athletic pressure”) significantly predicted academic burnout, but not athletic burnout or general burnout. This could be the result of a high stress environment in schools. Many students use sports as a healthy mechanism to relieve stress, and while it may end up causing a stressful environment sometimes, pressure is more influential in an academic setting as opposed to an athletic one.

The study sought to identify associations between variables of sports-related stress and variables of sports-related burnout. As all academic and general burnout stressors and variables were all intercorrelated, identification of specific associations could not be computed. However, in regards to sports-related burnout, the data showed that “felt tired to the point of exhaustion” was associated with “felt physically drained.” As such, pushing oneself to a point of significant physical distress could likely lead to an overall sense of physical exhaustion, a common consequence of athletic overwork. Constantly feeling physical exhaustion could eventually lead to burnout, as described by prolonged

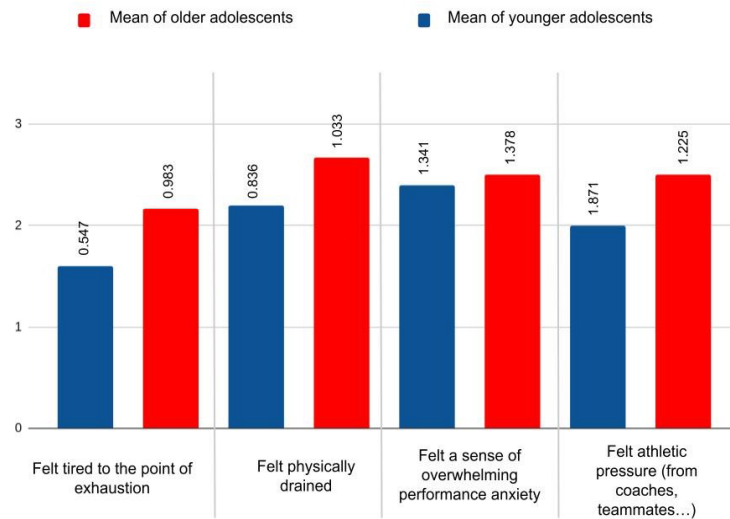


Figure 1: Mean of older and younger adolescents in comparison with numerous burnout symptoms

physical labor. In adolescents, it was also noted that feeling athletic pressure was significantly associated with feeling a sense of overwhelming performance anxiety. As adolescents are faced with the pressure of performing well in sports, whether it be from parents, coaches, or teammates, they continually tolerate high stress environments. Such environments could lead to a persistent sense of performance anxiety, oftentimes a feature of athletic burnout and underperformance in sports.

An aspect of data analysis covered in this study was a t-test analysis between stress and burnout comparing older and younger adolescents. Younger adolescents were categorized by ages 13-15, while older adolescents were considered ages 16-18. It was found that younger adolescents more frequently endorsed failing to push themselves in an athletic capacity than older adolescents, indicating that as adolescents grow in age, they are more likely to push themselves. College athletic recruitment could be a major cause of this, as a more intense athletic environment, or even changes in coaching can greatly influence athletic performance. In terms of an academic viewpoint, younger adolescents endorsed more pressure from their parents in school environments than their older counterparts. This association may indicate that with older age comes more independence, suggesting that parents may have higher amounts of involvement through lower grade levels and ages.

Survey results also showcased a relationship between the amount of sleep between older and younger adolescents. While these data were not statistically significant, there was a trend implying that older adolescents endorsed more frequently not getting enough sleep or sleeping less than 7 hours more often. The lack of sleep in older adolescents could largely be due to a higher workload, increased extracurricular activities, and a shift in the teenage circadian rhythm that encourages going to bed at a later time (Carskadon, 1990). To respond to school bell schedules, the later bedtime is hindered by an earlier wake-up, thus reducing the total amount of sleep obtained by teens. Another noteworthy statistic was that of feeling fatigued after homework. While it was not a statistically significant result, it is worth noting that older adolescents endorsed more frequently feeling tired after homework, as opposed to younger adolescents. Once again, this is likely due to the increased workload in high school in preparation for university education, as well as a higher intensity of athletically rigorous schedules.

4.1 Limitations

Several limitations of this study merit consideration. First and foremost, the small number of participants involved in this study plays a tremendous role in the scientific data and results. Such a small sample size (11) is important to note, especially considering that the found correlations may not be generalized across all adolescents or teens. Likewise, the small sample size warranted a small demographic variance. The majority of responses were from San Diego, California, or in a region within. There were only two responses from separate locations, one being from Menlo Park, California, and the other from Brooklyn, New York. This demographic information may indicate trends applying mostly to San Diego, as opposed to the nationwide sample initially predicted.

In addition to demographic limitations, another implied restraining factor was the lack of clarification between stress and burnout. In scientific literature, stress and burnout are often used in a cyclical structure, indicating that the two are sometimes difficult to differentiate. In the present study, stress was the predictor of burnout, but in many other studies, this differentiation is variable.

There is also the limitation of survey bias (also known as response bias). In a survey format, data points may be biased, in the participants effort to get through the survey quickly, please the researcher, or conform to previously disposed notions. Survey bias refers to a deviation of feedback as a result to conform to the expected results of the study. It is important to recognize the underreporting of stress experience and burnout symptoms within the survey and the consequential impacts on the present study.

An additional limitation within the study is sampling bias. Given that participants were asked to refer acquaintances, friends, teammates, and classmates to this survey, the sampling was not entirely random. The study was voluntary, potentially indicating that those who were more involved in athletics and mental health would have been more inclined to take the survey. This may have resulted in higher correlation tendencies between perceived stress and burnout within this study. Future studies should address this by including a more randomized selection of student athletes in the sampling process.

4.2 Future Directions

For future studies regarding the relationship between stress and burnout in adolescents, literature should include a larger sample size. Further, it would be beneficial to evaluate the extent to which stress and burnout are cyclical (meaning that burnout contributes to stress and vice versa), or whether it works in one direction. To do so, studies should include clearly specified stress and burnout variables and test to see the correlation between each one.

While the present study focused on the development of burnout in high-school student athletes, it would be beneficial to determine whether or not the results are consistent with a younger age group. While many scientific studies have been conducted regarding collegiate athletes and adults in the workplace, elementary level children have been neglected in this research. It would be valuable to evaluate whether elementary and middle school kids do experience burnout, and to what extent. As such, continuing this study on younger ages would be advantageous to the overall understanding of the development of burnout as a result of stress. This research could be vital to further understanding child development, and how the environment a child is raised in can contribute to their growing brains and bodies. Utilizing the same variables, definitions of stress and burnout, and similar questions tailored to a younger age group, a greater understanding of burnout development could be achieved.

With the results of these new studies, stressors in adolescents will become more clear. This knowledge can be used in an attempt to mitigate the effects of the stressors and ultimately aim to reduce burnout symptoms throughout youths. For instance, it was concluded in this study that feeling parental pressure can potentially indicate the development of academic burnout. Using this knowledge, one can ultimately reform parenting practices with the goal of aiding in child development and reducing future academic burnout.

5. Conclusion

Results of the present study indicate that the most prominent contributors of burnout could be feeling exhaustion, vulnerability to injuries and soreness, and athletic pressure, combined with a rigorous physical schedule that leaves student-athletes with no break. It could be concluded that older adolescents more frequently endure a more intense workload (both academic and athletic), which can lead to more frequent symptoms of burnout. Further, younger adolescents more frequently endure external pressures, especially from parental figures. As such, younger adolescents were more frequently exposed to burnout symptoms resulting from external pressures, whereas older adolescents were more frequently exposed to burnout symptoms resulting from a heavier workload.

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