

Psychological Experiences During Previous High School Sport Participation Predict College Students' Current Psychological Health

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Cover Page Footnote

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ABSTRACT

Adolescent sport participation has been positively associated with psychological health outcomes. Yet, further research is needed to explore how psychosocial health benefits from sport may be maximized or minimized based on one's psychological experiences during previous sport participation. The present study examined associations among retrospective psychological experiences of high school sport participation and markers of current college students' psychosocial health. American college students (N = 300) self-reported retrospective high school sport experiences (i.e., burnout, engagement, and stress) and current psychosocial health outcomes (i.e., social support, depressive symptoms, life satisfaction) via an online interface. Moderated multiple regression analyses showed high school sport burnout, stress, and engagement to predict significant variance in college social support ($p < .05$), anxiety ($p < .01$), depressive symptoms ($p < .01$), and life satisfaction ($p < .01$). Results provide evidence that retrospective accounts of high school sport participation experiences (i.e., low burnout, low stress, and positive engagement) were associated with more adaptive post-high school psychosocial outcomes in college. This information may guide future prospective studies and aid practitioners by providing a broader understanding of psychosocial outcomes of sport participation.

Keywords: burnout, depression, life satisfaction, social support, stress

Sport participation is the most commonly reported extracurricular activity of American adolescents (Child Trends, 2019). In 2018-2019, approximately 7.9 million American adolescents participated in at least one high school sport (National Federation of State High School Associations, 2019). Reported reasons for sport participation include fitness, development of social relationships, enjoyment of competition, and psychological development (Barber et al., 2001; Gould & Carson, 2008; Richman & Shaffer, 2000). Adolescent sport experiences also have ramifications for both short-term and long-term psychological health and well-being and likely are influenced by the quality of those sport experiences. Bailey and colleagues' (2015) summary of research concluded sport participation provides a range of unique benefits, including emotional (i.e., psychological, mental health), intellectual (i.e., cognitive, educational), physical (i.e., physical health, health behaviors), social (i.e., social networks, relationships), individual (i.e., life skills, interpersonal skills), and financial (i.e., future earning potential, job attainment, lower health care costs) outcomes. Given what already has been established in the research literature regarding the benefits to participants of sport activities, the purpose of the current study was to more deeply examine qualifying aspects of the experiences associated with prior sport participation and relatedness to current psychological health. More specifically, this study explored facets of the psychological experiences of previous high school sport participants and markers of their current psychosocial health in college. The findings of this work have important implications for practitioners working with high school athletes, current college students, and those who implement programming designed to maximize the quality of sport experiences for adolescent

athletes and young adults' psychological health, as well as implications for future research in this line of investigation.

Burnout, Stress, and Engagement

The potential association of high school sport experiences with late life psychosocial health outcomes likely is impacted by the psychological experiences high school athletes perceived during their high school sporting careers. Such experiences likely are to be demarcated by athlete engagement, a positive cognitive-affective experience characterized by confidence, dedication, and enthusiasm (Lonsdale et al., 2007a; Lonsdale et al., 2007b). In contrast, stress and coping theory (e.g., Lazarus & Folkman, 1984) explains how sport experiences, including burnout, psychological stress, and engagement, may develop as a result of sport participation. Athlete burnout is a maladaptive psychological syndrome characterized by dimensions of emotional/physical exhaustion, reduced sense of accomplishment, and sport devaluation (Raedeke, 1997), whereas sport stress is a perceived imbalance of sport-related demands relative to resources and an inability to effectively cope with the deficit (Lazarus, 1990). Previous research has identified the above-mentioned variables as key outcomes of sport participation, as well as noted their associations with each other (DeFreese & Smith, 2014; Raedeke & Smith, 2004). Moreover, stress-related psychosocial outcomes including burnout and athlete engagement also may develop at the same time. Continued maladaptation due to the imbalance in stress/taxation and resources leads to chronic negative responses and can accumulate into clinical problems such as anxiety and depression (Lazarus & Folkman, 1984). Research, using both cross-sectional and prospective study designs, has shown athlete burnout and sport stress to be positively associated with anxiety and depression (Raedeke, 1997) and negatively associated with social support satisfaction in athlete populations (DeFreese & Smith, 2014; Goodger et al., 2007; Lavallee & Flint, 1996). Positive sport experiences, including engagement, have also been shown to be negatively related to burnout in sport (DeFreese & Smith, 2013a, 2014).

Sport Participation and Psychological Health

For participating athletes, their individual psychological experiences in sport may have implications far beyond their high school sport careers, including for their mental health. Keyes' (2002) continuum of mental health highlights that outcomes of both negative (i.e., mental illness) and positive (i.e., well-being) mental health should be considered across the lifespan. These outcomes can be influenced by a variety of individual and environmental factors. For example, sport represents a key environment for American high school athletes that has the opportunity to negatively/maladaptively (i.e., anxiety, depression) and positively/adaptively (i.e., social support, life satisfaction) impact their psychological outcomes. For the majority of American high school athletes, the immediate period following high school is their college years. To this end, the combination of stress and coping theory, along with Keyes' mental health continuum model, provide the impetus for interpreting extant literature in this area, informing new research questions, testing hypotheses, and interpreting findings.

Specific to understanding a sport participant's psychological capital, Jewett and colleagues (2014) have shown adolescent sport participation to be positively associated with lower depressive symptoms, lower levels of perceived stress, and higher self-rated mental health. They also noted sport participation may negatively relate to both the quantity and severity of depressive symptoms, a notable psychosocial outcome. Importantly, research has linked more years of participation in adolescent team sports to fewer depressive symptoms in early adult life (Sabiston et al., 2016). Such findings may be explained, in part, by the social environment inherent in team sports. Further, team-oriented social relationships may positively influence physical and psychiatric disease by buffering stress (Cohen et al., 2000). Cumulatively, research suggests a potential positive impact of sport participation on the psychosocial health outcomes of post-high school sport participants. That said, Eklund and DeFreese (2015) have noted both negative psychological markers (e.g., athlete burnout and sport-related stress) as well as positive psychological markers (e.g., athlete engagement) to be characteristic of psychosocial experiences associated with sport

participation. These relationships merit further empirical exploration to discover their independent and collective impact on lifespan health and well-being.

Study Rationale

Previous research has shown potential predictive effects of adolescent sport participation on psychological health (Jewett et al., 2014; Sabiston et al., 2016). However, these important studies have not yet accounted for individuals' psychological responses to these sport experiences (i.e., the quality of) at the time in examining their links to markers of psychological (i.e., anxiety symptoms, depression, life satisfaction) and social (i.e., social support satisfaction) functioning. Building on the current knowledge base, further quantification of how psychological experiences during adolescent sport may predict the prolonged consequences of experiences on psychosocial health outcomes is needed. Retrospective assessment of the key sport-based perceptions of burnout, stress, and engagement during adolescence represents an innovative first step toward examining these areas, the findings of which would be important for practitioners working with high school sport participants and young adults in college settings, as well as for researchers, which would inform important future prospective research efforts.

In summary, the benefits of sport previously discussed may be maximized and/or minimized based on one's psychological experience at the time of participation, which may have longer-term health implications for adolescent athletes. Therefore, an important knowledge gap remains relative to the association of high school sport participation both to positive (e.g., social support, life satisfaction) and negative (e.g., anxiety, depression) post-high school psychosocial health outcomes. Ultimately, studies of athletes' varied psychological experiences and later life psychological outcomes are needed to advance knowledge of the implications of sport participation to mental health following high school sport career termination. Such work has important implications for both researchers and theorists seeking to strengthen the depth of this knowledge base as well as for practitioners (e.g., coaches, sport psychology professionals, academic counselors) who work to maximize both the real-time and longer-term implications of American high school sport participation.

Study Purpose & Hypotheses

This study examined associations among the negative (i.e., burnout, perceived stress) and positive (i.e., engagement) retrospective psychological experiences of high school sport participation and markers of current college students' maladaptive (i.e., anxiety, depression) and adaptive (i.e., social support, life satisfaction) psychosocial health. We hypothesized: (a) retrospective sport burnout would be positively associated with anxiety and depression, as well as negatively associated with social support and life satisfaction in current college students; (b) retrospective sport-related stress would be positively associated with anxiety and depression, as well as negatively associated with social support and life satisfaction in current college students; and (c) retrospective sport engagement would be negatively associated with anxiety and depression, as well as positively associated with social support and life satisfaction in current college students.

Method

Participants

Participants were 300 undergraduate students (10.3% first-years, $n = 31$; 14.0% sophomores, $n = 42$; 32.7% juniors, $n = 98$; 41.0% seniors, $n = 123$; 2.0% did not report, $n = 6$)¹ at a Southeastern American university ($M_{age} = 20.18$, $SD = 1.20$). Participants self-reported gender as 75% female ($n = 225$), 23.3% male ($n = 70$), and 1.7% unanswered ($n = 5$). The majority of

¹ Year in college did not have a linear relationship with any dependent variable nor did any two college years significantly differ from one another.

participants self-identified as White (77%, $n = 231$), while 9% identified as Black or African American ($n = 28$), 6% Asian ($n = 18$), 3.7% More than One Race ($n = 11$), 1.3% Unknown/Other ($n = 4$), 1% American Indian/ Alaskan Native ($n = 3$), and 1.7% did not answer ($n = 5$). The majority of participants self-identified as Not Hispanic or Latino (92.7%, $n = 278$), 5.3% identified as Hispanic or Latino ($n = 16$), and 2% did not answer ($n = 6$). Approximately half of participants indicated no sport participation beyond high school (49.7%, $n = 149$) while the remaining participants indicated varsity, club, or recreational sport status (48.7%, $n = 146$)² or did not report their current sport participation status (1.7%, $n = 5$).

Measures

Retrospective

The present study retrospectively assessed participant perceptions of high school sport stress, burnout, and engagement. Before beginning the assessment battery, all participants were primed for this via completion of a three-minute writing reflection task regarding their final season of high school sport. Specifically, participants were asked to write about a vivid performance memory. Previous studies have used writing techniques before completing retrospective measures as a means to increase the reliability of participant responses (Barczak & Eklund, 2020; Mosewich et al., 2013; Reis et al., 2015). Following this priming task, all participants then completed retrospective psychosocial variable assessments regarding their individual experiences during their final high school sport season. The Athlete Burnout Questionnaire (ABQ) assessed retrospective perceptions of athlete burnout (Raedeke & Smith, 2001, 2009) as well as has demonstrated good reliability for the ABQ in a college population (DeFreese & Smith, 2013b). The Athlete Engagement Questionnaire (AEQ) assessed the amount of engagement (Lonsdale, Hodge, & Jackson, 2007). Similarly, good reliability has been found for the AEQ in similar athlete populations (Lonsdale, Hodge, & Raedeke, 2007). The Perceived Stress Questionnaire (PSS-4; Cohen et al., 1983) assessed sport-specific stress. Previous researchers have demonstrated good reliability using the PSS-4 in a sport setting (Cohen et al., 1983). In this study, all retrospective measures exhibited satisfactory internal consistency. See Table 1 for a more detailed description of all study measures.

Current

Social support satisfaction was measured via the short form Social Support Questionnaire (SSQ-Short Form; Sarason et al., 1987). Researchers previously have demonstrated acceptable internal consistency of this scale in athletic populations (Raedeke & Smith, 2004). Anxiety was measured via the General Anxiety Disorder scale (GAD-7; Spitzer et al., 2006). General depressive symptoms were measured via the Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001). Researchers previously have demonstrated acceptable internal consistency reliability of the GAD-7 and PHQ-9 in athletic populations (Fraser et al., 2016). The general amount of satisfaction associated with one's current life status was measured via the Satisfaction with Life Scale (SWLS; Pavot & Diener, 2008). Researchers previously have demonstrated acceptable internal consistency reliability of this scale in athletic populations (DeFreese & Smith, 2014). In this study, all current measures exhibited satisfactory internal consistency (see Table 1).

² College students with no current sport reported significantly higher anxiety (mean difference = -2.41, SE = 0.55, $t_{293} = -4.42$, $p < 0.001$) and depression (mean difference = -2.34, SE = 0.52, $t_{293} = -4.47$, $p < 0.001$), as well as lower satisfaction with life, (mean difference = 0.52, SE = 0.15, $t_{292} = 3.48$, $p = 0.001$) than college students currently engaging in sport. Those currently engaging in sport did not differ from those not engaging in sport in social support satisfaction.

Table 1
Description, Calculation, and Interpretation of Study Measures

Measure	Variable	Description	Calculation	Interpretation	Internal Consistency*
Retrospective Measures	ABQ (15 Items)	Athlete Burnout Assesses perceived levels of athlete burnout in high school on a 5-point scale (1 = <i>Almost Never</i> , 5 <i>Almost Always</i>) “I’m accomplishing many worthwhile things in sport”	A total burnout score was calculated by averaging all 15 items.	A higher total score reflects greater feelings of athlete burnout in high school sport.	.92
	AEQ (16 Items)	Athlete Engagement Assesses perceived engagement in high school sport on a 5-point scale (1 = <i>Almost Never</i> , 5 <i>Almost Always</i>) “I believe I am capable of accomplishing my goals in sport”	An aggregate engagement score was calculated by averaging all 16 items.	A higher average score reflects higher levels of engagement in high school sport.	.97
	PSS-4 (4 Items)	Sport-related Stress Assesses perceived stress in high school sport on a 5-point scale (1 = <i>Never</i> , 5 = <i>Very Often</i>) “How often have you felt that you were unable to control important things in life?”	An aggregate stress score was calculated by averaging all 4 items.	A higher average score reflects greater perceptions of stress in high school sport.	.80
Current Measures	SSQ (6 Items)	Social Support Assesses satisfaction with current social support in college on a 5-point scale (1 = <i>Very Dissatisfied</i> , 5 = <i>Very Satisfied</i>) “Whom can you count on to console you when you are very upset?”	An aggregate social support score was calculated by averaging all 6 items.	A higher average score reflects greater satisfaction with current social support in college.	.91
	GAD-7 (7 Items)	Anxiety Assesses current general anxiety in college on a 4-point scale (0 = <i>Not at All</i> , 3 = <i>Nearly Every Day</i>) “Over the last 2 weeks, how often have you been feeling nervous, anxiety or on edge?”	A total anxiety score was calculated from a sum of all 7 items.	A higher score reflects greater feelings of current anxiety.	.89
	PHQ-9 (9 Items)	Depression Assesses current depressive symptoms in college on a 4-point scale (0 = <i>Not at all</i> , 3 = <i>Nearly every day</i>) “Over the last 2 weeks, how often have you been bothered by little interest or pleasure in doing things?”	A total depression score was computed from the sum of all 9 items.	A higher score reflects a greater experience of current depressive symptoms.	.87
	SWLS (5 Items)	Life Satisfaction Assesses satisfaction with life in college on a 7-point scale (1 = <i>Strongly disagree</i> , 7 = <i>Strongly agree</i>) “In most ways my life is close to my ideal”	An aggregate SWLS score was calculated by averaging all 4 items.	A higher average score reflects greater current satisfaction with life in college.	.92

Note. *Internal consistency results for the present study as measured by α .

Procedures

Institutional Review Board approval was obtained. Participants were recruited via mass e-mails, social media, and in-person class, club, or student group announcements at a Southeastern American university. Students were asked to provide an e-mail address where the study survey was sent. Interested participants were sent an e-mail with directions and the hyperlink for the online survey interface (i.e., Qualtrics). Consent information was embedded within the survey itself, which included an inclusion criteria screen (i.e., current college student, competed in high school sport prior to college). Participants were informed the survey was confidential and they could skip any questions they did not feel comfortable answering. Participants completed the survey on any internet-capable device at a time/place of convenience. All students completed all study procedures in the same order. All study procedures, including the reflective writing task, were embedded with the same survey. The average time to completion of the survey was 29 minutes and the estimated response rate was 55% for those who initially started the survey. No direct incentives were provided for study participation.

Statistical Analyses

Study analyses were conducted in three phases. The first phase involved assumption testing of study variables for normal distribution, homoscedasticity, and missing data. Outliers were identified using standardized scores (z-scores). Any individual with a z-score of less than -3.29 or

greater than 3.29 was considered an outlier and deleted listwise (Field, 2013). For any study model, no more than 2% ($n = 6$) of cases were removed due to listwise deletion for missing data or outliers. The second phase involved calculating correlations for all independent and dependent variables. Finally, the third phase involved conducting double moderation analyses on all dependent variables. The *PROCESS* macros tool (Model 2; Hayes, 2022) was used to perform separate moderation regression analyses for each outcome variable individually (i.e., social support, anxiety, depression, life satisfaction). In these models, burnout was input as the main predictor variable, then sport-related stress was input as the first moderator; lastly, engagement was added as a second moderator. This order of variable input was based on an a priori decision to examine the burnout-psychosocial outcome variable relationships and the contributions of stress and engagement in sequentially impacting these associations. Accordingly, interactions then were computed for burnout and engagement, burnout and sport stress, and both interactions. Next, the product term of the interactions between burnout and engagement as well as burnout and sport stress were entered. Finally, interactions were probed to evaluate and plot any significant interaction effects (Preacher et al., 2006). Correlational results were interpreted relative to recommendations by Cohen (1992) for low (0.10), moderate (0.30), and high (0.50).

Results

Data Screening

For each study variable, n 's ranged from 294–300 due to outliers and missing data. Following assumption testing for violations of multivariate analysis, it was found that all data were normally distributed. Further, no data were homoscedastic. Following these results, correlation and regression hypothesis testing was conducted.

Correlations

High school retrospective self-reported burnout demonstrated low-to-moderate negative relationships with current self-reported social support and life satisfaction and moderate positive relationships with current self-reported anxiety and depressive symptoms. High school retrospective self-reported sport-related stress was moderately related negatively with current self-reported social support and life satisfaction as well as positively with current self-reported anxiety and depression. High school retrospective self-reported engagement related positively with current self-reported social support (weakly) and life satisfaction (moderately) as well as negatively with current self-reported anxiety and depression (both moderately, see Table 2).

Table 2
Descriptive Statistics and Correlations for Study Variables

Variable	M ± SD	1	2	3	4	5	6	7
1. High School Sport Burnout	2.27 ± 0.69	--	-.80**	.74**	-.17**	.39**	.33**	-.29**
2. High School Sport Engagement	4.05 ± 0.75		--	-.70**	.14*	-.33**	-.27**	.31**
3. High School Sport Stress	2.49 ± 0.73			--	-.25**	.37**	.35**	-.36**
4. Current Social Support	3.78 ± 0.78				--	-.35**	-.42**	.55**
5. Current Anxiety	5.40 ± 4.80					--	.68**	-.43**
6. Current Depression	4.70 ± 4.61						--	-.59**
7. Current Life Satisfaction	5.25 ± 1.29							--

* $p < .05$, ** $p < .01$.

Regressions

Double moderated multiple regression (MMR) models were run to predict each current psychological health outcome. Regression models included burnout as the main predictor, sport-related stress as the first moderator, and engagement as the second moderator (see Table 3).

Social Support

The main effect of the double MMR model (8.7%, $N = 299$) significantly predicted the variance in current satisfaction with social support ($F(5,293) = 4.80, p < .01$), with perceived sport-related stress as the only significant, individual predictor ($t(297) = -2.33, p < .05$). No interactions were significant in this model. Overall, less sport-related stress predicted higher satisfaction with social support in college.

Anxiety

A significant main effect was observed on the double MMR model (17.6%, $N = 299$) predicting the variance in current general anxiety ($F(5,293) = 15.54, p < .01$) with sport stress ($t(297) = 2.13, p < .05$) and burnout ($t(297) = 2.44, p < .05$) as the only significant, individual predictors. No interactions were significant in this model. Overall, higher stress and burnout in high school predicted higher ratings of anxiety in college.

Depression

The main effect of the double MMR model (13.4%, $N = 299$) significantly predicted the variance in current depressive symptoms ($F(5,293) = 8.45, p < .01$) with sport stress ($t(297) = 2.31, p < .05$) as a significant, individual predictor, and burnout ($t(297) = 1.95, p = .05$), which approached significance. No interactions were significant in this model. Overall, greater burnout (approaching significance) and stress in high school predicted higher ratings of depressive symptoms in college.

Life Satisfaction

Finally, the main effect of the double MMR model ($N = 294$) accounted for 15% of the variance in current life satisfaction ($F(5,288) = 8.30, p < .01$), with sport stress as the only significant, individual predictor ($t(292) = -2.64, p < .01$). No interactions were significant in this model. Overall, lower levels of sport stress in high school predicted higher satisfaction with life in college.

Table 3
Summary of Moderated Multiple Regression Analysis for Outcome Variables

Outcome Predictor	Support Satisfaction			Anxiety			Depression			Life Satisfaction		
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>b</i>	<i>SE</i>	<i>t</i>	<i>b</i>	<i>SE</i>	<i>t</i>	<i>b</i>	<i>SE</i>	<i>T</i>
Burnout	-.03	.13	-.24	1.86	.76	2.44*	1.37	.70	1.95~	.06	.23	.26
Engagement	-.01	.12	-.10	-.14	.80	-.18	.40	.64	.63	.33	.23	1.41
SpStress	-.32	.14	-2.33*	1.28	.60	2.13*	1.55	.67	2.31*	-.53	.12	-2.65**
Model Summaries	<i>ΔR²</i>		<i>F</i>	<i>ΔR²</i>		<i>F</i>	<i>ΔR²</i>		<i>F</i>	<i>ΔR²</i>		<i>F</i>
Main Model	.09		4.80**	.18		15.54**	.13		8.45**	.15		8.30**
Interactions												
Burnout x Stress	.001		.115	.003		.57	.001		.110	.0004		.06
Burnout x Engag	.010		1.49	.0001		.02	.001		.070	.005		.67
Both Int	.025		2.54	.008		.74	.001		.070	.012		.89

Note. Burnout = high school burnout, Engagement = high school sport engagement, SpStress = high school sport stress, Burnout x Stress = the interaction between high school burnout and high school sport stress, Burnout x Engag = the interaction between high school burnout and high school sport engagement, Both Int = the combination of both interaction effects ~ $p = .05$, * $p < .05$, ** $p < .01$

Discussion

Study results highlight that psychological experiences during previous high school sport participation are associated with current collegiate psychosocial health and well-being. Specifically, significant associations of high school sport burnout, stress, and engagement were indicated for some, but not all, outcomes of social support, anxiety, depression, and life satisfaction for current college students. Though the overall impact of these findings is small-to-moderate in the context of variance explained, study findings have important research and practice implications.

Burnout & Sport-related Stress

Sport stress during high school sport participation was found to be significantly, positively associated with maladaptive (i.e., anxiety, depression) psychosocial outcomes and significantly, negatively associated with adaptive (i.e., social support, life satisfaction) psychosocial outcomes for current college students. Thus, perceived stress during the high school sport experience has the potential to have negative implications on the post-high school psychosocial health of college students. This is consistent with the broader literature on psychological stress (Segerstrom & Miller, 2004), including work conducted with athletes (e.g., Hardy, 1992). Moreover, despite the current cross-sectional design, the results of the study are consistent with prospective research efforts with Canadian youth (e.g., Jewett et al., 2014; Sabiston et al., 2016). Additionally, the high school stress response of participants in this study was the only significant predictor of all psychosocial outcomes assessed, and therefore may be an important longer-term factor to consider for later psychological health. Psychological stress is a very commonly experienced psychological outcome for athletes, potentially explaining its associations with study outcomes.

Importantly, there are a variety of possible factors influencing this stress-psychological health relationship, such as the stress-buffering effects of sport participation (Sabiston et al., 2016) and greater social opportunities afforded through sport (Jewett et al., 2014). As such, sport participation may not have a ubiquitous adaptive or maladaptive impact on participants' psychosocial health. Athletes are not a monolith nor are their experiences in sport, suggesting the need to consider individual variability in how high school sport participation associates with psychosocial outcomes across athletes. Regardless, the perceived psychological stress of currently competing high school athletes may have important implications for their health and well-being years into the future. This idea merits continued investigation via examination of potential moderators of sport participation and positive and negative outcomes beyond the American high school sport experience (e.g., stress, burnout, engagement).

Retrospective assessments of burnout during high school sport were identified to be positively associated with anxiety and depressive symptoms (which approached significance) in current college students. Further, burnout during high school was not identified as a significant predictor of either social support or life satisfaction in the current college student sample. To these findings, it is important to note components of positive and negative mental health exist on separate continua (Keyes, 2002), and burnout, by definition, tends toward alignment with negative mental health. Further, previous research has identified athlete burnout as an important concern for currently participating athletes' health and well-being (Eklund & Cresswell, 2007). Present study results provide evidence of the potentially detrimental implications of a high school sport experience for some participants, characterized by feelings of exhaustion, lack of accomplishment, and a devaluation of sport, that may then track into the mental health outcomes of former high school athletes in young adulthood (i.e., college). Though the implications should be approached cautiously given the cross-sectional nature of the present data, the potential longer-term impact of maladaptive psychosocial experiences associated with high school sport, such as burnout, also should not be dismissed. This represents an innovative finding within the athlete burnout literature with important implications for future athlete burnout research.

Such findings necessitate replication in prospective, cohort studies of high school athletes over time and, if supported, according to Smith (1986) may have important implications for the continued development of a stress-driven athlete burnout theory going forward. Indeed, the present study findings highlight the importance of monitoring sport stress and athlete burnout

simultaneously. Intervening during an athlete's high school sport career, when necessary, represents a potential means to improve the current and future psychosocial health outcomes of adolescent athletes. Secondly, study findings also correspond with self-determination theory (Deci & Ryan, 1985) approaches toward understanding the development of psychological experiences such as athlete burnout (e.g., Lonsdale et al., 2009). This motivational theory acknowledges predictors such as psychological stress, but more proximally posits the importance of athlete experiences across basic psychological needs including competence, autonomy, and relatedness in predicting athlete burnout. Self-determination theory is useful for interpreting mechanisms associated with current study findings as well as translating current data to inform future research efforts.

Sport Engagement

Study findings for sport engagement also merit consideration. Interestingly, previous high school sport engagement did not significantly contribute individually to any of the current psychosocial health outcomes assessed in the current study. This is somewhat surprising given the larger body of literature on sport engagement and its link to positive health and well-being outcomes (Hodge et al., 2009). However, the current study's findings do not dampen the importance of high school sport engagement, particularly as correlational results suggest it is associated with psychosocial outcomes when burnout and sport-related stress are not considered. One cross-sectional study should not dismiss the potential impact of engagement with both acute and longer psychosocial outcomes of study participants. Specifically, the impact of engagement on such outcomes may be most appropriately understood through its interaction (i.e., moderation effects) with other variables including participant motivation. Such findings certainly merit consideration in future research and practice efforts and are discussed in more detail below.

Practical Implications

Practitioners, including sport medicine professionals, athletic trainers, and sport psychology practitioners, can use the study findings to educate coaches, parents, and athletes on the importance of current sport participation experiences to later life outcomes of psychological and social functioning. For example, practitioners can teach these stakeholders that common strategies used to educate/coach high school athletes (i.e., modeling, reinforcement, punishment) can impact athlete psychosocial outcomes (i.e., burnout, stress engagement) during their adolescent sport participation as well as have subsequent mental health outcomes into these athletes' college years. Educating American high school coaches, for example, on the long-term implications of positive versus negative/aversive coaching methods (see Smith & Smoll, 2012 for a review of these methods) for athlete mental health may have broader impact on potential buy-in relative to the use of best practice coaching methods to support athlete psychosocial health and well-being.

Though replication of the study results using longitudinal research designs is needed, high school sport participation, marked by feeling as though one cannot cope with the pressures of their sport (i.e., sport-related stress) or the experience of emotional/physical exhaustion, reduced sense of accomplishment, as well as sport devaluation (i.e., athlete burnout) may lead to longer-term mental health decrements. This an important practical take-home of this study that should resonate with many parties interested in American high school sport including administrators, coaches, parents, and athletes themselves. Such ideas also are consistent with broader, contemporary discussions about the importance of mental health for adolescents, with youth athletes being a particular subsample of interest (Walton et al., 2021). An important area of practical interest related to this work is creating sporting environments promotive of athlete mental health disclosure (Bissett & Tamminen, 2022). Athletes tend to identify with and confide in practitioners and other support staff with whom they interact frequently (Clement & Shannon, 2011). This could be for clinical mental health concerns (e.g., anxiety, depression) or for other important but not diagnostic psychosocial issues (e.g., stress, burnout, lack of social support/engagement) that could benefit from practitioner consultation. Indeed, the study's findings offer spark for continued interest in this important topic of mental health disclosure within American high school sport.

Finally, study findings have important implications for sports medicine professionals who aid in the management of holistic athlete healthcare. For example, athletic trainers frequently are in the position to notice an athlete's altered mental health status and aid in the early identification and monitoring of heightened sport stress or burnout symptoms. Correspondingly, these individuals can make the appropriate referral so athletes can get the proper assistance needed to promote more positive sport experiences currently and, ultimately, psychosocial health outcomes long term. These implications are in line with a push for sports medicine and other sport staff, coaches, and parents to adopt a biopsychosocial view of holistic care and support for athletes (Wiese-Bjornstal, 2010).

Limitations

Study limitations also merit consideration and further discussion. First, the findings of this study are limited given its retrospective research design. Despite these limitations, use of a retrospective study design was innovative in its utilization of a task primer to elicit high school participation experiences, and each of the retrospective constructs measured for this study exhibited adequate internal consistency reliability scores in the collegiate population sampled. It is possible college students experiencing less adaptive psychological outcomes (i.e., more anxiety and depression, less social support and life satisfaction) may remember their high school sport participation psychological outcomes as less adaptive (i.e., more burnout and stress, less engagement) or vice versa. Future prospective work is needed to examine the directionality of identified associations.

Second, cross-sectional research designs are limited as causal inferences cannot be made. However, cross-sectional research studies are a critical approach to determining associative findings among study variables and across participants cross-sectionally before engaging in more highly rigorous prospective cohort design studies, which are resource-intensive and expensive. Given the inherent prospective nature of the study purpose, that is, to determine the extent to which high school sport participation is associated with later psychological health in college, the study, in consideration of its limitations, is an important first step that provides the preliminary evidence needed for further study of the longer-term implications of psychosocial experiences of sport participation including burnout, stress, and engagement. To our knowledge, it is among the first to uniquely measure high school burnout, sport stress, and engagement, retrospectively. Continued retrospective measurement validation research is warranted and represents a fruitful future research area.

Third, a variety of other personality and psychosocial factors could explain the differences in current college student psychosocial health outcomes including perfectionism, locus of control, history of stressors, and coping strategies, among others. Future work should consider a broader array of theoretically informed covariates in continuing this work, such as markers of athlete motivation, including whether and how their psychological needs are being met participating in sport (self-determination theory; Deci & Ryan, 1985), and/or relatedly, how much fun they experience participating in sport (fun integration theory; Visek et al., 2015, 2020). Fourth, our sample consisted of students within a university setting, which may not be representative of all former American high school athlete populations, including those not attending college. Fifth, the overall variance explained by the study variables was low to moderate at best, suggesting practical implications, as informed by the study findings, should be considered with caution. Sixth, and finally, the sample overwhelmingly self-identified as White. Future work assessing research questions in more diverse samples, including student-athletes of color, is critically needed. Importantly, a more diverse representation may shed greater understanding about minority and marginalized populations relative to the association of high school sport participation with college student psychological health outcomes.

Future Research Directions

Though preliminary, present study findings represent important initial data that inform and enhance the efficacy of future prospective studies that track high school athletes beyond their years of sport participation. This work could enhance the aforementioned research showcasing

potential long-term psychological benefits of sport participation by providing temporal data to enhance whether psychological responses at the time of participation (e.g., burnout, stress) may impact the degree of influence sport participation has on later life psychosocial health. Despite the lack of cross-sectional findings in the current study, foci of this work moving forward also should include engagement measures in the design of prospective studies as well as elucidating whether other positive responses to sport participation (i.e., fun/enjoyment, intrinsic motivation) may be more impactful long-term than engagement itself. This also could involve examining engagement as a potential mediator of the sport participation-psychosocial outcomes relationship. For future research, the Patient-Reported Outcomes Measurement Information System (PROMIS; Cella et al., 2010) represents a potentially useful well-being measure to monitor athletes over time. Alternatively, it may be that it is the negative psychological experiences of sport participation, like stress and burnout, which are most impactful on psychosocial health outcomes post-career. Study results, though preliminary, support this assertion, which deserves additional study using prospective designs and measures with diverse samples of former high school athletes to extend this area of research more meaningfully. Future work that involves collaborative stakeholders, including school systems, high school athletic associations, and funding agencies in community-engaged research is warranted.

Conclusion

This study's findings are novel because of the preliminary associations found for retrospective burnout, engagement, and stress with current psychosocial health outcomes. Though measured in a retrospective, cross-sectional design, our results identified these associations in a population of young adults in college, which can be a potentially stressful time including stressors of academic performance, pressure to succeed, and post-graduate plans (Beiter et al., 2015). Moreover, many Americans participate in a high school sport (National Federation of State High School Associations, 2019), making this an imperative time to intervene to promote psychosocial health later in life. In sum, this study further advances knowledge on sport participation and post-high school psychosocial health outcomes. Those invested in the experiences of athletes, including coaches, parents, and practitioners (e.g., athletic trainers, sport psychology practitioners) should consider monitoring athlete perceptions of burnout, sport stress, and engagement to aid in optimizing athlete sport experiences. The psychosocial well-being of currently competing athletes is important for its potential short-term effects on health and performance, but also for the prolonged consequences such experiences may have for overall post-high school psychosocial health and well-being.

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