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Sport schools in Europe: a scoping study of research articles (1999–2022)

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ABSTRACT

Sport schools have increased in popularity over the past three decades, and research in the area has proliferated. This study presents an overview of sport school literature, by investigating peer-reviewed articles, summarising the findings of relevant articles, and identifying possible gaps in this research area. In total, 55 articles are included. The descriptive summary reports publication year, study location, research design, methods, theoretical perspectives, population, and sport(s) studied. The thematic overview comprises two primary sections – *research about sport schools* and *research in sport schools*. The former cover 'outside' perspectives, such as socio-political and educational policy issues while the latter cover 'inside' perspectives focusing on the actors – student athletes and coaches. In the discussion it is acknowledged that pedagogical perspectives in sport school literature are limited, that research on sport schools' admissions processes is overlooked, and concerns raised as to if sport schools are or should be socially inclusive.

Introduction

In many countries in Europe, the combination of education and elite sport is arranged through so called school sport programmes or sport schools, that are usually, and are defined throughout this manuscript as, 'mainstream secondary schools which have a systematic and flexible approach to assisting young elite athletes to pursue their secondary education, while also training and competing at an elite level' (Radtke and Coalter 2007, p. 1). Sport schools aim to optimise the regular school day in relation to sport-specific training. The optimization is foremost achieved through flexibility in course scheduling, such as reducing the number of regular classes (Aquilina 2013; Metsä-Tokila 2002; Radtke and Coalter 2007; Saarinen et al. 2020).

While sport schools have increased in popularity over the past three decades, research in the area also has proliferated. However, to date there has been no structured approach to scope or review the literature which impedes our general understanding of the area.

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Therefore, the purpose of this study is to present an overview of relevant sport school literature, by investigating peer-reviewed articles, summarising the findings of relevant articles, and identifying possible gaps in this research area.

The article begins with a concise history of the development of sport schools, along with brief elucidations of both policy and practice dimensions. Thereafter the methodology is outlined, in which an established framework of a scoping study is utilised (Arksey and O'Malley 2005). The framework has increased in popularity the last decade and been used to scope the literature on, for example, learning in action sports (Ellmer, Rynne, and Enright 2020) and definition, delivery and outcomes of sport for social cohesion (Moustakas and Robrade 2023). Subsequently the findings are presented, including the characteristics of sport school research and a thematic summary which uncovers a multifaceted and complex research field. Finally, the findings and a course for future research is discussed.

Sport schools

Sport schools are a fairly new occurrence, developed mainly in the 1990s (De Knop et al. 1999; Radtke and Coalter 2007). The driving forces behind this development were the high numbers of dropouts from either sports or educational programmes (Aquilina 2013; Aquilina and Henry 2010; De Knop et al. 1999; Metsä-Tokila 2002). However, the implementation of sport schools was also driven by the escalating competition in international sports, often referred to as the 'global sporting arms race' (Oakley and Green 2001, p. 89). This phrase, signifies the aggressive pursuit of sporting excellence, often involving investments in training facilities, coaching, athlete development programs, and other resources to gain a competitive advantage on the international stage (De Bosscher et al. 2008). In essence, the underlying motivations for the implementation of sport schools have remained consistent: The aim is to enhance both national and international sports achievements while safeguarding the educational aspirations of young athletes (Aquilina 2013; De Bosscher et al. 2015; Metsä-Tokila 2002; Radtke and Coalter 2007).

At present, countries like Belgium, Denmark, Estonia, Finland, Germany, Norway, the Netherlands, and Sweden have implemented various types of sport school solutions (e.g. Flatau and Emrich 2011; Hedberg 2014; Kristiansen 2017; Metsä-Tokila 2002; Rasmussen 2011; Skrubbeltrang 2018; Van Rens, Elling, and Reijgersberg 2015). The significant differences in educational systems and school curricula across various countries result in considerable variations between and even within them. As demonstrated by Radtke and Coalter (2007), who compile data on sport schools from ten countries, some nations integrate sports schools into a broader national sport strategy or structure, whereas others feature multiple distinct specialised schools that exhibit localised flexibility to accommodate young athletes.

Amidst this range of diversity, certain shared resemblances can be discerned. In the majority of the above-mentioned nations, sports schools function as public secondary educational institutions, accommodating a significant population of high-level athletic students, employ adaptable curricula, and maintain partnerships with sports federations (Metsä-Tokila 2002; Radtke and Coalter 2007). At these institutions, sports training takes place both in the morning and the afternoon, at either the school facilities (e.g. Belgium,) and/or at local centres of excellence (e.g. Germany, the Netherlands, Sweden). To compensate for reduced classroom time, several strategies can be employed. For instance, athletes attending sport schools have the option to streamline their academic focus by covering a smaller

number of subjects, thereby reducing the overall curriculum time (Aquilina 2013; Metsä-Tokila 2002; Radtke and Coalter 2007; Saarinen et al. 2020). In certain countries, like Belgium, Germany and Sweden, athletes have the opportunity to extend their study period by an additional year. Another commonly adopted approach involves the provision of supplementary resources, such as distance learning materials or extra tutorials, which facilitate the continuation of academic work during extended absences for training or competitions. In terms of collaborations with sports federations, they often play a role in the admission process, the identification and selection of student athletes, and typically handle the selection (and hiring) of coaches as well (e.g. Belgium, Finland, France, Sweden) (Radtke and Coalter 2007).

In the abovementioned nations, the realm of sport schools has witnessed significant growth in research. Various disciplinary viewpoints, alongside diverse theoretical and conceptual frameworks, have been employed to examine and comprehend research inquiries pertaining to aspects such as sport school policy, contexts, and the stakeholders involved (e.g. Flatau and Emrich 2011; Hedberg 2014; Kristiansen 2017; Rasmussen 2011; Skrubbeltrang 2018; Van Rens, Elling, and Reijgersberg 2015). Hence, while an abundance of country-specific literature exists, there remains a notable absence of articles that systematically consolidate and integrate the comprehensive and interconnected knowledge within the field. Therefore, this scoping study aims to utilise peer-reviewed research to summarise peer-reviewed research in order to condense existing knowledge and areas of uncertainty. This will establish a foundation for guiding and interpreting future research, ultimately contributing to the development of a comprehensive understanding of the field (Gough, Oliver, and Thomas 2017). This holds particular importance considering the widespread European presence of sport schools (Radtke and Coalter 2007), which are encompassing students in the age range from 12 to 19 years (UNESCO 2012). As a result, sport schools hold a significant position in nurturing the educational and athletic growth of young individuals.

Method

This article undertook a scoping study, an approach to reviewing and synthesizing knowledge in a given area and ideal for studies intending to explore a specific subject and identify research gaps for future research (Arksey and O'Malley 2005; Davis, Drey, and Gould 2009; Dowling et al. 2020; Gough, Oliver, and Thomas 2017; Levac, Colquhoun, and O'Brien 2010; Mays, Roberts, and Popay 2001). In contrast to a systematic review, which is based on well-defined research questions, a scoping study tend to address broader topics. Moreover, systematic reviews aim to answer questions from a narrow range of quality-assessed studies whilst a scoping study is less likely to address very specific research questions or assess the quality of the included studies (Arksey and O'Malley 2005).

This article draws upon Arksey and O'Malley (2005) methodological framework for conducting a scoping study (Table 1). To ensure rigor and transparency, a clear description of every stage is given below. The description ensures that the study can be replicated by others, which increases the reliability of the findings (Arksey and O'Malley 2005; Mays, Roberts, and Popay 2001).

Table 1. Summary of Arksey and O'Malley (2005, p. 8) methodological framework for conducting a scoping study.

Stage	Process
1	Identifying the research questions
2	Identifying relevant studies
3	Study selection
4	Charting the data
5	Collating, summarising, and reporting the results
6	Consultation

Identification of research questions and delimitation

Over the past three decades, there has been an increasing prevalence of sport schools in Europe (Radtke and Coalter 2007). The schools involve numerous stakeholders, including sports federations, teachers and coaches, all playing a role in the education and development of young individuals. Given this understanding, delving into the sport school literature and pinpoint areas where research is lacking can contribute to enhancing our comprehension of this phenomenon for future exploration.

Given this context and acknowledging the absence of a review of literature on sport schools, three research questions directed this scoping study:

- What are the characteristics of peer-reviewed research which highlights sport schools?
- What themes and concepts underpin peer-reviewed research which highlights sport schools?
- What gaps in the literature can be identified from this scoping study?

The formulated research questions were intentionally broad in order to encompass a diverse range of literature as the study seeks to identify characteristics (e.g. theoretical perspectives, research design, sports studied and main results/conclusion), themes and research gaps in the existing literature (Arksey and O'Malley 2005).

Delimitation

The blending of education and competitive, and/or elite, sport is widely established throughout the world. In the US, for example, interscholastic/collegiate sports are an important part of the national sport system, with competitions organised in schools and between schools (Bourke 2020; Stokvis 2009; Pot and Van Hilvoorde 2013). However, interscholastic/collegiate sports are usually extra-curricular activities, which are not part of the schools' regular curriculum. Sport schools, as defined in this article, provide elite sport training as part of the regular school day. Consequently, sport schools are distinguished from extra-curricular activities, such as inter-scholastic/collegiate sport. Furthermore, they are distinguished from specialised sport institutions with limited or no contact with regular schools, such as sport academies where professional and/or private sports clubs provide academic flexibility for young athletes within a sporting environment.

Identification of studies and search strategy

The initial search strategy amounted to an explorative literature search, which included scanning journals and electronic databases to find potentially appropriate search terms

in studies that highlighted sport schools. The explorative search employed terms such as sport school, school sport, sport education, competitive sport and elite sport. The next phase of the search strategy was to systematically apply the identified terms in distinct search strings. Boolean logical expressions (AND and OR) were used to narrow the search, and different terminologies were considered, using truncations (*) to retrieve variations in words (e.g. school, schools, sport, sports, etc.) (Gough, Oliver, and Thomas 2017).

Four electronic databases were searched: ERIC, Scopus, SPORTDiscus and Web of Science. These were selected based on the criterion that they target scientific disciplines (social science, educational science, and sports science) in which articles concerning sport schools can be expected to be found. Several search strings were constructed and elaborated upon. However, as the following example [(School* OR education*) AND ('competitive sport*' OR 'elite sport*')] reveals, the strings yielded a great number of hits (in the example, 2161) in which a wide range of articles were considered irrelevant, as emphasizing social school-sport projects and interscholastic/extra-curricular activities.

Moreover, through the searches it was discovered that the term 'school sport' is used vaguely, occasionally synonymous with the subject 'physical education' (PE) or as an umbrella expression for different sports/physical activities in educational settings (e.g. Bailey et al. 2009; Piñeiro-Cossio et al. 2021; Schneider et al. 2009). However, when 'competitive' or 'elite' were included as prefix, the references obtained did relate to the definition of sport schools used in this study. Accordingly, the search strings were refined and narrowed down to one. The final string [('School sport*' OR 'Sport school*') AND (Competitive OR elite)] resulted in references to 620 peer-reviewed articles which were then retrieved for further analysis.

The selection procedure – inclusion and exclusion criteria

The search results (*n* = 620) were exported to the online citation manager Rayaan (2022) to collate the results and remove duplicates (*n* = 195). Two fundamental criteria guided the inclusion of articles: (1) English-language and (2) peer-reviewed; and two criteria guided exclusion: articles on (1) interscholastic/extra-curricular activities and (2) special sport school institutions, such as sport academies. As noted earlier, these subjects fall outside the scope of this article.

The first step in the selection procedure included a screening procedure. Titles, keywords, and abstracts were closely read to further ascertain whether the articles were appropriate to be included in this scoping study. Of the 425 articles, a large proportion (*n* = 345) were considered irrelevant and were therefore excluded. These lacked a specific association to the objective of this article, for instance focusing on PE (e.g. Kirk 2004), social school-sport projects (e.g. Ortega Vila et al. 2020) or sports and recreation policies which are tackling social and cultural aspects linked to sports in general (e.g. Devine 2018).

The remaining articles (*n* = 80) were retrieved and assessed for eligibility. Eleven articles were unavailable in full text while 14 were in other languages and were therefore excluded. Ultimately, a total of 55 articles are included in this study (see Appendix), Figure 1 is a flow chart showing the search and selection process.
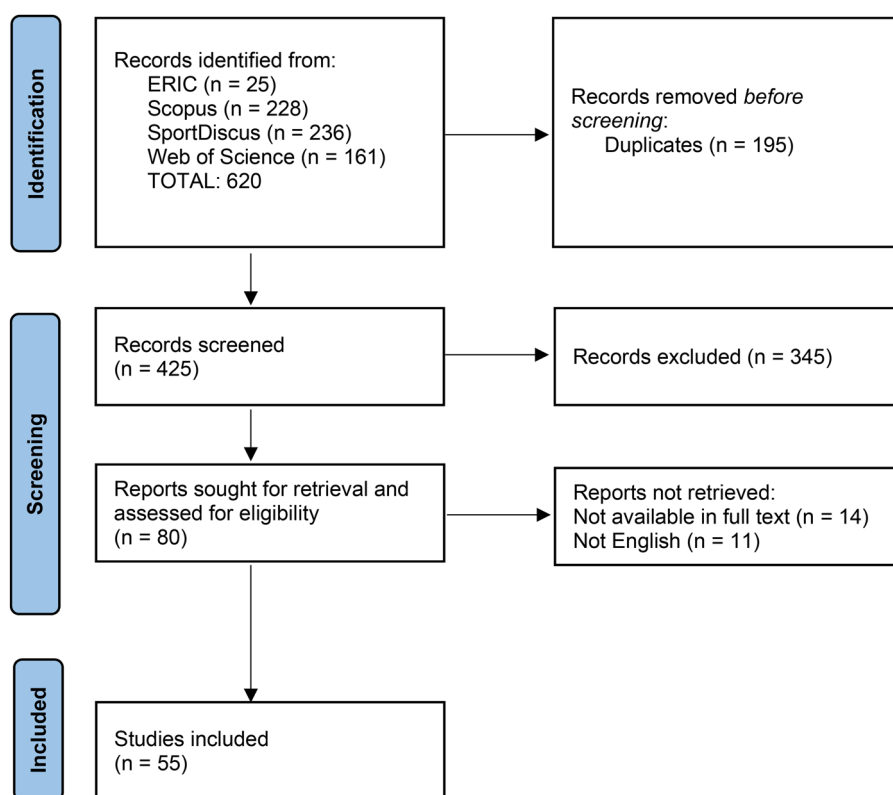
Figure 1. Flow chart showing the search and selection process.

Charting the data

The content of the 55 included articles was extracted to a data-charting form. Charting is a technique for synthesizing and interpreting qualitative data by sifting and sorting among the material according to key issues. By charting the data, a perception of the main areas of interest was developed (Arksey and O'Malley 2005).

The 'chart' of extracted content included key characteristics from each study, such as its author(s), year of publication, title, study location, journal, journal type (aims and focus), research objectives, article type (i.e. empirical/theoretical), theoretical perspectives, research design, methods, population, sports studied and main results/conclusion. Further, the articles were assigned numerical values (1–55) and are referenced in the text using numerical style, as in other scoping studies (e.g. Ellmer, Rynne, and Enright 2020).

Collating, summarising and reporting the results

This article presents a summary that combines both descriptive and thematic elements. For the descriptive summary, key variables were coded to describe the characteristics of the research, namely, publication year, study location, academic field (journal), research design and methods, population, and sport studied. For the thematic summary, Braun and Clarke (2006) six-step thematic analysis guide was applied. During the initial phase, an understanding of the content offered in the articles was formed by reading each of them ($n = 55$).

In the second step, codes of different features were created. These codes were derived from a combination of the articles' keywords (such as 'dual career', 'coping' and 'talent development') as well as from the content within the articles' findings, discussions, and conclusions sections (e.g. 'policy influence', 'sporting success' and 'athletic opportunities'). In the third step, a comparison of the codes was conducted to identify similarities and differences between them. Subsequently, the codes were organized into themes which thereafter were placed in one of the two following categories: *Research about sport schools: Shaping perspectives and Research in sport schools: Within the walls* (See Table 2 for an example of the thematic analysis process).

The analytic process of coding and the construction of themes were data-driven, and not adjusted in accordance with a pre-existing framework. However, as Braun and Clarke (2006) advocate, researchers cannot completely detach themselves of their prior understandings and assumptions. Taking that into consideration, I have attempted to provide a fair and balanced account of the various lines of research and their representation in the sport school literature.

Consultation

Arksey and O'Malley (2005) recommend that several practitioners should be included in the process of producing a scoping study. In this study the author was responsible for the analysis; however, colleagues served as critical readers with whom issues, challenges, and uncertainties was discussed throughout the process. The discussions were implemented to validate findings, add rigour and enhance transparency.

Findings

As noted above, a descriptive and thematic summary was formed, thus, the findings are divided into two sections. In the first section, general study characteristics of the research

Table 2. [An example of] codes, themes and categories.

Codes	Coded for	Theme	Category
Neoliberalism, marketization, privatization, deregulation, education reform	Policy influence	Neoliberal Sport Schools	Research about Sport Schools: Shaping perspectives
Evaluation, effectiveness, sporting success, outcomes	Assessing effectiveness	Sport schools and the development of talent	
Athlete development, talent program, talent environment, facilities, support service	Enhancing athlete/talent Development	Developing talent - Sport schools as advantageous sporting environments	
Adolescent, student/pupil, student-athlete, sporting capital, sports habitus	The individual and demographic characteristics	The student athlete	Research in Sport Schools: Within the walls
Dual career, career transition, athletic identity, student identity, coping	Integration of Sports and Education	The dual career – combining sport and education	
Coach, adviser, instructor, coach competence, educating	Coaching/Teaching	Coaching and educating in sport schools	

is presented, which include publication year, study location, academic field (journal), research design and methods, population, and sports studied. Thereafter, in the second section, the two categories – *Research about sport schools: Shaping perspectives* and *research in sport schools: Within the walls* – are presented. Each category includes themes and summaries of findings of relevant literature.

General study characteristics

Year of publication

As illustrated in Figure 2, the oldest article included in this scoping study was published in 1999 [8], whilst four of the articles were published during 2000–2009 [14, 15, 44, 53], and six [7, 11, 19–21, 32] between 2010–2014. In 2015–2021, there was a noticeable upsurge: 44 articles were published in this time-period.

Study location

Most of the articles ($n = 44$) included in this scoping study originate from Norway ($n = 12$), Sweden ($n = 12$), Germany ($n = 10$) and Russia ($n = 8$). Study locations also include Austria [21], Belgium [13], Denmark [47, 48], Estonia [28], Finland [44, 45], Lithuania [24], Poland [46], Slovenia [10] and Ukraine [38]. Two of the articles are multi-national studies, in which researchers have collaborated across different countries to gather a comprehensive perspective on sport schools [36, 49].

Journals

The majority of the included articles are published in sport science journals ($n = 36$), the most prominent of them being *Sport, Education and Society* ($n = 7$). However, there are also articles that are published in journals that relate to a variety of research fields, such as finance [20], medicine [e.g. 21, 23, 54], and psychology [12, 24].

Theoretical approaches

The authors of the included articles have approached their research and data in various ways. Firstly, several of the articles employ hypotheses [e.g. 1, 14, 16, 24]. Predominantly,
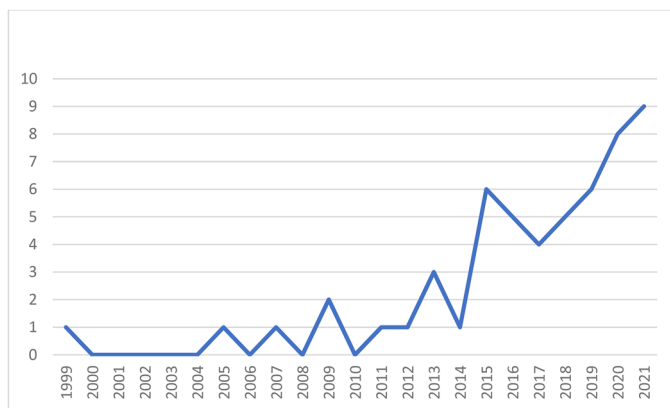

Figure 2. Number of peer-reviewed articles by year.

these hypotheses draw upon psychological perspectives [e.g. 3, 14, 28, 35], including theories of learning [2] and concepts such as self-determination theory [3] and coping [8, 31]. Furthermore, sociological [e.g. 7, 17, 18, 32, 48], and structural approaches [e.g. 13, 15, 29] are being employed. The sociological approaches entail Pierre Bourdieu's concepts field, capital and habitus, [17, 18, 47]; Erving Goffman's symbolic interaction theory [9]; Niklas Luhmann's system theory [7]; and Basil Bernstein's concept of recontextualization [25, 26]. The structural approaches, in this context involve analysing the organizational, institutional, and systemic factors that influence the implementation and outcomes of sport school policies, including organizational perspectives [6, 7] and economic theory [20].

Beyond the more general theoretical approaches, the articles also incorporate theories that are specific to the field of sports. For example, the concept of a 'dual career' [e.g. 1, 36, 44] is used in combination with athletic career models such as the standard model of talent development (SMTD) [6], career construction theory [45], the holistic athletic career model [36], the athletic career transition model [50] and the developmental transition model of athletes [50]. While the majority of authors utilise theoretical frameworks, specific articles demonstrate a lack of clarity in their theoretical approach [e.g. 4, 12, 21, 54].

Research design and methods of data collection
Empirical studies dominate among the 55 included articles, whereas five are theoretical [7, 10, 19, 49, 53], indicating a prevalent focus on practical observations and data-based analysis within the body of research. The most common research designs are the case study ($n = 17$) [e.g. 3, 5, 11] and cross-sectional designs ($n = 14$) [e.g. 13, 14, 24, 55]. Other approaches include mixed-method designs [8, 12, 30, 31, 50], prospective designs [1, 4, 21, 23], experimental designs [22, 27, 34, 43, 51], observational cohort study designs [34, 51, 52], applied research [28], pilot studies [39], and ethnography [48].

The most common methods of data collection are questionnaires ($n = 19$) [e.g. 1, 16, 23, 54] and interviews (focus groups and individual) ($n = 12$) [e.g. 9, 25, 40, 44], or a hybrid of the two [8, 12, 30, 31, 50]. The data collection methods also include participant observations [44, 48], register data [18, 33], text documents [25, 26, 32, 36], and video recordings [38].

Population
The majority of the included articles ($n = 46$) involve a population being studied, usually students at sport schools. The age of the participants varies; however, the primary age category ($n = 12$) is that of upper secondary students aged 15–19 [e.g. 9, 43, 50, 55]. Lower secondary pupils, aged 12–15, are exclusively studied in six articles [22, 30, 38, 44, 46, 47], while a total of five articles various other age ranges, 12–17 [8], 12–18 [14], 12–19 [54], 14–18 [41], 14–19 [21]. In seven of the articles the age of the participants is not specified [11, 13, 15, 20, 22, 27, 34].

Ten of the articles [e.g. 5, 12, 17, 39, 42] include teachers/coaches at sports schools, while three other articles [25, 29, 36] involve participants such as sports federations and parents of students in sports schools.

The articles involved both male (i.e. described as males, men, or boys) and female (i.e. described as females, women, or girls) participants. In sixteen articles, the distribution is (fairly) equally divided [e.g. 11, 24, 37, 50], but there are also articles in which the majority

of or the entire population studied is male [1, 21, 41, 54] or female [4, 9, 30, 31]. Twelve of the articles did not specify the sex and/or gender of their sample [e.g. 36, 38, 42].

Sport(s) studied

The descriptive analysis shows that in the included 55 articles a total number of 33 sports are mentioned and/or subject to enquiry. The most frequently occurring are skiing (i.e. alpine, cross-country, biathlon, free-ski, ski-orienteering) ($n = 12$), handball ($n = 10$), football ($n = 9$), track and field/athletics ($n = 7$) basketball ($n = 7$) and ice hockey ($n = 7$). Other sports mentioned include artistic gymnastics, badminton, cycling, fencing, floorball, golf, gymnastics, judo, snowboard, swimming, tennis, triathlon, volleyball, and table tennis.

In 25 of the articles no particular sport is specified; rather, sports are instead categorised as endurance, combat, and multidiscipline sports [37], individual/team sports or winter/summer sports [e.g. 15, 18, 20]. Furthermore, 20 of the articles consider more than one sport [e.g. 1, 44, 47].

Thematic summary

A particular interest of this scoping study was to identify key themes and concepts which underpin sport-school research. Utilising a thematic analysis, although one can recognise overlaps, two main categories were constructed – *Research About Sport Schools: Shaping Perspectives* and *Research in Sport Schools: Within the Walls* – each with subthemes and associated concepts. An overview of the relevant literature on each category, subthemes and recurrent concepts of the various themes is presented below.

Research about sport schools: shaping perspectives

This category include articles that delve into subjects beyond the confines of the sport school environment. These articles encompass socio-political and educational policy matters, assessments of sports school students' performance related to athletic achievements, and the establishment of sports schools for developing talent. In the following sections, a selection of relevant literature on each topic is presented.

Neoliberal sport schools

The analysis yielded seven articles that study the phenomenon of sport schools from socio-political and educational policy perspectives [7, 19, 25, 26, 29, 32, 53].

In a Norwegian and Swedish context, authors suggests that the development and continuation of sport schools is highly affected by neoliberalist reform processes [19, 25, 26, 29, 32]. Ferry et al. (2013) explores the relationship between the 'neoliberalization' of the Swedish school system and the growing number of sport schools, concluding that the neo-liberalization of educational policy has meant that schools use sport to attract students. Lund (2014) argues that neoliberal reforms has produced a shift in the policy rhetoric of school sports, from normative, which highlighted pupils' social and emotional reasons for choosing school sports as an educational path, to a rational rhetoric, which emphasises efficiency, standardization and the regulation of pupils' educational choices.

In a similar vein, Kristiansen and Houlihan (2017) suggest that the non-existent tradition of competitive sport within the Norwegian school system and increasing pressure to provide early sport specialization have created a market for private sport schools to attract young athletes. Kårhus (2016, 2019) implies that this development, affected by neoliberal processes – a marketization of schools – has created competition between private schools and state schools and 'legitimized' elite sport as a school subject (Kårhus, 2016). Furthermore, Kårhus (2019) argues that providing certain opportunities for certain students raises an education policy dilemma that challenges its values of equality and social justice.

Borggrefe and Cachay (2012) use the concept of structural coupling to analyse two German sport school systems. The authors argue that the structural coupling of elite sport and school constitutes an attempt to solve the problem of integrating athletic and academic careers by declaring elite-sport training to be a component of schools' curricular content. From an elite-sport point of view this is highly attractive and positive. However, from a school point of view, the authors conclude, elite sport content is not always compatible with schools' education function since admission is obtained through sport selection-processes.

As has been illustrated in this section, concepts such as neo-liberalization, marketization, privatization and systems theory have been utilised to acknowledge the influence of socio-political processes on the implementation, justification and continuous progress of sport schools. From the excerpts it is apparent that conflicts between sport and school, through sport schools, do appear, as sport and education are separate and autonomous systems [7, 18, 25, 26].

Sport schools and sporting success

Four [13, 15, 20, 33] of the 55 included articles evaluate sport schools from both sporting and academic perspectives, primarily, the former. The research utilises quantitative data to retrospectively analyse how sport schools contribute to enhancing the academic and sporting success of participating athletes.

De Bosscher et al. (2016) suggests that questions have arisen as to whether elite sport schools (ESS) in Flanders (Belgium) are effective and/or necessary to increase sporting success. A retrospective comparative study based on data from questionnaires and involving ESS-athletes and non-ESS athletes, revealed no clear evidence of more effective outputs (better sport performance), or more positive evaluation of throughputs (general services, training facilities, coaches' expertise) by athletes who attended an ESS. However, the study concluded that almost 95% of all students at an ESS attained their diploma in secondary education which is significantly higher than mainstream students.

In a German context, Emrich et al. (2009), compare the academic performance and competitive success of ESS and non-ESS athletes in the 2004 Summer Olympic Games and the 2006 Winter Olympic Games. The results indicate no difference in athletic performance between the two groups in the 2004 Summer Olympic Games, whereas in the 2006 Winter Olympic Games there was a significant difference. The authors suggest that the positive results for the Winter Olympic Games can be explained by the location of the schools, which were situated near special winter training facilities. This view is supported by Flatau and Emrich (2013) who conclude that ESS attendance, in high asset specificity settings (e.g.

adequate facilities), proves to have a significant positive effect on subsequent Winter Olympic sporting success.

As noted in this section, scholars, retrospectively, compare elite athletes who have never attended an ESS with those who have to examine the effectiveness of sport schools in increasing sporting success. The drawn conclusions exhibit a certain level of inconclusiveness; nonetheless, authors generally agree that sport schools offer satisfactory support services within qualitative talent development contexts [13, 15, 20, 33].

Sport schools and the development of talent

Talent (or athlete) development is either employed as a keyword [e.g. 6, 31, 36] or consistently revisited as a recurring concept [e.g. 20, 48, 53] in over half of the 55 articles encompassed in this study. Within the articles, sport schools are emphasized as significant and beneficial environments for fostering talent [e.g. 3, 6, 11, 29, 31], sometimes recognized as an essential component of the talent development trajectory in various countries [20, 36]. In these environments athletes have access to specific sport facilities, flexible coordination of school studies and training, and a network of highly skilled personnel [e.g. 5, 11, 13, 36, 48].

From an organizational perspective Morris et al. (2021) outline key features of the various options of sport schools in seven countries (Belgium, Denmark, Finland, Slovenia, Spain, Sweden and the UK). The authors construct a taxonomy of eight different environments of which two, sports-friendly schools and elite sport schools/colleges, were found in all seven countries. *Sports-friendly schools* are regional schools that permit elite sports or align themselves with elite sports to provide academic flexibility for athletes to train and compete in their own sporting environment. *Elite sport schools* are developed for elite athletes who wish to combine their athletic and academic careers – by providing a combination of sport and academic support (e.g. elite coaching and flexible studies). Elite sports schools maintain official communication channels with sport federations (for instance, both entities collaborate in the process of selecting athletes for attendance) and often receive financial support from the affiliated organization.

While the environments are described as beneficial and successful in producing successful athletes they are also subject to scrutiny and critique. Sport schools can exhibit organizational fragmentation, lack of coordination, and therefore susceptible to tensions that may arise among key stakeholders, such as club coaches and educational personnel [5, 29]. Moreover, the schools are skewed in favour for athletes deemed talented and as having potential to be successful elite athletes [5, 13, 15, 36]. This predisposition gives rise to sport-related issues, as it suggests that talent identification and selection procedures prioritize specific skills and personalities, leading to the formation of somewhat homogeneous talent groups [40, 48]. Consequently, this can result in social exclusion, a process in which certain individuals or groups are systematically disadvantaged or marginalised from participating in sport schools [18, 47].

Development of talent is an area of importance to individual nation states. In the light of the global 'sporting arms race', competition has increased, and more nations plan strategically for success [13, 36]. As a result, there is a growing prevalence of elite athletes within the educational system, expanding not only in upper secondary schools but also encompassing the emerging trend of lower-secondary sport schools [22, 30, 38, 44, 47].

Research in sport schools: within the walls

While the preceding section explores research which address topics 'outside' the school walls, the following section covers articles which address topics 'within' the school walls. Primarily, this section discusses the key participants in sport schools – coaches and student athletes – and their dual commitment to both elite sports and education.

The student athlete

The analysis yielded 33 articles [e.g. 9, 12, 14, 30] identified as broadly related to students in sport schools, usually referred to as 'student athletes' and occasionally as 'athlete students' [5], 'school athletes' [35] or 'sports students' [48].

In this body of research, several scholars use student athletes as study participants to acquire knowledge in a variety of scientific disciplines, particularly medicine/physiology. The articles highlight issues regarding training/physical fitness [23, 27, 34, 43, 51], doping [21, 54, 55], asthma [16, 23], dieting and disordered eating [41]. The results of these studies are not relevant to the objectives of the present study and will not be further discussed.

In articles focusing on student athletes, scholars explore both macro (social-structural) [e.g. 18, 47, 48] and micro (individual) perspectives [e.g. 3, 9, 40]. Concerning the former, the socio-economic backgrounds of student athletes in lower- and upper-secondary sport schools are analysed. By utilising Bourdieu's theoretical concepts, the authors suggest that sport schools attract a certain social group of pupils, a group with a 'taste' for sport and education, who tend to be highly motivated in both areas (Ferry and Lund, 2018, p. 280). Sport schools, therefore, are 'advantaging the already advantaged'; habitus reflects the way class structure intersects with educational and athletic opportunities (Skrubbeltrang et al. 2020, p. 52). Moreover, Skrubbeltrang et al. (2016) highlight that student athletes are expected to behave in specific ways. The 'code of conduct' is committing to working hard to develop athletic talents while exhibiting the same attitude towards schoolwork (p. 377).

Concerning micro (individual) perspectives, Berntsen and Kristiansen (2020) approach their discussion of student athletes by utilising the concepts of *eudaimonia* and *hedonia.* Hedonic athletes want to have fun while 'playing' sports (p. 13). On the other hand, eudaimonic athletes enjoy hard work and practice to develop and reach goals in their sports. The authors conclude that there is a need to combine the two concepts in school-sport training to enhance the learning of student athletes. Continuing this line of thought, Renström and Stenling (2019) argue that key learning dispositions in student athletes involved in a Swedish football school sport programme are resilience, reciprocity and play-fulness. In a general sense, their findings suggest that there is a necessity for learning environments to be accurately tailored to incorporate the diverse range of learning dispositions. These observations shed light on the multifaceted nature of skill development and personal growth within the context of sport schools [3, 40].

In the context of student athletes' learning and the development of their athletic and academic skills in sport schools, 'identity' is a recurrent concept [e.g. 9, 44, 50]. Within these articles, the emergence and coexistence of both an athletic and a student identity are deliberated upon. Particularly, the findings uncover that student athletes exhibit a more pronounced athletic identity compared to their student identity, influencing their approach towards academic responsibilities (Stambulova et al. 2015).

The dual career – combining sport and education

Several of the included articles [e.g. 1, 7, 10, 47, 50] refer to, or highlight, the concept 'dual career' (DC) – 'i.e. combining sport and education, sport and work' (Stambulova et al. 2015, p. 5). While the research in the theme above highlighted who the student athletes are (and who they are not), including aspects such as socio-economic backgrounds, the dual career research centres on the sport school process and the interaction between athletic career and education. In these articles it is emphasised that athletes are encouraged to pursue a dual career in sport schools, which is described as a suitable solution for balancing sport and other spheres of life and preparing for a life after sport [e.g. 29, 36, 53].

Nevertheless, while researchers emphasize the expectation for student athletes to excel in both academics and sports, there is also contention that a dual career can impose significant demands [e.g. 1, 44, 50]. The demands can lead to situations where the dual career process is perceived as challenging, potentially inducing psychological and/or physical health concerns [e.g. 1, 28, 31, 37]. Hence, it is argued, it is necessary for the student athlete to have certain psychological traits to manage the stressors. A recurrent concept in this context is 'coping', that is, the way athletes deal with stress, injury, high expectations and time management [e.g. 28, 50]. Student athletes lacking effective coping strategies are susceptible to the possibility of dropping out from their enrolment in a sport school [1, 8, 50]. Considering this situation, Baron-Thiene and Alfermann (2015) separate individual traits that can anticipate a decision to drop out. The results show that physical complaints, lack of motivation and volitional skills are central predictors and therefore the authors recommend psychological training, assistance in setting goals and developing a positive attitude to reduce the drop-out rate.

The above observations highlight factors characterizing and influencing the dual career and the extent to which they are conducive to managing it successfully. While the dual career can be viewed as an individual project, certain scholars emphasize that it should not rest solely on one person's shoulders. Instead, it should be approached as a holistic project in which support functions, such as social encouragement from family, teachers, and coaches, can encourage the student athlete to manage the dual career [e.g. 8, 30, 31, 50].

Coaching and educating in sport schools

Seven of the included articles [2, 3, 5, 6, 12, 17, 42] address sport-school coaches (in Sweden referred to as 'teachers') [17]. Occasionally, coaches are participants in studies in which the context (sport schools) is subordinate to the research inquiry [2, 42]. In articles that focus on coaches, they are described as advisers, instructors and educators who need to take education and sports into account while promoting athlete development, which is emphasised as challenging [5, 6, 12, 17].

In a Norwegian context, Bjørndal and Gjesdal (2020) interviewed coaches (handball and football) in sport schools who reported that they have an athlete-centred approach focusing on quality rather than quantitative training. The coaches also reported that they are conscious of the importance of their athletes' education and try to ensure that the academic syllabus is not overlooked. However, ensuring that athletes succeed in both sport and education is challenging: the coaches stress that it primarily requires flexibility in balancing the various demands on the part of the athletes themselves. Berntsen and Kristiansen (2020) interviewed both snowboard and freeski athletes and coaches at an elite sport-school in Norway. The authors highlight the paradox of the endorsement process in which the 'have

fun' mentality of the athlete meets the 'work hard' mentality of the coach (p. 17). A dilemma for the coach is that the inherent sport culture of snowboarding and freeski, which is non-organised training, results in the coach being perceived as controlling.

Ferry (2016) examines the conditions for school sport programmes in Sweden and analyses the competencies, education, and backgrounds that school sport teachers possess. While school sports in Sweden are carried out in the format of a school subject ('special sport') regulated by the government, the results show that a majority of the sport-school personnel are employed as coaches rather than teachers. Therefore, Ferry argues, school sports cannot be viewed as a legitimate part of the field of education but rather as part of the field of sport.

As noted in this section, scholars have acknowledged that education and sport belong to different social fields with different rationales which influence the role of the sport school coach [3, 5, 12, 17].

Discussion

This study has delved into the attributes characterizing peer-reviewed research that emphasizes sport schools and have explored the prevailing themes and concepts present within the corpus of literature.

The result of the descriptive summary indicated an increase in publications in 2015–2021, which suggests a growing interest in the research area. Clearly, researchers have gained insight into the subject of sport schools, often underlining issues arising from the intersection of two domains: education and elite sports [17, 18, 25, 26], in which the pursuit of excellence in high-performance sports [15, 20] aligns with educational demands [44, 50]. There is a widely held consensus that the intersection, wherein the dual career is in progress, leads to concerns regarding the overall well-being of student athletes [e.g. 1, 28, 31, 37]. As the number of sport schools grows, a greater number of athletes gain access to sport schools and its advanced training facilities, professional coaches and support personnel [11, 36]. With an expanding population it becomes important to engage stakeholders, including athletes, coaches, educators and researchers, to collectively develop and execute impactful strategies aimed at fostering a positive environment for both sports and learning.

The included articles primarily originate from Norway ($n = 12$), Sweden ($n = 12$) and Germany ($n = 10$), which can be explained by the rigorous definition of 'sport school' used in this study, as well as by the long sport-school history these countries have (Metsä-Tokila 2002; Radtke and Coalter 2007). Furthermore, the included articles draws from various disciplines such as psychology [e.g. 1, 12, 50], medicine [e.g. 21, 23, 54] and physiology [e.g. 23, 43, 51] and are primarily published in sport science journals. This is to be expected, as the findings frequently hold significance that aligns with the domain of sports such as insights on how to successfully combine sport and studies [50]. Interestingly, given the school context, only a few articles are published in educational journals. Evidently, there has been moderate interest in the topic of sport schools from educational science perspectives. While educational science covers different perspectives of knowledge, pedagogical approaches and strategies to enhance learning outcomes, there exists potential for pedagogical researchers to explore the conceptualization of sports as a form of knowledge and pedagogical reflections over the legitimatization of training as curricular content [7, 25, 26].

Forty-six of the 55 articles included a study population, consisting usually of students aged 15–19 [e.g. 28, 43, 52, 55], indicating that sport schools are most common in upper

secondary education [36]. However, lower-secondary sport schools have recently been established in several countries and aroused the interest of researchers [22, 30, 38, 44, 46, 47]. This development is in line with the theory of the 'global sporting arms race', the long-term goal of capturing more international medals (De Bosscher et al. 2008). Considering this perspective, sport schools as a means of cultivating young talented athletes can increase the already palpable pressure for early specialization [29, 30, 36], which can lead to negative consequences, such as higher injury rates, athlete burn-out or dropping out from sport at an early age [e.g. 1, 4, 30, 45].

Moreover, regarding the characteristics of the literature, it was noted that psychological, sociological, and structural approaches were applied in the included articles, while the most common method of data collection was questionnaires [e.g. 16, 23, 54] and interviews (focus groups and individual) [e.g. 25, 40, 44]. Hence, the field of research could benefit from a wider array of research methods. This diversity could promote a more comprehensive and nuanced investigation of sports schools, yielding valuable insights that are beneficial not only for academia but also for practical applications. For example, by employing approaches such as ethnography or mixed-methods research, researchers can delve deeper into social interactions, institutional structures, and cultural factors that influence sport schools. Moreover, diverse methodologies can yield insights with practical implications for policy-making and pedagogical strategies within sport schools.

While the descriptive summary presented the characteristics of sport-school research, the thematic summary uncovered a multifaceted field demonstrating that scholars are trying to understand sport-school issues from different perspectives, utilising different concepts. For example, as stated in the introduction, the aim of sport schools is to improve national and international sport performance (De Bosscher et al. 2015; Metsä-Tokila 2002; Radtke and Coalter 2007). As a result, scholars have evaluated whether sport schools are effective in producing sporting success [13, 15, 20], leading to a subsequent analysis of their role in developing talent [3, 11]. Bearing this in mind, a relatively large body of the literature acknowledges that sport schools are only for those who have been identified as talented and having the potential to achieve sporting success in the future [e.g. 13, 15, 25, 32, 36]. However, research (in a Swedish and Norwegian context) show that sport schools attract 'pupils with certain social backgrounds and predispositions' (Ferry & Lund, p. 280) and are therefore potentially 'advantaging the already advantaged' (Skrubbeltrang et al. 2020, p. 52). Based on the insights of these conclusions, concerns as to if and how sport schools are socially inclusive and fair could be raised. Therefore, it is recommended that scholars' address inequalities within and beyond the sport school learning site, i.e. the social learning environment. Such enquiry could contribute to the limited literature on the influence of power relations (such as conflicting interests between education and elite sports), leading to exclusion of social groups [18, 47] or constriction of wellness within sport school environments [e.g. 1, 28, 31, 37, 44, 50].

Concerning future research, this study also set out to examine the missing pieces in what we already know and find out where we need to learn more. This examination underscores specific areas that require more in-depth investigation. Firstly, there remains much scope for further work on the role of sport-school coaches' [3, 5, 6, 17] and student athletes' learning in sport schools [3, 40, 48], as the literature is scarce. While sport schools in Europe are well-established in upper-secondary education [e.g. 11, 29, 36, 50], and becoming increasingly common in lower-secondary education [22, 30, 38, 44, 46, 47], there is an

opportunity for more focused empirical attention exploring athletes' and/or coaches' learning and relationships in a sport-school context. Such research could address value-based leadership (Crossan et al., 2023) or coach-created motivational climates (Saarinen et al. 2020) and their possible implications for student-athletes' learning experiences and sports performances in sport school environments. This has the potential to offer new insights and knowledge with greater focus on appropriate sport pedagogies in the rather unique sport school environment which potentially can assist sport school coaches in their practice and thereby enhance pedagogical knowledge and pedagogical quality in sport schools.

Secondly, in several of the included articles, the authors state that sport schools either identify, admit, select, recruit, or accept the very best potential athletes [e.g. 13, 32, 36, 40, 46] and that the students who are admitted are highly talented [15] and have passed 'entrance exams' (Baron-Thiene & Alfermann, 2015, p. 43) or national physical aptitude tests [14, 44, 47]. While being selected to a sport school is an important and arguably inevitable part of the talent developmental pathway in many sports [5, 11, 13, 36, 48], the admission process – how the sport schools identify, select and test potential student-athletes – is a neglected field of research in need of research attention. Future research, by involving practitioners (sport-school coaches), needs to identify factors influencing admission processes and explore in which way the admission is enacted, and what methods have been developed to test and assess potential student athletes. This is significant in order to enhance social inclusion, improve transparency of, and further 'legitimatize', elite sport in educational environments [25, 26].

While this article began by pointing out that rich insight on sport schools has been gathered, the results of this study reveal that the research is highly complex and multifaceted. Hopefully, this study provides a starting point for developing the research field and is a useful platform for those who choose to pursue new and necessary work on sport schools.

Limitations

There are some limitations to this scoping study. To begin with, it is possible that some peer-reviewed articles were not included due to the specific definition of a sport school and the strict criteria for inclusion that were applied. Additionally, as previously mentioned, the absence of universally accepted terminology related to school sports leads to linguistic ambiguities. However, a thorough effort has been made to address these challenges and reduce potential confusion. Moreover, it should be emphasised that the interpretative activity of charting and thematic analysis is complex and can generate inconsistencies (Holloway and Todres 2003). Therefore, as with any quality research, the potential for bias and subjective judgements regarding data collection and analysis must be determined by the reader.

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Appendix

Table A1. List of articles included in the study.

Nr	Author(s)	Year	Country	Title
1.	Baron-Thiene & Alfermann	2015	Germany	Personal characteristics as predictors for dual career dropout versus continuation – A prospective study of adolescent athletes from German elite sport schools
2.	Berntsen & Kristiansen	2019	Norway	Successful coach learning: Digital workbook informed by pedagogical principles
3.	Berntsen & Kristiansen	2020	Norway	Perceptions of need-support when "having fun" meets "working hard" mentalities in the elite sport school context
4.	Bjørndal et al.	2021	Norway	An Examination of Training Load, Match Activities, and Health Problems in Norwegian Youth Elite Handball Players Over One Competitive Season
5.	Bjørndal & Gjesdal	2020	Norway	The role of sport school programmes in athlete development in Norwegian handball and football
6.	Bjørndal, Ronglan & Andersen	2017	Norway	Talent development as an ecology of games: a case study of Norwegian handball
7.	Borggrefe & Cachay	2012	Germany	"Dual Careers": The Structural Coupling of Elite Sport and School Exemplified by the German Verbundsysteme
8.	Brettschneider	1999	Germany	Risks and Opportunities: Adolescents in Top- Level Sport – Growing Up with the Pressures of School and Training
9.	Broms, Hedenborg & Radmaan	2020	Sweden	Super equestrians – the construction of identity/ ies and impression management among young equestrians in upper secondary school settings on social media
10.	Capranica et al.	2015	Slovenia	The European Athlete as Student Network ("EAS"): Prioritising Dual Career of European Student-Athletes
11.	Carlson	2011	Sweden	Talent detection and competitive progress in Biathlon – A national example
12.	Davis et al.	2019	Sweden	Alpine Ski Coaches' and Athletes' Perceptions of Factors Influencing Adaptation to Stress in the Classroom and on the Slopes
13.	De Bosscher, De Knop & Vertonghen	2016	Belgium	A multidimensional approach to evaluate the policy effectiveness of elite sport schools in Flanders
14.	Elbe, Szymanski & Beckmann (2005)	2005	Germany	The development of volition in young elite athletes
15.	Emrich et al.	2009	Germany	Evaluation of the Elite Schools of Sport - Empirical Findings from an Individual and Collective Point of View
16.	Eriksson et al.	2018	Sweden	Prevalence, age at onset, and risk factors of self-reported asthma among Swedish adolescent elite cross-country skiers
17.	Ferry	2016	Sweden	Teachers in school sports: between the fields of education and sport?
18.	Ferry & Lund	2018	Sweden	Pupils in upper secondary school sports: choices based on what?
19.	Ferry, Meckbach & Larsson	2013	Sweden	School sport in Sweden: what is it, and how did it come to be?
20.	Flatau & Emrich	2013	Germany	Asset Specificity in the Promotion of Elite Sports: Efficient Institutions of Governance for the "Production" of Long-Term Future Sporting Success
21.	Fürhapter et al.	2013	Austria	Evaluation of West-Austrian junior athletes' knowledge regarding doping in sports
22.	Inozemtseva & Zemlyakova	2021	Russia	Pre-season physical fitness model for junior middle-distance runners at excellence training stage
23.	Irewall et al.	2021	Sweden	High incidence rate of asthma among elite endurance athletes: a prospective 4-year survey

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24.	Ivaskiene, Skyriene & Markevičius	2017	Lithuania	Self-assessment and aggression's manifestation of judo wrestlers in age and qualification aspects
25.	Kårhus	2016	Norway	What limits of legitimate discourse? The case of elite sport as 'thinkable' official knowledge in the Norwegian national curriculum
26.	Kårhus	2019	Norway	Educational policy – elite sport as knowledge
27.	Khalikov et al.	2020	Russia	Functional state of middle-distance runners in terms of training correction
28.	Kiens & Larsen	2021	Estonia	Provision of a Mental Skills Intervention Program in an Elite Sport School for Student-Athletes
29.	Kristiansen & Houlihan	2017	Norway	Developing young athletes: The role of private sport schools in the Norwegian sport system
30.	Kristiansen & Stensrud	2017	Norway	Young female handball players and sport specialisation: how do they cope with the transition from primary school into a secondary sport school?
31.	Kristiansen & Stensrud	2020	Norway	Talent development in a longitudinal perspective: Elite female handball players within a sport school system
32.	Lund	2014	Sweden	Regulation and deregulation in education policy: new reforms and school sports in Swedish upper secondary education
33.	Makarov et al.	2018	Russia	Sroi-based sport school performance efficiency rating analysis
34.	Makharova et al.	2015	Russia	Prevention of sudden death in elite athletes in Republic of Sakha (Yakutia)
35.	Moen et al.	2015	Norway	Examining possible Relationships between mindfulness, stress, school- and sport performances and athlete burnout
36.	Morris et al.	2021	Multi-national	A taxonomy of dual career development environments in European countries
37.	Niehues, Gerlach & Sallen	2021	Germany	Measuring dual career motivation among German student-athletes using the Student Athletes' Motivation Toward Sports and Academics Questionnaire
38.	Nykytenko et al.	2018	Ukraine	Factors influencing the effectiveness of attacking and defensive actions of boxers and fencers of young age
39.	Polyak	2021	Russia	Interactive training course to develop information and communication competences in sport school coaches
40.	Renström & Stenling	2019	Sweden	Pupil-athletes' Learning Dispositions and Their Potential Effects in School Sports-situated Talent Development Programs
41.	Rosendahl et al.	2009	Germany	Dieting and disordered eating in German high school athletes and non-athletes
42.	Rodermel & Shamukhametova	2021	Russia	Coach-trainee communication as a basis for adolescent deviant behavior controls
43.	Rodionov, Rodionova & Inake	2019	Russia	Individual speed control models for swimmers
44.	Romar et al.	2021	Finland	The dual commitment of student athletes in lower secondary schools in Finland
45.	Ronkainen & Ryba	2018	Finland	Understanding youth athletes' life designing processes through dream day narratives
46.	Rubajczyk & Rokita	2015	Poland	Relationships between results of soccer-specific skill tests and game-related soccer skill assessment in young players aged 12 and 15 years
47.	Skrubbeltrang et al.		Denmark	Reproduction and opportunity: A study of dual career, aspirations and elite sports in Danish SportsClasses
48	Skrubbeltrang, Olesen & Nielsen	2016	Denmark	How to stay becoming – living up to the code of conduct in a sports class

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49.	Smolianov et al.	2020	Russia	Elite sport methods for public health: the analysis of world practices
50.	Stambulova et al.	2015	Sweden	Searching for an optimal balance: Dual career experiences of Swedish adolescent athletes
51.	Surina-Marysheva et al.	2018	Russia	Heart rate variability profiling tests to forecast competitive progress of 15–16 years old elite ice hockey players
52.	Sveen et al.	2019	Norway	CAM-type femoroacetabular impingement in male elite junior cross- country skiers and non-athlete controls: a cross-sectional MRI study
53.	Svensson	2021	Sweden	Educating the Elite in an Egalitarian Context: The Emergence of Sport Schools for Elite Talents in Sweden in the 1970s
54.	Wanjek et al.	2007	Germany	Doping, Drugs and Drug Abuse among Adolescents in the State of Thuringia (Germany): Prevalence, Knowledge and Attitudes
55.	Wippert & Fließer	2016	Germany	National doping prevention guidelines: Intent, efficacy and lessons learned - A 4- year evaluation