

Sport and School Burnout in Norwegian Lower Secondary School Student-Athletes: A Person-Oriented Approach

Author

Saarinen, Milla, Phipps, Daniel J, Jordalen, Gro, Bjorndal, Christian Thue

Published

2025

Journal Title

Journal of Clinical Sport Psychology

Version

Accepted Manuscript (AM)

DOI

[10.1123/jcsp.2024-0036](https://doi.org/10.1123/jcsp.2024-0036)

Rights statement

This work is covered by copyright. You must assume that re-use is limited to personal use and that permission from the copyright owner must be obtained for all other uses. If the document is available under a specified licence, refer to the licence for details of permitted re-use. If you believe that this work infringes copyright please make a copyright takedown request using the form at <https://www.griffith.edu.au/copyright-matters>.

Downloaded from

<https://hdl.handle.net/10072/435362>

Griffith Research Online

<https://research-repository.griffith.edu.au>

Sport and school burnout in lower secondary school student-athletes: A person-oriented approach

Milla Saarinen¹, Daniel J. Phipps^{2,3}, Gro Jordalen⁴, and Christian Thue Bjørndal^{1,4}

¹The Child and Youth Sport Research Centre, Norwegian School of Sport Sciences,

² Faculty of Sport and Health Sciences, University of Jyväskylä, Finland

³ School of Applied Psychology, Griffith University, Mt Gravatt, Australia

⁴The Department of Sport and Social Sciences, Norwegian School of Sport Sciences

Author Note

Correspondence concerning this article should be addressed to Milla Saarinen, Norwegian School of Sport Sciences, The Child and Youth Sport Research Centre, Postboks 4014 Ullevål Stadion, 0806 Oslo, Norway: milla.saarinen@nih.no.

This research was supported by the Norwegian Research Council, grant number 326532

Declarations of interest: None

Data availability statement: Data available from Milla Saarinen, upon a reasonable request. The data analysis code available from corresponding author upon a reasonable request. This study was not preregistered.

This is the Author Accepted Version of the article, which has been accepted for publication in Journal of Clinical Sport Psychology. This version may differ slightly from the final published version, as it may include revisions, updates to references, or changes made by the journal's editorial team.

Abstract

The study examined burnout profiles in adolescent student-athletes based on sport and school burnout symptoms. We explored whether psychological distress, self-esteem, athletic identity, and student identity were associated with these profiles, accounting for age, gender, and type of sport. Participants included 642 student-athletes from grades 8–10 (ages 12–14, 57% males, 43% females) in eight Norwegian sport schools. Using latent profile analysis, we identified five profiles: mild sport and school burnout (46%), high burnout (22.5%), well-functioning (17.9%), predominantly school burnout (8.6%), and predominantly sport burnout (5%). Female student-athletes and those in grades 9–10 were more at risk. Low self-esteem and high psychological distress increased the likelihood of burnout in sport and school, while a strong student identity seemed to protect against school burnout. These findings suggest that combining competitive sport with education at an early age may put student-athletes at risk for burnout symptoms in sport and school.

Keywords: Dual career, sport burnout, school burnout, mental health, latent profile analysis

Sport and School Burnout Profiles in Lower Secondary School Student-Athletes: A Person-Oriented Approach

In recent years, Norway, as in other European countries, has increasingly established specialized lower secondary sport schools for talented adolescent athletes aged 12–14 years old (Kårhus, 2016). The aim of these schools is to provide talented adolescent athletes opportunities for sport training during school hours, as well as teach them the necessary dual career skills to facilitate a successful transition to upper secondary education. Although studying in lower secondary sport school may provide student-athletes with opportunities for a successful combination of sport and school, there remains a concern that the pressure from two intertwined domains may lead adolescents to experience elevated levels of stress and even sport- and school-related burnout. While previous studies have shown that distinct profiles of sport and school burnout symptoms can be identified among adolescent student-athletes as early as at the beginning of upper secondary school in grade 11 (age 16) (Sorkkila et al., 2017), no research to date has examined the co-occurrence of different sport and school burnout profiles among younger student-athletes in lower secondary education, specifically in grades 8–10 (ages 12–15). Since student-athletes in lower secondary education may face pressure to perform well in both sports and academics, but different demographic factors and levels of psychological wellbeing can influence their ability to cope with the demands of sport and school, it is likely that some athletes will not develop burnout symptoms, while others may experience them in sports, school, or both. However, research examining these risk factors that may increase the likelihood of specific burnout profiles in this age group is limited. Therefore, the aim of the present study was to examine the different sport and school burnout profiles among student-athletes in lower secondary education. In addition, we examined the extent to which demographic

variables, psychological well-being, and identity were associated with different sport and school burnout profiles.

School and Sport Burnout among Adolescent Student-Athletes

School burnout is a psychological syndrome or emotional state arising from prolonged academic stress that transforms into burnout over time (Maslach et al., 2001; Salmela-Aro, Kiuru, et al., 2008). It consists of three components similar to those of job burnout: school-related exhaustion (chronic fatigue resulting from excessive schoolwork), school-related cynicism (a detached or indifferent attitude toward school and loss of interest in schoolwork), and feelings of inadequacy (a sense of reduced competence and success in school) (Maslach et al., 2001; Parker & Salmela-Aro, 2011; Salmela-Aro, Kiuru, et al., 2009). The prevalence of school burnout among student-athletes in lower secondary education has been found to vary from 10–35% (Kuokkanen et al., 2022; Saarinen et al., 2024).

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 of 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 may experience symptoms of sport burnout and that the numbers have increased in the past years (Glandorf et al., 2023; Saarinen et al., 2024).

Previous research on the co-occurrence of sport and school burnout profiles among student-athletes has only been conducted at the upper secondary school level

(Aunola et al., 2018; Sorkkila et al., 2017; 2018; 2020; 2019). Sorkkila et al. (2017) examined different sport and school burnout profiles among student-athletes at the beginning of upper secondary school (age 16, grade 11) and found that most student-athletes were well-functioning: 60% belonged to a well-functioning profile, showing no burnout symptoms in sport or school. Meanwhile, 30% demonstrated mild sport burnout symptoms, and only 10% showed relatively high school burnout symptoms. Along similar lines, Kuokkanen et al. (2022) who studied burnout and adjustment profiles in sport and school among lower secondary student-athletes (age 12, grade 8), found that half of the participants exhibited a well-adjusted profile, with low burnout symptoms in both sport and school. Additionally, 30% displayed a moderately functioning profile, and 10% demonstrated a struggling profile, both with higher burnout symptoms in sport and school.

The aforementioned examples notwithstanding, the majority of research in adolescent student-athletes to date has taken a variable centred approach – focusing on the relationship between variables rather than investigating individuals and subgroups within a population (for a review, see (Mäkikangas & Kinnunen, 2016). Thus, little is known about possible profiles of school and sport burnout especially among student-athletes in lower secondary school. Several scholars have noted that the variable-oriented approach may have limitations in examining processes in individual functioning, such as burnout, since it is difficult to translate the description of variables into the properties of distinct individuals (Gustafsson et al., 2016; 2018; Kuokkanen et al., 2022). Therefore, when examining burnout, a person-centered approach may be more appropriate than a variable-centered approach, as burnout has been identified as a phenomenon that affects individuals and not variables. Following this reasoning, in the present study, we adopted a person-oriented approach to studying burnout, which meant

not only identifying different burnout profiles but also providing proportions of the sample belonging to identified subgroups, such as those demonstrating low or high levels of burnout symptoms in sport, school, or both. Consequently, the first aim of the present study was to determine what kinds of burnout profiles based on sport and school burnout symptoms exist among student-athletes and how these profiles are distributed in the studied population. By applying a person-centered approach, we aimed to investigate different subgroups of student athletes who have similar symptom profiles.

Demands–Resources Model of Sport and School Burnout

This research is grounded in demands–resources theory, offering a novel framework to understand the developmental processes that contribute to burnout. Specifically, the theory explains how the alignment between adolescents' needs and the resources available to meet school and sport-related demands impacts their experiences of burnout in both domains (Demerouti et al., 2001; Kuokkanen, Romar, et al., 2024). This theory suggests that environments, such as sport schools, consist of various demands and resources. The balance between adolescents' available resources and these demands influences their well-being through two distinct psychological processes (Demerouti et al., 2001; Salmela-Aro & Upadaya, 2014). First is an effort-driven process, where increasing demands (such as time spent in training or academic challenges) lead to stress, energy depletion, and ultimately feelings of exhaustion and inadequacy, along with reduced interest and perceived meaningfulness of the activity. Second is a motivational process, in which the availability of resources (e.g., social support, autonomy, and psychological wellbeing) promotes engagement and overall life satisfaction (Demerouti et al., 2001; Lesener et al., 2020). The theory also suggests that psychological well-being factors, like psychological distress, self-esteem, or identity,

can influence burnout symptoms, as they may reduce students' capacity to cope with environmental demands through psychological processes (Widlund et al., 2021).

Antecedents of Sport and School Burnout among Adolescent Student-Athletes

Previous studies have suggested that different demographic variables may serve as antecedents to sport and school burnout profiles, although earlier literature examining these among adolescent student-athletes is limited (Glandorf et al., 2023; Ingrell et al., 2019). First, studies have shown that student-athletes' ages may be associated with burnout symptoms. For instance, Ingrell et al. (2019) found that athletes' sport burnout symptoms increased over three years of lower secondary education in grades 8-10 (see also, (Isoard-Gautheu et al., 2015). Studies on school burnout have also shown that school burnout symptoms tend to increase across the years in lower secondary school (Salmela-Aro & Upadyaya, 2014; Widlund et al., 2021) and that students in higher school grades demonstrate higher levels of school burnout symptoms (Vansoeterstede et al., 2023). This trend is often attributed to the increasing demands of sport and school as athletes grow older. Consequently, it can be assumed that student-athletes in higher grades are more likely to exhibit burnout symptoms than those in lower grades (Stambulova & Wylleman, 2019). However, this relationship has not been previously studied among student-athletes in lower secondary education.

Additionally, researchers have shown that student-athletes' gender plays a role in burnout symptoms in sport and school. A recent review showed that female students may be likelier to experience school burnout symptoms, especially exhaustion and inadequacy (Vansoeterstede et al., 2023). Previous research has revealed that school stress tends to increase among adolescent females in lower secondary education as a result of self-imposed demands (Löfstedt et al., 2019). It is possible that female students may experience more pressure to achieve academically (Widlund et al., 2020) and may

therefore be more concerned about poor performance and academic failure. Although studies concerning gender differences in sport burnout are scarce, Isoard-Gautheu et al. (2015) observed that sport devaluating was higher among female athletes across grades 8-10. In the lower secondary sport school context, it is particularly interesting to look at the gender differences in both sport and school burnout symptoms, as female student-athletes may, due to gender stereotypes, face additional demands to excel not only in their sports but also in school and be, therefore, more likely to demonstrate symptoms of sport and school burnout (Saarinen, Ryba, et al., 2023).

Additionally, the type of sport can be related to student-athletes' burnout. Although the evidence is mixed, some studies have suggested that athletes competing in individual sports may be more prone to burnout than athletes competing in team sports (Nixdorf et al., 2013). This trend may be due to the additional pressure and responsibility associated with performance that individual sport athletes often face (Saarinen, Bertram, et al., 2023). Individual sport athletes may also lack the sport-related social support that team sport athletes receive from teammates, which can serve as a coping resource against burnout (Glandorf et al., 2023). However, other studies suggest that team sport athletes might experience more severe burnout symptoms due to competition for team positions, which heightens the demands placed on student-athletes (Holden et al., 2016). These mixed findings underscore the need for further research to determine whether participation in individual as compared to team sports affects the likelihood of student-athletes developing specific burnout profiles (Sorkkila et al., 2017). Therefore, the second aim of the present study was to examine how student-athletes' age, gender, and type of sport are associated with the different burnout profiles.

189 In addition to demographic variables, poor psychological well-being can be
190 considered as precondition for the development of burnout symptoms in sport and
191 school (Markati et al., 2019). Scholars have consistently shown that psychological
192 distress, such as symptoms of depression and anxiety, are linked to higher levels of
193 burnout symptoms in school (Fiorilli et al., 2017; Salmela-Aro, Savolainen, et al., 2009)
194 and sport (Gerber et al., 2018; Markati et al., 2019). Individuals experiencing
195 psychological distress may have limited personal resources to cope with increasing
196 demands in both sport and school, as they may, for example, evaluate challenging
197 situations more negatively, thus increasing the likelihood of burnout (Salmela-Aro,
198 Savolainen, et al., 2009). Furthermore, studies indicate that nearly 25% of adolescent
199 student-athletes in Norway experience symptoms of anxiety and depression (Saarinen et
200 al., 2024), emphasizing the need to understand how these early symptoms might be
201 linked to sport and school burnout in this group. Although previous studies have not
202 specifically examined the associations between sport and school burnout and
203 psychological distress among adolescent student-athletes, it is likely that those with
204 higher levels of psychological distress might be more prone to exhibit burnout
205 symptoms (Markati et al., 2019).

206 Previous studies have shown that self-esteem levels significantly influence
207 individuals' susceptibility to burnout in both sport and school (Gustafsson et al., 2018;
208 Herrmann et al., 2019). Self-esteem is defined as a core personality trait reflecting one's
209 beliefs and feelings about personal worth and significance, often referred to as 'global'
210 self-esteem or self-worth (Rosenberg, 2015). High self-esteem likely serves as an
211 important personal resource against burnout, as individuals with high self-esteem tend
212 to see themselves as competent when facing challenging tasks (Luo et al., 2016) and
213 apply coping skills effectively (Gustafsson et al., 2008). In contrast, individuals with

low self-esteem may feel insufficiently competent to handle challenging tasks and may perceive competitions as more threatening, and may thus be more susceptible to experiencing burnout (Herrmann et al., 2019; Markati et al., 2019). Although no prior studies have examined the association between self-esteem and sport and school burnout profiles, it can be assumed that student-athletes with high self-esteem are less likely to demonstrate burnout symptoms in sport and school, and vice versa.

Another critical factor that may be associated with burnout profiles in sport and school among student-athletes is their athletic and student identities (Gustafsson et al., 2018). In sport, athletic identity has been defined as the degree to which an individual thinks and feels like an athlete (Brewer et al., 1993; Coakley, 1992). It has been argued that a strong identification with the athletic role may push athletes to train excessively, thereby compromising their health and making them more prone to experiencing burnout (Gustafsson et al., 2008). However, the results of earlier studies are somewhat inconsistent: some researchers found no relationship between athletic identity and sport burnout (Verkooijen et al., 2012), whereas others showed that a strong athletic identity was related to lower levels of athletic burnout (Gustafsson et al., 2018). Student identity, in turn, refers to identification with the student role—that is, viewing oneself as a student and believing that others primarily see them as a student (Moazami-Goodarzi et al., 2020). A strong student identity is reflected in a commitment to one's studies and study-related goals. Although no previous studies have explored the role of student-athletes' identities in burnout, research in educational contexts has shown that students with strong commitment to their student roles and high engagement in school tend to have lower levels of academic burnout compared to those with weaker student identities and engagement (Mannerström et al., 2023; Upadaya & Salmela-Aro, 2013; Virtanen et al., 2018). Therefore, the third aim of the present study was to examine how student-

athletes' psychological distress, self-esteem, and athletic and student identities are associated with different burnout profiles.

The Present Study

The present study expands upon previous studies by identifying different sport and school burnout profiles and the antecedents of these profiles among student-athletes in lower secondary education.

The present study was designed to address the following research questions:

- (1) Based on their symptoms of sport and school burnout, what burnout profiles do student-athletes have, and how are they distributed across the studied population?
- (2) How are student-athletes' age, gender, and type of sport associated with the different burnout profiles?
- (3) How are student-athletes' psychological distress, self-esteem, and athletic and student identities associated with different burnout profiles?

Methods

Participants and Procedure

The present study is part of the ongoing [*blinded for peer review*] project, which examines mental health and well-being, sport-related injuries, and growth and maturation among student-athletes attending lower secondary sport schools in Grades 8-10, ages 12-14. Participants were recruited from eight different lower secondary sport schools: three in Western Norway, one in Northern Norway, two in Southern Norway, and two in Central Norway. In the Norwegian education system, lower secondary education encompasses Grades 8–10. Students are usually 12 years old when they enroll to these schools and 14 when they graduate. After graduating from lower secondary education, students typically apply to upper secondary education. Currently, 23

specialized sport schools across the country are recognized by the Norwegian Directorate for Education and Training, with a total school population of over 4,000 students. These schools, although operating as private institutions, receive 85 % of their funding from the government. 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, some schools integrate specialized coursework on topics related to health and performance development. Admission to these schools is highly competitive. Prospective students must undergo physical tests and demonstrate high potential in their chosen sports to be accepted.

This study is based on data collected for the [*blinded for peer review*] project at the Time 1 measurement point in the fall semester 2023, involving 642 student-athletes aged 12–14 years. Of the participating student-athletes, 265 were in Grade 8, 227 were in Grade 9, and 150 were in Grade 10; 369 were male and 273 were female; 486 played team sports (e.g., football or handball) and 156 pursued individual sports (e.g., cross-country skiing or athletics) at various levels (i.e., regional, national, and international). 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). We contacted the participating schools through the school administrators (athletic directors and headmasters). Prior to data collection, we informed all participants of their rights, and they provided their written consent for voluntary participation 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 participants completed a series of electronic self-report questionnaires on burnout, identity, self-esteem, and

psychological distress. The data and data analysis codes are available from the first author (name anonymized for review purposes) upon reasonable request.

Measurements

Sport Burnout

We measured sport burnout using the Sport Burnout Inventory Dual Career Form (Sorkkila, Ryba, Aunola, et al., 2020), which was developed and adapted to the sport context based on the School Burnout Inventory (Salmela-Aro et al., 2009) and is an optimal tool for measuring sport burnout in dual-career contexts. The scale consists of 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"). All items were rated on a 5-point Likert scale (1 = completely disagree to 5 = completely agree). The Cronbach's alpha reliability value for the scale was .87.

School Burnout

We measured school burnout using the School Burnout Inventory (Salmela-Aro et al., 2009). The scale consists of 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"). All items were rated on a 5-point Likert scale (1 = completely disagree to 5 = completely agree). The Cronbach's alpha reliability coefficient for the total scale was .90. Previous studies have verified the good validity and reliability properties of this scale for sport (Sorkkila, Ryba, Aunola, et al., 2020) and school burnout (Salmela-Aro et al., 2009).

Psychological Distress

We assessed anxiety and depression symptoms using the 10-item Hopkins Symptom Checklist (HSCL-10; (Strand et al., 2003). Six of the 10 items in the scale relate to depression (e.g., “Feeling everything is an effort”) and 4 relate to anxiety (e.g., “Suddenly scared for no reason”). The response scale ranged from 1 = not at all to 4 = extremely), with high mean scores indicating an overall score for likely psychological distress, reflected in a high number of anxiety and depression symptoms (Cronbach’s α = .87). The HSCL-10 is a widely used and validated scale for use with adolescents in Norway, due to its comprehensive and brief nature (Ringdal et al., 2020) Strand et al., 2003). HSCL-10 was chosen for the present study because the interest was in the general levels of psychological distress rather than focusing on specific mental illnesses, such as depression. However, HSCL-10 has been shown to predict the risk of mental illness (Strand et al., 2003).

Self-Esteem

We measured self-esteem using the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 2015), which is a 10-item questionnaire for measuring global self-esteem (e.g., “I feel like a person who has a number of good qualities”). All items were rated on a 4-point Likert scale (1 = strongly disagree to 4 = strongly agree). We did not set cut-off points for the low and high self-esteem boundaries of the scale. The RSE is the most popular and widely used measure of global self-esteem (Brailovskaia & Margraf, 2020), and it has been validated for the adolescent population in Norway (Moksnes et al., 2022). The Cronbach’s alpha value was .86. Measuring individuals’ levels of self-esteem can be assumed to provide

important information regarding adolescents' mental health and functioning, especially during adolescence (Parviainen et al., 2021).

Athletic Identity

We used the Athletic Identity Measurement Scale (AIMS), developed by Brewer et al. (1993), to evaluate the participants' levels of athletic identity. The scale comprises 10 items (e.g., "Sport is the most important part of my life"), rated on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). The Cronbach's alpha value for athletic identity was .83.

Student Identity

A modified version of the AIMS (Brewer et al., 1993) to an academic context was used to evaluate levels of student identity (10 items; e.g., "Most of my friends are students"). A similar procedure was applied in a study of Finnish upper secondary school athletes by Moazami-Goodarzi et al. (2020) and Swedish upper secondary school athletes by Stambulova et al. (2015). The Cronbach's alpha value for student identity was .81.

Data Analysis

We analyzed the data using a multistep approach consistent with previous research that predicted burnout levels in student-athletes. First, we fit the questionnaire data for school- and sport-related burnout using confirmatory factor analysis, a technique for confirming how data reflects a hypothesized structure (Brown, 2012). Specifically, we tested the hierarchical three-factor structure suggested by Sorkkila et al. (2017), where burnout items contributed to three subscales (exhaustion, inadequacy, and exhaustion), which then contributed to the overall global score of burnout in each context. We then extracted latent variable scores from the global sport and school burnout confirmatory factor analyses and used them for the latent profile analysis. We

fit the latent profile analysis models using maximum likelihood analysis, a technique used to investigate potentially unobserved sub-populations within a sample (Spurk et al., 2020). Specifically, we examined the frequently occurring combinations of burnout in the sport and school contexts present in our sample. Starting values were determined using hierarchical clustering (Scrucca et al., 2016). The models were fitted for between one and six possible burnout classes, with options for fixed or varying variances and covariances. The best model according to the latent profile analysis was selected based on theoretical fit and model statistics, namely the AIC, sample size-adjusted BIC (SABIC), KIC, CLC, and entropy, with low AIC, SABIC, CLC, and KIC values considered desirable, a minimum acceptable entropy of .60 (Spurk et al., 2020), and a minimum acceptable profile size of 25 cases (Spurk et al., 2020). Finally, we used multinomial hierarchical logistic regression, a technique used to examine how a set of independent variables are associated with a categorical outcome. In this case, we used multinomial hierarchical logistic regression to predict class membership, comparing the factors associated with the likelihood of being classed into one profile or another. The models were fit in two steps. The participants' demographic information (i.e., grade, gender, and sport type) was entered into the model in step 1, while school identity, sport identity, self-esteem, and psychological distress were entered into the model in step 2. We then compared the contribution of each of these steps to explain class allocation using a χ^2 test, with a statistically significant result at each step, indicating that the additional variables improved the model's explanation of class allocation. We conducted all analyses using R version 4.3.2: the tidyLPA and mclust packages for the profile analyses (Rosenberg et al., 2019) and the jmv package for logistic regression.

Results

Burnout Scoring and Classification

The hypothesized factor structure for measures of burnout showed acceptable fit to the data for both school ($\chi^2(32) = 164.85, p < .001, CFI = .959, RMSEA = .080, SRMR = .052$) and sport ($\chi^2(32) = 132.96, p < .001, CFI = .958, RMSEA = .070, SRMR = .052$) burnout, indicating the global score of burnout, made up of scores on three subscales (exhaustion, cynicism, and inadequacy), was an acceptable explanation of the data for both sport and school in the current sample. The model fit statistics for the latent profile analysis variants are presented in Table 1. When we compared the model fit for the latent profile analyses of school and sport burnout, the AIC and CLC values indicated that a five-profile model had the best fit, whereas the SABIC and KIC values supported a three-class model. However, we opted to proceed with the five-profile model for several reasons. First, entropy statistics for the three-class model fell below the acceptable minimum cut-off, whereas the five-class model had acceptable entropy, with all classes sufficiently distinct and comprised a sufficient number of cases to warrant their retention (33 or more). Furthermore, the five-class model also showed good alignment with theory, including previous tests of burnout profiles in sport and school (Kuokkanen et al., 2022; Sorkkila et al., 2017).

The resulting five classes were defined as *well-functioning* (17.9%, $n = 115$), for which the confidence intervals for the mean of both school and sport burnout were below the overall sample mean; *mild burnout* (46%, $n = 295$), for which the mean burnout values for both school and sport burnout did not significantly differ from the mean; *predominantly school burnout* (8.6%, $n = 55$), for which the confidence intervals for the mean of school burnout were greater than the overall sample mean, but the mean value of sport burnout did not significantly differ from zero; *predominantly sport*

burnout (5 %, $n = 32$), for which the confidence intervals for the mean of sport burnout were greater than the overall sample mean, but the mean value for school burnout did not significantly differ from zero; and *high sport and school burnout* (22.5 %, $n = 145$), for which the mean values for both school and sport burnout were greater than the overall sample mean. The classes are presented visually in Figure 1.

Insert Table 1 near here.

Predicting Burnout Classifications

Of the five profiles, we employed the well-functioning profile as the reference category for the multinomial logistic regression. That is, for the following analyses, we compared which factors best explained being placed into any given burnout profile as compared to the well-functioning profile. The model showed acceptable fit in the first step ($\chi^2(12) = 51.10, p < .001, R^2 = .03$), with the participants' demographic information predicting a small and statistically significant portion of the variance in class allocation. In each case, the participants in grades 9-10 were increasingly likely to be assigned to mild burnout, school burnout, sport burnout, and high burnout classes compared to the well-functioning group. Females were significantly likely to be classed in the mild burnout, sport burnout, and high burnout groups, although there was no significant effect of gender on the likelihood of being classed in the predominantly school burnout group compared to the well-functioning group. Students' participation in individual sports compared to team sports was not significantly associated with the likelihood of having any particular profile.

In the second step, the addition of school identity, sport identity, self-esteem, and psychological distress accounted for a significant improvement in the models' explanation of profile allocation ($\chi^2(16) = 450.00, p < .001$), accounting for a modest portion of the variance in the overall class allocation ($\chi^2(28) = 501.00, p < .001, R^2 =$

.29). The participants with low self-esteem scores and those with high levels of psychological distress were likelier to have all burnout profiles than the well-functioning profile. Sport identity was not significantly associated with the likelihood of having any profile, but participants with strong school identities were less likely to be included in predominantly school burnout or generally high burnout classes. All parameter estimates are shown in Table 2.

Insert Table 2 near here.

Insert Figure 1 near here.

Discussion

We formulated our first research question to determine student-athletes' sport and school burnout profiles and how they were distributed across the studied population. We identified five burnout profiles based on the participants' burnout symptoms: (1) mild burnout (46%), characterized by mild levels of both sport and school burnout; (2) high sport and school burnout (22.5%), characterized by high levels of sport and school burnout symptoms; (3) well-functioning (17.9%), characterized by low levels of both sport and school burnout symptoms; (4) predominantly school burnout (8.6%), characterized by a relatively high level of school burnout but a low level of sport burnout symptoms; and (5) predominantly sport burnout (5%), characterized by a relatively high level of sport burnout but a low level of school burnout symptoms.

Based on the cut-off points that we set for sport and school burnout symptoms, we concluded that most of the student-athletes (46%) belonged to the mild burnout profile and exhibited some symptoms of sport and school burnout at the beginning of the school year. These burnout levels appear relatively high compared to previous studies, which have shown that approximately 30% of student-athletes in lower

secondary and early upper secondary education exhibit mild sport and school burnout symptoms (Kuokkanen et al., 2022; Sorkkila et al., 2017). Although no prior studies have specifically investigated sport and school burnout among student-athletes in Norway, this finding aligns with research suggesting that school-related stress and pressure have increased among Norwegian adolescents in recent years (Löfstedt et al., 2019). Because earlier studies have also shown that burnout symptoms in sport and school tend to increase across the school year for students in lower secondary education, it seems important to follow longitudinally the student-athletes with even a mild risk of burnout (Ingrell et al., 2019; Parviainen et al., 2021).

The second largest group of student-athletes belonged to the high sport and school burnout profile (22.5%), indicating that this group could be at risk of severe sport and school burnout. This finding is also relatively high compared to previous studies, which have indicated that the prevalence of severe sport and school burnout symptoms would be around 3–10% for athletes in lower and upper secondary school (Gustafsson et al., 2018; Sorkkila et al., 2017). One explanation for the conflicting results may be that student-athletes in this age group, 12–15 years old, compared to older student-athletes, may not yet have the coping and dual career skills needed to successfully balance the increasing training load, schoolwork, and competitive pressures and demands they face in sport schools (Kuokkanen et al., 2022). It is therefore possible that the conflicting demands from both sport and academic environments may exceed the resources available to student-athletes for effectively balancing these two areas. Another tentative explanation lies in the Norwegian lower secondary sport school system, where these schools are private and require tuition fees paid by guardians. Consequently, students at these schools may experience additional parental pressure to excel in both sports and academics, along with high personal expectations for success in

both domains (Kårhus, 2016; Sorkkila et al., 2017). It is also possible that school personnel, including coaches and teachers, may feel pressured to ensure that student-athletes achieve strong results both athletically and academically, potentially leading them to push students to work excessively in both areas. (Bjørndal & Gjesdal, 2020; Into et al., 2020).

In addition, two other groups of student-athletes were found to be at risk of burnout: those with predominantly school burnout profiles (8.6%) and those with predominantly sport burnout profiles (5%). Although school burnout has not previously been examined in Norway, the finding that nearly 10% of student-athletes exhibited symptoms of school burnout accords with earlier findings in other Nordic countries (Sorkkila et al., 2017) and athlete burnout research generally (Gustafsson et al., 2017).

The second research question asked whether student-athletes' age, gender, and type of sport (individual vs. team sport) would be associated with their burnout profiles. The results showed that participants in grades 9-10 were likelier to demonstrate all the burnout profiles than the well-functioning profile compared to the younger participants. This aligns with earlier literature suggesting that student-athletes' burnout symptoms tend to increase across the school years (Salmela-Aro & Upadyaya, 2014) Sorkkila et al., 2020). Consistent with the demands-resources theory, this finding suggests that as student-athletes transition to higher-level sports and approach upper secondary education, the increasing athletic and academic demands may exceed their available coping resources, leading to a rise in burnout symptoms (Bentzen et al., 2021; Ryba et al., 2016). Although it could be argued that student-athletes may develop resources like time management skills as they get older, this finding suggests that older student-athletes might benefit from additional environmental support as they approach the

transition to higher-level sports and upper secondary education (Stambulova et al., 2015).

In addition, female student-athletes were likelier to demonstrate mild burnout, predominantly sport burnout, and high burnout profiles than their male counterparts. Although no previous studies have specifically examined gender differences in sport and school burnout profiles among student-athletes, this finding aligns with research in both sport and educational contexts, which shows that females generally exhibit higher levels of burnout related to both sport and school (Isoard-Gautheu et al., 2015; Vansoeterstede et al., 2023). In addition to burnout, studies have shown that female student-athletes often demonstrate higher levels of mental illness symptoms and lower levels of mental well-being in sport school environments compared to males (Kegelaers et al., 2022; Kuettel et al., 2021). Several studies have shown that female student-athletes often experience greater pressure from their environment to achieve highly in both sport and academics, which may contribute to their increased burnout symptoms (Ryba et al., 2021; Saarinen, Ryba, et al., 2023). Finally, the type of sport did not significantly affect the likelihood of student-athletes having a particular burnout profile. This finding suggests that while individual and team sports may present different resources or demands related to burnout, neither type significantly increases the risk of burnout among lower secondary sport school student-athletes.

The third research question asked whether student-athletes' self-esteem, psychological distress, and athletic and student identities would be associated with their burnout profiles. First, student-athletes with low self-esteem scores and those with high psychological distress scores were likelier to be placed into all the burnout profiles compared to the well-functioning profile. This finding suggests that low self-esteem, high levels of psychological distress, and burnout symptoms go hand in hand among

student-athletes in lower secondary sport schools. Drawing from the demands-resource model (Demerouti et al., 2001), it is possible that low self-esteem and psychological distress, through effort-driven processes, reduce the resources available to student-athletes to cope with daily challenges, thereby predisposing them to burnout symptoms (Gerber et al., 2018; Herrmann et al., 2019; Salmela-Aro, Savolainen, et al., 2009). Although previous studies, particularly in educational contexts, have shown that psychological problems—such as low self-esteem, psychological distress, and burnout—are reciprocal in nature and often develop simultaneously, it is important to note that the cross-sectional design of the present study does not allow for causal conclusions (Glandorf et al., 2023). Therefore, the results of this study should be interpreted with caution. Sport schools should prioritize identifying early signs of psychological issues and burnout to allow for timely interventions. This is especially important because, although psychological distress and low self-esteem are not classified as mental illnesses, they are indicators of potential mental health concerns that could escalate into more serious conditions if unaddressed—particularly when combined with burnout symptoms (Orth et al., 2008; Salmela-Aro, Aunola, et al., 2008).

Furthermore, the results showed that student-athletes' student identities were associated with their burnout profiles: student-athletes with strong student identities were less likely to have predominantly school burnout or high sport and school burnout profiles than other burnout profiles. Strong athletic identities, however, were not significantly associated with any of the burnout profiles. Consistent with the demands-resources model (Demerouti et al., 2001), the results emphasize motivational processes, suggesting that student-athletes who find their schoolwork meaningful are more engaged with it and may be less likely to experience burnout in the academic domain (Kuokkanen et al., 2022). Several earlier studies have shown that students who identify

with their role and are more engaged in school are less likely to experience school burnout and perform better academically (Virtanen et al., 2018; Widlund et al., 2021). A strong student identity can also be an indicator of confidence, which, among other psychological factors can serve as an individual resource protecting against burnout (Mannerström et al., 2023). Given that many student-athletes have been found to prioritize sport over school, it seems important that sport schools aim to foster school engagement among their students.

Clinical Implications

Lower secondary sport school programs can utilize the insights from this study to inform their policies and daily practices in various ways. Because relatively high numbers of student-athletes in lower secondary sport schools seem to demonstrate either mild or severe symptoms of sport and school burnout, it is important that schools focus on the active prevention of burnout and the early detection of these symptoms. Since burnout develops when there is an imbalance between environmental demands and the resources available to individuals (Demerouti et al., 2001), it is essential for schools to focus on enhancing the resources they provide to students. Schools should also structure daily activities in ways that encourage adequate recovery, energy replenishment, and leisure time outside the demands of sports and academics. Student-athletes with mild burnout symptoms in both sport and school could benefit from regular check-ins with school staff to monitor the level and severity of their symptoms. Those with high burnout symptoms in both domains, on the other hand, could benefit from developing skills in dual career management and planning. Responsibility for teaching these essential skills could be shared among teachers, parents, and coaches (De Brandt et al., 2018). It has also recently been suggested that targeted interventions grounded in cognitive behavioral therapy could also be useful in the prevention of sport

burnout, but more research is needed, especially among younger athletes (Pires et al., 2024).

Student-athletes experiencing elevated psychological distress could, in turn, benefit from school-based interventions aimed at reducing stress, which have proven effective even among primary and lower secondary school students (for a review, see (van Loon et al., 2020). Student-athletes in need of these interventions could be identified through regular screenings conducted by the school nurse, with the HSCL-10 serving as a useful assessment tool (Strand et al., 2003). Early adolescence has also been recommended as a suitable stage for initiating school-based self-esteem interventions; as with psychological distress, at-risk student-athletes could be identified in the periodic meetings by school nurses (Herrmann et al., 2019).

Finally, additional support should be directed toward student-athletes in higher grades and female student-athletes by strengthening the environmental resources available to them. Earlier research indicates that supportive coaching and educational practices (Into et al., 2020; Meylan et al., 2020), along with motivating coaches and teachers (Virtanen et al., 2020), are linked to reduced burnout symptoms and greater engagement in school and sport among at-risk student-athletes

Limitations

The present study has several limitations. First, because the study was cross-sectional, the current data cannot be used to make assertions of causality. Since burnout is a condition that develops over time in tandem with factors such as psychological distress and self-esteem, future researchers may investigate the development of burnout in student-athletes using longitudinal or experimental designs to better understand the direction of the effects and to investigate potential bidirectional relationships. There is a need to further examine the developmental trajectories of burnout and its predictors

across school years. Second, the interpretation of burnout levels in the current study was based on comparisons with the sample means, since the scales used did not incorporate validated, standardized cut-offs for problematic burnout. Consequently, the study results should be interpreted in relation to individual differences in burnout symptoms rather than diagnoses, and no clinical conclusions should be drawn from the results. Finally, the study was conducted in the specific sociocultural context of Norwegian lower secondary school education. The private nature of sport schools in Norway may impact the study's findings and influence athletes' susceptibility to burnout. In contrast, in other Nordic countries like Finland and Denmark, student-athletes at the lower secondary level are enrolled in sports classes within mainstream public schools. These programs place less emphasis on athletic development and more on academic achievement (Kuokkanen, Saarinen, et al., 2024). Because the results of the present study 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 profiles differ across countries.

Conclusion

There is a consensus that sport and school burnout among student-athletes in upper secondary education is a concerning problem and should be addressed as early as possible. However, understanding the existence of sport and school burnout profiles among younger age groups of student-athletes has been limited due to the lack of earlier research in this age group. In the present study, we identified five different burnout profiles. The results suggest that a majority of the student-athletes in lower secondary school might be at risk for sport and school burnout at the beginning of the school year. These findings suggest that combining competitive sports with education at an early age within the sport school environment may impose demands that exceed the coping

resources available to many student-athletes. Sport schools and other stakeholders should work to enhance the environmental resources available to student-athletes, ensuring a better alignment between their needs and available support. Additionally, our findings indicate that factors such as age, gender, psychological distress, low self-esteem, and student identity are linked to burnout profiles, while the type of sport and athletic identity were not. Overall, this study underscores that distinct burnout profiles can already be identified among lower secondary student-athletes, highlighting the need for preventive measures against burnout before students transition to upper secondary school. Student-athletes in at-risk subgroups may particularly benefit from early interventions aimed at reducing burnout symptoms.

References

- Aunola, K., Sorkkila, M., Viljaranta, J., Tolvanen, A., & Ryba, T. V. (2018). The role of parental affection and psychological control in adolescent athletes' symptoms of school and sport burnout during the transition to upper secondary school. *Journal of Adolescence*, 69, 140-149. <https://doi.org/https://doi.org/10.1016/j.adolescence.2018.10.001>
- Bentzen, M., Hordvik, M., Stenersen, M. H., & Solstad, B. E. (2021). A longitudinal transitional perspective on why adolescents choose to quit organized sport in Norway. *Psychology of Sport and Exercise*, 56, 102015. <https://doi.org/https://doi.org/10.1016/j.psychsport.2021.102015>
- Bjørndal, C. T., & Gjesdal, S. (2020). The role of sport school programmes in athlete development in Norwegian handball and football. *European Journal for Sport and Society*, 17(4), 374-396. <https://doi.org/https://doi.org/10.1080/16138171.2020.1792131>
- Brailovskaia, J., & Margraf, J. (2020). How to measure self-esteem with one item? Validation of the German single-item self-esteem scale (G-SISE). *Current Psychology*, 39(6), 2192-2202. <https://doi.org/https://doi.org/10.1007/s12144-018-9911-x>
- Brewer, B. W., Van Raalte, J. L., & Linder, D. E. (1993). Athletic identity: Hercules' muscles or Achilles heel? *International Journal of Sport Psychology*.
- Brown, T. A. (Ed.). (2012). *Confirmatory factor analysis* (Vol. 361).
- Coakley, J. (1992). Burnout among adolescent athletes: A personal failure or social problem? *Sociology of Sport Journal*, 9(3), 271-285. <https://doi.org/https://doi.org/10.1123/ssj.9.3.271>
- De Brandt, K., Wylleman, P., Torregrossa, M., Schipper-Van Veldhoven, N., Minelli, D., Defruyt, S., & De Knop, P. (2018). Exploring the factor structure of the Dual Career Competency Questionnaire for Athletes in European pupil-and student-athletes. *International Journal of Sport and Exercise Psychology*, 1-18. <https://doi.org/https://doi.org/10.1080/1612197X.2018.1511619>
- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, 86(3), 499. <https://doi.org/https://psycnet.apa.org/doi/10.1037/0021-9010.86.3.499>
- Fiorilli, C., De Stasio, S., Di Chiacchio, C., Pepe, A., & Salmela-Aro, K. (2017). School burnout, depressive symptoms and engagement: Their combined effect on student achievement. *International Journal of Educational Research*, 84, 1-12. <https://doi.org/https://doi.org/10.1016/j.ijer.2017.04.001>
- Gerber, M., Best, S., Meerstetter, F., Walter, M., Ludyga, S., Brand, S., Bianchi, R., Madigan, D. J., Isoard-Gautheur, S., & Gustafsson, H. (2018). Effects of stress and mental toughness on burnout and depressive symptoms: A prospective study with young elite athletes. *Journal of Science and Medicine in Sport*, 21(12), 1200-1205. <https://doi.org/https://doi.org/10.1016/j.jsams.2018.05.018>
- Glandorf, H. L., Madigan, D. J., Kavanagh, O., & Mallinson-Howard, S. H. (2023). Mental and physical health outcomes of burnout in athletes: a systematic review and meta-analysis. *International Review of Sport and Exercise Psychology*, 1-45. <https://doi.org/https://doi.org/10.1080/1750984X.2023.2225187>
- Gustafsson, H., DeFreese, J., & Madigan, D. J. (2017). Athlete burnout: Review and recommendations. *Current Opinion in Psychology*, 16, 109-113. <https://doi.org/https://doi.org/10.1016/j.copsyc.2017.05.002>

- Gustafsson, H., Hassmén, P., Kenttä, G., & Johansson, M. (2008). A qualitative analysis of burnout in elite Swedish athletes. *Psychology of Sport and Exercise*, 9(6), 800-816. <https://doi.org/https://doi.org/10.1016/j.psychsport.2007.11.004>
- Gustafsson, H., Hill, A. P., Stenling, A., & Wagnsson, S. (2016). Profiles of perfectionism, parental climate, and burnout among competitive junior athletes. *Scandinavian Journal of Medicine & Science in Sports*, 26(10), 1256-1264. <https://doi.org/https://doi.org/10.1111/sms.12553>
- Gustafsson, H., Martinent, G., Isoard-Gauthier, S., Hassmén, P., & Guillet-Descas, E. (2018). Performance based self-esteem and athlete-identity in athlete burnout: A person-centered approach. *Psychology of Sport and Exercise*, 38, 56-60. <https://doi.org/https://doi.org/10.1016/j.psychsport.2018.05.017>
- Herrmann, J., Koeppen, K., & Kessels, U. (2019). Do girls take school too seriously? Investigating gender differences in school burnout from a self-worth perspective. *Learning and Individual Differences*, 69, 150-161. <https://doi.org/https://doi.org/10.1016/j.lindif.2018.11.011>
- Holden, S. L., Keshock, C. M., Forester, B. E., Pugh, S. F., & Heitman, R. J. (2016). Burnout and years of sports competition: Is there a correlation. *International Journal of Sports Science*, 6(1A), 8-11. <https://doi.org/DOI:10.5923/s.sports.201601.02>
- Ingrell, J., Johnson, U., & Ivarsson, A. (2019). Developmental changes in burnout perceptions among student-athletes: An achievement goal perspective. *International Journal of Sport and Exercise Psychology*, 17(5), 509-520. <https://doi.org/https://doi.org/10.1080/1612197X.2017.1421679>
- Into, S., Perttula, V.-M., Aunola, K., Sorkkila, M., & Ryba, T. V. (2020). Relationship between coaching climates and student-athletes' symptoms of burnout in school and sports. *Sport, Exercise, and Performance Psychology*, 9(3), 341. <https://doi.org/DOI:10.1037/spy0000180>
- Isoard-Gauthier, S., Guillet-Descas, E., Gaudreau, P., & Chanal, J. (2015). Development of burnout perceptions during adolescence among high-level athletes: A developmental and gendered perspective. *Journal of sport and exercise psychology*, 37(4), 436-448. <https://doi.org/https://doi.org/10.1123/jsep.2014-0251>
- Kegelaers, J., Wylleman, P., Defruyt, S., Praet, L., Stambulova, N., Torregrossa, M., Kenttä, G., & De Brandt, K. (2022). The mental health of student-athletes: A systematic scoping review. *International Review of Sport and Exercise Psychology*, 1-34. <https://doi.org/https://doi.org/10.1080/1750984X.2022.2095657>
- Kuettel, A., Durand-Bush, N., & Larsen, C. H. (2021). Mental health profiles of Danish youth soccer players: The influence of gender and career development. *Journal of Clinical Sport Psychology*, 16(3), 276-293. <https://doi.org/https://doi.org/10.1123/jcsp.2021-0035>
- Kuokkanen, J., Romar, J.-E., & Hirvensalo, M. (2022). Toward adjustment profiles for lower secondary student-athletes in the Finnish dual career context: A mixed-methods approach. *Psychology of Sport and Exercise*, 58, 102065. <https://doi.org/https://doi.org/10.1016/j.psychsport.2021.102065>
- Kuokkanen, J., Romar, J.-E., & Hirvensalo, M. (2024). Social Support, Engagement, and Burnout: A Comparative Analysis of Student Athletes and Regular Students in Finnish Lower Secondary Schools. *SAGE Open*, 14(2), 21582440241256224. <https://doi.org/https://doi.org/10.1177/21582440241256224>

- Kuokkanen, J., Saarinen, M., Romar, J.-E., & De Brandt, K. (2024). "I can join a sport class, but school has to come first": adolescent athletes' dual career construction styles in lower secondary sport schools. *International Journal of Sport and Exercise Psychology*, 1-18. <https://doi.org/https://doi.org/10.1080/1612197X.2024.2383956>
- Kårhus, S. (2016). What limits of legitimate discourse? The case of elite sport as 'thinkable' official knowledge in the Norwegian national curriculum. *Sport, Education and Society*, 21(6), 811-827. <https://doi.org/https://doi.org/10.1080/13573322.2014.975112>
- Lesener, T., Pleiss, L. S., Gusy, B., & Wolter, C. (2020). The study demands-resources framework: An empirical introduction. *International Journal of Environmental Research and Public Health*, 17(14), 5183. <https://doi.org/https://doi.org/10.3390/ijerph17145183>
- Luo, Y., Wang, Z., Zhang, H., Chen, A., & Quan, S. (2016). The effect of perfectionism on school burnout among adolescence: The mediator of self-esteem and coping style. *Personality and Individual Differences*, 88, 202-208. <https://doi.org/https://doi.org/10.1016/j.paid.2015.08.056>
- Löfstedt, P., Eriksson, C., Potrebny, T., Välimaa, R., Thorsteinsson, E. B., Due, P., Damsgaard, M. T., Suominen, S., Rasmussen, M., & Torsheim, T. (2019). Trends in perceived school stress among adolescents in five Nordic countries 2002–2014. *Nordisk välfärdsforskning| Nordic Welfare Research*, 4(2), 101-112. <https://doi.org/https://doi.org/10.18261/issn.2464-4161-2019-02-07>
- Mannerström, R., Haarala-Muhonen, A., Parpala, A., Hailikari, T., & Salmela-Aro, K. (2023). Identity profiles, motivations for attending university and study-related burnout: differences between Finnish students in professional and non-professional fields. *European Journal of Psychology of Education*. <https://doi.org/10.1007/s10212-023-00706-4>
- Markati, A., Psychountaki, M., Kingston, K., Karteroliotis, K., & Apostolidis, N. (2019). Psychological and situational determinants of burnout in adolescent athletes. *International Journal of Sport and Exercise Psychology*, 17(5), 521-536. <https://doi.org/https://doi.org/10.1080/1612197X.2017.1421680>
- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52(1), 397-422. <https://doi.org/https://doi.org/10.1146/annurev.psych.52.1.397>
- Meylan, N., Meylan, J., Rodriguez, M., Bonvin, P., & Tardif, E. (2020). What types of educational practices impact school burnout levels in adolescents? *International Journal of Environmental Research and Public Health*, 17(4), 1152. <https://doi.org/https://doi.org/10.3390/ijerph17041152>
- Moazami-Goodarzi, A., Sorkkila, M., Aunola, K., & Ryba, T. V. (2020). Antecedents and consequences of student-athletes' identity profiles in upper secondary school. *Journal of sport and exercise psychology*, 42(2), 132-142. <https://doi.org/https://doi.org/10.1123/jsep.2019-0084>
- Moksnes, U. K., Bjørnsen, H. N., Ringdal, R., Eilertsen, M.-E. B., & Espnes, G. A. (2022). Association between loneliness, self-esteem and outcome of life satisfaction in Norwegian adolescents aged 15–21. *Scandinavian Journal of Public Health*, 50(8), 1089-1096. <https://doi.org/10.1177/14034948221081287>
- Mäkikangas, A., & Kinnunen, U. (2016). The person-oriented approach to burnout: A systematic review. *Burnout Research*, 3(1), 11-23. <https://doi.org/https://doi.org/10.1016/j.burn.2015.12.002>

- Nixdorf, I., Frank, R., Hautzinger, M., & Beckmann, J. (2013). Prevalence of depressive symptoms and correlating variables among German elite athletes. *Journal of Clinical Sport Psychology*, 7(4), 313-326. <https://doi.org/https://doi.org/10.1123/jcsp.7.4.313>
- Orth, U., Robins, R. W., & Roberts, B. W. (2008). Low self-esteem prospectively predicts depression in adolescence and young adulthood. *Journal of Personality and Social Psychology*, 95(3), 695. <https://doi.org/https://psycnet.apa.org/doi/10.1037/0022-3514.95.3.695>
- Parker, P. D., & Salmela-Aro, K. (2011). Developmental processes in school burnout: A comparison of major developmental models. *Learning and Individual Differences*, 21(2), 244-248. <https://doi.org/https://doi.org/10.1016/j.lindif.2011.01.005>
- Parviainen, M., Aunola, K., Torppa, M., Lerkkanen, M.-K., Poikkeus, A.-M., & Vasalampi, K. (2021). Early antecedents of school burnout in upper secondary education: A five-year longitudinal study. *Journal of Youth and Adolescence*, 50, 231-245. <https://doi.org/https://doi.org/10.1007/s10964-020-01331-w>
- Pires, D. A., Isoard-Gautheur, S., Madigan, D. J., Smith, A. L., & Gustafsson, H. (2024). Five unsolved issues concerning burnout in athletes: An expert perspective. *Sports Psychiatry*. <https://doi.org/https://doi.org/10.1024/2674-0052/a000074>
- Raedeke, T. D., & Smith, A. L. (2001). Development and preliminary validation of an athlete burnout measure. *Journal of sport and exercise psychology*, 23(4), 281-306. <https://doi.org/https://doi.org/10.1123/jsep.23.4.281>
- Ringdal, R., Espnes, G. A., Eilertsen, M.-E. B., Bjørnsen, H. N., & Moksnes, U. K. (2020). Social support, bullying, school-related stress and mental health in adolescence. *Nordic Psychology*, 72(4), 313-330. <https://doi.org/https://doi.org/10.1080/19012276.2019.1710240>
- Rosenberg, J. M., Beymer, P. N., Anderson, D. J., Van Lissa, C., & Schmidt, J. A. (2019). tidyLPA: An R package to easily carry out latent profile analysis (LPA) using open-source or commercial software. *Journal of Open Source Software*, 3(30), 978. <https://doi.org/https://doi.org/10.21105/joss.00978>
- Rosenberg, M. (2015). *Society and the adolescent self-image*. Princeton university press. <https://doi.org/https://doi.org/10.1515/9781400876136>
- Ryba, T. V., Aunola, K., Kalaja, S., Selänne, H., Ronkainen, N. J., & Nurmi, J.-E. (2016). A new perspective on adolescent athletes' transition into upper secondary school: A longitudinal mixed methods study protocol. *Cogent Psychology*, 3(1), 1142412. <https://doi.org/https://doi.org/10.1080/23311908.2016.1142412>
- Ryba, T. V., Ronkainen, N. J., Douglas, K., & Aunola, K. (2021). Implications of the identity position for dual career construction: Gendering the pathways to (Dis) continuation. *Psychology of Sport and Exercise*, 53, 101844. <https://doi.org/https://doi.org/10.1016/j.psychsport.2020.101844>
- Saarinen, M., Bertram, R., Aunola, K., Pankkonen, J., & Ryba, T. V. (2023). Student Athletes' Causal Attributions for Sport and School Achievement in Relation to Sport Dropout and Grade Point Average. *Journal of sport and exercise psychology*, 45(1), 15-25. <https://doi.org/https://doi.org/10.1123/jsep.2022-0115>
- Saarinen, M., Phipps, D. J., & Bjørndal, C. T. (2024). Mental health in student-athletes in Norwegian lower secondary sport schools. *BMJ Open Sport & Exercise Medicine*, 10(2), e001955. <https://doi.org/https://doi.org/10.1136/bmjsem-2024-001955>
- Saarinen, M., Ryba, T. V., Kavoura, A., & Aunola, K. (2023). "Women easily feel that they have lost a year if they don't ski faster": Finnish ski coaches' discursive

- 844 constructions of gendered dual career pathways. *Psychology of Sport and*
 845 *Exercise*, 64, 102322.
 846 <https://doi.org/https://doi.org/10.1016/j.psychsport.2022.102322>
- 847 Salmela-Aro, K., Aunola, K., & Nurmi, J.-E. (2008). Trajectories of depressive symptoms
 848 during emerging adulthood: Antecedents and consequences. *European Journal of*
 849 *Developmental Psychology*, 5(4), 439-465.
 850 <https://doi.org/https://doi.org/10.1080/17405620600867014>
- 851 Salmela-Aro, K., Kiuru, N., Leskinen, E., & Nurmi, J.-E. (2009). School burnout
 852 inventory (SBI) reliability and validity. *European Journal of Psychological*
 853 *Assessment*, 25(1), 48-57. [https://doi.org/https://doi.org/10.1027/1015-](https://doi.org/https://doi.org/10.1027/1015-5759.25.1.48)
 854 [5759.25.1.48](https://doi.org/https://doi.org/10.1027/1015-5759.25.1.48)
- 855 Salmela-Aro, K., Kiuru, N., Pietikäinen, M., & Jokela, J. (2008). Does school matter?
 856 The role of school context in adolescents' school-related burnout. *European*
 857 *psychologist*, 13(1), 12-23. [https://doi.org/https://doi.org/10.1027/1016-](https://doi.org/https://doi.org/10.1027/1016-9040.13.1.12)
 858 [9040.13.1.12](https://doi.org/https://doi.org/10.1027/1016-9040.13.1.12)
- 859 Salmela-Aro, K., Savolainen, H., & Holopainen, L. (2009). Depressive symptoms and
 860 school burnout during adolescence: Evidence from two cross-lagged longitudinal
 861 studies. *Journal of youth and adolescence*, 38, 1316-1327.
 862 <https://doi.org/https://doi.org/10.1007/s10964-008-9334-3>
- 863 Salmela-Aro, K., & Upadaya, K. (2014). Developmental trajectories of school burnout:
 864 Evidence from two longitudinal studies. *Learning and Individual Differences*, 36,
 865 60-68. <https://doi.org/https://doi.org/10.1016/j.lindif.2014.10.016>
- 866 Scrucra, L., Fop, M., Murphy, T. B., & Raftery, A. E. (2016). mclust 5: clustering,
 867 classification and density estimation using Gaussian finite mixture models. *The R*
 868 *Journal*, 8(1), 289.
- 869 Sorkkila, M., Aunola, K., & Ryba, T. V. (2017). A person-oriented approach to sport and
 870 school burnout in adolescent student-athletes: The role of individual and parental
 871 expectations. *Psychology of Sport and Exercise*, 28, 58-67.
 872 <https://doi.org/https://doi.org/10.1016/j.psychsport.2016.10.004>
- 873 Sorkkila, M., Aunola, K., Salmela-Aro, K., Tolvanen, A., & Ryba, T. V. (2018). The co-
 874 developmental dynamic of sport and school burnout among student-athletes: The
 875 role of achievement goals. *Scandinavian Journal of Medicine & Science in Sports*,
 876 28(6), 1731-1742. <https://doi.org/https://doi.org/10.1111/sms.13073>
- 877 Sorkkila, M., Ryba, T. V., Selänne, H., & Aunola, K. (2020). Development of school and
 878 sport burnout in adolescent student-athletes: A longitudinal mixed-methods study.
 879 *Journal of Research on Adolescence*, 30, 115-133.
 880 <https://doi.org/https://doi.org/10.1111/jora.12453>
- 881 Sorkkila, M., Tolvanen, A., Aunola, K., & Ryba, T. V. (2019). The role of resilience in
 882 student-athletes' sport and school burnout and dropout: A longitudinal person-
 883 oriented study. *Scandinavian Journal of Medicine & Science in Sports*, 29(7),
 884 1059-1067. <https://doi.org/https://doi.org/10.1111/sms.13422>
- 885 Spurk, D., Hirschi, A., Wang, M., Valero, D., & Kauffeld, S. (2020). Latent profile
 886 analysis: A review and "how to" guide of its application within vocational
 887 behavior research. *Journal of Vocational Behavior*, 120, 103445.
 888 <https://doi.org/https://doi.org/10.1016/j.jvb.2020.103445>
- 889 Stambulova, N. B., Engström, C., Franck, A., Linnér, L., & Lindahl, K. (2015). Searching
 890 for an optimal balance: Dual career experiences of Swedish adolescent athletes.
 891 *Psychology of Sport and Exercise*, 21, 4-14.
 892 <https://doi.org/https://doi.org/10.1016/j.psychsport.2014.08.009>

- Stambulova, N. B., & Wylleman, P. (2019). Psychology of athletes' dual careers: A state-of-the-art critical review of the European discourse. *Psychology of Sport and Exercise*, 42, 74-88. <https://doi.org/https://doi.org/10.1016/j.psychsport.2018.11.013>
- Strand, B. H., Dalgard, O. S., Tambs, K., & Rognerud, M. (2003). Measuring the mental health status of the Norwegian population: a comparison of the instruments SCL-25, SCL-10, SCL-5 and MHI-5 (SF-36). *Nordic journal of psychiatry*, 57(2), 113-118. <https://doi.org/https://doi.org/10.1080/08039480310000932>
- Upadaya, K., & Salmela-Aro, K. (2013). Development of school engagement in association with academic success and well-being in varying social contexts. *European Psychologist*. <https://doi.org/https://doi.org/10.1027/1016-9040/a000143>
- van Loon, A. W. G., Creemers, H. E., Beumer, W. Y., Okorn, A., Vogelaar, S., Saab, N., Miers, A. C., Westenberg, P. M., & Asscher, J. J. (2020). Can Schools Reduce Adolescent Psychological Stress? A Multilevel Meta-Analysis of the Effectiveness of School-Based Intervention Programs. *Journal of Youth and Adolescence*, 49(6), 1127-1145. <https://doi.org/10.1007/s10964-020-01201-5>
- Vansoeterstede, A., Cappe, E., Lichtle, J., & Boujut, E. (2023). A systematic review of longitudinal changes in school burnout among adolescents: Trajectories, predictors, and outcomes. *Journal of Adolescence*, 95(2), 224-247. <https://doi.org/https://doi.org/10.1002/jad.12121>
- Verkooijen, K. T., van Hove, P., & Dik, G. (2012). Athletic identity and well-being among young talented athletes who live at a Dutch elite sport center. *Journal of Applied Sport Psychology*, 24(1), 106-113. <https://doi.org/https://doi.org/10.1080/10413200.2011.633153>
- Virtanen, T. E., Lerkkanen, M. K., Poikkeus, A. M., & Kuorelahti, M. (2018). Student Engagement and School Burnout in Finnish Lower-Secondary Schools: Latent Profile Analysis. *Scandinavian Journal of Educational Research*, 62(4), 519-537. <https://doi.org/10.1080/00313831.2016.1258669>
- Virtanen, T. E., Vasalampi, K., Kiuru, N., Lerkkanen, M.-K., & Poikkeus, A.-M. (2020). The role of perceived social support as a contributor to the successful transition from primary to lower secondary school. *Scandinavian Journal of Educational Research*, 64(7), 967-983. <https://doi.org/https://doi.org/10.1080/00313831.2019.1639816>
- Widlund, A., Tuominen, H., & Korhonen, J. (2021). Development of school engagement and burnout across lower and upper secondary education: Trajectory profiles and educational outcomes. *Contemporary Educational Psychology*, 66, 101997. <https://doi.org/https://doi.org/10.1016/j.cedpsych.2021.101997>
- Widlund, A., Tuominen, H., Tapola, A., & Korhonen, J. (2020). Gendered pathways from academic performance, motivational beliefs, and school burnout to adolescents' educational and occupational aspirations. *Learning and Instruction*, 66, 101299. <https://doi.org/https://doi.org/10.1016/j.learninstruc.2019.101299>

937 **Table 1.**

938 *Model fit statistics for latent profile models of school and sport burnout*

939

Model	Classes	Log Likelihood	AIC	SABIC	CLC	KIC	Entropy
Fixed	1	-1820.92	3649.83	3654.99	3643.83	3656.83	1.00
	2	-1723.84	3461.69	3470.71	3449.00	3471.69	0.66
	3	-1687.79	3395.58	3408.47	3376.97	3408.58	0.70
	4	-1667.37	3360.74	3377.50	3336.25	3376.74	0.76
	5	-1656.26	3344.51	3365.15	3314.10	3363.51	0.79
	6	-1651.60	3341.21	3365.71	3304.65	3363.21	0.72
Varying	1	-1720.96	3451.91	3458.36	3443.91	3459.91	1.00
	2	-1662.59	3347.18	3361.36	3326.49	3361.18	0.65
	3	-1639.16	3312.32	3334.24	3279.48	3332.32	0.58
	4	-1636.69	3319.38	3349.04	3274.53	3345.38	0.57
	5	-1625.73	3309.47	3346.87	3252.85	3341.47	0.69

940

941 **Table 2.**942 *Logistic Regression Predicting Class Membership*

943

Multinomial logistic regression model predicting burnout class membership

Class Comparison	Predictor	Step 1				Step 2			
		<i>b</i>	<i>SE</i>	<i>p</i>	<i>OR</i>	<i>b</i>	<i>SE</i>	<i>p</i>	<i>OR</i>
Mild Burnout - Well Functioning	Intercept	-2.68	1.35	.047	0.07	5.22	2.53	.039	184.07
	Gender	0.56	0.24	.019	1.74	-0.26	0.31	.409	0.77
	Grade	0.39	0.15	.011	1.47	0.55	0.18	.002	1.73
	Sport Type	0.09	0.26	.726	1.10	0.03	0.33	.916	1.04
	Self Esteem					-3.26	0.46	< .001	0.04
	SLC10					2.53	0.67	< .001	12.53
	School Identity					-0.20	0.15	.170	0.82
	Sport Identity					0.09	0.14	.530	1.09
Predominantly School Burnout - Well Functioning	Intercept	-7.72	1.98	< .001	0.00	3.14	3.59	.382	23.00
	Gender	-0.13	0.38	.739	0.88	-1.47	0.49	.003	0.23
	Grade	0.77	0.22	< .001	2.17	0.99	0.26	< .001	2.69
	Sport Type	0.26	0.41	.530	1.29	0.19	0.49	.703	1.21
	Self Esteem					-4.68	0.65	< .001	0.01
	SLC10					4.41	0.78	< .001	82.42
	School Identity					-1.00	0.23	< .001	0.37
	Sport Identity					0.36	0.22	.091	1.44
Predominantly Sport Burnout - Well Functioning	Intercept	-8.72	2.43	< .001	0.00	8.65	4.42	.050	5688.00
	Gender	0.94	0.42	.024	2.55	-1.46	0.56	.009	0.23
	Grade	0.79	0.26	.003	2.21	0.85	0.33	.010	2.33
	Sport Type	0.12	0.47	.795	1.13	0.22	0.59	.713	1.24
	Self Esteem					-7.02	0.82	< .001	0.00
	SLC10					5.14	0.81	< .001	171.01
	School Identity					-0.07	0.27	.794	0.93
	Sport Identity					-0.17	0.26	.506	0.84
Generally High Burnout - Well Functioning	Intercept	-5.84	1.56	< .001	0.00	8.26	3.13	.008	3858.60
	Gender	1.22	0.27	< .001	3.39	-0.57	0.39	.146	0.57
	Grade	0.63	0.17	< .001	1.88	0.77	0.23	< .001	2.16
	Sport Type	0.01	0.30	.973	1.01	0.11	0.41	.793	1.11
	Self Esteem					-5.33	0.58	< .001	0.00
	SLC10					4.66	0.74	< .001	105.92
	School Identity					-0.47	0.19	.015	0.62
	Sport Identity					-0.18	0.18	.310	0.83

Note. * indicates $p < .05$, ** $p < .01$, *** $p < .001$. Model 1 $R^2 = .03$, Step 2 $R^2 = .24$.

944

945

946

947

948

Figure 1.
Sport and School Related Burnout Profiles

