

Developmental Differences in Burnout Among High School Athletes in the United States: A Gendered Perspective

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Chu, T. L., Sommerfeld, B., & Zhang, T. (2022). Developmental differences in youth athlete burnout: A gendered perspective. *Journal of Clinical Sport Psychology*, 16(1), 42–54. DOI: 10.1123/jcsp.2021-0017

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Abstract:

Building on recent research examining athlete burnout trajectories, this study implemented the developmental model of sport participation to compare emotional and physical exhaustion, reduced sense of accomplishment, and sport devaluation between age groups (specializing [aged 13–15 years] vs. investment [aged 16–18 years]) and gender (boys vs. girls) among U.S. high school athletes. Participants were 367 high school athletes ($M = 15.53$; 212 males; 186 specializing) across various individual and team sports who completed a survey assessing their demographic information, sport backgrounds, and burnout perceptions. A 2×2 multivariate analysis of covariance, controlling for training hours, showed greater emotional and physical exhaustion and sport devaluation in the investment than the specializing group, but no developmental differences in reduced sense of accomplishment. Contrary to our hypothesis, no gender or interaction effects were found. Findings inform interventions and future research that address the role of developmental stages and gender in athlete burnout.

Keywords: age | developmental model of sport participation | specialization | youth sport

Article:

In the field of sport psychology, burnout has become one of the prominent research topics to understand athletes' negative experiences in sport (Gustafsson, DeFreese, & Madigan, 2017). Adolescents who begin to engage in rigorous sport training in addition to increasing academic demands are prone to burnout symptoms (Granz, Schnell, Mayer, & Thiel, 2019; Harris & Watson, 2014). According to Raedeke (1997), athlete burnout consists of three types of cognitive–affective symptoms: (a) emotional and physical exhaustion—the athlete experience of exhaustion from the rigors of training and competing, (b) reduced sense of accomplishment—the athlete perception of diminished ability and achievement in their sport, and (c) sport devaluation—the athlete perception of less personal importance and value placed on their sport. Numerous studies have supported the relevance of all three burnout factors in sport settings (see Li, Wang, Pyun, & Kee, 2013; Pacewicz, Mellano, & Smith, 2019). However, examination of the roles of demographic factors, including

gender and age, in athlete burnout has been limited (Granz et al., 2019). For coaches and sport psychology professionals (SPPs) to effectively prevent and treat burnout symptoms among youth athletes, empirical examination of developmental and gender differences is warranted.

Athlete burnout is a characteristic that develops over time with more training hours and competitions. Although athletes typically experience biological growth and maturation during early adolescence, the increased amounts of training hours and competitive stress elevate the risk for burnout symptoms, such as emotional and physical exhaustion, to develop (Appleby, Davis, Davis, & Gustafsson, 2018; Gustafsson, Kenttä, Hassmén, & Lundqvist, 2007). The literature generally supports the existence of developmental differences in athlete burnout (Giusti et al., 2020), yet little research has studied them directly with a developmental framework. The few studies examining these developmental differences have indicated that athletes perceive higher levels of burnout as they age, but mixed evidence exists in whether and how each burnout factor differs. For instance, when investigating the developmental trajectories of burnout factors in youth athletes, Ingrell, Johnson, and Ivarsson (2019) found increases in all three burnout factors in a Swedish sample (Mage = 12.70). In contrast, Isoard-Gautheur, Guillet-Descas, Gaudreau, and Chanal (2015) revealed a decrease in reduced sense of accomplishment, an increase in sport devaluation, and relatively stable emotional and physical exhaustion in a French sample (Mage = 15.67). When comparing U.S. youth swimmers, Harris and Watson (2014) indicated that the older adolescent group (aged 15–17 years) perceived higher levels of exhaustion, but not the other two burnout factors, than the younger adolescent group (aged 11–14 years). These mixed findings could potentially be due to differences in the contexts—sports; competitive levels; countries; cultures; and settings (e.g., school, club, national training center). On the other hand, researchers' approach to study developmental differences quantitatively and qualitatively—defining and categorizing age groups or development stages—may also influence their research findings (Giusti et al., 2020). In light of the need for theoretically informed and meaningful developmental comparison of burnout factors, we adopted the developmental model of sport participation (DMSP; Fraser-Thomas, Cote, & Deakin, 2005) to examine athlete burnout in this study.

The DMSP posits three stages of development that youth athletes pass through—the sampling years (from age 6 to 12 years), specializing years (from age 13 to 15 years), and investment years (age 16 years and above; Fraser-Thomas et al., 2005). After trying multiple sports mainly recreationally during the sampling years, athletes begin to focus on selected sports during their specializing years and put in more practice times due to that newfound focus. Once athletes progress to the investment years, they begin to commit to one sport and maximize deliberate practice in their sport beyond their scheduled practices (Fraser-Thomas et al., 2005; Wall & Côté, 2007). Coupled with the physical and psychosocial demands of adolescent development, the increasing demands in sport training and competitions could create a state of overload and imbalance if athletes' resources (e.g., social support, stress management techniques) are insufficient (Granz et al., 2019; Maslach & Leiter, 2007).

Applying the DMSP's categorization and definition, we focused on high school athletes, who constitute the largest youth athlete population in the United States, across the specializing and investment years. In the United States, youth athletes tend to participate in multiple sports during elementary school, specialize in selected sports during middle school and the first year of high school, and invest substantial time and energy in one sport year-round within and outside of school (e.g., club or travel teams) afterward if they intend to reach their highest level of competition to become a collegiate or professional athlete. Due to the time frame for the corresponding

competitive seasons, most high school athletes can partake and invest time in only one out of the many sports that have similar competition schedules. The progression of U.S. youth athletes' sport involvement is thus consistent with the DMSP.

Although around eight million high school students participate in athletics, 32% of them (a higher percentage of girls than boys) drop out of their sport by the end of high school (Sabo & Veliz, 2016). The amount of time that youth athletes invest in sport, including practices and competitions, could accelerate the development of burnout symptoms (Gustafsson et al., 2007). Understanding the differences in burnout factors between athletes in the specializing and investment years in addition to training hours alone can facilitate better evidence-based burnout prevention interventions that target these developmental stages with which many coaches and SPPs work. Moreover, school sport setting is one that teachers and other school personnel beyond coaches can also intervene if they are aware of the burnout development in their athletes.

In addition to age or developmental stages, other demographic variables, such as gender, might also influence burnout perceptions in youth athletes. Gender plays a key role in sport, especially within the school system, which typically separates sports by gender with different types of training and coaching that may create different sport experiences for boys and girls (Kanters, Bocarro, Edwards, Casper, & Floyd, 2013). Based on a dearth of research on gender differences in youth athlete burnout, girls tend to experience a higher level of burnout and its correlates (Granz et al., 2019; Isoard-Gauthier et al., 2015). Specifically, compared with boys, girls were found to perceive similar emotional and physical exhaustion, but greater increases in reduced sense of accomplishment and sport devaluation as they aged ($M_{age} = 15.67$) in French national training centers (Isoard-Gauthier et al., 2015) and greater reduced sense of accomplishment in German youth ($M_{age} = 16.33$) national teams (Granz et al., 2019). In a slightly older sample ($M_{age} = 17.20$), girls reported greater training hours and levels of stress, but not the three burnout factors, than boys in Swedish sport schools (Smith, Gustafsson, & Hassmén, 2010). These inconclusive findings regarding the role of gender in athlete burnout combined with the previously noted lack of research examining high school sports call for research evidence for coaches and SPPs to understand the complexity of the athlete burnout phenomenon across age and gender.

Using the DMSP as a theoretical framework, the current study aimed to explore potential developmental and gender differences, as well as their interaction, in U.S. high school athletes' perceptions of the three burnout factors. We expected that the high school athletes in the investment years and girls would report greater perceptions of burnout factors than those in the specializing years and boys, respectively. However, no hypothesis was made regarding which specific burnout factor would differ due to the mixed evidence in the literature focused mostly on elite athletes.

Method

Participants

Participants were 367 high school athletes (212 boys and 155 girls) from two high schools in the southwestern United States and two in the midwestern United States, which were all located in suburban school districts. This sample size exceeded the 264 minimum number of participants needed to detect a small effect size $f^2 = 0.02$, with $\alpha = .05$ and statistical power = 0.80, based on the analysis using G*Power (version 3.1; Faul, Erdfelder, Lang, & Buchner, 2007). The athletes were aged 13 to 18 years old ($M = 15.53$, $SD = 1.20$); 56.7% White, 22.9% Hispanic/Latinx, 7.9% African American, 4.1% Asian, and 8.4% other or multiracial. They played a variety of high school

sports: 18 athletes specializing in baseball, 44 (26 girls) in basketball, 27 (five girls) in cross country, 115 in football, two in powerlifting, nine (two girls) in soccer, 52 (20 girls) in tennis, 23 (16 girls) in track and field, 42 (all girls) in softball, and 10 (nine girls) in other sports. Furthermore, there was a mix of every high school grade level, including the ninth (32.4%), 10th (25.9%), 11th (24.5%), and 12th grades (17.2%). Based on the DMSP criteria, 186 athletes were in the specializing years (aged 13–15 years), and 181 were in the investment years (aged 16–18 years). They reported on average 12.09 hr of training and competition in their sport each week.

Measures

Demographic and sport backgrounds, including age, grade level, gender, race/ethnicity, main sport in high school, and total training and competition hours per week, were assessed.

The Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001) measures three sport burnout dimensions—Emotional and Physical Exhaustion (e.g., “I feel so tired from training that I do not find the energy to do other things”); Reduced Sense of Accomplishment (e.g., “I am not performing up to my ability in the sport”); and Sport Devaluation (e.g., “The effort I need to put into sport would be better used in another activity”). Participants responded to five items per subscale on a Likert-type scale of 1 (almost never) to 5 (almost always). The item scores for each corresponding burnout dimension were averaged for data analysis. The scores of Emotional and Physical Exhaustion ($\alpha = .89$), Reduced Sense of Accomplishment ($\alpha = .79$), and Sport Devaluation ($\alpha = .88$) subscales demonstrated good internal reliability in this study and past research (e.g., Harris & Watson, 2014; Isoard-Gauthier et al., 2015). Confirmatory factor analysis further supported the construct validity and factor structure of the measure: $\chi^2/df = 2.65$, comparative-fit index = .951, Tucker–Lewis index = .941, root mean square error of approximation = .066, standardized root mean square residual = .059 (Hu & Bentler, 1999).

Procedures

After receiving the Institutional Review Board approval from the University of Wisconsin–Green Bay and the University of North Texas, we obtained informed parental consent and child assent forms from the participants in accordance with the institutional review board and the school district requirements. During one of the practices around the middle of their corresponding sport season, participants responded to the study measures in the form of a paper-and-pencil survey, administered by the authors and other research assistants without the coach presence. The survey administrators reminded the participants of the confidential nature of the survey and instructed them to complete the survey based on their main sport if they participated in more than one sport in their high school. Each survey session took approximately 25 min.

Data Analysis

First, the data set was screened for missing data, invalid values, outliers, and normality to examine the adequacy of the data for further analysis (Tabachnick & Fidell, 2007). After the data were inspected, descriptive statistics, Cronbach’s alphas, and bivariate correlations were computed as preliminary analyses. Then, a 2×2 multivariate analysis of covariance was conducted to examine the main effects and interaction effects of age group (specializing or investment) and gender (boy or girl) on the three burnout factors, with sport training hours as a covariate. Follow-up univariate

analyses were conducted with Bonferroni-adjusted statistical significance levels of $.05/3 = .0167$ to examine the age and gender differences in specific burnout factors. Correlational coefficients ($r = .10, .30, \text{ and } .50$) and partial eta-squared ($\eta^2_p = .01, .06, \text{ and } .14$) values were used as an indication of small, medium, and large effect sizes, respectively (Cohen, 1988).

Results

Upon data screening, we found that three participants did not report their age and, thus, removed their data. There were <5% of missing values in each participant and across study variables, so we replaced them using the expectation–maximization technique (Tabachnick & Fidell, 2007). The box plot procedures by age group and gender then revealed the existence of 19 univariate outliers that were subsequently removed from further data analyses. Furthermore, no multivariate outliers were found as none of the cases exceeded the critical value ($p > .001$) of Mahalanobis distance. Thus, the final sample was reduced to 345 total participants ($M_{\text{age}} = 15.54$; $SD = 1.19$; 203 boys and 142 girls): 172 in the specializing and 173 in the investment years. The histograms presented normal distributions, with skewness and kurtosis values between -1 and 1 for all three burnout factors across age groups and gender.

Preliminary Analyses

The athletes reported lower than midpoint (three) levels of burnout—exhaustion ($M = 2.49$; $SD = 0.92$), reduced sense of accomplishment ($M = 2.28$; $SD = 0.73$), and sport devaluation ($M = 1.98$; $SD = 0.85$). Bivariate correlations indicated significant ($p < .05$) associations between (a) age and training hours ($r = .19$), age and exhaustion ($r = .22$), and training hours and exhaustion ($r = .15$) with small effect sizes; (b) age and sport devaluation ($r = .30$), and exhaustion and reduced sense of accomplishment ($r = .42$) with medium effect sizes; and (c) exhaustion and sport devaluation ($r = .53$), reduced sense of accomplishment and sport devaluation ($r = .60$) with large effect sizes.

Multivariate Analysis of Covariance

The 2×2 multivariate analysis of covariance indicated that total training hours were a significant covariate, $F(3, 338) = 2.93$, Wilks' $\lambda = 0.975$, $p = .03$, $\eta^2_p = .025$. Results further revealed a significant multivariate main effect of age group on burnout, $F(3, 338) = 6.82$, Wilks' $\lambda = 0.943$, $p < .001$, $\eta^2_p = .057$, when holding training hours constant. The follow-up univariate analyses indicated that the investment age group perceived significantly higher levels of exhaustion and sport devaluation with small effect sizes, but not reduced sense of accomplishment, than the specializing age group (see Table 1). There was no significant gender main effect, $F(3, 338) = 0.314$, Wilks' $\lambda = 0.997$, $p = .82$, $\eta^2_p = .003$, or interaction effect, $F(3, 338) = 0.240$, Wilks' $\lambda = 0.998$, $p = .87$, $\eta^2_p = .002$, on burnout. The girls and boys had comparable levels of exhaustion ($M = 2.49$ vs. 2.49), reduced sense of accomplishment ($M = 2.32$ vs. 2.25), and sport devaluation ($M = 1.98$ vs. 1.98).

Table 1 Univariate Analyses and Descriptive Statistics of Burnout Factors Between Age Groups

	Specializing years (n = 172)		Investment years (n = 173)		<i>F</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Emotional and physical exhaustion	2.34	0.70	2.64	0.73	8.75*	.003	.025
Reduced sense of accomplishment	2.23	0.56	2.34	0.59	1.84	.176	.005
Sport devaluation	1.80	0.64	2.18	0.67	16.96*	<.001	.048

*Significant group differences based on the estimated marginal mean values in the follow-up univariate analyses after Bonferroni adjustments ($p < .0167$).

Discussion

The purpose of the current study was to investigate the roles of developmental stages and gender in burnout factors—emotional and physical exhaustion, reduced sense of accomplishment, and sport devaluation—among U.S. high school athletes. As expected, athletes in the investment years (aged 16–18 years) reported greater burnout perceptions, specifically in emotional and physical exhaustion and sport devaluation, than those in the specializing years (aged 13–15 years). However, deviating from our hypothesis, no gender differences were found.

Partially supporting the findings of Ingrell et al. (2019) and Harris and Watson (2014), the current study showed that perceived levels of physical and emotional exhaustion and sport devaluation were higher among athletes in the investment years than in the specializing years. It is worth noting that these significant differences held up after controlling for total training hours in this study. It is plausible that, in addition to the quantity of training, high school athletes tend to invest more physical and emotional energy in intense training rather than playing sports for fun, thus leading to a greater likelihood of feeling physically and mentally exhausted (Côté & Vierimaa, 2014; Fraser-Thomas et al., 2005). This progression is common in the U.S. high school sport system in which athletes move from freshman to junior varsity to varsity teams (Seefeldt, Ewing, & Walk, 1992). On the other hand, less skilled athletes might begin to focus on other tasks in high school and life, such as preparing for standardized tests required for college admissions or applying for jobs, when realizing that they are not competitive enough to be the selected 6–7% to play college sport in the National Collegiate Athletic Association (National Collegiate Athletic Association, n.d.). Thus, these athletes may place less value on sports over time when knowing that they will likely not continue to compete for a school with coaches or teammates (Isoard-Gauthier et al., 2015). These findings are congruent with the DMSP stating that when athletes transition from the specializing to the investment stage around the age of 16 years, they dedicate more time to deliberate practice outside of their regular, scheduled training hours (Côté & Vierimaa, 2014; Wall & Côté, 2007). This increased sport involvement alongside a lack of immediate personal achievements may facilitate the development of emotional and physical exhaustion and sport devaluation (Gustafsson et al., 2007; Isoard-Gauthier et al., 2015). In addition, these burnout perceptions could be “contagious,” evidenced by the significant association between athletes’ perceived teammate burnout and their own burnout from increased training loads (Appleby et al., 2018).

Similar to a previous study on U.S. athletes (Harris & Watson, 2014), but deviating from Ingrell et al. (2019) who found a reduced sense of accomplishment in Swedish athletes and Isoard-

Gauthier et al. (2015) who found an increased sense of accomplishment in French athletes as they aged, we found no developmental differences in this burnout factor. These conflicting findings could be attributed to differences in participants' ages, countries and cultures, and sport contexts. The athletes in Isoard-Gauthier et al.'s (2015) study were recruited from a national training center and had the highest competitive level compared with those in other studies; these athletes might have a greater chance to not only compete but also have greater achievements as they age, leading to an increased sense of accomplishment. On the contrary, U.S. high school athletes usually do not compete at that elite level. Their sense of accomplishment may be relatively stable throughout high school as athletes compete for the same school with the same teammates or coaches and, in turn, a comparable win-loss record. However, their sense of accomplishment could drop alongside their athletic identity soon after competing for their last season when they are no longer a high school athlete (Harris & Watson, 2014).

Furthermore, this study suggests no significant gender differences or interaction between gender and age with regard to the burnout factors in high school athletes, contradicting the scarce literature that shows a greater likelihood for girls than boys to perceive higher levels of athlete burnout (Granz et al., 2019; Isoard-Gauthier et al., 2015; Smith et al., 2010). In addition to the previously mentioned reasons regarding the differences in sport contexts and participant demographics between the current and previous studies, one possible reason for similar levels of athlete burnout perceptions between girls and boys, which may initially sound counterintuitive, is the greater sport attrition rates in girls than boys during high school years (Sabo & Veliz, 2016). This phenomenon is known as the "healthy worker effect"—workers are healthy because those who are not healthy are not working—shown to be stronger for females than males (Shah, 2009). When experiencing burnout, high school girls may be more likely to drop out of sport than boys, who typically perceive greater pressure and expectations to play sports; girls currently participating in high school sport may not experience much burnout because those who do likely have already dropped out. This explanation is in line with previous research that showed low levels of athlete burnout in U.S. high school girls currently participating in sport, specializers and nonspecializers alike (Russell & Molina, 2018). Furthermore, gender may serve as a moderator, such as between coach-athlete relationship and burnout factors, rather than a predictor of burnout. Davis, Stenling, Gustafsson, Appleby, and Davis (2019) found that the association between the coach-athlete relationship and reduced sense of accomplishment was stronger for male than female athletes. Thus, gender and burnout could be related when social environments are taken into account, and further investigation of these variables is needed.

Practical Implications

The results of the current study provide valuable insights into the roles of developmental stages and gender in burnout perceptions of high school athletes in the United States. Our study supports the general understanding that perceived athlete burnout is greater in older than younger adolescents (Raedeke, 1997). A somewhat novel implication of the current study is that the quantity of training plays a role but may not be the major reason for burnout development (Wall & Côté, 2007). Coaches and SPPs should be aware of athletes' progression through the developmental stages based on the DMSP and pay more attention to athletes in the investment years, who are more likely to experience exhaustion and sport devaluation regardless of their amount of training. In addition to burnout, assessing high school athletes' stress, motivation, social support, and coping strategies both within and outside sports can help coaches and SPPs gain a

more comprehensive picture of each athlete's burnout likelihood and whether the existence of any burnout perceptions stems from only sports or also other domains, such as academic (Davis et al., 2019; Sorkkila, Tolvanen, Aunola, & Ryba, 2019). After conducting need assessments, coaches and SPPs may target their intervention to alleviate the burnout symptoms that athletes experience. For instance, SPPs may teach high school athletes in the investment years how to practice progressive muscle relaxation, mindfulness, and other stress management strategies to cope with stress and exhaustion (Gustafsson et al., 2017; Harris & Watson, 2014; Kroshus & DeFreese, 2017). Psychological strategies, such as goal setting, that involve specific weekly training goals as well as cognitive restructuring (e.g., clarifying own values in sports beyond winning) could be helpful for working with high school athletes who perceive greater sport devaluation. If an athlete's burnout symptoms are severe and reach clinical concerns, they should be referred to mental health professionals, including clinical SPPs, for personalized treatment, such as cognitive-behavioral and acceptance-commitment therapies (Gustafsson et al., 2017).

Although high school coaches might not have specialized training in sport psychology to conduct individualized interventions, they play an important role in preventing and alleviating athlete burnout. They can do so by creating optimal social environments (e.g., autonomy-supportive, task-involving climates) to satisfy athletes' psychological needs (Chu & Zhang, 2019; Granz et al., 2019), building quality relationships with athletes to show trust and compassion through frequent check-ins (Gustafsson, Hassme, Kenttä, & Johansson, 2008; McGee & Defreese, 2019), and communicating regularly with captains and other staff, such as athletic trainers and team managers, to gather information about each athlete's physiological and psychological states (Davis, Appleby, Davis, Wetherell, & Gustafsson, 2018; Kroshus & DeFreese, 2017). In addition, coaches should introduce a variety of training drills and occasionally deliberate play activities, especially during the noncompetition period of the season, to promote cross-training and athlete enjoyment and reduce exhaustion (Wall & Côté, 2007).

Coaches and SPPs should keep in mind that athlete burnout is dynamic, influenced by factors within and outside of sports, from quantity and quality of sport participation to physical, cognitive, and psychological development during adolescence (Appleby et al., 2018; Davis et al., 2019; Lundkvist et al., 2018). Although we did not find gender differences in burnout factors in our high school sample, we suggest coaches and SPPs still attend to how gender may interact with burnout factors and antecedents (e.g., social environments) shown to vary across sports and gender (Davis et al., 2018; Gustafsson et al., 2007). In practice, SPPs need to assess whether and, if so, how demographic factors, such as gender, may play a role in the manifestation of burnout perceptions, as Schinke and Stambulova (2017) pointed out, "every sport psychologist and athlete who steps into an unfamiliar training environment quickly realizes that there is uniqueness in the local context. Each sport has its own demands, dress code, terminology, a means of relating with athletes and coaches, and an accepted series of normalized behaviors" (p. 71). These assessments would have direct implications for understanding the development and prevention of athlete burnout in a particular sport context.

Limitations and Future Research

Several limitations of this study need to be addressed. First, this study is cross-sectional and correlational in nature, so none of the results can be taken as causal relationships. Future research should implement a longitudinal research design across the DMSP developmental stages to study the development of each burnout factor (e.g., Ingrell et al., 2019; Isoard-Gauthier et al., 2015), in

athletes throughout high school or even from middle school through high school (Fraser-Thomas et al., 2005). This approach can provide further evidence of how burnout factors may develop and potentially influence each other (Lundkvist et al., 2018). Moreover, we recruited athletes from only four high schools in two states in the United States. Although there was a good mix of sports and race/ethnicity that was representative of the overall high school athlete population, the results are not generalizable to high schools across the United States. Future research should examine larger samples of high school athletes, from more diverse states and types of schools (e.g., private vs. public) with varying sport competitive levels, to compare their findings across state and school characteristics as well as with our findings. Although we did control for total training hours and still found developmental differences as a novel finding, further studies assessing sociocultural (e.g., sport type); psychosocial (e.g., social support); and individual (e.g., personality) antecedents affecting athlete burnout across developmental stages are needed (Davis et al., 2019; Gustafsson et al., 2017; Pacewicz et al., 2019).

Another limitation of this study is assessing athlete burnout using the ABQ, the most commonly used measure that recently received criticisms regarding the lack of stability and clinical relevance (Gerber et al., 2018; Gustafsson et al., 2017; Lundkvist et al., 2018). Because we collected data around the middle of the corresponding sport seasons without examining longitudinal changes, the use of ABQ is still deemed appropriate, especially for comparing our results with previous findings (Granz et al., 2019). Furthermore, the psychometric properties of the ABQ are generally good across various athlete populations (Gerber et al., 2018), including our sample. However, SPPs who wish to predict mental health outcomes for research or assess clinical relevance of burnout symptoms for practice should consider using other measures, such as the Shirom–Melamed Burnout Measure (Melamed, Kushnir, & Shirom, 1992).

To inform more effective burnout prevention and treatment, future research should obtain objective burnout data, such as physiological measures that demonstrate plausible burnout responses beyond self-report data (Kroshus & DeFreese, 2017). Finally, more qualitative and intervention studies are needed. As noted previously, quantitative studies allow researchers to understand whether and what developmental and gender differences exist in burnout factors, but they do not show how and why differences may exist real life. Gathering qualitative data from athletes; their significant others (e.g., coaches, parents, and peers); and sport medicine professionals would facilitate a better understanding and interpretation of the sport environment and complex burnout phenomenon through triangulation of data and sources (Chu & Zhang, 2019; Gustafsson et al., 2008). After understanding the process of burnout development, SPPs can then design and test evidence-based intervention strategies accordingly. In light of the scarce literature, further development of theoretically informed burnout interventions in specific sport contexts is needed.

Despite several limitations, this study contributes to the literature by being the first to examine potential developmental and gender differences in athlete burnout factors, specifically in the U.S. high school sport context in which about 70–85% of all students partake (Sabo & Veliz, 2016). This study provides preliminary findings of developmental differences in emotional and physical exhaustion and sport devaluation for further examination using the DMSP as a developmental framework. On account of such a large proportion of high school students participating in various sports at different levels, the more we understand the complex mechanisms of burnout development in specific sport settings, the more likely are coaches and SPPs able to implement adequate strategies to prevent and alleviate athlete burnout across age, gender, as well as other influential factors related to demographics and sport backgrounds.

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