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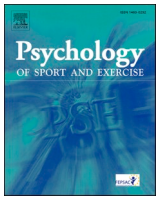

Burnout trajectories among adolescent student-athletes: The role of gender, success expectations, and parental affection

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ABSTRACT

In this longitudinal study, we examined the trajectories of sport and school burnout symptoms (exhaustion, cynicism, inadequacy) during the transition to lower secondary sport school among Norwegian student-athletes aged 13–14 years ($n = 265$; 58,5% males, 41,5% females). We also investigated how student-athletes' gender and individual success expectations, and their parents' reported levels of affection and success expectations, were associated with different burnout trajectories. Student-athletes completed associated questionnaires at the beginning and end of the first school year, while parents completed questionnaires at the end of the school year. Linear mixed models showed that sport and school burnout symptoms increased over the school year. Females reported higher baseline levels of sport burnout, and males lower baseline levels of school burnout. Low individual success expectations were associated with higher baseline levels of sport and school burnout, and increase in school burnout symptoms over time. High parental success expectations were associated with lower baseline levels of school-related exhaustion. Sport inadequacy increased for student-athletes whose parents reported either affection levels *and* success expectations that were either both high or both low. The results suggest that it is important that sport schools take the dual pressure student-athletes may experience into consideration, and provide them with adequate support during the transition to lower secondary education. In addition, interventions aimed at increasing parental knowledge of beneficial and harmful ways of involvement in student-athletes' lives are needed to facilitate student-athlete wellbeing.

Many earlier studies have shown that participation in competitive sports from an early age may protect adolescents from mental health issues and that the mental health of young athletes is often better compared to the general youth population (Kegelaers et al., 2022; Rosenvinge et al., 2018). Talented adolescent student-athletes who combine sports with education at specialized sport schools may, however, be at increased risk of burnout in sports and school due to the simultaneously increasing athletic and academic demands and expectations they experience during the transition to lower secondary sport school (Kuokkanen et al., 2022; Stambulova et al., 2021). Burnout may predict student-athletes' premature withdrawal from school and sports (Bask & Salmela-Aro, 2013; Sorkkila et al., 2019), be a risk factor for decreased engagement and achievement in sport and school (Kuokkanen, Romar, et al., 2024; Vansoeterstede et al., 2023), and be linked to mental health issues, such as anxiety and depression (Glandorf et al., 2023; Salmela-Aro, Savolainen, & Holopainen, 2009). Given the negative outcomes of burnout, it is important to prevent burnout among adolescent student-athletes and to better understand the possible risk and protective factors that affect its development. Therefore, in this longitudinal study, we examined the trajectories of sport and school burnout symptoms (exhaustion, cynicism, and inadequacy) across the first year of lower secondary sport school (Grade 8, ages 13–14). In addition, we investigated how student-athletes' gender and individual success expectations, and their parents' reported levels of affection and

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success expectations, were associated with different burnout trajectories.

1. School and sport burnout among student-athletes

School burnout is often considered a psychological syndrome or an emotional state arising from prolonged academic stress that leads to burnout over time (Salmela-Aro, Kiuru, et al., 2009). It is caused by a mismatch between a student's internal and external resources, school demands, and personal or environmental expectations of academic success (Parker & Salmela-Aro, 2011; Salmela-Aro et al., 2008). School burnout has been defined as exhaustion owing to school demands, leading to a disengaged and cynical attitude toward school and feelings of inadequacy as a student (Kiuru et al., 2008). Exhaustion at school manifests in school-related feelings of strain, particularly chronic fatigue due to overtaxing schoolwork and high academic pressure. Cynicism manifests in an indifferent or distant attitude toward general schoolwork, a loss of interest in schoolwork, and not seeing school as meaningful. Inadequacy refers to a student's diminished sense of competence, achievement, and accomplishment. Earlier studies have shown that around 10–35% of the adolescent student-athlete population experiences school burnout symptoms in lower secondary school and at the beginning of upper secondary education (Kuokkanen et al., 2022; Saarinen et al., 2024; Sorkkila et al., 2017).

In addition to school settings, earlier studies have shown that the pressure associated with competitive sports and progressively increasing training loads may also predispose young athletes to sport burnout (Gustafsson et al., 2018). In the dual career context, sport burnout has been defined as a multidimensional construct encompassing the same constructs as school burnout, including physical and emotional exhaustion in response to intensified sport demands, cynical devaluation of sports, and a reduced sense of sport accomplishment and competence (Raedeke & Smith, 2001). Earlier studies have shown that around 10% of adolescent student-athletes in lower secondary sport schools experience symptoms of sport burnout, and that the numbers have increased in recent years (Gustafsson et al., 2007; Madigan et al., 2022; Saarinen et al., 2024).

Most previous research on burnout among student-athletes has been cross-sectional; thus, little is known about its development across school years, especially during lower secondary education (Kuokkanen et al., 2022; Vansoeterstede et al., 2023). Earlier research examining stability and change in school burnout has shown that burnout symptoms tend to increase, especially during educational transitions (Salmela-Aro & Upadyaya, 2014; Wang et al., 2015) and over the course of lower secondary grades (Parviainen et al., 2021). Earlier studies focusing on sport burnout trajectories have considered student-athletes at the upper secondary level and they have shown that overall levels of sport burnout tend to increase across the years in upper secondary school (Aunola et al., 2018; Sorkkila et al., 2019). Less is known about student-athletes' sport burnout trajectories in lower secondary school. In Norway, as in many European countries, student-athletes experience the first major educational transition during adolescence around the age of 13, when they transition from primary school to lower secondary school. At the same time, student-athletes experience a sport-related transition from children's sports to more competitive youth sports, which is marked by a shift from play and inclusivity to increased training intensity, competition, and responsibility and the introduction of results ranking, (Bentzen et al., 2021; Kristiansen & Stensrud, 2020). As student-athletes face increasing academic demands, new social environments at school, competitive pressure, and ever-growing sport training loads, they also need to develop new coping skills to manage these challenges. (Kuokkanen, Romar, et al., 2024; Stambulova et al., 2021; Stambulova & Wylleman, 2019). This makes the transition particularly challenging for them. In addition, student-athletes may experience increasing social comparison and competition and high school, parental, and personal expectations of achievement and success after being selected to a be a student in a sport school (Øydna et al., 2024).

2. Demands–resources model of sport and school burnout

Demands–resources theory (Demerouti et al., 2001; Salmela-Aro & Upadyaya, 2014) offers a novel tool to understand the development of burnout in sport school contexts (Kuokkanen, Saarinen, Phipps, et al., 2024). According to this theory, environments such as sport schools involve both demands and resources (Hauser et al., 2022). Demands imposed by the environment (e.g., training hours, exams, and social pressure) require sustained physical and/or psychological (cognitive and emotional) effort from individuals and are associated with certain psychological and/or physiological costs, such as increased strain and, if prolonged, burnout. However, resources (e.g., positive self-evaluation and competence beliefs, social support, and autonomy) may function as buffers against burnout. For student-athletes, individual and environmental resources and demands tend to play a crucial role in determining outcomes, such as burnout (Sorkkila et al., 2020; Thompson et al., 2022). The balance between demands and resources is assumed to be context-specific and to differ between sports and school (Kuokkanen, Romar, et al., 2024).

Demands–resources theory has recently been applied to educational and sport school contexts based on the assumption that student-athletes, like adults, encounter diverse study-related demands (e.g., due to learning activities, time pressures, and achievement expectations) but also possess personal and contextual resources (Kuokkanen, Romar, et al., 2024; Lesener et al., 2020; Salmela-Aro & Upadyaya, 2014). In school and sports, burnout may emerge as a negative response to student-athletes' ongoing difficulties in coping with school- and sport-related pressures (Fiorilli et al., 2017; Walburg, 2014).Thus, burnout in sport and school can be seen as a stress response resulting from an imbalance between students' personal and environmental resources and their own or others' (e.g., parents', peers', coaches', and teachers') expectations and demands for school and sport success (Demerouti et al., 2001; Lesener et al., 2020).

3. Role of student-athletes' gender

Earlier studies have shown that gender may be linked to student-athletes' burnout symptoms due to the increased societal expectations female student-athletes face to excel in both sport and school (Kuokkanen, Saarinen, Romar, et al., 2024; Ryba et al., 2021). Although Sorkkila et al. (2017) and Kuokkanen et al. (2022) in their cross-sectional studies found no gender differences in overall sport and school burnout symptoms among student-athletes, Saarinen et al. (2024) noted that females were more likely than males to experience sport burnout symptoms. Isoard-Gautheu et al. (2015) examined sport burnout trajectories and observed that sport devaluation increased, especially among female athletes, across lower secondary school years. A recent review of school burnout trajectories showed that female students tend to experience more severe school burnout symptoms, especially exhaustion and inadequacy, than males (Vansoeterstede et al., 2023), while male students may experience more school-related cynicism (Parviainen et al., 2021; Salmela-Aro & Upadyaya, 2017). Given that almost no research has considered gendered changes in sport burnout trajectories among student-athletes, there is a need to better understand how gender determines the development of sport and school burnout trajectories across lower secondary sport schools.

4. Role of student-athletes' success expectations

In addition to gender, student-athletes' individual success expectations (Flett & Hewitt, 2005; Sorkkila et al., 2017), defined as an adaptive achievement strategy according to which an individual expects to succeed in or master the task and is not overly apprehensive of failure, are a particularly important factor influencing student-athletes' wellbeing in

the competitive sport school environments (Nurmi et al., 1995; Sorkkila et al., 2017). Indeed, if an individual anticipates failure when facing a challenging task and tends to avoid it, this may lead to emotional problems, particularly during adolescence and in competitive sport schools, where students are expected to develop new skills and are compared against each other (Anttila et al., 2023). Individuals' expectations for success in different achievement situations are reflected in their behavior, and those with high success expectations tend to employ active, task-focused strategies - that is, when facing challenges, they actively approach the task rather than avoid it (Anttila et al., 2023; Nurmi et al., 2003). High expectations of success have often been shown to be negatively related to sport burnout (Lemyre et al., 2008). Along similar lines, many recent studies, although not directly measuring success expectations, have shown that adaptive achievement strategies, such as pursuing mastery goals (Ingrell et al., 2019; Sorkkila et al., 2018), are negatively related to sport burnout, whereas task-avoidance strategies, such as fear of failure, are positively related (Gustafsson et al., 2017). Concerning student-athletes, Sorkkila et al. (2017) showed that high individual success expectations can protect against burnout in one domain (school or sports) but increase the likelihood of burnout in the other domain. However, because all previous studies have been cross-sectional, more longitudinal research on the associations between individual success expectations and the development of sport and school burnout symptoms is needed.

5. Role of parental affection

In addition to social agents in sport school environments, such as coaches, teachers, and peers, parental support is a key resource that helps adolescent student-athletes balance athletic and academic stressors, thereby preventing the onset of burnout (Henriksen et al., 2020; Kim et al., 2018; Knight et al., 2018; Tessitore et al., 2021). According to Baumring's (1966) traditional parenting style paradigm, one of the most important aspects of parental behavior for fostering adolescent well-being is parental affection, characterized by responsiveness, warmth, involvement, supportiveness, and acceptance (Aunola & Nurmi, 2005). A large body of research has shown that parental affection (i.e., the degree to which parents emotionally support their adolescents and provide them with warmth (Wouters et al., 2013); is the most important parenting factor for facilitating healthy adolescent development and well-being (Aunola et al., 2018; Saarinen, Tolvanen, et al., 2023; Upadyaya & Salmela-Aro, 2013; Vansoeterstede et al., 2023). A longitudinal study conducted by Aunola et al. (2018) showed that mothers' high levels of affection protected student-athletes against increasing school burnout, whereas fathers' affection was associated with low levels of sport burnout symptoms during the first year of upper secondary sport school. Similarly, Duineveld et al. (2017) found that parental affection protected against increasing school-related exhaustion across school years in lower secondary school. Although parental support and affection are considered especially important during educational transitions from primary school to lower secondary, no earlier researchers have examined the role of parental affection in the development of adolescent sport and school burnout symptoms in lower secondary sport schools (Gustafsson et al., 2016; Marion et al., 2014). In addition, the extent to which parental affection is associated with the different components of sport and school burnout (exhaustion, inadequacy, and cynicism) needs to be further clarified (for a review, see Vansoeterstede et al., 2023).

6. Role of parental success expectations

Another aspect of parenting that particularly affects adolescent burnout symptoms in competitive sport school contexts is parental success expectations. Earlier studies have shown that high parental expectations concerning adolescents' achievement and success in sports can increase their burnout symptoms (Flett & Hewitt, 2005; Gustafsson et al., 2016). Similarly, in school contexts, parental pressure and expectations of success may also contribute to students experiencing stress and burnout (Vansoeterstede et al., 2023). Although parental success expectations can be perceived as pressuring, earlier research has shown that they can also be supportive; that is, by conveying high expectations, parents express belief in their children's abilities to succeed (Ommundsen et al., 2006). More specifically, although pressure arises from what parents expect children "should do," success expectations relate to what parents expect children "can do". Regarding student-athletes, Sorkkila et al. (2017) showed in a cross-sectional study that high parental sport or school expectations were associated with low levels of burnout symptoms in the same domains. However, high sport or school expectations seemed to increase the likelihood of burnout in the other domain. Following Sorkkila et al.'s (2017) reasoning, in the present study, we conceptualized parental expectations of success as the extent to which parents believe in their children's abilities to achieve success in sport and school.

In terms of the development of burnout symptoms, it is plausible that parental affection and success expectations may have interactive effects on burnout trajectories. Indeed, student-athletes whose parents report high levels of both affection and success expectations may be particularly likely to report decreasing burnout symptoms over time (Aunola et al., 2018; Sorkkila et al., 2017) due to the emotional support and encouragement they receive from their parents. However, no earlier studies have longitudinally examined the association between parental affection and success expectations and the changes of sport and school burnout trajectories.

7. The present study

In the present study, we examined the trajectories of sport and school burnout symptoms (exhaustion, cynicism, and inadequacy) across the first year of lower secondary education (Grade 8, ages 13–14). In addition, we investigated how student-athletes' gender and individual success expectations, and their parents' reported levels of affection and success expectations, were associated with different burnout trajectories. The research was based on the following hypotheses (Hs):

H1. Sport and school burnout, particularly inadequacy and exhaustion, increase during the first year of lower secondary sport school (ages 13–14 years) due to simultaneously increasing academic and athletic demands (Parviainen et al., 2021; Sorkkila et al., 2019).

H2. Female student-athletes experience upward burnout trajectories during the first year of lower secondary sport school (Isoard-Gautheu et al., 2015; Vansoeterstede et al., 2023).

H3. Student-athletes with high success expectations report low initial levels of burnout symptoms and are less likely to report increasing burnout symptoms during the first year of lower secondary sport school (Sorkkila et al., 2017).

H4. Student-athletes who report high levels of (H4a) parental affection and (H4b) success expectations are less likely to report upward trajectories in burnout symptoms during the first year of lower secondary sport school (Aunola et al., 2018; Gustafsson et al., 2016; Sorkkila et al., 2017).

H5. Parental affection and parental success expectations interactively affect burnout trajectories (i.e., student-athletes whose parents report high levels of both affection and success expectations are particularly likely to report decreasing burnout over time) (Aunola et al., 2018; Gustafsson et al., 2016).

8. Methods

8.1. Norwegian sport school context

We conducted the present study in Norway, where compulsory basic education lasts for nine years and consists of primary education (Grades 1–7, ages 6–12 years) and lower secondary education (Grades 8–10, ages 13–15 years). Talented, elite young athletes often choose to pursue lower secondary education (Grades 8–10, ages 13–15 years) in lower secondary sport schools that facilitate the structural combination of sports and school in cooperation with national sporting bodies, thereby being characterized as elite sport schools (Morris et al., 2021). These schools, although operating as private institutions, receive 85% of their funding from the government, while the remaining 15% are funded by tuition fees paid by children's guardians. While adhering to the standard lower secondary school curriculum, they offer tailored daily training sessions to enhance students' general athletic abilities and sport-specific skills. Furthermore, sport schools integrate specialized coursework on topics related to health and performance development. Currently, the Norwegian Directorate for Education and Training recognizes 23 specialized sport schools across the country, with a total school population of over 4000 students. The admission procedure for sports schools is competitive, and schools assess students using physical aptitude tests to identify applicants with the highest sport developmental potential.

8.2. Participants and procedure

This study is part of an ongoing longitudinal mixed-methods research project Student-athletes' mental and psychosocial health and wellbeing, sport injuries and growth in secondary school sport classes, the aim of which is to examine mental health and well-being, sport-related injuries, and growth and maturation among student-athletes throughout their years in lower secondary sport schools. We collected data from 265 student-athletes at the beginning of the first year of lower secondary school (Time 1; September, Grade 8, aged 13–14, 58,5% males, 41,5% females). Follow-up data was collected at the end of the first year of lower secondary school, although 63 participants did not attend the Time 2 data collection (Time 2; June, Grade 8, aged 13–14, $n = 202$; 53.0% males, 47% females). We collected data on sport and school burnout both time points and data on student-athletes' individual success expectations at Time 2. Mothers' and fathers' parenting behaviors and beliefs, including affection and sport and school success expectations were assessed at Time 2 using related questionnaires. A total of 203 parents completed and returned the questionnaire. All 23 lower secondary sport schools were invited to participate in the project. Participants were recruited from nine different lower secondary sport schools where both school and parental consent had been obtained: three in Western Norway, two in Northern Norway, two in Southern Norway, and two in Central Norway. The participating student-athletes competed in various team sports (e.g., football or handball) and individual sports (e.g., cross-country skiing or athletics) at various levels (i.e., regional, national, or international). The participants reported spending approximately 15–20 h per week with their sport trainings or competitions.

The Regional Committee for Medical and Health Research Ethics in Southeast Norway approved the data collection procedure for this longitudinal study in March 2023 (decision number 601030) before participant recruitment commenced. We contacted the participating schools through the school administrators (athletic directors and head teachers). Prior to data collection, we informed all participants of their rights, and they provided their written consent to voluntarily participate in the study. We conducted the study according to the Declaration of Helsinki and § 17 of the Norwegian Act on Medical and Health Research (Health Research Act, 2008). Adolescents aged under 16 years had to provide evidence of parental permission before we started the data collection. The data and data analysis codes are available from the first author (name anonymized for review purposes) upon reasonable request.

Measurements.

8.3. Sport burnout

We measured sport burnout using the Sport Burnout Inventory Dual Career Form (Sorkkila et al., 2020), which is an optimal tool for measuring sport burnout in dual career contexts. The scale comprises 10 items, 4 of which measure sport-related exhaustion (e.g.,"I often sleep poorly because of matters related to my sport"), 3 measure cynicism regarding the meaningfulness of one's sport (e.g., "Sport doesn't interest me anymore"), and 3 measure feelings of inadequacy as an athlete (e.g., "I used to achieve more in my sport"). We rated all items using a 5-point Likert scale (1 = completely disagree to 5 = completely agree).

8.4. School burnout

We measured school burnout using the School Burnout Inventory (Salmela-Aro, Kiuru, et al., 2009), which comprises 10 items, 4 of which measure exhaustion at school (e.g. "I often sleep poorly because of matters related to my schoolwork"), 3 measure cynicism regarding the meaningfulness of school (e.g., "School doesn't interest me anymore"), and 3 measure feelings of inadequacy as a student (e.g., "I used to achieve more in school"). We rated all items using a 5-point Likert scale (1 = completely disagree to 5 = completely agree).

8.5. Sport success expectations

We measured student-athletes' sport success expectations using the Success Expectations Scale, which is a subscale of the Strategy and Attribution Questionnaire (Nurmi et al., 1995). The scale was modified to dual carer context by Sorkkila et al. (2017). The scale measures the extent to which one expects to succeed in a task and is not unduly apprehensive of failure. The scale was modified to fit the sport context, and it comprised three items (e.g., "When I enter competitions, I usually expect that I will succeed") rated on a 4-point Likert scale (1 = completely disagree to 4 = completely agree).

8.6. School success expectations

We measured student-athletes' school success expectations similarly using the Success Expectations Scale (Nurmi et al., 1995), which was modified for the school context and previously adapted to dual career context by Sorkkila et al. (2017). The scale comprised three items (e.g., "When I take exams, I usually expect that I will succeed") rated on a 4-point Likert scale (1 = completely disagree to 4 = completely agree).

8.7. Parental affection

We measured parental affection using Block's Child-Rearing Practices Report (Aunola & Nurmi, 2005; Roberts et al., 1984), which includes items regarding child-rearing attitudes, values, and behaviors. We calculated summary scores for parental affection for all parents based on 10 items that reflected a parent's positive relationship with an adolescent (e.g., "I often tell my child that I appreciate what he/she tries out or achieves"; "I often show my child that I love him/her"). We rated parents' responses using a 5-point Likert Scale (1 = not like me at all to 5 = very much like me).

8.8. Parents' sport success expectations

We measured parental sport success expectations using a modified version of the parental beliefs questionnaires developed by Frome and Eccles (1998). which had been modified by Sorkkila et al. (2017) to apply to the dual career context. The scale comprises three items (e.g., "How well do you think your child will do at sport later on?") rated on a

4-point Likert scale (1 = not very well to 4 = very well).

8.9. Parents' school success expectations

We measured parents' school success expectations using a modified version of the parental beliefs questionnaires developed by Frome and Eccles (1998), which had been modified by Sorkkila et al. (2017) to apply to the dual career context. The scale comprises two items for measuring general school beliefs (e.g., "In general, how well do you think your child will do at school later on?") and four items for measuring skill-specific school beliefs (e.g., "How well do you think your child will do in math later in school?") rated on a 4-point Likert scale (1 = not very well to 4 = very well). We calculated an overall score based on the sum of the general and skill-specific beliefs to indicate parents' school success expectations.

8.10. Data analysis

We analyzed the data using a random-intercept linear mixed model and the GAMLj3 package. We specified the model as a random effects maximum likelihood estimator with Wald confidence intervals and probed significant interaction effects ($p < .05$) using simple effects analysis. We imputed missing data using the random forest method with 10 imputations via the MICE package in R.

9. Results

Zero-order correlations, reliability statistics from the current sample, and descriptive statistics are presented in Table 1. Where the follow-up or parental data were missing, Little's test indicated data was missing completely at random ($\chi^2(82) = 94.81$, $p = .158$), indicating their viability for imputation and thus all 265 participants were retained for analysis.

Table 2 presents the detailed parameter estimates for each model. The model predicting sport-related exhaustion explained a significant portion of the variance when accounting for both fixed effects and random variation in the intercepts (conditional $R^2 = .629$, conditional $\chi^2(11) = 184.77, p <. 001$) and for fixed effects alone (marginal $R^2 = .062$, marginal $\chi^2(10) = 31.97, p < .001$). Intercept levels of sport exhaustion were not predicted by parental affection, parental success expectations, or children's success expectations, but they were higher in females than in males. The levels of exhaustion increased over time, but change over time was not influenced by gender, student-athletes' success expectations, parental affection, parental success expectations, or the interaction between parental affection and success expectations.

The model predicting sport-related cynicism explained a significant portion of the variance when accounting for both fixed effects and random variation in the intercepts (conditional $R^2 = .573$, conditional $\chi^2(11) = 157.06, p < .001$), and for fixed effects alone (marginal $R^2 = .088$, marginal $\chi^2(10) = 34.92, p < .001$). The intercept level of cynicism was higher in females than in males and lower in student-athletes with high success expectations, but it was not associated with parental success expectations or parental affection. Change in cynicism over time did not differ significantly from zero, nor was it predicted by gender, student-athletes' success expectations, parental success expectations, parental affection, or the interaction between parental affection and success expectations.

The model predicting feelings of inadequacy in sport explained a significant portion of the variance when accounting for both fixed effects and random variation in the intercepts (conditional $R^2 = .591$, conditional $\chi^2(11) = 175.13$, $p < .001$), as well as fixed effects alone (marginal $R^2 = .109$, marginal $\chi^2(11) = 47.30, p < .001$). The intercept level of inadequacy was higher in females than in males and in student-athletes with low success expectations, but it was not associated with parental affection or success expectations. Although we observed no main effects of time, there was a significant three-way interaction

Table 1
Zero-order correlations, reliability statistics, and descriptive statistics.

	1	2	3	4	5	6	7	8	10	11	12	13	14	15	16	17
1. T1 School Exhaustion	–															
2. T1 School Cynicism	.60***	–														
3. T1 School Inadequacy	.63***	.65***	–													
4. T1 Sport Exhaustion	.35***	.30***	.35***	–												
5. T1 Sport Cynicism	.24***	.21***	.23***	.50***	–											
6. T1 Sport Inadequacy	.42***	.35***	.48***	.63***	.52***	–										
7. T2 School Exhaustion	.57***	.38***	.36***	.34***	.18**	.31***	–									
8. T2 School Cynicism	.34***	.56***	.46***	.24***	.18*	.29***	.47***	–								
9. T2 School Inadequacy	.41***	.41***	.54***	.32***	.12	.36***	.57***	.62***	–							
10. T2 Sport Exhaustion	.41***	.28***	.38***	.56***	.18**	.39***	.51***	.37***	.44***	–						
11. T2 Sport Cynicism	.33***	.28***	.30***	.36***	.46***	.38***	.32***	.32***	.33***	.52***	–					
12. T2 Sport Inadequacy	.28***	.29***	.46***	.39***	.18*	.50***	.29***	.37***	.42***	.54***	.56***	–				
13. Parental Affection	−.02	.08	.00	.05	.03	.00	−.04	.07	−.04	.02	.05	.00	–			
14. Parental Sport Expectations	.06	.07	−.01	.00	−.18*	−.13	.07	.02	.00	.06	−.12	−.12	.15	–		
15. Parental School Expectations	−.21**	−.16*	−.22**	.04	−.08	−.05	−.18*	−.18*	−.27***	−.04	−.12	.13	.10	.20*	–	
16. Child Sport Expectations	.01	−.08	−.10	−.15*	−.16*	−.20**	−.03	−.12*	−.09	−.11	−.32***	−.33***	−.04	.22**	−.06	–
17. Child School Expectations	−.14*	−.18*	−.21**	−.06	−.05	−.06	−.28***	−.35***	−.43***	−.14*	−.17**	−.18***	−.05	−.01	.44***	.26***
M	2.17	2.53	2.42	1.93	1.35	2.17	2.37	2.86	2.63	2.11	1.45	2.27	4.36	3.34	3.27	3.17
SD	.93	.98	.95	.77	.60	.91	.96	1.05	.99	.84	.64	.87	.36	.43	.42	.45
ω	.86	.82	.75	.73	.77	.74	.83	.83	.75	.71	.80	.68	.78	.70	.83	.61

Note. * = $p < .05$. ** = $p < .01$, *** = $p < .001$. ω = McDonald's omega internal consistency statistic.

Table 2
Parameter estimates for mixed models predicting student athletes' burnout and change due to parental Characteristics.

	Intercept	Time	Gender	Student Athlete Success Expectations	Parental Expectations	Parental Affection	Time by Gender	Time by Student Athlete Success Expectations	Time by Parental Success Expectations	Time by Parental Affection	Time by Parental Expectations via Parental Affection
Sports Exhaustion											
B	2.01***	.13**	.31***	−.22	.10	−.02	.14	.14	.00	−.12	.56
SE	.04	.04	.09	.11	.10	.11	.09	.11	.13	.14	.37
p	<.001	.005	<.001	.057	.335	.824	.128	.217	.995	.413	.134
Sports Cynicism											
B	1.38***	.03	.21**	−.26**	−.14	−.01	.04	−.16	.06	−.03	.08
SE	.03	.04	.06	.08	.08	.08	.07	.09	.10	.11	.29
p	<.001	.354	.002	.002	.067	.906	.577	.068	.532	.778	.796
Sports Inadequacy											
B	2.23***	.08	.31**	−.50***	−.09	−.08	.16	−.16	.06	−.06	1.01*
SE	.05	.05	.10	.12	.11	.12	.11	.13	.15	.16	.43
p	<.001	.148	.001	<.001	.442	.533	.134	.235	.681	.732	.019
School Exhaustion											
B	2.27***	.16**	.23*	−.38**	−.27*	−.06	.03	−.30*	.25	−.11	.30
SE	.05	.05	.10	.12	.14	.13	.11	.12	.16	.17	.42
p	<.001	.003	.025	.002	.048	.654	.800	.015	.124	.517	.487
School Cynicism											
B	2.69***	.27***	.04	−.43***	−.17	.18	−.01	−.28*	.11	.04	.65
SE	.06	.06	.11	.13	.15	.14	.11	.13	.17	.18	.44
p	<.001	<.001	.751	<.001	.239	.180	.933	.029	.512	.840	.138
School Inadequacy											
B	2.51***	.14*	.23*	−.57***	−.23	.01	−.09	−.33*	.03	.17	.49
SE	.05	.05	.10	.12	.14	.13	.11	.12	.16	.17	.42
p	<.001	.011	.023	<.001	.097	.941	.386	.008	.841	.335	.247

Note. * = $p < .05$. ** = $p < .01$, *** = $p < .001$.

Table 3
Simple Slope estimates for change over time in student-athletes' feelings of sport inadequacy as a function of parenting Characteristics.

Parental Affection	Parental Success Expectations	*B*	*SE*	LLCI	ULCI	*p*
M-1SD	M-1SD	.18	.10	−.01	.37	.062
	Mean	.05	.07	−.09	.19	.486
	M+1SD	−.08	.11	−.29	.13	.462
Mean	M-1SD	.09	.07	−.05	.23	.215
	Mean	.07	.05	−.03	.17	.161
	M+1SD	.05	.07	−.09	.20	.459
M+1SD	M-1SD	.00	.11	−.21	.21	.999
	Mean	.09	.07	−.05	.24	.208
	M+1SD	.19	.10	.00	.38	.049

Note. M-1SD = the effect of time on sports inadequacy at one standard deviation below the mean. M+1SD = the effect of time at one standard deviation above the mean. LLCI = the lower-bound 95% confidence interval. ULCI = the upper-bound 95% confidence interval.

between time, parental success expectations, and parental affection. Unpacking this interaction with simple effects analysis (see Table 3) showed that feelings of inadequacy in sport increased most in student-athletes whose parents reported both low levels of affection and low success expectations or high levels of affection and high success expectations, but not in other combinations of success expectations and parental affection.

The model predicting exhaustion in school explained a significant portion of the variance when accounting for both fixed effects and random variation in the intercepts (conditional $R^2 = .609$, conditional χ^2 (11) = 181.23, $p < .001$) and when accounting for fixed effects alone (marginal $R^2 = .085$, marginal χ^2 (10) = 41.92, $p < .001$). Intercept levels of school exhaustion were lower in males than in females, and in those with higher student-athlete or parental success expectations, but they were not associated with parental affection. School-related exhaustion increased over time, but school-related exhaustion trajectories were not associated with gender, parental success expectations, parental affection, or the interaction between parental affection and success expectations. However, we observed a significant effect of student-athletes' success expectations on change over time, as exhaustion increased more rapidly in student-athletes with low ($B = .31$, $SE = .08$, $p < .001$) or mean levels of success expectations ($B = .17$, $SE = .05$, $p = .002$), but not in those with high success expectations ($B = .02$, $SE = .08$, $p = .800$).

The model predicting school-related cynicism explained a significant portion of the variance when accounting for both fixed effects and random variation in the intercepts (conditional $R^2 = .637$, conditional χ^2 (11) = 193.92, $p < .001$) and fixed effects alone (marginal $R^2 = .079$, marginal χ^2 (10) = 49.75, $p < .001$). A lower intercept level of school-related cynicism was predicted by high student success expectations but not gender, parental success expectations, or parental affection. School-related cynicism increased over time. Rate of change was not predicted by gender, parental success expectations, parental affection, or the interaction between parental affection and success expectations. However, we observed a significant effect of student-athletes' success expectations on change over time, as cynicism increased more rapidly in those with low ($B = .41$, $SE = .08$, $p < .001$) or mean levels of success expectations ($B = .27$, $SE = .06$, $p < .001$), but not in those with high success expectations ($B = .13$, $SE = .08$, $p = .096$).

The model predicting feelings of inadequacy in school explained a significant portion of the variance when accounting for both fixed effects and random variation in the intercepts (conditional $R^2 = .624$, conditional χ^2 (11) = 203.62, $p < .001$) and fixed effects alone (marginal $R^2 = .126$, marginal χ^2 (10) = 57.43, $p < .001$). Intercept feelings of inadequacy about school were higher in females than males, and when student success expectations were low, but they were not associated with parental success expectations or parental affection. Feelings of school-related inadequacy increased over time, but changes were not associated with gender, parental success expectations, parental affection, or the interaction between parental affection by and parental success expectations. However, we observed a significant effect of student-athletes' success expectations on change over time, as inadequacy increased more rapidly in student-athletes with low ($B = .29$, $SE = .08$, $p < .001$) or mean levels of success expectations ($B = .14$, $SE = .05$, $p = .012$), but not in those with high success expectations ($B = -.02$, $SE = .08$, $p = .769$).

10. Discussion

In the present study, we examined the trajectories of sport and school burnout symptoms (exhaustion, cynicism, and inadequacy) across the first year of lower secondary education in student-athletes (Grade 8, ages 13–14 years). In addition, we investigated how student-athletes' gender and individual success expectations, and their parents' reported levels of affection and success expectations, were associated with different burnout trajectories. The results showed that the levels of sport-related exhaustion and all dimensions of school burnout increased over time, highlighting the challenging nature of the educational and athletic transition involving growing school and sport demands and adjusting to new social environment (Bentzen et al., 2021; Kristiansen & Stensrud, 2020). Gender differences in the baseline levels of burnout were observed: Female student-athletes reported higher levels of all dimensions of sport burnout and school-related feelings of inadequacy. Males, in turn, reported lower levels of school-related exhaustion. This highlights that the transition to lower secondary sport school may be especially challenging for females in relation to the sport-related adjustment. Similarly, low individual success expectations were associated with higher baseline levels of burnout in both sports and school and with an increase of school burnout symptoms over time (Sorkkila et al., 2017). The finding that baseline levels of school-related exhaustion were lower for student-athletes with high parental expectations of school success shows that parental involvement may be an important environmental resource against school burnout at the beginning of lower secondary school (Demerouti et al., 2001; Lesener et al., 2020). Lack of parental support or potentially too intense involvement in sport, in turn, seems to resemble a situation where there is a mismatch between student-athletes' needs and environmental resources, as the feelings of inadequacy in sport increased for student-athletes whose parents reported either low levels of affection and low success expectations, or high levels of affection and high success expectations (Aunola et al., 2018).

According to the demands–resources model (Demerouti et al., 2001; Salmela-Aro & Upadyaya, 2014), our first hypothesis (H1) stated that sport and school burnout, particularly exhaustion and inadequacy, would increase over time among student-athletes due to simultaneously increasing academic and athletic demands (Sorkkila et al., 2019). This hypothesis was partially supported, as the levels of sport-related exhaustion, and all dimensions of school burnout, increased over time in the whole sample. The finding that both sport- and school-related exhaustion increased over time shows that the transition to lower secondary sport school is challenging and that several overlapping stressors (the more competitive training environment, the increasing training load, larger classes, and more responsibility and autonomy for one's own academic development (Bentzen et al., 2021; Kristiansen & Stensrud, 2020); may exceed student-athletes' available resources for coping with these demands, ultimately putting them at risk of stress and exhaustion. The question of why cynicism and feelings of inadequacy increased in school, but not in sport, is interesting. It is possible that sports are more rewarding for this age group of student-athletes, while managing school is important but perhaps not as enjoyable as sport (Kuokkanen et al., 2022; Ryba et al., 2021). In addition, many student-athletes tend to prioritize sports over school, which may, especially during a transition period when the academic demands increase, decrease their motivation to achieve academically and thus be linked to increased feelings of cynicism and inadequacy (Stambulova et al., 2015). As Norwegian lower secondary sport schools are private institutions with a strong focus on athletic development, one possible explanation might be that students are not provided with adequate resources to effectively balance the increasing athletic and academic demands in these environments. (Storm et al., 2021; Øydna et al., 2024).

Second, we expected (H2) that female student-athletes would exhibit upward burnout trajectories (Isoard-Gautheu et al., 2015; Vansoeterstede et al., 2023). This hypothesis was partially supported, as only baseline differences were observed, with female student-athletes reporting higher levels of all dimensions of sport burnout and school-related feelings of inadequacy at Time 1 (at the beginning of Grade 8). In addition, males simultaneously reported lower levels of school-related exhaustion. This finding shows that the gendered expectations for dual career pathways may already be visible at the beginning of the lower secondary sport school (Ryba et al., 2021): Earlier research has shown that male student-athletes are often more relaxed regarding their school-related achievement (Kavoura & Ryba, 2020; Löfstedt et al., 2019). Especially in sport school contexts that involve many competing interests, males may often be more interested in sports than in school, which may diminish school-related stress and pressure (Saarinen, Ryba, et al., 2023). The finding that females had higher baseline levels of burnout also suggests that the early months of secondary education and adjustment to lower secondary sport school can be particularly challenging for female student-athletes. Although a large body of prior research has shown that female student-athletes are often expected to invest in both sport and education more than males (Kuokkanen, Saarinen, Romar, et al., 2024; Saarinen, Ryba, et al., 2023), our finding highlights a probable mismatch between female student-athletes' needs and the resources provided by sport schools to help them balance these two domains. One tentative explanation for this can be that the majority of students in lower secondary sports schools in Norway are male, and as a result, the female students might not feel comfortable in these male-dominated environments (Persson, 2023; Saarinen, Ryba, et al., 2023). Similarly, the sport schools might not be adequately equipped or fully aware of the challenges their female student-athletes face.

Third, according to H3, we expected that student-athletes with higher success expectations would report lower initial levels of burnout symptoms and would be less likely to report increased burnout symptoms during the first year of lower secondary school (Lemyre et al., 2008; Sorkkila et al., 2017). This hypothesis was supported, as the baseline levels of sport-related cynicism and feelings of inadequacy were lower for student-athletes with higher individual sport success expectations. In the school domain, lower individual success expectations were not only associated with the baseline levels of all dimensions of burnout but were also associated with change, as burnout symptoms increased more rapidly for those with low or mean levels of school success expectations. This result suggests that higher success expectations may be an individual resource for student-athletes that facilitates a successful transition to lower secondary sport school (Stambulova et al., 2021). Indeed, high competence beliefs and adoption of mastery-oriented strategies when facing a challenging task rather than avoiding it seems to protect adolescents from experiencing burnout, especially in school work (Nurmi et al., 2003). It is important for the sport schools to take this finding into consideration and teach the students to focus on their own improvement and mastery of the tasks, rather than focusing on the competition or outperforming others. One tentative explanation for why higher success expectations where especially important in school could be the difference in the domains: school is a compulsory aspect of life for adolescent athletes which cannot be skipped. Thus, not expecting to succeed in it or avoiding challenging tasks might lead to a cumulative cycle where one failure leads to another, increasing the likelihood of feelings of cynicism and inadequacy, for example (Eccles & Wigfield, 2020).

According to H4, we expected that student-athletes who reported higher levels of parental affection (H4a) and success expectations (H4b) would be less likely to report upward trajectories in burnout symptoms during the first year of lower secondary sport school (Aunola et al., 2018; Sorkkila et al., 2017). The results did not support H4a, as parental affection was not associated with baseline levels of burnout or changes in burnout symptoms over time. Although this was not expected, it should be noted that the burnout levels in the sample were modest and below the cut-off point for severe burnout (Pires et al., 2024). It is possible that parental affection would have influenced burnout

trajectories if the student-athletes had demonstrated more severe levels of burnout.

Partly supporting H4b, baseline levels of school-related exhaustion were lower for student-athletes whose parents reported higher school success expectations. This suggests that parents who have higher success expectations for their children may be more engaged in their schooling and provide them with both practical and emotional support with schoolwork, such as help with homework and support with school-related issues and challenges. Earlier studies have shown that parental involvement is a key environmental resource that protects adolescents from school-related stress and exhaustion (Aunola et al., 2018; Knight et al., 2018). This also suggests that parental success expectations are positive rather than negative and, indeed, might indicate parental support in the school context (Sorkkila et al., 2017). Although not directly measuring success expectations, studies in educational contexts have consistently shown that social support from parents is associated with lower levels of exhaustion in school (Duineveld et al., 2017; Virtanen et al., 2020).

According to H5, we expected parental affection and success expectations to interactively affect burnout trajectories, meaning that student-athletes whose parents reported higher levels of both affection and success expectations would be particularly likely to report decreasing burnout over time. This hypothesis was not supported, as feelings of inadequacy in sport increased for student-athletes whose parents reported both lower levels of affection and lower success expectations, or higher levels of affection and higher success expectations. This interesting finding can be explained in multiple ways. First, it is possible that lower levels of parental affection combined with low sport success expectations reflect parents' lack of interest in their children's sporting achievement, which, in turn, due to the lack of environmental support, increases the student-athletes' feelings of inadequacy (Aunola et al., 2018). Second, high affection and success expectations may reflect parents' excessive involvement in their children's sports, meaning that they are "too involved" and might place great pressure on them. This may diminish student-athletes' feelings of autonomy and sense of control, and thus be linked to increased burnout symptoms (Aunola & Nurmi, 2005). Too high involvement may be especially detrimental during adolescence, when student-athletes become more autonomous and are expected to develop their own meaningful ways of engaging in sport (Aunola et al., 2018; Gustafsson et al., 2016; Tessitore et al., 2021).

Overall, the results suggest that parents play a role in adolescent student-athletes' burnout symptoms during the transition to lower secondary sport school, especially in the sport domain. However, it seems to be crucial to find a balance between adolescents' increasing need for autonomy and parental involvement. The results also highlight that parents' role in school burnout is related to initial levels of burnout rather than changes in burnout symptoms during the transition to lower secondary sport school. It is possible that parents' role in the development of school burnout is more crucial before the transition to lower secondary school, since other social agents (e.g., coaches, peer groups, and teachers (Stambulova et al., 2021; Vansoeterstede et al., 2023); become more important later on. Further research is needed to address not only the unique role of different socializing figures in the development of burnout symptoms, but also the possible combined effects of different social agents in sport school environments.

11. Implications

Practically, the results of the present study suggest that lower secondary sport schools need to focus on actively preventing increases in burnout symptoms among student-athletes during the transition to lower secondary sport schools. Burnout needs to be addressed early because, if left unaddressed, it may develop into more severe mental health conditions, such as depression or anxiety disorders (Glandorf et al., 2023).Given that all dimensions of school burnout increased during the first year, schools should attempt to increase the environmental resources they provide for student-athletes, and aim to ensure that the student-athletes have opportunities for a balanced dual career development considering the school domain as well. As earlier research conducted among Norwegian sport schools has indicated that the coordination between different stakeholders (sport clubs, school coaches, teachers) is often not very successful, improving coordination and relational quality between stakeholders could be useful (Bjørndal & Gjesdal, 2020). This could be achieved, for example, through periodic meetings between the various stakeholders in schools and clubs to ensure co-ordination regarding the overall workload faced by the student-athletes. Similarly, it would be important for someone, such as the sport directors in sport schools, to oversee the student-athletes' overall situation, as this would enable them to respond efficiently if a student-athlete begins to show symptoms of burnout (Storm et al., 2021).

Because the transition to lower secondary sport school seems to be especially challenging for female student-athletes in terms of sport-related adjustment, more attention needs to be directed toward providing additional environmental resources and fostering self-care and empowerment (Ryba et al., 2021). This could be achieved by ensuring that female students feel comfortable in the school environments, for example, by providing female role models and making it truly possible to find a good balance between sport and academic achievement. Since higher individual success expectations were linked to lower burnout levels in both sport and school in this study, it is important that sport schools encourage students to believe in their own skills and capabilities and to approach new and challenging tasks using active and mastery-oriented strategies (Anttila et al., 2023; Eccles & Wigfield, 2020). There is some evidence that student-athletes with high success expectations in school and sports may be better at combining the two domains together compared with student-athletes with lower expectations for success, so teaching these strategies might be essential in terms of later successful dual career development (Nikander et al., 2022). Therefore, schools should attempt to identify student-athletes with different success expectations and aim to provide targeted interventions for them. Similarly, the level and severity of student-athletes' burnout symptoms could be monitored during periodic discussions with school personnel. Finally, interventions aimed at increasing parental knowledge of beneficial and harmful forms of involvement in student-athletes' lives could be useful (Aunola et al., 2018). It seems especially important for parents to recognize that their involvement remains crucial in terms of student-athletes' sport burnout and to find the right balance between providing support and granting freedom to their children.

12. Limitations

The present study has some limitations. First, we examined the development of burnout across only one year, with two measurement points. To shed light on the different development trajectories of burnout symptoms, a longer follow-up period and more measurement points are needed. Second, we assessed student-athletes' symptoms of school and sport burnout only, so no conclusions about clinically significant levels of burnout can be drawn. Third, we measured parenting behaviors only once.; thus, it was not possible to examine the effect of adolescent-athletes' symptoms of burnout on parental affection or success expectations. Fourth, the response rate of fathers was low, with mothers contributing most of the parental responses. Although exploratory tests (see Supplementary Materials) showed that adding parents' gender did not significantly improve any model, the findings regarding potential differences between mothers and fathers should be considered tentative. It is possible that with a larger, more representative sample of fathers, we may have observed differences in the effects of parents' gender on athletes' symptoms of burnout. We also observed small effect sizes and few effects of parental affection on burnout. Generally, the observed levels of burnout in the sample were also low (Pires et al., 2024). Speculatively, it is possible that, as indicated by social cognition

models in psychology (Conner, 2020), general behaviors, such as parental affection, have only small effects on specific outcomes, such as burnout symptoms. Thus, future researchers may choose to investigate how parental affection applies to sport and school specifically to further elucidate how these constructs relate to student-athletes' burnout. Additionally, as parental success expectations in school were only found to be associated with the baseline levels of school-related exhaustion, future studies are needed to investigate the role of other significant others (coaches, teachers, peers) in the development of school and sport burnout among student-athletes (Knight et al., 2018). Finally, we conducted the study in the specific sociocultural context of Norwegian secondary school education. The private nature of sport schools in Norway could influence the study's findings and affect athletes' vulnerability to burnout. In contrast, in other Nordic countries such as Finland and Denmark, lower secondary student-athletes typically attend sports classes integrated into mainstream public schools. These programs prioritize academic achievement over athletic development (Kuokkanen, Saarinen, Romar, et al., 2024; Skrubbeltrang et al., 2020). Because the results may not fully apply to other educational, sport and cultural settings, future cross-cultural studies are needed to establish the extent to which differences and similarities in burnout trajectories differ across countries.

13. Conclusion

There is general agreement that student-athletes may be at increased risk of sport and school burnout symptoms during the transition to lower secondary school (Gustafsson et al., 2016; Kuokkanen et al., 2022). However, the understanding of sport and school burnout trajectories during lower secondary education and the possible risk and protective factors associated with these trajectories has been limited by the lack of longitudinal studies considering this age group of student-athletes. Our novel findings showed that school-related burnout and sport-related exhaustion increased among student-athletes during the first year of lower secondary sport school. The transition to lower secondary sport school seemed to be especially challenging for female student-athletes in terms of sport-related adjustment. In addition, high individual success expectations seemed to protect adolescent student-athletes against burnout symptoms in sport and school. High parental expectations of success were associated with lower school-related exhaustion. Finally, both a lack of support or too intense support and potentially pressure from parents were associated with increases in sport-related inadequacy during the first year of lower secondary school. The findings advance the theoretical understanding of the mechanisms and roles of individual success expectations, as well as parental affection and success expectations, as resources and demands in the development of burnout among adolescent student-athletes, while also providing new knowledge on the role of parents in the development of burnout symptoms during the transition to lower secondary sport school (Stambulova et al., 2021; Thompson et al., 2022).

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CRediT authorship contribution statement

Milla Saarinen: Writing – review & editing, Writing – original draft, Validation, Project administration, Investigation, Data curation, Formal analysis, Conceptualization. **Daniel J. Phipps:** Writing – review & editing, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Joni Kuokkanen:** Writing – review & editing, Conceptualization. **Christian Thue Bjørndal:** Writing – review & editing, Funding acquisition. **Marte Bentzen:** Writing – review & editing. **Yngvar Ommundsen:** Writing – review & editing, Funding acquisition. **Henrik Gustafsson:** Writing – review & editing, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.psychsport.2025.102831.

Data availability

Data will be made available on request.

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