

Multidimensional development of student-athletes: new perspectives on dual-career

Edited by

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Multidimensional development of student-athletes: new perspectives on dual-career

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Editorial: Multidimensional development of student-athletes: new perspectives on dual career

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athlete, student, athletes' career, career support, sport, education

Editorial on the Research Topic

Multidimensional development of student-athletes: new perspectives on dual career

Introduction

The phenomenon of dual careers in sports, in which sportspersons (e.g., athletes, coaches, physical trainers, referees, sports managers, and volunteers) simultaneously pursue sporting excellence and academic/professional development, has been the focus of growing attention from scholars and policymakers. For decades, dual career was often studied from segmented or unidimensional perspectives, emphasizing either sport or education. In addressing dual career, it is crucial to acknowledge that this concept extends beyond academic education, encompassing also vocational training as a key dimension in the development of student-athletes.

A substantial body of literature has emphasized the importance of holistic development systems, calling for the integration of efforts from multiple stakeholders to effectively sustain athletes throughout their educational and sporting pathways. In parallel, psychological research has made significant contributions to the dual career field, deepening our understanding of the personal, social, and emotional dynamics involved in balancing sport and education. Moreover, the area of career transitions has emerged as a relevant niche, highlighting the complexities athletes face when navigating changes within and beyond sport.

By incorporating these perspectives, the relevance of our special issue is further reinforced, as it seeks to address critical gaps in literature and practice while advancing the view of dual career as a multidimensional and evolving process. The challenges dual career sportspersons face are inherently multidimensional, shaped by the interplay of institutional frameworks, cultural contexts, psychosocial resources, health, and equity. The 14 contributions included in this Special Issue of Frontiers in Sports and Active Living advance this field by offering a comprehensive understanding of dual careers and highlighting the urgent need for integrative, evidence-based solutions.

Institutional policies and structural conditions

Dual careers cannot be understood without considering the structural conditions under which they unfold. Multiple studies in this collection demonstrate that institutional and systemic policies decisively shape opportunities for dual career sportspersons. Literature reviews have shown that while progress has been made across Europe, barriers remain in areas such as financial support, access to specialized services, and coordination between educational and sporting institutions. For example, although Brazilian universities have advanced in offering holistic support, limitations persist in financial aid and career transition strategies [da Silva](#). Similarly, in the Republic of Kosovo, insufficient awareness and a lack of integrated frameworks hinder the effective support of student-athletes [Gjaka et al.](#)

At the European level, divergences in perception between student-athletes and higher education experts were found, highlighting the need for mutual understanding and more transparent policy development. Complementing these findings, research mapping 31 institutional benefits across Europe underscored the importance of academic flexibility, justified absences, and access to sports facilities; however, it revealed wide variations in implementation. A specific example from Italy further showed that the introduction of dual career regulations at the University of Rome “Tor Vergata” led to greater participation in both academics and sports, illustrating how institutional commitments can yield tangible results [Cariati et al.](#)

Cultural contexts and comparative insights

Beyond institutional structures, cultural contexts exert a significant influence on how dual careers are experienced. In Spain, research revealed that identity, academic specialization, and competitive level strongly shape the choices and trajectories of student-athletes. Broader comparative studies between European and Brazilian contexts demonstrated that motivation and identity cannot be explained solely through individual traits but are deeply conditioned by social and organizational factors [Gonçalves et al.](#)

Identity, employability, and long-term transitions

The experience of dual career sportspersons extends beyond their current performance. It is intimately tied to identity formation and employability. An Italian study on employability highlighted how personal attributes, human capital, and social capital work together to influence transitions beyond sports. Similarly, findings from comparative research have shown that motivation and identity are mediated by both institutional

support and cultural expectations, affecting how student-athletes envision their careers after sports. Additionally, the Talent Project validated standards for the identification of student-athlete talent and guidelines for dual career support. Integrating these standards into institutional procedures, schools and clubs can align academic and sports requirements from the early stages of education, strengthening the school–club–family alliance and fostering more sustainable academic–sports transitions [Vicari et al.](#)

Equity, diversity, and inclusion

A multidimensional perspective cannot neglect questions of equity and inclusion. Gender inequality remains a central challenge, as shown by the experiences of Italian women’s football players, who continue to face disparities in recognition, financial resources, and institutional support. These inequalities reinforce the dual burden faced by women athletes, who must balance underfunded sports environments with demanding academic responsibilities. In addition, cultural and family pressures can also constrain the lives of student-athletes. Evidence from the Republic of Korea revealed how the internalization of extreme filial piety can lead to negative manifestations such as burnout, dropout, or disengagement (“athlete melt”), which compromise both athletic and academic development [Yoon and Lim](#).

Mental health, well-being, and workload management

The sustainability of dual careers also depends on the ability of sportspersons to manage the psychological and physical demands associated with their multiple roles. Mental health literacy has emerged as a crucial protective factor: higher levels of literacy are associated with reduced symptoms of anxiety and depression, while gaps in knowledge perpetuate psychological distress [Usenik and Kranjec](#). These findings align with global calls to integrate mental health education into sports development programs. Equally pressing is the question of workload balance. A longitudinal study of elite handball players highlighted how training intensity, combined with academic and psychosocial stressors, heightens vulnerability to injury and illness [Drole et al.](#)

Toward multidimensional ecosystems of support

Overall, these findings: (I) emphasize that dual career success is closely linked to systemic factors. Fragmented or absent policies risk leaving sportspersons unsupported, while harmonized, context-sensitive approaches provide a stronger foundation for balancing educational and athletic demands; (II) caution against universal policy transfers and instead advocate for culturally

sensitive approaches that respect national and regional particularities; (III) illustrate that fostering resilience, adaptability, and employability is as critical as supporting sports and academics, ensuring sportspersons to be prepared for multiple futures; (IV) remind us that equitable dual career systems must not only create generalized opportunities but also address the specific barriers shaped by gender, disability, and cultural expectations; (V) emphasize that dual career programmes cannot ignore the biopsychosocial dynamics of athlete health. Sustainable strategies must include flexible scheduling, adequate recovery time, and robust psychosocial support systems. Additionally, there is a need for further developing digital resources to help athletes managing their dual career path, which has been widely addressed through multiple European funded projects over the past decade.

Taken together, the contributions in this Special Issue underscore that dual careers are inherently multidimensional phenomena. Institutional frameworks, cultural contexts, psychosocial resources, employability strategies, equity concerns, and health considerations are deeply interwoven. Focusing on one dimension in isolation, be it academic concessions, financial aid, or mental health, cannot ensure sustainable outcomes. Instead, successful dual career systems must be built as ecosystems that integrate these multiple dimensions into coherent, sportsperson-centered support structures.

Moving forward, three priorities stand out. First, more longitudinal and mixed-methods research is needed to capture the evolving nature of dual career trajectories across different career stages. Second, diversity and equity must be systematically embedded in dual career programs to ensure inclusive opportunities for women, sportspersons with disabilities, and those in under-resourced contexts. Third, stronger cross-sector collaboration is necessary, linking universities, sports organizations, governments, and families to provide comprehensive and consistent support. By embracing this multidimensional approach, the field will not only address the current challenges but also prepare sportspersons for successful futures beyond sports.

Author contributions

RQ: Writing – original draft, Writing – review & editing. MD: Writing – original draft, Writing – review & editing. FG: Writing – original draft, Writing – review & editing. LC: Writing – original draft, Writing – review & editing.

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Dual career through the eyes of university student-athletes in the Republic of Kosovo

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Introduction: The successful combination of a sports career and education, known as the dual career, requires cooperation and a multi-dimensional approach. Although extensive research has been conducted on dual career programs and services in developed countries, there is limited information available on the dual-career phenomenon in developing countries. This study aimed to explore the dual career experiences of university student-athletes in the Republic of Kosovo.

Materials and methods: A 30-item online survey was distributed to student-athletes, addressing various aspects of the dual career. A total of 121 student-athletes (males: 63.6%; females: 36.4%) voluntarily participated in the survey.

Results: These student-athletes represented 13 different sports, with 102 (84.3%) participating in team and 19 (15.7%) in individual sports. Between individual and team sports no significant differences were found regarding university and sports engagement, and the time required to travel from the university to the training venue, whereas a significant difference ($p = 0.019$) emerged for the time needed to travel from home to the training venue. Significant differences ($p < 0.05$) were found between university majors in terms of sports engagement. The present findings highlight a lack of familiarity with dual career programs among student-athletes (89.3%) and the need for dual-career policies at the university (16.5%), sport (9.9%), and national (13.2%) levels. Student-athletes faced various challenges, mainly related to limited leisure time (62.8%), academic overload (60.3%), frequent absence from classes (59.6%), and financial uncertainty (35.5%). Recommended improvements included increased financial support (66.1%), the availability of sports facilities at or near the university (48.8%), greater educational flexibility (26.4%), tutoring services at the university (25.6%), and sports clubs (19%) levels, as well as improved communication regarding existing initiatives and legal aspects (53.7% and 47.1%, respectively). The study also identified parents (98.3%), coaches (86%), and siblings (60.3%) as important sources of support for student-athletes at personal, sports, and university levels.

Conclusions: In conclusion, to enhance the potential of future student-athletes in the Republic of Kosovo, relevant stakeholders in sports and higher education should collaborate closely and implement programs and services based on international best practices for dual-career support.

KEYWORDS

sport and education, dual career, support entourage, policies, programs

Introduction

In the pursuit of their holistic development, talented and elite athletes must balance their athletic and educational endeavors, commonly known as the “dual career” (1). The combination of elite sport and education is particularly challenging (2), yet crucial in preparing and empowering student-athletes for their future societal roles after their competitive sport career has ended (3, 4). In recognizing that an elite athletic career is temporary and not all athletes can generate and capitalize sufficient income for their life course, pursuing education and acquiring professional skills will help them establish long-term career prospects, even though demanding training sessions, traveling to competitions, and engaging in various sports events puts athletes at a distinct educational disadvantage compared to their non-athletic counterparts (1, 5). These challenges have a relevant impact not only on the athlete’s family and peer relationships but also on the academic paths, resulting in reduced interactions with professors/teachers, classmates, and peers, missed classes and exams, physical and psychological fatigue, and identity-related issues (6–11).

A dual career is affected by the athletes’ age, gender, motivation, sport, competitive level, university level, and academic majors, by their proximal (e.g., parents, peers, educators, coaches, and sport managers) and distal (e.g., sports clubs and federations, educational institutions) entourage, by the regional, national, and international dual career policies, and by various socio-cultural, media, and economic factors (7, 12, 13). Therefore, the quality of dual career support relies on the collaboration among multiple stakeholders, the implementation of dual career programmes and policies, a well-structured systematic monitoring system (7, 14, 15).

Primarily due to the influence of country-specific cultural and organizational regulations within the domains of sports and education, significant dual career disparities exist worldwide in the prerequisites and criteria for flexible academic paths, financial support, service-based assistance, and individualized agreements (7, 14, 16–22). Following the publication of the White paper on sports and the EU Guidelines on Dual Careers of Athletes, the European Commission endorsed the recommendation of Minimum Requirements for Dual Career Services and financed several collaborative partnerships under the ERASMUS+ programme (1, 14, 23, 24), which contributed to the development of a European dual career discourse in relation to socio-cultural context (25, 26), athlete’s identity (27), competences (28), motivation of student-athletes towards sport and education (29–31), and career development and transitions of athletes (32, 33).

Despite the European recognition and the growing awareness and of the importance of dual career support for athletes, there is a limited information regarding the national standards of support and the conditions provided to student-athletes in non-European Member States. To build more cohesive communities and to support capacity building in sport activities and policies beyond Member States, recently the European Commission included in the ERASMUS+ agenda the Western Balkan area as

third countries not associated to the Programme (34). In particular, the Republic of Kosovo was established in 2008 and is a multiethnic (92.9% Albanian, 1.6% Bosnian, 1.5% Serbian, 1.1% Turkish and 2.3% Roma, Ashkali, Egyptian and Gorani) country with >1.660.000 residents with an average age of 31.4 years (35). The Kosovo Olympic Committee organizes sports, with 35 registered sports federations (867 sports clubs) involving around 81,000 athletes (83% males, 17% females), and the Ministry of Culture, Youth and Sport has a limited budget for adopting programme policies according to priorities in the advancement of school, competitive, and infrastructural sports (36). At educational level, a high number of students (around 8% of the population), is enrolled in higher education institutions (8 public, 24 private), which align their education structures to the European Bologna Process to enhance the internationalization and competitiveness of the future labor force (37). However, it is necessary to ascertain the challenges that Kosovan athletes face in combining sports and education.

To ascertain the extent and consistency of dual career support of Kosovar student-athletes, the primary aim of this study was to acquire comprehensive data regarding various aspects, encompassing their: (a) socio-demographic characteristics; (b) level of involvement in sports and academics, as well as the awareness of national dual career legislation; and (c) personal, sports, and academic networks. It has been hypothesized that sport and academic engagement of Kosovar student-athletes might be influenced by the type of practiced sport as well as their academic major.

Materials and methods

This study obtained the approval (Nr. 11796/45, date 05.10.2023). From the Institutional Review Board of the University for Business and Technology (Pristina, Kosovo). To meet the inclusion criteria for participation, individuals had to be currently enrolled in a university program (regardless of major) and involved in competitive sports at the national and/or international level. Before accessing the survey, respondents provided a written informed consent.

The instrument

This cross-sectional study surveyed student-athletes using an online self-administered questionnaire (Google forms®). The survey was a modified version of the survey previously used by Condello et al. (19). The modifications broadened the scope of the previous survey from the university to the national level. To guarantee an equivalent translation of the original questions into Albanian language, the translation and back translation method was employed (10, 38) and changes to the survey were approved by the research group which consisted of renowned dual career experts in the field. To ensure clarity and flow, the survey was piloted and was revised based on the critical feedback of five student-athletes. Ultimately, an online survey consisting of 30

item questions was constructed, aiming to capture information regarding the major themes related to the dual career athletes such as: Socio-demographic characteristics including sex, age, university major, university level, typology of sport, competition level, previous experience at international sport events (Q1–7); sport and university engagement (Q8–12) consisting of questions related to time dedicated to sport, time needed to transfer from living site to training facilities, time dedicated to university, time needed to transfer from university site to training facilities, and challenges faced in combining sport and education; student-athletes' familiarity and awareness of dual career policies, programmes, initiatives, and available dual career documents and their sources (Q13–18); and dual career support entourage at their sport, academic and personal levels (Q19–30). Questions were closed-ended, with participants given the opportunity to provide additional elaboration as appropriate.

Recruitment

Due to the lack of pre-existing student-athletes database, the first phase was to identify the student-athletes. Initially, the researchers contacted the public and private Higher Education Institutions (HEIs) in the Republic of Kosovo to explain the purpose of the study, and asked them to identify the student athletes in their HEIs. To increase participation, various sports clubs were also approached and informed about the study's objectives and significance. After the identification of student athletes at the HEIs and sports clubs, an email was sent to the representatives of the HEIs and sports clubs, containing detailed information about the study and a link to the survey. These representatives were asked to distribute the email to the target population of student-athletes through official communication channels. Additionally, social media and personal contacts with student-athletes were utilized to encourage maximum participation. Ultimately, the survey was distributed to 450 student-athletes of different study majors (Bachelor, Masters, and PhD) and sports, out of which 121 responded to the survey. It was emphasized that participation in the study was voluntary, and that student-athletes could withdraw at any time without providing a specific reason. To improve response rates, two reminders were planned, with a two-week interval between them. Furthermore, electronic measures were implemented to ensure that only one response could be submitted per computer, preventing multiple responses from the same individual.

Data reduction

From the online survey, data extracted to a spreadsheet (Microsoft® Excel for Windows) were organized by the respondents' age, university major, and sport typology. Furthermore, only completed questionnaires were taken into consideration for further analysis. According to the literature (19), age (Q2) categories were 18–22, 23–27, and >27 years. Following the guidelines of the European Research Council (39), the university major (Q3) was classified into three broad categories:

Social Sciences and Humanities (e.g., Business and Administration, Environmental Sciences, Finances, Foreign Languages, Law, and Psychological Sciences), Physical Sciences and Engineering (e.g., Computer Sciences, Engineering and Architecture, Integrated Design, Mechanical Engineering, Mechatronics), and Life Sciences (e.g., Medicine, and Sport Sciences/Physical Education and Sport). The sport typology (Q5) was dichotomized into team sports (e.g., basketball, football, futsal, volleyball, handball) and individual sports (e.g., artistic gymnastics, athletics, combat sports, skiing, table tennis, triathlon).

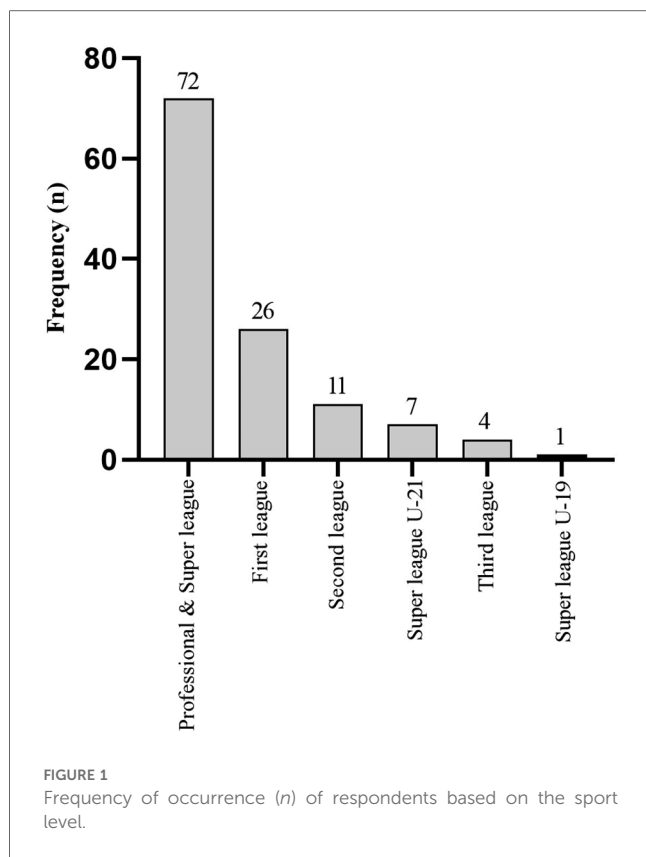
Statistical analysis

Statistical analyzes were performed using the Statistical Package for Social Sciences version 28.0 (SPSS Inc., Chicago Illinois), with a level of significance set at $p < 0.05$. Descriptive statistics was employed to analyze the frequency of occurrence for survey questions. The responses (singular or multiple) were expressed in absolute values or percentages. For questions Q8–11, participants were presented the opportunity to provide their own values. Subsequently, the frequency of occurrence, expressed in absolute values or percentages, was computed. Specifically, this analysis considered three classes of occurrence for the time dedicated to engagement in sport and university (<11, 11–20, and >20 h). Additionally, four classes of occurrence were used to assess the time required to travel from home and university to the training venue (e.g., <30, 31–60, 61–90, and >90 min). The Kolmogorov-Smirnov test was used to verify the normality of data distribution for data from Q8–11. One-way analysis of variance (ANOVA) was used to assess the effect of independent variable (university major) on dependent variables (e.g., sport and university engagement, transfer time from home and university to training venue) with Bonferroni as post-hoc test to determine differences between groups. Additionally, the Independent Samples *T*-test was used to test the effect of sport typology (independent variables) on sport and university engagement ($\text{hr}\cdot\text{week}^{-1}$) and time ($\text{min}\cdot\text{way}^{-1}$) needed to travel from home and university to the training venue (dependent variables).

Results

Demographic characteristics (Q1–7)

A total number of 121 student-athletes participated in the current study (males: $n = 77$, 63.6%; females: $n = 44$, 36.4%). Student-athletes were grouped in 6 groups based on their competitive level (Figure 1). Participants engaged in 13 different sport disciplines, with 59.5% of student-athletes competing at the professional and Super league levels. Compared to the individual sports ($n = 19$, 15.7%), the majority of respondents competed in team sports ($n = 102$, 84.3%), with football players being most represented ($n = 66$, 54.5%). 51.24% of student-athletes competed at international level, including Winter Olympic Games ($n = 2$), World Championships ($n = 7$); World Cups ($n = 3$); European

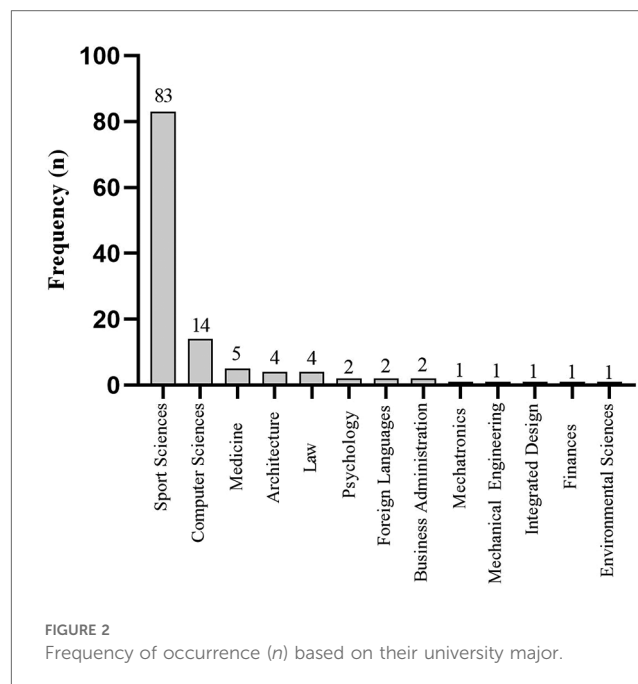


Championships ($n = 39$); Balkan Championships ($n = 25$) and other international competitions ($n = 38$), whereas, no student-athletes participated in the Universiade.

The majority of respondents were in the 18–22 years category ($n = 88$, 72.7%), whereas those included in the older categories (23–27 years and >27 years were 23.1% ($n = 28$) and 4.1% ($n = 5$), respectively. Regarding the education level, 90% ($n = 109$) of athletes were enrolled at bachelor level and 9.9% ($n = 12$), at the master's level. For the university major, the highest number of respondents was from Life Sciences ($n = 88$, 72.7%), followed by Physical Sciences ($n = 21$, 17.4%) and Engineering and Social Sciences and Humanities ($n = 12$, 9.9%), respectively. Participants represented 13 different majors, with the majority of them ($n = 83$, 68.6%) being enrolled in Sport Science degrees (Figure 2).

Sport and university engagement (Q8–12)

For sport typology, no significant differences between individual and team sports emerged with respect to academic engagement, sport engagement, and the time required from the university to the training venue (Figures 3A,B). A significant difference ($p = 0.019$) was found between team and individual sport student-athletes for the time needed to transfer from home to the training venue (Figure 3B). Moreover, a significant effect ($p < 0.05$) emerged for the university major on the time devoted to sport, with the Bonferroni post-hoc test revealing that student-athletes belonging to the Life Sciences university major spend more time



(15.91 ± 4.4 h-week⁻¹) compared to their Social Sciences and Humanities (12.42 ± 4.6 h-week⁻¹) counterparts (Figure 3C).

Regarding the sport engagement, around 75% of respondents reported that they devote 11–20 h-week⁻¹, whereas 14.9% and 10.7% declared to be engaged <11 h-week⁻¹ and >20 h-week⁻¹, respectively. Only 14% of student-athletes reported to be engaged at university >20 h-week⁻¹, whereas 42.1% and 43.8% declaring an engagement of <11 h-week⁻¹ and 11–20 h-week⁻¹, respectively. Moreover, most of the student-athletes (88.4%) need <30 min to reach their training venue from home, whereas 9.9% and 1.7% spend 30–60 min and 61–90 min, respectively. Regarding the time needed to transfer from university to the training venue, 41.3% reported to need <30 min, whereas 43.8% and 14.9% declared 30–60 min and 60–90 min, respectively.

Several challenges in combining sport and education emerged, with the most prevalent being limited leisure time (62.8%), overload (60.3%), prolonged missed classes (59.6%) and absences from single classes (53.7%), missing tests and exams (35.5%), financial uncertainty (35.5%), missing training sessions due to university duties (34.7%) and extended academic path duration (21.5%).

Student-athletes' familiarity and awareness of dual career policies, programs, initiatives, and documents availability (Q13–18)

Most of the respondents (89.3%) indicated a lack of familiarity with policies, programmes, or measures designed to facilitate the combination of elite sports and academic careers. Figures 4A–C show that respondents are generally unaware of dual career policies or initiatives (87.6%), documents outlining dual career policies (81.8%), and possible sources of information (66.1%), with internet considered a viable means of communication

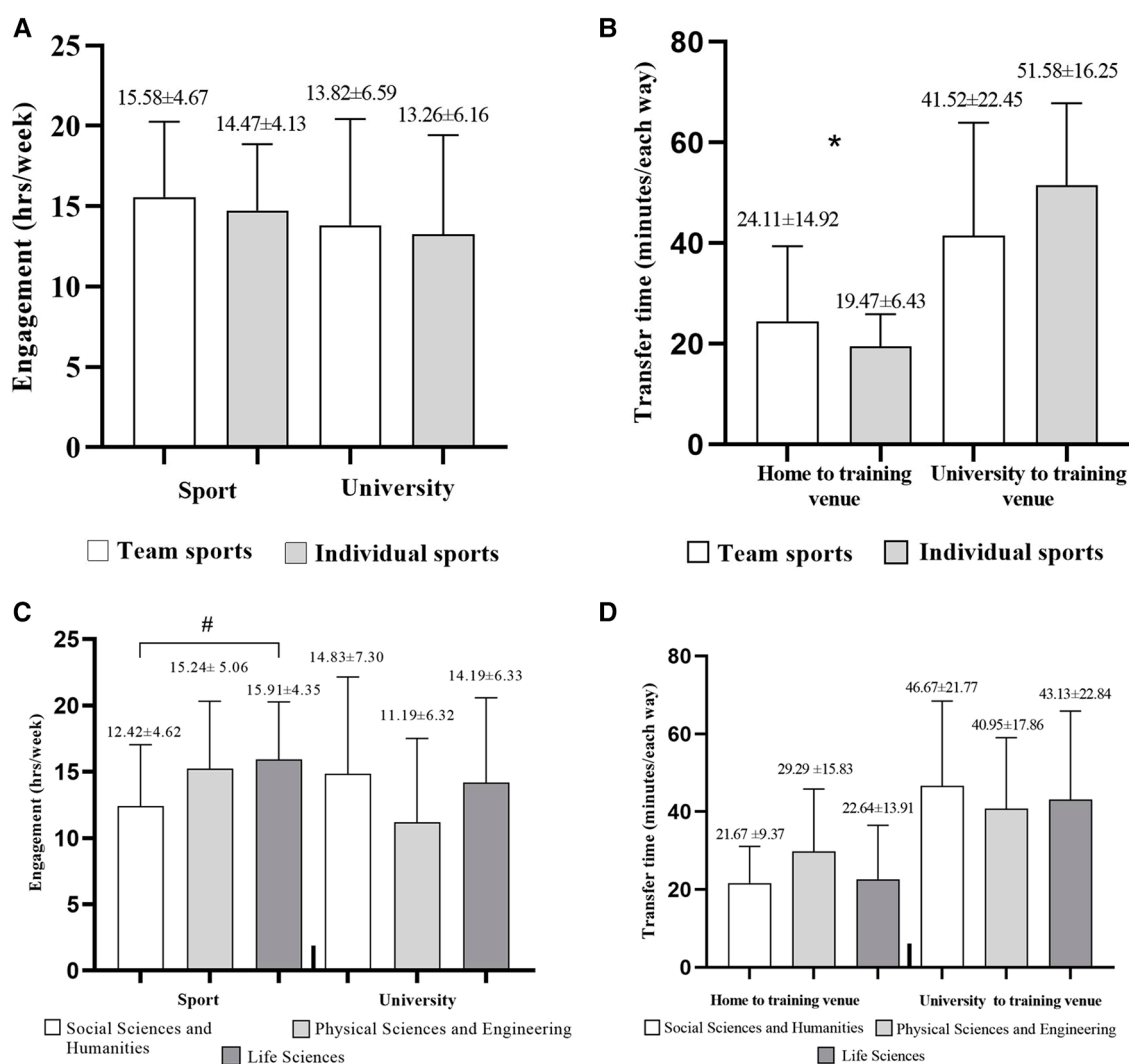


FIGURE 3

Mean and standard deviation of weekly engagement in sport and university (hours/week), and time required to transfer from home and university to training venue (minutes/each way) in relation to sport typology panel (A,B), and university major panel (C,D). *Team sport student-athletes significantly differ ($p = 0.019$) from individual sports student-athletes in terms of time needed to transfer from home to training venue. #Life Science student-athletes spend significantly more time ($p < 0.05$) in sport compared to student-athletes from the Social Sciences and Humanities major.

(33.9%). Dual-career policies were considered an issue for university (16.5%), sport (9.9%) and governing bodies (13.2%), with the main responsibility attributed to the educational (37.2%), sport (24.8%) and government (5.8%) domains. Specifically, the regulation of the integration of elite sports and academic studies is deemed pertinent at university (41.3%) and sport federation (16.5%) levels. Regarding the involvement of public authorities in dual career policies, emphasis was placed on the national level, with 24% of respondents recognizing its significance. However, most of the respondents (76%) demonstrated a lack of awareness regarding public authorities engaged in dual career policies. Regarding the evaluation of the effectiveness of dual career policies, 43.8% of the student-athletes ignored them, whereas 26.4% stated that there is a lack of an established evaluation system, and the rest of respondents highlighting both sport and academic achievements 15.7%, only

sport achievements 12.4%, and only academic achievements 3.3%, as possible means of dual-career monitoring.

Dual career support at personal, sport and academic levels (Q19–30)

Whilst most of the student-athletes (60.3%) indicated to receive some form of support, 39.7% reported no support. Among those receiving support, educational flexibility (33.9%) was the most frequent, followed by financial assistance (16.5%) and access to sport facilities at or near the university (9.9%). Interestingly, no tutoring was available either at the university or at the sport level. Recommendations for a relevant improvement of dual career support services regarded the enhancements of financial support (66.1%), sport facilities at or near the university (48.8%),

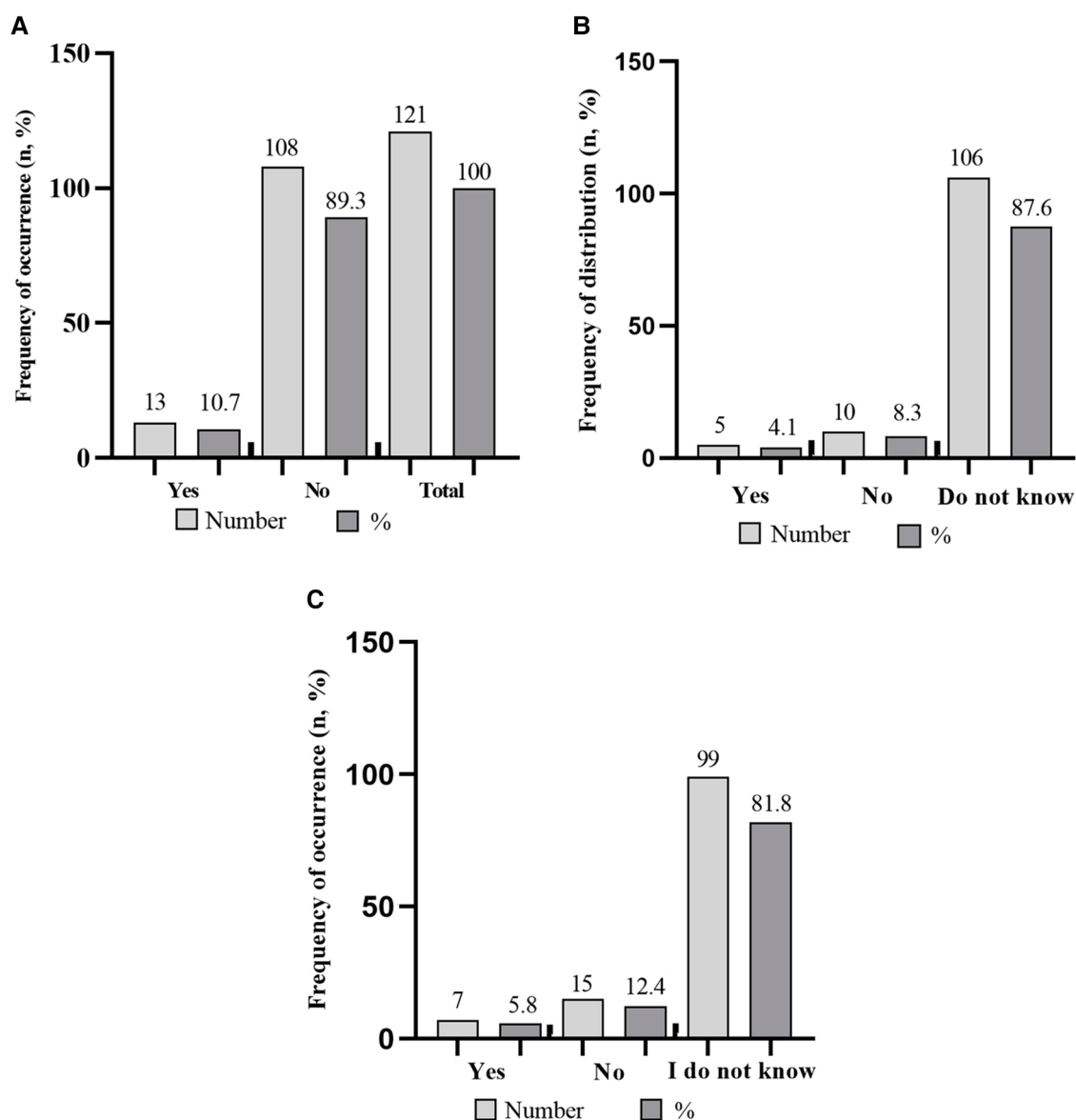


FIGURE 4

Frequency of occurrence (n, %) (A) of student-athletes stating to be (e.g., yes) or to be not (e.g., no) familiar with policies, programs or measures that facilitate the combination of elite sport and studies; (B) to be (e.g., yes) or to be not (e.g., no and do not know) aware of dual career policies and initiatives, and (C) to be (e.g., yes) or to be not (e.g., no and do not know) aware of the availability of policy documents in the field of dual career in the Republic of Kosovo.

educational flexibility (26.4%), tutoring services at the university (25.6%) and sport club (19%), and better communication of existing initiatives (53.7%) and legal aspects (47.1%).

Student-athletes perceived that the majority of athletes follow a dual-career path by being engaged in sport and in higher education, with frequencies of occurrence falling within the categories of <20%, 21%–40%, 41%–60%, and 61%–80% at rates of 14%, 28.1%, 30.6%, and 19%, respectively. Moreover, 34.7% of the participants indicated a lack of awareness regarding the specific number of student-athletes benefiting from dual career support. To note, the highest estimations were associated with the frequency categories of <20%, 21%–40%, and 41–60. Whilst

9.9% of student-athletes conveyed a lack of support, 72.77% of remaining sample reported a support at the sport level and 34.71% at the academic level. At the university level, the most frequently reported forms of support included career counselling, medical support, physiotherapy and sleeping facilities. However, there was limited availability of sport facilities at/close to the university, dual career tutoring, nutritional and psychological support. In fact, 32.2% of student-athletes reported no sport at the university level whatsoever. In the sport domain, support was mainly related to sport performance, including coaching, medical support, physiotherapy, and access to sports facilities, with sports nutrition and psychological aspects reported only by 3.3% and

TABLE 1 Frequency of occurrence (%) of dual career supporters at personal, sport, and academic entourage levels.

Personal entourage		Sport entourage		Academic entourage	
Supporter					
Parents	98.3	Coach	86	Few professors	41.3
Siblings (sister, brother)	60.3	Sport managers	14.9	Academic staff	24
Friends	36.4	Medical doctors	24	University sport staff	10.7
Teammates	33.9	Sport psychologist	2.5	Parents	9.9
Classmates	18.2	Olympic Committee	1.7	Olympic Committee	2.5
				Administrative staff	0.8
				No one/don't know	32.2

5.8% of respondents, respectively. Conversely, sport support did not include provision of study rooms, career counseling, and tutoring for dual career. In general, the student-athletes identified relevant dual career support entourage at the personal, sport, and university levels (Table 1). The highest frequencies of occurrence were attributed to parents (98.3%), coaches (86%), siblings (60.3%), teachers (41.3%), friends (36.4%), sport teammates (33.9%), academic staff (24%), and classmates (18.2%). In addition, university sport staff, and parent's support were reported also at the university level (10.7%, 9.9%, respectively). Although limited (2.5%), National Olympic Committee support at the university level could represent an example of integration of dual-career.

Discussion

In gathering information on the dual-career phenomenon through the eyes of student-athletes in the Republic of Kosovo, the main findings of the present study revealed: (a) no significant differences between individual and team sports concerning university engagement, sport engagement, and the time required to transfer from the university to the training venue; (b) significant differences between team and individual sport student-athletes on the time needed to transfer from home to the training site; (c) university major playing a significant role on the time spent in sport; (d) relatively low knowledge of dual-career policies, programmes, measures, initiatives and availability of policy documents that facilitate the combination of elite sport and studies paths. Beside the individual support provided by parents, coaches and some teachers, student-athletes urged dual career improvements at the sports, academic, and policy domains.

To meet the requirements and achieve success in both sports and academic domains, student-athletes face a simultaneous burden. Compared to the international student-athletes participating in the Universiade (19), Kosovar student-athletes spend less time in their dual career commitments, but more time in transferring from home or university site to training facilities. In considering that Kosovo is a small country, these findings substantiate the disconnection of the nation's sporting infrastructure and emphasize the importance of having sports facilities at, or near, the university. Differently from countries

where sport is traditionally embedded in the educational system (e.g., USA) or a relevant part of the academic culture (e.g., UK, Australia, Canada), in Kosovo sport and education are quite separated, despite at state level the Department of Sport is located within the Ministry of Culture, Youth and Sports. In the aftermath of the war in Kosovo a systematic development of infrastructure and essential public services is still needed. The possibility to build school and university sports facilities could help future generations of youth being involved in sport and talented athletes achieving elite sport levels without the burden of long transfers (40, 41). The impacts of sport infrastructures at the academic institutions is not only at the everyday level of student-athletes but can influence the larger political and societal levels putting an emphasis on education in and through sports and promoting a dual career culture, norms and principles, as well as a cooperation between academic institutions and sports bodies.

Differently from a lack of significant effects of university major on the time spent in sports reported for international athletes (19), the present study substantiates the hypothesis that involvement in sports influences the athletes' choice of a university major (42). Specifically, when compared to their counterparts enrolled in Social Sciences and Humanities degrees, Kosovar student-athletes pursuing Life Sciences degrees dedicate more time to sports, probably due to their interest in Sports Sciences to deepen their knowledge beyond the sport practice to pursue future careers in the sport sector (43, 44). These valuable insights could foster the development of tailored programmes and initiatives that are suitable for specific contexts, sport disciplines, and educational environments (45).

Despite student-athletes should be familiar with existing dual-career policies, initiatives, and opportunities, they tend to disregard the existing legislative framework (19). Also in this study, student-athletes were unaware of European dual-career documents and their availability, indicating that sports bodies and educational institutions have to inform athletes of their rights to pursue a dual career for their holistic development. In fact, student-athletes were concerned with a lack of financial assistance, educational flexibility, adequate sport facilities at or near the university, and availability of academic and sport tutors. Conversely, many respondents reported receiving medical and physiotherapy support from the university, which is provided free of charge to all students, including student-athletes, by the National Center of Sports Medicine. At sports level, student-athletes declared a support only pertaining coaching and sports facilities, which are fundamental requisites for their athletic development. These findings indicate that dual career at educational institutions and sports bodies needs to be implemented, although the recent enforcement of the law for the development of national sports includes provisions for supporting student-athletes in terms of educational expenses (46). Additionally, the National Olympic Committee annually provides symbolic scholarships, known as Olympic Hopes, to a limited number of student-athletes. Actually, this support is not sufficient to meet the student-athletes needs of financial aid, flexibility in educational arrangements, available sports infrastructures, academic and sport tutoring, enhancement of

legislation, and better communication of existing dual-career programmes and initiatives. Whilst a financial support is considered especially relevant in non-revenue-generating sports to pursue dual-career paths in a developing country like the Republic of Kosovo, the provision of tutors for student-athletes has been identified as a highly relevant and feasible dual career service (47). One positive aspect highlighted by student-athletes is the support they receive from university career centers, which need. In the Republic of Kosovo, all HEIs have their career centers that guide and advise students on career paths, but not specifically for student-athletes. As the literature emphasizes, these career centers should have trained and qualified personnel for dual career counseling (48), an area that requires improvement in the Republic of Kosovo.

It general, student-athletes naturally organize their lifestyle in relation to their sport commitment (26, 49, 50). This phenomenon has also been observed in the present study, where a significant number of student-athletes reported missing lectures and spending more time on their sports activities. Conversely, there are instances when student-athletes prioritize their academic pursuits and consequently have to sacrifice training sessions. Therefore, to optimize the effectiveness of the training-study schedule for the success of dual career paths, it is recommended to provide training centers within, or in closer proximity to, universities (51). This is particularly relevant for individual sport athletes, as team sport athletes are required to train with their teammates. Additionally, in such cases, the provision of study spaces, tutoring services at the club, and accommodations for sleeping should be considered. These initiatives would enhance the efficiency of the training-study schedule, which is vital for the successful pursuit of dual career paths (51).

Sport parenting is widely recognized for its significant impact on both sports and academics for children (52). Constructive emotional, financial, and social support from parents, along with encouragement, is crucial for motivating and achieving success for student-athletes in balancing sports and education. Conversely, negative parental attitudes can be detrimental to student-athletes, potentially leading to psychosocial challenges and dropout from sports or academics (53–55). In this study, participants emphasized the important role parents play in academic education, which aligns with the perceptions of student-athletes worldwide (19). In recognizing that the dual-career culture can benefit from a deep knowledge of the needs of parents as relevant dual-career actors, several researchers engaged in a participatory and a user-centered design approach for the development and validation of the online multilingual EMPATIA educational programme (<https://edu.empatiasport.eu/eng/>) tailored for parents of talented and elite athletes (9, 10, 56–58). In empowering the parents, it could be possible to manage difficult conversations and conflicts, and to envisage good and regular parents-athlete-teacher/coach communication, which is crucial to facilitate a successful dual-career alliance.

Coaches are also recognized as influential figures in shaping student-athletes, both within and beyond sports (59), as well as mentors and supporters in dual career pursuits (60). In the developmental years of athletes, coaches' mentorship role goes beyond the mastery of sport-specific skills and becomes crucial

to encourage education, balanced timetables, tiredness, goal settings, and personal development for post-sporting careers (19, 49, 61–63). Therefore, sports federations need to include dual career courses in the educational and professional development programs for coaches and sports personnel. These individuals have expertise in sport-specific requirements and can assist student-athletes in managing their academic responsibilities (64).

Additionally, university sports staff and professors should be aware of the challenges faced by student-athletes and be ready to reassess their roles as facilitators in effective lifelong learning. Consequently, the recruitment of dedicated personnel as formal dual-career tutors at both the sporting and educational levels is recommended. These tutors would guide student-athletes, coaches, and professors by offering advice on personalized whole-life development plans and monitoring progress (14, 48). In this respect, the online European Dual Career Toolkit (<https://starting11.eu>) could assist institutions in sport, education and the labor market in implementing effective dual career services for athletes. Furthermore, to organize a dual career process based on objectives, content, control, and evaluation systems, HEI decision-makers, rectors, and sport faculties could consider the methodological approach and the summarized experiences of the European More Than Gold Guidelines and Manual (65, 66).

Overall, the present exploratory study on the Kosovar student-athletes' perception of their dual career challenges resulted in line with the quest for implementation of dual career policies and provisions reported for different European Member States (56). In considering the infancy level of its dual career, the present findings set the foundation for the development of the dual career in the Republic of Kosovo. To build impactful and sustainable development of dual career policies and provisions, the Republic of Kosovo could profit from the accumulated valuable knowledge and experiences of the European dual career discourse. Looking ahead, dual career in the Republic of Kosovo could be shaped in three medium- and long-term interrelated factors. First, the recognition of the athletes' right of a holistic development and the crucial importance of student-athletes as prepared future actors of the society, being also role models for the next generations. Second, the need of a substantial alliance between the sport and academic environments for building dual career agreements, regulations, and infrastructures for implementing and administering dual career services. Third, the need to educate dual career actors (e.g., parents, coaches, teachers, sports managers, teachers, and academic staff) to build a strong supportive entourage for empowering athletes to pursue their dual careers.

The current study has some limitations which are worth highlighting. First, it should be acknowledged that the response rate for this study was relatively low. Furthermore, the uneven recruitment of student-athletes across sport typologies, and university majors could potentially constrain the generalizability of the research findings. However, to attain a more comprehensive understanding of the interplay between education and sports, it is imperative to conduct extensive research involving a larger sample size of student-athletes with diverse backgrounds in terms of both study majors and types of sports.

Conclusions

Based on the findings of the current results, it can be concluded that the establishment of the minimum standard of dual career services at national level is highly recommended in the Republic of Kosovo. Additionally, responsible bodies are encouraged to offer specific educational programs for dual career service providers at academic and sport levels, including parents, coaches and university staff, who play a strong supporting role in the pursue of dual career by student-athletes. Furthermore, it is essential to the success of the student-athlete, that academic institutions and sports organizations, such as sport clubs, to collaborate closely to create a supportive environment for student-athletes. This collaboration should involve the implementation of specific accommodations, such as flexible academic and sports timetables, online learning opportunities, tutoring services, studying spaces at the club, and support for student welfare. The implementation of these measures is critical in helping student-athletes manage their time effectively and overcome challenges related to balancing their dual career paths (7, 14). Moreover, seeing the lack of awareness the student-athletes have regarding their dual career rights, policies, programs, services, financial resources, and logistic support in place, dual-career stakeholders are strongly encouraged to use the right promotion means to inform student-athletes regarding these aspects.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Scientific Ethics Committee at UBT College. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

MG: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project

administration, Resources, Supervision, Visualization, Writing – original draft, Writing – review & editing. KF: Data curation, Methodology, Project administration, Visualization, Writing – original draft, Writing – review & editing. AnT: Formal Analysis, Methodology, Writing – original draft, Writing – review & editing. AbT: Writing – original draft, Writing – review & editing. LC: Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The author(s) declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

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Promoting dual careers at higher education institutions: 31 benefits ranked by the project Student Athletes Erasmus+ Mobility in Europe (SAMEurope)

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Introduction: The project Student Athletes Erasmus+ Mobility in Europe identified and defined a total of 31 benefits offered to dual-career student athletes who are combining their university studies with high-level training. The project was co-funded by the European Union and carried out by five universities: Chalmers University of Technology (Sweden), Institut national des sciences appliquées de Lyon (France), University of Jyväskylä (Finland), Karlsruhe Institute of Technology (Germany), and Universitat Jaume I (Spain).

Methods: The purpose of the study was to rank these benefits by combining the perspectives of the university staff and the student athletes from each university in the consortium. The university staff included experts from sports services and the international relations office. A questionnaire was also sent to the dual-career athletes enrolled at the consortium's universities. Of the 514 dual-career athletes, 208 (116 women) completed the questionnaire. The overall response rate was 40.47%. The university staff assessed the importance of each benefit, how easy it was to implement at the institution, and whether or not the university offered the benefit to its students. The dual-career students rated each of the 31 benefits and indicated whether or not they had used them. A specific methodology was designed to rank these benefits using the ratings of the university staff and the student athletes. Intra-group and inter-group Pearson correlations were performed.

Results: The results show a strong and significant correlation between the benefits from the perspective of the university staff ($r = 0.710$, $p = 7.76E-7$) and from the perspective of the students ($r = 0.715$, $p = 2.44E-6$). The correlation is moderate and significant when the benefits are correlated from the perspective of the two groups as a whole (0.363 , $p = 0.045$), with the three most important benefits being the free use of sports facilities, justification for absences, and the adaptation of the pace of studies.

Discussion: The study makes visible the commitment of higher education institutions to facilitating the dual career of student athletes and identifies those benefits that may be of greater interest to European universities as a whole. The European perspective has been considered, while respecting the specificities of each university and the country in which it is located.

KEYWORDS

dual career, benefits, universities, elite sport, athletes, SAMEurope

1 Introduction

The development of the term “dual career”, which emerged in 2007 as part of a resolution of the European Commission (1), focuses on the need to combine one’s studies or professional life with the development of a sporting career [EU (2, 3)]. Since 2012, the European Commission’s guidelines have highlighted developments in this area and the importance of addressing these two aspects for elite student athletes.

Thus, the European Commission recognizes and implements measures to mitigate the impact of this double profile for elite athletes. In particular, several publications show the complexity and current barriers to combining higher education with a sporting career (4–7). Stress and demands on student athletes have been identified as key factors impacting the development of dual careers, which has led to an investigation into the psychological issues affecting this group of students (8–10).

Another aspect is the need to take into account the limited duration of a sporting career (11). A good balance between academics and training helps facilitate more effectively the transition of student athletes to the professional market (12, 13).

Aquilina and Henry identified as early as 2010 that there were differences in the national organizational structures that serve elite student athletes. This helped highlight the fact that cultural and organizational conditions and contexts are elements that promote, to a greater or lesser extent, the development of the dual careers of student athletes (14).

These circumstances, together with the impetus provided by the European Commission through the creation of the Erasmus+ program in 2014 and an increase in funding (11,235,479.19 €), promote the development of projects in this field and partnerships for their implementation (15).

The guidelines of the European Commission and the increased funding have led to studies and publications that focus on the development of dual careers between 2015 and 2021 (16). Different approaches are used in the development of the projects, which help to clarify the current situation. Some focus on assessing the needs of the students through qualitative surveys in focus groups (17) or surveys of the university population (18–21). Others take into account the opinion of dual-career experts at the university (22); European Education and Culture Executive Agency (23).

Given all these conditions, one key element needed to contextualize this study is to determine which definition of dual-career athlete is to be analyzed within the dual-career framework.

First, we looked at elite athletes who were combining their sporting career with their studies at an institution of higher education (24, 25). We also analyzed the concept of an “elite athlete”, a concept that is still somewhat confusing and requires further definition, as interpretations are not homogeneous (26, 27). The European Commission considers an elite athlete to be an athlete who represents his or her country in his or her sport (26). Li and Sum (7), however, define an elite athlete as someone who has competed at the national, international, or Olympic level, or is a professional athlete or player (7). Thus, it is necessary to clarify this aspect in order to determine precisely which student athletes are being addressed. This paper defines student athletes as those who are taking part in a dual-career program at one of the universities participating in the study.

Thus, the project Student Athletes Erasmus+ Mobility in Europe (SAMEurope, project 101050378) of the Erasmus+ program was created in 2022 with the aim of developing the recommendations of the European Commission and the EU Guidelines on Dual Careers of Athletes (2), paying particular attention to Guidelines 28 and 29 which focus directly and specifically on the mobility of students between the different countries of the European Union and the creation of transnational consortia which have as a priority high-level university student athletes.

The SAMEurope project, co-funded by the European Commission, consists of a consortium of five European universities: Chalmers University of Technology (Sweden), Institut national des sciences appliquées de Lyon (France), University of Jyväskylä (Finland), Karlsruhe Institute of Technology (Germany) and Universitat Jaume I (Spain). The consortium is involved in several measures aimed at promoting the mobility of high-level student athletes. One of the first measures is to identify the programs and benefits offered to and used by students pursuing dual careers at these universities. The knowledge of these measures can help different higher education institutions to propose similar lines of action in order to homogenise the development of the dual career in higher education institutions in the European Union.

Thus, this paper aims to: (i) identify which benefits are offered to dual-career students at the universities in the consortium; (ii) rank these benefits at the consortium level, taking into account the perspectives of the university staff and the student athletes; (iii) establish intragroup and intergroup relationships to analyze and define improvement measures to facilitate the development of dual careers. Our hypothesis is that the ranking of benefits presented by the students is not related to the ranking presented by the university staff of the consortium.

2 Materials and methods

2.1 Subjects

The study is set within the context of the five universities participating in the SAMEurope project:

Institut National des Sciences Appliquées de Lyon (France)
 Karlsruhe Institute of Technology (Germany)
 Chalmers University of Technology (Sweden)
 University of Jyväskylä (Finland)
 Universitat Jaume I de Castellón (Spain)

Two distinct groups participated in the study: university staff with at least 5 years of experience in dual-career programs or international mobility at the consortium's universities and dual-career students at these five universities.

2.2 Procedures

The study was divided into three phases and was approved by all of the partner universities and by the Ethics Committee of the Universitat Jaume I of Castellón (CEISH/27/2022). It complies with the criteria laid down in the Declaration of Helsinki.

The first phase of the study was carried out from September 30, 2022 to October 20, 2022 and consisted of five semi-structured qualitative interviews with sports experts in charge of dual-career athletes at each of the consortium's universities. The purpose of the interview was to gain insight into the status of dual-career programs at the five universities, located in different countries and contexts. The aim was to draw parallels between the programs in order to obtain an overview in Europe of dual careers at the consortium universities.

The interviews were accompanied by a questionnaire with six blocks of open-ended questions (see [Supplementary Material S1](#)):

1. Description of the elite athlete program
2. Access to the program
3. Academic benefits of the dual career
4. Sports benefits of the dual career
5. Other benefits related to a dual career
6. Relationship with student athletes

Each interview lasted approximately 90–120 min. The information obtained from the interviews was analyzed, taking into account the similarities and the differences between the five universities and focusing on the benefits offered to dual-career students. Once all the benefits offered by the five universities had been identified, an initial list of benefits was sent to all members of the consortium for review. The universities provided feedback and expressed the need to better understand the benefits offered by the other universities in the consortium. Therefore, based on the feedback provided, the final list of 31 benefits was created and all 31 benefits were defined ([Supplementary Material S2](#)). This list, together with the definitions, was sent as a pilot-test and finally approved by the whole consortium.

The information obtained in the qualitative interviews and from the dual career questionnaire was used to create a list of the benefits for dual-career student athletes at the consortium's five universities. The list of benefits was sent to the project partners for validation. The interpretation and definition of each of the benefits was adjusted and a final list of 31 benefits was created ([Supplementary Material S2](#)). The consortium has grouped the 31 benefits into four categories according to their content:

1. All those benefits that directly affect their academic studies: Academic benefits (15 benefits).
2. All those benefits that focus on sporting activity and facilitate student athletes training or studies: Sports benefits (5 benefits).
3. All the benefits that have a health or fitness aspect: Health-related benefits (6 benefits).
4. All the benefits of different categories that favour the development of the students' dual career and that do not clearly fall into the three previous categories: Other benefits (5 benefits).

In the second phase of the study, which took place from January 10 to 20, 2023, a questionnaire was developed for the staff of the sports services and international relations offices to evaluate the list of 31 benefits. The questionnaire consisted of three main questions. Since the respondents were experts, they were asked to rate two of the questions according to three levels of relevance. The questionnaire asked participants to rate:

1. The importance of each benefit, regardless of whether their university offered that benefit or not. Scoring ranged from 1 to 3: 1 = not very important; 2 = important; 3 = very important.
2. Ease of implementing that benefit. Scoring ranged from 1 to 3: 1 = difficult to implement; 2 = fairly easy to implement; 3 = very easy to implement.
3. Whether the university offered the benefit. In this case, the possible responses were: yes, no or DK/NA.

The third phase of the study, from January 23, 2023 to February 28, 2023, focused on the dual-career students attending the universities participating in the SAMEurope project. In this phase, a detailed survey was developed using the Qualtrics® tool and it was approved and validated by the five universities in the consortium. The aim of the survey was to gather information about the dual-career students at the five universities, with a special focus on the needs of this group. Each partner university contacted its dual-career students and sent them the link to the Qualtrics® survey. The survey consisted of 27 questions divided into six sections:

1. Consent (1 question): agreement to participate in the study.
2. Personal information (3 questions): descriptive data about the dual-career student athlete.
3. Academic information (6 questions): data on their level of study and field of knowledge.
4. Athletic information (9 questions): data on the sport they play and their level of play.
5. Dual career (5 questions): data on the combination of academic and sporting life of dual-career student athletes, in particular the importance of the benefits received as dual-career students and their use of these benefits.

6. Erasmus (3 questions): data on the relevance of international mobility for dual career students.

The survey was written in English and translated into the national languages of the five consortium countries: German, Spanish, Finnish, French and Swedish. Each participant could choose to complete the survey in one of these six languages.

This paper focuses on the dual career section, in particular on the two questions about the benefits that universities provide to their dual-career students (Question 1: Rate from 0 to 5 the importance of each of these benefits in order to be able to combine your university studies and your high-level sport (0 = not at all important, 5 = very important); Question 2: Indicate which benefit or benefits you have used). The aim was to assess the benefits' importance and use. Dual-career students were asked to rate, from 0 to 5, each of the 31 benefits identified by the SAMEurope project (0 being not important and 5 being very important). They were then asked to indicate whether or not they had used each of the benefits.

2.3 Data analysis

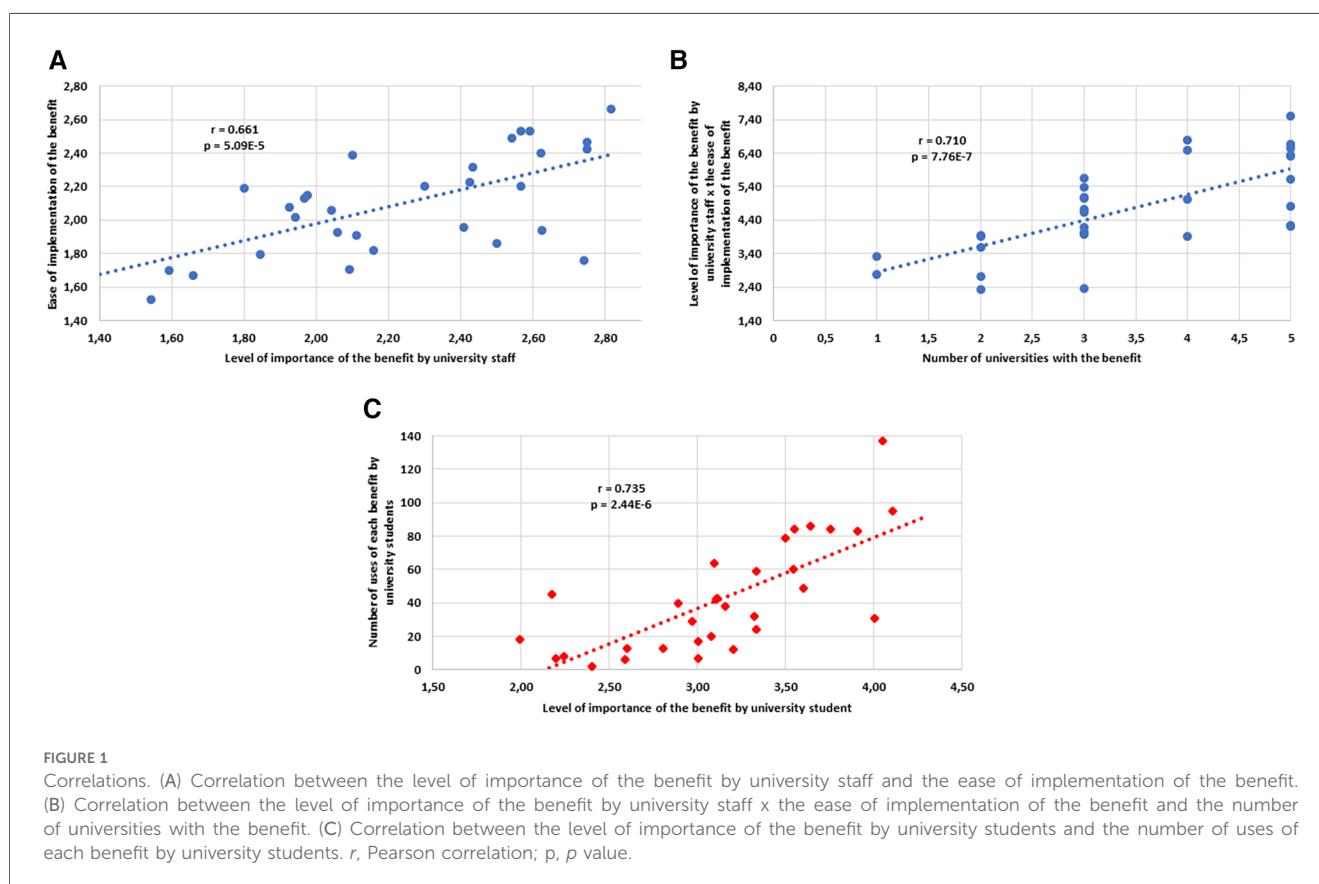
Statistical analyses were performed using the SPSS v27 software, and two-sided values of $p < 0.05$ were considered statistically significant. The Kolmogorov-Smirnov test was used to test the normality of the data for all variables used. Mean and standard deviation were used to describe the collected data

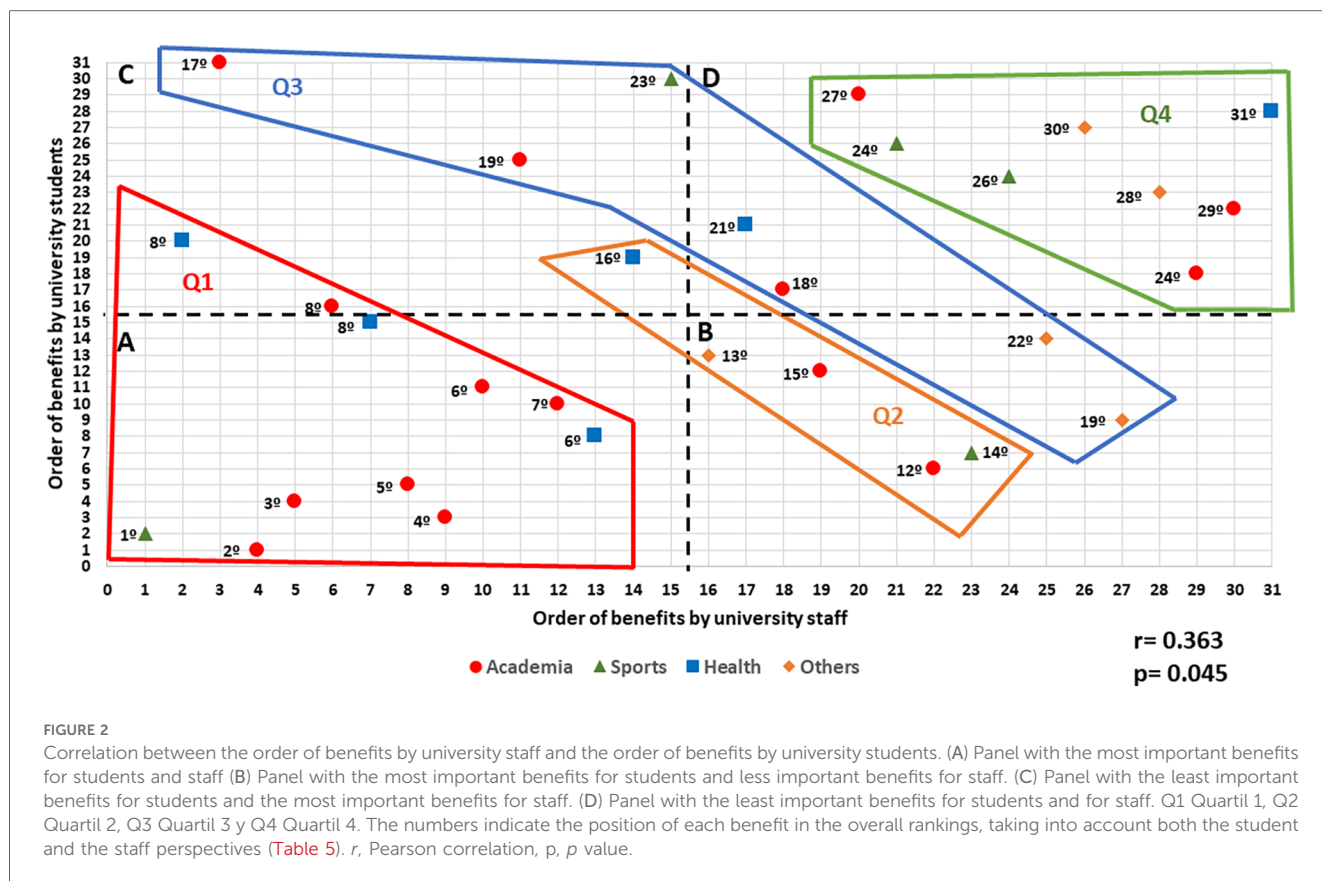
in terms of continuous variables, e.g., the value of a benefit or ease of implementation and sample size for categorical variables, e.g., number of times a benefit was used or number of universities offering a benefit. In the case of quartiles, Tukey's Hinges were used. A Pearson correlation test was used to analyze the intra- and inter-group correlations (Figures 1, 2). Cohen's criterion was used to determine the degree of correlation, whereby correlations with a value between 0.1 and 0.29 are considered weak correlations, correlations between 0.30 and 0.50 are moderate correlations, and correlations above 0.50 are strong correlations (28).

3 Results

Our study was able to identify and define 31 different benefits offered by the universities participating in the SAMEurope project (Table 1). These benefits have been grouped into four blocks: (i) Block 1 focuses on academic benefits that help students pursue their studies alongside their sports activity (15 benefits); (ii) Block 2 (5 benefits) aims at helping the student athletes pursue their sports training; (iii) Block 3 (6 benefits) aims at helping the student athletes maintain their condition and health throughout their dual career; and (iv) Block 4, referred to as "others" (5 benefits) are aspects that help to make the student athlete's daily life easier.

The set of 31 benefits illustrates the way in which the universities of the SAMEurope project support and assists these





dual-career athletes at their universities. A description of each benefit is provided in [Supplementary Material S2](#).

The 31 benefits described above were defined in three phases. The first phase involved 10 experts and the second phase involved 24 experts from the five universities in the consortium (three from Chalmers University of Technology, eight from the Institut National des Sciences Appliquées de Lyon, three from the Karlsruhe Institute of Technology, two from the University of Jyväskylä and eight from the Universitat Jaume I de Castellón).

The third phase involved 208 dual-career students from the five universities, 40.47% of the total number of students enrolled in the dual-career programs at these universities. Table 2 shows the distribution of the dual-career athletes from the five universities and the participation of the students.

The responses provided by the 24 dual-career experts from the different universities made it possible to rank the 31 benefits in terms of significance, taking into account three variables: the benefit's importance, its ease of implementation, and the number of universities that offer the benefit to their students. This ranking, divided into quartiles (Table 3), allows us to determine which benefits are the most relevant for the university staff participating in the survey. Thus, the three most important benefits from the universities' point of view were the free use of sports facilities, general medical services, and career advice. The three least important benefits were being part of a separate academic group, offers for remedial courses, and access to specialized physical education teachers. Note that the last two are benefits that are only available at one of the five universities participating in the SAMEurope project.

With respect to the relationship of the results obtained from the participating university staff, we observed that there was a positive, strong and significant correlation ($r = 0.661$, $p = 5.09E-5$) between the benefit this staff considered to be important and the ease of implementing this benefit (Figure 1A). At the same time, there was a positive, strong and significant correlation ($r = 0.710$, $p = 7.76E-7$) between the product of the importance of the benefit and the ease of implementation and the number of universities that offered this benefit (Figure 1B).

Similarly, the group of 208 students who rated each of the benefits and who indicated whether or not they used the different benefits (183 students used some benefit, with an average of 6.37 ± 4.85 benefits used per student), provide us with a ranking of the different benefits from the perspective of the students (Table 4). The ranking of these benefits in quartiles shows that justification for absences, the free use of sports facilities, and the changing of exam dates were the three most relevant benefits for students, while free semesters, reservation of places for sports courses, and career advice were the three benefits of least interest to the students.

In terms of intra-student correlations, the relationship between the value placed on the benefit by the students and the number of times they use it was positive, strong and significant ($r = 0.735$, $p = 2.44E-6$) (Figure 1C).

Once the benefits were ranked by the students and the staff at the universities, it was possible to obtain a general ranking of all 31 benefits. Thus, we obtained a global and joint view of the ranking of the benefits from the perspective of the staff and students, as well as results for the five universities that make up the SAMEurope project as a whole. These

TABLE 1 Set of 31 benefits defined in the five universities of the SAMEurope project to facilitate the implementation of the dual career for high-level student athletes.

Academic benefits	Choose class groups
	Justification for absences
	Online courses
	Remedial courses
	Specific courses (such as time management, sports marketing or social networks)
	Changing exam dates
	Online exams (without changing dates)
	Adaptation of the pace of study
	Extension of the number of exam sessions
	Extension of the criteria for permanency
	Partial enrollment
	Free semesters
	Separate academic group
	Academic tutoring
	Career advice
Sports benefits	Free use of sports facilities
	Private use of sports facilities
	Reservation of places for sports courses
	Extra credits for participation in university sport events
	DC tutoring
Health-related benefits	General medical services
	Mental health support
	Physiotherapy
	Nutricionist
	Testing (physiology, biomechanics, performance)
Other benefits	Specialized PE teachers
	Housing
	Discounts on meals
	Adapted catering service
	Scholarships
	Extra points in Erasmus evaluation

results, divided into quartiles (Table 5), show that the free use of sports facilities, justification for absences, and the adaptation of the pace of studies were the three most important benefits in the overall ranking of benefits. At the same time, the offer of remedial courses, extra points for Erasmus+ mobility, and specialized physical education teachers were the three least relevant benefits in the overall ranking.

Finally, when analyzing the correlation between the ranking of the benefits by the staff and by the students, we found that there was a positive, moderate and significant relationship ($r = 0.363$ $p = 0.045$) (Figure 2).

4 Discussion

The main objective of this study was twofold: to identify and to define the benefits offered to dual-career students at the five universities participating in the SAMEurope project. Once the benefits were defined, they were ranked according to their relevance from the perspective of the staff and the dual-career students. Then the level of the relationship within groups (staff and students) and between groups (staff vs. students) was determined.

The hypothesis is not fulfilled, as there is a correlation between the students' and the staff's ranking of benefits. However, this correlation has a very low value ($r = 0.363$, $p = 0.045$), in contrast to the p -values found within each of the groups (r between 0.661 and 0.735, $p < 0.001$), indicating that the relationship between the staff's ranking of importance and the dual-career students' ranking of those benefits has the potential to be improved by direct action by higher education institutions.

In the first part of the study, 31 benefits offered to dual-career students at the different universities in the consortium were identified and defined (Table 1 and Supplementary Material S2). These 31 benefits are in line with those presented by Izzicupo et al. (29), who defined 26 different aspects. In this study, the 31 benefits were analyzed, described and defined by experts working directly in the dual-career field at each of the five universities. In contrast to the study by Izzicupo et al. (29), the benefits were implemented and applied at the universities in the consortium. Each of these 31 benefits (Table 1) directly served the dual-career students pursuing their academic education at one of these universities. As can be seen in the results of the staff (Table 3), not all of the 31 benefits were implemented at all universities. Some benefits are offered by all five universities, such as

TABLE 2 Distribution of dual career students who participated in the survey conducted by the five universities of the SAMEurope project.

University	Chalmers	INSA	KIT	JYU	UJI	General
Questionnaires sent	103	150	26	140	95	514
Questionnaires received	32	89	15	22	50	208
Age	22.16 ± 1.34	21.54 ± 0.70	22.67 ± 2.81	23.09 ± 3.07	21.16 ± 5.76	21.79 ± 1.77
Men	13	31	11	17	19	91
Women	19	58	4	5	30	116
Non binary					1	1
Bachelor degree	32	42	11	16	49	140
Master degree		47	4	6	1	68
Regional level		1		1	1	3
National level	14	47		15	41	119
International level	18	41	15	6	8	86
% participation	31.07%	59.33%	57.69%	15.71%	52.63%	40.47%

Chalmers, Chalmers University of Technology; INSA, Institut National des Sciences Appliquées de Lyon; KIT, Karlsruhe Institute of Technology; JYU, University of Jyväskylä; UJI, Universitat Jaume I.

TABLE 3 Ranking of the benefits from the perspective of the university staff, taking into account the importance of the benefit, the ease of its implementation, and the number of universities offering it.

BLOCK	Benefit	LI	EI	NUni	LI x EI	LI x EI x NUni	OB	Q
SPORTS	Free use of sports facilities	2.82 ± 0.43	2.67 ± 0.44	5	7.51	37.56	1	1
HEALTH	General medical services	2.75 ± 0.39	2.43 ± 0.39	5	6.67	33.34	2	1
ACADEMIA	Career advice	2.59 ± 0.24	2.53 ± 0.29	5	6.57	32.83	3	1
ACADEMIA	Justification for absences	2.54 ± 0.41	2.49 ± 0.39	5	6.33	31.66	4	1
ACADEMIA	Adaptation of the pace of study	2.62 ± 0.66	2.40 ± 0.83	5	6.30	31.50	5	1
ACADEMIA	Academic tutoring	2.43 ± 0.41	2.32 ± 0.55	5	5.64	28.19	6	1
HEALTH	Mental health support	2.75 ± 0.41	2.47 ± 0.62	4	6.78	27.13	7	1
ACADEMIA	Choose class groups	2.57 ± 0.43	2.53 ± 0.41	4	6.50	26.01	8	1
ACADEMIA	Changing exam dates	2.74 ± 0.74	1.76 ± 0.70	5	4.82	24.10	9	2
ACADEMIA	Extension of number of exam session	1.98 ± 0.49	2.15 ± 0.45	5	4.25	21.23	10	2
ACADEMIA	Specific courses (e.g., time management, sports marketing & social media)	2.04 ± 0.15	2.06 ± 0.17	5	4.20	21.01	11	2
ACADEMIA	Partial enrollment	2.10 ± 0.28	2.39 ± 0.68	4	5.02	20.09	12	2
HEALTH	Physiotherapy	2.57 ± 0.42	2.20 ± 0.54	3	5.65	16.94	13	2
HEALTH	Nutritionist	2.43 ± 0.47	2.23 ± 0.42	3	5.40	16.19	14	2
SPORTS	Reservation of places for sports courses	1.94 ± 0.54	2.02 ± 0.58	4	3.92	15.66	15	2
OTHERS	Housing	2.63 ± 0.49	1.94 ± 0.39	3	5.10	15.29	16	3
HEALTH	Testing (physiology, biomechanics, performance)	2.30 ± 0.36	2.20 ± 0.34	3	5.06	15.18	17	3
ACADEMIA	Online courses	2.41 ± 0.53	1.96 ± 0.37	3	4.72	14.15	18	3
ACADEMIA	Online exams (without changing dates)	2.50 ± 0.55	1.86 ± 0.59	3	4.65	13.94	19	3
ACADEMIA	Free semesters	1.97 ± 0.42	2.13 ± 0.36	3	4.20	12.59	20	3
SPORTS	DC tutoring	2.11 ± 0.72	1.91 ± 0.66	3	4.03	12.09	21	3
ACADEMIA	Extension of the criteria for permanency	1.93 ± 0.42	2.08 ± 0.43	3	3.99	11.98	22	3
SPORTS	Private use of sports facilities	2.06 ± 0.06	1.93 ± 0.27	3	3.96	11.89	23	3
SPORTS	Extra credit for participation in university sport events	1.80 ± 0.66	2.19 ± 0.81	2	3.95	7.89	24	4
OTHERS	Scholarships	2.16 ± 0.57	1.82 ± 0.55	2	3.92	7.84	25	4
OTHERS	Extra points in Erasmus evaluation	2.09 ± 0.29	1.71 ± 0.33	2	3.57	7.15	26	4
OTHERS	Adapted catering service	1.54 ± 0.28	1.53 ± 0.27	3	2.35	7.05	27	4
OTHERS	Discounts on meals	1.59 ± 0.41	1.70 ± 0.80	2	2.71	5.41	28	4
ACADEMIA	Separate academic group	1.36 ± 0.12	1.72 ± 0.26	2	2.33	4.66	29	4
ACADEMIA	Remedial courses	1.84 ± 0.53	1.80 ± 0.73	1	3.31	3.31	30	4
HEALTH	Specialized PE teachers	1.66 ± 0.62	1.67 ± 0.53	1	2.76	2.76	31	4

Values for importance of benefit and ease of implementation are presented as means and standard deviation. LI, level of importance of the benefit by university staff; EI, ease of implementation of the benefit; NUni, number of universities with the benefit; LI x EI, level of importance of the benefit x ease of implementation of the benefit; LI x EI x NUni, level of importance of the benefit x ease of implementation of the benefit x number of universities with the benefit; OB, order of benefits by university staff; Q, quartil.

justification for absences or academic tutoring, and others are offered by only one university, such as specialized physical education teachers and remedial courses. These differences in the availability of the benefits are based on the context of each university, the social culture in which the university is located, legislation, and national models for support for elite athletes. The legislative framework of each country has a direct influence on policies to support elite athletes. However, university autonomy, which is a characteristic element of universities, allow for modifications and adaptations within the university regulations. Thus, there are universities that have a more open program towards the protection of dual-career athletes and other universities that are more restricted to the development of dual-career programs. There is a need to create a framework for action in the European Union aimed at the continuity of higher education studies and high-performance sport. Aquilina and Henry (14), and other subsequent authors (6, 15, 30) already point to differences in national models of support for dual-career students, which range from models with more state involvement, to models without a defined structure to support this group.

After the 31 benefits were defined and grouped into 4 areas, the benefits were ranked by asking for the opinion of the university staff with regard to each of the benefits (Table 3). Since these were experts, a very well-defined scale was used, with little room for indecision, to allow them to clearly position themselves with regard to the importance of the benefit and the ease of its implementation at their university. The experts were asked to provide their opinion to every question, regardless of whether or not their university offered the benefit.

Using this data, the results for each question were combined to produce an overall ranking of the benefits from most important to least important based on the responses from the participating university staff (Table 3). This model combines three questions asked in such a way that the ranking of the benefits takes into account how important the benefit is, how easy it is to implement at each university (the less easy it is, the more complex it is to implement) and the number of universities that offer the benefit (the more universities offering the benefit, the more relevant it is, because it is more widely implemented within the university system of the different

TABLE 4 Ranking of the benefits from the perspective of the dual-career university students, taking into account the importance of the benefit and the number of uses made of each benefit.

BLOCK	Benefit	LI	NUB	LI x NUB	OB	Q
ACADEMIA	Justification for absences	4.05 ± 1.36	137	555.25	1	1
SPORTS	Free use of sports facilities	4.11 ± 1.35	95	390.50	2	1
ACADEMIA	Changing exam dates	3.91 ± 1.40	83	324.42	3	1
ACADEMIA	Adaptation of the pace of study	3.75 ± 1.47	84	315.40	4	1
ACADEMIA	Choose class groups	3.64 ± 1.38	86	312.99	5	1
ACADEMIA	Extension of the criteria for permanency	3.55 ± 1.75	84	298.44	6	1
SPORTS	Private use of sports facilities	3.50 ± 1.54	79	276.50	7	1
HEALTH	Physiotherapy	3.54 ± 1.56	60	212.60	8	1
OTHERS	Adapted catering service	3.10 ± 1.73	64	198.15	9	2
ACADEMIA	Partial enrollment	3.33 ± 1.68	59	196.57	10	2
ACADEMIA	Extension of number of exam session	3.60 ± 1.62	49	176.45	11	2
ACADEMIA	Online exams (without changing dates)	3.12 ± 1.65	43	133.96	12	2
OTHERS	Housing	3.11 ± 1.68	42	130.44	13	2
OTHERS	Scholarships	4.00 ± 1.39	31	124.15	14	2
HEALTH	Mental health support	3.16 ± 1.54	38	120.03	15	2
ACADEMIA	Academic tutoring	2.89 ± 1.64	40	115.58	16	2
ACADEMIA	Online courses	3.32 ± 1.59	32	106.31	17	3
ACADEMIA	Separate academic group	2.17 ± 1.63	45	97.79	18	3
HEALTH	Nutritionist	2.97 ± 1.55	29	86.16	19	3
HEALTH	General medical services	3.33 ± 1.59	24	79.96	20	3
HEALTH	Testing (physiology, biomechanics, performance)	3.08 ± 1.62	20	61.54	21	3
ACADEMIA	Remedial courses	3.00 ± 1.60	17	51.08	22	3
OTHERS	Discounts on meals	3.20 ± 1.79	12	38.42	23	3
SPORTS	Extra credit for participation in university sport events	2.81 ± 1.82	13	36.50	24	4
ACADEMIA	Specific courses (e.g., time management, sports marketing & social media)	1.99 ± 1.51	18	35.83	25	4
SPORTS	DC tutoring	2.60 ± 1.67	13	33.81	26	4
OTHERS	Extra points in Erasmus evaluation	3.00 ± 1.73	7	21.03	27	4
HEALTH	Specialized PE teachers	2.24 ± 1.60	8	17.92	28	4
ACADEMIA	Free semesters	2.59 ± 1.80	6	15.55	29	4
SPORTS	Reservation of places for sports courses	2.20 ± 1.73	7	15.38	30	4
ACADEMIA	Career advice	2.40 ± 1.54	2	4.81	31	4

Values for benefit importance are presented as means and standard deviation. LI, level of importance of the benefit by university students; NUB, number of uses of each benefit by university students; LI x NUB, level of importance of the benefit by students x Number of uses of each benefit by students; OB, order of benefits by university students; Q, quartil.

universities). Thus, in contrast to the study by Izzicupo et al. (29), which ranks the 26 aspects taking into account the relationship between the importance of the benefit and the ease of implementation, and thus obtaining 4 quadrants for the location of the 26 aspects, our model manages to obtain a global ranking, taking into account three variables. However, both models have found that the most valued benefits are centered around aspects relating to logistics, academics and tutoring. In our case, the relevance of medical support for dual-career students was also included in the assessment for the first time. The results are presented in quartiles (Table 3) so that we can observe the ranking of the benefits from the perspective of the staff in four quartiles. The first quartile shows the importance of mental health support. The second quartile shows the importance of physiotherapy and the nutritionist. These benefits, considered important by university staff, have not previously been taken into account when assessing the support received by dual career athletes (8, 10, 31).

The results were correlated in order to see the relationship between the importance of the benefit and its ease of implementation. We found that there is a positive, strong and

significant relationship between both variables (Figure 1A). This leads us to believe that the expert personnel try to facilitate the implementation of those benefits which they consider to be important and to define action policies adapted to their own context. In this way, they implement tailor-made measures and policies that benefit dual-career students.

We also analyzed the correlation between the importance and ease of implementation with the number of universities offering this benefit. We found that there is a positive, strong and significant relationship between both variables (Figure 1B). Thus, higher scores for the importance of the benefit and for the benefits that are very easy to implement result in a greater number of universities offering these benefits. Thus, in contrast to the work of Izzicupo et al. (29), we find that the greater or lesser number of universities offering a particular benefit is related to the degree of importance of the benefit and its ease of implementation in each university. This combination of factors is an element that helps to understand why some benefits are more widely offered in more universities than others. Knowing the tools for implementing a benefit at one university paves the way for others to make it easier to implement it.

TABLE 5 Ranking of the benefits from the perspective of the university staff and the dual-career students of the five universities, taking into account the final ranking of each of the perspectives.

BLOCK	Benefit	OBSta	OBStu	GR	GO	Q
SPORTS	Free use of sports facilities	1	2	3	1	1
ACADEMIA	Justification for absences	4	1	5	2	1
ACADEMIA	Adaptation of the pace of study	5	4	9	3	1
ACADEMIA	Changing exam dates	9	3	12	4	1
ACADEMIA	Choose class groups	8	5	13	5	1
ACADEMIA	Extension of number of exam session	10	11	21	6	1
HEALTH	Physiotherapy	13	8	21	6	1
ACADEMIA	Partial enrollment	12	10	22	8	1
HEALTH	General medical services	2	20	22	8	1
ACADEMIA	Academic tutoring	6	16	22	8	1
HEALTH	Mental health support	7	15	22	8	1
ACADEMIA	Extension of the criteria for permanency	22	6	28	12	2
OTHERS	Housing	16	13	29	13	2
SPORTS	Private use of sports facilities	23	7	30	14	2
ACADEMIA	Online exams (without changing dates)	19	12	31	15	2
HEALTH	Nutritionist	14	19	33	16	2
ACADEMIA	Career advice	3	31	34	17	3
ACADEMIA	Online courses	18	17	35	18	3
ACADEMIA	Specific courses (e.g., time management, sports marketing & social media)	11	25	36	19	3
OTHERS	Adapted catering service	27	9	36	19	3
HEALTH	Testing (physiology, biomechanics, performance)	17	21	38	21	3
OTHERS	Scholarships	25	14	39	22	3
SPORTS	Reservation of places for sports courses	15	30	45	23	3
ACADEMIA	Separate academic group	29	18	47	24	4
SPORTS	DC tutoring	21	26	47	24	4
SPORTS	Extra credit for participation in university sport events	24	24	48	26	4
ACADEMIA	Free semesters	20	29	49	27	4
OTHERS	Discounts on meals	28	23	51	28	4
ACADEMIA	Remedial courses	30	22	52	29	4
OTHERS	Extra points in Erasmus evaluation	26	27	53	30	4
HEALTH	Specialized PE teachers	31	28	59	31	4

OBSta, order of benefits by university staff; OBStu, order of benefits by university students; GR, general results by staff and students; GO, general order benefits by staff and students; Q, quartil.

Similarly, the benefits were ranked from the student's perspective. It is important to note that the questionnaire was available in six languages so that each student could choose to complete the questionnaire in his or her own language. This facilitated the understanding of each benefit. When ranking the benefits from the students' perspective, responses to two questions were analyzed, one relating to the importance of the benefit and the other focusing on which benefits they had used. Thus, both variables were taken into account in the final ranking of the benefits. In recent studies, student surveys have been carried out qualitatively in focus groups (17) and quantitatively (19–21), in which the needs and interests of the students in being able to pursue an optimal dual career are shown in different sections. Our study focused on understanding their perceptions of the benefits offered to them by their universities. The dual-career students rated each of the benefits according to their relevance and indicated which benefits they had used in developing their dual career. For these two results, each benefit was ranked according to its relevance as a whole at the universities participating in the SAMEurope project. Among the 6 most relevant benefits for students, 5 of them are in the ACADEMIA section (they are benefits related to students' time management) and 1 benefit is in the SPORTS section (the free use

of sports facilities, which also directly affects students' time management). This fact is addressed in (32, 33), and it is in line with our results, pointing out that the most relevant aspect for students is to be able to manage their time. It can be seen that justification for absences stands out in this group, an aspect that has been shown to be important in the studies mentioned above (17, 19–21, 32, 33). Our study confirms its importance and its use by the dual-career students at the five universities (Table 4). It is also worth highlighting the scholarship benefit, which is ranked highly by the students but not utilized much, a fact that is conditioned by the number of universities that offer this benefit. Thus its final position in the ranking is much lower than the importance it has for this group. This shows the diversity of university policies and reinforces the autonomy of universities to make decisions tailored to the interests and needs of dual-career students. However, academic benefits continue to carry significant weight, albeit with a more practical and immediate impact on the students' daily lives, as with sports and health-related benefits.

In the case of the students, the relationship between the importance of the benefit and its use is positive, strong and significant (Figure 1C). Thus we see that the students are very consistent and utilize what they consider to be important,

whenever it is offered. Therefore, the more the dual-career program is tailored to their interests, the more these benefits can be expected to be utilized. The scientific literature has not addressed the question of how many benefits a university dual-career athlete uses. Our study is the first to address this issue. Each student athlete used 6.37 ± 4.85 different benefits, with a range of up to 31 benefits to choose from. The fact that not all benefits were offered by all universities may have influenced the number of benefits used.

After the analysis process, the 31 benefits were ranked, taking into account the three variables analyzed from the perspective of the staff and the two variables analyzed from the perspective of the students. An overall ranking was obtained for the group of experts and students from the five universities that make up the SAMEurope consortium (Table 5). The overall ranking shows eleven benefits in Quartile 1 (seven from the academic block, one from the sports block and three from the health block), five benefits in Quartile 2 (two from the academic block, one from the sports block, one from the health block, and one from the “other” block), seven benefits in Quartile 3 (three from the academic block, one from the sports block, one from the health block and 2 from the “other” block) and eight benefits in Quartile 4 (three from the academic block, two from the sports block, one from the health block, and two from the “other” block). The results show, for the first time, a system that ranks the set of benefits offered by different universities and from different countries globally and jointly, taking into account the two main actors involved in the development of dual careers for students at higher education institutions. This ranking can help to define the minimum benefits needed to be offered by an international dual-career program. Condello et al. (34) have already proposed this measure as a way to ensure the development of dual careers. Thus, the results obtained can act as a guide for defining the minimum benefits to be implemented at European universities.

Finally, a correlation was made between the ranking of the 31 benefits from the perspective of the staff and the students in order to verify the relationship between the two groups. This is the first time that such a correlation has been made. Previous studies have focused on both groups, staff and students, separately (19–21, 29, 31, 35). In this study, both groups are catered for at the same time. The result showed a positive, moderate and significant correlation (Figure 2), which leads us to assume that there is room for improvement in developing dual careers at higher education institutions and that the relationship between the two groups can be improved. Taking into account these results, improvements in the implementation of those benefits that are most relevant to the interests of the student athletes will enhance the relationship between the university and the dual-career student athletes, which, in turn, will promote the development of dual-career programs at European universities. Thus, a program more tailored to their interests and needs would increase the number of different benefits used by dual-career student to facilitate the compatibility of their academic life with their sporting life. The role of university autonomy is key to the promotion and development of these policies, as well as their influence on higher level regulations, such as national or EU policies.

Figure 2 shows the distribution of benefits in four panels. Panel A shows the benefits that are important to students and staff at the

five universities. Panel B shows the benefits that are most important to students and least important to the staff. Panel C shows the benefits that are important to the staff but less important to the students. And, finally, Panel D shows the benefits ranked least important by the staff and students.

When analyzing the results obtained in the global ranking, it is observed that in Quartile 1 there are seven academic benefits, one of which is located in Panel C, three health-related benefits, one of which is located in Panel C, and one sports benefit, which tops the global ranking. In Quartile 2, there are two academic benefits, one sports benefit and one benefit from the “other” section located in Panel B, and one health-related benefit located in Panel C. In Quartile 3, the most dispersed, there are three academic benefits—two of which are located in Panel C and one of which is in Panel D, one sports benefit located in Panel C, and two benefits from the “other” section that are in Panel B. Finally, Quartile 4 has three academic benefits, two sports benefits, two health-related benefits and one benefit from the “other” category, all located in Panel D.

Figure 2 helps to show which benefits need more decisive measures to bring the interests of the students more in line with those of the university. For example, the career advice benefit, located in Panel C and in Quartile 3 and ranked 17, requires measures to make students see this benefit as something useful for their professional future. On the other hand, the scholarship benefit, located in Panel B and in Quartile 3 and ranked 22, seems to be an element that can improve the rapprochement between both groups involved in the development of dual careers. Our analysis reinforces the need to combine the interests of both groups and to take a step forward with respect to publications that separately address the interests of the different collectives (17, 19, 29, 34).

One of the elements to consider is the search for consensus in defining what an elite athlete is. This highlights the fact that there are differences in the interpretation of what an elite athlete is. Some studies make efforts to define this (36, 37) and can provide a tool for establishing a consensus in the definition of elite athlete between different higher education institutions and in different countries or contexts. This, in turn, would help to facilitate the recognition and mobility of student athletes between universities.

In this study we have listed and ranked a total of 31 benefits aimed at facilitating the combination of higher education and elite sport. These 31 benefits were ranked from the perspective of the two groups directly involved in the dual career at universities: the student athletes and the university staff working with dual-career athletes. This ranking of the 31 benefits can serve as a guide for higher education institutions to select those benefits that are more decisive in the pursuit of a dual career and to opt for programs that are more in line with the interests and needs of both groups.

4.1 Limitations

One of the limitations of this study was the number of dual-career students who participated in the survey. Even though 52.14% participated, only 40.46% completed the questionnaire. Higher participation would strengthen the results and it would be advisable to increase the number of participating students.

Similarly, the participation of only five universities in the study is another limitation and it would be advisable to reproduce the study with a larger number of European universities.

Another limitation is the possible misinterpretation of the meaning of the different benefits by the students, however an attempt was made to reduce potential misinterpretations by conducting the survey in six languages, one in English and one for each country in the consortium.

This study shows that the structural profiles of each country lead to different academic policies. Therefore, within the framework of the European Union, studies focusing on the individual reality of each institution/country will facilitate the creation of programs to promote the mobility of all high-level student athletes in higher education institutions and to support their international mobility within the framework of the European Union.

One limitation to bear in mind is that this study has focused on the two most representative groups of dual career in higher education institutions, students and university staff (faculty and technical staff), but in the field of high-level sport, it may be necessary to include in this analysis the group of coaches who are responsible for the training programs of dual-career student athletes.

4.2 Conclusions

This paper identifies 31 benefits offered to student athletes at one or more of the universities in the SAMEurope consortium to facilitate the development of their dual career. A ranking of the benefits was established from the perspective of the participating staff members and from the perspective of the students. In addition, a prioritized ranking of the 31 benefits was established by combining the two perspectives across the five universities in the consortium. A strong positive relationship was observed between the importance of the benefits and the ease of implementation by the university staff. Furthermore, this positive and strong relationship is also present with regard to the number of universities offering the benefits. Similarly, there is a strong positive relationship between the importance of the benefits and their use by the students. However, there is only a moderate relationship between the ranking of the benefits among the staff and the students. Thus, there is significant room for improvement to better align the benefits offered by the universities to the priorities of the students.

The marked differences in the definition of elite athlete in each country make it difficult to agree on a single criterion for the university community. The establishment of a consensus definition will make it easier for higher education institutions to find a stable criterion for standardization.

Data availability statement

The datasets presented in this article are not readily available because the traceability of responses can lead to the identification of the subjects. Partial data are available upon request to the corresponding author. Requests to access the datasets should be directed to CH, hernando@uji.es.

Ethics statement

The study was divided into three phases and was approved by all of the partner universities and by the Ethics Committee of the Universitat Jaume I of Castellón (CEISH/27/2022). It complies with the criteria laid down in the Declaration of Helsinki.

Author contributions

CH: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. MRM: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. PT: Data curation, Investigation, Supervision, Validation, Visualization, Writing – review & editing. JB: Data curation, Investigation, Supervision, Validation, Visualization, Writing – review & editing. MK: Data curation, Investigation, Supervision, Validation, Visualization, Writing – review & editing. SK: Data curation, Investigation, Supervision, Validation, Visualization, Writing – review & editing. MR: Data curation, Investigation, Supervision, Validation, Visualization, Writing – review & editing. AK: Data curation, Investigation, Supervision, Validation, Visualization, Writing – review & editing. SS: Data curation, Investigation, Supervision, Validation, Visualization, Writing – review & editing. PK: Data curation, Investigation, Supervision, Validation, Visualization, Writing – review & editing. FA: Data curation, Investigation, Supervision, Validation, Visualization, Writing – review & editing. AD: Data curation, Investigation, Supervision, Validation, Visualization, Writing – review & editing. DB: Data curation, Investigation, Supervision, Validation, Visualization, Writing – review & editing. MM: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fspor.2024.1407194/full#supplementary-material>

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Dual career policy at federal universities in Brazil: analysis of academic and sporting support

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Internationally, the implementation of holistic programs aimed at academic, financial and retirement preparation support for student-athletes who find themselves in dual careers, such as university students, has been widespread and intensified. However, little is known about the subject in the Brazilian national context, because although there are related studies, they are punctual and related to specific universities. In view of the above, this study aimed to investigate public policy aimed at student-athletes at Brazilian federal universities. This is an exploratory, qualitative, cross-sectional and documentary study, using the websites, internal regulations and public notices of 69 Brazilian federal universities for the year 2023, using the content analysis technique. The results indicate that 72.05% offer some kind of support to DC based on the holistic model, 66.17% of which is academic and 60.29% sports. Among the academic support, the flexibility of assessments (57.35%) and the differentiated treatment of absences (51.47%) were close. The sporting support is centered on partial payment of competition costs (60.29%) and athlete grants are restricted to 20.58% of universities. It can be concluded that Brazil's federal universities have policies that include support actions that integrate the holistic model (academic), with incipient coverage of scholarships (sports), but do not effectively follow the holistic model.

KEYWORDS

public politys, university sport, federal universities, dual career, holistic model, academic support, sporting support

1 Introduction

It takes an average of five to ten years for an athlete to become part of the sporting elite (1), peaking between the ages of 20 and 30 (2). This age group has with a high percentage of university-educated athletes in South Africa (3), Belgium (4), Spain, Latvia, Italy, Portugal, Romania (5), the United States (6), Turkey (7), Spain (8) and Sweden (9). Therefore, people who find themselves in a dual career (DC) (10).

Dual career consists of combining a sporting career with studies or work (11). In this context, they accumulate the roles of student-athletes and their routines are permeated by numerous competing demands. In addition to the obligations inherent in a sporting career (physical, tactical and technical training, concentration, travel, friendly matches and competitions), they are also faced with the academic scenario, which has several other demands (fulfilling credits in subjects, studying to prepare and fix content, out-of-class work (12). This complexity is not linear, and it varies according to sporting level (amateur, semi-professional and professional) (13), which means that some dedicate 17.4 h a week (professionals) and others, 16.6 h (amateurs) (14). Macro issues (cultural and political) are also conditioning factors, which means the time dedicated to sport

varies—Asia (27.6 h), Oceania (23.9 h), America (21.4 h), Europe (20.9 h) and Africa (14.7 h) (15). This is similar between countries, with a weekly dedication to sports of between 20 and 30 h in the United States (16), 11–20 h in Turkey (7), 6–9 h in public universities or over 10 h in private universities in Brazil (17). In addition, student-athletes are subjected to academic demands, which vary from less than 11 h/week (7) to 20 h/week (15).

This complex context, conditioned by various factors, has often overloaded student-athletes and resulted in incompatibilities, such as a lack of time to study, attend classes and reconcile exams and competitions (18), damaging their sporting careers with reduced training (15) and abandonment of their sporting careers (19). It has also had an impact on academic training, with absences from classes (7, 15), delays, failures, changes of shift (or university) and prolonged absenteeism from the course (7). In addition, the problems have gone beyond sporting and academic limits, because leisure time is limited (7, 15, 20), reconciliation with other daily experiences—studying, working, social relationships and leisure—is impaired (21). This is because the more student-athletes prepare and the more hours they dedicate to practicing and competing in sport, the less favorable the conditions for professional training become (22).

In view of this, in order to mitigate the side effects, the implementation of actions based on the holistic model, which consists of the reciprocal interaction between athletic, psychological, psychosocial and academic, and vocational development (23, 24) has been advocated for some decades, consisting of actions related to academic, sporting and transition to retirement aspects. These measures are essential for successful DC, given that DC is a multifactorial element, influenced by individual (talent and psychological characteristics), interpersonal (social support and culture), environmental (tools and services available) and political (national and international standards) aspects (25).

With regard to academic activities, the holistic model recommends making entry requirements more flexible, extending the school term, personalized study schedules, alternative access to course offerings, individual or small group classes. As for sports, the suggestions include scholarships, professional support, infrastructure for elite sports and elite sports development programs. As for the transition to retirement, the guidelines focus on scholarships, the introduction of new programs adapted for retiring athletes and lifestyle management services (26).

Faced with these demands and the possibilities of holistic interventions, initiatives aimed at a culture of DC have been implemented on the international stage. In the European Union, the Member States have made DC one of the strategic and political priorities of sport, including it in sports documents (27) and specific guidelines created for this purpose (28–30). In addition, transnational programs have been implemented, such as Program European Community Action Scheme for Mobility of University Students (ERASMUS+ Sport) (31), Empathy (32); Dona, Starting11, Athletes2Business, European Athlete as Student, More Than Gold (31), with adaptations to entry requirements, flexibility of schedules and exam dates in France, Hungary, Spain, Portugal (33).

These programs can serve as a basis for implementing DC-oriented policies in other international contexts, such as South America. However, they sometimes come up against the particular regulations of each country, as shown by Capranica et al. (34). In other words, polity is a conditioning factor for the policy model undertaken in each country.

This can be seen in Brazilian politics, where although in the past there were decrees granting academic support to student-athletes, there are no longer any. Since 1977, participation in sports competitions has been considered school attendance (35), but in 1993 it was revoked (36). Absences resulting from participation in national and international competitions between 1971 and 2019 could be excused by the Ministry of State for Education (37), but in 2019 the decree was revoked (38). Subsequently, these benefits were no longer included in any other sports or education law in the country (36, 39, 40).

On the other hand, financial support is provided by the Scholar-Athlete Program, which was implemented in 2004. Initially made up of five categories (basic, student, national, international and Olympic and Paralympic), student-athletes, in particular, can be included in the student category (41, 42).

Due to the lack of federal laws regulating academic support, such as flexible class attendance and the replacement of assessments missed due to participation in competitions, DC policy in Brazil is developed on an individual basis, with each institution's own initiatives. This is because, as regulated by the Brazilian Federal Constitution (43), universities enjoy didactic-scientific, administrative and financial and asset management autonomy. Therefore, as long as they do not violate the Federal Constitution, federal laws and/or decrees, universities can create their own policy, including those related to DC, academic support or sports.

However, in Brazil specifically, little is known about DC, because even though there are contributions on the subject, they are limited to the particular realities of specific universities, such as the University of Brasilia (44, 45) and the Federal University of Mato Grosso do Sul (12, 46, 47). An exception is the study by Quinaud et al. (17), which included a representative group of student-athletes taking part in the Brazilian University Games (JUBs), including those from public and private universities, but focusing only on identity issues.

Therefore, unlike what is evident in the international literature, to date there has been no research that has focused on a comprehensive analysis at the national level in Brazil, a gap that gave rise to the academic agenda in question. The data from this study could corroborate the debate on the subject in bodies responsible for educational and sports policy in the country, as well as broadening the international debate with an expanded scenario.

In light of the above, this research aimed to analyze policies focused on DC in Brazilian federal universities. Specifically, investigated it aimed the academic and sporting support directed at student-athletes in the context of Brazilian Federal Universities. It was hypothesized that the recommendations of the holistic model are present in an individualized and incipient way in the policies of Brazilian federal universities through academic and sporting support specific.

2 Materials and methods

2.1 Design

This is an exploratory study with a descriptive (48), cross-sectional (49) approach and qualitative-quantitative analysis (48).

2.2 Information sources

The research population was Brazil's federal universities. The sources of information were online documents related to the dual career sport policy. Of the 69 federal universities (50), 68 took part in the survey. Among them, 20 are located in the Northeast region, 19 in the Southeast region, 11 in the North region, 11 in the South region and 7 in the Center-West region.

2.3 Analysis technique

The analysis technique was documental, which consists of written records that provide information for understanding facts and relationships, making it possible to know the historical and social period of the actions and reconstruct the facts and their background. Written institutional records are those provided by government institutions (48). With regard to research into DC, document analysis (politys, regulations and plans) is an excellent methodological tool for discovering structural anchoring in national contexts. To provide a baseline and influence the phases of implementation projects that involve primary data collection, desk research includes the collection and content analysis of documents containing information on politys, regulations and plans, providing insights into problems and challenges (31).

In carrying out the research, the parameters indicated by Gil (48) were adopted, with organization in stages.

- ✓ Formulation of the problem: built up with the preparation of the research pre-project, based on the literature review, an action which, according to Deslandes (51), constitutes exploratory research.
- ✓ Drawing up the work plan: a preliminary and provisional stage in the process, consisting of drawing up the research project (48), drawing up the timetable (temporal organization of the bibliographical survey, literature review, data collection, analysis and interpretation of the results and preparation of the article for publication).
- ✓ Identification of Sources: classic documentary sources include public archives and official documents, trade associations, political parties, trade unions and scientific associations (48). Based on an exploratory review of studies already produced on the subject, the sources under investigation were identified: (a) Didactic regulations for undergraduate courses at Brazilian Federal Universities; (b) Sport and leisure politys at Brazilian Federal Universities; (c) Calls for proposals and results for scholarships and financial aid at Brazilian Federal Universities.
- ✓ Locating sources and obtaining material: based on the access to information law, consultations were carried out with Brazilian federal universities via the fala.br platform. Information was

requested the existence of scholarships for training and participation of student-athletes in sports competitions; financial aid grants for participation of student-athletes in sports competitions; existence of academic regulations granting compensation for absences and/or replacement of exams to student-athletes on occasions of participation in sports competitions; existence of admission (entrance exam or similar) to the undergraduate program. In addition, it was requested that, if any of the concessions existed, the regulations and, in the case of scholarships and financial aid, the opening and results notices be made available.

- ✓ Data analysis and interpretation: the analytical procedures are different depending on the type of design, with content analysis being the most widely used technique for objectively, systematically and qualitatively describing transcribed communications (48). The following steps were followed in the content analysis: (a) definition of objectives; (b) creation of a reference framework; (c) selection of documents to be analyzed; (d) construction of a system of categories and indicators; (e) definition of analysis units; (f) definition of enumeration rules; (g) validity and reliability test; (h) data processing; (i) data interpretation.

Defining the objectives was one of the steps in the analysis process, which was developed in conjunction with the research problems. The frame of reference was established using the guiding assumptions of the holistic model of DC (24, 25), although, obtaining data related only to academic and sporting (26, 33). Another important step was the creation of categories and indicators. In constructing the system of categories and indicators, they were defined after reading the selected material. The categories were made up of key terms indicating the central meaning of the concept and the indicators the variations of this concept. The categories analyzed (variables considered) were: existence of CD policies at federal universities; characteristics and specificities of the academic support (type of academic support, type of standardization of academic support, type of absence compensation); characteristics and specificities of the financial support (target audience, type of regulation, application of financial aid, sources of funding), characteristics and specificities of the grants awarded (target audience, source of funding, scholarship amount, weekly training hours). Absolute frequency (number of cases) and relative frequency (percentage) analysis was applied to the data. Absolute frequency (number of cases) and relative frequency (percentage) analysis was applied to the data.

As this is a documentary study, following the guidelines, it was not necessary for the study to be submitted to and assessed by a Research Ethics Committee.

3 Results

Of the 68 federal universities participating in the survey, 72.05% offer some kind of support to student-athletes, with a predominating two types—academic (differentiated assistance in relation to absences and evaluations) and sporting (payment of

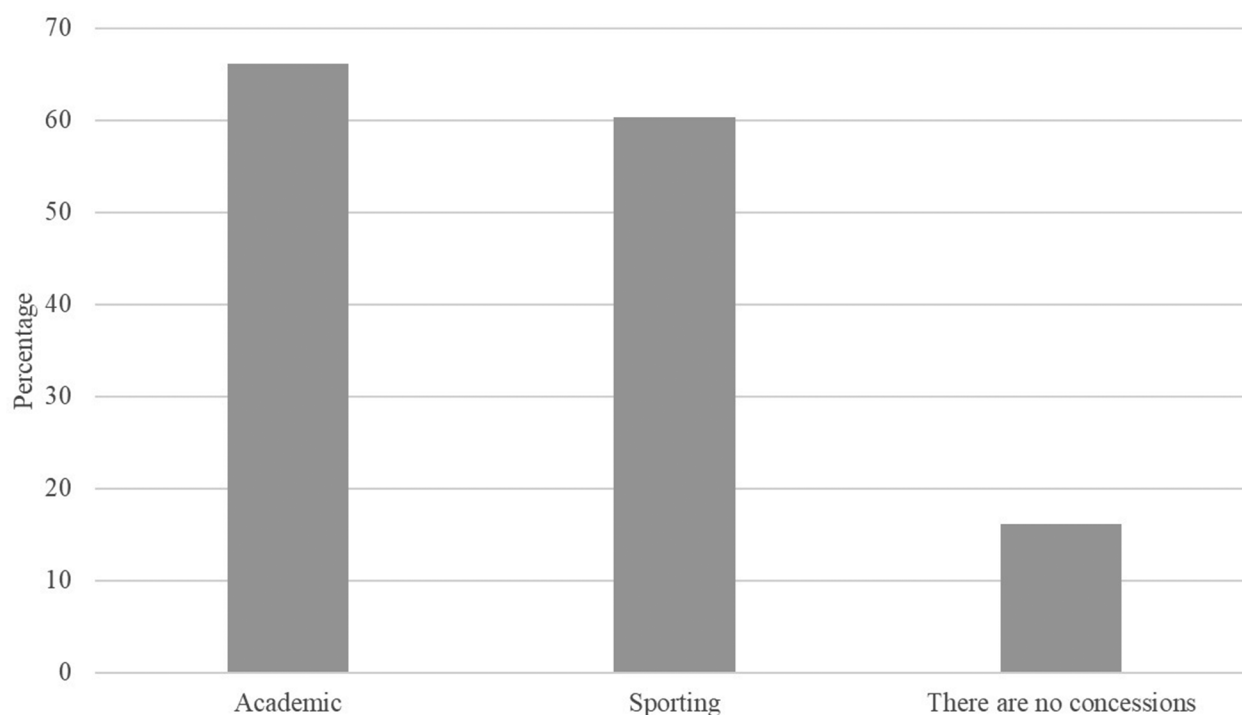


FIGURE 1
Percentage of occurrences by type of aid granted to student-athletes at Brazilian federal universities.

scholarships and financial aid for participation in competitions). However, academic concessions stand out, because they are present in 66.17% (Figure 1).

Despite different types of measures created to mitigate existing barriers to dual careers (absence in classes, assessments on alternative dates, specific entrance exams for student-athletes, scholarships and financial support for participation in events), the granting of only two types of specific services (38.23%) was the most frequent (Figure 2).

3.1 Academic support

Academic support are present in 61.17% of the universities analyzed. Among them, the flexibility of assessments predominated (57.35%), with student-athletes being able to take them at another time when unable to due to sports competitions. Differential treatment in relation to absences showed similar percentages (51.47%) (Figure 3).

Regarding the types of benefits granted for absences from classes as a result of sports competitions, 35 universities that offer this service, with predominance of compensating absences through the universities' own regulations (40.00%). However, there were also absenteeism allowances regulated by the universities (22.85%) and allowances conditional on the teacher's decision (20.00%). However, only 40.00% universities compensate for absences through a study plan, in which the student carries out academic activities home-based academic activities based on a study plan with activities prescribed by the lecturers.

In relation to assessment activities, 39 universities grant this benefit. Most of them (74.35%), have the right regulated by internal regulations, with a new assessment carried out (94.87%), in the second call format (62.86%) (Table 1).

3.2 Sporting support

Among the 41 Federal Universities that have some action aimed at sporting support, there is a predominance of financing participation in sports competitions (57.35%) compared to the payment of scholarships (20.58%) (Figure 4).

Of the 39 federal universities that provide financial aid, the target audience is predominantly undergraduate students (38.46%), using funds from the National Student Assistance Plan (41.02%). In most Brazilian federal universities, these benefits are the subject of general public notices, which encourage participation in academic-scientific, cultural, student representation and sporting events. Among the units of expenditure, payments for transportation (61.53%), registration in competitions (56.41%) and accommodation (53.84%) predominate (Table 2).

As with financial aid, the main target group for grants were undergraduate students (71.42%), especially those in vulnerable situations (42.85%) and primarily those in socio-economic vulnerability (28.57%). This is related to the National Student Assistance Plan being the main source of funding (64.28%) for the scholarships. The value of the 50% grant was 62.57€, with the most frequent schedule being 12 h (28.57%) (Table 3).

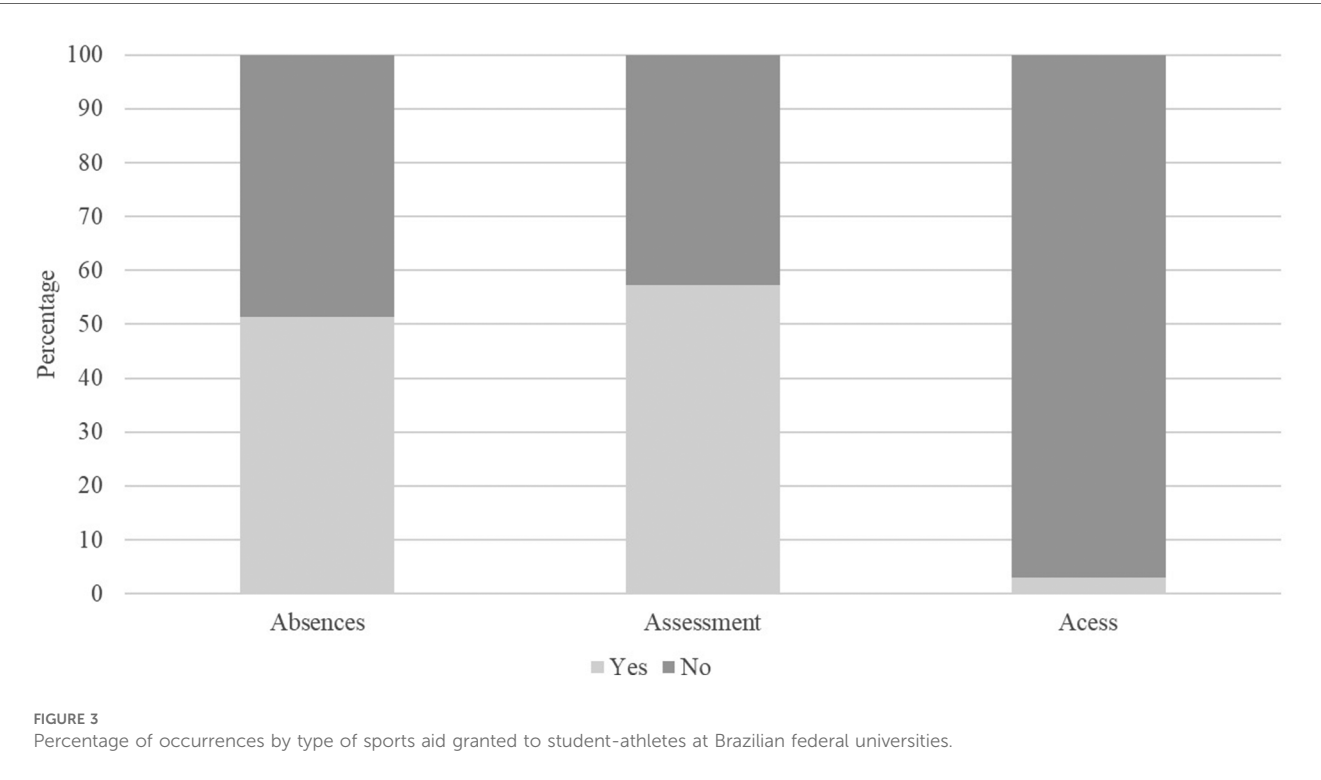
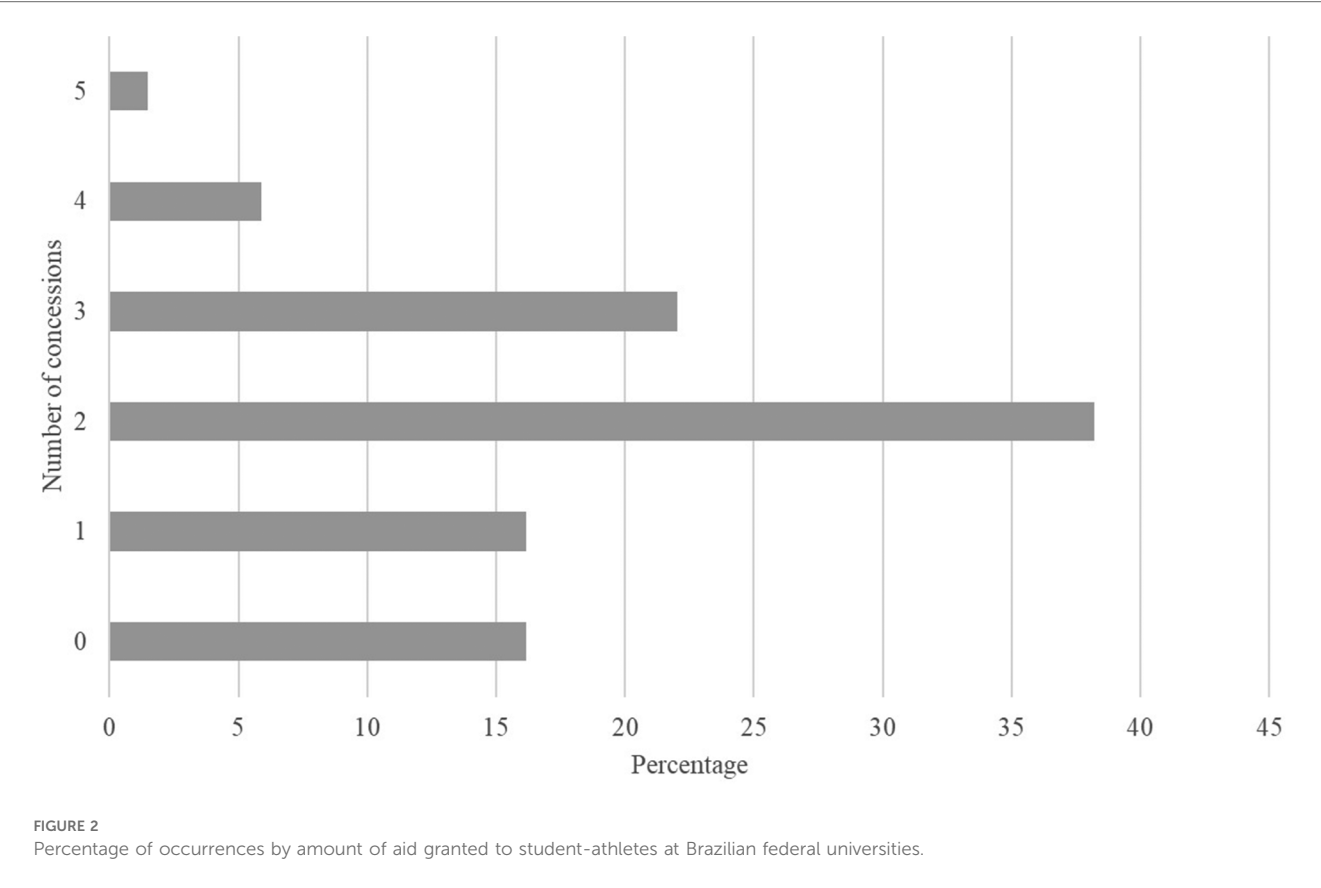


TABLE 1 Types of academic support granted to student-athletes at Brazilian federal universities.

Description	Absences		Flexibilization evaluations	
	N	%	N	%
Type of academic support				
Allowance regulated by universities	8	22.85	–	–
Compensation regulated by universities	14	40.00	–	–
Justification regulated by the IFES	3	8.57	–	–
Allowance conditional on teacher's decision	7	20.00	–	–
Allowance based on extinct laws	2	5.71	–	–
Evaluation standardized by IFES	–	–	29	74.36
Evaluation at the teacher's discretion	–	–	4	11.43
Evaluation based on extinct laws	–	–	4	11.43
Verification work/exercises	–	–	2	5.71
Not specified	1	2.94	–	–
Type of standardization of academic support				
Specific leave	1	2.86	1	2.56
Leave of absence	8	22.86	–	–
Justification	6	17.14	1	2.86
Reduced schedule	1	2.86	–	–
Home regime	9	25.71	7	20.00
Accompanied activities	1	2.86	1	2.86
Exceptional treatment	1	2.86	–	–
Specific exercise regime	1	2.86	1	2.86
Content and attendance replacement scheme	1	2.86	–	–
Special arrangements	1	2.86	–	–
Academic leave	2	5.71	2	5.71
Compensation	1	2.86	–	–
Second call	–	–	22	62.86
Exceptional learning assessment	–	–	1	2.86
Special learning regime	–	–	1	2.86
Special exam	–	–	1	2.86
Replacement of work	–	–	1	2.86
Not specified	1	5.72	2	5.71
Type of absence compensation				
Evaluation	–	–	37	94.87
None	15	42.86	–	–
Study plan	14	40.00	–	–
Academic activity	1	2.86	–	–
Work/checking exercise	1	2.86	2	5.40
Not specified	4	11.42	–	–

4 Discussion

This research aimed to analyze policies focused on DC in Brazilian federal universities. Specifically, it aimed the academic and sporting concessions directed at student-athletes in the context of Brazilian Federal Universities. In order to better analyze the data obtained, the discussion is presented in topics.

4.1 Academic support at Brazilian federal universities

Almost three quarters of Brazilian federal universities provide some kind of support to student athletes. These results are positive and exceed those seen in Colombia, which has 67.40% of

the universities investigated, including public universities (67.00%), which together with institutions with a specific degree in Physical Culture, Sport and Recreation or Sports Sciences (70.00%), have the best results (52). On the other hand, data from Spain is more favorable in relation to Brazilians and Colombians, since of the 49 universities investigated, 79.60% had official support programs for student athletes (53).

Since 1990, Spain has had a regulatory framework focused on dual careers (1990 Sports Law, Royal Decree 1467 of 1997, Order of April 14, 1998, and Royal Decree 971 of 2007), making it a country that uses the state-centered model, with federal regulations and university obligations towards student-athletes defined in regulations (26). In the last 17 years, dual career has been included among the priorities of European sports strategies and politics (28–30), and has been accelerated by the Treaty on European Union since 2009 (26). In 2012, the Member States

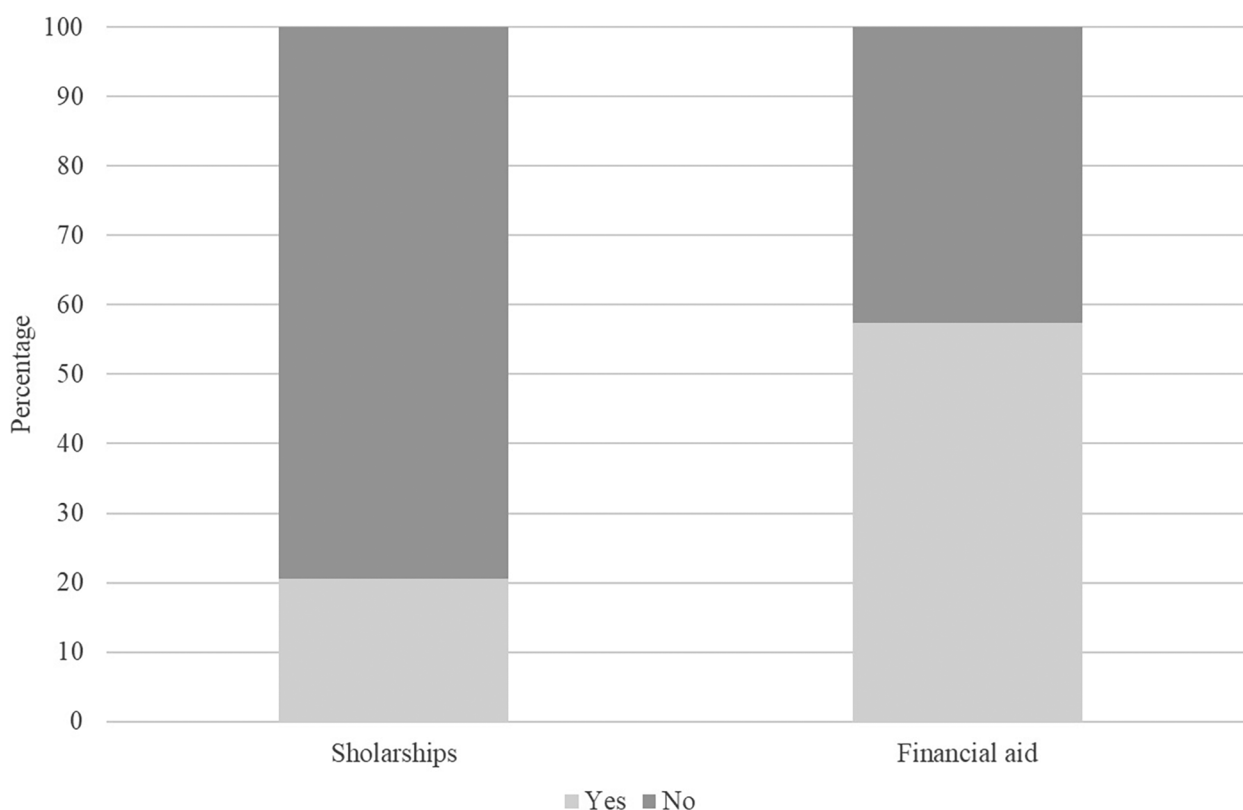


FIGURE 4
Percentage of occurrences by type of sports aid granted to student-athletes at Brazilian federal universities.

drew up the European Guidelines for dual university careers and, from the transnational creation of the guidelines, were directed to create national polities and guidelines, which may explain the normative structure and Spanish polity.

Therefore, unlike what happens in countries that have specific regulations centered on the state, such as France, Hungary, Luxembourg, Spain, Poland and Portugal (33), in Brazil, the *laissez-faire* model prevails (46), in which little or no formal structure is directed at DC (26). This situation stems from the fact that there are no federal laws or decrees in Brazil that deal directly with PD, whether in the field of education or sport.

The only mention of the subject occurs indirectly and in authoritative terms in the Pelé Law and the General Sports Law. Article 85 and article 206, respectively, state that

The education systems of the Union, the States, the Federal District and the Municipalities, as well as the higher education institutions, will define specific rules for verifying the performance and controlling the attendance [sic] of students who are part of national sports representation, in order to harmonize sports activity with the interests related to school achievement and promotion" (39, 40, s.p.).

In this context, in the absence of federal laws regulating DC, support to student-athletes depend on the creation of internal

and specific rules by universities, including federal universities, which are entities of the executive branch that make up the state, but which, according to article 207 of the Brazilian Federal Constitution (43), enjoy didactic-scientific, administrative, and financial and asset management autonomy. As Durhan (54) points out, universities have the prerogative to regulate themselves by means of their own rules in order to fulfill the social purposes for which they were set up, with the Regulations and Statutes being the way in which they establish their own rules. In the case of federal universities, which are fully funded by the federal government, the relationship with government bodies is closer. However, even so, they are not a state body like the others, since they are *sui-generis* institutions.

In this sense, the presence of academic and/or sporting activities highlighted in this study stems from the political will and importance given to sport by the managers of each institution and, in particular, to performance sport practiced by DC students. The observance of political will towards student-athletes at the universities investigated is a positive and favorable factor in the Brazilian context, given that at an international level, according to Abelkals et al. (5), university rectors and directors have been shown to be the least supportive of student-athletes.

In this sense, public polity promoted by the Executive (public administration), such as the Brazilian Federal Universities, through concrete actions such as the academic ones shown in this study, are

TABLE 2 Characteristics and specificities of the financial support given to student-athletes at Brazilian federal universities.

Description	Financial support	
	N	%
Target audience ^a		
Undergraduate students, primarily in socio-economic vulnerability	15	38.46
Postgraduate students	6	15.38
Undergraduate students	12	30.76
Not specified	12	30.76
Servants	1	2.56
Scholar-athletes	1	2.56
Postgraduate students, with priority given to socio-economically vulnerable students	1	2.56
Type of regulation		
General (teaching, research, extension and sport)	19	48.71
Specific to sports	11	28.20
At the request of the higher administration	9	23.07
Application of financial aid ^a		
Accommodation	21	53.84
Food	18	46.15
Transportation	24	61.53
Registration in competitions	22	56.41
Uniforms/equipment	4	10.25
Medical examination	1	2.56
Health insurance	1	2.56
Allowance	1	2.56
Sources of funding ^a		
National Student Assistance Plan	16	41.02
Others headings	2	5.12
Others sources	1	2.56
Not specified	18	46.15
Institutional representation fund	1	2.56
Own sources	3	7.69
Union lines	1	2.56
Parliamentary amendments	1	2.56

^aVariables identified in the documentary analysis of more than one alternative.

materialized in political programs/government plans in which they define the contents (policy), which are conditioned by the normative dimension of the institutional structure of the political-administrative system (polity) and both, inserted in a broad and complex process of disputes between the different actors involved in the selection of objectives, contents and distribution of powers (politics).

4.1.1 Flexibility in daily academic activities

Academic benefits are those that do not directly require the investment of financial resources. All that is needed is the political will of managers to propose and mobilize the internal support of representatives of the central administration, the sector and students so that the standardization of benefits at the institutional level takes place and the procedures to be adopted are outlined and implemented via resolutions. This could explain which may explain their predominance among Brazilian federal universities.

TABLE 3 Characteristics and specificities of the grants awarded to student-athletes at Brazilian federal universities.

Description	Financial support	
	N	%
Target audience ^a		
Undergraduate students	10	71.43
Postgraduate students	1	7.14
Undergraduate students, with priority given to socio-economically vulnerable students	4	28.57
Socioeconomically vulnerable undergraduate students	6	42.86
Distance learning undergraduate students	1	7.14
Stricto <i>sensu</i> postgraduate students	2	14.29
Source of funding		
National Student Assistance Plan	9	64.29
Not specified	3	21.43
Parliamentary amendments	1	7.14
Own resources	1	7.14
Scholarship amount ^a		
31.96€	1	7.14
49.18€	1	7.14
65.57€	7	50.00
86.06€	2	14.29
114.75€	2	14.29
Not informed	1	7.14
Weekly training hours		
6h	1	7.14
8h	3	21.43
12h	4	28.57
20h	2	14.29
Not informed	4	28.57

^aVariables identified in the documentary analysis of more than one alternative.

On the international stage, flexibility in daily academic activities allows student-athletes to fulfill academic activities on individual study and exam schedules in Hungary. In addition, they are provided with textbooks, manuals, special literature and other auxiliary educational materials that allow them to study during periods of training and competition (26).

The flexibility of academic issues dates back more than 21 years in Europe, as in 2003 initiatives were registered in Belgium, Germany, Denmark, Greece, Spain, France, Ireland, the Netherlands, Finland, England, Northern Ireland, Scotland and Wales (26). This condition is similar to the attention given to academic issues in private and public universities in Spain, since of the 49 participants in the research, 79.60% had official support programs and, among them, 69.60% had academic support, such as personalized tutoring and flexibility in teaching schedules and 78.30% allowed the change of assessment dates (53). The Catholic University of Murcia, Spain, promotes monitoring of academic and sporting performance, personal tutoring for information and ongoing advice on topics of interest (academic, personal and professional), coordination of sporting commitments and respective academic obligations, coordination of academic, administrative and economic procedures, access to the student tutor and access to the virtual system (55). In South America, Colombia promotes absenteeism (76.70%), flexible deadlines for

assessment activities (62.80%) and exams (58.10%) (52), a condition also evidenced at the University of Santo Tomás (56).

Academic flexibilization in Brazil was present in federal regulations for more than 48 years (1971–2019), during which time Decree No. 69.053 of August 11, 1971 was in force, giving the Minister of State for Education and Culture the prerogative, by means of an ordinance, to validate the participation of students in national and international sports competitions as academic attendance (37). In this sense, it followed the general sports regulations (1977–1993), which in article 144, recognized participation in official student sports competitions as school attendance, limiting them to 180 days (international competitions), 90 days (national competitions), 60 days (state competitions) (35).

Despite the significant percentage of federal universities that have their own mechanisms for granting benefits to student-athletes, over the last 31 years there have been regulatory setbacks in university sports policy, since federal laws and decrees that ensure such rights have been repealed. Therefore, the federal support regulated by laws and decrees must be rethought and reincorporated back into Brazilian legislation, with parliamentary amendments to the General Sports Law enacted in 2023 being one of the possible avenues to be undertaken by the Sports Commission of the Chamber of Deputies, the body responsible for processing changes to sports-related laws at the federal level.

Although it is not a condition for universities to implement their own polities via internal rules, the creation of regulatory rules at the federal level and with the duty to comply by universities, will enable the benefits of programs based on the holistic model to be present not only in part, but in all Brazilian federal universities. This situation could increase the possibilities for athletes to enter higher education and enjoy greater and better conditions to progress in academic training and sports performance.

This is a high and present demand on the national (45) and international scene, given that a high percentage of Olympic athletes (Barcelona/1992, Atlanta/1996 and Sydney/2000 Olympic Games) experienced the dual career process when they were at a level of sporting excellence. In addition, the percentage of athletes with higher education at the time of retirement from sport was higher among those who went through dual careers (53.30%) compared to those who dedicated themselves exclusively to sport (14.50%) or work (27.30%) (8).

4.1.2 Absence allowances and Brazilian regulations

Despite the prerogatives of university autonomy, it is clear that, among the Brazilian federal universities that grant leave of absence, five do so in the wrong way and contrary to federal regulations, as they are based on revoked decrees—n° 54.215/64 (57), n° 69.053/71 (37), n° 69.450/71 (58), n° 80.228/1977 (35)—when, in theory, they should be supported by current laws n° 9.615/98 (39) e n° 14.597/2023 (40). In addition, 15 universities grant the absence allowance without any kind of replacement or compensation, which is also illegal, since current legislation requires 200 days of effective academic work to be completed, and students must attend at least 75.00% of the course load (59, 60).

In addition to being illegal, the allowance of absences based on personal assessments, such as those in which there are no regulations and the teachers decide, as evidenced in this research at seven universities, is an inadequate and ineffective factor for DC. In this regard, Álvarez and López (18) warn that when issues are left to the individual, with each athlete having to deal with the teachers, students often don't find the necessary support in requests for changes to assessment dates. The lack of sensitivity on the part of teachers (77.80%) at La Laguna University in Spain was among the main obstacles to reconciling academic and sporting life (61). In Kosovo, even though it is the main mechanism for academic achievement, support from teachers is infrequent (20).

Considering that Brazilian educational legislation prohibits the excusing of absences, except in cases that have legal authorization; that current sports legislation establishes that universities will create specific rules for harmonizing academic and sports training; the regulations with the inclusion of absences in a compensation process through academic activities at 14 universities proves to be an appropriate path to be followed by the others. Such allows students to recover lost content through home studies, favoring the maintenance of student-athletes in DC. Still allows as providing them with quality training, since promoting alternative learning conditions for the content worked on during the period of absence is essential.

Regarding qualitative care for student-athletes, it is important to note that internationally, such as in Hungary, textbooks, manuals, special literature and other auxiliary educational materials are adopted and allow study during periods of training and competitions (26). In the Brazilian Federal Universities can incorporate them into future programs, in addition to the study plan.

4.1.3 Forms of admission for student athletes

Since the forms of admission are a decision established by the universities themselves because they have didactic-scientific, administrative and financial and asset management autonomy (43) and are responsible for establishing the criteria and rules for selecting and admitting undergraduate students (59), the creation of specific entrance exams for student athletes at the Federal University of Mato Grosso do Sul (UFMS) and the Federal University of Santa Maria (UFSM) in 2023/2024 demonstrates innovation in the DC scenario in Brazil. On the other hand, it suggests a late policy in relation to the international context, since 21 years ago (2003) student athletes from Germany, France, Finland and the United Kingdom (26), already had this benefit.

The UFMS entrance exam covers all types of student-athletes, whether at university representation, amateur or elite level (Olympic Games, Paralympic Games or Brazilian University Games). At the Federal University of Santa Maria, only athletes in training, between the ages of 16 and 23, with the potential to be a sporting talent in futsal, athletics, handball and volleyball, and former high-performance athletes who have had international prominence in sports recognized by the Brazilian Olympic Committee (62).

In addition to the model adopted by the two Brazilian universities (specific entrance exams), there are other specific mechanisms on the international scene for student-athletes to gain access to universities. In Spain, high-performance athletes

who meet at least one of the requirements are allocated 3.00% of the places; in Hungary, Olympic medalists have the benefit of entering any university without having to take entrance exams; in Poland, athletes with exceptional sporting results, when referred by their federations to the Ministry of Education and Sport, do not have to take entrance exams (26, 33).

The academic initiatives (absences, flexibilization of assessments, specific entrance exams) seen in Brazilian federal universities for student-athletes are relevant national measures that can make important contributions to harmonizing academic training and sports performance, given the incompatibility of schedules between the two activities (5, 61) have a negative impact on academic life—lack of time to study (61, 63), delays, failures, changes of shift or academic abandonment (64)—and on sporting life—career abandonment (19).

4.2 Sporting support

Financial aid consists of sporadic concessions, which occur according to specific demands (actions, projects, programs or competitions), and can be promoted via general public notices (teaching, research, extension, sport, student representation), specific ones, such as sports or by demand of interest from the higher administration. Scholarships, on the other hand, are amounts paid monthly, with a defined value and period, and are not to be confused with employment, but rather a donation due to student participation in projects/programs.

The percentage of Brazilian federal universities receiving some kind of financial support was lower than that found in Colombia, where 74.40% of the institutions taking part in the study reported receiving it (52). However, they are positive compared to a study carried out in Spanish universities, of which only one of the 10 investigated had this device (65).

The provision of financial aid for participation in events such as sports competitions, as evidenced in this study, is essential for students, including those in DC, to have part of their transportation, registration, accommodation and food costs covered. In a study carried out by Abelkals et al. (5) in Europe, financial support for participation in international competitions was identified by 48.00% as the fourth greatest need of student athletes. According to Albuquerque, Vasconcelos and Silva (46), financial aid can increase motivation to stay in DC, as well as encourage participation in a greater number of competitions, given that the cost of traveling to the city, state and international level to compete is high.

On the other hand, the granting of scholarships to student-athletes was not very present in Brazilian research, reaching only 20.58%. These results are lower than those observed in Spanish universities, which also do not have a significant percentage, limited to 34.80% (53). Low involvement in scholarships funding is common, and is also present in other locations, such as in Catalan institutions, where out of ten universities investigated, only one promoted this benefit (65) and at the University of Turin, only 1.68% of student-athletes are covered (66).

Although students at federal universities in Brazil have free access, the payment of scholarships is of great importance and can

contribute to maintaining part of the expenses inherent in sporting and academic life. In Italy, Portugal, Latvia, Romania and Spain, financial support was considered fundamental, especially by those involved in sports with no income, which may be related to the fact that it gives them access to advantages they wouldn't otherwise have (34). Because they dedicate themselves to academic and sporting training concurrently, student-athletes are unable to incorporate another demand (work), because for many, even if there is pecuniary remuneration, sport is work itself (12).

The monthly income from dedication to academic and sporting training can contribute to the purchase of sports equipment, food, supplements, gym fees, medical treatment, among other things. Paz et al. (67) found that funds from scholarships were used to buy supplements, gym equipment and clothing and to pay for a nutritionist. In addition to sports expenses (tuition, sports materials, gyms), Lagos Cortes (52) showed that scholarships also help with academic costs (books, school materials) and personal costs (food, housing, transportation).

Therefore, the granting of this benefit is of great importance, as its loss would lead to sports dropout (13, 68) or academic dropout (18, 64). Parents of student-athletes from European Union Member States (France, Ireland, Italy, Portugal, Slovenia) point out that the maintenance of expenses by the family itself (academic and/or sports fees and expenses related to sports equipment, participation in competitions, transportation, accommodation, equipment classes, specialized training, academic support and extra academic classes) is a factor that makes it difficult to continue in DC (25). On the other hand, academic and sports scholarships make it easier to stay (69).

In addition to the low percentage of institutions offering scholarships to student-athletes at Brazilian federal universities, another limitation was the lack of a specific program to pay for them, since the main source used comes from the student assistance polic. The program was created in 2010, with the aim of increasing the conditions for young people to remain in federal public higher education, with universities being able, based on the creation of internal mechanisms of their own regulation, to apply the resources derived from it in actions of student housing, food, transport, health care, digital inclusion, culture, sport, daycare and pedagogical support (70). As this is a student assistance program and not specifically a DC policy promotion program, not everyone can benefit from it, because in addition to proving sports performance skills and physical athletic aptitudes, priority for assistance must be given to students from public high schools who have a per capita income of up to one and a half minimum wages, as is evident from the main target audience.

Given the limited conditions for funding scholarships via the National Student Assistance Plan, another alternative is the athlete scholarship from the federal program created in 2004 (71). Among the different categories, student-athletes can be included in the "student athlete" category, which is aimed at students aged 14–20, who are awarded up to third place in individual sports or are elected among the six (6) best athletes in each team sport in national student events organized in the previous year, directly or indirectly, by the Brazilian Olympic Confederation, the Brazilian Paralympic Confederation, the

Brazilian School Sports Confederation (CBDE) and the Brazilian University Sports Confederation (CBDU), recognized by the Ministry of Sport, provided they continue to train and take part in national competitions (40).

Despite appearing as an alternative, the “student athlete” category has a limit of 21 years. This makes it difficult hardly covers student-athletes at university level in Brazil, as the majority of participants the Brazilian University Games (JUBs) in 2020 (54.00%) and 2022 (54.00%), were over the age of 21 (72, 73).

With regard to the amount allocated to scholarships, 65.57€ prevailed, which is higher than the amount financed by the Ministry of Sport in the “student athlete” category of the federal Bolsa-A atleta program, which since 2011 has financed 12 installments of 60.65€ (74). Although the efforts made by the managers of Brazil’s federal universities to implement scholarships for student athletes are important and relevant, even operating with amounts higher than those practiced by the Ministry of Sport, when compared to the costs inherent to DC, the amount is derisory, given the various expenses arising from the accumulation of academic and sporting activities.

In addition to being derisory, the payment of scholarships in the context of Brazilian federal universities is discontinuous. Because the financial resources come from transfers from the Ministry of Education, which begin annually in April (46), the maximum paid has been 9 months, which is a problem, since in order to achieve the desired sporting performance, student-athletes are subjected to training on average 5.7 days/week in individual sports and 4.6 days/week in team sports (14), for 6–9 h at public universities (17). In this sense, increasing the value of the scholarship to 114.75€, as some of the federal universities analyzed already operate, would be a feasible alternative, since the value of the scientific initiation scholarship operated by the National Council for Scientific and Technological Development is a parameter for other scholarships in the context of Brazilian higher education (46) and, since February 2023, the entity has readjusted the scientific initiation scholarship to 114.75€ (75).

The requirement to dedicate at least 12 h to sports training in most universities indicates that this is lower than that observed in amateur, semi-professional and professional student-athletes (14). However, they are higher than those observed in a Brazilian study of public and private universities (19), which may be related to changes in polities aimed at DC at federal universities.

The hypothesis initially raised that the support academic and sporting of the holistic model are present in an individualized and incipient way in Brazilian federal universities through specific support, was partially refuted. This is because although in the Brazil there is no national polity aimed at DC (*laissez-faire* model), the support academic is present in most universities, with only the granting of athlete scholarships being incipient.

Despite the advances in scientific production promoted by the research in question, highlighting the DC policy in all Brazilian federal universities, as it was not the object of the investigation, the profile of student-athletes was not known, which appears as a limitation. Another limitation was the restriction of the analysis contained in documents, which did not make it possible to delve deeper into the issues related to the student-athletes’ perception of

the policy undertaken at Brazilian federal universities, as well as other types of support that integrate the holistic model in the political aspect. Another limitations were difficulties in accessing the documents of each university, challenges in comparing them, and the dynamic nature of the data, which may have changed between the time it was gathered (2023–2024) and now (2024–2025).

Therefore, it is necessary that future research be developed directly with student-athletes in order to outline their demographic and sporting profile, enabling a greater understanding of the proximity or distance between the DC policies of Brazilian federal universities and those implemented at an international level, condition that is necessary, as age (junior vs. adult), structural/organizational (culture and university export policy in each country) and athletic proficiency (regional vs. national; national vs. international) transitions may differ around the world. Likewise, it is also appropriate for future investigations to produce data regarding other factors that make up the holistic dual career model, in other types of support in polity, as well as other aspects (individual, interpersonal and environmental) are analyzed.

4.3 Practical implications

This research is the first to analyze data from all Brazilian federal universities. Since evaluations of public policies are a mechanism for guiding public managers in obtaining results and optimizing public resources, improving decision-making in the allocation of resources, the data obtained can corroborate the design of policies aimed at DC. At a micro level, universities that have no support can mirror those that already have a certain structure. Those that already have actions in place can expand the existing types of support. At a macro level, the findings of this research could encourage discussions in political arenas, such as the legislature, in order to create laws that regulate the flexibilization of teaching activities when student athletes take part in official competitions.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

JS: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Preliminary results of student survey at the University of Rome "Tor Vergata" practicing sports: a focus on the effects of Dual Career regulation

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The importance of sports and the approval of the Dual Career regulation at the University of Rome "Tor Vergata" are highly significant topics for the well-being and personal development of students. In line with European and international policies, this initiative recognizes the specific needs of student-athletes by offering them tools and flexibility to excel in both sports and academics. However, monitoring student-athletes by Universities requires thorough investigations and the development of initiatives to promote students' adherence to sports practice. Therefore, our study aims to analyze the results of a survey administered to students enrolled at the University of Rome "Tor Vergata" during the academic years 2020/2021, 2021/2022, 2022/2023, and 2023/2024, investigating the effects of the introduction of the Dual Career regulation on the student population. Our preliminary results showed that the introduction of the Dual Career program was associated with a significant increase in the number of students practising sports over the academic years, with greater participation in the academic years 2022/2023 and 2023/2024. Noteworthy, the number of student-athletes who applied to the Dual Career program markedly increased in the last year, with the highest number of enrollments in the macroareas of Medicine and Surgery, Economy, and Engineering. Overall, the Dual Career regulation offers the possibility to plan the study path in a personalized way, dedicated academic support, and flexibility in deadlines, making the University of Rome "Tor Vergata" a model of integration between education and sportiness.

KEYWORDS

dual career, university, sport, student-athletes, education

1 Introduction

The number of elite athletes engaging in academic-level study has increased in recent years, fostered by the European publication of the Dual Career Guidelines to encourage a balance between sporting life and professional training (1). The process of developing guidelines to ensure the adequacy of Dual Career services for student-athletes became evident as early as 2010 with the study by Aquilina and Henry, who analyzed how European Union (EU) Member States were meeting the educational needs of elite

young athletes (2). Particularly, EU Member States' positions on Dual Career policies were characterized, finding four different ways of dealing with them. In countries such as France, Hungary, Luxemburg, Spain, Poland and Portugal, a state-centred arrangement was adopted and supported by legislation; while in Belgium, Denmark, Estonia, Germany, Finland, Latvia, Lithuania and Sweden, the State acted as a facilitator able to promote formal agreements between educational and sporting bodies. In countries such as Greece and the United Kingdom, national federations and sports institutes could act as facilitators or mediators by directly engaging in negotiations with educational institutions on behalf of the individual athlete. Finally, in Austria, Cyprus, Malta, the Czech Republic, the Netherlands, Ireland, Slovenia and Italy, a "laissez faire" approach was adopted where no formal structures were in place and any agreements were largely based on individual negotiations. In the Italian context, Aquilina and Henry's study highlighted a problematic situation in terms of guaranteeing flexibility for athletes interested in pursuing a university education, although some sports federations offered financial support to promote the athlete's education (2). Therefore, the Dual Career Guidelines issued by the EU have made it possible to reduce the inequalities between elite athletes in different national contexts by providing the tools to ensure adherence to educational pathways and social inclusion.

The provision of services and facilities to athletes engaged in study programmes should be a prime objective for universities, as it could offer such individuals the possibility of a longer-lasting sports career and embarking on new career paths at the end of their sporting career (3). This is true because properly balancing life as an athlete with life as a student requires constant commitment and a strong motivational drive, qualities necessary to avoid abandoning either career (4). In fact, practising sport at a competitive level involves training, travel and competitions that require considerable physical and mental commitment on a daily basis (5). In addition, study commitments, which include attending classes, taking exams and spending time on preparation, are all factors that determine the outcome of academic life (6).

This constant challenge on two fronts has a major impact on the athlete's life, as relationships with family, peers, partners, as well as with other students and professors, are influenced by the effects of the dual career (7). The importance of the social context in supporting dual-career athletes was highlighted by Tessitore and colleagues who demonstrated a crucial role of athletes' parents in determining their sporting and academic success (8). Nonetheless, reconciling life as an athlete and as a student is not easy, highlighting the need to develop and adopt strategies to safeguard the athletes' educational and professional paths (9).

In this context, the possibility of taking advantage of a regulation that would allow University-registered athletes to manage their commitments more efficiently, in addition to facilitating the dual career of such individuals, could be a decisive factor in favoring the enrolment of additional athletes or sports students in degree programmes (10). Indeed, many

professionals are involved in the world of sport, such as referees and coaches, who are constantly working and who could be encouraged to undertake a dual-career degree. In this regard, Fusco and colleagues showed the results of a survey which revealed that elite coaches are highly motivated to join degree programmes in sports science (11). The inclusion of such figures in the University would be a positive change both for these individuals, who could deepen and renew the numerous knowledge acquired in the field, and for academic institutions, which could increase their visibility and reputation in economic and social terms (12).

Importantly, in countries such as Australia, Canada, New Zealand, Qatar and the United States, dual career programmes are well established and student athletes are an important resource for Universities (13, 14). For this reason, in April 2022, the University of Rome "Tor Vergata" approved the "Dual Career" Program that allows athletes, coaches and referees of national and international interest to combine a university career with a competitive one. In fact, the University of Rome "Tor Vergata", in collaboration with the University Sports Centre (CUS), offers the student population the opportunity to practise sports at a recreational and competitive level in many disciplines. Specifically, the CUS makes use of the technicians of the degree course in Sport Sciences to guarantee students the opportunity to engage in sports such as football, cycling, basketball, judo and many others, also taking advantage of agreements with external sports facilities to offer comprehensive services. The introduction of the "Dual Career" Program has regulated the status of student-athletes, providing concessions on university fees, compulsory attendance of classes and recognition of university credits, as well as the possibility of suspending studies for a year for important sporting commitments, to reconcile a student-athlete's university career and competitive sporting career. Moreover, since the beneficial effects of competitive and recreational sport are well known and widely documented, the monitoring of students practising sport by Universities could be useful to promote initiatives aimed at encouraging students' adherence to the sport practice. Therefore, we analyzed the results of a survey administered to students enrolled at the University of Rome "Tor Vergata" in the academic years 2020/2021, 2021/2022, 2022/2023 and 2023/2024, to (i) determine the number of students engaged in competitive or recreational sporting activities, and (ii) assess the effects of the introduction of the Dual Career regulation.

2 Materials and methods

2.1 Participants, instrument and procedure

An up-to-date view of the current situation of the student population at the University of Rome "Tor Vergata" was provided by requesting all students enrolled in the 2020/2021, 2021/2022, 2022/2023 and 2023/2024 academic years to complete a survey. The survey was administered online at the final stage of the enrolment process on the Delphi website to allow for

temporal and geographical flexibility, ensuring quick completion and effective retrieval of information.

A total of 113,890 students participated in the survey. Specifically, 17,558 students enrolled in the 2020/2021 academic year, 19,994 students enrolled in the 2021/2022 academic year, 25,310 students enrolled in the 2022/2023 academic year, and 51,028 students enrolled in the 2023/2024 academic year.

The survey was structured in a demographic section and a sports section to collect data on various aspects of students' lives. Specifically, the demographic section included questions on age, the degree course attended and the year of enrolment at University. The sports section consisted of questions on the type of sport played, the level of competition, and the frequency and duration of training. Specifically, based on the responses of the students who participated in the survey, three categories were considered: competitive sport, which includes students who engage in sport by participating in competitions and intensive training; recreational sport, which includes students who participate in sporting activities for recreation, physical and social wellbeing, without the intensity and commitment required at the competitive level; and no sport, i.e., students who do not engage in sporting activities for a variety of reasons, including lack of time, interest, or other priorities. All questions were closed to collect quantitative data that could be easily analyzed, offering space to each student for additional answers. Specifically, the questions in the sports section included:

"Do you practise sport?", with three answer options: Yes, No, Sometimes

"What is the level at which you practise sport?", with three answer options: Competitive, Recreational, I do not practise sport

"What type of sport do you practise?", with four response options: Individual, Couple, Team, Other (specify)

"What sport do you practise?", with six answer options: Football, Basketball, Swimming, Athletics, Tennis, Other (specify)

"In which time frame do you prefer to practise sport?", with five answer options: 8–13, 13–16, 16–23, 23–2, Other (specify)

Another objective of our survey was to verify whether the establishment of a Dual Career regulation could increase the number of student-athletes enrolled at the University of Rome "Tor Vergata", combining competitive sport activity with university studies. Therefore, we carried out a data collection from the registers of the University and the CUS, monitoring the number of student-athletes who activated the Dual Career after the introduction of the special regulation, in the academic years 2022/2023 and 2023/2024.

2.2 Statistical analysis

Statistical analysis was performed using GraphPad Prism 8 software (GraphPad Prism 8.0.1, La Jolla, CA, USA). Specifically, the collected responses were organized and coded for analysis by processing datasets for each of the key survey questions.

The distribution of responses was displayed with vertical bar graphs to show the total number of responses for each academic year. One-way ANOVA and Tukey's multiple comparison test were performed to compare the number of student respondents for each academic year who played competitive or recreational sport. Data were expressed as mean $\pm$ standard error and were considered significantly different if $p < 0.05$.

Contingency analysis was used to verify the existence of a significant distribution of competitive or recreational students across academic years, depending on the sport practised. Therefore, a contingency table was constructed to examine the joint distribution of the two categorical variables, applying the chi-square test to assess their association. The data were considered significantly different if $p < 0.05$.

Lastly, a pie chart was constructed to represent the total number of student-athletes for the academic years 2022/2023 and 2023/2024, with the relative percentages, in association with a vertical bar graph to show the distribution of the total number of enrolled student-athletes divided by each macroarea of the University of Rome "Tor Vergata".

3 Results

Figure 1 illustrates the distribution of students according to their participation in sporting activities for each academic year.

Undoubtedly, an increasing number of students have been enrolled at the University of Rome "Tor Vergata" in the last four years, with the highest number recorded in the academic year 2023/2024 [Figure 1(a)]. Noteworthy, the percentage of students practising competitive or recreational sport increased in the academic years 2022/2023 and 2023/2024, in association with a reduction in the number of students not practising sport [Figure 1(b)]. Indeed, in the 2020/2021 academic year, 13% of students played competitive sport, 44% of students played recreational sport and 43% of students did not play sport. In the 2021/2022 academic year, 12% of students played competitive sport, 42% of students played recreational sport and 46% of students did not play sport. Although the number of students responding to the survey has increased over the academic years, in the 2022/2023 academic year, there was a clear increase in the number of students practising sport. Specifically, 12% of students played competitive sport, 58% of students played recreational sport and 30% of students did not play sport. In agreement, in the academic year 2023/2024, 19% of students played competitive sport, 62% of students played recreational sport and 19% of students did not play sport.

The comparison between the number of students participating in competitive and recreational sport for each academic year was

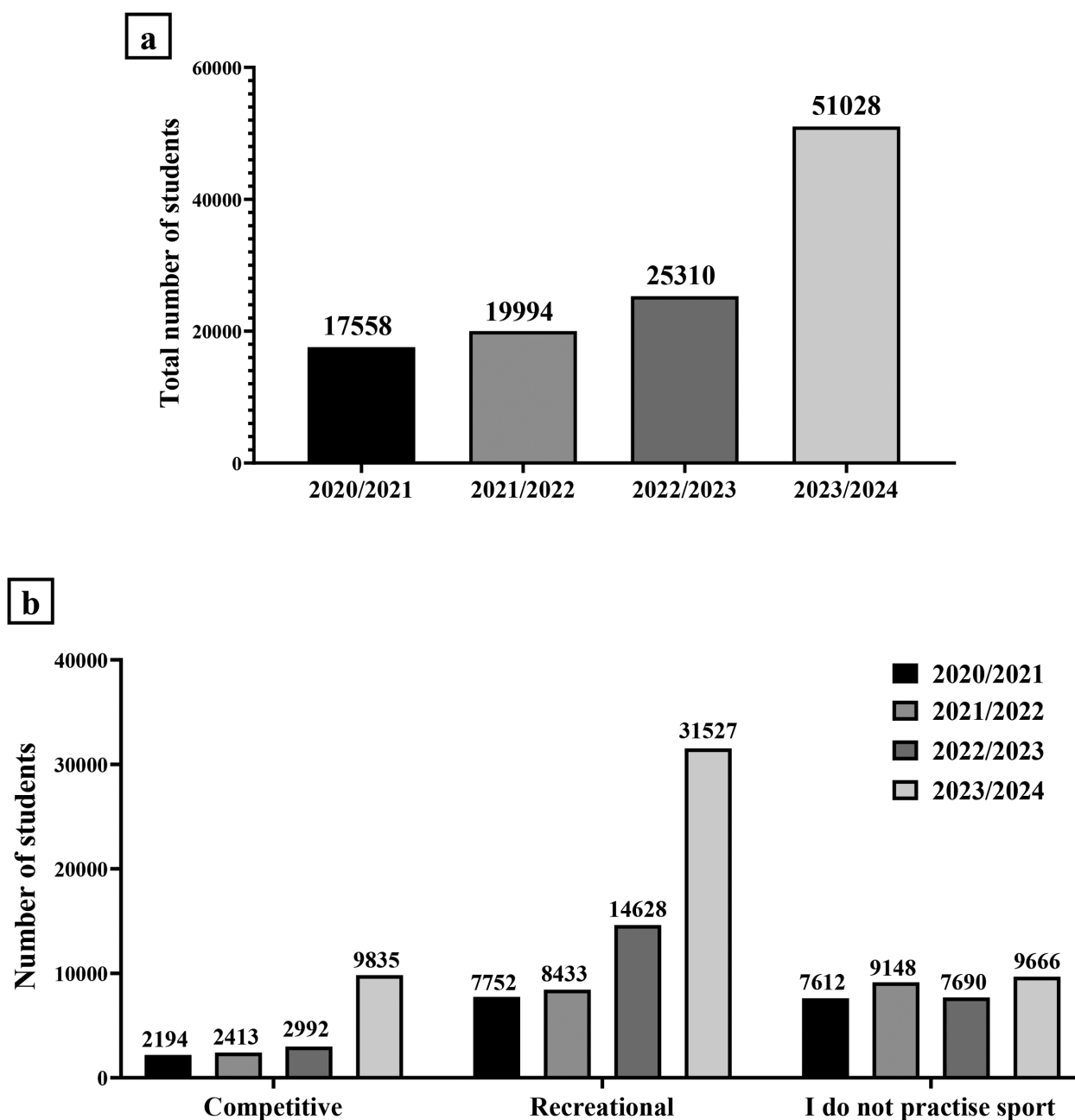


FIGURE 1

Distribution of students based on their participation in sports practice for each academic year. (a) The total number of students enrolled at the University of Rome "Tor Vergata" who participated in the survey was 17,558 in the academic year 2020/2021, 19,994 in the academic year 2021/2022, 25,310 in the academic year 2022/2023, and 51,028 in the academic year 2023/2024. (b) In the academic year 2020/2021, 2,194 students (13%) participated in competitive sports, 7,752 students (44%) participated in recreational sports and 7,612 students (43%) did not participate in sports. In the academic year 2021/2022, 2,413 students (12%) participated in competitive sports, 8,433 students (42%) participated in recreational sports and 9,148 students (46%) did not participate in sports. In the academic year 2022/2023, 2,992 students (12%) participated in competitive sports, 14,628 students (58%) participated in recreational sports and 7,690 students (30%) did not participate in sports. In the academic year 2023/2024, 9,835 students (19%) participated in competitive sports, 31,527 students (62%) participated in recreational sports and 9,666 students (19%) did not participate in sports.

performed using vertical bar graphs to visually compare data and detect trends over time.

Figure 2 shows a significant increase in the number of competitive and recreational sporting students in the 2023/2024 academic year compared to previous academic years. Indeed, the

mean number of students participating in competitive sport was 48.3 ± 10.9 in the 2020/2021 academic year, 54.9 ± 12.1 in the 2021/2022 academic year, 65.8 ± 15.1 in the 2022/2023 academic year, and 214.4 ± 48.6 in the 2023/2024 academic year ($***p < 0.001$) [Figure 2(a)]. On the other hand, the mean number of students

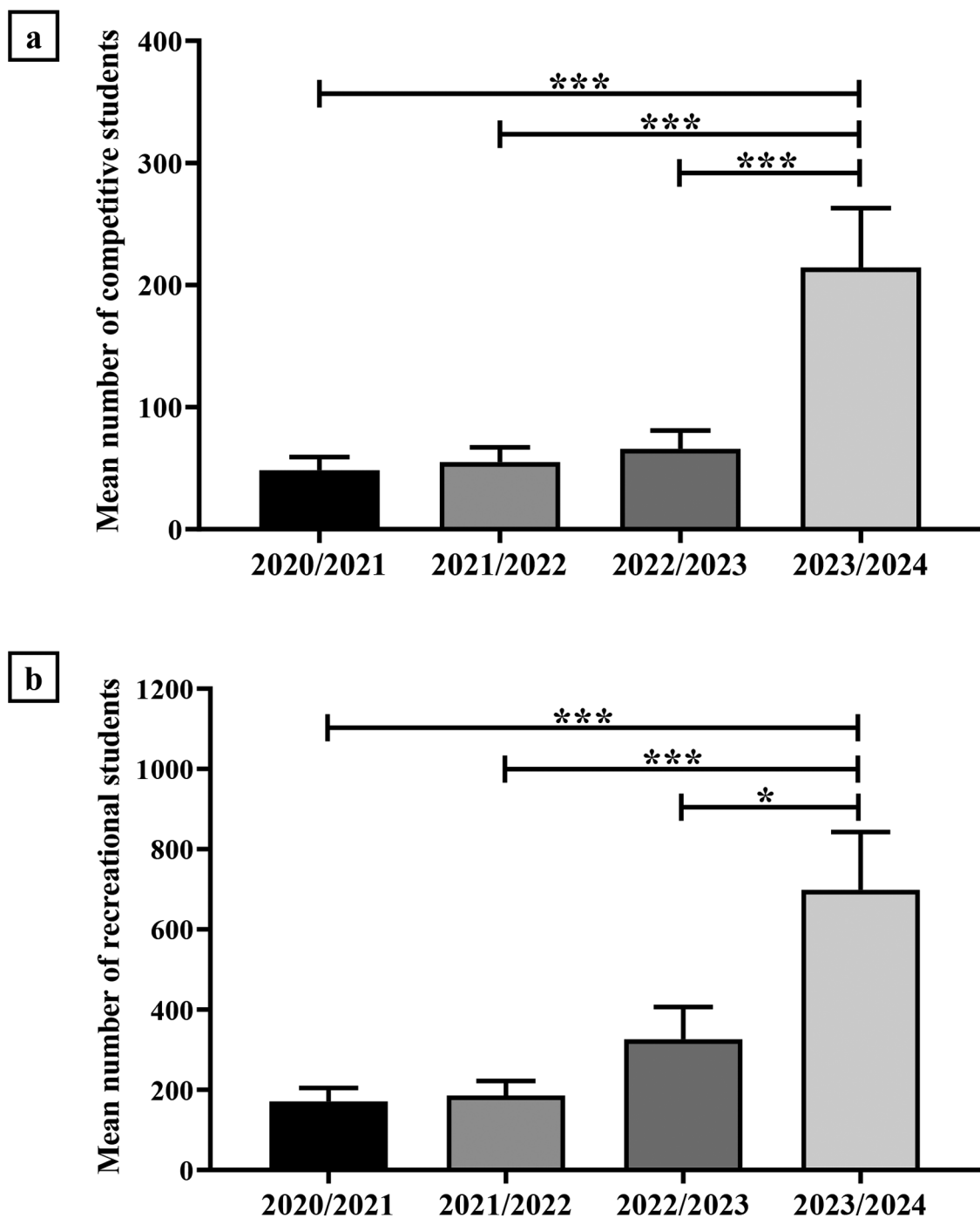


FIGURE 2

Comparison of the number of competitive and recreational students for each academic year. (a) Mean number of students participating in competitive sports: 48.3 ± 10.9 in the academic year 2020/2021, 54.9 ± 12.1 in the academic year 2021/2022, 65.8 ± 15.1 in the academic year 2022/2023, 214.4 ± 48.6 in the academic year 2023/2024 ($***p < 0.001$). (b) Mean number of students participating in recreational sports: 170.8 ± 33.9 in the academic year 2020/2021, 185.8 ± 36.4 in the academic year 2021/2022, 326.0 ± 80.7 in the academic year 2022/2023, 698.3 ± 144.7 in the academic year 2023/2024 (2020/2021 and 2021/2022 vs. 2023/2024, $***p < 0.001$; 2022/2023 vs. 2023/2024, $*p < 0.05$).

participating in recreational sports was 170.8 ± 33.9 in the 2020/2021 academic year, 185.8 ± 36.4 in the 2021/2022 academic year, 326.0 ± 80.7 in the 2022/2023 academic year, and 698.3 ± 144.7 in the 2023/2024 academic year (2020/2021 and 2021/2022 vs. 2023/2024, $***p < 0.001$; 2022/2023 vs. 2023/2024, $*p < 0.05$) [Figure 2(b)].

A contingency analysis was performed to verify the existence of a significant distribution of competitive or recreational students across academic years, depending on the sport played.

Table 1 summarizes the distribution of competitive students for each academic year and each sport, while Figure 3 visually displays

TABLE 1 A schematic representation of the number of students participating in competitive sports for each academic year.

Sport	2020/ 2021	2021/ 2022	2022/ 2023	2023/ 2024
11-a-side football	419	468	592	1,929
5-a-side football	154	160	224	560
Archery	10	9	8	40
Artistic gymnastics	33	56	31	197
Athletics	76	101	102	394
Basket	149	151	202	597
Beach volley	40	42	67	193
Boxing	35	42	57	150
Canoe/Kayak	14	18	26	60
Canoeing	3	6	9	15
Caribbean dancing	19	28	29	108
Cheerleading	7	2	6	24
Climbing	24	37	21	127
Cricket	38	21	32	88
Cycling	7	16	12	47
E-sports	24	75	14	287
Fencing	14	25	19	76
Functional gymnastics	6	6	19	35
Golf	8	6	9	23
Greek-Roman wrestling	5	7	10	26
Gym	125	127	213	604
Judo	39	20	45	112
Karate	35	46	62	179
Kickboxing	33	32	60	159
Kitesurf	2	/	4	4
Martial arts	79	88	102	337
Other sports	77	113	100	241
Paddle	15	41	36	122
Paralympic sports	1	2	2	4
Pilates	12	9	9	45
Rhythmic gymnastics	7	13	8	60
Riding	51	21	74	95
Rugby	31	33	46	127
Sailing	13	8	15	32
Shooting	8	7	11	32
Skiing	8	9	12	37
Sports dance	87	127	152	452
Surf	1	1	1	8
Swimming	153	151	189	665
Table tennis	9	7	10	32
Taekwondo	10	7	9	45
Tennis	66	69	66	290
Volleyball	249	247	317	1,062
Water fitness	51	54	41	260
Yoga	24	18	19	96

this data, allowing an immediate comparison between sports and years. Interestingly, the number of students playing 11-a-side football and 5-a-side football increased steadily over the four academic years. High student numbers were also recorded for basketball, gymnastics, swimming and volleyball, with higher participation in the 2022/2023 and 2023/2024 academic years. For all other sports, the number of competitive students remained the same or changed less markedly between the four

academic years considered. Overall, the contingency analysis found that the differences in the number of students participating in competitive sports were statistically significant ($\chi^2 = 357$, **** $p < 0.0001$), indicating that the observed increase was not due to chance.

Table 2 summarizes the distribution of recreational students for each academic year and each sport, in addition to Figure 4 which visually illustrates this data and allows for immediate comparison between sports and years.

Contingency analysis shows that gym is the most popular recreational sport, with increasing participation per academic year. High numbers of students were also registered for swimming, while 11-a-side football and 5-a-side football were among the most popular recreational sports, with higher participation in the 2022/2023 and 2023/2024 academic years. About the other sports, less marked variations or no variations were observed in the number of recreational students between the four academic years considered. Overall, the increase observed with the contingency analysis is not due to chance, as statistically significant differences were found in the number of students playing recreational sports ($\chi^2 = 1495$, **** $p < 0.0001$).

Another objective of our study was to examine the distribution of Dual Career student-athletes at the University of Rome “Tor Vergata”, after the approval of the appropriate regulation in April 2022. Therefore, our analysis focused on the distribution of student-athletes in the academic years 2022/2023 and 2023/2024 and the breakdown by macroarea of enrolment, evaluating the trend of Dual Careers in the last two academic years.

Specifically, Figure 5(a) depicts the number and relative percentage of student-athletes who activated Dual Careers in each of the last two academic years. Importantly, the percentage of students who took up Dual Careers increased from 20%–80% in the most recent academic year.

In addition, Figure 5(b) shows the distribution of student-athletes among the five macroareas of the University of Rome “Tor Vergata”, with marked variations between the two academic years considered. Unsurprisingly, the highest number of student-athletes with Dual Careers was recorded in the Medicine and Surgery macroarea, with an increase from 3–29, respectively, in the academic years 2022/2023 and 2023/2024. A similar trend was also observed in the Economy and Engineering macroareas. Regarding the Humanities and Philosophy and Mathematical, Physical and Natural Sciences macroareas, the number of student-athletes increased slightly in the most recent academic year, while no changes were found in the Law macroarea.

4 Discussion

Sport has a significant impact on the quality of life of individuals with psycho-physical and social effects, as it promotes the wellbeing of body and mind and encourages interaction and comparison between athletes (15). For this reason, Universities’ monitoring of students engaged in sporting activities can provide relevant information and induce Universities to adopt strategies aimed at promoting and guaranteeing participation in sport

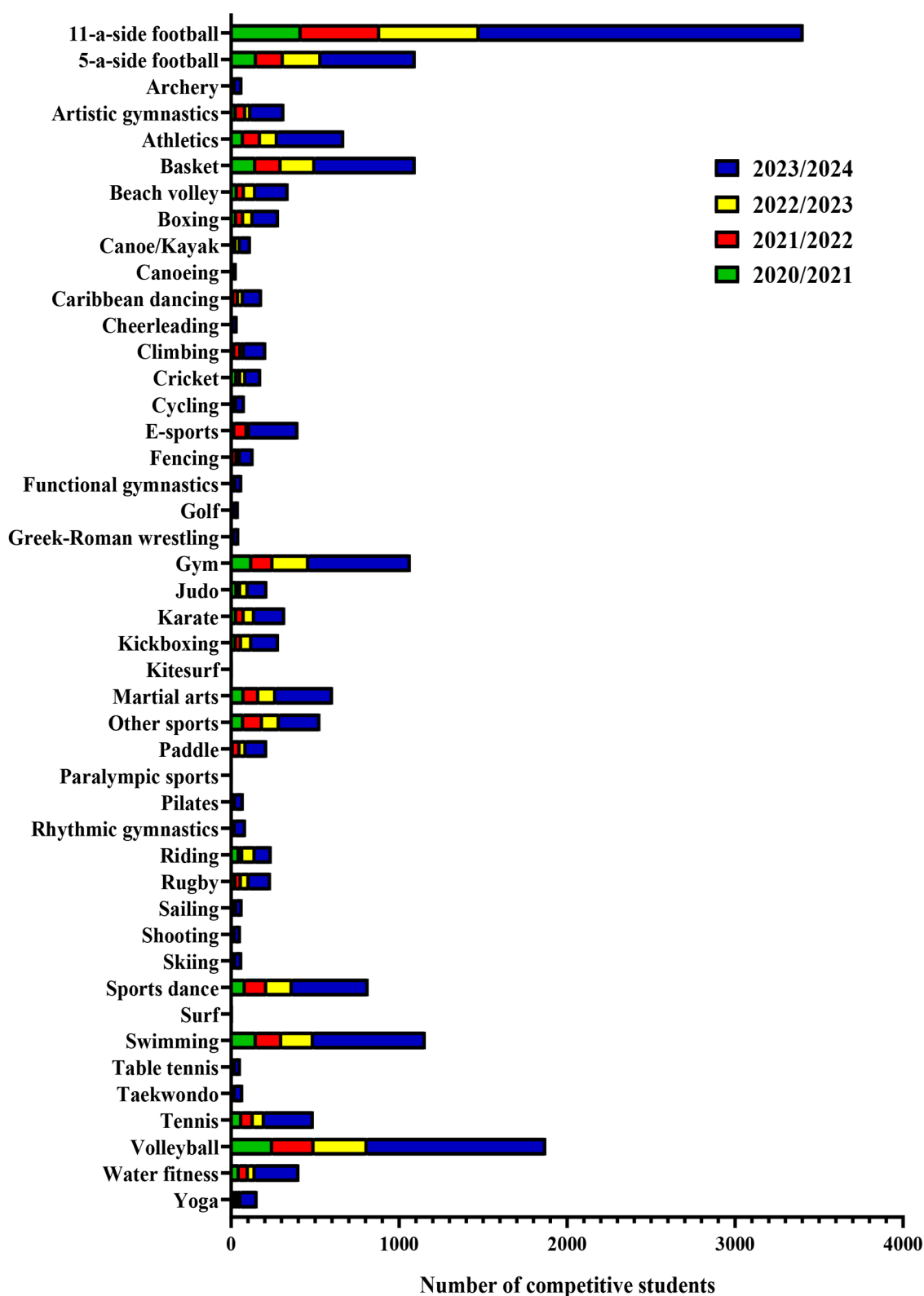


FIGURE 3

Distribution of competitive students by academic year and by sport using contingency analysis. The highest number of students participating in competitive sports was recorded for 11-a-side football, 5-a-side football, basket, gym, swimming and volleyball. Less marked variations or no variation in the number of competitive students across the four academic years were observed for other sports ($\chi^2 = 357$, **** $p < 0.0001$).

TABLE 2 A schematic representation of the number of students participating in recreational sports for each academic year.

Sport	2020/ 2021	2021/ 2022	2022/ 2023	2023/ 2024
11-a-side football	560	602	892	2,176
5-a-side football	571	622	1,174	2,092
Archery	43	61	50	209
Artistic gymnastics	109	98	172	409
Athletics	368	434	666	1,386
Basket	198	195	308	805
Beach volley	192	250	278	902
Boxing	141	125	285	500
Canoe/Kayak	78	87	98	295
Canoeing	25	37	36	80
Caribbean dancing	238	210	325	778
Cheerleading	44	58	39	207
Climbing	104	108	203	524
Cricket	55	69	61	237
Cycling	135	144	242	476
E-sports	97	286	93	966
Fencing	23	23	31	86
Functional gymnastics	197	187	550	650
Golf	28	28	29	113
Greek-Roman wrestling	16	11	17	48
Gym	1,454	1,560	3,910	6,544
Judo	36	53	55	167
Karate	43	64	93	217
Kickboxing	191	175	253	652
Kitesurf	22	23	24	72
Martial arts	138	130	360	633
Other sports	274	298	369	1,295
Paddle	127	239	231	697
Paralympic sports	2	2	/	6
Pilates	138	142	256	595
Rhythmic gymnastics	29	35	39	116
Riding	243	92	261	333
Rugby	28	25	33	91
Sailing	20	23	34	76
Shooting	16	17	16	53
Skiing	42	24	78	113
Sports dance	327	307	574	1,236
Surf	24	27	36	88
Swimming	788	854	1,300	3,150
Table tennis	18	17	30	78
Taekwondo	11	12	18	42
Tennis	208	278	402	936
Volleyball	317	360	423	1,432
Water fitness	138	148	358	556
Yoga	169	191	295	705

during the university career. Therefore, our study aims to obtain an estimate of students involved in sport activities and to evaluate the effects of the introduction of a Dual Career regulation at the University of Rome “Tor Vergata”.

Our preliminary results show that the Dual Career regulation has been positively received, as the number of student-athletes enrolled in the University has increased in almost all macroareas since its introduction. Particularly, the marked increase in the

number of student-athletes enrolled at the University of Rome “Tor Vergata” in the 2023/2024 academic year has shown that the facilities established by the regulations to protect athletes have promoted a greater enrolment in degree courses in the Medicine and Surgery and Economy macroareas. In addition, a significant increase in the number of students engaged in both competitive and recreational sporting activities was observed, at the same time as a reduction in the number of students not practising sport.

In this regard, the University of Rome “Tor Vergata” promotes numerous initiatives in sport and health aimed at both the prevention of pathologies and the adoption of a healthy lifestyle based on regular physical activity to encourage students to take up sport. Undoubtedly, a regulation to protect athletes engaged in degree programmes is essential for those who decide to embark on a Dual Career, as this requires a constant commitment and scrupulous organization of resources, including time and energy, ensuring the success of both paths (4). In fact, the success of a sports career is strictly dependent on the individual’s technical characteristics, which are developed with high training volumes, especially in individual disciplines such as swimming, gymnastics and martial arts (14, 16). On the other hand, individual sports offer athletes the possibility of customizing training schedules according to the athlete’s needs, while team sports impose constraints related to the needs of the community. In this context, several studies have examined Dual Career paths at various Universities, highlighting time management as the factor that most concerns student athletes. In fact, in addition to the time they must devote daily to training and academic life, the time needed to travel from one location to another must also be considered (17, 18). Therefore, the possibility of flexible working hours, guaranteed by the Dual Career regulation, makes it possible to overcome time management obstacles, favoring full and harmonious adherence to both careers.

In addition, athletes face significant financial burdens to support the university course, paying fees and books, and the sports course, which includes the costs of training, equipment and participation in competitions, including accommodation and meals (19). In this respect, the partial exoneration of university fees guaranteed by the regulation, in addition to reducing the economic pressure to which student-athletes are subjected, could promote an economic gain for the Universities through the visibility they produce. In fact, although most student-athletes do not enjoy the notoriety that allows them to generate income on their own, the involvement of followers through shares on social networks can increase the popularity of the University and encourage the dissemination of values related to sport (19, 20).

Finally, the social and relational impact that the Dual Career programme entails in the lives of individuals should be considered, as the difficulties associated with managing time, energy and financial resources often result in a sacrifice in interpersonal relationships on the part of the student-athlete. In this context, evidence has shown the importance of support from parents, siblings and coaches on a personal, sporting and university level to achieve success in all areas involved (8).

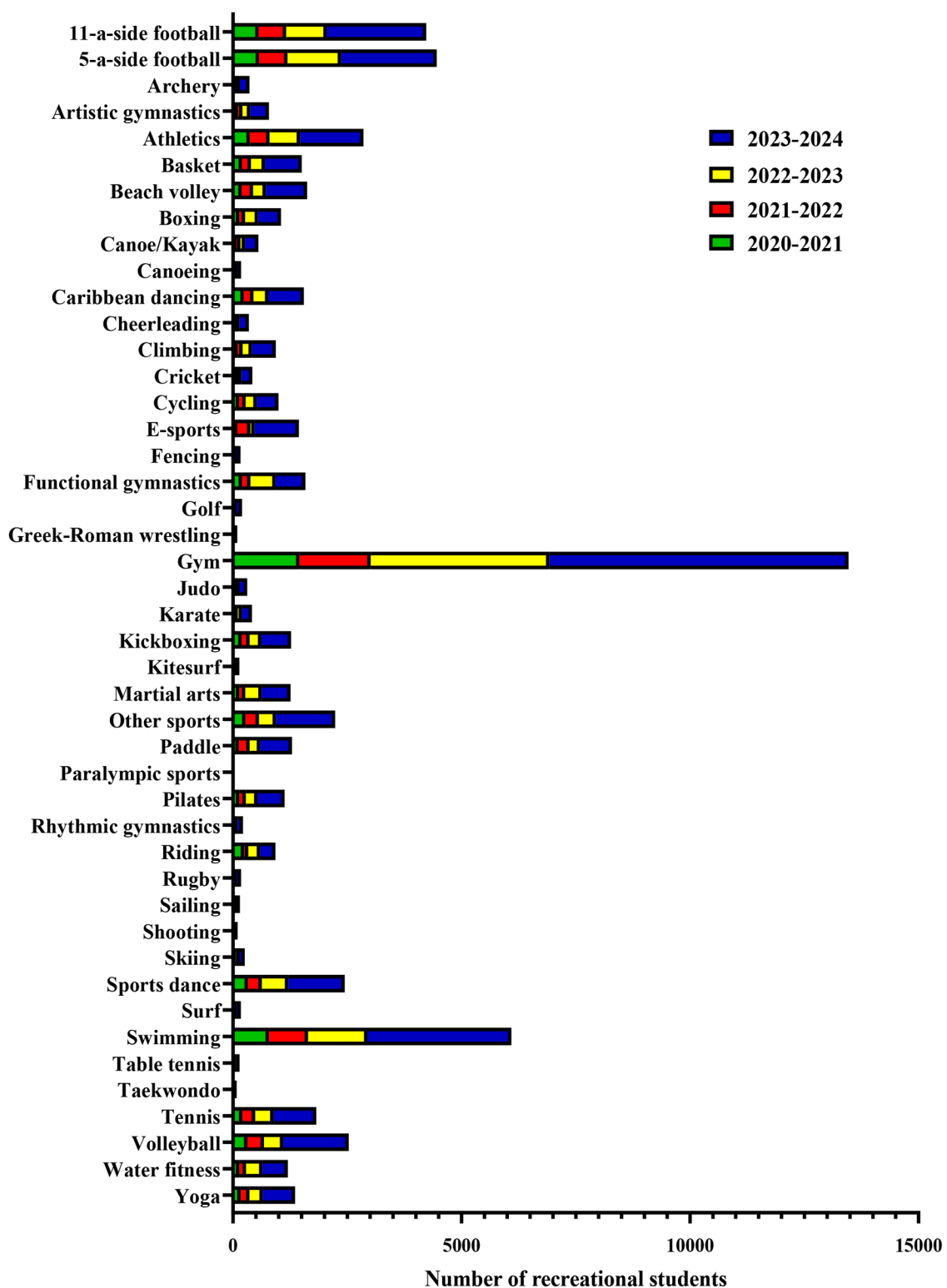


FIGURE 4

Distribution of recreational students by academic year and by sport using contingency analysis. The highest number of students participating in competitive sports was recorded for gym, swimming, 11-a-side football and 5-a-side football. Less marked variations or no variation in the number of competitive students across the four academic years were observed for other sports ($\chi^2 = 1,495$, **** $p < 0.0001$).

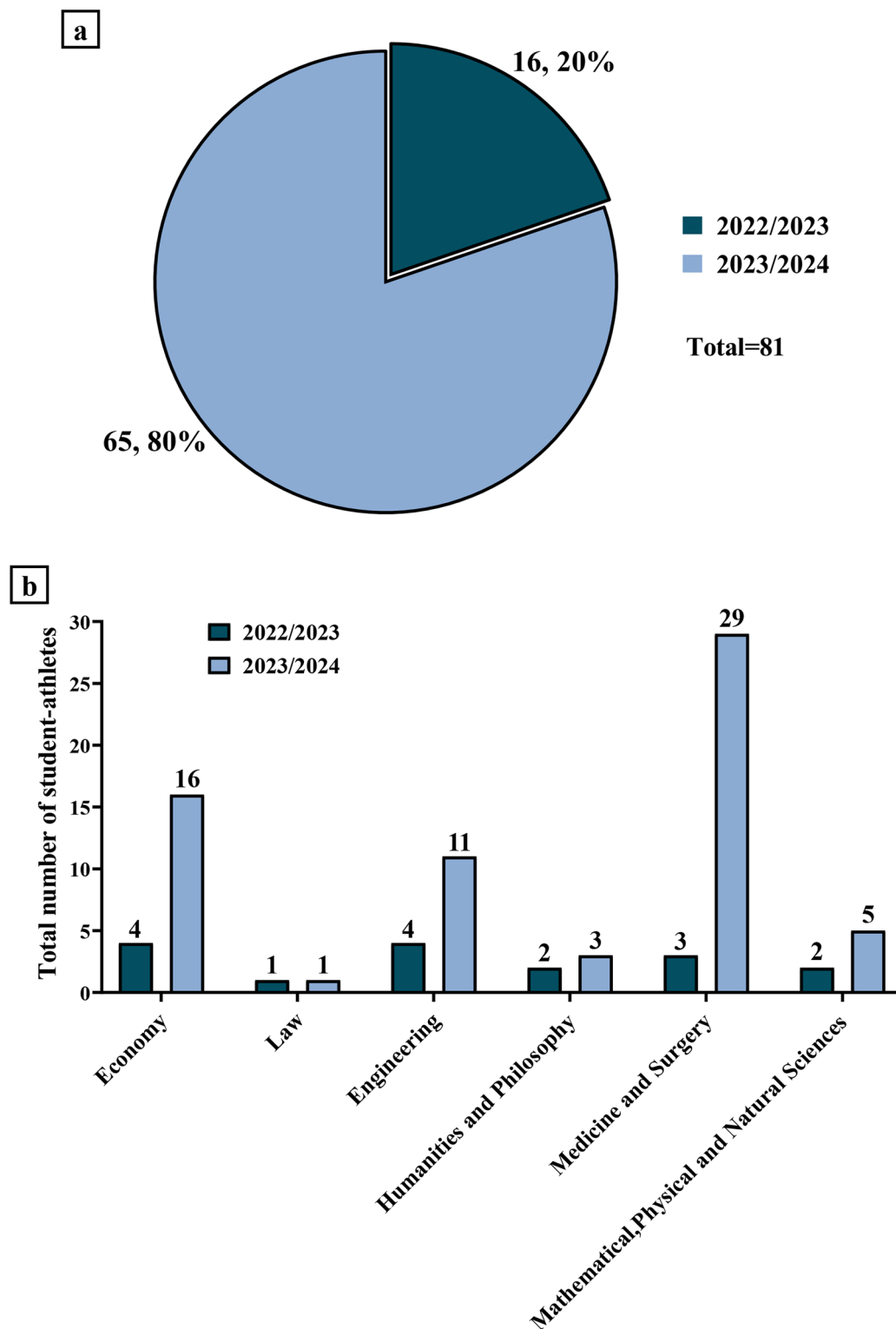


FIGURE 5

Distribution of student-athletes who activated the dual career program at the university of Rome "Tor Vergata" in the academic years 2022/2023 and 2023/2024. (a) 16 students (20%) activated the Dual Career program in the academic year 2022/2023, while 65 students (80%) activated the Dual Career program in the academic year 2023/2024. (b) Academic year 2022/2023: the number of student-athletes who activated the Dual Career program was 4 for the Economy macroarea, 1 for the Law macroarea, 4 for the Engineering macroarea, 2 for the Humanities and Philosophy macroarea, 3 for the Medicine and Surgery macroarea, and 2 for the Mathematical, Physical and Natural Sciences macroarea. Academic year 2023/2024: the number of student-athletes who activated the Dual Career program was 16 for the Economy macroarea, 1 for the Law macroarea, 11 for the Engineering macroarea, 3 for the Humanities and Philosophy macroarea, 29 for the Medicine and Surgery macroarea, and 5 for the Mathematical, Physical and Natural Sciences macroarea.

Noteworthy, the period of social isolation experienced during the COVID-19 pandemic altered the balance between the athlete and the social context, reducing both the possibility of training in appropriate sports environments and support from teachers (21). In other words, the health crisis faced during the pandemic highlighted the delicate balance between sporting practice, quality of life and emotional state to which student-athletes are exposed, as well as the importance of a proactive social fabric to ensure continued engagement in both sport and study (22). In fact, the return to the daily routine in the post-lockdown period emphasized a real difficulty in resuming training and recovery cycles, as it was reported that elite athletes tended to spend more time resting and less time training than in the pre-lockdown period (23). Therefore, the life of the student-athlete is a constant physical, psychological and emotional challenge that requires *ad hoc* protection to ensure the individual's success.

Overall, our preliminary results of the survey administered to students enrolled in the academic years 2020/2021, 2021/2022, 2022/2023 and 2023/2024 showed that, following the introduction of an *ad hoc* Dual Career regulation, an increasing number of student-athletes and sports students enrolled at the University of Rome "Tor Vergata". This result shows that the facilities provided by the regulation, which are necessary for the continuation of both paths, are indeed required by athletes embarking on a university career. Noteworthy, the regulation introduced in April 2022 seems to meet the needs of student-athletes, although further surveys will have to be conducted to assess their level of satisfaction. Nevertheless, preliminary results show that the main barriers encountered by athletes have been overcome by the Dual Career regulation, promoting higher enrolment in tertiary education courses.

In conclusion, the constant commitment of the University of Rome "Tor Vergata" in promoting and disseminating the importance of a lifestyle based on physical activity and the values associated with sports has had a positive impact on the student population, encouraging their participation in various sports disciplines. Further monitoring surveys will be necessary to verify the effect of the events and activities promoted by the University on student sports participation.

5 Limits of the study

The high number of students responding to the survey has resulted in a substantial amount of data that requires thorough and targeted analysis. Therefore, the present study presents preliminary results with some limitations that must be considered when interpreting the results. Firstly, no differentiated analysis was conducted based on the age and gender of the students, limiting our understanding of potential differences that could influence academic performance and participation in sports activities. For student-athletes, the specific sport practiced was not considered. In addition, the subdivision of sports according to type (individual, couple, team) requires a more in-

depth and targeted investigation to provide an adequate stratification of the entire student population. Undoubtedly, these elements represent an area for future investigation for a more comprehensive understanding of the phenomena studied. Furthermore, the analysis of interactions between demographic, sports, and academic variables would offer a more integrated and detailed understanding of the factors that influence students' experiences and performance.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

Author contributions

IC: Conceptualization, Data curation, Investigation, Writing – original draft. RB: Conceptualization, Data curation, Investigation, Writing – original draft. MO: Conceptualization, Investigation, Writing – original draft. VT: Conceptualization, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Dual-career student athletes in Spanish universities: characteristics and interests

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The path that student-athletes follow to pursue their dual careers is both complex and demanding. However, an increasing number of elite athletes enroll in higher education today. To explore the current situation of elite university athletes in Spain, a study was conducted with the main objective of identifying their characteristics, concerns, interests, and challenges when combining their sporting and academic careers. To this end, a survey consisting of 27 items was distributed among a group of Spanish universities belonging to the Spanish University Sports Committee. A total of 563 responses were collected, of which 411 were ultimately processed from 27 different Spanish universities, providing us with insight into pursuing a dual career in Spanish universities. Descriptive data were gathered on various aspects such as age, field of study, hours dedicated to sports and studies, sports level, most relevant sports disciplines, interest in transnational mobility, and the perception and use of the benefits student-athletes receive when pursuing a dual career. Ultimately, this work aims to assist higher education institutions in developing tools that facilitate the program design for elite athletes.

KEYWORDS

dual career, elite athletes, higher education, benefits, Spanish universities

1 Introduction

The dual career of elite athletes has been studied for decades. The balance between training, peak athletic performance, and the professional prospects at the end of the athletic career have been topics of great interest (1–4).

All this interest revolves around the emergence of the term “dual career” (DC). This term was coined with the publication of the European Commission’s White Paper on Sport in 2007 (5–7) and has become a key element in promoting actions aimed at improving the well-being of this group (6, 8). A balance is sought in integrating a sporting career with education or work during the years of maximum sporting activity (9–11). In 2012, the European Commission itself published a guide to promoting dual careers, providing a framework for actions to strengthen them (12).

Based on the definitions of DC athletes, which consider both the work and education framework together with the sport framework (13–16), it is necessary to specify that this work is circumscribed within the framework of elite university student athletes who are studying at the highest level of their sporting careers.

This stage is a very complex period and has a significant impact on this group, which maintains a dual profile of student and athlete. This fact has been demonstrated in various

publications, which show the difficulty of combining higher level academic training with a sports career (1, 13, 17–19). It has been identified as a period of high stress that directly affects the development of the dual career and the psychological well-being of the person (13, 20, 21). However, there are studies that demonstrate a correlation between motivation (22) and identity (23) and the level of competition and age of the student athletes in question. These studies indicate that the values in question are higher in those student athletes who have a higher level of sport and are younger.

One aspect that has been highlighted, and that needs to be considered, is the concern about career opportunities: how to facilitate the transition to the labor market when they finish their peak performance phase and retire from their sports career. In this regard, it is necessary to account for the duration of the sporting career and its stages, as well as the fact that a higher level of academic training contributes to a better transition (2, 24–27). Thus, programs that facilitate the combination of higher education with a balanced athletic career ensure a smoother transition to the labor market at the end of the athletic career (28–30).

This reality has been reflected at the European level in different intervention models: one where the government acts as regulator or facilitator; another carried out by national sports federations; and a third with no specific structure (1, 15, 31, 32).

Spain falls into the first category, in which the government acts both as regulator and facilitator. National laws affecting elite, high-performance, and high-competition athletes (33–37) exist, along with regional laws that guarantee aid to this group of student athletes.

In addition to these regulations, the autonomy of universities allows for the expansion of support programs for this group.

In this context, the Spanish government, through the Consejo Superior de Deportes, manages the Programa de Atención al Deportista de Alto Nivel (PROAD) (<https://n9.cl/1fw1p>), which aims to promote a policy of support and comprehensive care for all athletes. According to data provided by PROAD (38), 53 universities claim to offer some kind of support to elite athletes. In addition to government regulations, universities are taking steps to achieve a balance between academic training and athletic careers. Ten years ago, López de Subijana (39) analyzed the participation of universities in processes to promote this balance between studies and sports careers from the point of view of what students receive from the university. It is necessary to understand their perceptions and interests, and also to determine if students utilize what the university offers or if they require other types of help.

Thus, the main aim of this paper is to identify the current situation of elite university athletes in Spain, their characteristics, concerns, interests, and challenges in combining their sporting and academic careers.

2 Materials and methods

This study is based on a European study on DC student athletes (40), conducted by the Student Athletes Erasmus+

Mobility in Europe (SAMEurope) consortium and funded by the European Commission (Erasmus+ project 101050378).

2.1 Subjects

The survey, which was conducted from March 1 to May 12, 2023, involved 46 Spanish universities that are members of the Spanish Committee of University Sport and that had participated in a previous study on dual careers in Spain. Of the 46 universities invited to participate in the study, DC student athletes from 27 universities responded to the survey.

2.2 Procedures

The Student Athletes Erasmus+ Mobility in Europe (SAMEurope) project on DC student athletes identified and validated 31 benefits offered by the consortium universities to DC students. The project consortium then surveyed DC experts and DC students at the consortium universities. The survey process is described in Hernando et al. (40).

To collect information on elite university student athletes in Spain, the survey developed by SAMEurope was adapted to the Spanish context, using the Qualtrics® program. This research was approved by the Ethics Committee of Universitat Jaume I of Castellón (approval number CEISH/27/2022 of 21-12-2022 obtained by written document). It complies with the criteria laid down in the Declaration of Helsinki.

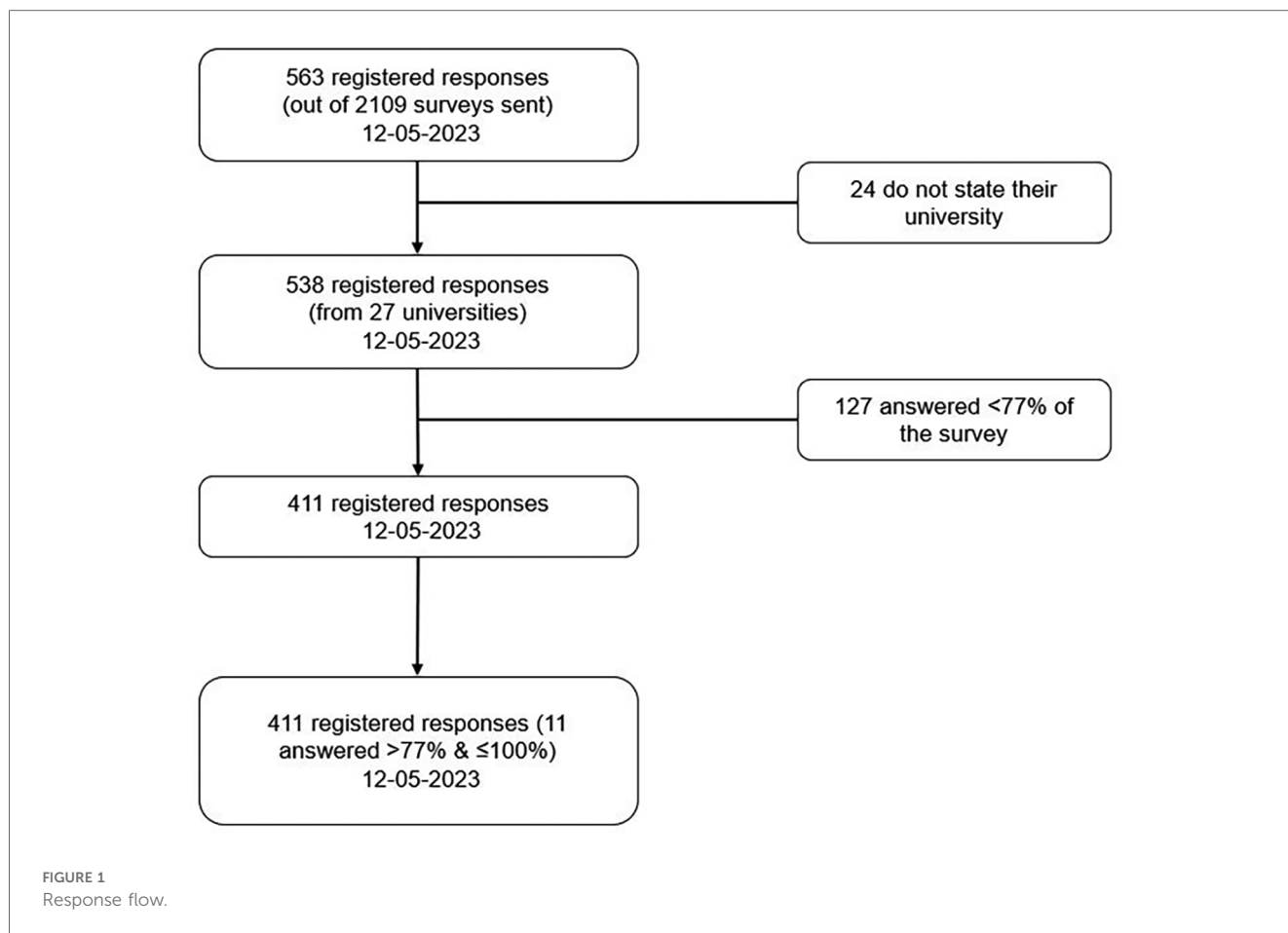
All participants were university students aged 18 years or older. No minors were involved in the study. In the first question of the survey, participants received full information about the project and the safety conditions were explained. Participants who were willing to take part in the survey gave a written consent to participate in the first question and could then complete the survey. If participants refused to participate, they could not answer any further questions in the survey.

The survey can be found in [Supplementary Material 1](#).

The surveys were sent to the DC students in the following order. First, the link to the Qualtrics® survey was sent to the people responsible for dual careers in the 46 Spanish universities (out of the 78 universities that are members of the Spanish Committee of University Sport) that had participated in a previous study on the DC situation in Spanish universities. Second, each university sent the link to its DC student athletes to complete the survey. The survey was available from March 1 to May 12, 2023. A total of 563 responses were collected, of which 411 responses from 27 Spanish universities were processed, as shown in [Figure 1](#).

The survey included seven sections:

1. Consent (question 1).
2. Personal information: year of birth and gender (questions 2–3).
3. Academic data: country where you are studying, name of the university where you are studying, level of study, field of knowledge, name of the degree you are studying,



number of credits enrolled in this academic year, and hours per week devoted to university studies (questions 4–10).

4. Sports data: type of sport you participate in, sport modality, level of sport, highest level of championship in which you participated, hours per week spent on sports, and participation in university competitions (questions 11–16).
5. Dual career: criteria for entering the university, criteria for choosing the university, problems in combining elite sport with studies, evaluation of the importance of the benefits offered by the university for combining university studies and elite sport, use of the benefits offered by being a DC student, list of the benefits used and support persons in the dual career (questions 17–24).
6. International mobility: interest in doing an Erasmus+ stay and criteria for choosing a host university (questions 25–26).
7. Recognition of the dual career (question 27).

In the dual career section, among other questions, student athletes were asked to rate the 31 benefits listed in the SAMEurope project and collected by Hernando et al. (40). Question Q21 asked DC student athletes to rate the importance of each of the 31 benefits of combining university studies and elite sport from 0 to 5 (0 = not at all important, 5 = very important). In question Q23, they were asked to indicate which benefits they had taken advantage of as DC students.

With the data obtained from these two questions, the value of the benefit and the number of times each benefit was used, a calculation formula was created to combine the two results and assess the relevance of each benefit. Specifically, the level of importance of a benefit (LI) was multiplied by the percentage of use of this benefit [the number of uses of the benefit (NU) divided by the total number of responses received (TAS), in this case 411], and the result was multiplied by 10 to obtain a number that was not too small $[LI \times (NU/TAS) \times 10]$. This calculation makes it possible to rank the benefits by combining the importance for the students and the number of uses of the benefit in relation to the total number of participating students. The ranked benefits were then divided into quartiles to identify those benefits that were in the first quartile, and those that were in the second, third, and fourth quartiles.

Then, to determine the relationship between the importance that the students attached to each benefit and the number of times it was used, a Pearson correlation was performed between the two variables, level of importance and number of times each benefit was used.

2.3 Data analysis

A descriptive study on the situation of dual careers among Spanish university students was carried out. Based on the work

carried out by López de Subijana et al. in 2014 and 2015 in Spanish universities (13, 39), a sample calculation was performed to obtain a confidence level greater than 95% with a margin of error of $\pm 5\%$. Statistical analysis was performed using SPSS v27 software, and results were considered statistically significant if the p -value was less than 0.05. The Kolmogorov-Smirnov test was used to test the normality of the data. Data were presented as mean and standard deviation for continuous variables. For frequency or proportion variables, sample size values were used. The distribution of benefits was divided into quartiles using Tukey's hinge model. When the data did not meet normality criteria, a nonparametric statistic was used. The Kruskal-Wallis test was used with a Mann Whitney *post hoc* test for pairwise comparisons. The Pearson correlation was used to analyze the correlation between the evaluation of the benefits and their use by the students. Cohen's criterion was used as the framework in which the degree of correlation was determined, with a weak correlation when the value is between 0.1 and 0.29, a moderate correlation when the value is between 0.30 and 0.50, and a strong correlation when the value is higher than 0.50 (39).

3 Results

The survey was distributed to 46 Spanish universities, which in turn sent the link to the survey to 2,109 students. A total of 411 students participated, which corresponds to a participation rate of 19.49%. The results have a confidence level of more than 95% and a margin of error of $\pm 5\%$.

Table 1 shows the names of the participating universities and the number of links to the survey that each university emailed to its DC students, sorted by university (universities marked with an asterisk did not provide information on the number of DC students to whom they sent the survey link), as well as the number of accepted responses and the percentage of participation they represent.

A total of 411 DC students participated in the study, of whom 207 were female, 202 were male, and 2 identified as non-binary. The majority of these students, 388, were pursuing graduate studies, 17 were enrolled in master's programs, and 6 were engaged in doctoral studies.

The students who responded to the survey had a mean age of 21.53 ± 3.14 years, ranging from 18 to 41 years, with the vast majority (79.08%) between the ages of 19 and 22.

As stated above, 94% of the students are enrolled in undergraduate programs, 4% are enrolled in master's programs, and 2% of the DC students who responded to the survey are enrolled in doctoral programs.

The field of knowledge proposed by UNESCO was established using a two-digit system to identify the field in which all dual career students were studying (41). It is evident that 25% of the dual career (DC) students are pursuing studies in the field of medical sciences, followed by 16% in technological sciences, 14% in economic sciences, and 12% in life sciences. The total number of fields of study pursued by these student athletes can be found in [Supplementary Material 2](#).

TABLE 1 Number of surveys sent and accepted and% they represent.

	Sent	Accepted	%
Universidad Carlos III de Madrid	86	25	29,07%
Universidad Católica San Antonio de Murcia	218	41	18,81%
Universidad Católica San Vicente Mártir de Valencia	14	2	14,29%
Universidad de Alcalá	43	11	25,58%
Universidad de Alicante	131	13	9,92%
Universidad de Almería	27	6	22,22%
Universidad de Barcelona	147	42	28,57%
Universidad de Burgos	19	7	36,84%
Universidad de Deusto	5	1	20,00%
Universidad de Girona	74	9	12,16%
Universidad de Huelva	7	2	28,57%
Universidad de las Islas Baleares	53	3	5,66%
Universidad de Murcia	76	12	15,79%
Universidad de Navarra	*	2	*
Universidad de Valencia	322	20	6,21%
Universidad de Valladolid	264	33	12,5%
Universidad de Vigo	71	24	33,80%
Universidad Miguel Hernández	26	5	19,23%
Universidad Nacional de Educación a Distancia (UNED)	*	1	*
Universidad Pablo de Olavide	82	8	9,76%
Universidad Pública de Navarra	74	22	29,73%
Universidad San Pablo CEU	40	7	17,50%
Universitat Autònoma de Barcelona	*	1	*
Universitat Internacional de Catalunya (UIC Barcelona)	38	10	26,32%
Universitat Jaume I de Castelló	95	50	52,63%
Universitat Politècnica de València	120	37	30,83%
Universitat Pompeu Fabra	77	17	20,08%
Total	2,109	411	19,49%

*Data not provided.

Table 2 shows the results obtained from the sports profile of the DC students who responded to the survey, including credits enrolled, hours spent studying and practicing sport on a weekly basis, as well as participation in National University Championships.

Ninety-two percent of the DC students participate in non-disabled sport modalities, but it is interesting to note that 8% of the DC students practice their high level sport in the adapted sport modality.

Regarding the distribution of students by sport level, the surveys show that 36% of DC student athletes are considered international level athletes, while 59% are considered national level athletes and 5% are considered regional level athletes.

Of the DC student athletes at the international level (146 in total), 5 have competed in Olympic Games and the majority (83) have competed in World Championships. The question (Q14) asked what the highest level of competition they had participated in was, suggesting that the highest level in this section implies that they have also participated in lower level competitions.

The number of credits enrolled is 57.10 ± 13.72 and they spend 27.25 ± 11.06 h per week on their studies. The number of hours spent per week on aspects related to sport (training, physiotherapy, medical.) is 20.47 ± 8.85 h per week. 59% of DC students participate in national university competitions.

TABLE 2 Sport profile.

N	Type of sport			Sport level			Highest Int. championship					
	ALL	NA	A	R	N	Int	K-W	OG	WC	EC	IUC	NT
	411	378	33	22	243	146		5	83	31	4	23
CE	57.10 ± 13.72	56.87 ± 13.91	59.70 ± 11.09	60.11 ± 12.78 ^a	58.51 ± 13.72 ^b	54.30 ± 14.77 ^{ab}	0.003	56.8 ± 14.81	53.29 ± 15.17	51.97 ± 16.05	57.00 ± 8.12	60.09 ± 12.87
H St/W	27.25 ± 11.05	27.32 ± 11.02	26.48 ± 11.66	27.79 ± 10.81 ^{ab}	33.27 ± 8.35 ^{ac}	25.45 ± 11.46 ^{abc}	0.002	15.80 ± 11.02 ^{xy}	24.60 ± 11.11 ^{xz}	30.29 ± 11.41 ^{yz}	25.75 ± 18.41	24.00 ± 10.75
H Sp/w	20.47 ± 8.84	20.67 ± 8.88	18.18 ± 8.30	13.36 ± 5.36 ^{ab}	19.14 ± 8.08 ^{ac}	23.76 ± 9.30 ^{abc}	1.64E-10	35.00 ± 9.45	23.28 ± 9.11	22.97 ± 9.05	25.25 ± 4.5	23.91 ± 9.89
P-NUC Yes (N)	242	223	19	18	159	65		1	28	19	4	13
P-NUC No (N)	169	155	14	4	84	81		4	55	12	0	10

Data are presented as mean and standard deviation in continuous variables, sample size is indicated in frequency variables. N, number; CE, credits enrolled; H St/W, hours study/week; H Sp/w, hours sport/week; P-NUC, participation in National University Championships; ALL, all students; NA, not adapted; A, adapted; R, regional; N, national; Int, international; K-W, Kruskal-Wallis test; OG, Olympic Games; WC, World Championship; EC, European Championship; IUC, International University Championship; NT, National Team. ^{abc,xyz} indicate the values of significant differences between groups according to the Mann-Whitney test. Bold type indicates values indicating statistical significance in the Kruskal-Wallis test.

A detailed breakdown of the distribution of enrolled credits, study hours and sport hours by profile can be seen in [Table 2](#).

A total of 70 distinct sports modalities were reported by all respondents to the survey. The most popular sport was track and field, with 70 out of 411 respondents indicating this as their primary sport. This was followed by basketball, handball, and swimming, with 20 out of 411 respondents indicating each of these as their primary sport. A total of nine sports (five team sports and four individual sports) account for 50.37% of the dual career student-athletes who participated in the study. The remaining 49.63% are distributed among 61 different sports. Details of the sports played by the total number of dual career students who participated in the survey can be found in [Supplementary Material 3](#).

[Figure 2](#) shows the results disaggregated by sport level to illustrate the differences in credits enrolled, hours of study, and hours of sport by sport level of DC student-athletes.

There are significant differences in the number of credits enrolled between the international level group and the national and regional level groups. This is replicated in hours of study and hours of sport. The regional level group also shows significant differences from the national level group in the number of hours devoted to sport and to study.

In [Figure 3](#), special attention is paid to the international level DC students to examine their differences in terms of credits enrolled, hours of study, and hours devoted to sports-related aspects. When the international level group is analyzed in detail, there are no significant differences in the number of credits enrolled or hours devoted to sport among the five groups that make up this level.

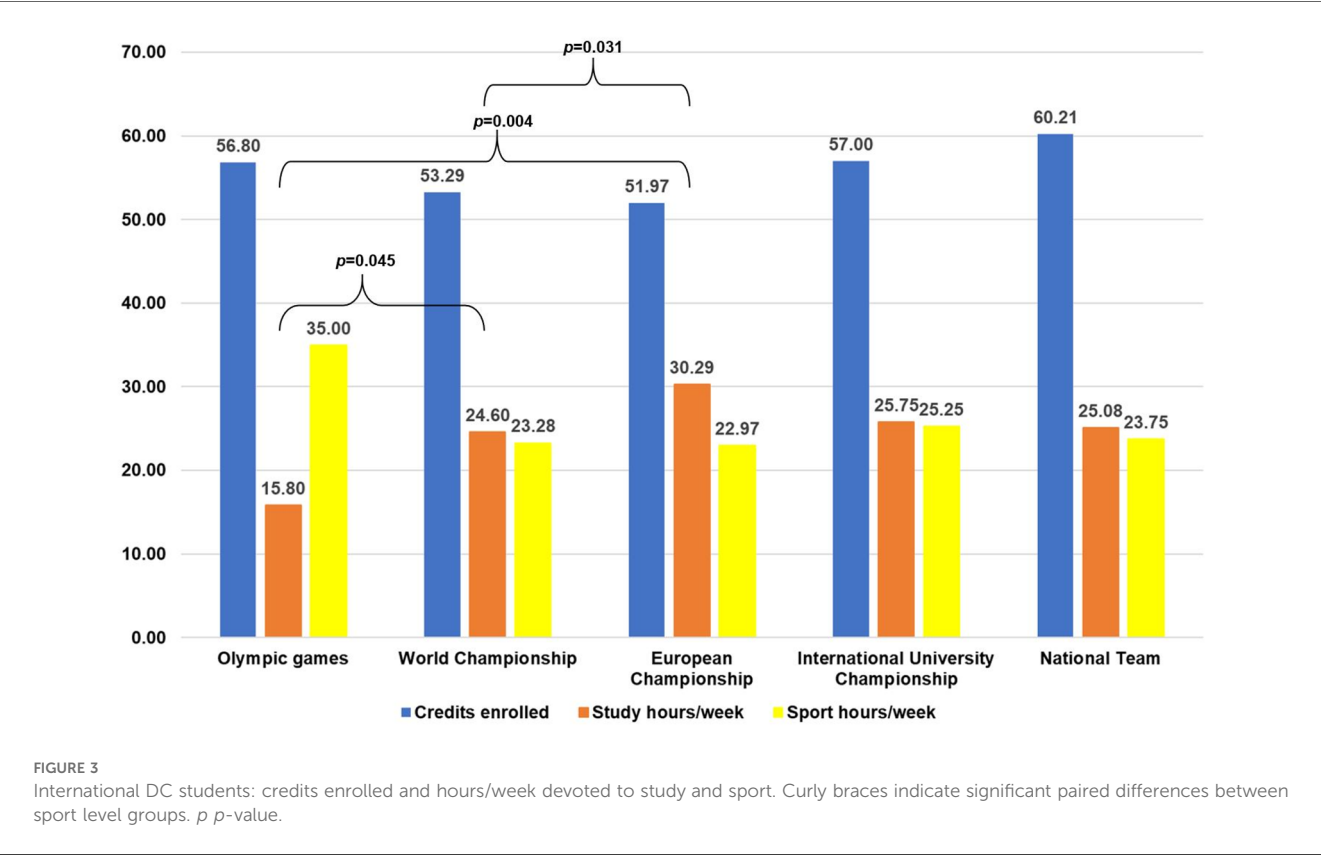
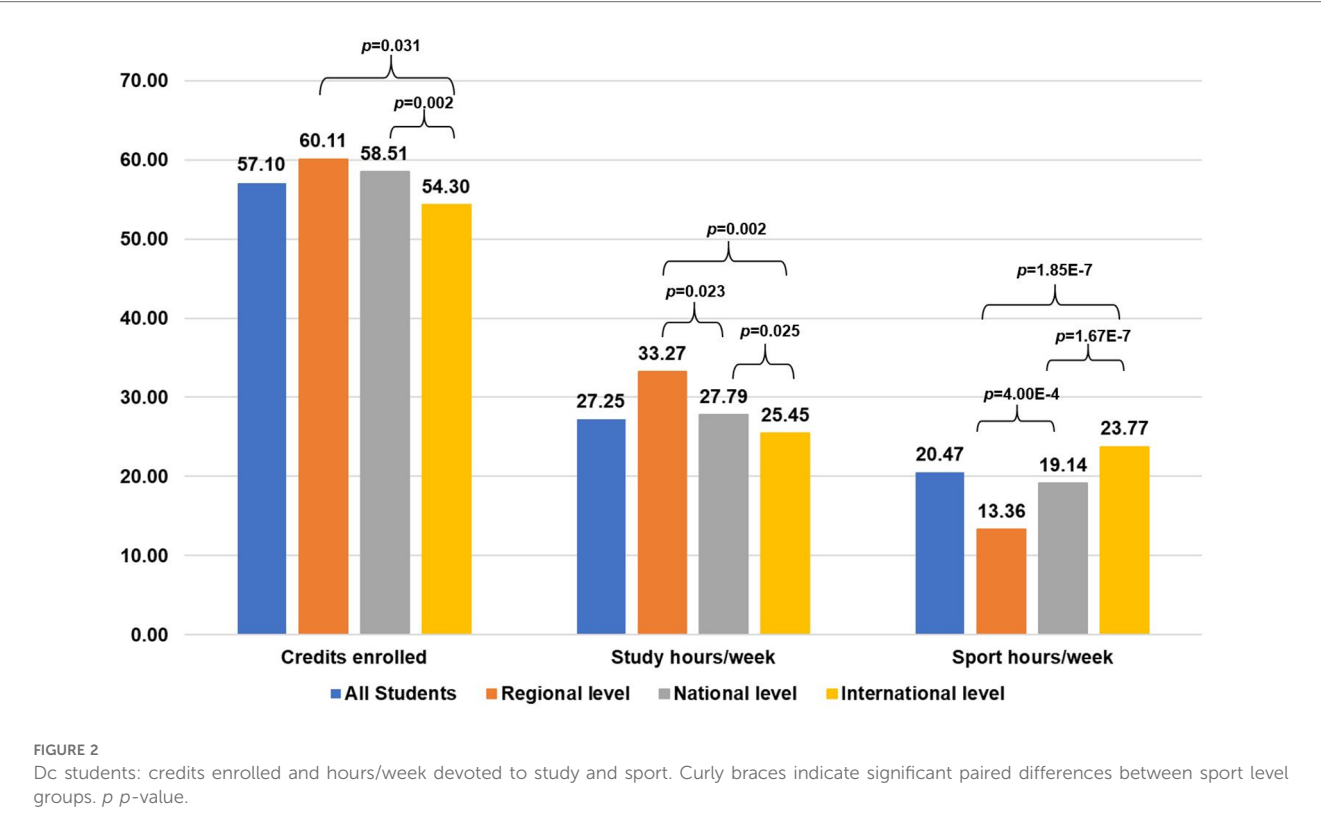
However, there are significant differences in the number of hours devoted to studying, especially in the group of Olympic athletes, which is different from the group of athletes who participate in World Championships and from the group of athletes who participate in European Championships. There is also a significant difference between the athletes who participate in the World Championships and those who participate in the European Championships.

Fifty-two percent of the DC students from the 27 Spanish universities represented in the survey indicated that they entered their studies based on academic criteria, with 48% of those who entered their studies based on sports criteria regulated by national or regional regulations (Law 39/2022; RD 971/2007; D 39/2020) which reserve places for high-level, high-performance or elite athletes.

Similarly, 49% of the students stated that the choice of the university where they could pursue their higher education was based on the support that each university offered to DC students in combining their studies and their sports careers.

[Figure 4](#) shows the degree of importance DC students place on the problems encountered reported in combining their studies and sports careers. It can be seen that managing the time dedicated to travel and the lack of free time are the main problems for the development of their dual career.

Sixty-one percent of DC student athletes say they are aware that their university can help them balance their studies with playing a high-level sport, although 39% are not aware of this option.



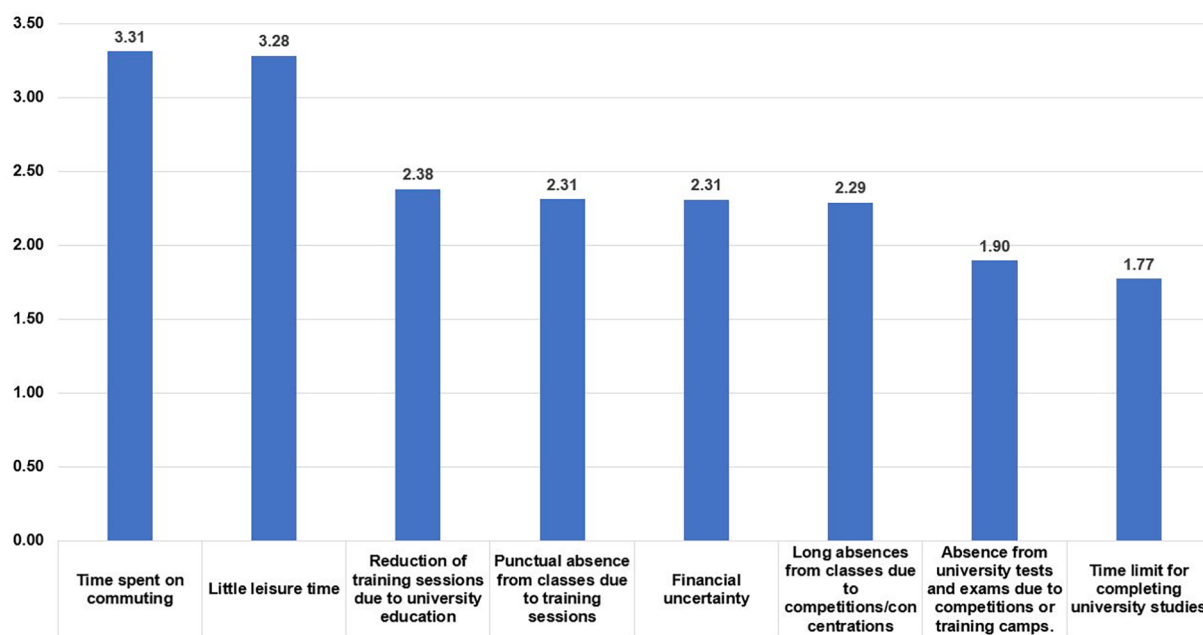


FIGURE 4
Problems in combining elite sport with studies.

DC student athletes were asked to rate a series of 31 benefits from 0 (not important) to 5 (very important).

Column LI of [Table 3](#) shows the importance of each benefit from the students' point of view. Scholarships are the most valued benefit, followed by the change of exams and the justification of absences.

Seventy-one percent of DC students report that they have used at least one benefit. Column NU of [Table 3](#) shows the number of times each benefit was used. The most commonly used benefit by DC student athletes is excusing absences (220 uses out of 411 respondents), followed by changing exam dates (149 out of 411) and choosing class groups (127 out of 411).

In the order of the benefits (GO column of [Table 3](#)), taking into account the two variables together—the importance of the benefit and the number of uses they have made, as indicated in the Materials and Methods section—it can be seen that the most important benefit is justification of absences, followed by change of exam dates and scholarships. The benefits are divided into four quartiles: 8 benefits in quartiles 1, 2 and 3, and 7 benefits in quartile 4.

When analyzing the correlation between the importance of the benefit for the students and the number of uses ([Figure 5](#)), it is observed that it has a value of $r = 0.64$, a $p = 0.00011$ and a CI: 0.359–0.806. This indicates a positive, strong and significant correlation.

When students were queried about the individuals who provide them with support in pursuing their dual careers, they indicated that their classmates are the primary source of assistance, with an average rating of 3.46 on a 5-point scale. This was followed closely by other individuals, primarily family members and coaches, with an average rating of 3.37, followed by faculty or

academic staff, with an average rating of 2.14, while administrative or service staff received an average rating of 2.04.

Eighty-four percent of the DC student athletes who responded to the survey said they would like to participate in an international mobility through the Erasmus+ program.

Among the criteria for choosing a destination for an Erasmus+ mobility, the first is that it offers the right conditions for developing their sports career, closely followed by the conditions for developing their university studies. Other important criteria for DC students when choosing a university abroad are the country in which the university is located and the language in which the studies are taught.

Fifty-five percent of the DC student athletes who participated in the study believe that their university does not recognize their dual career.

4 Discussion

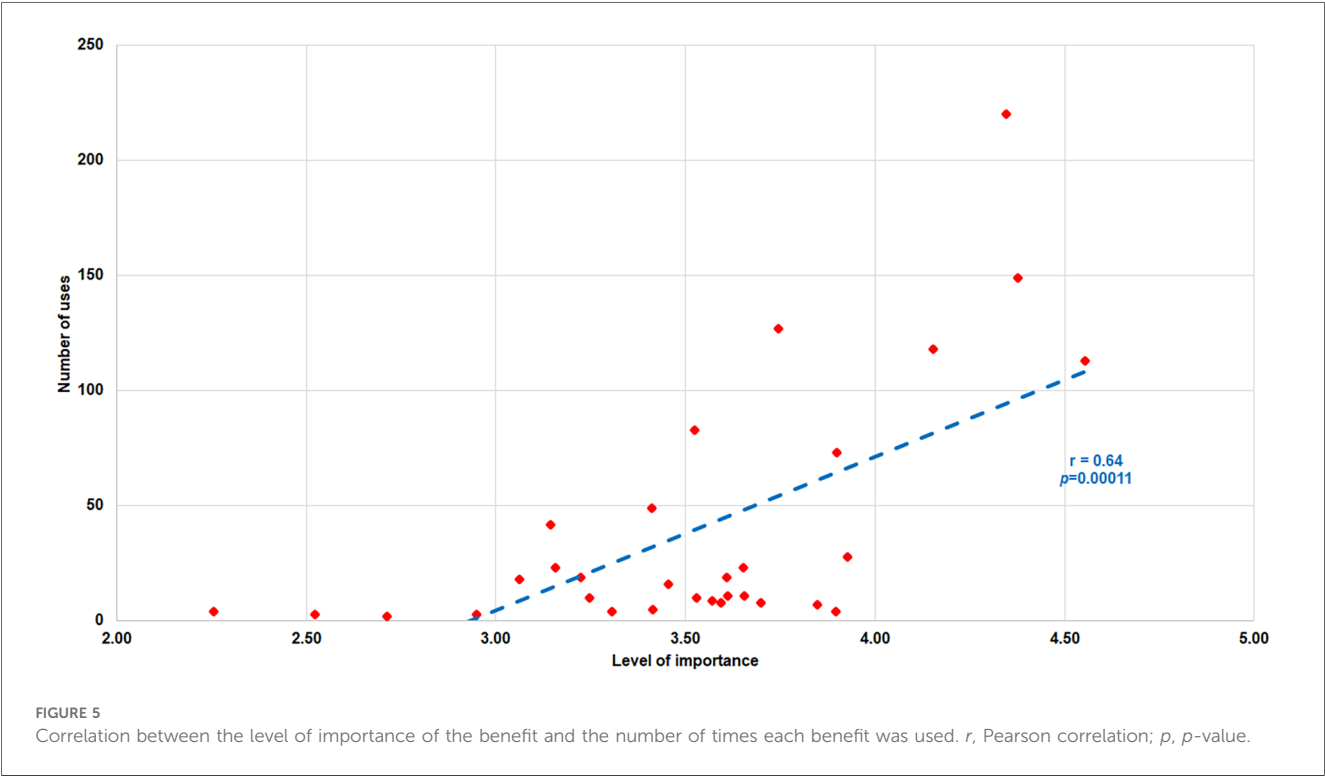
The main aim of this paper is to identify the current situation of elite university athletes in Spain, their characteristics, concerns, interests, and challenges in combining their sporting and academic careers.

To this end, a number of different areas pertaining to the characteristics of DC students have been addressed. It has been determined that the average age of these students is 21.53 years old. There is an approximately equal number of men and women. The majority of them are pursuing a Bachelor's degree. There is considerable variation in the types of sports they engage in. Approximately 60% of them are concentrated in 13 sports. Similarly, the time dedicated to study and sport on a weekly

TABLE 3 Valuation of benefits by DC athletes.

	Benefits	LI	NU	$LI \times (NU/TAS) \times 10$	GO	Q
ACADEMIA	Justification for absences	4.35 ± 1.19	220	23.26	1	1
Academia	Changing exam dates	4.38 ± 1.18	149	15.87	2	1
Others	Scholarships	4.55 ± 1.04	113	12.52	3	1
Sport	Free use of sports facilities	4.15 ± 1.40	118	11.92	4	1
Academia	Choose class groups	3.74 ± 1.60	127	11.57	5	1
Academia	Academic tutoring	3.52 ± 1.56	83	7.11	6	1
Sport	Extra credit for participation in university sport events	3.90 ± 1.52	73	6.92	7	1
Sport	Private use of sports facilities	3.41 ± 1.65	49	4.07	8	1
Academia	Partial enrollment	3.14 ± 1.70	42	3.21	9	2
Health	Physiotherapy	3.93 ± 1.50	28	2.68	10	2
Academia	Adaptation of speed of study	3.65 ± 1.52	23	2.04	11	2
Sport	DC tutoring	3.16 ± 1.67	23	1.77	12	2
Sport	Reservation of places for general sports courses	3.61 ± 1.58	19	1.67	13	2
Academia	Online courses	3.22 ± 1.68	19	1.49	14	2
Academia	Career advice	3.45 ± 1.51	16	1.35	15	2
Academia	Online exams (without changing dates)	3.06 ± 1.67	18	1.34	16	2
Academia	Extension of number of exam session	3.65 ± 1.57	11	0.98	17	3
Others	Discounts in meals	3.61 ± 1.64	11	0.97	18	3
Health	Specialized PE teachers	3.53 ± 1.58	10	0.86	19	3
Others	Housing	3.25 ± 1.77	10	0.79	20	3
Health	General medical services	3.57 ± 1.61	9	0.78	21	3
Others	Extra points in Erasmus evaluation	3.70 ± 1.61	8	0.72	22	3
Health	Testing (physiology, biomechanics, performance)	3.59 ± 1.56	8	0.70	23	3
Health	Nutritionist	3.85 ± 1.46	7	0.66	24	3
Academia	Remedial courses	3.41 ± 1.55	5	0.42	25	4
Health	Mental health support	3.90 ± 1.50	4	0.38	26	4
Academia	Extension of the criteria for permanency	3.31 ± 1.65	4	0.32	27	4
Academia	Separate academic group	2.26 ± 1.67	4	0.22	28	4
Others	Adapted catering service	2.95 ± 1.74	3	0.22	29	4
Academia	Specific courses (ex. time management, sports marketing & social media)	2.52 ± 1.65	3	0.18	30	4
Academia	Free semesters	2.71 ± 1.74	2	0.13	31	4

LI, level of importance; NU, number of uses; TAS, total answers of students; GO, general order; Q, quartile. Table sorted by the GO column.



basis has been identified, allowing for a comparison of the time invested in both activities with the level of sporting achievement. Furthermore, the benefits received and utilization of these have been studied in depth. In a novel addition, the mobility of these DC students has been addressed, with a high level of interest demonstrated. Throughout this section, these characteristics, perceptions and interests will be elaborated upon in depth.

In this study, 27 Spanish universities participated, with a total of 563 responses, of which only the data of 411 students were processed due to the fact that the remaining responses were incomplete (Figure 1). In the work of López de Subijana et al. (14, 39), 39 universities were analyzed to determine their support for elite athletes, with 575 of 2,378 PROAD athletes, not all of whom were university students. In 2024, according to the data provided by PROAD, 3,109 athletes have been supported by the program, of which 1,147 are pursuing higher education. Therefore, the sample analyzed in this work (411 active student athletes from 27 universities in Spain) is representative of this group in Spanish universities.

The first data point to be considered is the mean age of this group, 21.53 ± 3.14 years, which indicates that they are in a phase of mastering their sport with a high level of dedication while also pursuing higher-level studies (11, 25, 26, 42). It is also observed that the age range spans from 18 to 41 years old. There are 10 subjects, 2.43%, who are over 30 years old, which helps us understand that some athletes follow a different academic trajectory compared to other students (e.g., they start studying at the end of their sporting career, take breaks in their academic development, or extend their academic period). This phenomenon is addressed by projects focusing on the transition phase between a sporting career and integration into the labor market (29, 30, 43). The literature emphasizes that this transition is easier when higher academic education directly facilitates entry into the labor market (2, 10, 28, 44, 45). Therefore, the need to support this compatibility is a crucial action to be taken by higher education institutions.

We observed a balance between men and women, indicating a normal distribution within the group of DC students, with two subjects identifying as non-binary—a relatively new consideration in the sports world that is starting to gain recognition.

The average number of enrolled credits is 57.10 ± 13.72 , nearly a full academic year, which is 60 credits, with the majority of undergraduate students (94.44%). Doctoral students represent 1.5% and Master's students 4.14%. These values indicate that some elite athletes continue their studies beyond the Bachelor's degree, which aligns with the findings of Condello et al. (17), who analyzed the increasing number of elite athletes pursuing higher academic education. This trend is recognized by the Spanish government and is reflected in Law 39/2022, of December 30, on Sport, in its Article 24.2.a, which introduces a new rule extending access to higher-level studies for elite athletes, previously limited to degrees, to Master's or postgraduate studies. However, it should be noted that the criteria for access to higher-level studies are well defined in public universities, which adhere to state and regional regulations. In contrast, private universities may have different criteria adapted to their own regulations.

Thus, Law 39/2022 of December 30 on Sports confirms the model in which the Government acts as a regulator and facilitator to support the compatibility of studies and sports careers for student athletes pursuing a dual career (15, 31, 39).

The DC students who participated in the survey, as shown above, mainly study degrees in medical sciences (24.82%), followed by technological sciences (8.76 points) and economics (over 10 points). This data contrasts with the work of Condello et al. (17), who analyzed 476 university students participating in competitions of the International University Sports Federation (FISU) and the European University Sport Association (EUSA), where the most common fields of studies were Sports Sciences, followed by Business and Administration. This work employs the UNESCO coding system, which differs from that used by Condello et al. (17). This may be a contributing factor to the discrepancies observed in the fields of knowledge pursued by DC students. For example, the field of Sports Science is not represented in the employed coding, which suggests that these studies may be subsumed within the broader domain of Medical Sciences. In Spain, in the field of Medical Sciences offers a range of degree programs that are highly sought after by DC students, including Medicine, Physiotherapy and Nursing. Furthermore, there are degrees in Sport Sciences that are offered with a health profile, which is analogous to that of Medical Sciences, and others with a Social Sciences profile, which is more closely aligned with the Life Sciences in the UNESCO codes. Moreover, the admission requirements for these programs in Spain are highly competitive, reflecting the high level of demand (46). Consequently, this group may utilize the access route stipulated in Article 9.1 of Royal Decree 971/2007, of July 13, on high-level and high-performance athletes to gain admission to these programs, given that their grades may not meet the requisite standards for direct entry. These findings appear to align with our results, as 48% of DC students who participated in the study indicated that they gained admission to university studies through the access route regulated by Article 9.1 of Royal Decree 971/2007. In addition, the total number of students pursuing studies in Medical Sciences is 25%, while the figure for those studying Life Sciences is 12%, resulting in a total of 37%.

Regarding the type of sport practiced, it is encouraging to note that 8.03% of DC students participate in adapted sports. This figure contrasts with the 1.67% of students with functional diversity who are undergraduates in Spanish public universities, according to data presented by Hernández et al. (46). This group is typically not addressed in great detail within the context of dual career in universities. By making this group visible, we can enhance their social recognition and, consequently, the likelihood of attracting new student athletes to these programs. While the percentages are low, actions that make them visible can reinforce their promotion and full inclusion and normalization within the scope of the dual career in university.

One of the important elements to point out is the complexity of reaching a consensus on the definition of an "elite athlete" in the international framework (47). Authors such as Swann et al. (48) or McKay et al. (49) have conducted studies to define more objectively the level or grade of an athlete. In Spain, the term

“elite athlete” is defined in Royal Decree 971/2007, of July 13, on high-level and high-performance athletes and the criteria for being an elite athlete are well established. However, there are other athletes included in dual-career programs in universities, as Spanish universities, due to their autonomy, can go beyond the definition established by the Spanish law. In this case, 5.35% of the students are in dual-career programs at the regional level, 59.12% are at the national level and 35.52% are at the international level. The works of Condello et al. (17), with 426 athletes from 5 continents, and Capranica et al. (30), with 77 athletes from 5 countries, focus on athletes at the international level. In our case, the sample is extended to all students pursuing a dual career in Spanish universities.

For DC students at the international level, the highest percentage is for participation in world championships, with a significant number of athletes who have participated in the Olympic Games and who responded to the survey (Table 2).

Figures 2, 3 show the level of dedication to studies and sports. It is clear that the number of hours students devote to studying and sports depends on their level of sports. Thus, the higher the level of sports, the greater the number of hours devoted to sports and, in turn, the fewer the hours devoted to studies (Figure 2).

This information is relevant for understanding the distribution of time devoted to study and sport in this group of dual-career students, and it shows the differences in commitment according to their level of sport. Gjaka et al. (50) make a comparison between sport and university hours, differentiating between individual and team sports, and they show that students who participate in team sports devote a greater number of hours to university. A new line of research would be to analyze the time devoted to study and sport by sport level and to add the variable introduced by Gjaka et al. in 2024.

The findings indicate that as the level of sport participation increases, so does the amount of time spent on sport. International DC students were observed to engage in sport for 10 and 6 additional hours per week compared to regional and national students, respectively. Conversely, international DC students dedicate between two and eight fewer hours per week to academic studies than their regional and national counterparts. These findings align with those of Lupo et al. (23), indicating that the higher the level of sport, the greater its impact on the time allocated to studies. Consequently, these students require enhanced support and benefits from higher education institutions to effectively balance their academic and sporting commitments.

If we focus on the international level (Figure 3), the hours devoted to studies are quite balanced, except at the Olympic Games level, where there is a difference between the time devoted to sports and to studies, with more than twice the weekly time devoted to sports compared to studies. However, there are significant differences in the number of hours spent studying. The group of Olympic athletes devotes significantly less time to studying than athletes participating in the World Championships and those participating in the European Championships. This significant difference also occurs between students participating in the World Championships and those participating in the European Championships (Figure 3). It is important to note that the majority

of Olympic athletes view athletics as a profession, which significantly influences their lifestyle. For this group, dedication to sport is akin to a full-time job (35 h per week), which poses a challenge in allocating time for academic pursuits. However, it is noteworthy that despite this lack of dedication to study (15 h per week), they are enrolled in 56.80 credits, which is equivalent to a full academic year. These results show how dedication to sport influences the possibility of devoting hours to study, so that the higher the sporting level of the student, the more they need measures to balance their academic and sporting life.

The total hours of study and sport are 46.63 h/week at the regional level, 46.93 h/week at the national level, and 49.22 h/week at the international level. If we add 56 h/week of sleep at each level, according to the sleep recommendations for adults and athletes (51–53), we have approximately 9–9.45 h/day left for their “free” time. This is reflected in Figure 5, where the DC students indicate that the issues most affecting DC athletes are clearly the time spent on transfers and their limited free time. Therefore, as in previous studies (17, 39, 40, 50, 54, 55), it is evident that time management is one of the most significant challenges for DC athletes. However, other issues also appear, such as missed training, missed classes, or financial problems. To address some of these issues, several authors (12, 29, 39, 56) advocate for distance learning as a solution. We believe that this is an interesting proposal, but it must be adapted to the profile of the university. For example, face-to-face universities, although they can use distance learning as a complementary tool, have limitations in implementing fully online studies. In contrast, universities that are already virtual or non-face-to-face by design have a model defined for offering online courses.

A total of 70 different sports modalities were detected in the set of responses, which aligns with the work of Condello et al. (17), where track and field is the most practiced sport, followed by sports such as swimming, basketball, and football. Although handball is a relevant sport in Spain, in the work of Condello et al. (17) there was no handball competition, so it is not included among the most relevant sports. Instead, baseball appears, which is not a sport with a high number of participants in Spain.

This paper examines 31 benefits offered by universities to help students manage their dual careers. The benefits analyzed are based on the work of Hernando et al. (40), which describes 31 benefits offered to varying extents in European universities. The analysis considers the level of importance assigned by this group to each benefit and whether they have used it to combine their sporting career with their academic studies. It is important to note that the benefits analyzed are those that facilitate the continuation of an academic career alongside a sporting career, i.e., they pertain to active students pursuing a university degree. Thus, benefits such as the allocation of 3% of university access places are not considered in this work, as this benefit aids access to studies, not their continuation. This distinction is important to emphasize in the context of the university because the support for DC student athletes begins after their enrollment.

The 31 benefits are divided into 4 blocks: Academia, Sport, Health and Others, as described by Hernando et al. (40). In Table 3 we observe that scholarships are considered the most important

benefit, followed by changes in exam dates and justification of absences. The least important benefits include having a separate academic group, specific courses, and taking semesters off.

On the other hand, the most used benefits are the justification of absences, changes in exam dates, and the option to choose a class group. The least used benefits are having semesters off, taking specific courses and having an adapted catering service.

The applied analysis enables us to understand the importance that DC students attach to a benefit offered by the university and, in addition, determine whether they use this benefit. With this dual perspective, the benefits can be ranked by combining both results and classifying the benefits according to both variables: the level of importance and the number of students who use it. Thus, the benefits can be ranked and the universities can identify how best to support DC students by providing them with the most important and most used benefits. The ranking resulting from combining these two variables differs from the individual ranking based on only one of the two criteria. Therefore, in the final ranking, we find that justification for absences, changes in exam dates, and scholarships are the top three benefits, while adapted catering, specific courses and free semesters rank lowest. This criterion for analysis has not been used in previous works (13, 30, 39), so this study provides a new objective approach that facilitates decision-making by higher education institutions.

In this dual-perspective analysis, the question is: if DC students think a benefit is important, do they use it? To answer this, an analysis correlating both variables was conducted. The result showed a positive, strong, and significant correlation, suggesting that Spanish students are very consistent in their choices and that they tend to use what they consider very important, when it is offered to them. The correlation was found to be 0.64

compared to a value of 0.74 in the work by Hernando et al. (40). Although both results are high, their difference may be due to the fact that the list of the 31 benefits originates from a project involving five universities in Europe, which have a different context and idiosyncrasy. As a result, conducting the survey on these benefits exclusively in one country reduces the degree of correlation between the two variables. Nevertheless, it is important to emphasize that students take advantage of what is offered to them and what is important to them. A clear and comparable example is the benefit of scholarships: in Spain, scholarships have the highest importance value and yet are not the most used, perhaps because not all universities offer this benefit to DC athletes. This contrast is even more striking when we analyze the case of European universities in Hernando et al. (40), where scholarships are the third most important benefit, but, when the two criteria are combined, scholarships rank fourteenth because their use is low, indicating that few universities have a scholarship program for DC students. Thus, this analysis provides universities with objective and adjusted criteria for more effective decision-making.

Finally, it is important to highlight the interest of DC students in participating in a mobility program within the Erasmus+ program. Eighty-four percent of DC students have expressed their interest in this international mobility. This interest is reflected in the work of Fuchs et al. (57), which involves students from five different countries, and in Ryba et al. (58), which analyzes the profiles, interests and problems associated with transnational mobility. Spanish students also show this interest, knowing that this predisposition is conditioned by two very decisive elements: the continuity of their sporting career and, closely following this, the continuity of their academic career (Figure 6). The other selection criteria are less representative

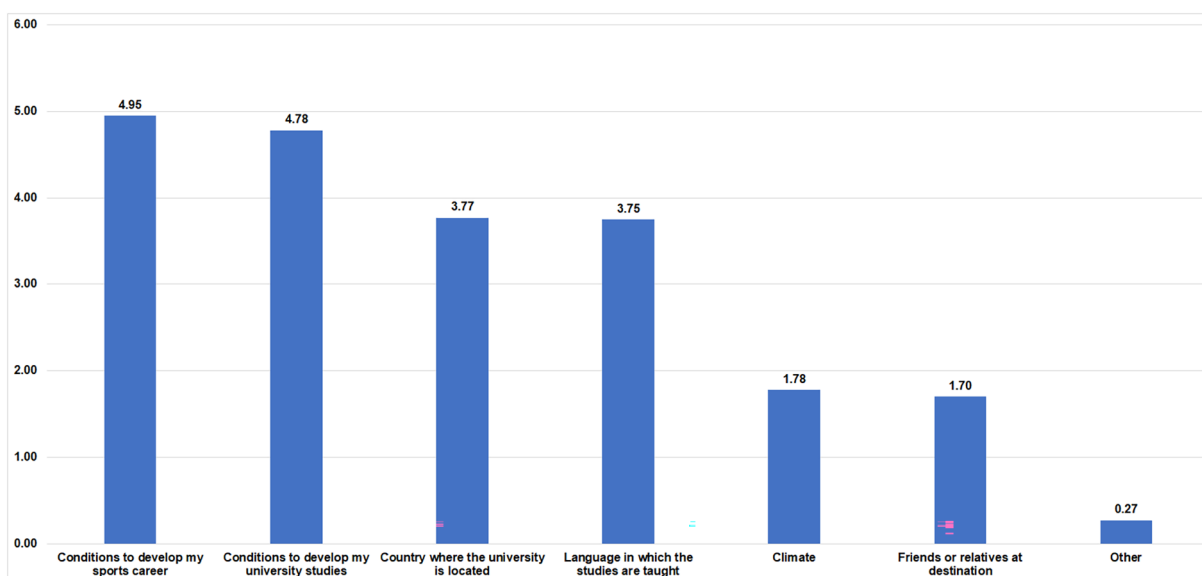


FIGURE 6
Criteria to choose a university for an Erasmus+ exchange.

when choosing a university for transnational mobility. These two very important conditions for DC students show their commitment to their dual career. It is one of the great strengths of this group, so any action by the Spanish university to support students in balancing these two facets will help to create a better national and European citizenship and improve their sports and academic career.

The main limitation of this study is the sample collected. The fact that 411 valid responses were obtained from 27 Spanish universities out of the 78 represented in the Spanish University Sports Committee introduces a small bias that limits the generalizability of the conclusions for Spanish universities. Although 563 responses were received, not all of them could be processed because they were not sufficiently completed. In future research, it would be beneficial to obtain more input from the expert personnel on dual career in Spanish universities and to schedule the period of availability of the study, taking into account the specific casuistry of Spanish universities. This approach could potentially enhance the sample size and yield results with greater statistical significance.

The continuation of lines of research that will delve into various aspects in Spanish universities, such as adapted sports, mobility programs, and labor market insertion, will contribute to the advancement of knowledge in these fields. As previously stated, an expansion of the sample would be advantageous for the collection of more comprehensive data and the examination of specific details, such as the number of dual-career athletes who engage in adapted sports modalities and the unique challenges they face in balancing their academic and athletic pursuits. Furthermore, it would be beneficial to ascertain whether dual career students engage in mobility programs during their university studies and, if so, how they reconcile this with their participation in sports. It would also be valuable to understand their experiences, the benefits they perceive, and how they manage to maintain their academic and sports performance. It would also be beneficial to investigate how DC athletes position themselves professionally in the labor market and the advantages they gain from pursuing a dual career trajectory for their professional advancement.

5 Conclusions

It can be affirmed that there is a specific identity among student-athletes' dual career in Spanish universities, which necessitates a set of measures to help them balance the demands of combining their sports career with their academic career.

In Spain, the government acts as a regulator and facilitator, enabling DC student athletes to access and combine their studies with their sports careers. However, it is the Spanish universities, within the framework of their autonomy, that are responsible for implementing various actions to develop and expand programs for elite athletes, both in terms of benefits and access criteria to their own programs.

This document enables the identification of the aspects deemed most pertinent to the student, the resources they utilize and the

obstacles they encounter. The outcome is a pertinent instrument that can be employed by the university to incorporate actions within its benefit program for DC students that are most impactful to them. For instance, the provision of scholarships for their particular expenses and the accessibility of sports facilities at no cost facilitate the reduction of travel and enhance time management for the student athlete, a significant challenge within this demographic.

There is a significant number of elite athletes pursuing higher education, with a balance between men and women, spanning a wide range of sports disciplines. Notably, some DC student athletes participate in adapted sports. The establishment of a dedicated structure for DC athletes within the university provides a centralized point of reference for them, offering guidance, support, and assistance in navigating the requirements of the elite athlete program as approved by the university's governing bodies.

A new methodology has been developed to assess the benefits offered by universities to DC students. This method combines the students' opinions on the importance of the benefit and its usage, resulting in a ranking with dual criteria that facilitate decision-making when a university decides to include or promote a benefit. There is a positive, strong and significant relationship between the perceived importance of a benefit and its use—a relationship that can be further strengthened if universities tailor these benefits to meet the needs of student athletes.

It should be noted that these DC students demonstrate a high level of interest in transnational mobility and that their main concerns being the continuity of their sports and academic careers, underscoring their commitment to both.

Data availability statement

The datasets presented in this article are not readily available because the datasets presented in this article are not readily available because the traceability of responses can lead to the identification of the subjects. Partial data are available upon request to the corresponding author. Requests to access the datasets should be directed to Carlos Hernando, hernando@uji.es.

Ethics statement

The studies involving humans were approved by Ethics Committee of Universitat Jaume I of Castellón (CEISH/27/2022). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

CH: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing –

original draft, Writing – review & editing. MR-M: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. MPM: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fspor.2024.1507859/full#supplementary-material>

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The experience of Italian student athletes enrolled in a dual career university program: the challenges of employability

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Introduction: In the so-called “new career era,” career transitions and employability have attracted growing attention. For elite athletes, the Dual Career experiences may be regarded as a protective factor during various career transitions, with the end-of-career transition being closely linked to employability. This contribution aims to explore the dual career paths of athletes through the lens of graduate employability, as perceived by the individuals themselves. Thus, employability can be considered as an important resource for athletes during the many transitions that characterize their sports careers.

Methodology: Study participants included 21 student-athletes participating in the first four editions of the Dual Career program at an Italian university. Using a phenomenological-interpretive approach, semi-structured interviews and focus groups were conducted with participants. A top-down and bottom-up content analysis was conducted using Nvivo software for qualitative analysis.

Results: The data derived from interviews and focus groups are presented with reference to four dimensions—Human Capital, Social Capital, Individual Behaviors, and Individual Attributes—that, according to Clarke’s integrated model, impact perceived employability in graduate students, including student-athletes. The results highlight traits shared with classic university students while, at the same time, emphasizing peculiar sub-dimensions.

Discussion: This study integrates the constructs of employability and career transitions in the target group of university athletes. Through the Clarke’s model, which offers a complex and multidimensional definition of employability, this research explores why the dual career pathway represents a resource for athletes during transitions. The results can serve as a first step in developing good practices for supporting and guiding student-athletes enrolled in Dual Career programs, by addressing aspects recognized in the scientific literature as practical implications for supporting employability development.

KEYWORDS

graduate employability, athletes, dual career, career transitions, student-athletes

1 Introduction

Contemporary labor markets are undergoing significant economic changes (e.g., globalization) as well as technological changes (e.g., the rise of artificial intelligence), leading individuals to increasingly change jobs, employers, and/or professions multiple times throughout their careers (1, 2). In the so-called “new career era,” career

transitions and employability have attracted growing attention from scholars in the fields of professional and organizational psychology (3). While contemporary career literature implicitly or explicitly assumes a strong connection between the two concepts, there has been limited theoretical or practical exchange between the two fields [(4), p. 799]. In the contemporary career context, it is generally acknowledged that there is no ideal career path characterized by a set of predictable transitions that all workers go through at specific points in their lives (5). Career transitions, recurring throughout the lifespan (6), thus instead refer to every move from one position to another within social spaces (7). The notion of “one life, one career” (8) is shifting towards much more complex and idiosyncratic career models, making the individual the central actor (5, 9).

One population particularly affected by career transition dynamics is that of elite athletes—that is, sportsmen and sportswomen competing at the national or international level. During their sports careers, which are characterized by brevity compared to other professions, athletes face numerous transitions. Sports transitions can be normative (i.e., predictable, such as the Junior to Senior transition), non-normative (i.e., unpredictable, such as career-ending injuries) (10), and quasi-normative (i.e., predictable transitions for a group of athletes, such as cultural transitions (11)). The Holistic Athletic Career Model (12) explores the development of athletes through five different levels—athletic, psychological, psychosocial, academic/vocational and financial levels—which are characterized by various transitions faced by the same individual.

The inclusion of an academic dimension in the study of athletic careers makes it possible to contextualize both athletic and academic careers (13). In recent years, increasing attention has been paid in the sports context to the concept of Dual Career (DC), understood as the opportunity for elite athletes to successfully initiate, develop, and terminate both a sports and educational or work-related path (14, 15). Dual career athletes manage the demands of education, training, and future employment alongside their athletic careers, all within the larger frameworks of sports management and education (16, 17). DC is seen as a challenge for athletes and their environment (18), but it can also be considered as a protective factor for identity definition during critical transition moments, especially at the end of their careers (19, 20). Among the various career transitions, one of the most delicate for athletes is retirement. Sooner or later, every elite athlete faces retirement, and athletes' retirement is a multifaceted, complex, and subjective phenomenon (21, 22). Researchers have examined various factors (e.g., athletic identity, voluntary career termination) influencing the quality of athletes' transitions (20, 23, 24). In this sense, research has highlighted the importance of transition in athletes' lives and the challenges they face in their post-athletic life (25). These challenges include uncertainties related to employment and potential lifestyle changes; feelings of vulnerability in managing changes in their expectations, goals, and plans; anxiety about the unknown (26); and barriers to reaching a satisfactory job position (27). In this context, DC has the potential to support athletes' readiness for a working life after sports

retirement, as the majority of them must rely on another professional occupation to sustain themselves after sport (28).

The theme of end-of-career transition is closely related to the construct of employability, which has evolved over the years from a strictly individual perspective determined by the human capital needed to enter a specific professional field and have a linear career (5) into a “multidimensional, lifelong, and life-wide” phenomenon (29, 30). The personal perception of opportunities in the internal and external job market is increasingly emphasized, as well as how this perception is influenced by individual and contextual factors and is related to career decisions and subsequent outcomes (31). A target group that is strongly interested in the construct of employability, due to the urgency of employment, is that of graduates. Thus, Higher Education Institutions are key actors in the DC reality concerning employability development (28).

Over the years, two consolidated models of occupational capital have been established and verified to prepare university students for the transition to the job market through empirical evidence. Tomlinson's model (32) defines graduate capital as an accumulation of five forms of capital: human, social, cultural, identity and psychological. Clarke (33) defined an integrated model conceptualizing employability “*as comprising the human capital, social capital, and individual behaviours and attributes that underpin an individual's perceived employability, in a labour market context, and that, in combination, influence employment outcomes*” [(33), p. 1931]. Human Capital is a core component because the development of skills and competences is considered significant for tertiary educational paths, being associated with occupational expertise. Combined with Social Capital and its components—university ranking, network and social class—this form of capital enhances graduate employability. Individual attributes and behaviors are acknowledged as essential to achieving career success. Finally, the current labor market shapes both perceived employability and graduate employability.

For elite athletes, the issue of employability is a continuous concern throughout their sports careers, primarily due to widespread contractual instability in the sports field, difficulties in finding sustainable work compatible with their sports career, the complexity of seeking alternative employment following injuries, and the challenges female athletes face in continuing their careers after pregnancy (34, 35). One of the primary challenges in the European discourse on Dual Career is to promote “sport and education within the business community in Europe” [(18), p. 86]. The construct of employability can thus be thought of as a bridge between the sports and educational/work-related paths at various points in the sports career, including: when they are still active in elite sports (active phase), when they are planning to retire or have already retired and are not (yet) employed in their post-sports career (retirement phase), and when they are employed in their post-sports career (new career phase) (36).

In summary, student-athletes face numerous challenges and transitions at different levels during their lives. From a holistic perspective, academic and sport dimensions are considered

integrated and mutually influential. Furthermore, given the brevity of athletic careers, athletes face the need to integrate into the labor market upon retirement. As highlighted by Stambulova and Wylleman (18), graduation from university is considered as a transition in which athletes play an active role in shaping their career paths. We thus hypothesize that DC may serve as a supportive factor in the employability development process for this specific target group. As the target group are also students, the construct of graduate employability has been chosen as a reference, particularly according to Clarke's (33) model.

The present study addresses the challenge posed by Stambulova and Wylleman (18) regarding athletes' employability challenges, linking it to dual career in sport and education. This contribution aims to explore the dual career experiences of athletes through the lens of graduate employability, as perceived by the individuals themselves. Hence, two research questions will guide this study:

- (1) Which dimensions of DC are connected with graduate employability?
- (2) How can the DC experience serve as a resource for athletes during the many transitions that characterize their sports careers?

2 Methodology

2.1 Participants

A purposive sampling technique was applied to involve 21 student-athlete participants (9 male and 14 female) from the first four editions of the Dual Career Program at an Italian University. Having participated in the Program for at least one year was set as the only inclusion criterion.

Participants practiced 17 various sports, both individual (e.g., motocross, karate, water skiing, wakeboarding, etc.) and team-based (e.g., volleyball, rugby, water polo, etc.).

Sixteen of the student-athletes were studying for a Bachelor's degree, four for a Master's degree, and one for a Single-cycle Master's Degree related to 6 different Faculties (e.g., Economics, Educational Sciences, Political and Social Sciences, etc.) and 11 diverse academic programs (e.g., Economics and Management, Sports and Exercise Sciences, etc.).

2.2 Procedure and instruments

Based on a phenomenological-interpretive approach (37), seven semi-structured interviews and three focus groups were conducted with the participants. Each focus group involved from three to six student-athletes.

The aim was to explore participants' perception of the DC Program attended and how it could develop their employability and serve as a resource for future career transitions. The interview and focus group guides were identical, including questions about their sports and academic careers and the

intersections of the two paths, as well as the skills, learning, and awareness developed within them. The interviews and focus groups were conducted from 2022 to 2023 and lasted between 25 and 50 min.

The study's objectives were explained to all participants, and they were assured of the confidentiality of their responses, the anonymity of data processing, and their right to withdraw at any time. All provided their informed consent, and various tools (i.e., video calls) were used to overcome some scheduling difficulties due to the sports and academic commitments of the student-athletes. The interviews were audio-recorded, transcribed verbatim, and subjected to content analysis. The study was approved by the Ethics Committee of the Department of Psychology of the authors' university.

2.3 Data analysis

The analysis was conducted by the first author using NVivo software for qualitative analysis. A coding framework based on Clarke's integrated model of perceived employability in university students (33) was created for this purpose. Relevant themes selected were (a) human capital, (b) social capital, (c) individual behaviors, and (d) individual attributes. Following an initial familiarization with the data, they were coded by applying the four identified categories.

Subsequently, according to the standard IPA technique (37), transcriptions were analyzed using a bottom-up approach, remaining open to codes emerging from the data. Initial coding was performed, identifying significant aspects in each transcription, and codes were later aggregated in themes. The analysis was then verified and revised multiple times by all authors until a triangular consensus was reached (38, 39).

3 Results

Data derived from the analysis of interviews and focus groups are presented with reference to four dimensions—Human Capital, Social Capital, Individual Behaviors, and Individual Attributes—that, according to Clarke's integrated model (33), impact perceived employability in graduate students, including student-athletes. We consider it appropriate to use these dimensions because they refer to a subjective dimension of employability which we believe is consistent with the target group of student-athletes, the DC program, and the methodology used.

3.1 Human capital

Despite the ongoing debate regarding the transferability of soft skills, their development remains a marking peculiarity of graduates (33).

In the present study, the participants defined the dimension of competences included in Clarke's model (33), highlighting the skills and abilities that a Dual Career path allows them to

develop. Foremost among these is organization, understood as the ability to balance two very demanding paths while thinking ahead to future competitions and exams:

“The ability to organize oneself not only in the short term, during the week, but also in the long term, thinking about the competitions I already know I will participate in, as well as the exams and assessments that I have in my study plan.” (M, swimming)

Coping skills and problem-solving also emerge in interviews as competences that can be mutually reinforcing across the two paths, helping student-athletes to face challenging situations:

“The ability to face an exam as you have learned to face a competition, a match.. you learn how to handle an exam or a degree or other important commitments..” (M, canoeing)

“Being able to solve problems quickly, as being exposed to various situations, they can solve a problem quite quickly.” (F, sport dance)

Others underlined the development of stress management competence, understood as

“The ability to manage various pressures from all points of view, from sports, parents, coaches, university, friends.” (M, sport dance)

Participants also considered teamwork as a fundamental competence, because participating in project gives them the feeling of belonging to a team that can support them and to which they can turn for help in achieving their goals.

The sports experience of student-athletes integrates the work experience of internships and traineeships in Clarke’s model (see [Figure 1](#)) and enhances the development of specific competences and skills:

“If we think about a student who only studies, in practice, he devotes himself full-time to his studies. On the other hand, a professional student-athlete performs two full-time jobs in one day and would like to do both well.” (M, water skiing)



3.2 Social capital

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University reputation and the possibility of activating networks are relevant elements concerning student-athletes’ perception of their employability. The participants’ university offers access to excellent services and contacts with companies, fostering internship and future employment opportunities.

It could also be suggested that unique features of the DC Program can further enhance social capital. These including meeting sessions with other student-athletes are planned and the distinctive DC experiences of student-athletes that are shared on the university website.

Additionally, and specific to the target of student-athletes, the support received from tutors of the DC Program emerges as a significant dimension of social capital. Tutors not only offer organizational assistance but also provide emotional and psychological support:

“I thought I could do everything without help, but the support I received from other people during this path.. made me realize that I am not alone.” (M, fencing)

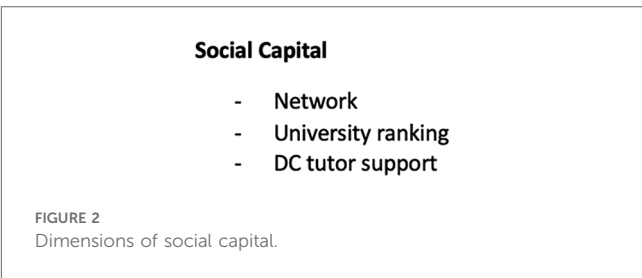
Social class dimension did not emerge as a significant theme in this study (see [Figure 2](#)).

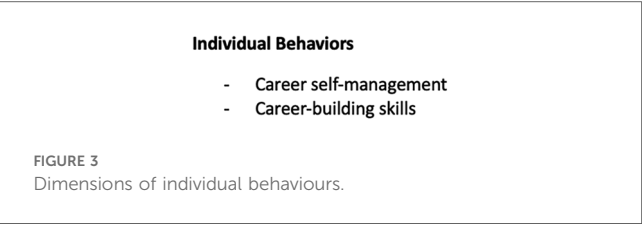
3.3 Individual behaviors

The sub-dimensions of career self-management and career-building skills find ample representation in the words of student-athletes (see [Figure 3](#)). Regarding the former, a valuable element in the path is represented by the support to student-athletes in developing self-awareness and emotional intelligence, and in designing their future

“I have become more aware of what I really wanted and how to achieve it..in fact, I decided to change coach because it had been a long time since I felt comfortable with the old one.” (F, athletics)

“It’s like putting myself in someone else’s shoes who is in my situation.. this emotional intelligence that I would have had





with someone else, I had it with myself.. because I had it with myself, I was able to develop it to have it with my friends or other people.. I must say that I started to look at things from other emotional perspectives.” (M, rugby)

The sub-dimension of career-building skills also emerged as central in the DC path, particularly in terms of seeking help, determination, and resilience:

“Even asking for help may seem obvious but it isn’t, both in university and in sports. You have to accept your limits and understand that if you continue like this, you can also fall..” (F, waterpolo)

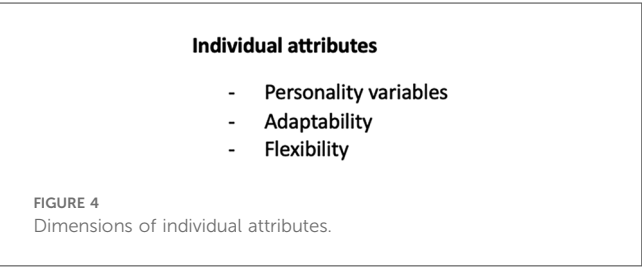
“It’s about having hunger, we want to get there, having the determination to achieve a goal.” (F, ski)

“Maybe I’m saying something obvious, but for me, resilience comes to mind in the sense that there are more failures than successes, and it’s the ability to always put oneself on the line, the willingness to do it over and over again.” (M, swimming)

3.4 Individual attributes

Personality variables constitute a sub-dimension that recognizes the individual traits of each student-athlete, which impact their self-perception and the path they are facing. Additionally, both adaptability and flexibility are skills that each student-athlete develops, both during their sports career and once they have undertaken the DC (see Figure 4):

“And then there’s flexibility in the sense that my days were very intense and I knew I didn’t have a routine. I am usually rigid



and follow a routine, and I have learned to be flexible.” (F, Karate)

“Basically, I changed coaches every 2 years, each has their own method and style, there are the more sympathetic and the less sympathetic ones, you have to adapt to what they ask you for at that moment and try to make your teammates accept it.” (F, rugby)

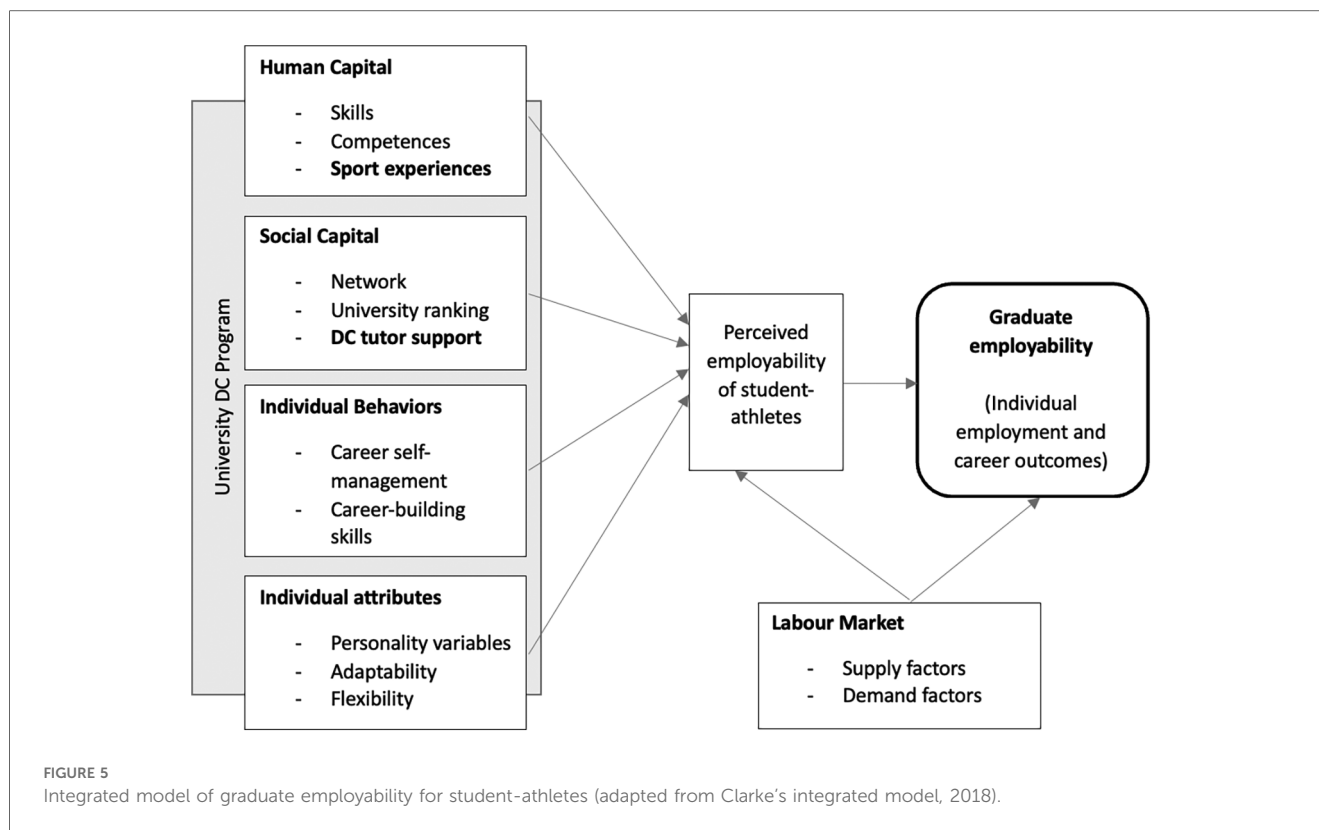
4 Discussion

This paper presents a qualitative study focused on exploring student-athletes’ perceptions of their DC experiences through the lens of graduate employability.

Findings highlight that the construct of employability in the target group shares commonalities with “classic” university students but, at the same time, emphasizes peculiar sub-dimensions. Foremost, the support provided to student-athletes, not only from an organizational point of view but also (and especially) psychosocially, emerges as crucial in the process of attributing meaning to both sports and academic experiences.

Within a DC path, the core components of graduate employability summarized in Clarke’s model (33) can be enhanced (see Figure 5). The Human Capital of student-athletes is expressed through the development of competences and skills that are both enhanced and used in academic and sports domains. Furthermore, sports experiences are considered similar to the work experiences described in the model. Attending a prestigious university and engaging in diverse networking opportunities beyond sport, combined with the unique relationship with DC tutors, enables student-athletes to cultivate Social Capital. Finally, Individual Attributes and Behaviors of student-athletes require support in developing self-awareness and reflecting on these dimensions.

It is noteworthy that these dimensions are central in preparing the athlete for typical career transitions, both athletic and non-athletic. Consequently, employability could be understood in a broader sense than the early conceptions of “possession” (40), as a dimension that facilitates effective transition. In light of the fact that athletes’ career development is characterized by diverse transitions across different developmental levels (12), student-athletes significantly emphasized the importance of organizational guidance (e.g., planning academic and sports commitments) and psychological support provided through the DC Program for successful transitions in both athletic (i.e., changing teams and coaches) and non-athletic (i.e., from high school to university) domains. Planning for retirement, developing multiple identities, and preserving a broad network of social relationships in both sporting and non-sporting environments are essential processes that guide successful transitions within and outside sport (41). Moreover, student-athletes defined various competences (i.e., organization, coping skills, problem-solving, stress management, and teamwork)



developed through DC experiences that could be considered as resources during career transitions.

Conceiving sports and athletic careers as places and spaces for personal and professional growth, DC Programs are in line with professional development interventions conducted outside the curriculum (42). The role of DC tutors in guiding student-athletes in reflecting on themselves—developing strong self-awareness and understanding their strengths, areas for improvement, and values, which are conceived not as fixed but as continuously evolving—represents an important element to move in the direction of identity openness.

The construct of identity plays a significant role in the effectiveness of a transition (43), particularly in the case of athletic career transitions. In major cases of athletes engaging in elite competitions, the prevailing dimension is that of athletic identity. Defined as the degree to which an individual feels like and thinks of oneself as an athlete (44), athletic identity is positively associated with athletic performance. It is also one of the main factors affecting athletes' personal and psychological development, subsequent adjustment difficulties following retirement from sports, post-injury emotional distress, and social isolation (45). When individuals approach the end of their athletic career, they tend to proactively reduce the personal importance of their athletic identity and explore neglected, abandoned, or entirely new dimensions of their identity. This creates a conflict in the athlete between *what is* and *what they want* or *what should be*, stimulating them to mobilize resources to cope with the challenges of the process. Moreover, in a

population that by definition focuses on short-term goals and the “here and now,” increased planning for the future is an element that impacts perceived employability and prevents some pitfalls of end-of-career transitions. The typical mode of an athlete is to act in an “interventionist” manner on the problem at hand. Being in a DC pathway can help the athlete in building long-term thinking and broader planning by shifting focus to the “there and then.”

If employability capital can be developed through person-centered pedagogical practices (46), problem-based learning (47), and opportunities for personal reflection (48), being in a pathway that works on developing self-awareness and at the same time develops an identity alternative to the athletic identity (e.g., academic or professional) can truly represent a protective factor in transitions. Employability is therefore closely linked to individuals' identity and the transitional moments they go through (49). With this approach, the typical change experienced during transitions will not be understood as mere adaptation and management of new life events but, rather, as a real transformation that concerns one's existence and, consequently, one's identity (49).

The goal of reflexive practice (50) should therefore be to develop a flexible identity construction that adapts well to “liquid modernity” (51) and promotes thinking about a life plan, whether inside or outside of sports. An important element is thus to activate awareness and reflection on how the two paths—academic and athletic—can be intertwined and not just parallel. Parallelism implicitly brings with it the idea of two things that

never touch; in contrast, the idea we support within DC pathways is that what develops in one context, if reworked, can constitute a resource for the other. So far, we have only considered dimensions pertaining to the intrapersonal sphere, which includes the constructs of identity, awareness, and long-term thinking. However, a more contextual and systemic perspective should not be overlooked. The literature highlights the interconnected and interdependent nature of different actors operating within a work ecosystem (52). In the Employability Capital Growth Model (ECGM), Donald and colleagues (42) have highlighted how graduate students, educators, career professionals, and employers are the main stakeholders; in the target group of student-athletes, key actors from the sports world should be added, such as coaches, agents, and managers.

To move towards the dimensions highlighted in the results and discussion, a change is needed in the approach characterizing the sports/education and sports/labor world dichotomies. The tendency for these contexts to not communicate and to view each other with suspicion and distrust, in the belief that one takes away space and energy from the other, should be replaced with a more harmonious integration between sports and education. This approach will make it possible to develop athletes with separate but interconnected identities, which can constitute an invaluable resource even in the delicate moment of end-of-career transition.

5 Limitations

This study focuses on student-athletes enrolled in the DC Program of a single university, which represents only one of the network of Italian universities committed to promoting DC programs to students. It would be interesting to extend the study to other DC programs, both Italian and European, to explore whether the specific design and development approach of each university impacts dimensions related to perceived employability and, consequently, the typical transitions of the target group. Additionally, the study provides a snapshot of the present moment without longitudinally monitoring the subjects' developments, transitions, and future employment as an outcome of employability. Further research could also develop this temporal dimension by collecting data from the same subjects at multiple points in time.

6 Conclusions and practical implications

To the best of the authors' knowledge, there are no studies in the literature to date that integrate the constructs of employability and career transitions in examining the target group of university athletes. These constructs, which can be seen as two sides of the same coin, seem to represent an

interesting lens for designing and developing support services for student-athletes and preventing unemployment and difficulties at the end of their sports career and during the transitions they experience. The results of the present study can thus serve as a first step in developing best practices for supporting and guiding student-athletes enrolled in Dual Career programs by addressing aspects recognized in the scientific literature as practical implications for supporting employability development, such as goal-oriented behaviors, taking ownership of one's career, developing networks, engaging in continuous and lifelong learning, and understanding the value of work experience. Thus, the construct of employability, in its broader definition beyond mere possession of skills useful to the labor market, can serve as a common ground for dialogue between the sports, educational, and (in the future) labor worlds. This is true not only at the specific moment of end-of-career transition—when the question of “who am I now” and the activated skills becomes urgent and emergent—but throughout the athlete's whole sports and educational journey, encompassing various but equally important transitions, shaping athletes' perceived employability.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Ethics Committee for Psychological Research (CERPS)—Catholic University of the Sacred Heart. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

MB: Conceptualization, Data curation, Formal Analysis, Investigation, Writing – original draft, Writing – review & editing. AF: Writing – original draft, Writing – review & editing. CG: Writing – review & editing, Conceptualization. CD: Writing – original draft, Writing – review & editing, Conceptualization, Formal Analysis.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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A study on the implementation of dual career at European higher education institutions: the student-athletes' and experts' views

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Introduction: The holistic development of elite athletes is a *priority* within European sports policies, necessitating a coordinated approach to dual career support. This study evaluated the perspectives of both university experts and student-athletes (S-As) on various dual career aspects, aiming to provide actionable insights for improving policies within European higher education institutions (HEIs).

Materials and methods: Data was collected through an online survey tailored for HEI experts and S-As across multiple countries. A total of 46 HEI experts and 321 S-As responded to the survey. The role of the country of origin on each dual career aspect for S-As was investigated using a MANOVA, followed by an ANOVA and *post hoc* analyses using Tukey's test when an effect emerged. The data from HEI experts and comparisons between S-As and HEI experts were handled descriptively due to the violation of assumptions of homogeneity of variances and sufficient sample size.

Results: The study revealed significant trends and disparities in the availability and quality of support services. In particular, logistic, and financial support, and other support/policies areas showed a significant effect for S-As countries of origin, with Romanian and Serbian S-As generally reporting better scores and Italian and Spanish worse. In general, HEI experts rated dual career provision areas more favorably than S-As.

Conclusion: This study underscores the importance of integrating both HEI expert and S-As' perspectives to develop effective dual career policies. Tailored interventions and enhanced communication about available resources are crucial for improving the dual career experiences of S-As across Europe.

KEYWORDS

dual career, student-athletes, policies, programmes, sport and education, support entourage

1 Introduction

The holistic development of elite athletes is a priority in sports policies of the European Parliament and globally (1–6), as it is essential not only for their immediate success but also for their long-term career prospects beyond athletics. The European Union (EU) is a geopolitical entity made up of 27 member states with different languages, cultures, regulations, and laws, retaining full authority over education and sports policies. Consequently, the EU implements a non-directive strategy aimed at fostering and facilitating coordinated intergovernmental collaboration to ensure a unified approach to development in these sectors (1–4, 7). In particular, the Bologna Process and the European Community Action Scheme for the Mobility of University Students (ERASMUS) have fostered structured cooperation among European higher education institutions, enhancing student, teacher, and staff mobility, standardizing degree accreditation and duration, unifying curricula content and teaching methods, and streamlining the credit transfer and accumulation system (ECTS) (8–10). In 2010, a seminal study on the implementation of policies for the combination of sports and academic careers (e.g., dual career, DC) across Europe (11) identified four main approaches: (1). State-centric regulation, with government legislation or statutory regulations imposing responsibilities on higher education institutions (HEIs) to provide flexible academic paths for student-athletes (S-As); (2). State as a sponsor/facilitator, with states promoting formal agreements to meet the S-As' educational needs; (3). National Sporting Federation/Institute as an intermediary, with national governing or sports bodies negotiating with HEIs flexible academic paths for S-As. (4). Laissez-faire/No Formal Structures, with sports bodies and HEIs as distinct and separate domains, thus requiring agreements individually negotiated, when possible, which can impair the holistic development of S-As. The publication of key documents, such as the EU Guidelines on Dual Careers of Athletes (12), along with more specific guidelines for universities and governing bodies (13, 14) has significantly advanced DC policies and provisions at the HEI level. Nonetheless, despite these efforts, the fragmented nature of dual career policies highlighted by Aquilina and Henry in 2010 remains largely unchanged. Many European countries still lack unified and comprehensive frameworks to fully support dual career development, resulting in significant variability in the availability and quality of DC services across the continent. Additionally, European studies examining minimum quality

requirements for DC services (15) and qualifications related to DCs in sports (16) have further contributed to the DC progress. However, the European DC scenario remains fragmented and S-As still face considerable challenges in balancing their academic and sports careers due to limited or non-existent provision of assistance/tutorship, curricula requirements, financial support, logistic support, social support, and DC policies as aspects, which are deemed crucial for the holistic development of S-As (17). To ensure that the S-As academic and athletic needs are effectively met, both the opinion of HEIs employee/experts and S-As can offer important insights to monitor the implementation and maintenance of DC policies and services at HEIs (12–14, 18). Whilst the S-As views can highlight specific gaps and areas needing improvements to make the support systems relevant and effective, the opinions of HEI experts can provide a critical perspectives of institutional policies and support systems through their perceived relevance and the feasibility of DC implementation (17–19). Furthermore, the collaborative approach between HEI experts and S-As of different countries could identify common trends and national specificities, leading to various and widely accepted co-constructed solutions for policy-making (13, 14, 17, 20, 21). Recently, the European ERASMUS + Collaborative Partnership approved the “FIND-ME: University Dual Career Opportunities (FIND ME—101134043)” project, which is based on the coordinated efforts of 6 HEIs with a solid DC experience from Italy, Romania, Serbia, Slovenia, and Spain, the European Athlete as Student (EAS) DC network, and two innovation companies aiming to structure an evidence-based European platform specifically tailored for dual career at HEI level. The countries included in this study were not selected based on their classification within the typology of Aquilina and Henry (11) but were instead determined by their membership in the FIND-ME consortium. As such, their organization type within the typology is incidental. Therefore, the present study aims to: (i) Compare the opinions of HEI experts on DC provisions across different countries; (ii) Compare the perceptions of S-As on DC provisions across different countries; (iii) Identify similarities and differences between HEI experts' and S-As' perceptions of DC provisions, highlighting potential gaps in support services. These objectives were pursued through a survey evaluating multiple aspects of dual career support, in line with the recommendations of the EU Guidelines on Dual Careers of Athletes (12). Given the lack of prior research comparing the opinions of HEI experts and S-As on dual career provisions, the present study adopts an exploratory approach.

The aim is to collect and analyze data to identify trends, similarities, and differences in their perceptions without formulating specific *a priori* hypotheses.

2 Materials and methods

All procedures were in accordance with the 1964 Helsinki Declaration for research involving human participants, including its later amendments or comparable ethical standards (Ethics Board of Universidad Internacional de La Rioja, Code: PI062/2024). Written informed consent was assumed with the completion of the online survey, which was chosen to provide time and geographic flexibility, as well as to facilitate multimedia integration and self-administration (22).

2.1 The instruments

Two questionnaires were developed based on validated instruments previously developed during ERASMUS+ Sport projects specifically tailored for HEI experts and S-As, yet addressing common items on the actual availability, quality and potential implementation of DC policies and provisions at their HEI experts (14, 17, 18, 23). In particular, the FIND ME questionnaire for HEI experts was based on the More Than Gold instrument (14, 17, 18) and consisted of 31 questions organized into two sections. The first section (13 questions) gathered information on the country, the HEI and its academic areas, the number of degrees offered at the bachelor's, master's, and PhD levels, the respondent's academic position and DC role (e.g., tutor, academic referent, consultant, or other), the university website, and the availability of internal DC regulations in English. The second section (18 questions) assessed the current status of six thematic DC areas at the university, using a 5-point Likert scale to rate their quality from 1 (non-existent) to 5 (outstanding), and implementation status from 1 (not planned) to 5 (ongoing), as well as the expected time for implementation. These six thematic areas included logistic support, which refers to logistics and facilities, including access to sports and academic facilities, as well as housing options. Assistance and tutorship encompass all forms of assistance aimed at meeting S-As' needs, such as tutoring and psychological support. Curriculum requirements involve the modes of delivery for academic courses and examinations, including distance learning options, customized study plans, ECTS recognition, and other strategies. Social support includes initiatives promoting and recognizing dual career efforts and achievements of S-As, such as seminars, public campaigns, and recognition programs. Financial support covers financial assistance, such as scholarships, tuition fee waivers, and other forms of funding. Lastly, other forms of support and policies address additional aspects such as the establishment of dual career observatories, national legislation, and special contingents for athletes. Based on the ESTPORT instrument (23), the FIND ME questionnaire for S-As encompassed two sections for a total of 60 questions for the collection of the S-As' perceptions of DC programmes offered at their HEIs. The first section included

demographic information, such as nationality, age, gender, practiced sport, competitive level, the academic level and major, and the type of their HEI (e.g., private, public) and academic programme (e.g., on-site or online). The second section collected opinions about the six thematic areas for DC included in the instrument administered to the HEI experts (e.g., logistic support, assistance/tutorship, curricula requirements, social support, financial support, and other supports/DC policies). This section used a 5-point Likert scale from 1 (lowest value) to 5 (highest value).

2.2 Recruitment

Through their national and European non-FIND ME networks, the FIND-ME team identified and invited potential respondents, informing them that participation was voluntary and anonymous, and that they could withdraw from the study at any time without providing a reason. A link to the online survey was provided, and informed consent was assumed upon completion of the survey. The survey opened on March 25, 2024, and closed on June 15, 2024. To increase the response rate for online surveys encompassing more than 20 items, reminders were sent every two weeks (22). Given the significant heterogeneity in dual career provisions across Europe—both between countries, as highlighted by Aquilina's typology, and within countries, where universities may adopt diverse strategies or implement national guidelines differently, even when national legislation exists—the sampling strategy adopted was flexible. Potential respondents were identified through three main approaches: (i) Direct contact with individuals responsible for dual career initiatives, based on the existing knowledge and professional networks of project partners; (ii) Leveraging the EAS network, which maintains an up-to-date database of European professionals working in dual career support; (iii) Requesting universities to indicate the appropriate office or individual responsible for dual career provisions. Eligible participants were defined as any individual serving as an internal reference point for dual career matters within their university, including faculty members, researchers, or administrative staff involved in dual career support or policy implementation. Exclusion criteria were applied to exclude individuals without a formal or recognized role in dual career initiatives within their institutions, ensuring that all respondents had direct experience or responsibilities related to dual career provisions.

2.3 Characteristics of the sample

Characteristics of the sample are showed in Table 1. A total of 69 responses were collected for the HEI experts' questionnaire, with 24 responses subsequently excluded due to duplicate ($n = 1$) answers erroneously provided by S-As ($n = 2$) or by university representatives indicating that no DC policy was in place (Bosnia-Herzegovina: $n = 2$; Kosovo: $n = 2$; Italy: $n = 5$; Latvia: $n = 2$; Romania: $n = 8$; Serbia: $n = 2$). Most of the remaining 45 responses were provided by HEI experts holding DC responsibilities (65.2%), followed by DC tutors (15.2%), DC consultants (15.2%), and other

TABLE 1 Distribution of HEI experts and S-As by country.

Country	Number of HEI experts and participating universities	Number of S-As
Italy	22	122
Romania	7	52
Serbia	4	44
Slovenia	2	17
Spain	6	58
Non-Find Me Countries	4	28
Total	45	321

roles such as Olympic Committee Assistant, Sports Delegate, and member of the institutional DC commission (2.1%). The countries with the highest HEI representation were Italy (50.0%), Romania (15.2%), and Spain (13.0%), followed by Serbia (8.7%) and Slovenia (4.3%), with additional contributions from Croatia, Latvia, Poland, and Portugal (2.1%). Only 11 HEIs provide DC regulations in English (Italy: $n = 4$; Romania: $n = 5$; Serbia: $n = 1$; Spain: $n = 1$).

From the 329 responses initially gathered from S-As, 8 were excluded due to erroneous answers provided by non-athletes ($n = 6$) or former athletes ($n = 2$). From the remaining 321 responses, most were Italian S-As ($n = 122$, 38%), followed by Spanish ($n = 58$, 18.1%), Romanian ($n = 52$, 16.2%), Serbian ($n = 44$, 13.7%), Latvian ($n = 18$, 5.6%), Slovenian ($n = 17$, 5.3%), Kosovarain ($n = 9$, 2.8%), and English ($n = 1$, 0.3%). There was a balanced proportion for sport typology (individual sports: $n = 161$, 50%; team sports: $n = 160$, 50%) and gender (males: $n = 189$, 58.9%; females: $n = 132$, 41.1%). Most of the participants were semi-professional athletes ($n = 149$, 46.4%), followed by their professional ($n = 113$, 35.2%) and amateur ($n = 59$, 18.4%) counterparts.

2.4 Data analysis

The sample sizes for S-As and HEI experts were not homogeneous due to the varying numbers of universities present in each country, ranging from three public universities in Slovenia and more than 90 in Italy, Romania, and Spain. Considering that a single approach to the analysis would have violated the assumptions of homogeneity of variances and sufficient sample size, linear statistics were applied to S-As' data whereas a descriptive approach was applied to HEI experts' data. To investigate the role of the country of origin of the S-As, a MANOVA was applied to each of the six thematic areas included in the survey, with the respondents' country of origin (e.g., Italy, Romania, Serbia, Slovenia, Spain, and Non-Find ME Countries) as the independent variable. To control for Type I error, Bonferroni corrections were applied to the significance levels of the six separate MANOVAs, while Pillai's Trace was used for the MANOVAs between countries, as it guarantees high robustness in presence of violation of the assumptions of homogeneity of covariance matrices and normality. For significant differences ($p < 0.05$), univariate ANOVAs were conducted on individual items within each area, with Bonferroni corrections applied to control for Type I errors. *post hoc* analyses

using Tukey's test were conducted to further explore significant differences between groups. All statistical analyses were computed using JASP Team (2023). JASP (Version 0.18.1).

3 Results

3.1 University experts' opinions of the DC provision

For each considered country, [Supplementary Table 1](#) reports the items of the six dual career areas at HEIs including the percentages of actual presence and the means and standard deviations of the HEI experts' quality ratings, and the percentages of planned implementation and the expected years, respectively. In general, HEI experts reported the presence of DC services ranging from $88 \pm 5\%$ (Serbia) and $63 \pm 15\%$ (Spain). The implementation plans are expected to be completed from 2024 and beyond 2027, with the Serbian HEIs reporting the highest percentages (range: 50%–100%, $91 \pm 14\%$), and one of the Slovenian Universities (50%) planning the implementation of only the education facilities. Overall, HEIs from the other countries reported limited implementation plans (Italy: $49 \pm 16\%$; Romania: $58 \pm 12\%$; Spain: $21 \pm 14\%$; and Non-FIND Me countries: $78 \pm 24\%$).

Logistic support showed the highest presence and quality ratings, with higher values were reported for educational facilities (range: 83%–100%; 3.3–5.0 pt), sport facilities (range: 75%–100%; 3.0–5.0 pt), and economic investments in facilities (range: 83%–100%; 2.5–4.4 pt) compared to accommodation for S-As (range: 37%–100%; 2.0–4.3 pt), which showed the lowest presence for Italy (37%), and the lowest quality ratings for Spain (2.0 pt). The implementation plans for the items included in logistic support showed a high variability (Italy: $69 \pm 13\%$; Romania: 71%; Serbia: $94 \pm 13\%$; Slovenia: $13 \pm 25\%$; Spain: $17 \pm 13\%$; Non-FIND ME countries: $69 \pm 13\%$).

Regarding the assistance and tutorship area, the tutorship/mentorship item was more prevalent in Spain, Non-FIND ME countries and Italy (range: 96%–100%, 4.3–4.6 pt) compared to Romania, Serbia, and Slovenia (range: 50%–75%, 3.5–5.0 pt). But for Serbia and Romania (range: 50%–71%, 2.0–2.8 pt), individual programme showed a high presence and quality (range: 96%–100%, 3.5–4.4 pt). Slovenia and Non-FIND ME countries reported a full integration of dual career in academic department, sports or professional services (quality range: 3.3–3.5 pt) and psychological support (quality range: 2.5–3.5 pt), whereas the relative picture for the other countries ranged from 83% (Spain) to 57% (Serbia) with 2.3–3.7 pt quality ratings for integration of dual career in academic department, sports or professional services, and ranged from 77% (Italy) to 67% (Spain) with 3.9–2.7 pt quality ratings for the psychological support. Except for Non-FIND ME countries (100%, 3.3 ± 0.5 pt), dual career proactive programmes showed a limited presence (range: 30%–77%) with a quality range of 3.3–3.5 pt. The implementation plans for the items included in the assistance/tutorship area also showed high variability (Italy: $52 \pm 3\%$; Romania: $54 \pm 16\%$;

Serbia: 100%; Slovenia: 0; Spain: 24%; Non-FIND ME countries; $75 \pm 29\%$).

For the curricula requirements area, individualized study plans were not reported for Serbia, with the other countries showing a presence ranging from 86% (Romania) to 50% (Slovenia), with a quality rating ranging from 3.8 pt (Spain) to 5.0 pt (Slovenia). While Slovenia and Non-FIND ME countries indicated a full availability of distance learning (quality range: 3.5–4.3 pt), the other countries showed a lower presence (range: 59%–86%) with a quality ranging from 2.7 pt (Romania) to 4.0 pt (Serbia). Low presence of recognition of ECTS for the sport career was reported (0%–75%) with a quality ranging from 2.7 pt (Romania) to 5.0 pt (Spain). Similarly, except for Serbia (100%, 3.0 pt), untraditional learning strategies showed a limited presence (range: 14%–75%) with a quality range of 2.0–4.0 pt. The implementation plans of the items included in the curricula requirements area resulted $42 \pm 10\%$, $64 \pm 8\%$, $92 \pm 13\%$, 0%, $13 \pm 9\%$, and $69 \pm 13\%$ for Italy, Romania, Serbia, Slovenia, Spain, and Non-FIND ME countries, respectively.

For the social support area, in general HEIs provided publicity for their S-As representing the university (range: 83%–100%, 3.0–4.7 pt). While HEIs in Serbia and Non-FIND ME countries declared to organize local/international seminars, workshop, meeting on dual career issues (100%, 2.7–4.0 pt), the other countries showed lower presence (range: 50%–71%, 3.5–4.0 pt). Except for Serbia (100%, 2.7 ± 0.6 pt), the other countries showed lower presence of an institutional dual career committee (range: 50%–63%, 3.0–4.1 pt). Only the Non-FIND ME countries reported providing publicity of S-As' characteristics for labor market, whereas the relative picture for the other countries range 43%–75% with a mean quality ranging from 2.3 pt. (Serbia) to 3.7 pt (Romania). Peer to peer was fully implemented at HEIs in Romania, Serbia, and Non-FIND ME countries (quality range: 2.7–3.7 pt), whereas lower presence emerged for the other countries (range: 50%–73%, 3.5–5.0 pt). Except for Non-FIND ME countries (100%, 3.3 ± 1.0 pt), the others tended not to organize seminars, workshop, meetings with parents and coaches (range: 40%–75%, 2.5–3.7 pt). The HEIs from Serbia and Non-FIND ME countries reported the highest frequency of implementation plans ($92 \pm 13\%$) of the items included in the social support area, whereas the relative picture for Italy, Romania, Slovenia, Spain was $57 \pm 12\%$, $64 \pm 8\%$, 0%; $33 \pm 10\%$, respectively.

Overall, lower values emerged for the items included in the financial support area (range: 9%–64%, 2.7–4.0 pt), especially evident for the lack of scholarships for S-As in Serbia and Slovenia, the remission of tuition fees for S-As in Slovenia, and salary in Romania, Slovenia, and Spain. Except for Serbian HEIs ($81 \pm 24\%$), the implementation plans of the items included in the financial support area presented low frequency of occurrence (Italy: $29 \pm 12\%$; Romania: 42%; Slovenia: 0; Spain: $17 \pm 13\%$; Non-FIND ME countries; $69 \pm 47\%$).

Only the HEIs from Serbia and Non-FIND ME countries declared a full provision of the items included in the other supports/DC policies area (quality range: 2.7–4.0 pt), whereas no observatory of the application of the dual career statute was reported for Slovenia. In general, higher presence emerged for national legislation and lower

for special access contingent for actual or former elite athletes. Also, for the implementation plans of the items included in the other supports/DC policies area the HEIs from Serbian (100%) and Non-FIND ME countries ($92 \pm 14\%$) presented the highest frequency of occurrence, whereas lower values emerged for Italy: $41 \pm 10\%$; Romania: 43%; Slovenia: 0; Spain: $17 \pm 17\%$.

3.2 S-As opinions

For all the considered six thematic areas of DC Box's M test indicated a violation of the assumption of homogeneity of covariance matrices. Additionally, the Shapiro–Wilk test indicated a violation of multivariate normality. **Supplementary Table 2** reports the items of the six dual career areas at HEIs including their percentages of the presence and the means and standard deviations of the S-As' quality ratings.

3.2.1 Logistic support

The country of origin showed a significant effect on the opinions regarding logistic support [Pillai's Trace = 0.24, Approx. $F_{(20, 1260.00)} = 4.11$, $p < 0.001$]. But for the quality of economic investment for university facilities, the other dimensions of the students' ratings of perceived quality of logistic support services showed significant effects as reported in **Supplementary Table 2**. For access to educational facilities, a significant effect was found, with *post hoc* analyses revealing that Italian students perceived lower quality compared to Romanian students. Regarding the quality of sport facilities, a significant effect was found with *post hoc* analyses underlining that Romanian reported higher quality ratings with respect to their Italian and Spanish counterparts. Finally, for the quality of accommodation facilities for S-As, the ANOVA results indicated a significant effect. *post hoc* analyses revealed that Romanian students rated the quality higher compared to both Italian and Spanish students. Additionally, Romanian students rated the quality higher compared to Slovenian and Non-Find ME students. Furthermore, Serbian students reported higher quality ratings compared to Spanish students.

3.2.2 Assistance/tutorship

A country-related effect of the opinions regarding assistance/tutorship emerged [Pillai's Trace = 0.22, Approx. $F_{(25, 1575.00)} = 2.85$, $p < 0.001$]. However, further comparisons between countries showed no differences for the various items in this category.

3.2.3 Curricula requirements

A country-related effect was found for the S-As' opinions regarding curricula requirements [Pillai's Trace = 0.11, Approx. $F_{(20, 1260.00)} = 1.70$, $p = 0.03$]. However, further analysis showed no effects of the perceived quality of individual study plans, distance learning, and recognition of ECTS for the sport career, whereas the initial effect emerging for the quality of available untraditional learning strategies (e.g., creating digital portfolios,

using social networks) was not maintained after applying the Bonferroni correction.

3.2.4 Social support

The country of origin showed a significant effect on the opinions regarding social support [Pillai's Trace = 0.26, Approx. $F_{(30, 1570.00)} = 2.93$, $p < 0.001$]. Despite the initial effects observed for local to international seminars, workshops, and meetings on up-to-date DC issues, and for publicity on S-As and their characteristics suitable for the labor market, the Bonferroni correction did not maintain any significant difference for these DC aspects. For countries, a significant effect was found for the quality of social support through an institutional DC committee, with *post hoc* analysis showing that Italian students reported lower ratings compared to Serbian students, but higher ratings compared to Spanish students. Furthermore, Romanian students reported significantly lower ratings compared to Serbian students, and Serbian students reported significantly higher rates compared to Spanish students. For peer-to-peer support, a significant effect was found with *post hoc* analyses revealing lower ratings for Italian students compared to Serbian students, who reported higher ratings compared to Spanish students and Non-Find ME students. Additionally, an effect was found for seminars, workshops, and meetings with parents and coaches, with Italian students reporting

lower ratings compared to Serbian students, who reported higher values compared to Spanish students (Supplementary Table 2).

3.2.5 Financial support

The country of origin proved had an effect on the opinions regarding financial support [Pillai's Trace = 0.30, Approx. $F_{(20, 1260.00)} = 5.05$, $p < 0.001$]. An effect was found for the quality of scholarships, with Italian students reporting lower ratings compared to their Romanian and Serbian counterparts. For the remission of tuition fees for S-As, an effect was found, with Serbian students reporting higher ratings compared to Romanian and Spanish students. Regarding the salary for S-As, an effect emerged, with Serbian students reporting higher ratings compared to Italian, Romanian, Slovenian, Spanish, and Non-Find ME students. Furthermore, differences were maintained also for Romanian students reporting higher ratings compared to Spanish students (Supplementary Table 2).

3.2.6 Other support/Dc policies

The country of origin had an effect on the opinions regarding other support/DC policies [Pillai's Trace = 0.16, Approx. $F_{(15, 945.00)} = 3.45$, $p < 0.001$]. The perceived quality of a sport observatory (controlling and monitoring the application of the DC statute) showed an effect, with Serbian students showing higher ratings compared to their Italian, Romanian, and Spanish

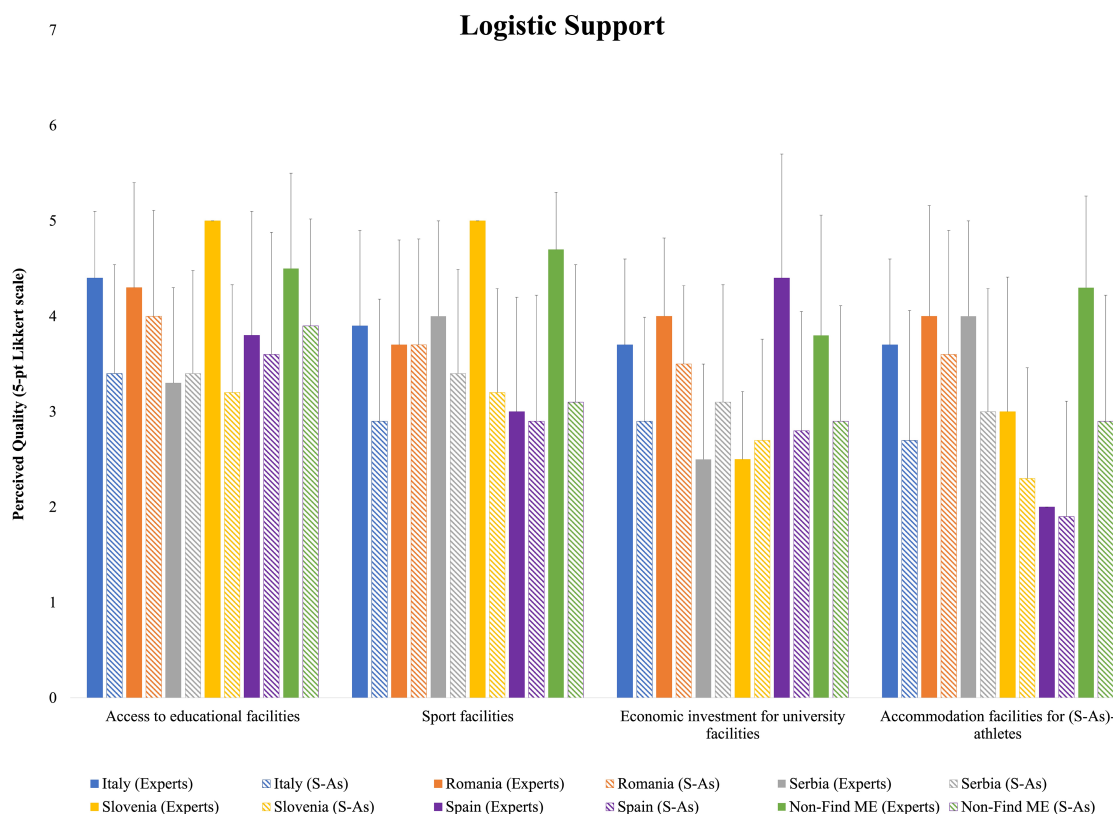


FIGURE 1

Means and standard deviations of the national HEI experts' and S-As' perceived quality for logistic support ratings.

counterparts. For the quality of national legislation, an effect was found, with Serbian students reporting higher ratings compared to Italian, Romanian, Spanish, and Non-Find ME students. For the quality of special access contingents (reserved for actual or ex-high sport performance practitioners), an effect was found, with Serbian students showing higher ratings compared to Italian, Romanian, Spanish, and Non-Find ME students (Supplementary Table 2).

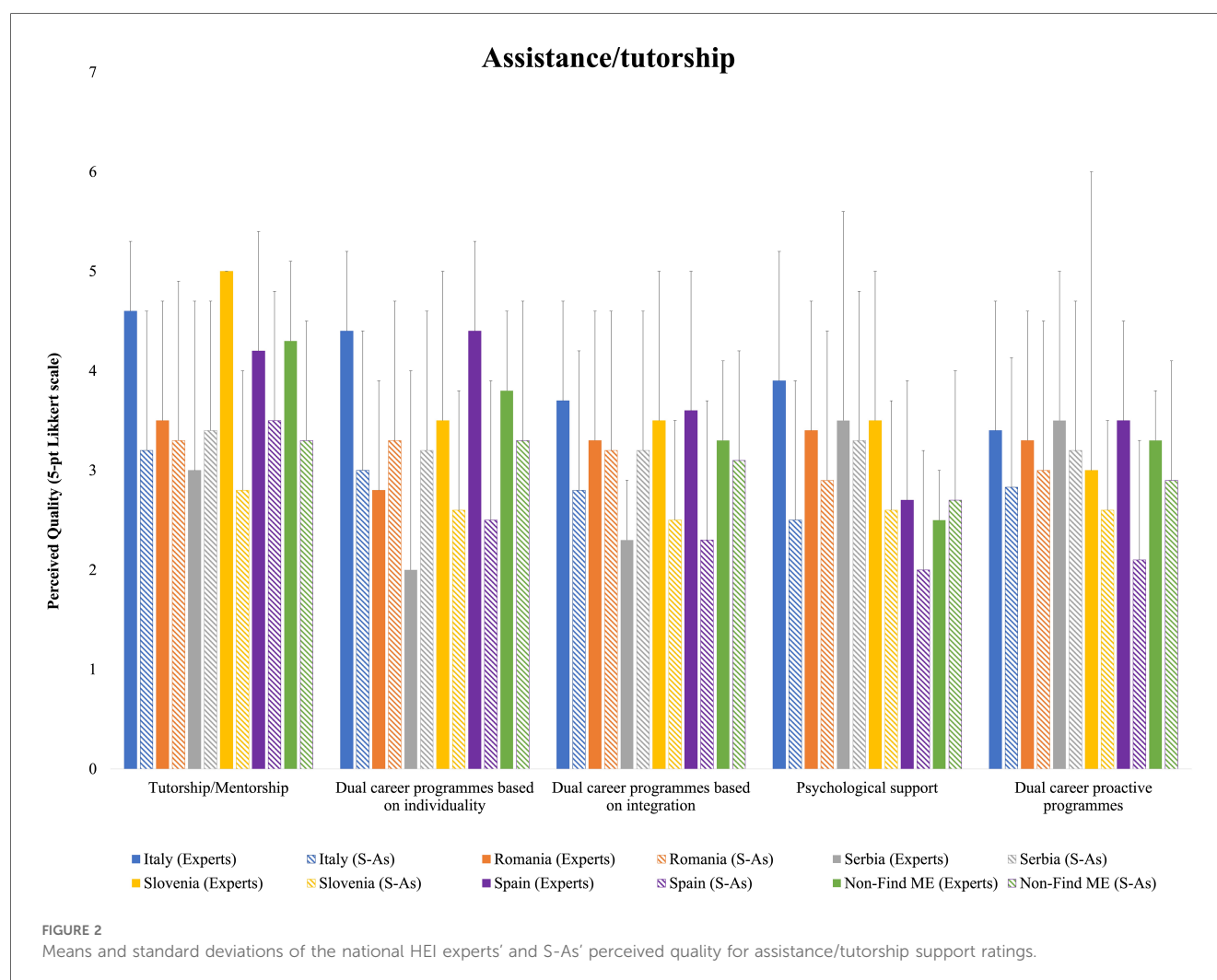
3.3 Comparison between HEI experts and S-As

On average, S-As rated the quality of logistic support lower than their academic counterparts, with higher ratings for access to educational facilities and lower ratings for accommodation facilities (Figure 1). Closer agreement between HEI experts and S-As was observed regarding access to educational facilities for Romanian and Spanish respondents, while Serbian S-As provided slightly higher evaluations than the HEI experts. Romanian and Spanish respondents also offered similar evaluations for sports facilities, whereas Serbian S-As rated them even higher than their expert counterparts. For accommodation facilities, Romanian and

Spanish respondents once again showed closer alignment with HEI expert evaluations.

Figure 2 shows the average quality of HEI experts and S-As for assistance and tutorship. Except for Romanian HEI experts and S-As showing similar ratings and Serbian S-As showing higher ratings than HEI experts for the items of the assistance/tutorship area, experts of the other countries generally showed higher quality ratings with respect to their S-A counterparts. For DC programmes based on individuality, Romanian and Serbian HEI experts reported lower quality ratings with respect to those of S-As, whereas the opposite picture emerged for Italian, Slovenian, Spanish and Non-FIND ME HEI experts. Mixed results were found for DC programmes based on integration, with Serbian S-As reporting higher evaluations than the HEI experts. Comparable quality ratings for psychological support emerged for HEI experts and S-As in Serbia and Non-Find ME countries, but higher especially for Italian, Slovenian, and Spanish HEI experts. For DC proactive programmes, lower quality ratings for S-As with respect of those of the respective HEI experts' counterparts.

Except for a few cases, HEI experts generally rated the quality of curricular requirements higher than their respective S-A

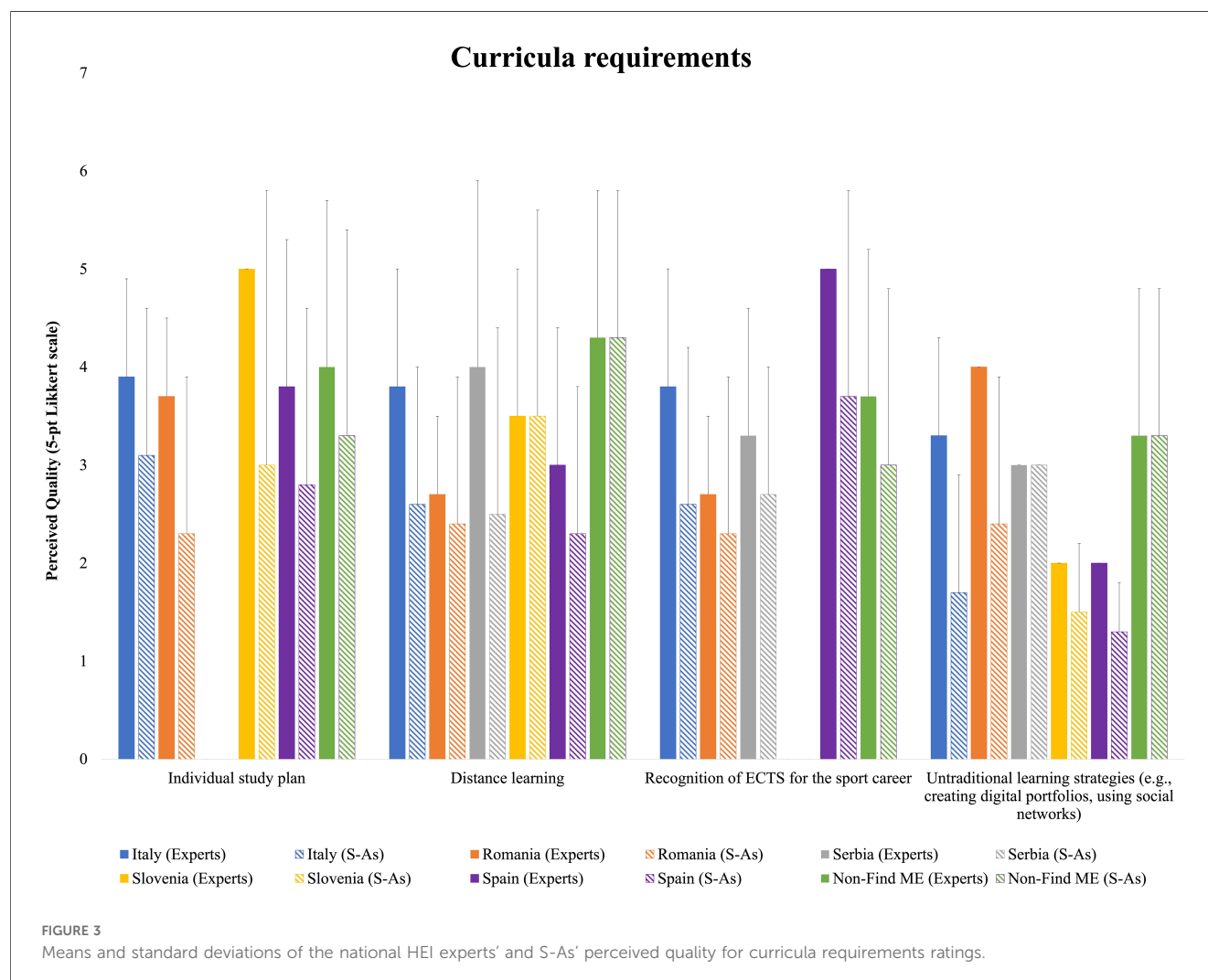


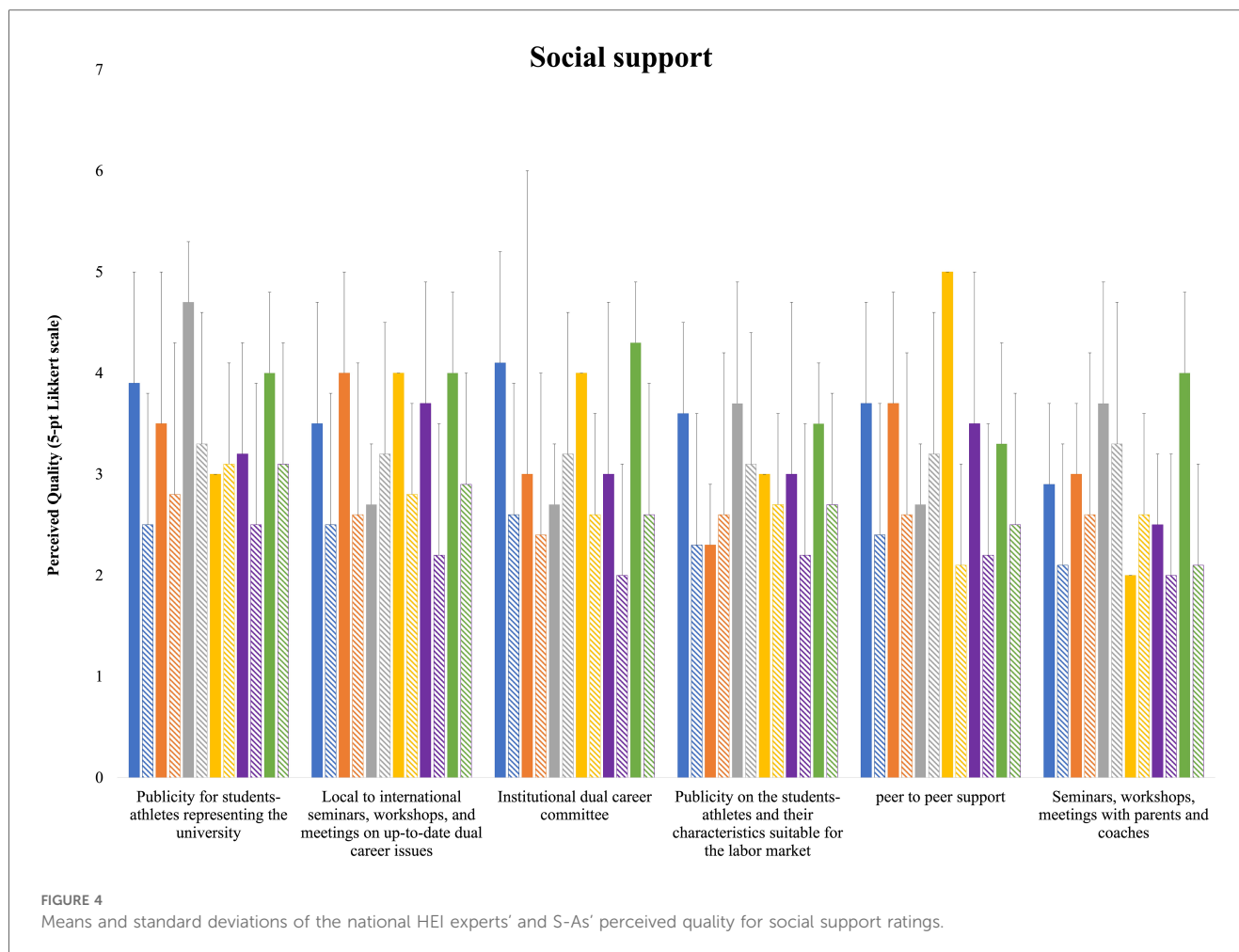
counterparts (Figure 3). The evaluation of the Individual Study Plan and the recognition of ECTS for sports careers were consistently rated higher by experts. Regarding distance learning, closer evaluations were observed among Romanian, Slovenian, and Non-Find-ME respondents. For untraditional learning strategies, Italian and Romanian HEI experts rated considerably higher than S-As, while Serbian and Non-Find-ME respondents provided similar evaluations.

Figure 4 shows the Except for average quality of HEI experts and S-As for social support. Slovenian respondents, HEI experts generally tended to rate the publicity for S-As representing the university higher than their S-A counterparts. A larger discrepancy was evident for Italian and Serbian respondents. Regarding local to international seminars, workshops, and meetings on up-to-date DC issues, only Serbian S-As provided higher ratings than their expert counterparts, while Romanian and Spanish respondents exhibited the largest discrepancy between S-As and HEI experts. Serbian S-As also rated the institutional DC committee higher than HEI experts, whereas Non-Find-ME HEI experts rated it considerably higher than their S-As. For publicity about S-As and their characteristics suited for the labor market, only Romanian S-As

rated the service better than HEI experts, although Slovenian respondents provided closely aligned evaluations. Serbian S-As once again rated peer-to-peer support better than HEI experts, with the largest discrepancy between S-As and HEI experts observed for Slovenian respondents. Regarding seminars, workshops, and meetings with parents and coaches, Slovenian S-As rated them higher than HEI experts, while Romanian, Serbian, and Spanish respondents showed closely aligned evaluations (Figure 4).

Regarding the category Financial support, Serbian and Slovenian HEI experts did not provide evaluations for scholarships, while the remaining respondents rated them higher than S-As, particularly the Italians. Regarding the remission of tuition fees, only Serbian S-As provided higher evaluations than HEI experts, whereas Italian and Romanian experts showed the largest discrepancies compared to their S-As counterparts. Similarly, Slovenian experts did not provide ratings in this category. Other forms of financial support were once again rated higher by Serbian S-As, while Italian and Slovenian HEI experts displayed the largest differences in ratings compared to their S-As. Finally, regarding salary evaluations, only Italian, Serbian, and Non-Find-ME HEI experts provided assessments, showing close alignment with Serbian respondents,





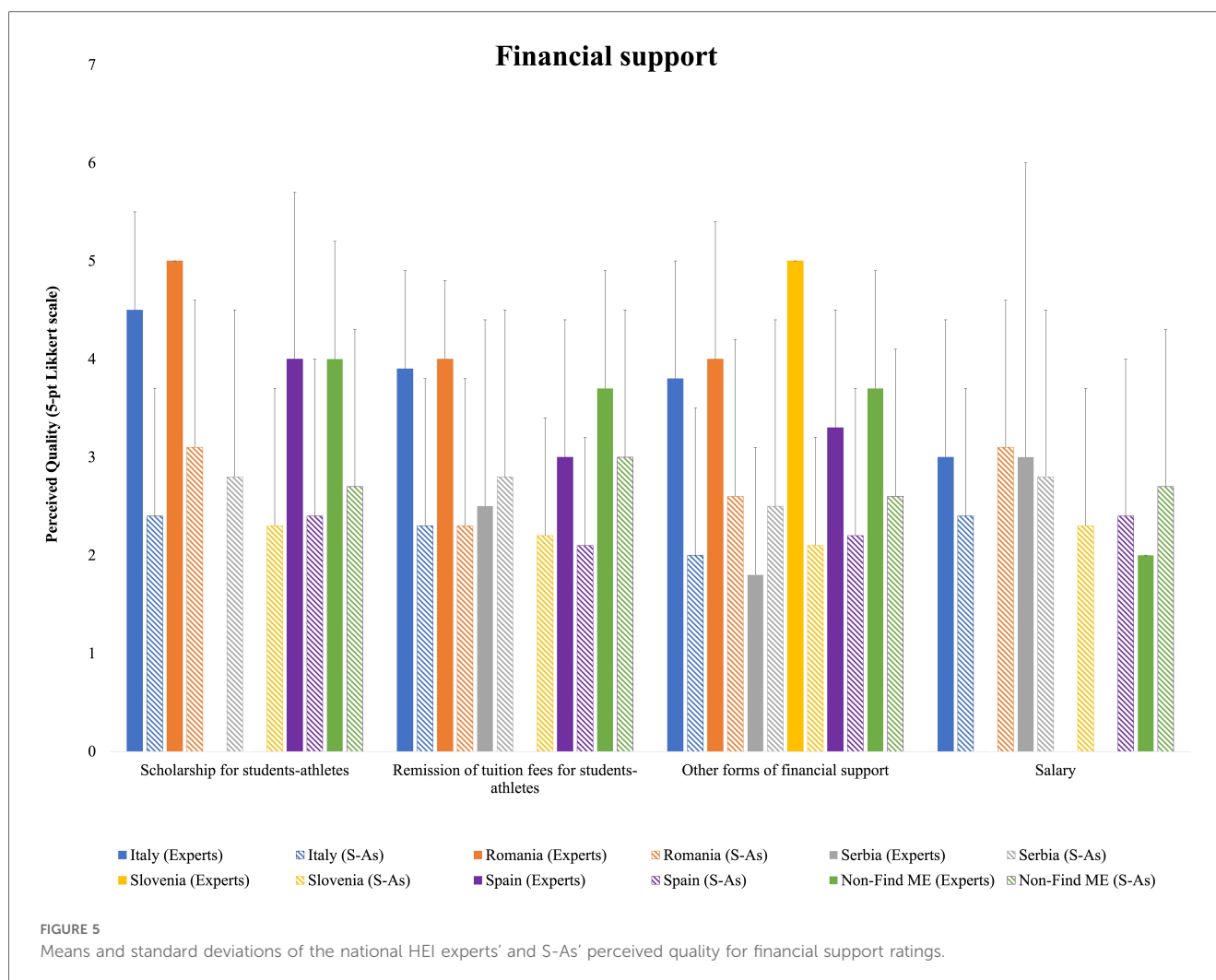
but with higher ratings from Non-Find-ME S-As compared to HEI experts (Figure 5).

The remaining categories related to other forms of support and policies are shown in Figure 6. Apart from Serbian respondents, HEI experts generally rated these categories higher than S-As. The university's Sports Observatory rating showed a similar discrepancy between experts and S-As across all groups, except for Serbian respondents. Moreover, while Slovenian S-As provided a rating for this aspect, HEI experts marked it as unavailable. For National Legislation, higher ratings were attributed by HEI experts in all cases except Serbia, where S-As provided better evaluations, and Slovenia, where the values were nearly identical. Finally, for Special Access Contingency, the largest discrepancy between HEI experts and S-As was observed among Slovenian respondents, followed by Spanish and Italian respondents, whereas the differences were less pronounced for Romanian and Non-Find-ME countries.

4 Discussion

In reporting the perspectives of both HEI experts and S-As on DC aspects, the present explorative study aimed to: (i) compare the

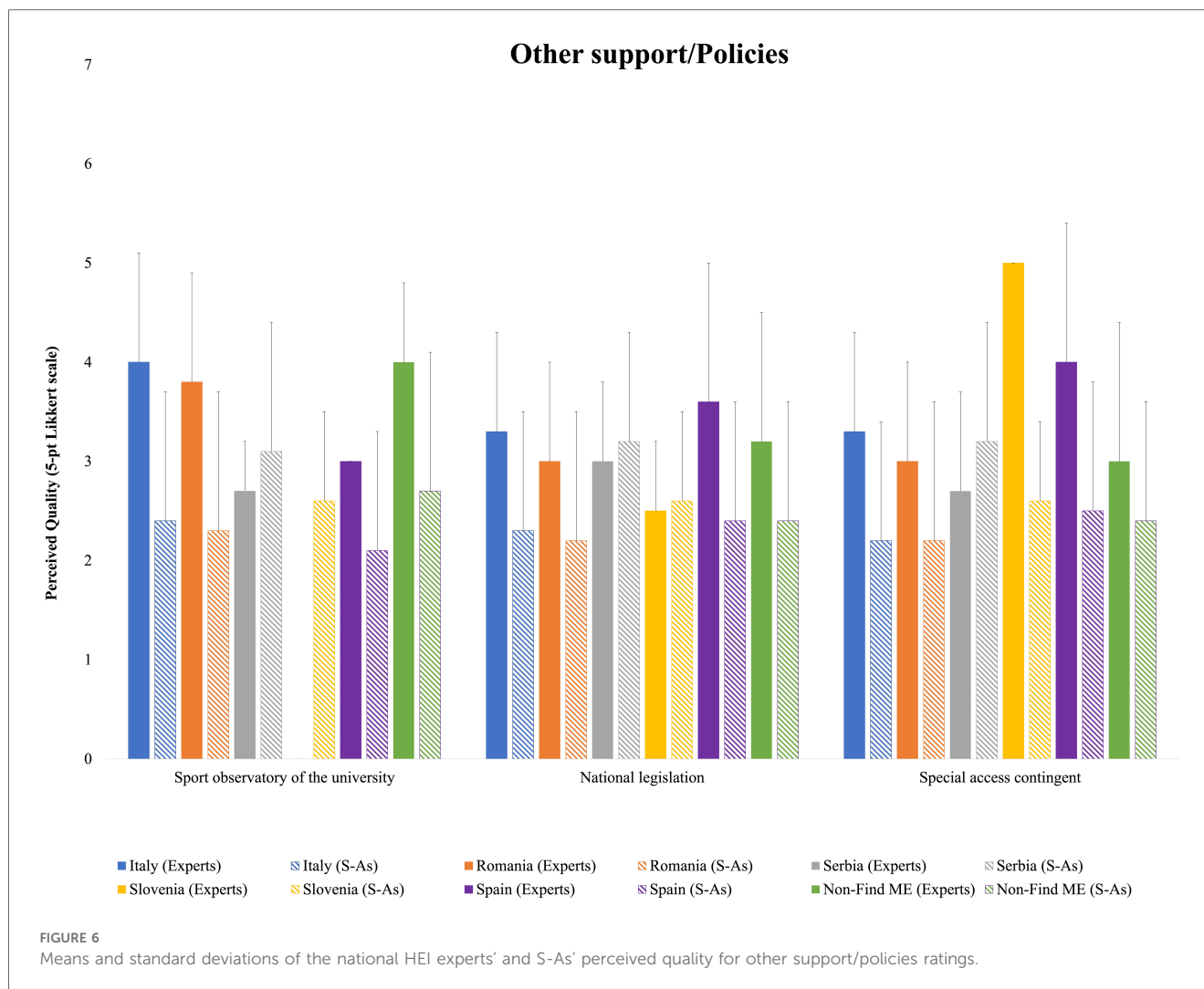
opinions of HEI experts on DC provisions across different countries; (ii) compare the perceptions of S-As on DC provisions across different countries; (iii) identify similarities and differences between HEI experts' and S-As' perceptions of DC provisions, highlighting potential gaps in support services. These objectives were pursued to provide actionable insights for improving DC policies and provisions at European HEIs. In line with the literature (18), the main findings confirmed the differences in the provisions of DC services between and within the investigated countries. In addition, the surveys revealed not only the quality of the actual DC services, but also the ongoing or planned implementation expected in the next few years, which is a consequence of the firm European policies on raising the awareness and supporting the development of a DC discourse (4). Whilst S-As might base their evaluations on personal experience of practical usability and personal convenience of the received DC support, HEI experts have a broad view of institutional policies and support systems, focusing on the overall provision rather than specific daily usability (24). Furthermore, S-As may be less satisfied if they are aware of better facilities available elsewhere compared with the current support (25). On the other hand, HEI experts may evaluate based on realistic achievements within budgetary and policy constraints. Finally,



both HEI experts and S-As may not be fully aware of all available resources for supporting and developing DC competencies, being DC support providers a not established and regulated profession within the European context (26, 27). Depending on the HEIs' and S-As' perspective taken, the results could be interpreted under the perspective of "a glass half empty or half full". However, the identified nuances could help best support DC initiatives and assist HEIs and governments in implementing policies conducive to improving the holistic development of S-As as empowered citizens.

Logistic support resulted as the most prevalent service provided to S-As. Whilst a high-quality provision of educational facilities was expected, the opinions of both HEI experts and S-As highlighted the necessity for tailored interventions to enhance the DC experiences of S-As across different countries. The additional implementations declared to be ongoing or expected already in the next year are in line with the European quest for innovative educational tools, methods, and resources tackling inclusive and connected social challenges (28). Within this area, the provision of accommodation for S-As resulted the least available service, which is not surprising, as only an average of 15% of students in Europe live in student accommodations, despite the substantial

gap between the demand and supply, and the high international student mobility supported by the ERASMUS programme (29, 30). European countries do not have an official mandate on the provision of affordable on-campus housing, which is primarily a concern of national and local policies and culture, yet it remains a crucial aspect of the academic experience of students. The present findings highlight differences of the S-As' perceptions on the available logistic support, with Romanian S-As consistently rating higher quality compared to their Italian and Spanish counterparts. In fact, HEIs in central and northern Europe provide more well-structured on-campus housing programmes with respect to their Mediterranean counterparts (29). While pinpointing the exact origins of the important differences between countries is beyond the aim of this study, it is plausible that socioeconomic factors, such as national income levels, public funding for higher education, and the effectiveness of policy implementation within countries play a crucial role. However, the significant cross-country differences suggest the need for a tailored approach to develop and implement integrated institutional strategies to improve the overall satisfaction and well-being of their students (29). In having strong, direct, and personal relationships with the athlete, tutors play a crucial



supporting role of the S-As entourage (6, 31, 32). Following the publication of the EU Guidelines on DCs of Athletes, HEIs were urged to adopt new pedagogical models and to provide a tutoring system for their S-As (31). Despite the differences between and within countries, in general HEIs offer tutoring/mentorship and individualized programmes, and planned their implementation in the next years to meet the desires and needs of S-As. To note, no difference between countries emerged for S-As' perceived quality of tutoring, even though ample margin of amelioration is envisaged. The development process of S-As and the environment that supports them is complex and dynamic, with both contributing to each other's evolution (33). Due to a lack of a defined professional role and defined skills, at present tutors learn how to support students by addressing the various scenarios the S-As encounter to navigate effectively their sports and academic environments. To facilitate this process, there is a need to integrate and consolidate the cooperation between the academic, professional, and sports services and activities currently scattered across different agencies, units, departments, and institutions. This cooperation could help structuring individualized programmes ensuring suitable DC

paths for each athlete, and to adopt a proactive attitude to anticipate future needs of the S-As (31). To foster both the academic and athletic development, a key factor is the creation of a cohesive and integrated support network that aligns with the individual needs of S-As. Interesting to note, S-As rated higher the quality of DC proactive programmes with respect to their HEI expert counterparts. In considering the development process of DC in the last decade, it is possible to speculate that university S-As might have experienced a limited support during the previous years, which made them particularly appreciate the sensible DC management and climate factors offered at their HEIs.

Notwithstanding the Bologna process, uniformity in curricula requirements still presents a challenge in the harmonization of European higher education systems due to the different regulations in place in the Member States (9) European Commission, 2012; European Parliament, 2004, 2017). In this area, the HEI experts confirmed the differences between countries, with individual study plans, distance learning, and ECTS recognition for the sport career being more represented with respect to untraditional learning strategies. However, most of the HEI experts reported plans for implementation expected

in the next years, in line with the European quest of increasing innovation and competitiveness, and the promotion of harmonization for an automatic and mutual recognition of the ECTS credits also earned outside the higher education, the Diploma Supplement, micro-credentials, and the spread of digital learning approaches associated with the COVID-19 pandemic (10). Harmonisation and interoperability depend on interlinkages between actors, policies and provisions, which lead to further interlinkages and interdependencies. In this respect, DC could be considered an innovative approach, with S-As valuing their DC skills for maintaining effective time management, self-motivation, and discipline during unexpected COVID-19 circumstances with respect to their non-athlete counterparts (34). Unlike other DC areas that are strongly influenced by individual university policies and national directives or laws, curricula requirements and assistance/tutorship relate closely to university activities that directly involve students and professors. Thus, the rather low S-As quality ratings of this area, with no differences between countries, indicate areas where alignment and improvements may be needed to enhance the DC experiences. Often, S-As are not fully aware of their role and the services available to them, which can be due to insufficient communication from the institutions or a lack of proactive engagement from the students themselves (20). This lack of awareness can lead to underutilization of available resources, resulting in a perceived uniformity in evaluations. It is essential to improve the visibility and accessibility of these support services to ensure that S-As can fully benefit from them (17, 35). According to the data collected from HEI experts and S-As, the social support area presents important margin for implementation through the organization of seminars, workshops and publicity of the S-As, in line with the Athlete365 Career + programme for Olympic athletes (www.olympic.org/athlete365/career). In establishing positive relationships with faculty and peers S-As build confidence, academic focus, and strong university connections. In this study, publicity for student-athletes representing the university provided higher presence and quality results for HEI experts with respect to their S-As counterparts. Whilst the American collegiate athletics association (NCAA) has traditionally been coupled with the academic mission of an institution that influence the social and cultural discourse of campus life, in the labour market companies engage elite sportspersons as testimonials for the promotion of their products and for creating meaning and value transfer (36, 37). In considering that a significant implementation is expected in the next years, the present findings indicate a need to co-create value through DC (18, 36). Much of the social support might be delivered through new channels (e.g., the publicity for S-As in the job market and their achievements), which can leverage the same social channels across various countries, contributing to the lack of differences in S-As opinions. Although parents and coaches represent crucial actors of the social support entourage of S-As (20, 38), the present findings highlight that HEIs pay a limited attention to engage them in seminars and workshops. Recently, a free online multilingual educational programme has been developed to empower parents of S-As athletes (<https://edu.empatiasport.eu/it/>),

which could be used to organize seminars, workshop, meetings to bridge the gap between HEIs and the parents and coaches for establishing a cohesive supporting entourage of their S-As (17, 38). Financial investments and HEI funding systems differ tremendously across Europe, being closely associated with university policies, which are in turn constrained by the national regulatory framework (39). Although in Europe the average tuition amount of public HEIs is rather low when compared to that of HEIs from Anglo-Saxon, North and Latin American, and Northeast Asian countries, Continental and European Southern European countries spend less on financial student aid, often based on need-based (e.g., family or individual income) and merit-based (e.g., ECTS and grade point average) grants, or a combination of the two, with sport achievement receiving little or no consideration (39). Coherently, in the present study the area of financial support tended to present the lowest support, especially related to the salary for S-As. Furthermore, the national socioeconomic context and cultural background can influence the S-As' expectations. In countries with stronger economic support structures, S-As may expect more comprehensive financial aid, whereas in others, lower expectations might result in higher satisfaction with more limited resources. In being not financially independent when competing in nonrevenue-generating sports, S-As reported financial uncertainty and envisaged possible improvements, which would merit future attention from policy makers and future studies on the financial support S-As receive from government, HEIs, families, and sports and private sectors (20).

According to (11), the countries included in our study have different approaches to DC support, with Spain adopting a state-centric regulation with the government imposing responsibilities on HEIs to provide flexible academic paths, and the other countries presenting a laissez-faire approach with no formal structures (11). However, these approaches did not necessarily translate into clear differences in the presence, quality, and planned implementation of the studied DC areas. On the contrary, the cross-national variability observed in our results suggests that cultural and socioeconomic factors play a critical role. Kuettel et al. (40) demonstrated that dual career support systems are heavily influenced by welfare models and the historical trajectories of individual countries. Their study highlights how broader systemic factors, such as national investment in social welfare and the integration of sport within societal priorities, shape the availability and quality of dual career resources. For example, Serbian HEI experts reported the highest presence of services and implementation plans (Supplementary Table 1), which could reflect Serbia's status as an emerging country. Conversely, the lowest presence of services and plans in Italy and Spain might stem from a more precise understanding of what has been effectively implemented and a clearer awareness of the national legislative framework, compared to countries where the dual career topic is still emerging. Additionally, these findings may reflect higher expectations in countries accustomed to well-established services, leading to more critical evaluations. In Spain and Italy, S-As consistently provided lower evaluations than HEI experts, suggesting potentially higher expectations or a more critical perspective on the services received. Conversely, in

Serbia, S-As often rated services higher than HEI experts, a trend occasionally mirrored in Slovenia, Romania, and Non-Find ME countries. These patterns highlight how cultural and socioeconomic contexts shape not only the availability of dual career services but also their perception. Overall, the findings of this study align with Kuettel et al. (40), confirming that the diversity in dual career provision reflects not only institutional practices but also the underlying welfare ideologies and cultural frameworks shaping each country's approach. The differences between HEI experts and S-As might be due to a limited familiarity and awareness of DC policies, programmes, initiatives, and documents available in the country and call for better communication and understanding of the legal DC framework that impacts on the available support structures (20, 41). Actually, improvements in DC do not necessarily derive from national policies but can also emerge from the cooperation of different stakeholders. In fact, the recent establishment of the Italian network of HEIs Unisport Italia fostered the cooperation with the Olympic (CONI), Paralympic (CIP) and the University Sport Federation (CUSI) to publish the Italian DC guidelines, the national online DC platform for S-As interested in enrolling at universities offering a suitable educational degree and a DC support (<https://www.unisport-italia.it/dual-career/>), and a relevant involvement of HEIs in ERASMUS+DC projects (41, 42). It is also possible to speculate that such a consolidated dialogue on DC determined the highest percentage of Italian respondents to the surveys. Finally, the European Commission is the driving force softly directing the development of the quality assurance of DC infrastructure, and a powerful actor in the evaluation processes through its funding, networks, indicators, data processes, and discourses (42).

The results of the present study highlight the importance of considering both institutional perspectives and the experiences of S-As in shaping effective DC policies. Specifically, the observed cross-national variability highlights the need for tailored policy approaches that reflect the unique cultural and socioeconomic contexts of each country. Policymakers should use these findings to align national strategies with European frameworks, such as the EU Guidelines on Dual Careers of Athletes, while adapting them to local needs to ensure fair access to DC provisions. Improving communication and resource visibility is essential, as gaps in knowledge and usage of DC services indicate the need for centralized platforms that provide clear information on available resources, guidelines, and best practices. These platforms could also offer tools for personalized academic planning, helping S-As better balance their commitments. Strengthening collaborations between HEIs, governments, sports organizations, and private entities is also critical. Such partnerships can drive the creation of innovative and sustainable DC ecosystems, support the co-creation of tailored solutions, promote resource sharing, and enhance the overall quality of DC support systems. Policymakers should also prioritize long-term investments in digital learning, flexible curricula, and financial support mechanisms to address current gaps and anticipate the evolving needs of S-As in a rapidly changing educational

landscape. By addressing these key areas, policymakers and practitioners can develop strategies that are both practically viable and theoretically robust, fostering an environment where S-As can pursue dual careers successfully. These efforts will contribute to strengthening the European education area and ensuring that DC policies translate into tangible benefits for both institutions and S-As.

The present study has several strengths, including a comprehensive evaluation from both S-As and HEI experts' perspectives, offering a well-rounded understanding of the current DC landscape. It also provides a cross-country comparison, highlighting both common trends and country-specific differences, which provides valuable insights for policymakers at various levels. Additionally, the study offers actionable insights by identifying specific areas for improvement in DC support and offering concrete suggestions for enhancing the quality and availability of services. However, the study also has limitations, firstly due to the sample size of different groups and the uneven representation of countries, with some nations being underrepresented, especially those with less universities. This imbalance might have influenced the findings, potentially amplifying some trends or underreporting unique challenges faced by underrepresented countries. Additionally, in countries with smaller sample sizes, extreme scores, either particularly high or low, might reflect the influence of outliers rather than a real trend across a given country. This could skew the overall interpretation of findings for these nations, highlighting the need for caution when generalizing results. As a result, the generalizability of the study's conclusions may be somewhat limited, particularly for nations with different socio-economic or cultural contexts. Future research should aim to address this limitation by ensuring more balanced representation across countries through targeted sampling strategies or collaborative international efforts. Secondly, the reliance on self-reported data could introduce bias, as participants' perceptions may not fully align with objective measures of support quality or availability. In some cases, the responses suggest a potential lack of knowledge regarding certain aspects of dual career support. As an example, HEI experts might have provided evaluations for National Legislation even in countries where such legislation does not formally exist, potentially confusing it with other documents, such as framework agreements or institutional guidelines. Furthermore, S-As often report the presence of services that experts do not recognize as available, likely because these services may be offered informally. This divergence underscores the complexity of dual career support systems, where formal policies and informal practices coexist, leading to potential inconsistencies in the perception and reporting of available resources. Thirdly, the study lacks longitudinal data, which limits its ability to assess the long-term impact and sustainability of dual career policies and support systems. For instance, some of the observed trends may reflect temporary conditions, such as recent policy changes, rather than stable patterns. This limitation also hinders our understanding of how dual career policies adapt to the evolving educational and athletic systems, as well as the broader socio-economic and political

context. Addressing this gap in future longitudinal studies could involve tracking the implementation, sustainability, and effectiveness of specific initiatives, evaluating how policies influence the development of S-As over time, and assessing whether short-term benefits lead to long-term outcomes. Finally, the present study focuses exclusively on the perspectives of HEI experts and S-As. However, the absence of data from other relevant actors, such as parents, coaches, and policymakers, represents a limitation. These stakeholders play critical roles in shaping the dual career ecosystem, and their perspectives could provide valuable additional information. Future research should aim to include these voices to offer a more comprehensive understanding of the challenges and opportunities within dual career support systems.

5 Conclusions

To align to the DC priority of European sports policies and guidelines for pursuing the holistic development of elite athletes, a coordinated approach to DC support is required (6, 12, 14, 16, 18, 43). In conclusion, the findings from the present study underscore the complex and multifaceted nature of DC support for S-As across Europe. While logistic support is generally the most provided service, significant variations exist in quality and availability among different countries. The confirmation of logistic support as a prevalent service underscores the importance of maintaining and enhancing these resources. Future policies should focus on addressing the identified gaps, particularly in countries where support is less robust, to ensure equitable access for all S-As. In this regard, leveraging broader policy frameworks, such as the Bologna Process and ERASMUS+ initiatives, could play an important role. The Bologna Process provides tools like micro-credentials and mutual recognition of qualifications, which can help harmonize educational pathways for S-As. Similarly, the ERASMUS+ initiative offers funding opportunities for transnational collaborations and innovative program development, which could be especially beneficial for resource-constrained HEIs. By aligning institutional strategies with these frameworks, HEIs and policymakers can create more cohesive and accessible dual career support systems across Europe. Notwithstanding, the discrepancies between the evaluations of S-As and HEI experts highlight the necessity of considering both perspectives to improve support systems effectively.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Ethics Board of Universidad Internacional de La Rioja, Code: PI062/2024. The studies were conducted in accordance with the local legislation

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Author contributions

PI: Conceptualization, Data curation, Funding acquisition, Investigation, Visualization, Writing – original draft, Writing – review & editing. SS: Data curation, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing. IP: Data curation, Investigation, Methodology, Writing – review & editing. AF: Data curation, Methodology, Supervision, Validation, Writing – review & editing. BA: Investigation, Writing – review & editing. TADH: Investigation, Writing – review & editing. BÇ: Investigation, Writing – review & editing. ADB: Investigation, Supervision, Writing – review & editing. HE: Investigation, Writing – review & editing. AJF: Investigation, Writing – review & editing. BG: Investigation, Supervision, Writing – review & editing. HG: Investigation, Writing – review & editing. IO: Writing – review & editing, Methodology. RO: Investigation, Writing – review & editing. MP: Investigation, Writing – review & editing. AR: Investigation, Writing – review & editing. AS: Investigation, Writing – review & editing. NSTA: Investigation, Writing – review & editing. NSTO: Investigation, Writing – review & editing. MD: Investigation, Writing – review & editing. LC: Conceptualization, Data curation, Investigation, Supervision, Visualization, Writing – original draft, Writing – review & editing.

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Supplementary material

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Motivation and identity among European and Brazilian elite student-athletes: a Bayesian multilevel regression and poststratification analysis

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Introduction: The global dimension of elite sport enrolls a vast number of student-athletes and universities around the world. However, the majority of higher education institutions do not share the same vision and policies about education and elite sport. Hence, comparative studies are needed. The goal of the present study was to use Multilevel Regression with Poststratification to estimate variation between Brazilian and European university student-athletes' motivation toward sports and academics, and two dimensions of identity, affectivity and social identity.

Methods: 508 student-athletes (311 Brazilian, competing at the national university games; 197 European, competing at the European University Games) participated in the study and answered to two questionnaires used in cross-cultural research: SAMSAQ, for academic and sport motivation, and BIMS, for social identity and emotions.

Results: For all the variables our estimations showed significant differences between Brazilian and European athletes, with the former expressing higher scores in all dimensions of motivation and identity.

Discussion: The findings suggest that the macro-effect of the organizational and cultural context is the most important source of influence on athletes' motivation and identity, which appears to be more significant in Brazil. Cultural nuances among European countries and Brazilian states seem to have little impact on the athletes' responses. It is necessary to move on from an ethnographic stance and assume methodological sophistication as a way to assimilate a body of knowledge that can be subject of comparison and interpretation. Educators need to compare and see what works at a global level, because thousands of elite athletes are enrolled in higher education and feed national and international competitions with their commitment and quality. Our findings highlight the need for policymakers and educational institutions to develop tailored support systems that acknowledge the cultural and organizational differences impacting student-athlete motivation and identity. Implementing flexible academic programs, fostering supportive athletic environments, and promoting dual career pathways are crucial for optimizing the student-athlete experience globally.

KEYWORDS

cross-cultural comparison, universities, sports, multilevel analysis, Bayesian approach

1 Introduction

The enrollment of elite athletes in higher education is a widespread phenomenon, with numerous individuals representing their universities and clubs in national and international competitions. This global trend is strengthened by policies and funding initiatives from both national and supranational bodies, which directly impact student-athletes through financial support and mobility programs. Prior studies suggest that elite sport can serve as a vehicle for personal development, facilitating the acquisition of psychosocial skills and life competencies (1, 2). Consequently, collaboration between educational institutions and sports organizations is essential for recognizing the skills that athletes develop through both formal education and non-formal athletic experiences (3).

While the collegiate athletics system in the United States is often highlighted for its integration of elite sport and higher education, it is crucial to recognize the distinct characteristics of the Brazilian and European higher education systems. The European Union's Erasmus program has significantly increased international student-athlete mobility, highlighting a growing global trend (4). This mobility is supported by EU policies aimed at enhancing dual-career opportunities through scholarships and specialized programs (5). However, the European landscape remains diverse, with countries like Portugal or France having comprehensive school sport legislation and higher education institutions offering structured support through government-guided policies (6).

In contrast, Brazil adopts a more liberal, laissez-faire approach to university sports. While the number of student-athletes engaging in international mobility is increasing, as seen globally, the level of institutional support within Brazilian universities varies significantly compared to European models. This disparity underscores the need for comparative studies that transcend ethnocentric limitations and embrace methodological sophistication (7). Such studies are crucial for understanding the diverse experiences of student-athletes and for developing effective policies that support their dual-career pathways.

It is important to acknowledge that the number of student-athletes involved in dual-career pathways within Brazil and Europe is substantial, although precise figures are challenging to obtain due to varying data collection methods and definitions. However, participation in university sports is growing, driven by increasing recognition of the benefits of dual-career development.

Despite these structural disparities, sport is generally viewed as a socially positive force, enhancing institutional reputation, fostering student engagement, and contributing to academic achievement and career readiness. As a result, policymakers and educational stakeholders require empirical data to inform policies and practices that optimize the dual-career experience for student-athletes. Given the heterogeneity in institutional and cultural settings, comparative studies are necessary to elucidate the interactions between academic and athletic identities in various national contexts. Research on student-athletes often centers on specific case studies or localized contexts (8, 9), with few studies offering a broader comparative perspective that

includes student-athletes' own experiences (10). Moreover, the diversity of analytical approaches within sports research, some of which may not adequately address the complexity of the data, underscores the need for methodological rigor. As the field of sport sciences advances toward an internationally integrated framework, it is essential to transcend ethnocentric limitations and adopt robust methodologies that allow for meaningful cross-cultural comparisons.

Although the Brazilian higher education system is structurally similar to the pre-Bologna European model, Brazil's unique social, geographical, and cultural landscape provides an opportunity for a nuanced comparative analysis. This requires a rigorous approach to measurement and validation, particularly when exploring psychological constructs across diverse settings (11). This commitment to methodological rigor is essential for understanding how constructs like motivation and identity manifest in the complex interplay of academic and athletic pursuits within distinct cultural contexts. Therefore, leveraging robust analytical frameworks that can accommodate the nuances of hierarchical data is crucial for generating accurate and generalizable insights. By employing such sophisticated methodologies, researchers can move beyond localized perspectives and contribute to a deeper, more comprehensive understanding of the global student-athlete experience. This study addresses the following research questions: (i) how do sports and academic motivation, along with affective and social identity, vary among Brazilian and European student-athletes?; (ii) what are the regional differences in these constructs within Europe and across Brazilian sub-regions?

To address these complexities, this study focuses on two key psychological constructs: identity (the extent to which student-athletes identify as students, athletes, or both) and motivation within both domains. These constructs are assessed through the Baller Identity Measurement Scale (BIMS) and the Student-Athletes' Motivation toward Sports and Academics Questionnaire (SAMSAQ), which have been validated in various cultural contexts, including Brazil and Europe (12–14). Given the hierarchical nature of the data concerning student-athletes' identity and motivation, this study employs Multilevel Regression with Poststratification (MRP), a robust analytical framework that enables accurate interpretation of hierarchical data structures (15, 16). MRP is particularly useful for our study as it allows us to model individual outcomes as a function of individual and contextual covariates, accounting for the nested data structure. (e.g., students within universities, universities within regions), reducing bias in small-group estimates, and enabling more accurate population-level predictions (17). This is particularly valuable in cross-cultural comparative studies where sample sizes and representativeness may vary across Brazilian and European regions.

Using MRP, this study aims to estimate variation in sports and academic motivation, along with affective and social identity, among Brazilian and European student-athletes. Based on existing literature, we anticipated that regional differences would be observable within Europe and across Brazilian sub-regions, though specific comparative outcomes were not hypothesized.

2 Materials and methods

2.1 Study design and participants

This study employed an exploratory, cross-sectional design, with no specific hypotheses due to the novel, comparative nature of the topic. The sample comprised 508 student-athletes, including 311 Brazilian athletes competing in national university games and 197 European athletes competing in the European University Games. Data collection occurred through an online survey administered via Google Forms during the Brazilian championships and the 4th European University Sports Association (EUSA) Games. Participation was voluntary and anonymous, with survey administration approved by the Brazilian University Sports Confederation and the EUSA Organizing Committee. All participants provided informed consent, and European participants confirmed their fluency in English.

The sample was further categorized by sport type (individual and team sports), by gender, and by region within Brazil and Europe. Brazilian participants were grouped into five regions based on standards from the Brazilian Institute for Geography and Statistics (IBGE): North, Central-West, South, Northeast, and Southeast. This regional approach accounts for Brazil's vast geographical, cultural, and socio-economic diversity, which is essential for an accurate comparative analysis. European participants were grouped into five geographical regions (North, South, West, Central, and East) according to the EuroVoc thesaurus classification for geographical groups (https://eurlex.europa.eu/browse/eurovoc.html?params=72#arrow_7206). This classification reflects established geopolitical and cultural divisions within Europe, providing a structured framework for examining potential regional variations in student-athlete experiences.

Potential biases include self-selection bias, as participation was voluntary. Data collected during university games might have introduced a performance bias, as athletes' responses could be influenced by their immediate competitive experiences. To mitigate these biases, we ensured anonymity and emphasized the importance of honest responses. However, future studies should consider employing diverse data collection methods and incorporating longitudinal designs to minimize these potential limitations.

2.2 Instruments

Participants completed validated versions of SAMSAQ (13, 18) and BIMS (14, 19), both administered using a 6-point Likert scale, with responses ranging from 1 (strongly disagree) to 6 (strongly agree). The SAMSAQ measures motivation across three dimensions: (i) Academic motivation, which captures the drive to succeed academically alongside athletic commitments. Example item: "I am willing to put the time to earn excellent grades in my courses." (ii) Sport motivation, which assesses the desire to achieve athletic success. Example item: "It is worth the effort to be an exceptional athlete in my sport." (iii) Career Motivation:

Reflects motivation to engage in the athletic career. Example item: "I choose to play my sport, because it is something I am interested as career. want to succeed equally in both my sport and my studies." The SAMSAQ has been validated in both Europe and Brazil, confirming the robustness of its three-factor structure across these diverse cultural contexts.

The BIMS assesses identity across two dimensions: (i) Social Identity: Evaluates the extent to which participants see themselves as student-athletes within a social context. Example item: "I consider myself a student athlete." (ii) Affectivity: Measures emotional investment in one's athletic role, both positive and negative. Example item for positive affectivity: "When I am a student-athlete, I feel good about myself." Example item for negative affectivity: "I feel bad about myself when I do poorly when I am not a student-athlete."

Both questionnaires have undergone validation studies for European (18) and Brazilian contexts (12–14), ensuring cultural relevance and psychometric reliability in assessing motivation and identity factors for student-athletes in these regions. In particular, The Portuguese version of the BIMS (12) has a two-factor structure, Affectivity ($\alpha = 0.92$) and Social Identity ($\alpha = 0.73$), and a confirmatory factor analysis indicated acceptable fit indices (TLI = 0.91, CFI = 0.96, GFI = 0.95). The Portuguese version of the SAMSAQ (12) has a three-factor structure: Academic Motivation ($\alpha = 0.92$), Sport Motivation ($\alpha = 0.88$), and Career Motivation ($\alpha = 0.85$), and a confirmatory factor analysis showed acceptable fit indices (TLI = 0.90, CFI = 0.96, GFI = 0.87), with all factor loading exceeding 0.70.

2.3 Data analysis

We estimated individual responses based on individual (gender and sport) and geographic (region) characteristics, using partial pooling for each individual i , indexed by g , s , and r for gender, sport, and region, respectively. This hierarchical approach allows us to model both individual-level (demographic and sport) and regional influences on student-athletes' identity and motivation across Brazil and Europe. The model for each outcome variable (e.g., social identity, academic motivation) can be expressed as follows:

$$y_i \sim \text{Norm}(\mu_i, \sigma)$$

where y_i is the response (e.g., social identity, motivation) for individual i . For computational convenience, we assumed that the response is truncated to the interval [1, 6].

$$\mu_i = \beta_0 + \gamma_g[g_i] + \gamma_s[s_i] + \gamma_r[r_i]$$

where:

- β_0 is the overall intercept (i.e., the baseline level for the outcome),

- $\gamma_g[g_i]$, $\gamma_s[s_i]$, and $\gamma_r[r_i]$ represent random intercepts for the effects of gender, sport, and region on the response, respectively, modeled as normally distributed random effects:

$$\begin{aligned}\gamma_g[g_i] &\sim \mathcal{N}(0, \sigma_g) \\ \gamma_s[s_i] &\sim \mathcal{N}(0, \sigma_s) \\ \gamma_r[r_i] &\sim \mathcal{N}(0, \sigma_r)\end{aligned}$$

where σ_g , σ_s , and σ_r are the standard deviations of the random effects for gender, sport, and region.

We applied weakly informative priors to regularize the model estimates:

$$\begin{aligned}\beta_0 &\sim \mathcal{N}(3.5, 1.25) \\ \sigma_g &\sim \mathcal{N}(0, 1) \\ \sigma_s &\sim \mathcal{N}(0, 1) \\ \sigma_r &\sim \mathcal{N}(0, 1)\end{aligned}$$

To estimate outcomes for identity and motivation across specific demographic and geographic groups, we applied MRP. We used data from the Brazilian University Games 2018 and the European University Games 2018 to weight the predicted scores by population frequencies in each poststratification cell c . Each cell's prediction θ_c was weighted by its frequency w_c :

$$\theta_r = \frac{1}{N_r} \sum_{c=1}^{C_r} \theta_c \cdot w_c$$

where N_r is the total weight across cells in region r , and θ_c represents the estimated response in cell c .

The multilevel models were fit using a Bayesian framework with the “brms” package (20) in R [R2018], which enables flexibility in Bayesian modeling. Four chains ran in parallel with 500 iterations, including 250 warm-up iterations, for reliable convergence.

3 Results

Convergence was assessed using $\hat{R}$ values, which were close to 1 across parameters, indicating good mixing of the chains. Posterior predictive checks (21) showed that the model adequately captured the observed data, suggesting a reasonable fit given our data and assumptions.

The multilevel regression parameters for the BIMS dimensions and the SAMSAQ dimensions are summarised in Tables 1, 2, respectively.

Figures 1, 2 illustrate the regional trends in the BIMS dimensions and the SAMSAQ dimensions, respectively, showing the variation with 68% and 90% credible intervals (representing approximately one standard deviation and a broader uncertainty range, respectively). Predictions for the Central West Brazil region are not included in the figures due to limited data and observations for post-stratification in this region. Consequently,

TABLE 1 Posterior estimates and 68% uncertainty intervals for BIMS dimensions, considering gender, sport, and region.

	Social identity	Affectivity
Population-level parameters		
β_0	3.59 (3.04, 4.15)	4.27 (3.22, 5.22)
Group-level parameters		
σ_{gender}	0.25 (0.06, 0.74)	4.33 (3.42, 5.25)
σ_{sport}	0.48 (0.20, 0.98)	0.71 (0.30, 1.31)
σ_{region}	1.05 (0.81, 1.37)	4.02 (3.46, 4.65)
σ	1.48 (1.39, 1.60)	2.11 (1.94, 2.30)

TABLE 2 Posterior estimates and 68% uncertainty intervals for SAMSAQ dimensions, considering gender, sport, and region.

	Academic motivation	Sports motivation	Career motivation
Population-level parameters			
β_0	3.99 (3.21, 4.74)	3.96 (3.40, 4.49)	5.07 (3.90, 6.17)
Group-level parameters			
σ_{gender}	0.26 (0.06, 0.75)	0.19 (0.04, 0.68)	0.69 (0.19, 1.46)
σ_{sport}	0.53 (0.25, 1.06)	0.34 (0.12, 0.80)	1.98 (1.32, 2.67)
σ_{region}	2.08 (1.72, 2.50)	1.31 (1.06, 1.63)	0.83 (0.25, 1.58)
σ	0.90 (0.83, 0.98)	1.04 (0.99, 1.11)	5.16 (4.49, 5.96)

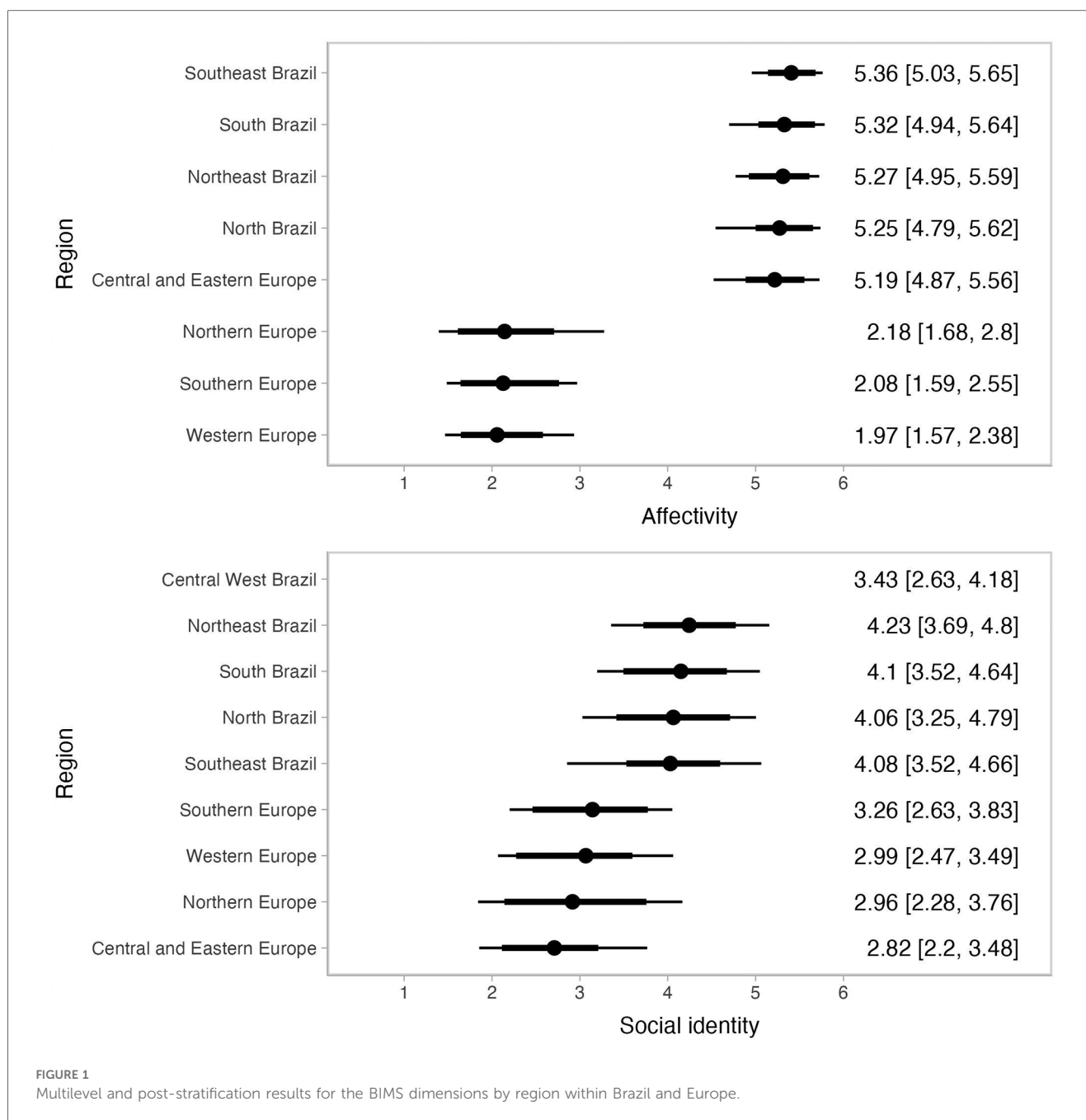
predictions for this region primarily reflect the multilevel model estimates and associated uncertainty.

Our findings, with the exception of career motivation, indicate significant differences between Brazilian and European athletes, with Brazilian athletes reporting higher scores across all dimensions of identity and motivation. Patterns across Brazilian and European regions were consistent, showing no significant regional variation in outcomes. Additionally, there was no significant effect of gender or sport type on student-athletes' identity or motivations toward dual careers.

4 Discussion

In the present study, we aimed to examine the characteristics of identity and motivation among student-athletes from Europe and Brazil from a comparative perspective. At the same time, the multiple layers that define the dual condition of students and athletes require a multidimensional approach. For this reason, it is essential to consider cultural, academic, and athletic variables in order to understand how student-athletes' motivation and identity vary across specific social contexts.

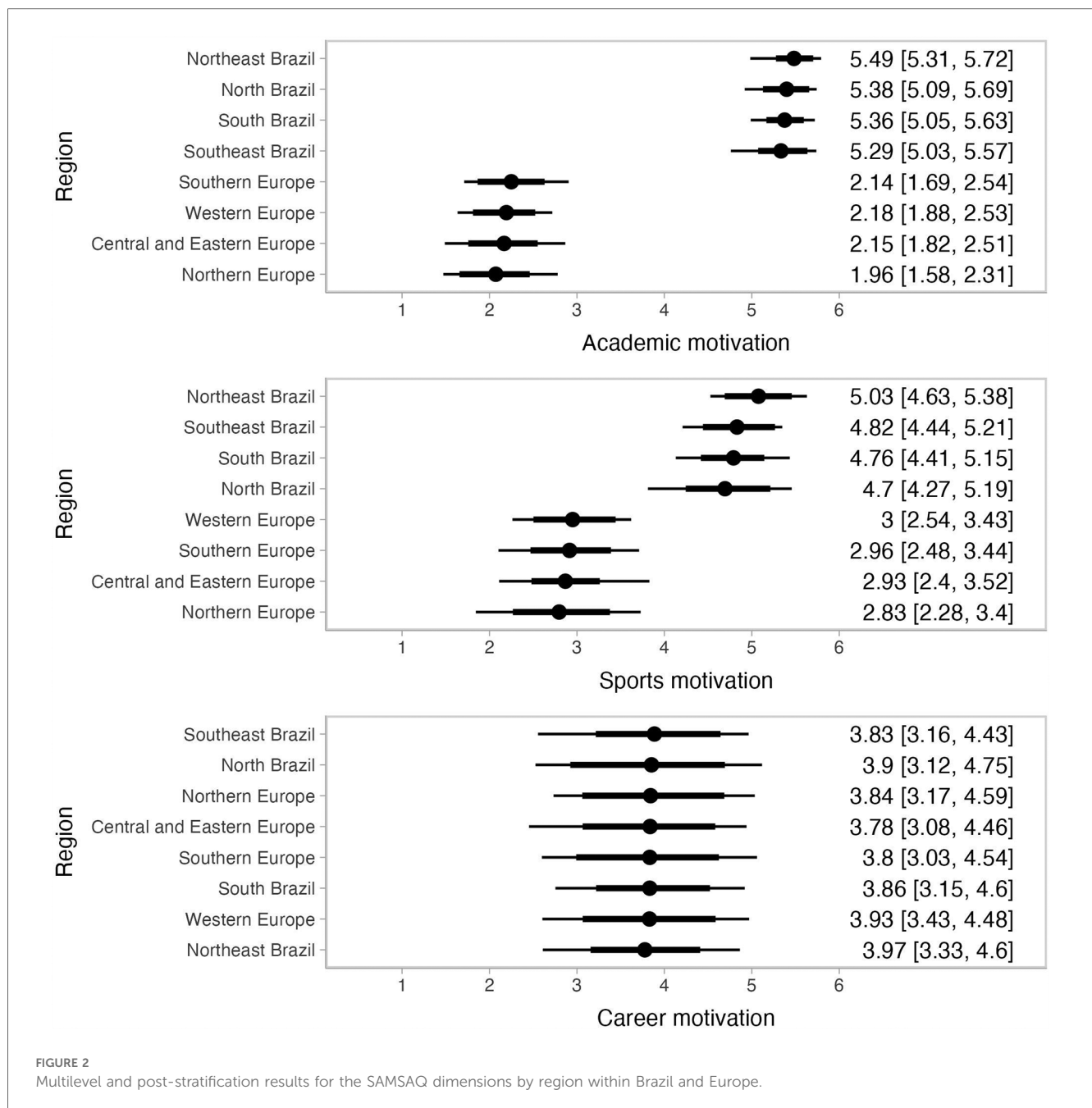
The findings suggest that the macro-effect of the organizational and cultural context is the most significant source of influence on athletes' motivation and identity, particularly in Brazil. Cultural nuances among European countries appear to have little impact on athletes' responses. A similar pattern was observed in Brazil, where, despite the more developed economic status of the southern and southeastern states, no significant differences were found.



In addition to geographical, economic, and cultural differences, European states can also be categorized by the policies in place regarding dual careers, as follows: (1) State-centric regulation; (2) State as sponsor/facilitator; (3) National Sporting Federations/Institutes as intermediaries; and (4) Laissez-faire/No Formal Structures (European Commission, 2016). In the group of countries with state-centric regulation (France, Hungary, Luxembourg, Poland, Portugal, and Spain), no northern European countries are included, suggesting that legislative frameworks may overlap with cultural differences. In contrast, Brazil adopts a more liberal and laissez-faire approach to university sports, where higher education institutions set their own sport policies without interference from federal or state governments.

In the EU, direct relationships exist between national and EU bodies. At the national level, governmental departments collaborate with universities to establish regulations and allocate financial resources. However, these macro-level relationships do not appear to translate into differences in motivation and identity or, as is possible to speculate, into a common development of dual career paths among EU member states.

The globalized culture of elite sport has given rise to the phenomenon of transnational athletic migration. Different typologies of migrating elite athletes require careful consideration in research and international policies (22). Since identity is partly shaped by others' recognition, individuals can suffer significant harm if society reflects a demeaning image of them.



Misrecognition can be a form of moral harm that undermines self-esteem and the capacity for full personhood. This issue became particularly acute with modernity, where recognition could no longer be based solely on tradition or ritual. Individuals were expected to develop themselves independently, but soon realized that they relied on others to recognize their authentic selves. This may be the case for student-athletes, who face public scrutiny in the sport arena, which in the two events considered in this study, receives substantial media attention.

Student-athletes represent a unique group because their identity is formed and reinforced within two dominant social contexts: academics and athletics. This dual context can foster the belief that athletic and academic identities reflect athletes'

perceptions of themselves as a dual persona—both athlete and student. Recent studies have demonstrated a direct connection between institutional organization and athletic identity (13, 23).

In Europe, it is believed that most athletes enroll in higher education not to pursue a sporting career but to obtain an education that will lead to better job opportunities in the future, as they believe financial independence through sport is unlikely (24, 25). However, in the present study, our estimates show that Brazilian students exhibit higher levels of academic motivation, possibly due to the elite sample of European athletes.

The higher levels of academic motivation observed among Brazilian student-athletes may be attributed to several socio-economic factors. In a nation where social mobility is often

linked to educational certification, pursuing higher education can be viewed as a crucial pathway to future success. Moreover, the inherent challenges of navigating a less structured university sports system in Brazil may foster a heightened sense of determination and resilience. The relative prestige of university education in Brazil, coupled with the desire to overcome economic disparities, could act as a powerful motivator. The cultural value placed on sport, and the potential for it to provide social and economic opportunities, may further amplify academic motivation. It is also important to consider that the elite athletes from Brazil, that were part of this study, have most likely had to overcome many obstacles to arrive at the level they are at, which can increase their motivation. The economic realities in Brazil, where many talented athletes face financial constraints, could also drive higher motivation, as they may view academic achievement as a safety net, ensuring a stable future beyond their athletic careers. The high levels of social inequality present in Brazil, may also influence the high level of motivation, as the athletes may view this as an upward mobility opportunity.

Although significant differences exist among states regarding national legislation and policy recommendations, student-athletes seem either unaware of these policies or perceive them as too distant to have a tangible impact on their academic and athletic careers. We assumed that student-athletes from states with centralized political decisions regarding university sports, as seen in some European countries, would exhibit higher levels of academic and sport motivation compared to other organizational models (12). However, this was not the case, and we suggest that the homogeneity of the sample, consisting of elite athletes competing at an international level, is the likely cause for this result.

Although significant differences exist among states regarding national legislation and policy recommendations, student-athletes seem either unaware of these policies or perceive them as too distant to have a tangible impact on their academic and athletic careers. We assumed that student-athletes from states with centralized political decisions regarding university sports, as seen in some European countries, would exhibit higher levels of academic and sport motivation compared to other organizational models (12). However, this was not the case, and we suggest that the varying levels of elite participation across our Brazilian and European samples, rather than simple homogeneity, is the likely cause for this result. In Brazil, a broader range of athletic levels participate, potentially diluting typical gender disparities and influencing overall motivation patterns.

The findings also indicate that Brazilian student-athletes strongly desire to develop a dual career. This contrasts with the lack of national policies addressing dual careers, even at the level of federal states. In a previous study (12), model estimations suggested that Brazilian student-athletes exhibit higher affectivity and social identity compared to a sample of Portuguese student-athletes. Given that university sports programs in Brazil tend to be less structured, it seems that Brazilian university contexts may provide more opportunities for sport participation, allowing students with varying levels of sport experience to engage in athletics while supporting elite student-athletes in national

competitions. In Europe, athletes' development is closely tied to the club system and is less school-based (26, 27), which could explain why European athletes exhibit lower levels of affectivity. The social identity values align with the diverse organizational models across continents, with student-athletes from Brazilian universities displaying higher scores than their European counterparts.

There is no ideal strategy to balance academic and athletic careers for student-athletes (24). However, our results suggest that cultural, social, and political contexts directly affect motivation to pursue a dual career. Clearly, local university policies seem to have the greatest impact on their student-athletes. Additionally, previous studies in Europe (28) and Brazil (12) found local differences in motivation and identity. In our study, these differences appear to diminish, suggesting a cultural alignment within continents that warrants further attention.

The importance of providing athletes with opportunities to develop academic careers in a high-level sport environment has been emphasized, noting that this is one of the prime factors athletes consider when choosing a university (29). On a global scale, athletes face similar challenges, but understanding how student-athletes identify with their own reality, how they face these challenges, and how they balance the demands of sport and education requires comparative studies of the contexts in which they are engaged (24, 26, 30). Thus, innovative approaches to understanding the dual nature of their training (academic and athletic) are needed. Transnational studies and projects can play a critical role in identifying best practices to reduce dropout rates in both academic and sports careers, promoting successful transitions for athletes, and advising governments, sports organizations, and educational institutions on better management of sports and education (31, 32). We acknowledge that the empirical nature of our research does not diminish the complexity of how sport perceptions vary across states.

While traditionally males are seen as more athletically oriented, our study found no gender differences. This may be due to the varying levels of elite participation across our Brazilian and European samples. In Brazil, a broader range of athletic levels participate, potentially diluting typical gender disparities. Additionally, the intense demands of elite student-athlete life, balancing academics and sports, may create a shared motivational landscape that minimizes gender differences. Future research with more diverse samples is needed to explore this further.

The limitations of the current study primarily arise from its cross-sectional and quantitative design. Further research is necessary to gain a more comprehensive understanding of the dual commitments required of student-athletes and their institutions. It is essential to move beyond the parochialism and ethnocentrism that often characterize much of the sport research literature and to examine the factors influencing motivation and identity from a global perspective. The phenomenon of university sport requires a more universal understanding, without preconceived models. While the U.S. commercial model is frequently presented as a benchmark, its applicability to other regions of the world remains limited. This study's focus on elite

athletes in specific events limits generalizability to broader student-athlete populations. Future research should prioritize diverse samples, longitudinal designs, and consider a wider range of regions to capture the complexities of student-athlete experiences. Additionally, the study's cross-sectional design and data collection during specific events may introduce bias. Future studies should consider the time of year, proximity to events, and wider athlete skill levels to improve generalizability.

Our findings underscore the need for tailored interventions to support student-athletes in diverse contexts. For educators, this implies developing flexible academic programs that acknowledge the rigorous demands of elite sport. Policymakers should consider implementing or refining dual career policies, drawing on best practices from various models while recognizing the specific cultural and institutional landscapes. For sports organizations, fostering a supportive environment that values both athletic and academic achievements is crucial. This could involve providing mentorship programs, academic advising, and resources to navigate the dual career path. Specifically, in Brazil, given the lack of federal support, it becomes imperative that universities develop robust internal policies and support structures. Furthermore, sports organizations should advocate for increased public and private investment in dual career initiatives. It would be a major step forward if higher education institutions create dual career programs that provide academic flexibility, psychological support, and career counseling.

In this regard, we have deliberately avoided the dichotomy between cultural relativism and universalism, as it is not productive in the context of this study. Our approach to the data has been free from *a priori* assumptions. Furthermore, it is imperative to move beyond ethnographic approaches and adopt more sophisticated methodologies that allow for the accumulation of knowledge that can be meaningfully compared and interpreted across different contexts. In this field, the distribution of samples is rarely normal, requiring the use of advanced statistical techniques beyond traditional inferential methods. Lastly, it is crucial to conduct comparative studies at the global level to identify effective strategies. Thousands of elite athletes are currently enrolled in higher education and contribute to both national and international competitions, demonstrating their commitment and skill.

Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found below: <https://osf.io/grb56/>.

Ethics statement

The research was approved by the Ethics Committee of the Faculty of Sport Science and Physical Education at the University

of Coimbra and the Human Ethics Committee of the Federal University of Santa Catarina. All procedures followed local legislation and institutional guidelines. Informed consent was obtained from all participants before their involvement in the study.

Author contributions

CEG: Writing – original draft, Writing – review & editing, Supervision. HMC: Writing – original draft, Writing – review & editing, Conceptualization, Formal analysis, Supervision, Visualization. AF: Writing – review & editing. SE: Conceptualization, Writing – review & editing. RTQ: Data curation, Writing – original draft, Writing – review & editing. LMR: Writing – review & editing, Conceptualization, Funding acquisition.

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Conflict of interest

The author(s) declared that they were an editorial board member of *Frontiers*, at the time of submission. This had no impact on the peer review process and the final decision. The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Women elite Italian football players' perceptions on gender equality and dual career opportunities

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Introduction: The aim of the present study was to explore dual career experiences of elite women Italian football players in light of potential gender inequalities that might have affected their sporting and academic career paths.

Methods: A 25-items semi-structured questionnaire was administered to 22 elite Italian football players (age: 25.8 ± 4.3 years).

Results: The mixed-method thematic analysis highlighted participants' difficulties in combining sport and education (e.g., lack of time, lack of dual career opportunities), reporting a higher support received from the sporting context (e.g., training absences and schedule adaptation) rather than from the educational institutions (e.g., lack of flexibility for class absences and for exams/evaluation schedule). Seven participants only benefited from the recognition of the "student-athlete status" and the formal access to a dual career program, mainly due to gender differences in the recognition of eligible competitive levels and past gender equality policies. Furthermore, the gender pay gap in professional football was perceived as a crucial factor in determining women's major interest in academics and educational achievements over their football performance development.

Discussion: The present findings reflect previous literature in this field, with the football career perceived as unsecure and precarious, even more for women in such male-dominated industry, urging them to prioritize their education. Although the recent professional recognition was positively perceived, the present study highlighted the need for further research in this area. Furthermore, the translation of evidence-based information into further policy implementation towards gender mainstreaming and equal dual career paths in football should be envisioned.

KEYWORDS

gender equality, football, dual career, questionnaire, thematic analysis

1 Introduction

Sustainability in sports represents both a great challenge and an opportunity (1), with gender mainstreaming and quality education representing key factors to pursue strategic objectives of sustainable development (2). In this framework, gender inequalities and dual career (e.g., the pursuit of both elite athletic performance and academic or vocational development, allowing individuals to balance their sporting demands with

education and/or professional career aspirations) issues still permeating several sporting contexts urge policy interventions, recommendations, the dissemination of good practices, and concrete actions for the promotion and monitoring of both gender mainstreaming and the safeguard of elite sportspersons' rights to education (3–7). It is well documented that a considerable gender inequity in sports still persists (6–8), with prevalent discriminatory practices affecting several sports disciplines and professional profiles (e.g., professional athletes, coaches, sport managers/directors, referees). Furthermore, being a sports career a dynamic, multidimensional, multilevel, and multifactorial process (9), the progressive increase of athletic demands, dual career requirements, and socio-cultural and life aspects strongly impact career transitions (e.g., from the youth talented stage till retirement and post-athletic career) of elite sportspersons (9–20). Thus, sport and academic support, facilitating external socio-cultural environments, financial resources, and services are key in determining athletes' career trajectories, also in relation to their gender (9, 11, 13, 21–24).

Globally, football represents the most popular sport worldwide (25, 26), accounting for the highest share of both participants and fans (e.g., around 270 million and 4 billion of people, respectively). Since its establishment in the 19th century in England, football was mostly played by boys and men, with several antecedent forms of play (e.g., wild folk games) where males fought against their opponents while striving to score a goal. Since its early developmental stages, football was included in English education programs for young boys to learn self-control and rule compliance, and was fully embraced by the working classes with matches attracting massive masculine audiences (27–29). Conversely, women's football struggled to gain popularity in terms of both public attention and participation (26, 30–33). Even today, football represents a social ground for the expression and reinforcement of hegemonic masculinity, legitimating discriminatory hierarchical relations between genders (27–29). Being strength, speed, muscularity, and competitiveness the dominant characteristics of the game, traditionally men were given more opportunities and better conditions to pursue an elite level career with respect to their women counterparts, with financial gaps and lack of professional recognition having affected female players' career trajectories till recent times (30, 31, 34). Furthermore, females were found to prioritize education and work outside the elite football environment, as confirmed by several studies (27, 35–39) suggesting a higher drop-out rate due to unfair football conditions with respect to their male counterparts.

Gender mainstreaming in sport has become a crucial priority at European level (5). The establishment of a dedicated “High Level Group on Gender Equality” to provide recommendations and an action plan to increase the share of women and girls in sport participation, coaching and officiating, and leadership positions reflects the European Commission's commitment in this area (5). Strategic areas of intervention pertain also the promotion of gender equality in social and economic aspects of sport, equity in media coverage, and the fight against sports-related gender-based violence. In general, international recommendations are adopted differently within national contexts and translated into national

strategies for implementation. Worldwide, given the variety of national contexts in terms of general and/or specific sports policies, as well as conditions for elite sportspersons recognition and working welfare, national action plans are crucial to determine a tangible impact. Hence, governmental and sports organizations formulate targeted policies, support projects, and sustain concrete interventions to promote gender mainstreaming at different levels (e.g., grassroots sport participation, support services for elite athletes, welfare and equality for sporting professionals). In top-level football, the establishment and strengthening of national and international women's competitions, the recognition and management of women's football by major umbrella sports organizations (e.g., the Union of European Football Associations, UEFA; and Federation Internationale de Football Association, FIFA), and the inclusion of women's football in the Olympics represent milestones towards gender mainstreaming in this area (32). In particular, the major football governing body FIFA is strongly committed in reducing the gender gap launching the FIFA's Women's Football Strategy, sustaining the professional recognition of women players (40), and including gender equality in its strategic plan towards a global game (41). With the women's football movement rapidly evolving, national football federations worldwide complied with FIFA's strategic action plan and objectives by taking direct action and establishing their own national strategy towards more women and girls in football at all levels. In the past decade, various reconfigurations within the different national contexts have been observed (40). An example is the recent restructure of English football in the sport season 2018/19, requiring all clubs participating in the women's first league to move to the full-time status. This transition should be considered a milestone for women elite players as professionals, with football becoming a tangible career opportunity (40). In parallel, national teams' successes at international level are also crucial for attracting sponsorships and investments to increase the overall economic and cultural impact of the sport within national contexts, as well as a measure of women empowerment (34).

Since its early appearance in the 30s, the development of Italian women's football has been characterized by a slow and progressive growth, leading to the establishment of the first National (informal) Serie A championship in 1968. However, in 1986 only the Women's Serie A became an official competition. Since then, only 19,000 female players were registered at the Federazione Italiana Giuoco Calcio (FIGC) in 2008–2009, whereas in 2019–20 a 65% increase was recorded, exceeding 31,400 women members. Hence, FIGC took ownership of the management and organization of top-level national competitions (e.g., Serie A, Serie B, Primavera, Coppa Italia, and Supercoppa) (42). In parallel, also the television coverage, social media engagement, and the overall economic impact of women's football have increased, leading to the adoption of a Strategy 2020–2025 (43) and the establishment of the professional status for female football players in 2022 (42). At present, Italian men's and women's football occupies the 10th and 15th rank position in their respective world ranking, substantiating the strong tradition and cultural engagement of the sport at national level (44).

Furthermore, given the increasing relevance of Italian women's football at large since the professional status of female players has been recognized, regulatory frameworks for the protection of their interests have been also implemented (45).

Regarding dual career, no formal policy is in place in Italy, with a legislative reference only for the protection of high school student-athletes' right to education (46). To meet the needs of youth talented male football players, the top-level club academies complement their football training and competition programs with residency, educational support, tutoring, and counselling services, and establish agreements with local educational institutions. Conversely, similar dual career opportunities are limited for female players. Despite the recent publication of the national dual career guidelines at higher education level and the inter-institutional agreement protocol on dual career (47) (e.g., including institutional efforts to promote dual career of elite athletes, identification of tools and resources to implement dual career programs, enhance the dialogue with elite sporting bodies and military sport groups, provide visibility to elite student-athletes enrolled in a dual career program, enlarging own networks of dual career stakeholders), a limited number of Italian universities formally adopt internal rules and *ad hoc* dual career programs for athletes, and apply different eligibility criteria (e.g., competition level, type of sport, training and competition volume, other criteria) to recognize the "student-athlete status" and/or the "elite sportsperson" status necessary to benefit of dual career-related flexibility and services (47–49). Furthermore, the association of Italian Universities interested in sport (e.g., Unisport Italia) provided a platform to inform athletes on dual career opportunities adopted by some higher educational institutions. Thus, before the professional women's football recognition in 2022, unequal dual career status recognition and opportunities might have occurred for Italian male and female players.

Over the past two decades, a growing scholars' interest regarding women's football mainly focused on its historical development and inequalities affecting female players' career paths (26–28, 30–33, 40), highlighting a substantial gendered pay gap despite comparable skills and dedication to the sport (50). To date, little empirical research has been conducted on the working status and conditions of women as elite professional players, mainly due to limited resources, lack of media coverage, and lower sponsorship investments and engagement (40, 51–53). Research on men's football career pathways highlighted that a professional football career is of short-term nature, both in contract length and career duration (54), precarious, and lacking long-term security (55, 56). Career trajectories of women players and the impact of the full-time status on their career development have also been investigated. Interestingly, several authors questioned the derived benefits and the long-term sustainability of professional women's leagues, also in considering that women's football careers have been shaped on a masculine model in a male-dominated industry (40, 51, 52). Research highlighted also that the gendered patterns in remuneration of male and female players determined a normative dual career path in elite women footballers in the past (57). Whilst the "chase of sporting dreams" has been always

ascribed to the masculine gender, women are culturally expected to focus on their academic career and to take their traditional family role (53, 58, 59).

Transitioning from amateur to professional sport involves increasing dedication to rigorous training, competing at higher levels, managing contracts and sponsorships, and often adapting to a more demanding lifestyle (60), which might include a parallel dual career path. Athletes pursuing dual careers need time management, resilience, and networking skills, alongside academic or vocational knowledge, and they should therefore receive support from sports federations, educational institutions, and specialized career advisors (61). To date, female players pursuing dual careers sometimes receive support such as tailored training schedules, educational guidance, and mentorship programs. Although still rare and scattered, these resources aim to help them balance elite athletic performance with academic or vocational commitments effectively (62). To note, the recent establishment of the full-time status in women's football and the derived increased earnings might determine different trends in career choices and a possible shift in the dual-career discourse in the future. In fact, as already showed in men's football (54, 63–67), a dual career path might become a "backup plan" also in women footballers out of higher financial resources during their peak-performance years. However, it might be also plausible that gendered pathways in career choices will continue to be prevalent.

Given the global significance of football and the relevance of women's professional football as an emerging research area and discourse (26), it would seem appropriate to further explore and understand the intersection between the recent professional status of women football and the female players' dual career perceptions, needs, and opportunities. Despite the recent efforts of the FIGC towards the promotion of gender mainstreaming in Italian football (42, 43) and the raising awareness regarding the dual career needs of elite sportspersons at national level over the past decade, there is a need to fill the existing knowledge gap regarding the experiences of female football players in transitioning from amateur to professional sport. Evidence-based information could be key to guide future policy implementation in this area. Being dual career a right of the sportsperson, equal student-athletes' recognition and dual career support would nurture a well-educated workforce equipped with relevant knowledge and skills needed for productive and fulfilling employment after the sport career. In this framework, in line with the 2030 Agenda for Sustainable Development (2) a full participation in football-related career development and dual career should be guaranteed by adequate policies and actions towards gender mainstreaming in this area.

In exploring the potential gender inequalities and dual career experiences of elite women Italian football players, the present study represents the first attempt to investigate elite Italian female football players' perceptions regarding their sports and dual career trajectories, before the professional recognition recently occurred. It was hypothesized that to pursue better career opportunities Italian female football players might have prioritized one career over the other, potentially putting at risk their athletic success and/or jeopardizing future professional

career prospects out of sport, also in relation to a gender discrimination characterizing football over the past decades.

2 Methods

2.1 Study design

The present study was performed under the Erasmus + Sport Collaborative Partnership “Women—new leader’s empowerment in sports and physical education industry—New Miracle” co-financed by the European Commission (Project number: 622391-EPP-1-2020-1-LTSP0-SCP), and approved by the Institutional Review Board of the University of Rome Foro Italico (CAR 156/2023, May 17th, 2023, Rome, Italy), ensuring ethical standards have been guaranteed towards qualitative excellence and scientific rigor (68, 69).

An elite career (e.g., playing at the highest national competition level) in football implies athletes’ facing relevant time demands and efforts for sport training and competition, which might be overloaded by their academic commitment and other social life aspects. Not requiring additional efforts to participants’ dense sport and academic schedules, a semi-structured electronic questionnaire was considered appropriate to elicit participants’ perceptions and opinions in relation to the quality, challenges, problems, concerns, and needs of their dual career path, in light of potential experienced gender inequalities (68, 70). According to the literature (71), open-ended questions embedded in a semi-structured questionnaire do not limit respondents’ answers to specific closed-ended items, but rather stimulate the reflection on the proposed themes and the free expression of perceptions and opinions through an empty text entry field. Thus, both quantitative and qualitative thematic analyses have been considered to develop a contextualized understanding of the sport and academic career trajectories of the participants. In this framework, to highlight possible intersecting inequalities between dual career and gender equality in Italian women players, the following research themes were deemed crucial: (i) the management of the dual career path in Italian women’s football; (ii) the perceived difficulties and challenges in pursuing a dual career, also in relation to potential gender inequalities; (iii) the effect of elite football involvement on sport and academic career success and satisfaction.

Due to a lack of a valid semi-structured tool for the evaluation of women athletes’ perceptions and opinions in relation to the quality, challenges, problems, concerns, and needs of their dual career path, a tailored semi-structured electronic tool was developed. In profiting from the co-authors’ extensive knowledge and proven experience in the field of elite sport, dual career of sportspersons, and the football community, the research team engaged in focus groups to develop the tailored instrument to be used in the present study. Firstly, a pool of both closed-ended and open-ended items to be organized into thematic sections has been preliminary generated in relation to the core research objectives. Then, a second focus group has been implemented to: (i) discuss the coverage and relevance of the content and structure of the semi-structured tool;

(ii) identify potential needs to reformulate and/or implement questions; (iii) reach a consensus on the structure of the tool (e.g., number of sections; number of items; items’ typology), on the clarity of the content and wording of each selected item, and on the grouping of items deemed relevant to collect the necessary information coherently with the scope of the study; and (iv) to define clear procedures for questionnaire administration, data acquisition, and data extraction and analysis with no pre-conceptions and/or interferences with participants’ opinions. Finally, a preliminary version of the semi-structured questionnaire was piloted through internal testing within the research team (72). Hence, a 25-items version of the instrument was considered suitable to be electronically administered for data collection.

To produce a homogenous sample, a criterion-based sampling was adopted considering the following inclusion criteria: (i) being an elite Italian female football player, actively involved in the 2023 national Serie A championship; and (ii) being or having being enrolled in a dual career path over her football career. The exclusion criteria included: (i) having quitted the football career in 2023; and/or (ii) having lowered her competition level in 2023. Potential respondents were preliminarily contacted through social media platforms and direct contact with their Football clubs’ managerial staff. Upon the expression of interest to participate in the study, participants were recontacted by email to provide them with further information regarding the aim of the study, their expected involvement upon participation, and the specific features of the semi-structured questionnaire. Participants were ensured that their participation was voluntary, the confidentiality of their responses, the right to refuse to answer specific questions, and the option of dropping out at any time without providing any reason. After having collected a written informed consent, participants were provided with the web link to access the semi-structured questionnaire.

To avoid potential bias in the analytical process of open-ended items responses, two members of the research team engaged in repeated, recursive readings of all open-ended responses to reach a consensus on the identification and revision of the major themes. In case of disagreement in the analytical process of open-ended items responses, a third author’s opinion was sought.

2.2 Participants

Out of 80 preliminary contacts among Italian professional teams competing in the National Serie A (e.g., Como, Fiorentina, Inter, Juventus, Milan, Parma, Roma, Pomigliano, Sampdoria, Sassuolo), 40 players expressed their interest to participate in the study and received the electronic questionnaire. Among them, 7 subjects (17.5%) did not respond to the questionnaire, whereas 11 (27.5%) responses were considered not suitable for data analysis due to missing data. Conversely, 22 responses (response rate = 55%) were considered eligible for data extraction and analysis. In particular, Italian women elite footballers participating in the present study were aged 25.8 ± 4.3 years (range: 20–33), held different education levels (e.g., High school

59%; Bachelor 18%; Master's Degree 23%), and lived in different Italian macro-regions (e.g., North 41%; Centre 50%; South 9%).

deepening their responses by providing comments, details, and additional information.

2.3 Instrument

Table 1 presents the structure of the tailored 25-item semi-structured questionnaire used in the present study, consisting of four main thematic areas as follow:

- Demographic information (e.g., age, educational attainment, geographical position, competition level; items 1–4);
- Dual Career path information (e.g., difficulties, received support from both sports and academic environments, recognition as student-athlete, access to a formal dual career path; items 5–17);
- Dual career and gender issues (e.g., perceived gender inequalities in dual career for football players; items 18–21);
- Career satisfaction (e.g., perceived satisfaction with the dual career path and with sports and academic achievements; items 21–25).

In general, closed-ended items aimed at collecting quantitative information regarding major research themes considering different response typologies (e.g., scale, dichotomous, and multiple choice), whereas open-ended items were designed to allow participants

2.4 Data analysis

Collected responses were aggregated based on data typology (e.g., closed-ended and open-ended items). Based on closed-ended item typologies (e.g., multiple choice; dichotomous; scale), quantitative analysis encompassed frequency of occurrence (*n*; percentages, %) and mean and standard deviation calculations (score computation). For qualitative analysis of open-ended items responses (73), inductive (e.g., players' personal experiences) and deductive (e.g., conceptual framework of potential gender biases in accessing and progressing a dual career path in Italian elite football) data analyses were used. In particular, six phases characterized the thematic analysis: familiarization, coding, theme development, refinement, naming, and writing up (74). Then, individual raw quotes were coded and categorized into sub-themes, to be expressed as frequencies of occurrence (e.g., number of times each sub-theme was cited within collected open comments). Multiple readings of the text, the involvement of two authors in the data analysis, and the extraction of major themes to be discussed until consensus was reached ensured the

TABLE 1 Semi-structured questionnaire on dual career and gender equality experiences in Italian football.

Area	Items	Text	Response
Demographic information	Item 1	What is your age (years)?	O-E
	Item 2	What is the highest educational qualification you have held?	C-E (MC)
	Item 3	Where your football club is geographically located?	C-E (MC)
	Item 4	What is your sporting level?	C-E (MC)
Dual career path	Item 5	Did you encounter any difficulties in combining your studies with your football career progression?	C-E (D)
	Item 6	If yes, can you describe the main difficulties?	O-E
	Item 7	In which course of study did you encounter the greatest difficulties (for example, during the school period or during the university period, or both)?	C-E (MC)
	Item 8	Can you elaborate on the previous answer, providing more details regarding the experiences you have had and the critical issues you have encountered?	O-E
	Item 9	During your studies, did your sports club support you in combining your sporting and study commitments?	C-E (D)
	Item 10	If so, can you provide details regarding the received support?	O-E
	Item 11	During your studies, did the coaches and technical staff with whom you worked in your football career support you in combining your sporting and study commitments?	C-E (D)
	Item 12	If so, can you provide details regarding the received support?	O-E
	Item 13	During your studies, did the school and/or university where you studied support you in combining your sporting and study commitments?	C-E (D)
	Item 14	In combining your football career with your school/university education, have you been able to benefit from the recognition of your student-athlete status?	C-E (D)
	Item 15	If so, were you able to access a formally recognized dual career program?	C-E (D)
	Item 16	If so, can you describe what type of school/academic support was provided to you?	O-E
	Item 17	If not, can you describe why you were not granted with the student athlete status?	O-E
Dual career and gender issues	Item 18	In your opinion, is it more difficult for women in football to access dual career programs than their men counterparts?	C-E (S)
	Item 19	Can you elaborate on the previous answer with a comment?	O-E
	Item 20	In your opinion, is it more difficult for women in football to be a student-athlete than their men counterparts?	C-E (S)
	Item 21	Can you elaborate on the previous answer with a comment?	O-E
Career satisfaction	Item 22	Are you satisfied with how you were able to combine your school/academic career with your football career (dual career)?	C-E (S)
	Item 23	How satisfied are you with your football career and sporting achievements?	C-E (S)
	Item 24	How satisfied are you with your school/academic career and achievements?	C-E (S)
	Item 25	Can you elaborate on the previous answers?	O-E

C-E, closed-ended; O-E, open-ended; MC, multiple choice; D, dichotomous; S, Likert scale 1–6 pt., where lower scores indicate low agreement/satisfaction, and higher scores indicate high agreement/satisfaction.

minimization of potential bias in the process. Furthermore, in case of disagreement in the analytical process of open-ended items responses, a third author’s opinion was sought (73).

3 Results

Results relative to both closed-ended and open-ended items responses are presented in **Tables 2, 3**, respectively. In particular, **Table 2** presents quantitative data (e.g., scale items: scores as mean and standard deviation; dichotomous and multiple-choice items: frequency of occurrence, *n*) derived from closed ended items, whereas **Table 3** reports the frequency of occurrence (*n*) of cited subthemes in relation to open-ended items. Major findings proving an integrated and comprehensive picture of participants’ responses to both closed- and open-ended items will be presented discursively in relation to two macro-themes: (i) dual career experiences; and (ii) gender impact on dual career paths and career satisfaction.

3.1 Dual career experiences

Regarding dual career experiences, 60% of participants encountered difficulties in their dual career path (item 5), independently from the education level (around 50% for both secondary and tertiary education; item 7). Among the major difficulties affecting the combination of their elite sport and academic demands, 64% of participants reported the lack of time for class attendance and individual study, lack of support from teachers/professors and academic institutions, migration issues

(e.g., mobility for pursuing better football career conditions, but constraining their academic path), mobility to undertake university exams, and football and academic schedule issues. In particular, the players highlighted:

“In high school, I had little time to study and the teachers never sustained my dual career efforts (the contrary!). During my university path, the only problem was having to move for football reasons (vocational mobility), while not having the opportunity to change the University”

“Making long trips to take exams because the university was far from the field where I played was challenging, and with the university not meeting the needs of the athlete”.

“During school I lived at home and played near home. During my university years I started to travel for football as a work, and it was difficult to organize timetables and transfers to the university, making it impossible to attend classes”.

Furthermore, 64% of respondents highlighted (item 8) time management issues due to the lack of flexibility for absences and for class/evaluation schedule, the lack of rest time, and the lack of time for study between school hours and training sessions as a major factor affecting their dual career, as reported in the following comments:

“Time management has always been an issue in my dual career. In Italy, compared to other countries, no merit is recognized for people who carry out an excellent academic and athletic career, making the combination of sport and academic demands almost incompatible”.

“Absences for class attendance were never justified. Lack of availability of educational institutions to activate educational paths with alternative timetables in terms of frontal lessons and/or exams”.

Regarding supportive measures, most of the respondents (74%) highlighted a support received from the sport environment (item 9 and 11), mainly in the form of flexibility for training absences in case of exams and or intensive study periods, and flexibility for training schedule (item 10 and 12; 46%). Conversely, educational institutions were generally perceived as less supportive (36%; item 13), as reported in the following comments:

“Despite my extra-curricular commitment at both Serie A and national level, I was always treated by the teachers as if my only daily commitment was school”.

“Coaches and football club supported me by accommodating my training schedule, giving me more time to study, and the possibility of having instructors who helped me with my studies.”

TABLE 2 Frequency of occurrence and scores of responses to closed-ended items.

Dual career experiences (Item 5, 9, 11, 13, 14, 15)	Yes (n)	No (n)
Difficulties in combining sport and education (item 5)	13	9
Support from football club received (item 9)	13	9
Support from coaching staff received (item 11)	13	9
Support from school/university received (item 13)	8	14
Student-athlete status recognition (item 14)	7	15
Formal dual career path provision (item 15)	5	2
Gender influence on dual career paths and career satisfaction (item 18, 20, 22, 23, 24)	Score (pt)	Mean SD
Greater difficulties for women players to access dual career paths (item 18)	4.5	1.5
Greater difficulties for women players to be a student-athlete (item 20)	3.7	1.5
Dual career satisfaction (item 22)	3.9	1.5
Football career satisfaction (item 23)	4.7	1.2
Academic career satisfaction (item 24)	4.0	1.2
Which path was more difficult (item 7):	(n)	
High school	10	
University	10	
Both	2	

22/22 (100%) respondents.

TABLE 3 Frequency of occurrence of major themes emerged from responses to open-ended items.

Item and topic	Respondents (out of 22 participants)	Cited themes	(n) ^a
Item 6: Issues in DC paths	<i>n</i> = 14 (64%)		
		Lack of time for class attendance and individual study	5
		Lack of support from teaching staff	3
		Migration issues (mobility for football, but not for university)	3
		Mobility (long travels) to take university exams	3
		Football and academic schedule issues	3
		Lack of formal opportunities and support for DC	2
		Lack of rest time	1
		Proximity issues (distance between the university and the football facility)	1
		Lack of future prospects in the football career	1
		Lack of recognition of the professional status for Serie B players	1
		No issues encountered (good time management is needed)	1
		No issues encountered (training sessions scheduled in the evening)	1
Item 8: Difficulties in managing DC paths	<i>n</i> = 14 (64%)		(<i>n</i>)
		Lack of flexibility for absences and class/evaluation schedule, also due to travels for games	8
		Lack of rest time and need for good time management	5
		Lack of time for study between school hours and training sessions	3
		Lack of understanding from teaching staff	1
		Proximity issues (distance between the university and the football facility)	1
Item 10 and 12: DC support (sports environment)	<i>n</i> = 20 (46%)		(<i>n</i>)
		Flexibility for training absences in case of exams and or intensive periods of study	9
		Flexibility in training schedule	9
		Academic tutor provision	1
		Academic career prioritized over the football career	1
		Sensibility from coaches (of the stress deriving from a DC path)	1
Item 16: DC support (academic environment)	<i>n</i> = 5 ^b (100%)		(<i>n</i>)
		Flexibility in the academic schedule (university) for class attendance and exams	4
		Flexibility in school evaluations	3
		Justified absences for class attendance	3
		Recognition of training sessions as working internship	1
		Academic tutor	1
Item 17: Lack of student athlete status recognition	<i>n</i> = 14 (82%)		(<i>n</i>)
		Lack of recognition as a student-athlete in the past	4
		Gender difference in the eligible competitive level to be considered a student-athlete (men = Serie C; women = Serie B)	4
		Administrative issues derived from the start of a new dual career national programme (lack of consistent procedures and practices)	3
		I was not aware of DC opportunities	2
		Lack of recognition within the working environment	1
Item 19: Gender-related inequalities in accessing DC paths	<i>n</i> = 13 (59%)		(<i>n</i>)
		Lack of development policies in the past for women's football, leading to a lack of recognition for women student-athletes	4
		Gender equality in football is a hot topic (as in other social domains) and an ongoing process	3
		Men's football attracts more interest, leading to more opportunities for male student-athletes (i.e., private academies, agreements with schools/universities)	3
		Belief that women's football is less demanding than that of men's, leading to a lack of resources and support	2

(Continued)

TABLE 3 Continued

Item 19: Gender-related inequalities in accessing DC paths	<i>n</i> = 13 (59%)	Cited themes	(<i>n</i>)
		A DC path means that athletes need to study because they do not earn enough money from their football career	1
		Lack of financial resources and time for managing a DC	1
Item 21: Difficulties for women to be a student-athlete	<i>n</i> = 13 (59%)	Cited themes	(<i>n</i>)
		Pay gap (women tend to dedicate more to their study path due to limited income from football; conversely, men have higher salaries, leading to a lower need to invest in their academic career)	8
		Football related demands are less recognized for women (i.e., a hobby)	4
		Men in football have more opportunities	2
		Lack of time for managing a DC	1
		There are no gender differences	1
Item 25: Career satisfaction	<i>n</i> = 10 (45%)	Cited themes	(<i>n</i>)
		The football career was negatively influenced by the academic career (relocation decisions, no past professional recognition)	4
		The academic career was negatively influenced by the football career (time management)	2
		Satisfied with the academic career, but could have done more	2
		Satisfied with the football career, but willing to do more	2
		Not satisfied of a study path in an online university	1

DC, dual career.
^a(*n*) = frequency of occurrence (*n*) of citations received by each subtheme within collected open comments.
^bItem 16: out of 5 respondents involved in a formal dual career path.

“Making themselves (coaches) available for my study plan, as much as possible”.

When this aspect was further investigated (item14), the student-athlete status during the dual career path was recognized only for 7 participants (32%), with only few (28%) of them benefiting of accessing a formal dual career path (item15) mostly consisting in flexibility in the academic schedule, class attendance and exams/evaluations, and justified absences (item 16). Conversely, 82% of the sample with no recognized student-athlete status and/or formal access to a dual career programme in the past reported the lack of awareness towards student-athletes’ needs, gender differences relative to the eligible competitive level to be considered a student-athlete (e.g., men; Serie C-third league; women: Serie B-second league), and administrative issues as dual career constraining factors (item 17). In particular, one player shared a relevant experience in this regard:

“During my school and academic years most of the female footballers could not apply for dual career services and the student-athlete recognition. In both school and university, all football competitive levels were recognized for male colleagues, whereas only Serie A was the minimum eligible level for women players. At the university, I contacted the Equal Opportunities Committee to report this inequality. After various conversations with the managers of the application for dual career services, the same competitive levels were recognized for both male and female players.”

3.2 Gender influence on dual career paths and career satisfaction

Regarding the perceived gender influence on dual career paths, participants reported higher difficulties in accessing a dual career programme for women players (item 18). As major reasons substantiating the gendered patterns of dual careers in football, 59% of participants reported: the lack of development policies in the past for women’s football (leading to a lack of recognition for women as student-athletes); the infancy stage of the gender equality discourse within the field of football; the higher interest around men’s football, thus attracting more economic resources and interests, leading to more opportunities for male football student-athletes (i.e., private academies, agreements with educational institutions); and the belief that women’s football is less demanding than that of men’s, leading to a lack of resources and support.

However, gender was not perceived as a constrain for being a student-athlete dedicated to combine effectively sport and academics (item 20). In particular (item 21), 59% of participants reported that women tend to dedicate more to their educational path due to lower financial resources derived from their football career, whereas men footballers were perceived to have a lower need to invest in their academic career in light of high football-related incomes, and more opportunities to access a dual career programme. Furthermore, the lower recognition of football-related demands of women football considered more as a hobby was also highlighted, as reported in the following comments:

“Women’s football in Italy is only recently gaining recognition from a social and professional point of view. It follows that the

recognition of the professional athlete status for female footballers is still a very hot and controversial topic today, and for this reason it is still the subject of debate and struggle for the recognition of equal rights with respect to male colleagues. And not just in the world of football.”

“Football for women is not compared to men’s football as there are enormous differences in multiple areas (infrastructures, financial resources, etc.), this provides a distorted perception to the outside world (women football as less demanding).”

“The perception of women who play a male-dominated sport leads to thinking that for women it is just a hobby and not a real commitment”.

Regarding the perceived career satisfaction, dual career paths (item 22) received the lowest score (3.9 ± 1.5 pt.), whereas intermediate and highest scores emerged for specific academic attainment (item 24; 4.0 ± 1.2 pt.) and football achievements (item 23; 4.7 ± 1.2 pt.), reflecting participants’ commitment to succeed in both the athletic and educational spheres. Although respondents reported a general satisfaction with their career outcomes, further insights (45%) were provided in responses to item 25, highlighting the mutual constrain determined by sport and academic demands in absence of a formal dual career programme, as highlighted in the following comments:

“Having a daily football commitment that takes up the whole morning leads to having less time for studying. I am happy for having fulfilled my university obligations for this year (exams) and I am also aware that with more time I could often have obtained higher grades.”

“Combining my football career with my academic was really difficult for me, without the help of the University and schools in general I always had to organize myself as best I could, trying to reconcile everything. It wasn’t always easy, and both school and sporting results have been affected.”

“I feel satisfied with the results I managed to obtain at university level, with the little time I was able to dedicate to them. I am not fully satisfied on my football achievements because I believe that if I had had the opportunity to follow my university career more easily, I would have been able to experience football at a higher level, and eventually to profit of higher national (and maybe international) football mobility.”

4 Discussion

The main objective of the present study was to investigate gender and dual career intersecting inequalities in Italian elite football by means of the views of women elite footballers, and to explore difficulties in combining sport and academic commitments that might be overcome through the recent professional recognition of

women’s football, which might facilitate their career development in a male-dominated industry. The main findings generally confirmed previous literature in the area of gender in football (27, 30–33, 35–39, 56, 75, 76), with women having struggled to be recognized as professional elite athletes, and receiving lower welfare and support measures for their career development with respect to their men footballer counterparts, including their dual career.

4.1 Women’s football and dual career support from an institutional perspective

Although male and female players dedicate similar efforts to achieve sporting success, participants highlighted that women’s commitment to football is still perceived as a hobby rather than a professional involvement in elite sport and/or a tangible career opportunity, with women’s football perceived as less demanding and not requiring particular efforts to accommodate sports, academic, working, and life commitments (27, 35–40). The present study highlights the issues female footballers faced in the past years to be recognized as elite players and to successfully pursue a dual career, as well as the lack of services that might have facilitated their career path. In this framework, the recent recognition of the full-time status would have a positive impact in the future development of women’s football at national level, as well as conditions for a dual career in Italian female players.

A positive outcome from the present study is the support participants received from the football environment (e.g., club, coaching staff), mainly in the form of flexibility for training absences in case of exams and or intensive periods of study and in training schedule. Although previous literature on dual career of student-athletes at sport level reported a general lack of flexibility in adaptation of training schedule (77, 78), the present findings attributed a relevant dual career role to coaches who care the holistic development of the athletes supporting their commitment in formal education, thus challenging the culturally dominant discourse that flexibility should pertain mainly the educational institutions (20, 49, 53). In fact, the participants in the present study reported a lower support received from academic institutions, questioning the opportunity, efficacy, and availability of academic services for student-athletes. In light of the full-time recognition to elite women footballers, the improvement of dual career services offered by educational institutions should be envisaged.

In absence of dual career support services and with limited financial resources and time availability, athletes might experience high levels of stress leading to sport or academic drop-outs, thus limiting the possibility to pursue a professional sport career or delaying education to pursue high athletic achievements (79, 80). In this study, the players’ comments highlighted the gender differences in accessing dual career opportunities, which were due to lack of development policies for women’s football and the consequent lack of resources and support services. Coherently, the negative impact of one career over the other was highlighted. Interestingly, one participant emphasized that “involving in a dual career path means that athletes need to study because they do not earn enough money from their football career”, confirming

previous research showing that women athletes tend to prioritize their academic career to increase their future career prospects (57–59, 81, 82). In fact, being the gender pay gap substantial, a low opportunity to capitalize for the life course and uncertain financial future push female players towards a higher involvement and dedication towards their education compared to their male counterparts (35–37, 80). In this framework, a disconnection between education and football was confirmed, with investments in academic achievements seen as a wise plan when foreseeing post-sport career transitions in the labor market (57). Although participants in this study reported a good overall satisfaction in relation to their career achievements and outcomes, their low satisfaction for dual career at academic level urges measures to achieve a successful combination of football and educational demands, which would support the athletes in time management skills for developing multiple areas of their life (19, 83–85).

4.2 Dual career issues and support in relation to gender

Specific to their dual career experiences, respondents reported difficulties well documented in previous research (9–11, 13, 14, 17, 18, 20, 86), especially within academic environments (e.g., flexibility in class attendance, lack of time for individual study, lack of support from teaching staff). Women players also reported that migration and national relocation to pursue better football career outcomes determined issues in combining their football demands with the academic career, mainly due to mobility (e.g., lack of proximity between sports facilities and educational institutions, long travels to take university exams) and time schedule constraints. Migration and/or relocation and/or mobility burdens also affected the necessary rest time and the private and social life of athletes, which represents a relevant component of a well-balanced dual career path (9, 20, 77, 87, 88). This finding should be considered also in light of the lack of both formal opportunities and support for dual career in women's football, requiring them to place high efforts to succeed in sport and academics, as stated in previous research in the field (35–37, 80). Whilst Italian educational institutions offered dual career programs to male players competing already at the third league (Serie C) level or included in elite youth football academies, only sub-elite (Serie B) and elite (Serie A) women players were recognized to be eligible for the student-athlete status, as substantiated by the only five participants reporting to have been enrolled in a formal dual career program adjusting their academic schedules. In considering that a dual career impact elite athletes' life at multiple (e.g., sporting, academic, psychological, socio-cultural, and financial) levels (10, 11, 13, 15, 19, 89) and the high economic impact of football (25), more resources should be allocated to implement dual career support services (e.g., psychological support, counselling, tutoring, financial support) to elite and talented players. Furthermore, the football community at large should show a higher awareness towards the recognition of the student athletes' needs, independently from their gender. In compliance with international (3–8) and sports-specific (41) recommendations and quest for a

gender mainstreaming, concrete actions should be taken at national and local levels not only to increase the number of women football players but also to ensure them equal dual career opportunities and conditions. The perceived gender discrepancy has been substantiated also by two respondents reporting no knowledge of dual career opportunities determined by a lack of information provided through the academic and sports institutional communication channels and/or sensibility towards the needs of elite female student-athletes. Thus, it would seem appropriate to further invest to properly disseminate available opportunities and services in both sports and educational organizations for elite student-athletes (20, 47, 90).

5 Conclusions and future directions

The present study contributed to shed light on the presence of gender issues in the pursue of a dual career in the Italian football context, with women facing additional challenges to combine their sport and academic demands with respect to their men counterparts, especially due to the lack of recognition, support, and available services. Although the present findings could not be considered conclusive in providing a comprehensive picture on the state of art of dual career support in the European elite football context, it represents the first attempt to collect preliminary information on perceived intersecting gender and dual career inequalities in Italian football through the involvement of elite women football players. In considering the declared intention of FIGC to implement several policy actions in women's football (43) (e.g., to increase the number of registered young female players by 50% by 2025, to achieve international successes, to improve the competitiveness and spectacle of the competitions, and to increase the fan base), the introduction of professionalism for women players in 2022 into Serie A represents the first step towards the achievement of the strategic goals. Future studies should be envisioned to deepen the understanding and knowledge regarding women elite players' career development and trajectories, with a particular focus on the effects of professionalism on their sport and education choices, also in relation to potential differences with respect to their men counterparts.

Whilst ensuring the sustainability of the championship at sporting level might represent a *priority*, in implementing strategies towards gender equality in football FIGC should consider also other aspects, such as fair working conditions, equal pay, student-athlete recognition, and dual career services. To date, although the recent recognition of women's professional status should be considered a milestone towards equality in this sport discipline, discrimination and abuse of female players has not been completely overcome (91). Surely, a comprehensive approach would challenge stereotypes, dismantle barriers to equal recognition of men's and women's football, and advocate for the necessary change towards a more inclusive and equitable future for all athletes, regardless of gender. Thus, synergic, multistage, and multidimensional cooperation with all the involved stakeholders is necessary to implement strategies fostering a more inclusive and supportive environment for female athletes in football in the future

through the addressing of general and specific issues and challenges derived from the lack of gender mainstreaming in the past.

Future multistage and multidimensional policy implementation should be envisioned, taking into account evidence-based information regarding barriers, opportunities, needs, and necessary support for successful dual career paths, also in relation to fair and equal conditions for both female and male players. In this regard, this approach would not only nurture a stronger link between scientific research and evidence and real implementation, but also address specific challenges and necessary actions based on a solid priority framework. At specific sport policy level, FIGC should continue along the necessary multi-stage journey at national level to further align with FIFA and UEFA policies towards gender equality in football. This should include multiple short-, mid-, and long-term actions, to be planned and implemented at different levels, encompassing the enlargement of female participants in the sport, the allocation of fundings for grassroots development, further investments on women's leagues at different competition levels (e.g., junior and senior; local, regional, national and international competition levels), the fostering of the professionalization and financial sustainability of the whole women's football sector, the challenging of the pay gap through the synergistic involvement of elite football multiple stakeholders (e.g., leagues, clubs, sponsors, players' associations, media), the promotion of women in coaching, refereeing, and executive roles, and the establishment of stronger anti-discrimination, -harassment, and -abuse policies. Coherently, at local, regional and national levels football organizations should also comply with international and national policies through the design and implementation of programs aligned with women's football strategic objectives (e.g., girls and women football courses, investments in women's teams, visibility of women's championships, agreements with educational stakeholders to promote dual careers). Finally, a higher awareness in the not-sporting community and stakeholders at large (e.g., parents of athletes, educational institutions, teachers/professors, dual career service providers) should be envisioned to facilitate dual career footballers in their career path and to equip them with the necessary skills to cope with the difficulties occurring during their career transitions. Hence, educational bodies and personnel (e.g., governmental; schools and universities; teaching and administrative personnel) should be involved in this process, promoting the dialogue and cooperation with sporting organizations and the reinforcement of dual career services for elite footballers, independently of their gender.

The current study provides novel insights into the women players' perceptions on gender equality and dual career welfare in the Italian elite football context. However, the present findings must be considered in light of several limitations. Firstly, the limited sample size challenges the generalizability of findings. Indeed, although our sample might be considered representative of women football players competing in elite Italian football, a higher number of participants should be envisioned in future studies to provide a more comprehensive picture of female players' challenges and needs in relation to their career development, trajectory, and dual career-related issues. Secondly,

having the study the aim to highlight perceived gender disparities in elite Italian dual career footballers, a sample composed by only women challenged the possibility to gain further insights from reported diverse career pathways and experiences in relation to gender. Thus, future research should envision the inclusion of both male and female players to allow a direct comparison and to shed light on different gendered perceptions on elite football and dual career pathways within the Italian context. Thirdly, a data collection made through an electronic semi-structured questionnaire could have limited the depth of the collected information, since self-reported data could introduce response and recall biases. Thus, triangulating and mixed-method study designs (e.g., integration of questionnaire responses, in-depth interviews, and/or institutional data) should be considered in future research.

To conclude, to explore the different perceptions on career opportunities and development, and to identify possible strategies to promote gender mainstreaming in football, further studies are needed enlarging the sample size, involving male and female players as well as various football and dual career stakeholders, and applying mixed-methods approaches for data collection. Furthermore, both national and cross-national research in this area should be considered to allow comparisons and to identify potential best practices to be exploited within and beyond national contexts to a broader community devoted to the promotion of gender mainstreaming in football careers.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The study was approved by the Institutional Review Board of the University of Rome Foro Italico (CAR 156/2023, May 17th, 2023, Rome, Italy). All participants provided written informed consent to participate in the study.

Author contributions

FG: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. SC: Conceptualization, Formal analysis, Methodology, Writing – review & editing. SD: Conceptualization, Methodology, Writing – review & editing. PC: Conceptualization, Data curation, Investigation, Writing – review & editing. CL: Conceptualization, Methodology, Writing – review & editing. EP: Conceptualization, Methodology, Resources, Writing – review & editing. LC: Conceptualization, Funding acquisition, Methodology, Resources, Supervision, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The talent project and the validation of standards for the identification of student-athlete talent

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Introduction: The aim of the TALENT project is to promote equality in education, prevent exclusion, support dual careers (sport and school), create new role models for the benefit of young talents and prepare them for lifelong learning and professional sport from an early age. It is promoted by a European consortium of 7 partner institutions and runs from December 2022 to May 2025. It consists of five work packages. In the first work phase, developing the WP2 (from December 2022 to October 2023), under the coordination of UNIPA, NIS University, KMOP and EAS standards for talent recognition were identified and validated.

Methods: Initially, 12 focus groups were conducted with teachers (77 teachers) and coaches (73 coaches) on creating talent identification standards; subsequently, workshops were held with dual career experts to validate these standards. This was a key piece of work that enabled the establishment of clear guidelines and protocols to identify and support talented young people in their dual careers.

Results: A final list of 41 shared statements was identified: 20 related to teachers and 21 related to coaches. For example, teachers emphasized the need for multidisciplinary approaches and early identification of talent, while coaches underlined the importance of psychological readiness and collaboration with schools and families.

Discussion: These statements not only provide structured reference points for talent identification but also highlight actionable needs across educational and sport systems. As such, they represent a solid foundation for developing standard operating procedures in talent recognition and dual career support.

KEYWORDS

dual career, talent, coaches, teachers, standards

Introduction

Reconciling high-level sporting activity with education is one of the main problems of the student-athlete who often risks abandoning one of the two activities or not practicing them successfully (1–3). The Erasmus+ project Cloud Based Education for Creative Sports Talent¹ (TALENT) supports dual careers and prevents sports and school dropouts by working on the development of the system for young talents (Figures 1, 2). The partner composition is diverse and thus covers all necessary areas of the TALENT project activities, outputs and results. The consortium consists of seven partner institutions: Higher Education Institutions (University of Palermo and University of Nis); Research center (Center for Social Innovation); Education institution Centar izvrsnosti Splitsko-dalmatinske županije (CI SDZ), and NGOs Kentro Mermnas Oikogeneias Kai Paidiou (KMOP) and Sarajevo Meeting of Culture (SMOC) as well as The European Athlete as Student (EAS) network established with main aim to support European athletes in combining high performance sport and education. Project aim is to promote equal education, preventing exclusion, supporting Dual Careers, creating new pattern of behavior for the benefit of young talented children's and preparation for Long Life learning and professional sport from childhood. TALENT Project focuses on standards for recognition and awareness increase about sporting talent and the spread of the dual-career concept from the first grades of school talented sport youths from 12 to 16.

To achieve proficiency and to perform at the highest level, talented sports or performing arts youth need to engage in a minimum of 10 years, or 10,000 h of deliberate practice in their chosen field, which requires an early childhood skill development through specific and demanding quality training (4–6). In the developmental years, talented youth encounter several challenges in accommodating concurrent and reciprocal interaction between the demands of school and training commitments (i.e., dual career) (7, 8). Even though children hold the burden of developing their talent, several stakeholders have been identified as supportive entourage at the meso (e.g., parents, peers, teachers/employers, coaches, sport managers), the macro (e.g., sport clubs/federations, educational institutions, and labour market), and the policy (e.g., national and European governing bodies) levels of dual career paths (8–13).

Despite not a single person, institution, or specific context have the main responsibility to help youth improving their personal resources, parents, coaches, and teachers have been recognized a



FIGURE 1
Official logo of the TALENT project.



Co-funded by the
Erasmus+ Programme
of the European Union

FIGURE 2
The Erasmus+ logo.

crucial supportive role in enhancing the talented youth's motivation by providing role-models, encouragement, financial support, and logistics (14). However, teachers, coaches, and parents need to be aware and ready to cooperate for fine-tuning their support in relation to the different challenges of dual career paths (15, 16). In fact, it is important to understand specific talent development trajectories. Therefore, to ensure a dual career success the various interested groups involved with nurturing youth need to establish a solid alliance in relation to the specific dimension of talents. The aim of this study was to address the existing gap in dual career research by developing and validating a set of context-sensitive standards and guidelines for talent identification among student-athletes, with the broader objective of strengthening early recognition practices and systemic support across educational and sporting domains.

Materials and methods

During the first project work phase (WP2) the standards for talent recognition were identified and validated. To ensure diverse perspectives, separate focus groups were held with teachers and coaches during the initial phase of standard development for talent identification, and subsequently, a workshop was organized with dual career experts for the validation of the aforementioned standards. The thematic areas explored during the sessions included participants' professional backgrounds and experiences, current practices and strategies for talent identification in youth sports, and the criteria they consider relevant when assessing children's potential. Further topics addressed included the availability

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and perceived usefulness of existing guidelines or protocols, the role of collaboration between professionals, the involvement of families in the identification process, and the challenges faced in supporting talented children. Finally, participants were invited to provide suggestions for improving existing systems and to share additional insights based on their practical experience. This stage runs from December 2022 to October 2023, under the coordination of UNIPA, NIS University, KMOP AND EAS standards for talent recognition were identified and validated. Initially, 12 focus groups were conducted with 77 teachers and 73 coaches on creating talent identification standards; subsequently, workshops were held with dual career experts to validate these standards. In each country, the teachers and coaches participated in the focus group using their native language and the final results were translated into English.

A final list of 41 shared statements was identified: 20 statements related to teachers and 21 statements related to coaches on talent identification. This list of statements could help coaches or teachers identify talent. The study was conducted in accordance with the recommendations of the Declaration of Helsinki for the involvement of people in research and was approved by the Ethics Committee of the Faculty of Sports and Physical Education of the University of Nis (04-215/2).

Focus groups

Participants

Each partner, except 1 (EAS²), conducted two focus groups: one with at least 12 sports coaches and one with at least 12 teachers. To be recruited, the coaches had to have a background of at least 5 years of field activity. We have tried to recruit a fair number of team and individual sports coaches. As regards teachers, to be recruited, they also had to have at least 5 years of school activity at different levels of education. One hundred fifty (150) participants contributed their valuable insights and experiences, with 77 teachers/educators and 73 coaches. The findings from the focus group discussions in Greece, Italy, Serbia, Bosnia and Herzegovina, Cyprus, and Croatia collectively shed light on the complex landscape of identifying and supporting talented student-athletes. While each country provided unique insights based on its specific context, certain common themes and needs emerged across these diverse settings.

²The EAS Network is committed to optimising training conditions for athletes/students, but also to securing their future by making education or vocational training possible, so that they have a secure platform from which to start again once their sports career is over. EAS's reach is Europe-wide and has no specific country of reference this is why EAS did not conduct FGs.

Procedures

The focus group interview consisted of 8 open-ended stimulus questions. Questions for the focus group with teachers are shown in [Table 1](#). Questions for the focus group with coaches are shown in [Table 2](#). The duration of the focus groups was 60 min. The focus group was conducted in a comfortable room in a convenient location, responsive to the needs of the participants. Participants were seated in a circle with some participants connected remotely as agreed at the TPM in Palermo by all partners. Before proceeding, all participants signed an attendance and consent form. All participants were notified that the meetings were being recorded. Each focus group was led by a moderator and an assistant moderator. The moderator promoted the discussion and debate, and the assistant took notes. All partner countries used the same questionnaire model for each target group (coaches and teachers) in order to have a common basis for the analysis of the results. Once the focus groups were carried out, a report was created for each partner summarizing the results collected from the focus groups. By collecting this data, it was possible to comprehensively understand the results of the focus groups and use them to identify standards for gifted children.

Workshop

To further emphasize these statements' significance and reach a consensus on their relevance, importance, and necessity, a pivotal workshop was convened in Gaeta (Latina) on 3 and 4 October 2023, by the project partner European Athlete Student (EAS). The EAS Conference represents the annual meeting point for international experts to discuss and share policies and initiatives to support the compatibility of sports and academic/work careers (e.g., dual career) of the sportspersons, including lectures, workshops, and round tables on relevant aspects of dual career.

Participants

A group of 25 people (academics, members of International Sports Organizations, members of the Paralympic Committee, and members of the EAS) international experts on the topic of dual careers participated in this workshop.

Procedures

The workshop was held on 3 October 2023 from 17:00 to 18:00. The workshop was introduced by two contributions framing the talent project and the pathway developed within WP2. This introductory phase was followed by the questioning of the experts. Through the Mentimeter software and the sharing of two QR codes with the audience, the experts had the opportunity to evaluate, according to the RELEVANCE criterion, each statement produced. First, the statements taken from the focus groups conducted with the teachers were evaluated, and then the statements taken from the focus groups conducted with the coaches.

Before going on to present the results of the workshop, we would like to briefly illustrate the process that led to the formulation of the statements to be submitted to the experts for

TABLE 1 Questions for teachers.

Questions for teachers	Research topic
1. Can you briefly introduce yourself, how long have you been working with children, and what is your experience as a teacher?	Introduction and background
2. How do you evaluate the current methods of detecting sports talents in the school environment?	Identifying talent
3. What criteria or characteristics do you consider when identifying talented children (in sports) in your field? Are there any specific indicators or behaviours that catch your attention?	
4. Are available any guidelines or protocols to you for detecting and supporting sports talents in school? What additional resources or training would you like to have?	
5. What strategies do you use to identify children's sports talents? Do you involve parents or guardians in the process? Any best practices?	Observation and assessment
6. Do you communicate with other coaches/teachers to identify and support talented children? If yes, are there any challenges you face in communicating effectively?	Collaboration and communication
7. What obstacles do you face when identifying or supporting talented children? Do you have any techniques to overcome them?	Overcoming obstacles
8. Are there any suggestions you would like to make for establishing and improving the system or any additional insights you would like to share?	Closing thoughts

TABLE 2 Questions for coaches.

Questions for coaches	Research topic
1. Can you briefly introduce yourself, how long have you been working with children, and what is your experience as a coach?	Introduction and background
2. How do you evaluate the current methods of detecting sports talents in your sport?	Identifying talent
3. What criteria or characteristics do you consider when identifying talented children in your field? Are there any specific indicators or behaviours that catch your attention?	
4. Are available any guidelines or protocols to you for detecting and supporting sports talents? What additional resources or training would you like to have?	
5. What strategies do you use to identify children's sports talents? Do you involve parents or guardians in the process? Any best practices?	Observation and assessment
6. Do you communicate with other coaches physical education and health teachers to identify and support talented children? If yes, are there any challenges you face in communicating effectively?	Collaboration and communication
7. What obstacles do you face when identifying or supporting talented children? Do you have any techniques to overcome them?	Overcoming obstacles
8. Are there any suggestions you would like to make for establishing and improving the system or any additional insights you would like to share?	Closing thoughts

validation. The partners discussed the statements through a shared excel file in which each partner produced its own statements concerning the results of the national focus groups developed.

They then followed the standards developed by each partner.

The statements above were synthesized and analyzed. The criteria followed in constructing the summary statements were recurring statements between the partners, complementary aspects on talent identification, summary, affirmative form.

A final list of 41 agreed statements were identified: 20 statements related to teachers and 21 statements related to coaches on talent identification. Analysis of the results led to a reorganization of the standards in order of relevance. No standard was excluded as no statement was deemed “not relevant”.

Results

Focus group with coaches

The focus groups in Greece, Italy, Serbia, Croatia, Cyprus, and Bosnia and Herzegovina provided valuable insights into the challenges and strategies for identifying and nurturing talented children in sports. Common themes emerged, underscoring the importance of a holistic approach to talent development. Across these countries, coaches faced challenges related to the lack of formal guidelines and protocols for talent identification, parental expectations, and coordination with the school system. They recognised the significance of character traits, early exposure to

sports, and psychological readiness in identifying talent. Coaches also emphasised the need for better infrastructure, cooperation among sports clubs, and multi-stakeholder collaboration involving parents, schools, and sporting organisations. To improve the talent identification process and support talented children effectively, coaches called for standardised parameters and standards, dual career options, and measures to ensure the long-term development of young athletes. While each country had unique experiences and challenges, the collective insights highlighted the importance of addressing these issues to create an environment where young athletes can thrive and fulfil their potential in sports and education.

Each partner developed standards, in the form of statements, summarising the content of the focus groups conducted. An overview of the results country by country is shown in [Table 3](#).

Common findings include the urgent need for teacher training and the call for better school-sport collaboration. These recurring themes reinforce the need for systemic interventions and serve as reference points for policy implementation.

Focus group with teachers

Across Greece, Italy, Serbia, Cyprus, Croatia, and Bosnia and Herzegovina, the focus group discussions underscored common challenges and unique aspects of identifying and nurturing talented children within their respective education systems. Common challenges included the lack of a structured system for talent recognition, financial constraints, the role of technology in

TABLE 3 Standards developed by each partner.

Standards developed by each partner		
Teachers statements SMOC	1	Proper guidance enhances the effectiveness of athletes who can strategically utilize their potential in physical activities
	2	Important to support, select and properly direct children towards the more suitable sport
	3	Evident lack of a talent recognition system, which poses a significant problem in identifying and supporting gifted children
	4	Establish a multidisciplinary approach to talent identification
	5	Necessary collaboration between sports experts, educational personnel, and psychologists
	6	Better understanding of children's needs and facilitates among teachers needed to support talented children
	7	Should special curricula be designed for talented children
	8	An insufficient number of grades is accumulated during a semester due to participation in sport contests (who is to blame? – the children, teachers, parents, school, coaches?)
	9	The information flow requires better communication between teachers, pupils/students and parents
	10	Should the government think about special schools for talented children
	11	It all comes down to personal success of individual children - no talent recognition mechanisms exist
	12	Evident lack of knowledge of teachers on the topic of talent recognition (organise trainings, seminars, etc)
Coaches statements SMOC	1	Expressed frustration about the lack of support and understanding from teachers, who often failed to recognize the demands and commitments faced by young athletes
	2	Conflicts between school obligations and sports training or competitions, resulting in talented athletes feeling discouraged and a high dropout rate
	3	Need for Improved communication and cooperation
	4	Coaches proposed better communication channels and cooperation between schools, sports clubs, coaches, and parents
	5	Creating a mutual understanding and support system that allows young talents to pursue their athletic ambitions
	6	The coaches stressed the need for training and awareness programs for teachers to enhance their understanding of the specific needs and challenges faced by talented student-athletes
	7	A more supportive environment should be established for young talented athletes
	8	Synchronization with the school system is necessary (not that coaches and clubs can always influence/decide on competition dates)
	9	Absence of clear rules, protocols, and instructions for identifying and developing talented children in sports
	10	Establishment of specific parameters and standards to guide talent identification at different age groups
	11	Challenges related to infrastructure and financing, as the existing system often prioritized short-term results over the long-term development of talented children
	12	Better infrastructure to provide optimal conditions and a revised financing system that recognizes and supports talent development
	13	Improving coordination, communication, and understanding among teachers, coaches, parents, and sports clubs
	14	Improvements in school-sport club communication and cooperation, including dual career options
	15	Expectations and ambitions of some parents often overshadow the needs and desires of the children themselves
	16	Parents should also be involved in the process of promoting and supporting talents
Teachers statements UNIPA	1	Difficulty in defining one's role in talent recognition
	2	Extracurricular engagement
	3	Awareness of unwillingness to deal with the topic
	4	Pay attention to the spontaneous actions of students
	5	Every student has a talent
	6	Synergy between teacher, family, community
	7	Inadequate school structures
	8	Need for sports technicians or qualified persons in the teaching team
	9	Need for economic incentives
	10	Multidisciplinary experimentation
	11	Systemic change in mentality
	12	Making investments in infrastructure and school buildings
Coaches statements UNIPA	1	There is no specific and systematic approach for the identification of sporting or other talents in the sporting environment
	2	Each sport travels different paths although they are considered complementary
	3	Each coach identifies and manages subjectively students' talent, using their instinct and personal perceptions
	4	Each coach identifies and manages students' talent with professionalism and competence
	5	Time for talent to flourish is necessary
	6	Sports technicians' experience is crucial
	7	Lack of resources
	8	Few trainers
	9	The activity must be differentiated, and the talent must be carefully monitored and cultivated; on the other hand, space and attention must be given to everyone equally.
	10	Facilities are often lacking
	11	Creating a network outside the locality
	12	Talent is "a gift from mother nature"
	13	A talent is such to the extent that there is a good coach who knows how to identify, manage, and accompany it.
	14	Talent is proportionate to the commitment and perseverance a talent puts into his or her training project.

(Continued)

TABLE 3 Continued

Standards developed by each partner		
	15	Training is a special pedagogical and sporting process.'
	16	Commitment and genetics are crucial, but they are not enough
	17	Talent identification occurs differently depending on the type of sport
	18	Talent is someone who can "replicate the technical gesture in a natural way"
	19	Talent also depends on character and mental ability
	20	Stubbornness, courage, imagination, grit and optimism, perseverance, humility, and the desire to grow are all transversal elements that play a part in the formation of talent
	21	Acquiring self-awareness, both of weaknesses and strengths, is crucial
	22	There are those who have a natural inclination and those who need more training, but it is all in the management of talent
	23	Becomes imperative to coach by skills not by age
	24	The family is often a critical point even if it is considered important
	25	A team must be created to support the trainee athlete.
Teachers statements KMOP	26	Long-term planning is successful
	1	We cannot discuss sports facilities in public schools when there are still classrooms in containers or building basements
	2	We are not trained to recognise talented students
	3	Each professional should stick to their expertise and talented students should be monitored by their coaches
	4	Collaboration with the school and the sports clubs is rare
	5	There is no funding to collaborate or organise mutual activities
	6	It's difficult to recognise talent
	7	We don't have tools/resources to recognise talented students
	8	Need of seminars on the active role of schools/educators in students' dual careers
	9	Seminars towards educators about the benefits of sports in student's life
	10	Collaboration between schools-sports clubs is important
	11	Need of professionals to monitor and support students and their skills through an assessment
	12	Need for strengthening public sports schools' operation
	13	Implementation of specific programs in schools dedicated to talented athletes and their support
Coaches statements KMOP	1	There is no long-term program to support young athletes throughout their developmental and athletic stages and their inclination to be detected and supported
	2	There are no official programs and methodologies in recognising talent
	3	There are initiatives that allow coaches to observe the minor participants in different sports and inform their parents about their kid's inclinations
	4	Coaches need to use their personal experience to monitor and recognise talent
	5	Most sports are considered a hobby for most parents, so they do not care about standardised methodologies and strategies
	6	In case coaches detect a talent, they talk to parents, but some sports are undervalued and they do not pursue it
	7	it is difficult for such methodologies to be applied, due to the lack of the necessary equipment, time and staff
	8	I rarely speak with educators about sports and talent
	9	I usually communicate with the parent and the parent with the educator and vice versa
	10	Adaptation of methodologies/best practices from abroad to national context
	11	Training of trainers on soft skills deriving from sports psychology
	12	Primary measurements in schools from sports educators in basic sports skills (e.g., speed, balance, and strength)
	13	Regular follow-up tests and measurements of all athletes
	14	Development of a common tracking system per sport
	15	More accurate and faster methodologies
	16	Introducing a broader range of sports in the formal educational system to provide children with the opportunity to explore and familiarize themselves with various sports
	17	Close collaboration between parents-school-coaches for the co-creation of a realistic plan for talented athletes
	18	Specific training programs in talent identification for physical education teachers
	19	Human and financial resources to support relevant protocols and procedures in the sports club
Teachers statements CI SDZ	1	There is no specific and systematic approach for detecting sports or any kind of other talent in school environment.
	2	Puberty as a key dropout age from any activity, necessity to work more to avoid it
	3	General lack of funding of any and structural restrictions to any additional activities
	4	Teachers rely on their expert eye to detect talent
	5	Talented children always ask clever questions
	6	Talented children have logical reasoning that is over developed for their age.
	7	More active children are always more talented for sports in general
	8	Talent identification and development as a marathon process, not a sprint.
	9	Talented children are fast learners, but they need continuation in their work and only with constant work and support their talent will develop
	10	Public awareness on these topics is very low
	11	Communication with children is key

(Continued)

TABLE 3 Continued

Standards developed by each partner		
	12	Communication with parents is necessary in order to be on same page for child's development.
	13	Educators need to take into an account parents' perspective and work alongside them.
	14	Collaboration between school and sport clubs depends mostly on good will of the individuals within organisations.
	15	Talented children need to be taught they need to work on their talent
Coaches statements CI SDZ	1	Coaches are not familiar with any specific methods or any system for detecting sport talent.
	2	Coordination ability is an ability that makes a difference in any sport.
	3	System of discovery of talent is for most of them often based on putting children in more encouraging environments
	4	Biological characteristics are not enough to detect talented children
	5	Character is key factor as well as children's motivation
	6	Children who are (based on some preliminary talent identification) proclaimed as "stars" soon lose interest and motivation
	7	Necessity for better and more equipped infrastructure in order to have more better conditions to be able to direct more attention towards talented individuals
	8	Need for better cooperation within their specific sports with other clubs as well as with other experts
	9	Talent identification is a long-term process and that it depends on coaches' understanding children's needs.
	10	Development of children has to be simultaneous process with the development of parents as their support system
	11	Biggest issue (apart from infrastructure) is bad synergy with school system
	12	Would like to have specific parameters and standards for identification of sport talents in specific age.
Teachers statements CSI	1	Talent recognition is mainly based on daily observations of students' performance in the class
	2	Talent recognition is also based on performance testing (e.g., tests, competitions)
	3	Athletic, or sports talents often surface during informal assessments and competitions conducted within the school setting.
	4	Certain behavioural traits appear in children with a specific talent (in any field) such as confidence, enthusiasm, patience, and commitment to the skill or subject in which they excel.
	5	Children who show an exceptional interest in a specific subject often require less effort to meet established benchmarks
	6	It is important to offer opportunities to children to exhibit their talents.
	7	A talent show organized at the schools was a good incident for teachers to uncover talents they had previously been unaware of.
	8	Talent identification sometimes occurs unexpectedly; for instance during a conversation with parents
	9	Teachers often go beyond conventional curricular requirements to offer additional support to gifted students
	10	Extracurricular activities offered through afternoon clubs provide an alternative yet equally significant platform for talent cultivation
	11	For nurturing talent, especially in sports, the collaborative efforts between teachers and coaches play a pivotal role
	12	There are however ongoing challenges in executing a seamless collaborative approach between teachers and coaches; better communication is required
	13	Communication between teachers and parents or guardians emerges as a crucial element in supporting talents
	14	In the secondary educational level of the school, the operation of a "sport school" program offers a tailored schedule to talented athletes
	15	It is a challenge to balance individualized student needs with the advancement of gifted/talented learners in the classroom setting
	16	Another challenged is the limited parental involvement, as teachers find it challenging to gain parental support for nurturing their children's talents
	17	There is a need for specialized approaches and interventions specifically designed for nurturing talent
	18	There is a need for strong communication with external experts or coaches for specialized talent development
Coaches statements CSI	1	A key approach for talent identification involves using coaches' observations of children's performance
	2	Another indicator is how quickly a child can learn a new skill or technique. Rapid acquisition of skills can be a sign of natural aptitude
	3	The use of specialized tests to measure quantifiable traits in athletes, varying by sport, for talent identification
	4	Examples include the time taken to execute a particular exercise or drill and the success rates achieved
	5	Another example from football, if a child consistently scores average or above in these tests, it might indicate that they have a significant talent
	6	In swimming, a first sign of talent is a child's lack of fear of water, followed by how well they follow the instructor's guidelines
	7	Various tests are used that measure agility, explosiveness, speed, and other ergometric measurements for talent identification
	8	Personality traits of a child or athlete were also identified as crucial indicators of potential, e.g., leadership skills
	9	Talent identification in younger children should emphasize on basic motor skills and cognitive traits as initial indicators, e.g., proper walking, correct body posture, appropriate running techniques, reaction times, changes in direction, hand-eye coordination, and the ability to quickly process and apply new information
	10	There are established norms for every sport, catering both to technical and psychological training
	11	Talent identification is multifaceted, which is not restricted just to physical prowess but also encompasses mental and psychological aspects
	12	Collaboration among coaches is an essential strategy
	13	Still, there is room for improvement in the approaches to identify and support talents in athletics
	14	It is important for the coaches to continuously be updated with information on the subject (talent identification)
	15	The experience of a coach plays a significant role in identifying talent
	16	The existence of a universally applicable tool that could be utilized by any coach without the need for specialized equipment remains a gap
	17	Identifying talent does not ensure its growth. The child's social environment – encompassing family, friends, and teammates – plays a significant part
	18	Also, factors like the nature of the child's daily obligations, the school commitments, and the type of school they attend (i.e., whether it is a sports-school or not), also play a pivotal role

(Continued)

TABLE 3 Continued

Standards developed by each partner		
	19	For team sports, the promotion of talent appears to be more challenging when compared to individual sports
	20	Communication with parents and guardians is challenging
	21	The mindset of parents often influences their child's development in a sport
	22	In team sports like football, one challenge highlighted by coaches is to find the correct position for a talented child on the field
	23	Another constraining factor is the quality of the facilities
	24	Parents usually prioritize their child's academic pursuits
	25	For future implementation strategies, coaches showed interest in the development of a universally applicable talent identification tool
	26	There is also a consensus on the need to establish programs that balance both athletic and academic pursuits
Teachers statements FSFV	1	The motivation of students to participate in sports is a major barrier
	2	Technology, financial constraints, and declining discipline were identified as hurdles to sports participation
	3	Cooperation between schools and sports associations boost student involvement
	4	The role of parents as both positive contributors and potential sources of pressure is recognized
	5	The absence of a structured system for identifying sports talents in schools was a key concern
	6	The pilot project involving physical education classes and sports examinations is promising for talent identification and development
	7	Reintegrating sports sections into schools is necessary to instil a passion for sports from a young age
	8	Partnerships between schools, sports associations, and city-level competitions is important for talent development
	9	Teachers supported initiatives like physical education classes in schools with enriched schedules to identify talent
	10	Mass competitions and cooperation between schools and sports associations are welcome to increase student engagement in sports
Coaches statements FSFV	1	The complexity of measuring talent, particularly in complex sports like football, is a major barrier to effective talent identification
	2	The absence of a definitive formula for talent selection is recognized
	3	Challenges related to international standards, attributes like speed and courage, and early exposure to sports are the most frequent
	4	Communication challenges between coaches and teachers and varying perspectives on parental involvement exist
	5	There is a need for improvement, including measurement systems and parental education to optimize talent identification and support young athletes
	6	Performance evaluations during training and competitions, motor skills assessments, and consideration of anthropometric data are key parameters for talent identification
	7	Some teachers were willing to support children in sports competitions, and primary school teachers played a vital role in preparing students with well-developed motor skills
	8	Suggestions for improvement included structured parents' meetings in sports clubs to educate parents and build trust between parents and coaches
	9	Effective strategies included early exposure to sports opportunities in school settings and structured meetings between coaches and teachers
	10	The importance of parental education to encourage a balanced approach and prevent undue pressure on young athletes was recognized

distracting students from physical activities, and the need for improved communication between schools, parents, and sports clubs. Educators in these countries emphasised the importance of early identification of talent and the need for multidisciplinary approaches to support talented children in their dual careers. While each country had its unique context and practices, some shared recommendations emerged. These included advocating for professionalization in coaching, creating opportunities for extracurricular activities, involving parents constructively, and developing systematic approaches to talent identification and development. In conclusion, fostering the development of talented children in sports and other domains requires concerted efforts across the education system, sports organisations, parents, and the wider community. Implementing structured systems for talent recognition and support, along with improving communication and collaboration among stakeholders, are essential steps toward nurturing these young talents' potential and helping them succeed in their chosen fields. The full results are reported in the [Table 3](#).

Common themes

- **Communication and Cooperation:** In all countries, there was a consensus on the necessity of improved communication and cooperation between educational institutions, sports clubs, coaches, and parents to provide holistic support for talented student-athletes.

- **Structural Challenges:** Participants highlighted challenges related to infrastructure, financing, and resources in both sports clubs and educational institutions. Addressing these structural deficiencies was considered crucial.
- **Parental Involvement:** The role of parents in the talent development process was acknowledged as crucial but also challenging. Striking a balance between parental support and undue pressure on children was emphasised.
- **Standardisation and Training:** The need for standardised methods and training programs to streamline talent identification and support processes was a recurring theme.
- The statements above were synthesized and analyzed. The criteria followed in constructing the summary statements were:
 - recurring statements between partners,
 - complementary aspects on talent identification,
 - summary,
 - affirmative form.

Workshop

Unified statements are according to the explicit criteria and ordered according to the highest score obtained in relation to the "RELEVANCE" criteria and are reported in the [Table 4](#).

TABLE 4 Unified statements achieved in terms of percentage.

Unified statements teacher	Score (%)	Unified statements coaches	Score (%)
1. Investments in infrastructure and school buildings	9	1. Long-term planning is successful	6
2. Specific training on talent recognition by technicians	7	2. Official programs and methodologies in recognising talent	6
3. Multidisciplinary integrated intervention	6	3. Coaches' experience is crucial	8
4. Synergy between teacher and family	6	4. Training is a pedagogical, psychological and sporting process	6
5. Need for tools and resources	6	5. The basic soft skills demanded by educational environments are fundamental	4
6. Raising awareness of dual careers and the benefits of sport	5	6. Regular follow-up tests and measurements of all athletes	6
7. Systematic intervention on the support of the student athlete	5	7. Developing a sport-specific monitoring system	5
8. Economic incentives	4	8. Human and financial resources to support relevant protocols and procedures	8
9. Student observation in the classroom is crucial	4	9. Synergy between coaches and family	7
10. Talent identification is based on testing	4	10. Synergy between coaches and school environments	9
11. Preventive measures school and/or sports drop-out	6	11. Adequate resources and facilities	5
12. Creating opportunities to identify talent	7	12. Genetic component	4
13. Creating a talent show is a good practice	4	13. Mental and temperamental component	4
14. Extracurricular engagement	5	14. Child development is a simultaneous process with parental development as a support system	4
15. Focus on interpersonal communication	4	15. Age-specific parameters and standards	3
16. Balancing individual student needs	5	16. Talent observation is crucial	6
17. Initial and process evaluation are crucial	3	17. The rapid acquisition of skills is a sign of natural aptitude	3
18. Need for specific dual career programmes for schools	5	18. Talent identification is based on standardised tests	2
19. Synergy between teacher and community	3	19. Synergy between coaches from different sports	2
20. Define specific curricula for sports talent	4	20. Basic motor skills and cognitive traits as initial indicators	3
		21. Balance between sporting and educational objectives	5

Discussion

Standards for the recognition of students' talent emerged from the course developed. Among other things, the discussion with experts also brought out standards that are more relevant than

others. A limitation of the investigation carried out might be that the results arrived at would differ depending on the point of view with which one looks at the issue. This means that probably if the standards had been analysed by the coaches or teachers, different conclusions would have been reached. However, the involvement of the experts, academics and scholars on dual careers could represent a desire to look at the issue through the eyes of those who are *super partes* in order to give relevance to the person experiencing the dual career condition.

From the results of the focus groups (Table 3) and the standards generated (Table 4) it is possible to see some divergence or agreement between the different groups involved in the production of the document. Indeed, these results underscore the importance of recognizing the multifaceted nature of talent identification and development.

The cross-national results, particularly the high relevance scores attributed to statements such as "Creating opportunities to identify talent" (teachers, 7%) and "Coaches' experience is crucial" (coaches, 8%), highlight key priorities for real-world application. These findings provide not only conceptual insights but also practical guidelines that institutions can adapt to enhance dual-career support for young athletes.

Bridging the gap between sports clubs and educational institutions, establishing formal guidelines, fostering cooperation, and providing adequate resources are key steps toward effectively meeting the specific needs of talented children, ensuring their holistic development, and nurturing their academic and athletic potential. The gap between sports clubs and educational institutions was frequently mentioned, with participants from both groups citing communication breakdowns and lack of cooperation. These gaps often result in fragmented support systems for talented children and contribute to early dropout risks (17, 18).

The insights gained from these diverse perspectives offer valuable input for future research and policy formulation in the field of talent identification and support.

An additional point worth considering is the potential dynamic nature of standards for recognizing talent, which may evolve over time and differ significantly across cultural and institutional contexts. While the study highlights the value of expert perspectives in defining these standards, it also implicitly underscores the need for inclusive and continuous dialogue involving all relevant stakeholders — including students themselves, families, coaches, and educators. This broader involvement could enrich the framework by incorporating practical insights from those directly engaged in the day-to-day realities of dual careers (13).

Moreover, the tension between objective criteria and the subjective nature of talent identification raises an important methodological challenge. Standardization, while beneficial for comparability and policy alignment, must be balanced with the flexibility to adapt to individual pathways and the diverse trajectories that talented students may follow. In this sense, the dual career model should be seen not only as a structured support system but also as a living ecosystem that needs to be responsive to personal growth, emotional well-being, and long-term aspirations beyond sport or academia alone.

Therefore, the current findings should be seen as a foundation rather than a conclusive endpoint. They serve as a springboard for further interdisciplinary research and dialogue.

Conclusion

Talent identification plays a key role in sports and school dropout prevention measures. Therefore, validation of these standards provides an opportunity to work in accordance with the SOP (standard operating procedures) methodology, i.e., to think in terms of clear and unambiguous models and information about the meaning of “talent”. Although the concept of “talent” is inherently complex and sometimes ambiguous, the inclusion of concrete examples, such as students showing rapid acquisition of sport-specific skills or consistent demonstration of psychological traits like perseverance, leadership, and adaptability, helps to clarify its meaning.

The project’s main takeaway is the urgent need for structured, collaborative, and context-sensitive approaches that address both the sporting and educational needs of student-athletes grounded in the voices of coaches, teachers, and experts across Europe.

The need to create standards for the recognition of talented children on the one hand, it might be limiting to discuss in terms of standards if one assumes the complexity of the issue, the contexts and the person as such (15, 19, 20). However, it turned out to be a necessity to proceed according to the SOP (standard operating procedures) methodology, i.e., to think in terms of clear and unambiguous models and information. Although the phenomenon is hardly verifiable and there is a certain degree of uncertainty, through reasoning mediated by the SOP methodology, secondary bias is excluded. Thus, having concluded that there is no consensus on what is to be understood by the term “talent”, a shared methodology could significantly contribute to the study of, on and for talent (21–23).

Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by Ethics Committee of the Faculty of Sports and Physical Education of the University of Nis. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

DV: Writing – original draft. AB: Data curation, Methodology, Supervision, Writing – review & editing. MA: Writing – original draft. LC: Methodology, Supervision, Validation, Writing – review & editing. MD: Writing – review & editing. EK: Writing – review & editing. GA: Writing – review & editing. OT: Writing – review & editing. TG: Writing – review & editing. IZ: Writing – review & editing. DČ: Writing – review & editing. DM: Writing – review & editing. SK: Writing – review & editing. DV-H: Writing – review & editing. ZM: Writing – review & editing. NSto: Writing – review & editing. NSta: Writing – review & editing. AK: Methodology, Project administration, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The author(s) declare that no Generative AI was used in the creation of this manuscript.

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A scoping review of student Athletes' perspectives on dual career policies, provisions and challenges

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Dual career (DC) athletes face significant challenges in balancing dual demands of academic and athletic commitments. A scoping review of 25 studies published between 2014 and 2024 included data from over 3,000 student-athletes across 23 countries, with 88.5% focused on European contexts. Most adopted qualitative (52%) or quantitative (44%) approaches, with one study (4%) using a mixed method. Findings, synthesized using PRISMA guidelines, addressed logistical, social, financial, tutorship, curricula, and policy aspects. Recurring barriers included a lack of flexible educational programs, insufficient financial aid, and limited access to proximate sports and facilities. Social support systems, such as mentorship and institutional committees, emerged as essential for engagement and reducing isolation. European athletes frequently cited the need for improved financial support, highlighting scholarships and fee waivers. During the COVID-19 pandemic, e-learning strategies supported educational adherence and reduced stress, emphasizing their potential as flexible tool for addressing DC demands. However, disparities in policy implementation and service provision persist, with studies identifying cohesive institutional strategies for DC athletes. These findings underscore the

need to develop harmonized frameworks across Europe, prioritizing integrated logistical planning, expanded financial support and tailored curricula. Broader perspectives from stakeholders are needed to enable DC athletes to thrive academically and athletically.

KEYWORDS

dual career, student-athletes, education, dual career services, support

1 Introduction

Sport has undergone rapid social and economic growth, playing a crucial role in promoting personal development and individual fulfilment, especially among youth. Furthermore, sport participation offers individuals opportunities for physical, mental, and emotional growth, while ensuring and preserving educational and vocational rights, as well as opportunities to succeed in society and integrate into the labour market after the end of their sports career (1). In this context, a growing interest has emerged in the promotion of combining education and sport commitments (2).

Recently, the term “dual career” (DC) was introduced to describe the specific challenges athletes face in combining sport and study activities (3). Achieving elite status in sport is a complex task requiring years of intensive training sessions and competitions (4). Indeed, athletic careers can require a long-term practice from 20 to 30 h per week in training and competition activities, combined with 30 or more hours per week in educational demands (5). The dual demands placed on DC athletes often result in psychological (6, 7) and physical stress (8), as well as time constraints that make it difficult to excel in both sport and educational activities, potentially leading to burnout and reduced engagement over time (9, 10). DC athletes may encounter significant difficulties when attempting to combine their sportive activities and educational demands, leading to a high risk of sport or academic dropouts (7, 11–13). Thus, to prevent the athletes’ integration from being compromised by their sporting careers, it is necessary to address athletes’ rights and opinions regarding their access to supports in education and sport. For this reason, and to achieve the right of DC athletes to balance their sporting and educational demands, the European Union (EU) (14) has promoted several strategies at local, regional, national, and transnational levels, highlighting logistic, social, financial, tutorship, curricula requirements, and policy items.

Following this line, scientific research has focused on several DC aspects, with systematic, scoping, narrative, and critical literature reviews summarizing findings and highlighting future challenges on psychological and social aspects of DC athletes, high school student-athletes’ mental health, barriers and routines of DC paths, mentoring DC athletes, efforts of parenting DC athletes, DC gaps in women’s sport, and transnational collaborations of DC European funded projects (3, 6, 7, 15–22). Among the several DC challenges (17, 19, 23–26), educational institutions are encouraged to provide DC services that meet a minimum level of quality, including the integration of DC strategies into the institutions’ overall vision, mission, and

policies (12, 14, 27). To promote the dual career of university athletes-students, the EU-funded More Than Gold project provided guidelines for higher education institutes regarding financial support, infrastructure, mentors/tutors, curricula requirements, social support, and other support such as peer-to-peer assistance, DC observatory, promotion of student-athletes achievements, organization of DC events, seminars, workshops, etc. (28).

In this era of rapidly advancing technologies and a growing emphasis on accessibility and inclusion, incorporating flexible educational programmes and examinations for athletes through blended and distance learning and recognizing informal learning credits earned through participation in sports have become both essential and unique (16). Also, the presence of tutors and counsellors, key figures in the development of new learning models with an in-depth understanding of challenges and opportunities in pursuing a DC, is essential to provide personalized support for athletes (29, 30). Nevertheless, regarding the socialization aspect, DC athletes are often more limited than their peers (31) due the amount of sport and educational requirements. Logistics has also been highlighted as an essential topic. Specifically, sports centres and educational buildings, or accommodations such as sleeping facilities and cafeterias, should be located close to each other to enhance athletes’ mobility (12). Moreover, it should also be noted that some DC athletes experience financial burdens related to sporting travel and university fees, which make it impossible to fully participate in both educational and athletic commitments (23). As a result, many student-athletes experience a sense of isolation and struggle to effectively balance their educational and athletic responsibilities (6, 15, 16, 18–21).

Although previous researches has highlighted the need to carry out studies on DC to gain a perspective of athletes’ the difficulties during their academic path (31), no comprehensive review on this topic has been conducted to summarize DC interventions and policy development at higher educational level. Based on the European DC guidelines for universities (14, 28, 32) the present study adopt a scoping review methodology to summarize the available evidence and to highlight potential gaps dealing with student-athletes’ specific opinions on logistic, social and financial supports, assistance and tutorship, curricula requirements, and policies domains in tertiary education (33). Significant, updated, and comprehensive information could provide a clear picture of the main thematic areas related to the implementation of university DC programmes and offer suggestions to scholars for future research and to academic authorities for the implementation of key DC priorities (32).

2 Materials and methods

The methodology used was a scoping review that allows for the categorization and the identification of key aspects of a specific topic, highlighting gaps in the scientific literature and serving as a starting point for future researches, interventions, and policy development (34). As methodological guidance, authors followed the specific criteria described in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement (35).

2.1 Eligibility criteria and search strategy

To carry out the present scoping review, studies were considered eligible for inclusion if they (I) focused on DC athletes at the university level; (II) were peer-reviewed articles; (III) collected information about the thematic areas such as logistic support, assistance and tutorship, curricula requirements, social support, financial support, other supports, and policies; and (IV) were related to the COVID-19 pandemic. On the other hand, the following exclusion criteria were considered: (I) reviews; (II) conference abstracts; (III) book chapters or guideline documents; (IV) grey literature; and (V) studies not written in the English language.

The exclusion of grey literature, conference abstracts, book chapters, and guideline documents was adopted to ensure the inclusion of studies with peer-reviewed quality standards, methodological transparency, and replicability. Although such sources may provide preliminary or contextual insights, they often lack sufficient methodological detail and are not subject to rigorous peer-review processes, which could compromise the reliability and comparability of findings.

Regarding the identification of scientific articles, a computer-based search was conducted from Scopus (version December-2025), Web of Science (version January-2025) and PubMed (version January-2025) databases from April 2024 to November 2024. The 2014–2024 timeframe was selected to capture the most recent decade of research, reflecting current policies, support systems, and challenges faced by DC athletes, and to ensure the inclusion of studies potentially addressing the impact of the COVID-19 pandemic on this population.

To organize and combine terms, the Context-How-Issues-Population (CHIP) tool (36) was used. In particular, keywords and terms related to DC athletes, including both males and females, were grouped for the selection of studies' abstracts (Table 1).

2.2 Identification and selection of relevant studies

To guarantee a systematic approach, strength, and validity of the present search methodology, the PRISMA's three steps (identification, selection, and inclusion) were assessed. Prior to the screening session, and to ensure procedural proficiency and consistency among the authors, a tutorial was organized. This

TABLE 1 Keywords organized with the CHIP (context; how; issues and population) tool.

Context	Research in dual career athletes
How	Method: "qualitative" OR "quantitative" OR "mixed" OR "interviews" OR "questionnaires" AND
Issues	Dual career: "dual career" OR "dual-career" or "Elite Sport" AND Education: "college" OR "university" Themes: "support" OR "assistance" OR "tutorship" OR "curricula" OR "financial support" OR "policies" OR "facilities" OR "programmes" Period: "COVID-19" OR "pandemic" OR "coronavirus" OR "lockdown"
Population	Male and Female: "athletes" OR "sportsperson"

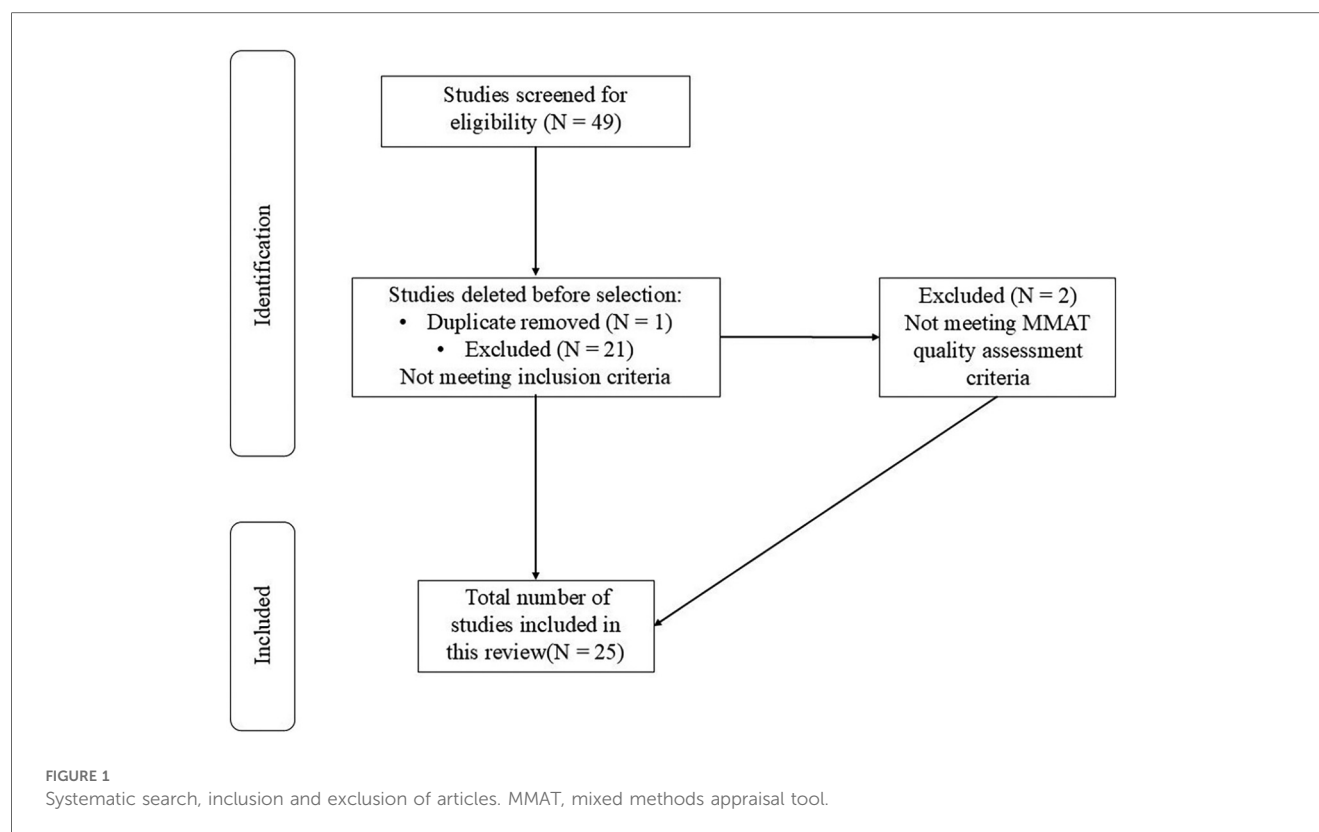
session covered aspects about the thematic areas and their respective items. Finally, authors were provided with a user schematic guide. Once the potential studies were identified and their references were downloaded and collected in the bibliographic management Mendeley software (Mendeley Desktop v1.19.8-dev3), duplicates were eliminated. Subsequently, studies were screened by titles and abstracts, and full-text were analyzed to evaluate eligibility, with studies not meeting the inclusion criteria being excluded. During this phase, all authors participated, and any discrepancies were resolved by a DC expert author. Additionally, to maintain transparency in this process, a PRISMA flowchart (Figure 1) was created to document the decisions made during the screening process.

2.3 Coding and data extraction

To facilitate data cleaning, a data extraction tool referring to key characteristics of studies such as authorship, year of publication, participants and sport modality, study focus, design and methodology, and themes in the form of a table was developed (3) (Supplementary Table S1). The first and second authors were responsible for this data cleaning, with supervision from other authors. The included articles were arranged alphabetically by the authors' surnames.

2.4 Assessment of the quality of included studies

The quality of the present research methodology for the involved articles was assessed using the Mixed Methods Appraisal Tool (MMAT) (37), a critical appraisal tool designed for the evaluation stage of systematic mixed studies reviews, which include qualitative, quantitative, and mixed methods studies. The document consists of a checklist section composed of two generic screening questions and five specific ones for each type of study, with responses limited to "yes", "no", or "can't tell". A single "yes" corresponds to 20%; two "yes" to 40%; three "yes" to 60%; four "yes" to 80% and five "yes" to 100% of the MMAT criteria. Studies were also classified as very low (0%–19%), low (20%–39%), acceptable (40%–59%), moderate (60%–79%) or high (80%–100%) quality. Two independent reviewers



screened each study, with an independent third-party researcher involved in case of disagreements.

The MMAT quality assessment of the involved studies by qualitative, quantitative and mixed methods is shown in [Supplementary Table S2](#).

3 Results

From the electronic search, forty-nine studies were retrieved. After eliminating duplicates and excluding studies that did not meet the inclusion criteria, twenty-seven studies were identified. Moreover, following the MMAT quality assessment, two studies were removed. Finally, a total of twenty-five studies, published between 2014 and 2024, were included in the present scoping review for analysis. The main results and characteristics of interest for each study are presented in [Supplementary Table S1](#).

The following sections provide an overview of the characteristics of DC studies, followed by a narrative synthesis of the knowledge generated through these studies.

3.1 Description of study characteristics

The twenty-five included studies addressing the logistic, assistance, tutorship, social and financial supports, policies, and curricula requirements for DC themes were carried out across five different continents, with 88.5% focused on European countries. Two studies were conducted during the COVID-19

pandemic (27, 38) and two studies focused on student-athletes with disabilities (39, 40). Regarding the study design, the selected works employed mainly qualitative (52%) and quantitative (44%) methodologies, and one (4%) study a mixed methodology combining semi-structured interviews and surveys (41). The most common techniques used for data collection were questionnaires/surveys and semi-structured interviews, with two studies utilizing focus groups (25, 42). With regard to the studies' focus, logistics, assistance, and tutorship supports are the most commonly assessed aspects. Lastly, based on the MMAT quality assessment, most studies were rated as high (80%–100%), three studies (38, 43, 44) as moderate (60%–79%) and one (45) as acceptable (40%–59%) quality.

3.2 Scope of DC studies

The section presents a narrative synthesis of the knowledge related to student-athletes' perceptions, including logistic, assistance, tutorship, social and financial supports, as well as policies and curricula requirements. A total of 25 studies mainly focused on managing DC demands. The predominant methodological approach used form 13 studies was qualitative, while 11 studies using a quantitative approach. Additionally, only 1 study adopted a mixed method approach. The studies covered and merge a wide topic of research topics, including DC student athletes and logistics ($n=18$); assistance ($n=13$); tutorship ($n=21$); social ($n=18$) and financial ($n=17$) supports; policies ($n=9$); and curricula requirements ($n=19$). Therefore, managing

a DC is often seen as challenging, especially when balancing the demands of both sport and educational activities (39, 45–49). Student-athletes are deeply connected to both their school and sport for several reasons, highlighting the need for enhanced support networks and services tailored to their educational responsibilities (44). DC student athletes frequently face several issues, particularly when they are pursuing both academy and sports goals. Success in both demands could be influenced by the time management (training sessions, exams, competitions and/or travel), institutional support (flexible schedule) and/or geographical mobility (accommodations and academic building). The findings of the analyzed studies revealed that the most reported barriers for DC include the absence of flexible programmes and exams (44, 50, 51), and the long distance between sport centres and educational buildings (25, 45, 52). Addressing these challenges require a cohesive and comprehensive approach including universities sport organizations and governments to provide dedicated resources in supporting DC model. On the other hand, less frequently reported are the absence of tutors or counsellors (53, 54) and social support structures such as seminars, workshops, meetings with parents and/or coaches, institutional DC committees, and peer-to-peer support (18, 25, 45, 55). The reviewed literature revealed that structured tutorship and peer-to-peer programs could provide a valid DC network, enabling athletes to excel in both demands by offering both emotional and professional support. Some analyzed studies also emphasized limited financial support (25, 31, 45). Balancing academic responsibilities with the rigorous demands of trainings and competitions require not only time and dedication but also financial resources. Many student-athletes, as well as families, could face economic difficulties, as their schedules often prevent them from taking part-time jobs to support themselves. In fact, drawing from the interview data, DC student athletes expressed their disappointment regarding the lack of comprehensive financial assistance available in supporting their dual commitments. Add to this, the lack of clear national policies (25) contributes to relevant discrepancies in their effectiveness. Evidence indicated that DC athletes encountered unharmonized policy support system among Europe. The student-athletes foresee the implementation of these aspects as essential for assisting in managing time, overcoming DC-related challenges, and preventing potential dropouts. Despite the negative impact of the COVID-19 lockdown on sports and study activities, increased e-learning opportunities represented a flexible strategy for DC (27), with student-athletes demonstrating better adherence to educational programs and perceived their DC in a positive manner (38).

4 Discussion

The main findings of this scoping review underscore an evolving scientific dialogue on logistic, social and financial supports, assistance and tutorship, curricula requirements, and policies domains concerning DC using different methodological approaches, substantiated by an upward trend for DC. According

to Edmonson and McManus (56), the DC research could be considered entering its intermediate stage, in line with other DC topics (17). Specifically, the included studies present different methodological approaches, mainly characterized by interviews or not-validated and reliable tools to generalize findings over large-scale, cross-sport, and cross-country contexts (17). However, structured in its DC scope, the present study provides a starting point for understanding the DC support phenomenon and calls for empirical studies providing relevant information on the effectiveness of DC supports at academic level by considering both the student-athletes' and academic DC experts' opinions across Europe (57).

In the last decade, there has been an increasing volume of publications on DC as a multi-faceted nature of the DC phenomenon, highlighting several key aspects of the student-athletes' needs in balancing sport and educational careers (2, 19, 58). Despite the EU guidelines and actions for the development of DCs and the athletes' rights to a holistic development through formal high level education, the scientific literature highlighted deficiencies in the implementation of academic support for student-athletes (2, 14). A large-scale evaluation revealed that the main barriers for DCs are logistical challenges, lack of social and financial supports, insufficient assistance and mentorship, and issues related to curriculum requirements and policies. Even though the student-athletes' opinions are essential to identify needs and anticipate solutions that create an environment supporting their DC, the opinions of DC academic experts are equally crucial to identify challenges in implementing a DC supportive environment at university level (57).

Logistic support represents a crucial aspect in DC lifestyles (25, 45, 52). It involves the organizational and practical resources provided to help athletes combining their educational and sporting requirements, for example, easily accessible sport, accommodation, and sport facilities (14). According to the European Study on Minimum Quality Requirements for DC Services (12), educational facilities such as study rooms and e-libraries, accommodation options like sleeping facilities and cafeterias, and training centres should be located within a maximum travel time of fifteen minutes to reduce stress and enhance mobility for student-athletes. Furthermore, DC relies on specific equipment, facilities, and environmental conditions, yet educational resources often fail to meet these needs (55). To fill this gap, although scientific literature have yet highlighted the importance of institutional support (19), stronger relationships between sports bodies and academic institutions should be established to make available nearby facilities to help student-athletes (59). Since student-athletes spend a significant amount of time traveling between home, educational buildings, and training venues, institutions are also encouraged to address logistics by offering or implementing specific transportation arrangements (31). In considering the globalized sport phenomenon, another important aspect involves sleeping accommodations, which could be useful for the relocation or migration of student-athletes (60). Conversely, only 18% of European student-athletes live in student accommodation (59). Therefore, prioritizing DC perspective is crucial to effectively support student-athletes in their overall development.

Social support refers to an entourage providing emotional, informational, and practical assistance to student-athletes encompassing family, peers, coaches, and institutional sources (25, 55). Specifically, students are encouraged to build positive relationships with peers to foster confidence, enhance academic performance, and create a supportive environment. Indeed, institutions have responsibilities to allocate resources for learning opportunities, student-athlete engagement programs and services that promote active involvement (55). However, the significant amount of time and effort that student-athletes dedicate to their sport can often disconnect them from their educational peer groups, resulting in a perception of limited social life outside training (44). In considering the important role of non-athlete classmates in helping student-athletes connecting with academic life and form friendships outside of their athletic domain, institutions could promote peer-to-peer tutoring, especially for first year student-athletes who need to adapt to a new context (25, 61). Moreover, consistent with searches (62), institutional DC committees could be established to facilitate dialogue among DC stakeholders, such as teachers, educational staff, coaches, and parents, while information on DC-related issues could be shared through seminars, workshops, and meetings (63). In delivering high-quality education, educational institutions might reinforce or introduce social actions to facilitate DC (14), also involving parents of student-athletes prepared to enhance the cooperation with the sports organizations and other stakeholders (21, 25, 64, 65). In this respect, it could be also useful to consider the EU-funded DC multilingual educational platform for parents of DC athletes (66).

The scientific literature also emphasizes financial support structures for student-athletes, addressing the many ways that institutions and sports organizations provide financial aid to help them balance academic and athletic commitments (23, 25, 31, 45). Student-athletes' financial support refers to resources provided to help them managing costs associated with both their educational and athletic pursuits, such as scholarships, tuition fee remission, salaries, and sponsorships (67). In this regard, many EU Member States offer sports scholarships to students, providing financial support throughout their university studies and enabling them to balance higher education with athletic pursuits (14). However, these scholarships do not cover financial assistance for certain sport-related expenses, such as equipment or travel. In fact, studies reported that high-performance athletes and their families often face long-term financial challenges, sometimes beginning at a young age (14). This aligns with previous findings that underline the need of sustained financial support over time, often as discontinuous and inadequate (68). The financial pressures associated with supporting young high-performance athletes in both sport and educational pathways could also lead to DC dropouts (69). Therefore, scholarship programs might include criteria encouraging athletes to excel educationally or athletically in exchange for rewards, including budgets for student-athletes planning to travel abroad for sports and/or education. Additionally, contributions from private organizations to these scholarships could be simulated through tax deductions.

In the context of seeking new learning models for student athletes, institutions are invited to create more inclusive, flexible, and effective educational experiences, empowering them to succeed educationally while fulfilling their athletic potential. This model includes the role of tutors, who are responsible for activities that assist and support student athletes academically (30). An effective tutorship system for DC student-athletes intellectually and emotionally motivates them to find solutions to challenges and invest the necessary effort in completing required tasks. In this context, tutors play a crucial role in positively influencing athletes' personal motivation and self-encouragement. Tutors offer guidance, share knowledge and experiences, and promote self-discovery through an approach that emphasizes low pressure (19, 50, 70). Conversely, the absence of such a figure hinders student-athletes in their learning processes, as they need proper supervision and support (53, 71). This supervision system must be adaptable to the individual needs of the student-athlete, both personally and professionally. Therefore, the tutoring system demonstrates the importance of developing innovative learning models to help athletes successfully attend educational courses (30). Moreover, when sporting activities increase, scientific literature highlights the importance of establishing an informal relationship with a tutor to mediate with academic staff and teachers in finding creative solutions, leveraging social communication channels. Through personal interactions, teachers can be more willing to offer additional work in case of missed classes, along with online consultations, support, and other tool valuable for athletes (72). For all these reasons, DC presents a challenge for educational environments, which must develop innovative ways to reorganize their knowledge and adapt learning models offered to students. In this sense, adaptable, integrated, and proactive DC programmes, based on intra- and inter-departmental cooperation and professional services, represent best practices to build a solid DC. In this respect, it could be also useful to consider the EU-funded DC toolkit for educating service providers (73).

Another key aspect of DC addressed is curricula requirements. According to the European DC recommendations (74), student-athletes require flexible curricula, personalized study plans, and distance learning options, particularly when they face conflicting schedules due to sports commitments. Since the COVID-19 pandemic, remote learning is no longer a new concept, and institutions should develop e-learning systems that include, for example, recorded lessons. These systems must provide continuous access, enabling distance teaching, educational flexibility, and ensuring future opportunities for adequate support for student-athletes (55). In fact, incorporating self-regulated remote learnings can enhance academic performance by reducing stress, helping student-athletes balance academic and athletic responsibilities, and increasing their sense of autonomy. Moreover, by awarding academic credits for sports-related activities (e.g., training, competition, and leadership roles), institutions can acknowledge the value of the skills and experiences gained through sports. This recognition reduces the workload for student-athletes, allowing them to focus on both their education and their sporting careers more effectively.

Institutions might also offer credits or academic recognition for major sporting achievements, such as representing their institutions in national or international competitions. Hence, when not available, DCs may miss these vital elements (16, 75).

The European Commission (14) recommends Member States develop national DC guidelines that consider the specificities of their sport and education systems, as well as the cultural diversities within their countries. However, at present, national recommendations have been published in Sweden and in Italy (48, 76), with a few other countries regulating the principles of sport and education (e.g., Portugal 2019, 2025 and Spain 2007), yet a systematic DC-approach is often lacking at the European education level (12). Despite some institutions established policies outlining the expected behavior and responsibilities of student-athletes (e.g., maintaining academic integrity, upholding athletic standards, and adhering to institutional rules), the present scientific overview highlights that the term “policy” is still not well defined, resulting in unequal treatment of European student-athletes and unharmonized data across Member States (12, 31).

In conclusion, the scientific literature analyzed in this scoping review suggests that the student-athlete’s needs in relation to logistics, social, and financial supports, as well as assistance, tutorship, curricula requirements, and policies, remain critical and require further attention. To implement effective European strategies, universities should try to overcome specific cultural and organizational regulations and establish structured cooperation for DC eligibility process, recognition, service provision, and monitoring procedures (77).

4.1 Practical implications

The findings of the present review substantiate the need of DC academic support to facilitate a holistic development of athletes. The definition of DC objectives and the feasibility of implementation strategies are grounded on their relevance and availability of resources. In this regard, the EU-funded More Than Gold project developed guidelines for higher educational institutions, which offer suggestions and practical directions to realise actions also in presence of limited resources (28, 32). Actually, universities are not only responsible for implementing DC policies and provisions based on the needs and expectations of their student-athletes, but also must make the athletes aware of the DC opportunities they offer (31). In this respect, universities should enable successful cooperation with sport bodies and DC stakeholders to publicize their commitment in helping athletes pursuing a higher degree, whereas scholars should engage in future research collaborations to investigate the acquisition of DC policies and provisions across tertiary education.

4.2 Limitations and future lines of research

This study presents several limitations. First, DC is a multifaceted process that must be framed and managed within different contexts and cultures (70). Relevant information

regarding DC cannot be fully understood by analyzing only student-athletes’ views and expectations. Key actors that play a role in supporting and guiding student-athletes throughout their academic and athletic journeys include family, coaches, tutor, peers, and government bodies. In fact, integrating the opinions of key actors could facilitate the creation of a supportive system that enables student-athletes to succeed academically while pursuing their athletic goals. Second, the sample was limited to university student-athletes. The integration of multiple educational levels in future research would provide a more holistic perspective on the existing DC knowledge. Extending the scope of research would facilitate the examination of more articles and a more diverse set of data, thus enriching insights into the issues addressed in this scoping review. Consequently, it is recommended that future studies consider the limitations identified in this research as a starting point for further investigation, aiming to obtain a clearer and more exhaustive understanding of DC services and associated challenges.

5 Conclusions and future studies

This scoping review collected and analyzed studies focusing on student-athletes’ opinions regarding logistical, social, and financial support, assistance and tutorship, curricula requirements, and policy-related domains, to obtain a global perspective of the difficulties encountered by student-athletes in developing their DC while enrolled in college. The main findings highlight the need to reinforce or introduce new actionable policies to support the status of DC student-athletes and to promote meaningful changes, especially in the aforementioned topics. Based on the evidence emerged from the present review, future research should aim to incorporate the perspectives of key stakeholders (e.g., academic tutors, coaches, parents, and institutional decision-makers) in order to foster a systemic and multidimensional approach to DC management. Moreover, the scope of investigation should be expanded by including student-athletes from various educational levels, thereby enabling a more comprehensive and longitudinal understanding of the phenomenon. It is also recommended that empirical studies assess the effectiveness of existing support measures, alongside comparative analyses of national contexts with differing levels of DC policy implementation. Finally, particular attention should be paid to the long-term impact of DC experiences on psychosocial well-being, career transitions, and professional integration, with the aim of informing the development of tailored and sustainable interventions.

Author contributions

MDM: Data curation, Formal analysis, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing. SM: Data curation, Formal analysis, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing. OP: Writing – original draft,

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Negative manifestations of internalized extreme filial piety culture among Korean high school student athletes: dropping out, “Athlete Melt”, tie-in sale, and “Running Away”

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Introduction: This study investigates the adverse impact of extreme filial piety culture on the career trajectories of elite Korean amateur athletes following professional league contract failures.

Methods: Using narrative interviews and participant observation, we explored the experiences of high school student-athletes who were unable to transition to professional sports, secure university admission as athletes, or chose to abandon their athletic careers.

Results: Our analysis revealed four key phenomena: some student-athletes drop out of high school or forgo university to pursue other careers; illicit “tie-in sales” allow parents to leverage sports performance for admission to prestigious universities; several student-athletes run away from home due to abusive or unsupportive environments and feelings of entrapment; and internalized extreme filial piety generates overwhelming guilt as athletes feel compelled to repay parental sacrifices through their success.

Discussion: These findings highlight the need for policy interventions and support systems that broaden career options, curb excessive parental and coaching pressures, and foster greater autonomy in student-athletes’ decision-making.

KEYWORDS

Korea, student-athletes, filial piety culture, dropping out, tie-in sale, running away, career dilemmas, athlete transition

1 Introduction

In Korea, parents play a pivotal, and often demanding, role in the journey of student athletes aspiring to become professionals (1–3). Parents influence their children’s entry into sports (4–7) and shape their career as athletes (7–9). Particularly, the parents’ involvement with their children’s sports team will affect the child’s inclusion in competitions; specifically, parents are expected to enter into personal relationships with the coaches and provide them with financial and other benefits (1, 10, 11). Parents frequently provide various forms of support, such as preparing food, purchasing training equipment, and coordinating team cheering. Additionally, they may engage in social interactions with coaches, including shared meals, karaoke outings, or drinking alcohol with the coaches after a game or practise. Sports requires parental support, both

materially and emotionally (7, 12–15), and they inevitably end up overextending themselves by going above and beyond to provide for their children, such as buying expensive exercise equipment, providing assistance with personal training, or arranging private tutoring from professional athletes (2, 16–19). In the past, it was possible for children to participate in sports without parental involvement or support. However, sports programs today are increasingly privatized, affected by residential and living areas, becoming more expensive, and have complicated participation schedules and organizational structures (20). The privatization of sports programs has led to a growing dependence on parental involvement and financial support, making independent participation increasingly challenging for student athletes (3, 7, 21–27).

Although parental and coaching support play a crucial role, statistical data indicate that only 5%–10% of student athletes successfully transition to professional leagues in Korea (28–30). This discrepancy highlights the need for alternative career pathways and policies (30–35). This results in a typical elite sports pyramid where only a select few succeed professionally, while others must abandon their aspirations due to injury or insufficient skill (32, 35–39).

Most Korean student athletes in school sports departments dedicate their elementary, middle, and high school years solely to training, often at the expense of academics (3, 40–42); they undergo life experiences that differ from other students (35, 43–45). This is because student athletes believe that they can succeed as an athlete, and sacrifice the potential future rewards of excellent grades (e.g., college admissions, professional admissions, financial rewards) in exchange for the reality of being forced to overtrain and forfeiting their right to learn (30, 40, 46, 47).

Thus, if they leave sports, they face significant challenges due to having focused solely on athletics, often sacrificing even fundamental education at an early age (17, 48, 49). As a result, finding alternative career paths becomes difficult once they recognize their inability to go professional (1, 2, 50, 51).

The success rate for athletes is statistically very low (29, 52), and despite many student athletes quitting or even running away from home to escape sports, the number of aspiring athletes in Korea remains high (3, 35, 53–55). This phenomenon may stem from strong parental enthusiasm for education (56), high parental aspirations for their children's success (57), and deeply ingrained social expectations of parental dedication (58, 59). Previous studies have examined the role of parents in athletic socialization, but research into why some parents persistently support their children's athletic careers remains limited (5).

Although most student athletes in Korea's school sports departments deal with unfavourable circumstances, and some even experience the need to run away from home to escape the pressures of sports, research on why certain parents continue to push their children toward athletic careers remains insufficient. To address this gap, understanding the culture of school sports departments and the role of parents within this environment is crucial.

To that end, this study explored the emotions and influences experienced by student athletes in the course of their parents'

sports parenting behaviour. It further analyzes the experiences of student athletes in school sports departments, focusing on the influence of extreme Confucian filial piety, which remains prevalent in Korean society (60, 61).

Filial piety culture involves respecting and caring for one's parents, obeying and supporting them, and refusing to engage in behaviour that humiliates the family (62, 63, 184). It particularly emphasizes the concept of family honour (64, 65). In Eastern societies, this cultural principle fosters a strong hierarchical relationship between parents and children (61, 63, 65–67).

Filial culture is very interactive and entails the child reciprocating parental sacrifices (68–71). It is ubiquitous, although there are terminological differences worldwide, and the depth of relationships may vary due to differences in religion, region, and era (60, 68, 72–74). Confucianism believes that “filial piety is the foundation of virtue”. Similarly, in Christianity, predominantly representative of the West, one of the 10 Commandments in Chapter 20 of the Book of Exodus states, “Honor your father and your mother” (70, 71).

Filial piety has been recognized as the highest virtue in Confucian countries such as Korea, China, and Japan for thousands of years (69, 75–78). As such, Eastern Confucianist filial piety culture is constantly being recreated throughout history and social contexts (62, 79–82, 185), and it has changed directions according to changes in historical experience, political governance, and socioeconomic structure (62, 80, 82–86).

In China, the Confucian traditional ideology of the family was prohibited as counter-revolutionary after the socialist revolution in 1949, and the onus of community responsibility was placed on the political leader (87, 88), thus weakening the culture of filial piety in China (61, 79, 89).

In Japan, the tradition of oriental filial piety continued pre-World War II, and the *ie* system or patriarchal immediate family system was created (90, 91), which was abolished in 1948 (91, 92). Subsequent decreases in the children's tendency to support their parents has led to a weakened family support consciousness (61, 78, 91).

In contrast, in Korea, which has long adhered to the Confucian culture, there is a rare deep parent-child bond (74, 93). Evident from the Act Regarding the Encouragement and Support of the Practice of Filial Piety, intended for a level of long-term conservation and encouragement of the filial piety culture not witnessed elsewhere, Koreans deem filial piety to be crucial and respond sensitively to it (60, 71, 93, 94).

As most adolescents in Korea receive unconditional love and attention from their parents and grandparents from an early age, they do their best to meet the expectations of their families in return, even if their parents do not want repayment (60, 83, 93, 94). This is a manifestation of extreme filial piety; where parents blindly sacrifice for their children, and the children feel that they owe their parents a debt that they cannot repay (74, 83, 94). Korea's distinctive history and social context brought about this extreme version of the Oriental Confucian filial piety culture.

Especially, this phenomenon manifests more intensely among student athletes. The minute someone becomes an athlete at the behest of respected elders like a coach or parents or their own

desires and improves competency to a certain extent, they fall into the fetters of extreme filial piety culture (83). As expectations of success as a professional athlete increase, the burden on both the parents and the child increases (6, 95). This is because the failures of children are perceived as the failures of parents in Korean society (83, 96–98).

In Korea, if the child has a good job, the parents think that their child's social status and treatment will be applied equally to themselves. Even if the parent's social status is low, if their child's job entails a high social status, they think their own social status will rise as a result (99–101). The dream is to raise the status within the generations through elevations in status between generations, especially in low-income households (101–107).

In pursuit of their children's success, many Korean parents make significant financial and emotional sacrifices, often going beyond what is typically expected (3, 13, 71, 108–110). They engage in extensive support activities (21, 108), including ingratiating themselves with coaches and contributing financially to the team (111, 112). However, as only a small fraction of student athletes achieves professional status (113), the majority face an abrupt transition out of sports, often accompanied by intense feelings of guilt and frustration. This burden is exacerbated in low-income households, where sports are seen as a potential path to social mobility (42, 105). When success does not materialize, both parents and children struggle with the emotional and financial consequences of their deep investment, reinforcing the pressures of extreme filial piety (96, 102, 103, 106, 107, 114, 115).

On the above basis, this study examines how the internalization of extreme filial piety influences the career trajectories and decision-making processes of Korean student athletes. Despite the slim chances of achieving professional success, many athletes persist due to deeply ingrained familial and societal expectations. The research aims to identify the psychological and social difficulties faced by student athletes when they fail to meet these expectations, particularly focusing on issues such as dropping out, “athlete melt”, tie-in sales, and running away. Through in-depth interviews, this study explores the mechanisms by which extreme filial piety shapes both parental and student behaviors, revealing how it reinforces rigid career paths and exacerbates emotional distress. The findings contribute to the understanding of how cultural values affect athletic careers and suggest policy measures to provide more diverse and realistic career options for student athletes.

2 Methods

2.1 Participants

Participants were carefully recruited to represent typical examples of the topic of this study. To ensure confidentiality, pseudonyms were used, and all interviews were conducted with strict data protection measures. Given the study's nature, snowball sampling was utilized, with initial participants

introduced through athletes from various sports with whom rapport had already been built. During this process, the researcher ensured personal protection, data confidentiality, and voluntary participation. The study's purpose was explained, and informed consent was obtained. The study focused on high school student athletes whose parents played a key role in their athletic careers or provided significant parental support. Additionally, it explored whether they had dropped out of high school or chosen not to enroll in university. A total of 11 individuals expressed interest in participating; however, two withdrew, leaving nine final participants. Additionally, Yang, a 36-year-old male tennis coach with a university degree, joined as an auxiliary participant at his own request. All participants actively agreed to in-depth interviews.

In total, nine high school athletes participated in the study, competing at the national and regional levels in Korea across five sports: baseball, basketball, soccer, tennis, and wrestling. Among the student athletes, two had dropped out of high school, three were currently attending university, and four had graduated from university. The group consisted of seven male and three female athletes. The participants were recruited from two major cities in Korea: Seoul and Busan. These cities were selected due to their high population density and diverse range of sports programs, ensuring a representative sample of student athletes.

Table 1 presents the demographic and athletic characteristics of the student athletes, including their education level, sport, and gender. The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Korea Institute of Sport Science (protocol code KISS-22038-2303-03).

2.2 Data collection method

2.2.1 In-depth interview

In-depth interviews were conducted with a focus on four study participants who had built a rapport with the researcher and actively participated in the research; oral consent was obtained from them. One unstructured interview was conducted with each of them for about 1 to 2 h, depending on participant availability. Subsequently, all study participants were asked questions related to their experiences in school sports departments, their

TABLE 1 Personal characteristics of study participants.

No.	Name*	Age	Gender	Education level	Event
1	Seong	24	Male	High school dropout	Baseball
2	Kang	22	Female	High school dropout	Tennis
3	Yoon	24	Male	Attending University	Basketball
4	Lee	25	Male	Attending University	Wrestling
5	Kim	23	Male	Attending University	Soccer
6	Han	29	Female	University graduate	Tennis
7	Jeong	27	Male	University graduate	Soccer
8	Park	28	Male	University graduate	Baseball
9	An	28	Female	University graduate	Basketball
10	Yang	36	Male	University graduate	Tennis coach

*Pseudonyms have been applied to protect the identities of the study participants.

relationships with parents, and personal reflections. The initial four unstructured interviews served as exploratory interviews that helped identify key thematic areas. These early interviews informed the refinement of subsequent interview strategies. Based on these findings, the researcher conducted semi-structured interviews with all participants, using open-ended questions to ensure depth while maintaining flexibility. The main topics explored were: parental involvement in athletic careers; decisions around school and sport; and the emotional burden associated with filial expectations.

The researcher made efforts to exclude those who felt even slightly burdened by the interview or did not express their active willingness to participate. The participants were informed about their ability to stop the interview at any given time.

Participants responded to the interview without significant difficulties, and the recorded data were transcribed. Interviews continued until data saturation was reached. Saturation was defined as the point at which no new themes or perspectives emerged from subsequent interviews. This was assessed through ongoing transcript reviews and comparison across cases, with recruitment ending when new data became redundant.

After scheduling interviews at locations chosen by participants and obtaining their consent, each participant took part in one or two in-depth, one-on-one interviews.

2.2.2 Collection of auxiliary research data

Auxiliary research data were collected using search engines, such as Google and Naver, including the Korean academic database RISS4U. The collected research data were discussed in depth by advisors, including the researcher, and only the data deemed to bear sufficient significance were used in this study.

2.2.3 Data analysis

This ethnographic study involved iterative reading, interpretation, and categorization of the collected qualitative data (116). Audio recordings made during fieldwork were transcribed for analysis. Thematic analysis was carried out using an inductive coding approach, without applying any predefined frameworks (117). All transcripts were reviewed multiple times to ensure familiarity with the data. Open coding was used to identify recurring patterns and meaningful units of text, which were subsequently grouped into higher-order categories and overarching themes through an iterative comparison process. Internal supporting materials (e.g., interview transcripts, field notes, and memos) were organized by the research team to ensure consistency and traceability throughout the analysis but are not publicly available.

2.2.4 Reflexivity and positionality

As qualitative researchers, we are aware that our interpretation of participants' experiences is not value-neutral. Our role in selecting, framing, and interpreting the data inherently involves subjectivity. Throughout the research process, we remained reflexively aware of how our perspectives, assumptions, and interactions with participants could shape the research outcomes.

This reflexive stance was essential to maintaining analytical transparency and ensuring that findings reflect both participants' voices and the interpretive context in which they were analyzed.

2.2.5 Verification of data authenticity

Thick description is a method that provides overall information about the subject of description and describes an experience with context, intention, and meaning to allow readers to fully understand the situation (118). Therefore, the researcher did not report simple facts of all situations and actions that occurred to the study participants regardless of intention or context. Efforts were made toward in-depth descriptions, starting from experiences in school sports departments and the context, intention, and meaning of subsequent research results.

Additionally, efforts were made to eliminate distortions and errors that might have disrupted the analysis and interpretation of interview data.

3 Results and discussions

3.1 Dropping out and "Athlete Melt"¹: the interplay between parental expectations and student-athlete decisions

Trow (119) classified stages of higher education development, indicating that if the university age group exceeds 50%, a stage of universalization has been reached. In Korea, the university enrollment rate reached 51.4% in 1995, and more than 70% of high school students become university students unless they face ongoing financial crisis (120, 121).

Similarly, Korean student-athletes generally aspire to attend university unless they transition directly into professional leagues. Because student-athletes from elementary to middle school dedicate themselves entirely to sports, often sacrificing academic studies, they seek to enter university through the sports specialist admission system² (30, 97, 98, 122–128). However, as they approach university admission, both student-athletes and their

¹This term adapts the U.S. concept of "summer melt." In the Korean context, it refers to student-athletes who refrain from university enrollment due to structural barriers, financial pressures, and societal expectations—even after years of athletic dedication.

²Introduced in 1972, the sports specialist admission system enabled student-athletes to enter universities based purely on athletic ability. The goal was to foster elite athletes and enhance national prestige. However, this policy led to an education system where academic achievement was largely disregarded. The limitations of this approach became evident in 2016 when an equestrian athlete was found to have gained university admission through irregular means. In response, the Ministry of Education implemented a 'minimum level of education' requirement for student-athletes in 2017, though its effectiveness remains limited.

parents face a critical dilemma. Some athletes, realizing that their chances of a successful sports career are slim, choose to drop out or experience “athlete melt”. This is often an attempt to ease their parents’ financial burden, influenced by deep-rooted filial expectations. However, this decision often conflicts with parents’ firm belief that their child’s success reflects their own sacrifices and efforts. Many parents view their sacrifices as part of their duty, making it difficult for student-athletes to step away from sports without feeling a sense of failure—not only for themselves but for their families as well. This paradoxical tension between parental expectations and individual reality leads to a difficult and emotionally painful decision-making process. These outcomes—dropping out or experiencing athlete melt—result from either the student-athlete’s decision being respected or parental acquiescence.

This case illustrates how parental expectations impose psychological and financial burdens on student-athletes, significantly influencing their dropout decisions.

It’s so difficult to take care of athletes, and I felt guilty because I thought I wasn’t doing well, so I wanted to reduce the burden on my parents. In my case, I have many family members and older sisters, so I tried my best to lighten their burden as much as possible... (sentence omitted) So I dropped out of school... (sentence omitted) Anyway, I thought it was too late to study now. I believed that if I succeeded as an athlete, studying wouldn’t be necessary... (sentence omitted) I just didn’t know that I wouldn’t succeed as an athlete. (Kang, 22, female/tennis)

This account illustrates how student-athletes experience significant pressure due to their families’ expectations, leading to decisions shaped by both personal aspirations and parental influence (6).

While financial concerns are important, student-athletes mainly believe that academics will not help their future as athletes. This perception strongly influences their decision to drop out or skip university (129, 130). According to Sun and Baek (42), 73.3% of high school student athletes stated that while they attended school, but did not actively participate in academic activities because they believed school classes were irrelevant to their future careers. Although school attendance is mandatory, the intense demands of athletic training often prevent student-athletes from engaging in academics (131). This highlights a systemic imbalance between education and sports commitments, particularly in the context of dual careers (30, 33, 35, 42, 132–135, 182). As a result, these athletes often lead highly specialized lives focused solely on sports, missing out on fundamental educational and social experiences (34, 131, 133).

Once student-athletes fall behind academically, it is almost impossible to recover while continuing their athletic training (136–138). If they stop playing sports in high school, their low GPAs prevent them from taking the KSAT college entrance exam³, severely limiting their chances of university admission.

Additionally, those who fail to advance to professional sports teams lack both the academic ability to enter college and the athletic skills required for sports specialist admissions.

As a result, parents play a decisive role in shaping student-athletes’ academic and career decisions (139, 140). Without such intervention, many student-athletes end up taking physically demanding jobs. In Korea, individuals whose highest level of education is high school graduation face implicit social stigma (106, 141–148). This social pressure pushes student-athletes and their families toward university, even when it doesn’t match the athlete’s goals or academic ability (130, 138).

Those who forgo university education face significant disadvantages in Korean society, with high school dropouts experiencing even harsher conditions (186–188). Even for part-time jobs, education level is often a required field on job applications. Although most student-athletes choose not to enroll in university rather than dropping out of high school, societal neglect and discrimination leave those who do not pursue higher education struggling for recognition as full members of society (106, 141, 142, 186, 187).

Therefore, while financial concerns are a factor, the primary reasons for dropping out or not enrolling in university lie in the structural issues of Korea’s sports education system and the societal disadvantages faced by those without higher education (106, 147, 148).

In Korea, unless athletes are signed by professional teams, they must attend college to continue competing in sports. However, prestigious universities only admit top-tier athletes, leaving those with weaker sports records unable to continue their athletic careers. Student-athletes with lower athletic performance can still enroll in local colleges or junior colleges struggling with student recruitment, as these institutions often accept athletes without requiring the sports specialist admission system or entrance exam (149, 150).

However, for student-athletes with poor athletic ability aiming for a prestigious university, financially motivated admissions irregularities have been reported. A newspaper article reported that such under-the-table admissions require payments ranging from three to six times the annual salary of a typical office worker (151). Even these limited opportunities are available only to a select few.

³In Korea, when a student drops out of high school, their GPA, a key factor in college admissions, is erased. University admissions are divided into early and regular processes: early admission prioritizes GPA with a minimum KSAT requirement, while regular admission relies more on KSAT scores. Student-athletes often neglect academics, making both routes difficult. Early admission excludes them due to low GPAs, and regular admission penalizes weak academic performance. To overcome this, some quit sports and drop out to reset their GPA. Once their GPA is erased, it can be replaced by a recalculated KSAT score. This allows them to reapply under better conditions. This makes dropping out a strategic move for entering prestigious universities.

I was completely at a loss. I would wake up early to get ready to go to my morning group training, but I felt an overwhelming emptiness on the first day after withdrawing from sports... (sentence omitted) I broke down in tears, feeling so small. I couldn't bring myself to face my parents in the room adjacent to mine, so I stayed in my room all day without eating. (Seong, 24, male/baseball)

Dropping out of high school or skipping university puts student-athletes and their families at risk of socioeconomic marginalization. During family gatherings, parents often feel a deep sense of shame and try to avoid discussing their child's future, while also struggling to respond when acquaintances inquire about their children's current pursuits (97, 98). This is because, in Korean society, the parents' sacrifices and their child's achievements are deeply interconnected, reinforcing extreme filial expectations.

Student-athletes often hesitate to express their wish to quit sports due to family expectations. Many delay action until external factors force them to change course. The structural reliance on parental support in elite sports further complicates this decision-making process (3, 21).

Meanwhile, a case in which a Korean athlete's father committed suicide in 2013 regarding a Taekwondo referee corruption was treated as an example of unfairness and unethical issues in the sports community (18), and it is also an example of frustration wherein the dedicated efforts and support from athlete's parents came to no avail due to referee corruption.

This illustrates a case in which factors other than a player's athletic ability were involved in the sports community, and it is also a case where bribes were paid by the parents or coaches of the opposing team. This is illustrative of why student athletes have no choice but to depend on their parents, a phenomenon that is also an example of student athletes and their parents becoming entangled in the culture of extreme filial piety.

Furthermore, parents' interest in the elite athletes' participation in sports is significant, as exemplified by soccer players Park Jisung and Son Heungmin, and golfer Park Seri's fathers and figure skater Kim Yuna's mother. The process of extreme dedication from such star athletes' parents often becomes intense and demanding. Parents' intense sacrifices to help their children enter good colleges or find better jobs often make student-athletes feel obligated to succeed. This success is seen as a form of repayment for parental dedication.

For the parents of athletes, the success of their children is no different from their own success. To them, it's also a way for the child to give back. That's A form of filial piety, isn't it? Parents stake everything for their children's success, and that caused anxiety disorder in the case of OOO. I kept thinking, "If my parents sacrificed this much, then I have to succeed just as much". That pressure was too much for me. I couldn't handle it anymore. so I ended up dropping out of school... (Yang, 36, male/tennis coach)

I felt deeply apologetic to my mother about going to university. She had a hard time. She even took on the role of general manager at the team parents' association because she was worried, I might feel discouraged for not being good enough. That was the hardest part. By the time I reached high school, I realized that my parents had to pay a lot of money for me to attend university. You come to understand this once you're in high school. In particular, it's difficult to enroll in prestigious universities in popular sports like mine. I could sense my parents' concerns. So, I was the one who first brought up the idea of dropping out. I told them I would quit sports and leave school... (Seong, 24, male/baseball)

Most of the study participants who responded to the interview felt apologetic toward their parents. This feeling may have arisen due to the excessively competitive environment of Korean sports along with the parents' purpose of supporting children. There is an underlying mentality of prioritising winning and ranking first, which may be noted as one of the most representative issues in the Korean sports community. Amid fierce competition, it has been demonstrated that the parents' commitment mentally pressures student athletes to "repay" them. Further, the causes of conflict appear not owing simply to the parents' expectations and greed but also to their sense of responsibility for guiding their children in the right way (152).

3.2 Tie-in sale: coerced compliance and its psychological consequences

A tie-in sale means bundling poor-quality items with desirable ones. It is used to get rid of low-demand products by attaching them to popular ones (153). Such tie-in sales have been employed by parents and coaches as a means to manipulate the career trajectories of student athletes (124, 154–156).

Sports specialist selection in Korean universities involves a structure wherein a university's main coach makes the first recommendation for players who meet the conditions and then makes a final decision through the selection committee (149). As selection committee members often lack specialized knowledge about the university's player requirements or the status of recruited athletes, the coach's initial recommendation holds decisive influence over college admissions (124, 149). In addition, when Korean high school players enter college, it is customary that they go through the high school and college coaches as intermediaries (41, 149). The high school coach arranges for the college to accept not only star player A, but also lower-skilled players B and C from the same school. Now the parents of players B and C must hold up their end of the deal and pay player A and the university manager, etc., instead of the university, in the name of player A's scouting expenses (157–159).

Although such practices are clearly prohibited under Korean law—specifically the Act on the Aggravated Punishment, etc. of Specific Crimes (160)—the tie-in sale strategy continues to exist.

It is sustained through under-the-table payments made by parents of less-skilled athletes to university officials, high school coaches, or even top athletes' parents (41, 124, 149).

This practice allows student-athletes with lower athletic performance—who do not meet the criteria for sports specialist admissions or regular university entrance—to gain admission through corrupt recruitment.

In summary, these outcomes—exemplified by tie-in sales—arise when parental will be decisively imposed and student-athletes, by acquiescing to such practices, inadvertently perpetuate a corrupt recruitment system.

It used to be somewhat common. In particular, OOO had talents far too great for K University, making it feel like a waste. As far as I know, OOO told his/her parents in advance that he/she would enroll in K University on the condition that his/her younger sibling would also be admitted to K University. Whether this was a sacrifice is debatable, the costs of raising him/her were offset by helping a younger sibling. (Yang, 36, male/tennis coach)

Considering the money my parents spent, the coach had no right to say anything. Large bribes were given, team dinners were paid for, and even after I graduated, I still covered team dinner expenses. Despite that, they asked me for money if I wanted to go with OOO, one of the key players, to T University. I said I wouldn't go because the whole situation felt corrupt. But things don't work out that way—somehow, my parents managed to gather the money to pay (sentence omitted) I feel deeply apologetic toward my parents. (Han 29, female/tennis)

For me, I've seen kids who got into university that way and then moved on to business teams the same way, coerced by coaches into attending mid-tier universities because they were blocked from enrolling in higher-ranking ones. It's ridiculous. I clearly told the manager I didn't want to join that team, but the contract had already been signed. I was so angry that I argued, but they said my parents did it. My father had signed the contract. What more could I say? I still don't like it. I'll transfer to another business team as soon as my contract expires. (Lee, 25, male/wrestling).

My parents decided which university I would attend. The coach asked me in advance, but in the end, I couldn't go to the university I wanted. My parents were consulted, and my father made the final decision ... (Yoon, 24, male/basketball).

As shown in the interviews, student-athletes have little control over decisions about their own careers (97, 98, 149, 161). Of course, devoted parents may discover their children's talents in adolescence and build follow-up plans out of the resulting hope (162, 163). Ultimately, student athletes who never practiced 'self-determination' in their adolescence end up leaving decisions regarding future careers entirely to their parents (163–165).

I felt both deeply apologetic and grateful that my parents gave up and sacrificed a lot for me. However, I also felt a lot of pressure. I thought I had to succeed, but that's not easy. Whenever I performed poorly in a game, I felt completely devastated and dreaded going home. I didn't know what I would do if I didn't become a professional athlete, especially after they invested everything in me. (Jeong, 27, male/soccer).

On days when I didn't get any base hits, the atmosphere in my house felt as if someone had passed away. It was unbearable. I didn't even want to go home. It was even worse in my senior year of high school. My chances of being recruited by a university or a professional team were all tied to that one moment. (Park, 28, male/baseball)

As seen in the study participant's statement, when student-athletes meet parental expectations, their actions are perceived as fulfilling filial duty; however, failing to do so can lead to significant psychological distress, including lower self-esteem and familial conflict.

Previous studies suggest that excessive parental involvement fosters a strong emphasis on education (56), an instrumental approach to achievement (58), and a deep identification with parental roles (59). However, the direct subjects of tie-in sales due to parental involvement suffer considerable stress and low self-esteem.

Honestly, I had wanted to quit sports for a long time because I'm not confident in those terms. One mistake, and I knew without a doubt that I would face verbal abuse from the coach. I hated everything about it and wanted to walk away, but I couldn't say it when I thought about my parents who had worked hard, taking care of me. For four years, I wrestled with this decision and brought it up a few times. But my parents always asked me, "What will you do if you drop out of university?" They told me there was nothing else for me and urged me to stick with it. I couldn't quit. I felt trapped—like if I quit, I would become nothing. (Kim, 23, male/soccer)

In Korean society, where the mere admission into a university located in the country's capital Seoul is a source of pride, the fact that someone could not enroll in a university, or had to enroll in a less prestigious university, is perceived as "unfilial" on the child's part and as a "failure" on the parents' part or in turn "unfilial" to the students' grandparents (71, 149). This uniquely Korean phenomenon arises from intense parental devotion. Parents often invest everything into their children's success. As a result, children feel obligated to "repay" them—often at the expense of their own self-esteem.

3.3 Running away from home: a silent clamour against an inescapable reality

Student athletes who responded to interviews could not easily answer the question about what they wanted to be other than athletes. The reasons may be that they were often unaware of what they could do and were ignorant about vocational options. As mentioned above, career paths for student athletes are often determined by their parents (124, 139, 140, 149, 154–156, 166), and once they start playing sports, because they also give up their academic studies, they have no choice but to proactively and actively cling to sports. Thus, there may be fears that student athletes will become social failures if they give up on sports without becoming professional players (30, 123, 125, 126, 128).

Furthermore, they are trapped in situations where they cannot easily give up sports even if they want to, due to other's expectations, parents' sacrifices, and coercion by coaches (30, 149, 167). As a result, some student-athletes run away from home—at least temporarily—to escape their hopeless situations (74).

This outcome—running away from home—results from an uncompromising standoff between parents and student-athletes, often leaving young athletes feeling trapped with no alternative but to escape. But running away rarely solves the problem. Most athletes return home with guilt and uncertainty about what comes next.

At the time, I didn't fully understand my own feelings, but looking back now, I realize I wanted to temporarily escape from reality. My coach and seniors beat me every day, and my parents expected too much from me, so I was under significant pressure, and I knew I wasn't talented enough to become a professional athlete. Since I couldn't say that I would quit, I think things kept building up in my heart. Then, I ran away from home one morning, saying I was headed to training. (An, 28, female/basketball)

Considering how much money my parents had invested in my training, I knew I shouldn't have done that. The coaches weren't teaching us anything, they just made us throw balls and hit them. I didn't run away because I didn't enjoy sports; I was frustrated—frustrated beyond words. I felt stuck, as if I belonged nowhere, and at that age, I couldn't stand the reality that even if I won a competition, I couldn't make it to the team competition because of athletes who are not as talented as I am but who coaches support because of bribes or same-school ties. (Han, 29, female/tennis)

I ran away to the countryside, but after a week, I ran out of money and had nothing to do, so I returned home on my own. Still, I wanted to express it even if it was in that way. I wanted to quit, but my parents were expecting too much of me, and I felt like I was going crazy. (Park, 28, male/baseball).

In fact, when student athletes try to run away from home, they are mostly aware of its not being a solution. The longer they stay away, the more guilty they feel for failing to repay their parents' sacrifices, and the more frustration builds upon return. However, the study participants had in common a desperation and a need to escape from their situation by any means. Of course, the primary reason for being cornered in such a desolate situation is not the poor performance of the athlete but the university entrance structure, wherein 99% of student athletes cannot help but fall into such a hopeless (30, 113, 149). Furthermore, preconceptions regarding student athletes cannot be dismissed as a matter of athletes' responsibility alone.

Beyond familial conflicts, the rigid university entrance structure and societal expectations further exacerbate these issues, making it nearly impossible for student athletes to consider alternative career paths (42, 106, 130, 138, 141, 142, 186, 187). The belief that athletes must focus only on sports, along with weak career support, traps them in a narrow path with few alternatives.

I really hated it. I couldn't even bear to glance at a soccer ball, and I didn't want to go home. When I saw my parents, every time I saw my parents, I felt overwhelmed with guilt for failing as an athlete. But instead of expressing that guilt, I lashed out and said hurtful things... I did manage to tell them once that I wanted to quit, but when I saw my mother break down in tears, I couldn't bring myself to bring it up again. (Seong, 24, male/baseball)

In many countries abroad, systems exist that enable student-athletes to balance sports, exercise, and academics simultaneously (168, 169), but in Korea, only the law, School Sports Promotion Act (170), stipulates the continuation of their studies, and there is a prevailing societal expectation that student-athletes should focus exclusively on sports, often at the expense of their academic development (3, 40–42).

In other countries, there are athletes who excel academically while also competing at the national level. It is difficult to understand why Korea cannot adopt a similar system. If I had been born in a different country, my situation would undoubtedly have been completely different. (Kang, 22, female/tennis)

Running away can be seen as a form of non-verbal resistance. It reflects deep emotional distress and a desire to break away from oppressive circumstances. Therefore, in order to eliminate the negative influence of this extreme filial piety culture, while changing the perceptions of student athletes and parents is the top priority (42, 166), there is also a need to change the mindset of equating wealth and honour with success. This also applies to the hierarchical structure of high school graduation < junior colleges < local universities < metropolitan universities (42, 97, 98) that promotes unfair perceptions in society.

Through the interviews in this study, the common perception of success among student athletes can be summarized as the

pursuit of money and fame. Achieving success as an athlete in Korea and globally is an extremely rare event, with only a small percentage of individuals reaching the top while the majority do not.

One does not necessarily have to make high earnings and become famous in order to succeed. This deeply ingrained belief in equating success with fame and wealth stems from past generations' experiences, where financial security was the only measure of success (42, 83, 96–98). The economic hardships that many parents faced in their youth have led them to prioritize stability and prestige over personal fulfillment (171, 183). However, as societal values evolve, redefining success to include personal fulfillment and happiness becomes crucial. Demonstrating to one's parents that living humbly, raising a family, and being happy can also be seen as success shows a shift in the perception of filial piety culture in Korea (172). This redefinition of success is also significant in the context of sports parenting. In Korean society, many parents have traditionally equated the success of their children who are athletes with fame and financial achievement (83, 101, 173). However, encouraging student-athletes to explore their aptitudes, interests, and diverse career opportunities beyond their athletic performance reflects a broader shift toward a more sustainable and fulfilling concept of success (161, 173, 174).

4 International and cross-cultural implications

Our findings on extreme filial pressure among Korean student-athletes reflect similar dynamics in other Confucian societies—such as China, Taiwan, Singapore, Hong Kong, and Japan—where family honour often overrides individual choice (175, 176). In these contexts, academic or athletic success is viewed as repayment of parental sacrifice, and authoritarian expectations can undermine youth autonomy (63). To mitigate these pressures, policymakers should implement dual-career frameworks—like the EU's flexible-curriculum and credit recognition models—that allow athletes to continue their education alongside intensive training (133, 177, 178). Simultaneously, parent-education programs grounded in research on autonomy-supportive vs. controlling parenting (179, 180) can teach caregivers to praise effort, provide structure, and encourage decision-making rather than impose undue pressure.

Ultimately, culturally sensitive approaches are needed to balance family values with youth autonomy. For example, guidance and education programs could help students develop communication and negotiation skills, allowing them to honor parental expectations while still pursuing their own goals. In doing so, practitioners might draw on Bedford and Yeh's (181) dual filial piety model, which emphasizes the value of gratitude and mutual care over authoritarian obligation. These strategies can help families uphold traditional values while empowering young athletes to thrive both emotionally and independently.

5 Conclusions

This study examined how extreme filial piety culture affects student-athletes in Korean school sports departments and the consequent career strategies of student-athletes and their parents. To achieve this, in-depth interviews were conducted with nine primary study participants and one auxiliary participant. Based on the collected data, the following key conclusions were drawn.

First, student-athletes often withdraw from sports or forgo university enrollment due to financial constraints and the pressure to alleviate their parents' burdens. This “Athlete Melt” phenomenon shows how students see their careers as obligations—not choices—due to structural problems in Korea's sports system.

Second, the expectation of securing a prestigious university placement through athletic performance remains a dominant factor shaping student-athletes' career trajectories. However, this process often involves non-transparent recruitment practices, such as “tie-in sales”, where student-athletes comply with career paths dictated by external pressures, leading to long-term psychological distress and reduced self-esteem.

Third, the decision to continue or withdraw from sports is often hindered by feelings of guilt and indebtedness toward parents. Many student-athletes hesitate to pursue alternative career paths, fearing they may fail to meet societal and familial expectations. As a result, some resort to drastic decisions such as running away from home or persisting in an unsustainable athletic career until reaching a dead end.

These findings show that extreme filial piety in Korea strongly shapes how student-athletes make career decisions. The perceived necessity to reciprocate parental sacrifices through athletic success contributes to structural barriers, limiting students' autonomy in career selection. Furthermore, the lack of institutional support for dual-career pathways exacerbates the challenges faced by student-athletes navigating between academics and sports.

6 Recommendations

Future studies should aim to prevent dropout and the “Athlete Melt” phenomenon by reorganizing policies to create an environment that empowers student-athletes to make autonomous career decisions. Establishing comprehensive support systems to guide both post-athletic career development and the fostering of dual careers is essential. Practically, this involves offering flexible class schedules, vocational training, and career counseling so athletes can balance school and sports. Moreover, reducing the undue influence of high school and college coaches on recruitment and career transitions is critical. In Korean sports, coaches often serve as intermediaries between players, their parents, and higher education or professional institutions, which can lead to non-transparent practices such as tie-in sales. Shifting the control of recruitment and contractual matters directly to institutions or designated representatives may help prevent these practices. Long-term research should support a social system where studying is seen as normal for athletes and dual

careers are encouraged. Finally, altering entrenched perceptions about the supremacy of athletic victory, rigid university hierarchies, and extreme filial piety through targeted media initiatives is vital for fostering a balanced model of familial responsibility.

Data availability statement

The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by the Ethics Committee of Korea Institute of Sport Science (protocol code KISS-22038-2303-03). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

SY: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Validation, Writing – original draft, Writing – review & editing. SL: Conceptualization, Data curation, Funding acquisition, Investigation, Project administration, Resources, Supervision, Visualization, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The author(s) declare that no Generative AI was used in the creation of this manuscript.

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Mental health literacy and psychological outcomes in dual-career athletes

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Introduction: Dual-career athletes experience the unique challenges of balancing sporting, academic, and vocational pursuits, which can strain their well-being and increase psychological distress. This study examined the mental health of Slovenian dual-career athletes, including the prevalence of anxiety, depression, and overall well-being, as well as their mental health literacy and its potential relationship with psychological distress and well-being.

Methods: 219 Slovenian dual-career athletes (58% female; age 15–29) completed self-report measures of anxiety (GAD-7), depression (PHQ-9), and mental well-being (WHO-5), alongside the Slovenian version of the Mental Health Literacy Scale (S-MHLS). Point and lifetime prevalence of mental health problems were assessed. Multiple regression analyses were employed to examine group differences and predictors of mental health outcomes.

Results: Moderate to severe symptoms of anxiety and depression were reported by 22% and 23% of athletes, respectively, while 43% scored below the threshold for positive mental well-being. Female athletes reported significantly poorer mental health across all indicators. Regression analyses showed that greater knowledge about where and how to seek mental health information predicted lower levels of anxiety and depression and higher well-being. In contrast, more stigmatizing attitudes were linked to higher psychological distress.

Discussion: These findings suggest that improving athletes' mental health literacy could help protect their well-being in the dual-career context. Tailored strategies to promote help-seeking and reduce stigma, while considering gender and the demands of dual careers, may be crucial for enhancing young athletes' psychological well-being and creating more supportive environments.

KEYWORDS

dual-career athletes, anxiety, depression, mental well-being, mental health literacy

1 Introduction

The concept of a dual career refers to athletes pursuing both sports and academic or professional development simultaneously (1). In such a dual career, an athlete's development represents a series of interconnected transitions across multiple domains—athletic, psychological, psychosocial, academic, vocational, and financial as he/she progresses through different athletic career stages (2). These transitions occur simultaneously and influence each other, shaping the athlete's performance and overall well-being. Within this dual career perspective, the athlete is viewed as a whole person with a multidimensional development spanning both athletic and non-athletic domains, providing a comprehensive understanding of the multiple factors influencing their mental health throughout their career and beyond.

A dual career can offer numerous benefits, such as positive identity development, intellectual stimulation, improved life balance, financial security, and career preparation beyond sports (3). However, balancing elite sports with academic development can represent a challenging path that entails additional barriers and demands, such as high expectations in both domains, inadequate recovery, and lack of time, support, or flexibility (3). Athletes may simultaneously struggle with sport-related stress [e.g., performance slumps, injuries, competition pressure, selection dilemmas; (4)], relationship tensions (5), academic pressures [e.g., exams and deadlines; (6)], and financial strain (7). Struggling to manage these pressures can lead to psychological distress, reduced well-being, and even early dropout from sport or education (8).

In the past decade, dual-career athletes' mental health has emerged as a crucial factor for optimal athletic and academic career development (9). Researchers, practitioners, and policymakers emphasize mental health as a key factor for a successful dual career (10). They also highlight the responsibility of dual career organizations and support providers in protecting and enhancing student-athletes' mental health (11). While mental health has traditionally been defined by the absence of mental illness, recent frameworks, such as Keyes' (12) dual-continuum model, emphasize that mental well-being and mental illness exist on separate but related continuums. This means that an athlete can experience psychological distress (e.g., anxiety, depression) while still maintaining aspects of positive mental health (13). Conversely, an athlete who does not meet clinical diagnostic criteria for mental illness may still struggle with low levels of well-being, motivation, and life satisfaction (14). A mental health continuum approach appreciates that mental health is not a discreet, fixed state of mind, mood, or behaviour, but it is an ever-evolving state of being (15). Positive mental health is commonly conceptualized through indicators of subjective well-being, including emotional vitality, life satisfaction, and positive psychological functioning. A widely used measure of these constructs is the WHO-5 Well-Being Index, which captures the frequency of positive mood states—such as feeling relaxed, energetic, and in good spirits—over the past two weeks (16). In the present study, positive mental health was operationalized using this instrument, offering a complementary perspective to symptom-based assessments of psychological distress, such as anxiety and depression.

While a dual career is believed to help balance the stressors of competitive sport and enhance student-athlete well-being (6), it can also place significant strain on their mental health. Both elite athletes (17) and non-athlete students (18) are at risk for mental health issues, with some suggesting that the dual demands of sport and academics put student-athletes at an even higher risk (19). Research shows that athletes experience a wide range of subclinical and clinical mental health symptoms and disorders (20). Nearly half of dual career athletes experience symptoms of at least one mental health disorder during their careers (21), with prevalence rates for common disorders ranging from 19% to 34% over periods of 4 weeks to 12 months (17). Athletes have been found to experience a wide range of disorders including

depression, anxiety, substance abuse, and eating disorders (22). For depression, the point prevalence among athletes varies, with estimates ranging from under 10% (23) to as high as 30%–34% (22, 24). Generalized anxiety disorder prevalence among athletes ranges from 6% for clinically confirmed cases to 14.6% for elevated self-reported symptoms (20). It is important to note that most studies comparing student-athletes to the general youth population find that student-athletes report similar or even lower prevalence of mental health symptoms overall [for a review, see (25)]. Mental health statistics for student-athletes may nevertheless be underestimated, possibly due to their low tendency to seek help (26).

While these mental health challenges affect many dual-career athletes, they do not do so uniformly. Gender differences in mental health symptoms among athletes have been consistently documented across both elite and youth sport populations. Recent meta-analytic evidence shows that female athletes are significantly more likely to report symptoms of anxiety, depression, psychological distress, and disordered eating compared to their male counterparts, who in turn report higher rates of alcohol misuse, substance abuse, and gambling problems (27). Similarly, Saarinen et al. (25), in a comprehensive scoping review of adolescent student-athletes in European sport school contexts, found that although student-athletes may demonstrate lower overall rates of mental illness than the general youth population, female athletes consistently reported higher levels of psychological distress. These patterns have been linked to both biological factors and social mechanisms, including gendered expectations, unequal support structures, and the pressures of pursuing academic and athletic excellence simultaneously (28, 29). Given these disparities, there is growing consensus that gender-sensitive mental health strategies are needed to effectively support the well-being of female student-athletes within dual-career environments.

In athletes, most mental health disorders emerge during adolescence and early adulthood, with the first onset in elite athletes typically occurring around age 19 (21). Symptoms often intensify as the demands of competitive sport increase, particularly during peak performance years (15). Adolescence is a critical period for mental health, as rapid biological, psychological, and social changes increase vulnerability to anxiety, depression, and other mental health disorders (30). Emerging adulthood brings new challenges, including greater independence, academic or career transitions, and financial responsibilities, all of which can contribute to stress and mental health difficulties (31). These two stages of development typically coincides with the peak competitive years for elite athletes (32). In addition to these general developmental challenges, major athletic career transitions, such as the transition from junior to senior levels, cultural adjustments, major competitions, and retirement, pose significant mental health risks. The junior-to-senior transition exposes athletes to increased demands in training, competition, organization, and lifestyle, often coinciding with higher education enrollment (15).

In Slovenia, the dual-career system is shaped by a combination of national legislation and institutional autonomy. During primary

education (ages 6 to 14), talented young athletes may already begin training seriously, and schools can offer some basic accommodations, such as schedule adjustments or support for competition absences. These adjustments become more formalized during secondary education (ages 15 to 19), where many student-athletes attend specialized sport schools that provide structured support, including flexible timetables, modified workloads, and coordinated academic planning. These measures are intended to help athletes balance their academic and athletic responsibilities more effectively. However, such support is less consistent beyond the secondary level. In higher education (typically age 19+), universities operate autonomously under the Higher Education Act and determine their own academic calendars and study regimes. Consequently, elite athletes at this stage often rely on informal arrangements or must negotiate academic flexibility individually, often with the support of sports associations or coaches (33). This variability in institutional support across educational stages may influence how athletes experience stress, manage their responsibilities, and access help—factors that are closely tied to mental health and mental health literacy. The Slovenian context, therefore, provides a meaningful backdrop for exploring how MHL relates to psychological outcomes across different phases of the dual-career pathway. Mental health literacy (MHL) refers to the knowledge and attitudes that aid in recognition, management and prevention of mental health issues (34). With the increased interest in athletes' mental health, MHL also became an important topic, especially since research suggests that MHL contributes to positive mental health within the dual career environment (35).

MHL emerged from research on health literacy, which demonstrated a link between low functional literacy and negative health outcomes (36). Health literacy refers to an individual's ability to access, evaluate, and apply health information to make informed decisions about their well-being and healthcare (37). MHL is recognized as a subset of health literacy (34), broadening the scope of health knowledge to include both physical conditions and mental health diagnoses (36). Expanding on the concept of health literacy, Kutcher et al. (34) outlined four key components of MHL: (a) knowledge of mental health management; (b) knowledge of the different types of mental health disorders and treatments; (c) ability and action to decrease mental health stigma; and (d) appropriate help-seeking behaviours, which involves knowing when and where to seek professional care and enhancing self-care practices.

At an individual level, having adequate MHL is associated with better health outcomes, such as suicide prevention (38). In the general student population, lower MHL has been linked to reduced help-seeking behaviours, as students with limited knowledge struggle to recognize clinical symptoms and are uncertain about where to seek professional support (39). Research on athletes' MHL is limited, but existing studies indicate that sufficient levels of MHL in athletes contribute to better recognition and interpretation of behaviour concerning overall well-being (40). Mental health literacy therefore appears to be a critical factor in the well-being of athletes. In dual

careers, in which athletes face numerous pressures in multiple domains of their development, MHL can play a crucial role in helping athletes recognize distress, seek appropriate support, and manage mental health proactively (40).

In recent years, several MHL interventions have been developed to support athletes' psychological well-being by reducing stigma and improving help-seeking knowledge. Programs such as Help Out a Mate (41), Ahead of the Game (AOTG) (42, 43) and Team Talk (44) have demonstrated that sport-based, developmentally tailored interventions can enhance athletes' mental health knowledge, increase help-seeking intentions, and build resilience through psychoeducation and team-based discussions. Systematic reviews indicate that these programs are especially effective in reducing stigma and improving mental health literacy outcomes (45–47). However, despite growing recognition of their importance, MHL programs are still not systematically embedded in the curricula of most sports schools. For older athletes, structured MHL training remains scarce, although some elite sport systems have begun integrating athlete welfare or mental health support modules into high-performance programs. Despite promising evidence for existing MHL programs, their applicability across different stages of athletic development remains underexplored. The present study includes both adolescent/pre-elite and elite-level dual-career athletes. While these groups share overlapping dual-career pressures, such as balancing academic demands with training and competition, they may face distinct psychological and contextual challenges. Elite athletes often experience heightened performance expectations, international travel, and public scrutiny, whereas pre-elite athletes more frequently encounter uncertainty regarding future sport careers, transitions between competitive levels, and identity development. By including both groups, this study seeks to capture a more comprehensive picture of how mental health literacy relates to psychological outcomes across the dual-career pathway.

Given the increasing recognition of mental health as a critical component of dual-career athletes' well-being, this study aims to explore the relationship between mental health literacy (MHL) and key mental health indicators, including anxiety, depression, and mental well-being, in dual-career athletes. While previous research has established that dual career athletes face unique psychological challenges due to the dual demands of sport and education and/or vocation, little is known about the relationship between MHL and different mental health aspects. By investigating the interplay between MHL and mental health symptoms, this study seeks to identify whether greater MHL serves as a protective factor in managing psychological distress and promoting well-being among dual-career athletes.

Specifically, this study has three main objectives: (1) to evaluate the prevalence and severity of anxiety, depression, and overall mental well-being within Slovenian dual-career athletes; (2) to assess the levels of their MHL, examining potential differences based on gender and developmental stage (adolescence vs. emerging adulthood); and (3) to investigate the predictive role of MHL in mental health outcomes, determining whether higher MHL is associated with lower levels of anxiety and depression and greater mental well-being.

2 Methods

2.1 Participants

The sample consisted of 219 Slovenian dual-career athletes, including 127 females (58%) and 92 males (42%). The mean age of the participants was 17.7 years ($SD = 3.26$), with an age range of 15 to 29 years. Most athletes (90.4%) combined their sporting careers with education, while a smaller proportion (9.6%) had both education and work alongside their sporting commitments. Regarding their educational level, younger athletes (aged 15 to 19) were predominantly enrolled in upper secondary schools with student-athlete programs (e.g., sports departments of gymnasiums), whereas older athletes attended higher education institutions. In terms of competition level, most athletes took part in international competitions (51.6%), followed by national competitions (42.5%). A smaller percentage took part in Olympic or Paralympic events (3.2%) or competed at regional level (2.7%). Based on competition level, the sample included both adolescent/pre-elite athletes (those competing primarily at national or youth international levels) and elite-level athletes (those competing at senior international, Olympic, or Paralympic levels).

In terms of sports disciplines, 47.9% of athletes competed mainly in individual sports, while 44.3% competed in team sports. In addition, there was a subgroup of athletes who practiced both sports: 4.1% primarily focused on individual sports but occasionally participated in team competitions, and 3.7% primarily practiced team sports and occasionally participated in individual competitions. In total, the sample comprised 42 different sports, with the eight most common disciplines accounting for 69.7% of the sample. These included football, athletics, basketball, volleyball, swimming, judo, tennis and handball.

2.2 Measures

The **Generalized Anxiety Disorder Assessment-7** [GAD-7; (48)] is a 7-item screening tool developed to assess the severity of generalized anxiety disorder. For each item, athletes were asked to rate the severity of their symptoms over the past two weeks (e.g., “Feeling nervous, anxious, or on edge”) using a 4-point Likert scale, ranging from 0 (not at all) to 3 (nearly every day). The total score was calculated by adding up the answers to all seven items, resulting in a possible range of 0 to 21. Higher scores indicate a higher level of generalized anxiety. Cut-off values for clinical severity levels are as follows: $5 \geq$ mild, $10 \geq$ moderate, $15 \geq$ severe. The original version of the GAD-7 has demonstrated strong validity and reliability (Spitzer et al., 2006), as has its Slovenian adaptation on a sample of students [see (49)]. In our sample, a Cronbach’s alpha of 0.92 was determined.

The **Patient Health Questionnaire-9** [PHQ-9; (50)] is a self-report measure consisting of nine items designed to assess the severity of depression in the general population. Athletes rated

the severity of their symptoms over the past two weeks (e.g., “Feeling down, depressed, or hopeless”) using a 4-point Likert scale, ranging from 0 (not at all) to 3 (nearly every day). The total score is calculated by summing the responses to all nine items, resulting in a possible range from 0 to 27, with higher scores indicating greater levels of depression. Cut-off values for clinical severity levels are as follows: $0-4$ none-minimal, $5 \geq$ mild, $10 \geq$ moderate, $15 \geq$ moderate/severe, $20 \geq$ severe. The PHQ-9 has been used in the Slovenian healthcare population and has demonstrated high internal reliability [see (51)]. In our sample of dual-career athletes, a confirmatory factor analysis (CFA) was performed using MLR estimator (skewness: 0.28 to 2.06; $Q1 = 0.43$, $Q3 = 1.16$; kurtosis: -1.19 to 3.47 ; $Q1 = -0.90$, $Q3 = 0.69$) to test the one-factor model. The PHQ-9 proved to be a valid measure: RMSEA = 0.05; CFI = 0.98; TLI = 0.97; SRMR = 0.03. The standardized factor loadings ranged from 0.63 to 0.78. Additionally, Cronbach’s alpha was 0.89.

The **Well-Being Index** [WHO-5; full version available in (16)] is a self-report tool designed to measure mental well-being. Athletes rated each of the five positively worded items (e.g., “I woke up feeling fresh and rested”) on a 6-point Likert scale, ranging from 0 (at no time) to 5 (all the time). The total raw score is obtained by summing the ratings for all five items, resulting in a score range from 0 to 25. Higher scores indicate better mental well-being. Although the raw score can be converted to a percentage score by multiplying by 4 (16), our study utilized the raw score. The original scale has proven to be valid and reliable measure (16). Furthermore, the Slovenian version of the WHO-5 has been shown to be psychometrically sound in a sample of students [see (52)]. In our sample, a Cronbach’s alpha of 0.88 was determined.

The point and lifetime prevalence of mental health problems was assessed using two dichotomous (yes/no) questions, following the approach of previous studies [e.g., (21)]. To assess current mental health problems, participants were asked, “Are you experiencing psychological suffering right now (daily for at least the last two weeks) so severe that you have obvious difficulties functioning as usual in everyday life and/or in sports?” To determine lifetime prevalence, they responded to the question, “Have you ever experienced psychological suffering (daily for at least two weeks) so severe that you had significant difficulties functioning as usual in everyday life and/or in sports?” If participants responded “yes” to the lifetime prevalence question, they were also asked to indicate the age of onset and the number of previous episodes (1, 2 or more than 2).

The **Mental Health Literacy Scale** [MHLS; (53)] assesses various aspects of mental health literacy. In contrast to the original unidimensional scale, which consists of 35 items, the Slovenian version of the MHLS (S-MHLS) (54) comprises 27 items, which are divided into four theoretically and psychometrically valid factors. Different response formats are used for these factors: (1) Attitudes towards people with mental health problems (e.g., “How willing would you be to move next door to someone with a mental illness?”; response scale: 1—definitely unwilling, 5—definitely willing; 7 items); (2) General attitude towards mental health problems and help-seeking (e.g.,

“Mental illness is not a real medical illness”; response scale: 1—strongly disagree, 5—strongly agree; 8 items); (3) Recognition of mental disorders (i.e., identifying descriptions of mental disorders, such as generalized anxiety disorder, major depressive disorder, and agoraphobia; response scale: 1—very unlikely, 4—very likely; 8 items); (4) Knowledge about seeking mental health information (e.g., “I am confident that I know where to seek information about mental illness”; response scale: 1—strongly disagree, 5—strongly agree; 4 items). The total score for each factor is calculated as the average response. A Slovenian validation study showed reliable internal consistency for all factors, although the factor Knowledge of seeking mental health information showed the lowest reliability [$\alpha = .59$; (54)]. In the current study, Cronbach’s alpha values for the four factors were as follows: Attitude toward people with mental health problems (.86), General attitude toward mental health problems and help-seeking (.82), Recognizing mental disorders (.70), Knowledge of seeking mental health information (.50).

2.3 Procedure

The study was approved by the Research Ethics Committee of the University of Maribor (approval no. 038-08-143/2023/9/FFUM). Prior to data collection, a pilot study was conducted to test the comprehensibility of the questionnaires among the athletes. The final questionnaires were distributed using 1KA, an open-source online survey platform. Data collection took place over a three-month period, starting in May 2024, using a multi-channel recruitment approach. Secondary schools with student-athlete programs were contacted, and the National Olympic Committee supported recruitment efforts by sending email invitations to registered dual-career athletes. Eligibility was based on active secondary school enrolment and participation in competitive sports at the regional, national or international level. For underage participants (<18 years), only those with prior parental or guardian consent were included in the study. Participants were given access to the study via a unique link and provided their electronic consent before proceeding. They first read a brief introduction explaining the purpose of the study, the voluntary nature of participation, and the assurance of data confidentiality. By clicking to proceed to the next page, they declared that they were informed about the nature of the study and agreed to the terms of participation. A gentle reminder function was provided to encourage completion of unfinished responses.

2.4 Data analyses

First, Mplus 8.0 (55) was used to conduct a confirmatory factor analysis (CFA) for the PHQ-9 measure, as it has not yet been validated in the Slovenian context. The following cut-off values indicated acceptable model fit (56): CFI and TLI ≥ 0.90 , RMSEA and SRMR ≤ 0.08 . Statistical analyses were conducted using IBM SPSS Statistics (version 29.0). Descriptive statistics, Pearson’s

correlation analysis, and regression analyses were performed. Group differences in key variables were examined based on gender and developmental stage, with the latter classified according to contemporary frameworks: adolescence (<18 years) and emerging adulthood (18 to late twenties) (57). Independent-samples *t*-tests were employed to assess group differences, with effect sizes interpreted following Cohen’s *d* criteria (small: 0.20; medium: 0.50; large: ≥ 0.80) (58). To analyse point and lifetime prevalence of mental health problems (MHP) across gender and developmental stage, chi-square tests were conducted. Finally, a series of multiple regression analyses were conducted using the Enter method to investigate the predictive role of mental health literacy in anxiety, depression, and mental well-being. The explanatory power of each regression model was determined based on the following criteria: low ($R^2 < 0.13$), medium ($R^2 = 0.13\text{--}0.25$), and high ($R^2 > 0.26$) explanatory power (58).

3 Results

Table 1 presents descriptive statistics and group comparisons for anxiety, depression, and mental well-being among dual-career athletes, categorized by gender and developmental stage (adolescence: up to age 18; emerging adulthood/adulthood: ages 18 to late twenties or early thirties). Females reported significantly higher levels of anxiety and depression, as well as lower levels of mental well-being compared to males, with effect sizes ranging from small to medium (Cohen’s *d*). No significant differences were observed between adolescents and emerging adults regarding their average levels of anxiety, depression, and mental well-being. A notable proportion of athletes experienced symptoms of anxiety and depression to varying degrees. While many showed none-to-minimal or mild symptoms, over a third of the sample met the criteria for moderate (≥ 10) to severe symptoms for both anxiety and depression.

The results presented in Table 2 show that a notable proportion of dual-career athletes (16.4%) reported experiencing current mental health problems, while the majority (83.6%) did not report such difficulties. No significant differences were found between males and females or between adolescents and emerging adults in point prevalence of mental health problems. In contrast, the lifetime prevalence of mental health problems was higher, with a significantly higher proportion of females than males reporting previous experience of severe mental health problems. In addition, emerging adults were significantly more likely than adolescents to report a history of mental health problems.

The age of the first episode was determined only for athletes who reported mental health problems. On average, athletes reported experiencing their first episode in early adolescence, while emerging adults reported a slightly later onset compared to adolescents. In addition, more than half of the athletes experienced multiple episodes, and the distribution of recurrence patterns was relatively similar across both genders and developmental groups.

TABLE 1 Descriptive statistics and group comparisons for mental health aspects in dual-career athletes.

Variable	Total (<i>n</i> = 219)	Males (<i>n</i> = 92)	Females (<i>n</i> = 127)	Adolescents (<i>n</i> = 154)	Emerging Adults/ Adults (<i>n</i> = 65)	<i>t</i> (gender)	<i>p</i>	<i>d</i>
Anxiety (GAD-7)	8.08 (5.57)	6.43 (5.12)	9.28 (5.60)	8.15 (5.70)	7.92 (5.30)	3.84	<.001	.53
						<i>t</i> (DS)	<i>p</i>	<i>d</i>
% above cut-off					0.27	.784	.04	
10 ≥	21.5	12.0	28.3	23.4	16.9			
15 ≥	14.6	8.7	18.9	14.3	15.4			
Depression (PHQ-9)	8.43 (6.16)	6.96 (5.77)	9.50 (6.24)	8.41 (6.33)	8.48 (5.79)	3.07	.002	.42
						<i>t</i> (DS)	<i>p</i>	<i>d</i>
% above cut-off					−0.07	.941	−.01	
10 ≥	22.8	18.5	26.0	24.0	20.0			
15 ≥	8.7	6.5	10.2	7.8	10.8			
20 ≥	7.3	4.3	9.4	8.4	4.6			
Mental well-being (WHO-5)	13.11 (4.96)	14.46 (5.01)	12.13 (4.71)	13.20 (5.10)	12.89 (4.64)	−3.51	<.001	−.48
						<i>t</i> (DS)	<i>p</i>	<i>d</i>
% below cut-off					0.42	.675	.06	
≤13	43.4	33.7	50.4	39.6	52.3			

Note: DS, developmental stage. The series of independent samples *t*-tests were conducted at a significance level $p < .05$.

TABLE 2 Descriptive statistics and group comparisons for point and lifetime prevalence of mental health problems (MHP) in dual-career athletes.

Variable	Total (<i>n</i> = 219)	Males (<i>n</i> = 92)	Females (<i>n</i> = 127)	Adolescents (<i>n</i> = 154)	Emerging Adults/ Adults (<i>n</i> = 65)	χ^2 (gender)	<i>p</i>
Point prevalence of MHP (%)	16.4	14.1	18.1	17.5	13.8	0.62	.433
						χ^2 (DS)	<i>p</i>
						0.45	.501
Lifetime prevalence of MHP (%)	32.1	20.9	40.2	25.5	47.7	9.04	.033
						χ^2 (DS)	<i>p</i>
						10.32	.001
	<i>n</i> = 70	<i>n</i> = 19	<i>n</i> = 51	<i>n</i> = 39	<i>n</i> = 31		
Age of first episode (<i>M</i> , <i>SD</i>)	15.61 (3.66)	16.89 (4.07)	15.14 (3.42)	13.90 (2.08)	17.77 (4.09)		
Number of episodes (%)							
1 episode	25.7	26.3	25.5	25.6	25.8		
2 episodes	20.0	10.5	23.5	20.5	19.4		
More than 2 episodes	54.3	63.2	51.0	53.8	54.8		

Note: DS, developmental stage. The series of chi-square tests were conducted at a significance level $p < .05$.

We also examined the average level of mental health literacy aspects in the entire sample and by gender and developmental period (Table 3). Compared to males, females demonstrated significantly more positive attitudes towards people with mental health problems; however, there were no significant differences between adolescents and emerging adults. Similarly, females exhibited slightly greater recognition of mental disorders, although no differences between younger and older athletes were observed.

Male athletes reported significantly more negative general attitudes towards mental health problems and help-seeking than female athletes. Compared to adolescents, emerging adults showed significantly fewer stigmatizing attitudes, suggesting a possible change in perception over time. Finally, knowledge

about seeking mental health information was significantly higher among males than females, although the effect size was small. No significant differences were found between adolescents and emerging adults. Overall, effect sizes ranged from small to moderate.

A series of multiple regression analyses was conducted to examine the predictive relationships between mental health literacy (MHL) subscales and levels of anxiety, depression, and mental well-being in dual-career athletes (see Table 4). More positive attitudes towards people with mental health problems (i.e., greater acceptance of individuals experiencing mental health illness; ATP), and more negative general attitudes towards mental health problems and help-seeking (i.e., higher stigma; GA), significantly predicted higher levels of both anxiety and

TABLE 3 Descriptive statistics and group comparisons for mental health literacy subscales (MHLS) in dual-career athletes.

Variable	Total (<i>n</i> = 219)	Males (<i>n</i> = 92)	Females (<i>n</i> = 127)	Adolescents (<i>n</i> = 154)	Emerging Adults (<i>n</i> = 65)	<i>t</i> (gender)	<i>p</i>	<i>d</i>
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)			
S-MHLS: ATP	25.74 (4.65)	24.90 (5.15)	26.34 (4.16)	25.53 (4.83)	26.22 (4.18)	2.23	.024	.31
						<i>t</i> (DS)	<i>p</i>	<i>d</i>
						−0.99	.322	−.15
S-MHLS: GA	18.42 (5.31)	20.10 (5.95)	17.20 (4.44)	19.23 (5.56)	16.51 (4.13)	−4.12	<.001	−.56
						<i>t</i> (DS)	<i>p</i>	<i>d</i>
						3.55	<.001	.53
S-MHLS: RMD	24.85 (2.96)	24.24 (3.01)	25.30 (2.86)	24.73 (3.12)	25.14 (2.55)	2.65	.004	.36
						<i>t</i> (DS)	<i>p</i>	<i>d</i>
						−0.92	.357	−.14
S-MHLS: KHM	14.73 (2.39)	15.20 (2.40)	14.39 (2.34)	14.71 (2.37)	14.77 (2.46)	−2.50	.013	−.34
						<i>t</i> (DS)	<i>p</i>	<i>d</i>
						−0.17	.863	−.03

Note: ATP, attitudes towards people with mental health problems; GA, general attitude towards mental health problems and help-seeking; RMD, recognition of mental disorders; KHM, knowledge about seeking mental health information; DS, developmental stage. The series of independent samples *t*-tests were conducted at a significance level $p < .05$.

TABLE 4 Results of multiple regression analyses for prediction of anxiety, depression, and mental well-being from mental health literacy subscales in dual-career athletes.

Predictor variables	Anxiety (GAD-7)	Depression (PHQ-9)	Mental well-being (WHO-5)
	β	β	β
Attitudes towards people with mental health problems (ATP)	.221***	.293***	−.116
General attitudes towards mental health problems and help-seeking (GA)	.231***	.261***	−.027
Recognition of mental disorders (RMD)	.072	.134*	.047
Knowledge about seeking mental health information (KHM)	−.170*	−.138*	.262***
<i>R</i> ²	.101	.149	.073
<i>F</i>	6.04***	9.34***	4.21**

* $p < .05$.

** $p < .01$.

*** $p < .001$.

depression. Due to the deviation from the expected results, an additional correlation analysis was performed by dividing the sample into two groups: athletes with none or minimal anxiety symptoms ($n = 66$) and those with mild/moderate/severe anxiety symptoms ($n = 153$). Distinct patterns of association emerged between the two groups. Among athletes without anxiety symptoms, a more positive attitude towards individuals with mental health issues was linked to lower levels of anxiety ($r = -.12$, *n. s.*). In contrast, among athletes experiencing anxiety symptoms, a more positive attitude towards people with mental health conditions was associated with higher levels of anxiety ($r = .24^{***}$). The direction of associations with depression remained consistent across both groups, as observed in the full sample. Although both ATP and GA were associated with lower mental well-being in the Slovenian sample of athletes, these associations did not reach statistical significance.

Furthermore, greater recognition of mental health disorders (RMD) was found to significantly predict increased depressive symptoms, but not anxiety or overall mental well-being. Additionally, a correlation analysis revealed differing patterns in

these predictive relationships. Among athletes without depressive symptoms ($n = 68$), a better recognition of mental health disorders was negatively associated with depression ($r = -.09$, *n. s.*). In contrast, among athletes who reported mild, moderate, or severe depressive symptoms ($n = 151$), this association was positive ($r = 0.16^*$).

Finally, greater knowledge about seeking mental health information (KHM) was linked to lower levels of anxiety and depression, as well as higher mental well-being. The regression models demonstrated low to moderate explanatory power.

4 Discussion

The present study aimed to investigate the mental health and mental health literacy (MHL) of Slovenian dual-career athletes by addressing three key objectives. First, it examined the prevalence and severity of anxiety, depression, and overall mental well-being in this population. Second, it assessed athletes' levels of MHL, exploring potential differences based on gender and

developmental stage (adolescence vs. emerging adulthood). Third, the study explored the predictive role of MHL in mental health outcomes, with the goal of determining whether higher MHL is linked to lower levels of psychological distress and higher levels of well-being.

Findings revealed that a substantial proportion of dual-career athletes reported symptoms of psychological distress. Specifically, 21.5% met the threshold for moderate to severe anxiety, and 22.8% reported symptoms of moderate to severe depression. These rates are in line with previous research on student-athletes, suggesting that psychological distress is a relevant concern in this population, even if not necessarily higher than in general youth samples (14, 25). In their recent study about student-athletes mental health, Moore et al. (59) found that around 15% met the criteria for moderate to moderately severe depression, while 25.8% met the threshold score for generalized anxiety disorder. In the broader athlete population, comparable studies reflect considerable variation. While Weber et al. (23) reported that fewer than 10% of youth athletes showed elevated depressive symptoms, other studies have found substantially higher rates. For example, Poucher et al. (22) reported depression point prevalence as high as 30%–34% in certain athlete samples. Similarly, Reardon et al. (20) noted that the point prevalence of generalized anxiety disorder in athletes ranged from 6% (clinically diagnosed) to 14.6% (self-reported symptoms). Taken together, these findings suggest that the prevalence of anxiety and depression among Slovenian dual-career athletes falls within the range observed in other athletic populations and highlight the importance of monitoring and supporting their mental health. Rather than indicating a universally heightened risk, the results point to the need for context-sensitive mental health support systems that address the specific challenges dual-career athletes face.

In terms of mental well-being, 43.4% of athletes in our study scored below the mental well-being threshold, indicating low positive mental health. In comparison with the rates we found for anxiety and depression, this paints an even more concerning picture of dual-career athletes' overall psychological functioning. The fact that a greater proportion of participants reported low mental well-being than those who met the criteria for psychological distress aligns with the two-dimensional understanding of mental health proposed by Keyes (12). In his dual-continuum model, mental well-being and mental illness are conceptualized as separate but interrelated constructs. This means that an athlete can experience psychological distress (e.g., anxiety, depression) while still maintaining certain elements of positive mental health (13), and vice versa—an athlete may exhibit low well-being even in the absence of clinical symptoms, as was the case for a substantial part of our sample. This supports the notion that using a dimensional approach enables a more nuanced understanding of athletes' mental health, moving beyond binary diagnostic thresholds to better capture the complexity of their psychological experiences (15).

These findings resonate with prior research emphasizing the importance of considering well-being as a distinct and essential component of mental health in dual-career athletes. Aalto et al.

(60) highlighted several psychological and social factors—such as perfectionism, elevated stress, low autonomy, and unsupportive environments—that are strongly associated with lower mental well-being in this population. Dual-career athletes often navigate overlapping demands across sport, education, and personal life, which can lead to chronic overload, compromised recovery, and a reduced sense of vitality and balance (3). Even when athletes manage to avoid significant psychological distress, these cumulative stressors may still diminish their capacity to experience emotional, psychological, and social well-being.

In our study, gender differences were evident across all three indicators of mental health. Female dual-career athletes reported significantly higher levels of anxiety and depression, as well as lower levels of mental well-being compared to their male counterparts. These findings are consistent with previous research in both elite and student-athlete populations. For instance, studies have repeatedly shown that female athletes tend to report more internalizing symptoms, such as anxiety and depression (61), while male athletes are more likely to underreport symptoms due to prevailing norms around masculinity and emotional control (22). Within the dual-career context, gendered experiences may further exacerbate this discrepancy. Research suggests that female student-athletes are more likely to pursue a stable dual-career pathway, placing relatively equal emphasis on both academic and athletic commitments (62). This increased striving for excellence in multiple life domains may amplify stress exposure and the risk for emotional exhaustion, particularly in environments that lack adequate support or flexibility, and underscores the importance of gender-sensitive, developmentally appropriate mental health promotion strategies that extend beyond illness prevention and address broader psychosocial well-being (25).

While gender differences were clearly observed, our findings did not reveal significant differences in anxiety, depression, or mental well-being between adolescent and emerging adult athletes. This is somewhat surprising given that previous literature highlights emerging adulthood as a particularly sensitive developmental period for mental health challenges. According to Åkesdotter et al. (21), the typical age for the onset of mental disorders in elite athletes is around 19 years, coinciding with the transition into emerging adulthood. This stage is marked by increased demands for autonomy, identity exploration, and major life transitions—including entry into higher education or more competitive sport levels—which are known to heighten psychological vulnerability (63). Despite these findings, our results suggest that psychological distress and low well-being are already present at comparable levels during adolescence in the dual-career athletes population, possibly due to the early onset of dual-career stressors such as performance pressure, academic workload, and time conflicts.

Moreover, it is important to consider that both adolescents and emerging adults within dual careers navigate multiple simultaneous transitions across athletic, academic, and personal domains (2). As highlighted by Stambulova and Wylleman (3), the dual-career pathway often exposes young athletes to complex demands at an earlier age than their non-athlete peers, potentially blurring

developmental distinctions in mental health profiles. While our findings did not indicate statistically significant differences between the age groups, emerging adults did report a slightly higher lifetime prevalence of mental health problems, aligning with broader trends in developmental psychology Auerbach et al. (18). These patterns underscore the importance of early, sustained mental health support across developmental stages and the need for age-appropriate interventions that address both shared and unique challenges faced by adolescent and emerging adult dual-career athletes.

The present study also explored the role of mental health literacy (MHL) in dual-career athletes using the Slovenian version of the Mental Health Literacy Scale [S-MHLS; (42)], which comprises four distinct subscales: (1) Attitudes Towards People With Mental Health Problems, (2) General Attitudes Towards Mental Health Problems and Help-Seeking, (3) Recognition of Mental Health Disorders, and (4) Knowledge About Seeking Mental Health Information. Significant gender differences emerged across all four subscales, with female athletes reporting more positive attitudes toward people with mental health problems, less stigmatizing general attitudes toward mental health and help-seeking, and greater recognition of mental disorders. These results align with earlier studies showing that male athletes tend to hold more stigmatizing beliefs and report lower MHL levels compared to female athletes (39). These gendered patterns are often attributed to prevailing cultural norms around masculinity, emotional control, and help-seeking in sport, particularly in male-dominated or individual sport settings (64). In contrast, male athletes in our sample scored significantly higher on knowledge about where to seek mental health information, which may reflect greater familiarity with navigating systems or online resources, rather than a readiness to apply that knowledge in real-life help-seeking situations.

With respect to the developmental stages, fewer differences were observed. Emerging adults reported significantly more positive general attitudes toward mental health and help-seeking than adolescents, indicating a potential developmental shift in stigma-related beliefs as athletes mature and gain more exposure to mental health education or personal experiences with distress (18). However, no significant differences were found between adolescents and emerging adults in attitudes toward people with mental illness, recognition of mental disorders, or knowledge about seeking help. This suggests that foundational knowledge and beliefs about mental health may be established earlier in adolescence and remain relatively stable into emerging adulthood, or that current interventions in sport and education are beginning to close developmental gaps in MHL. The relatively uniform MHL across age groups in our sample may therefore reflect recent efforts to integrate mental health awareness into youth sport and educational settings, although further targeted interventions are still needed to address stigma and encourage help-seeking. Nevertheless, the higher lifetime prevalence of mental health problems among emerging adults, as revealed in our data, underscores the importance of ongoing MHL efforts tailored to developmental transitions and their associated stressors (21).

In line with the study's third objective, our findings provide important insights into the predictive value of mental health literacy (MHL) for psychological outcomes among dual-career athletes. Of the four MHL subscales, knowledge about seeking mental health information was the most consistent protective factor, predicting lower levels of anxiety and depression and higher levels of mental well-being. This suggests that athletes who know where and how to seek help—whether online, in person, or through formal mental health services—may be better equipped to manage psychological challenges when they arise. These findings align with prior studies indicating that limited knowledge of available mental health resources is a key barrier to timely help-seeking among students and athletes alike (65). In high-demand environments such as dual careers, where athletes must balance sport and education, improving access to such knowledge appears particularly vital.

Interestingly, both more positive attitudes toward people with mental health problems and more negative general attitudes toward mental health problems and help-seeking significantly predicted higher levels of anxiety and depression in dual-career athletes. While this combination may seem contradictory at first glance, it can be understood by considering the distinct nature of each subscale. More accepting attitudes toward individuals with mental illness—reflecting one's willingness to interact with or support people facing psychological challenges—may signal increased empathy or personal relevance, particularly among athletes who are themselves experiencing distress. This is consistent with previous research showing that individuals with lived mental health experience are often less stigmatizing toward others (66). However, such accepting views do not necessarily protect against poor mental health outcomes, suggesting that the directionality between attitudes, personal experience, and well-being is complex. In contrast, more negative general attitudes toward mental health and help-seeking—reflecting internalized stigma—were also linked to greater psychological distress and lower well-being. This subscale includes both stigmatizing beliefs (e.g., "Mental illness is a sign of weakness") and negative help-seeking attitudes (e.g., "Seeing a professional means you are not strong enough"; "If I had a mental illness, I would not seek help"). These findings align with evidence that stigma, especially when internalized, serves as a powerful barrier to recognizing symptoms, accessing care, and engaging in adaptive coping strategies (67). For dual-career athletes—who often face high expectations in both academic and athletic settings—internalized stigma may further inhibit openness about distress and contribute to avoidance of professional support. As shown in prior research, adolescents and young adults with stigmatized views are less likely to disclose emotional struggles or seek help in a timely manner, leading to poorer long-term outcomes (68). The combination of self-stigma and role conflict—where athletes feel pressure to appear strong, composed, and successful—can result in suppressed emotional expression and delayed intervention, thereby exacerbating psychological symptoms. These findings highlight the importance of addressing not only public stigma but also deeply held beliefs about mental illness and help-seeking within performance-oriented environments such as dual-career pathways.

Additionally, recognition of mental disorders (RMD) was found to significantly predict higher levels of depressive symptoms, though this relationship appears to be influenced by the dual-career athletes' current mental health status. A closer examination of the data revealed that among athletes without depressive symptoms, RMD was not significantly associated with depression. However, among those reporting mild to severe depressive symptoms, higher recognition was positively correlated with greater symptom severity. This suggests that recognition of mental health disorders may function differently depending on whether a dual-career athlete is currently experiencing distress. For those already struggling with depressive symptoms, increased recognition might reflect heightened awareness or focus on psychological challenges, which could potentially amplify distress when not accompanied by effective coping strategies or access to support. In contrast, among athletes without symptoms, recognition alone may not have a meaningful impact—either protective or detrimental.

These findings underscore that while symptom recognition is an important dimension of mental health literacy, its effects may be context-dependent and not inherently protective. In the case of dual-career athletes, who often manage overlapping academic and athletic demands with limited time and support, recognition of symptoms without the confidence, skills, or resources to act may increase psychological burden. This highlights the importance of integrating symptom recognition with other facets of MHL—such as stigma reduction, help-seeking efficacy, and mental health self-management—in order to provide dual-career athletes with the tools they need to effectively respond to distress. In this regard, MHL should not be approached as a checklist of separate components, but as a dynamic and interconnected set of competencies that can support well-being and early intervention in the unique context of dual careers.

The findings of this study carry important implications for mental health support, education, and policy in the context of dual careers. First, the high prevalence of anxiety, depression, and low mental well-being among Slovenian dual-career athletes underscores the urgent need to prioritize mental health within sport and educational systems. Given the early emergence and persistence of psychological distress in this population, mental health initiatives should be implemented proactively, starting in adolescence and continuing through emerging adulthood. These initiatives should be embedded in the environments athletes already navigate—schools, universities, sports clubs, and national sports federations—ensuring accessibility, continuity, and cultural relevance.

Second, the multidimensional nature of mental health literacy (MHL) identified in this study suggests that interventions should move beyond simple awareness campaigns and instead target the full range of MHL competencies. These should include stigma reduction—both public and internalized—accurate recognition of mental health symptoms, and most importantly, the ability and confidence to seek appropriate support. In our sample, knowledge about where and how to access mental health information emerged as the most consistent predictor of lower anxiety and depression and higher well-being. This finding aligns

with outcomes from established MHL interventions in sport, such as *Help Out a Mate* (41), *Ahead of the Game* (43) and *Team Talk* (44). These programs demonstrate that sport-integrated, developmentally appropriate interventions can improve mental health knowledge, foster help-seeking intentions, and build psychological resilience. However, as systematic reviews reveal, the impact of such programs on actual help-seeking behaviors remains limited (45–47), echoing our own observation that knowledge alone is insufficient when stigmatizing beliefs persist. Therefore, future interventions must combine practical skill-building with efforts to change underlying attitudes and norms, especially within sport cultures that often valorize toughness and self-reliance.

Third, the gendered patterns observed in both mental health and MHL suggest a need for gender-sensitive approaches. Female athletes reported greater psychological distress and lower well-being, yet also demonstrated more open and empathetic attitudes toward mental health. Meanwhile, male athletes, despite higher knowledge about seeking help, held more stigmatizing beliefs and may be less inclined to act on their knowledge. This highlights the importance of tailoring interventions to address these specific dynamics—normalizing help-seeking for male athletes and supporting emotional coping strategies for female athletes in high-pressure environments. These dynamics are consistent with broader findings across European sport school contexts, where female student-athletes report significantly higher rates of psychological distress, burnout, eating disorders, and dysfunctional sleep patterns than their male peers (25, 29). Female athletes often face unique psychosocial stressors, including body image pressures, lower perceived coaching support, and higher social evaluative concerns, all of which can contribute to compromised mental health (59). In contrast, male athletes may be less likely to acknowledge distress due to internalized stigma or fear of appearing weak, which can contribute to underreporting of symptoms rather than actual lower prevalence (69). Yet most existing interventions—such as *Help Out a Mate*, *Ahead of the Game*—were originally designed for male adolescent athletes, and few have been meaningfully adapted to meet the specific needs and experiences of female athletes. For MHL programs to be effective, they must explicitly recognize and respond to these gender-specific stressors. Interventions should be tailored not only to the general demands of dual-career pathways but also to the gender-specific stressors and barriers that influence how male and female athletes experience, express, and manage their mental health. Doing so can help ensure that all athletes—regardless of gender—receive the type and level of support needed to maintain psychological well-being and performance sustainability.

Fourth, the findings suggest that dual-career athletes may benefit from integrated support systems that bridge sport and education. The increasing recognition of MHL underscores the opportunity for more systematic integration into sport school curricula, which remains limited in many settings, including Slovenia. For older athletes, structured MHL training remains scarce, although some elite sport systems have begun integrating athlete welfare or mental health support modules into high-

performance programs. To address these disparities, we propose embedding MHL education within sport schools and club environments and expanding the target audience beyond athletes. Coaches, teachers, school counselors, and sport psychologists should work collaboratively to monitor well-being, identify at-risk individuals, and provide timely support. Training key figures in athletes' networks in mental health literacy—particularly in recognizing early signs of distress and initiating supportive conversations—can strengthen this system of care. Existing evidence suggests that even brief training for coaches and support staff can lead to significant improvements in mental health knowledge and reductions in stigma (70).

These considerations are particularly relevant in the Slovenian context, where the level of formal dual-career support differs across educational stages. While secondary-level sport schools may offer institutional adjustments for athletes, higher education institutions are not uniformly equipped to accommodate the needs of student-athletes. As such, older athletes in our sample may face greater barriers to academic flexibility, time management, and access to mental health resources. We recommend that Slovenian sports schools and universities consider embedding mental health literacy into both academic and athletic development programs. This could involve co-created MHL initiatives delivered via workshops, athlete mentoring, or peer-led formats, supported by trained staff across sport and education sectors. Ensuring consistent access to such programs throughout an athlete's dual-career pathway may help reduce stigma, support early intervention, and promote sustainable well-being.

Finally, national and institutional policy should reflect the recognition that mental health is essential to athletes' development and performance. Dual-career programs should explicitly incorporate mental health objectives, allocate resources for psychological support, and evaluate their environments using well-being indicators, not just academic or sporting success. Doing so would affirm mental health as a shared responsibility—an integral component of athlete development and not an individual burden to be silently carried.

4.1 Limitations and further directions

While this study offers important insights into the mental health and MHL of Slovenian dual-career athletes, several limitations should be noted. Although the sample included athletes from a range of sports and competition levels, the study was conducted within a single national context. The structure of dual-career pathways in Slovenia—marked by a separation between educational and sport systems, limited institutional support, and specific cultural norms regarding mental health—may not reflect the experiences of dual-career athletes in other countries. Future research should adopt cross-national comparative designs to explore how different dual-career models and support systems influence athletes' mental health and literacy.

An additional limitation is the heterogeneity of the sample in terms of athletic level. While the inclusion of both pre-elite and elite-level dual-career athletes reflects the diversity of real-world

sport pathways, these groups may differ in their exposure to performance stress, institutional support, and mental health risks. Although our developmental subgroup analyses captured age-related differences, future research would benefit from explicitly stratifying participants by athletic level to better understand how elite status interacts with mental health and literacy outcomes. Tailored interventions may be needed to address the unique challenges each group encounters.

Another limitation concerns the internal reliability of the Knowledge About Seeking Mental Health Information subscale, which was relatively low (Cronbach's $\alpha = .50$). Although this subscale still emerged as the most consistent protective predictor of mental health outcomes, its psychometric limitations warrant caution in interpretation. Future studies should aim to refine and validate this subscale—especially in athlete populations—to ensure accurate measurement of this crucial aspect of MHL. In addition, the current study did not consider several potentially influential factors, such as the type of sport (e.g., team vs. individual), level of competition, injury history, or access to formal mental health services. Prior research suggests that these variables may meaningfully shape both mental health risk and protective processes in athletic populations (17, 20). Expanding future analyses to include these contextual and sport-specific variables would enable a more nuanced understanding of the diverse experiences of dual-career athletes.

Finally, reliance on self-report measures may introduce reporting biases—particularly underreporting due to stigma or social desirability, which remain salient concerns in high-performance sport environments. While the use of validated instruments adds strength to the methodology, future research would benefit from a multi-method approach. Integrating qualitative data, observational methods, or input from coaches, psychologists, and educators could offer richer insights into how athletes experience, interpret, and manage mental health challenges in dual-career settings.

Despite these limitations, the present study provides a valuable foundation for further exploration of mental health and MHL in dual-career athletes. Future research should prioritize longitudinal studies, evaluate the impact of targeted MHL interventions, and adopt ecological frameworks that take into account the complex interactions between personal, sport-related, and systemic factors. Such efforts are essential for shaping effective, evidence-based strategies to support the mental health and holistic development of athletes navigating the dual-career pathway.

5 Conclusion

This study provides novel and timely insights into the mental health and mental health literacy of dual-career athletes in Slovenia. The findings revealed considerable levels of psychological distress and low mental well-being, particularly among female athletes, highlighting the mental health vulnerability of this population. Importantly, the study demonstrated that mental health literacy—especially knowledge

about where to seek help—plays a meaningful role in predicting mental health outcomes, offering a promising pathway for targeted interventions. At the same time, the results underscore the complexity of MHL, showing that not all components operate uniformly and that attitudes and recognition may interact with symptom experience in nuanced ways.

Taken together, the findings advocate for a multidimensional and developmentally sensitive approach to promoting mental health within dual-career systems. Strengthening athletes' mental health literacy—by reducing stigma, increasing access to information, and fostering supportive environments—should be recognized as a key pillar of athlete development. As sport and education systems continue to evolve, ensuring that psychological well-being is integrated into dual-career support structures will be essential for helping athletes thrive both on and off the field.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Research Ethics Committee of the University of Maribor (approval no. 038-08-143/2023/9/FFUM). The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

JU: Conceptualization, Writing – original draft, Funding acquisition, Investigation, Formal analysis, Writing – review & editing. EK: Data curation, Methodology, Formal analysis, Writing – review & editing.

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Physical, psychosocial and dual-career loads as risk factors for injuries and illnesses in elite handball players: a 45-week prospective cohort study

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Introduction: While training and competition load are well-documented risk factors for injury, the influence of dual-career loads, life stressors and overall load on both injury and illness remain less clear. The aim of this study was to investigate whether injury/illness occurrence is influenced by the training, competition, academic and work loads, as well as the overall load (sum of academic/work, training and competition loads) and life events in elite male handball players.

Methods: In this 45-week prospective cohort study, 189 elite male handball players weekly reported their load across training, competition, academic, and work domains. We derived an “overall load” variable as the sum of training, competition, academic and work hours. Health problems, including acute non-contact, overuse injuries and illnesses, were recorded using OSTRC-H2-SLO, while psychosocial load was assessed using the LESCA questionnaire. Multivariate logistic regression and non-parametric tests were used to identify risk factors and group differences.

Results: Injured athletes reported significantly higher training (MD = 2.6 h; $p < 0.001$), and overall loads (MD = 2.9 h; $p = 0.042$), but lower academic loads (MD = 2.5 h; $p = 0.001$) than non-injured athletes. Similarly, ill athletes had higher training load (MD = 1.55 h; $p = 0.026$) and competition loads (MD = 0.23 h; $p < 0.001$) but lower academic loads (MD = 2.24 h; $p = 0.001$). Training load emerged as a significant predictor of both injury (OR = 1.33) and illness (OR = 1.23), and competition load strongly predicted illness (OR = 37.00). Academic and work loads were not significant predictors. Higher LESCA total scores were associated with increased injury ($p = 0.041$) and illness risk ($p = 0.017$), while negative scores were associated with increased illness risk ($p = 0.012$).

Discussion: Training and competition loads are key modifiable risk factors for injury and illness, while dual career might serve as a protective factor. While negative life events appear to be associated with illness, the overall volume of life changes—regardless of whether they are positive or negative—emerges as a significant factor in injury risk. Our results support the development of an integrated biopsychosocial model of athlete’s health, where sports- and non-sports-related loads, together with life events shape an athlete’s vulnerability to injury and illness.

KEYWORDS

training load, competition load, academic load, work load, student-athlete, health problems, life events, biopsychosocial injury and illness aetiology model

1 Introduction

Elite athletes face numerous physical and psychosocial stressors that exert considerable strain on the body's biological systems. While physical demands such as high training volumes, repetitive movements, and player contact are known to increase the risk of health problems (1, 2), mental stressors—such as competitive pressure, academic or work responsibilities, and life events—can compromise an athlete's immune function and further elevate the risk of injury and illness (3–6).

In Slovenia, the structure of elite sport often reflects a hybrid model. While few teams in the 1st Slovenian male handball league have better financial support and lean more towards professional structure (1/4 of teams), it is common for athletes across many sports, including handball, to combine their sports career with academic studies or employment. This stems from the European initiatives such as the EU Guidelines on Dual Careers of Athletes and the Erasmus + Sport programme that have emphasized the importance of enabling athletes to pursue education and employment alongside sport, encouraging member states and sports bodies to develop structured support systems (7). However, the dual career pathway is not only driven by athlete development strategies (e.g., those supported by the EU and Slovenian Olympic Committee's dual career and talent development plan) but also by the financial limitations of clubs and the fact that athletes cannot rely solely on the income from their sports career. As a result, even elite athletes, such as top-league handball players frequently navigate dual careers, balancing the demands of elite handball with university education, part-time or full-time work.

Although the dual-career pathway offers important advantages such as greater long-term security after sports retirement, a safety net in case of unexpected career termination and improved psychological resilience, it also brings challenges that athletes must navigate (8). Players must manage dense training and competition schedules alongside academic deadlines and job responsibilities, often resulting in chronic time pressure, emotional fatigue, and suboptimal recovery (9, 10). In student-athletes, academic stress has been linked to increased injury and illness occurrence (11–14). The Stress and Injury Model (15) suggests that athletes' appraisal of stressors—and their cognitive and physiological responses—can influence injury risk, especially in those with high trait anxiety or limited coping resources (e.g., social support). While this model is widely cited, much of the evidence stems from general athletic populations and may not fully reflect the demands faced by dual-career athletes competing at a professional level. In this context, the cumulative impact of physical load, academic pressure, and life stressors can further increase the risk of both injury and illness (4, 16).

Although research on training load among elite athletes has grown in recent years (17), studies examining the relationship between different types of loads and health problems remain scarce. For example, one study described training loads and health problems in handball players but did not explore their associations or causal effects (18), while another focused primarily on statistical approaches to analyzing training load data

(19). While earlier research has linked stress to injury in broader athletic populations, no studies have comprehensively examined this association within a holistic load framework that accounts for the combined demands of elite sport, life stressors, and dual-career obligations. To address this gap, the present study investigates how physical, psychosocial (life events), and dual-career loads contribute to injury and illness occurrence in elite male Slovenian handball players. We hypothesized that:

1. Greater overall load would be associated with an increased occurrence of injury and illness.
2. Higher academic or occupational demands would be associated with an increased injury/illness occurrence.
3. Injury and illness rates would be higher during periods of higher academic stress compared with periods of lower academic stress.
4. Major life events would be associated with increased injury and illness occurrence.

2 Materials and methods

2.1 Study design and participants

We designed the study as a prospective cohort study and conducted it in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (20) guidelines and A Checklist for statistical Assessment of Medical Papers (21).

The study sample size ($N = 149$) was calculated prospectively for the purpose of this project (22). We invited male handball players from the Slovenian First Men's Handball League (Tier 4: Elite level) (23), and 189 (23.3 ± 4.4 years) responded to participate, all of whom met the inclusion criteria of being male players over 18 years old and actively competing in the league. A total of 33 athletes discontinued participation for various reasons: transfers ($n = 6$), loans ($n = 5$), moving into a goalkeeper coaching role ($n = 1$), and changes of the head coach ($n = 21$). Data from these individuals were included in the analysis until the point of their withdrawal. Eligible players who agreed to participate were informed of the study's purpose and asked to provide written consent. The study was conducted in compliance with the latest version of the Declaration of Helsinki and received approval from the National Medical Ethics Committee of Slovenia (approval number: 0120-109/2022/3). Additionally, the study was prospectively registered on ClinicalTrials.gov (registration number: NCT05471297).

2.2 Materials and procedure

We followed the athletes through 45 weeks between July 19th 2022 and June 2nd 2023 during the entire 2022/23 handball season, according to the previously published protocol (22). In collaboration with their support staff—including coaches, strength and conditioning specialists, and physiotherapists—the athletes submitted weekly reports on the following:

(1) Health Problems

Health problems were collected using the Slovenian version of the Oslo Sports Trauma Research Center Questionnaire on Health Problems (OSTRC-H2-SLO) (24). For the purpose of the current study, only first health problem occurrence was taken in account. Furthermore, to assess the predictive value of different types of load on injury and illness occurrence, we excluded contact injuries, as they are typically caused by external forces rather than by training, competition or psychosocial load.

Consequently, health problems were categorized into two distinct categories:

- (a) Category 1: Acute non-contact and overuse injuries
- (b) Category 2: Illnesses

(2) Load

Load was reported across four categories:

- Training Load: Divided into sport-specific (handball) training and strength and conditioning training.
- Competition Load: Measured by the number of minutes played in games, converted to hours for the purpose of statistical analysis.
- Academic Load: Time spent in lectures, exams, practical courses, and studying. Exam periods were considered as periods of high academic stress, while periods including lectures, practical courses, and studying were classified as pedagogical periods, representing lower academic stress.
- Work Load: Any additional employment undertaken alongside the athletes' sports careers.

Load calculations were based on a four-week window preceding the injury event. Due to high response rate to the weekly questionnaire, no imputation of missing values was performed.

A composite variable, overall load, was calculated as the sum of training, competition, academic, and work loads, and expressed in hours.

- (3) Additionally, the athletes completed the *Life Events Survey for Collegiate Athletes (LESCA)* (4), which is a standardized questionnaire designed to assess significant life events experienced by athletes over the past 12 months. It captures

both positive and negative events across personal, academic, and athletic domains, allowing for evaluation of the individual's psychosocial load.

2.3 Statistical analysis

We conducted the statistical analysis using the SPSS software (version 29.0, IBM Inc, Chicago, United States of America). Descriptive statistics were used to summarize the outcomes of interest and are presented as mean $\pm$ standard deviation, except in Table 1, where they are presented as median $\pm$ interquartile range. The normality of data distribution was tested using the Shapiro–Wilk test. Due to the non-normal distribution of most of the data of interest, differences between healthy and unhealthy/injured athletes in load (training load, competition load, academic load, work load, and overall load), and in LESCA derived scores (i.e., negative; positive; and total score) were tested by using Mann–Whitney test. A multivariate binary logistic regression was used to determine whether different load domains represent risk factors associated with the occurrence of health problems. Accordingly, odds ratios (OR) with 95% confidence intervals were calculated and reported.

To assess differences in the occurrence of health problems between athletes with or without dual career and periods of high and low academic stress a Pearson's Chi-squared test was conducted. Additionally, Spearman's rank correlation was used to examine the associations between the LESCA negative score, LESCA total score, and the number of all health problems, injuries, and illnesses.

The following thresholds of the correlation coefficient were used to assess magnitude of the relationships analysed: weak ≤ 0.35 ; 0.36 $\leq$ moderate < 0.67 ; 0.68 $\leq$ high < 1 (25). Statistical significance for all analyses was accepted at $p \leq 0.05$.

3 Results

Detailed characteristics of the study sample, including age, training experience, weekly training and competition loads, as well as academic and occupational engagement, have been

TABLE 1 Weekly load comparison between non-injured and injured, and between non-ill and ill players.

Weekly load	Category 1: non-injured ($n = 83$)	Category 1: injured ($n = 81$)	Wilcox statistics	Wilcox p -value
Training load (hours)	8.77 $\pm$ 3.90	10.50 $\pm$ 3.62	2,028.00	$p < 0.001$
Competition load (hours)	0.20 $\pm$ 0.24	0.25 $\pm$ 0.62	3,282.50	0.796
Academic load (hours)	0.19 $\pm$ 6.85	0.00 $\pm$ 0.00	3,437.00	0.001
Work load (hours)	0.00 $\pm$ 3.67	0.00 $\pm$ 5.50	2,893.00	0.566
Overall load (hours)	12.11 $\pm$ 9.86	13.31 $\pm$ 11.81	2,744.00	0.042
Weekly load	Category 2: non-ill ($n = 146$)	Category 2: ill ($N = 39$)	Wilcox statistics	Wilcox p -value
Training load (hours)	9.05 $\pm$ 4.09	10.00 $\pm$ 4.44	2,187.00	0.026
Competition load (hours)	0.20 $\pm$ 0.21	0.44 $\pm$ 0.43	1,849.00	$p < 0.001$
Academic load (hours)	0.00 $\pm$ 6.88	0.00 $\pm$ 0.25	2,910.50	0.032
Work load (hours)	0.00 $\pm$ 5.18	0.00 $\pm$ 0.00	2,618.00	0.213
Overall load (hours)	11.84 $\pm$ 9.28	12.52 $\pm$ 7.53	2,506.00	0.252

Data presented as median $\pm$ interquartile range.

described previously (26). This earlier publication also presents the prevalence and types of reported acute, overuse injuries and illnesses in this cohort. Briefly, athletes accumulated 50,778 h of handball-related activity, comprising 3,675 h in matches and 47,103 h in handball training. Additionally, they have dedicated 20,674 h to strength and conditioning training. Across the study period, 316 health problems were recorded, leading to a total of 3,318 days of absence, with an average of 10.7 days lost per health problem. The most commonly reported health problems were acute lower limb injuries and overuse injuries affecting the knee, lower back/pelvis and shoulders. Infections, particularly upper respiratory tract infections, represented the majority of illness cases. The weekly load comparison between non-injured and injured, and between non-ill and ill players is presented in Table 1.

3.1 Physical load

3.1.1 Acute non-contact and overuse injuries

Results showed that injured athletes ($n = 81$) had significantly higher training load [mean difference (MD) = 2.6 h; $p < 0.001$], higher overall load (MD = 2.9 h; $p = 0.042$), and lower academic load (MD = 2.5 h; $p = 0.001$) than their non-injured counterparts. Differences in competition load and work load were also observed, but they did not reach statistical significance ($p > 0.05$ for both).

3.1.2 Illnesses

Results showed that athletes who reported an illness ($n = 39$) had significantly higher training load [mean difference (MD) = 1.55 h; $p = 0.026$], higher competition load (MD = 0.23 h; $p < 0.001$), and lower academic load (MD = 2.24 h; $p = 0.001$) than their healthy counterparts. Differences were also noted in work load and overall load, but these did not reach statistical significance ($p > 0.05$ for both).

3.2 Dual-career load

3.2.1 Acute non-contact and overuse injuries

Results indicated that dual-career athletes ($n = 106$) were no more likely to sustain an injury than athletes devoted solely to sport (OR = 0.83; 95% CI 0.61–1.14; $\chi^2 = 1.13$; $p = 0.288$). Likewise, when injury odds were compared across academic periods, dual-career athletes showed identical injury risk in exam and pedagogical periods (OR = 1.01; 95% CI 0.51–1.86; $\chi^2 = 2.32$; $p = 0.999$).

3.2.2 Illnesses

Results indicated that dual-career athletes ($n = 106$) were no more likely to report illnesses than athletes devoted solely to sport (OR = 0.63; 95% CI 0.37–1.14; $\chi^2 = 1.05$; $p = 0.098$). Likewise, when illnesses odds were compared across academic periods, dual-career athletes showed no difference in illnesses risk

in exam and pedagogical periods (OR = 0.43; 95% CI 0.06–1.49; $\chi^2 = 0.99$; $p = 0.318$).

3.3 Load as risk factor for injury and illness

3.3.1 Acute non-contact and overuse injuries

Results from multivariate binary logistic regression revealed that training load was the only significant risk factor for injury occurrence: each hour of increase in training load was associated with a 33% increase in the odds of injury (OR = 1.33, 95% CI 1.17–1.55, $\beta = 0.29$, $z = 3.99$, $p < .001$). Competition load showed a positive but non-significant association (OR = 2.65, 95% CI 0.77–9.66, $\beta = 0.97$, $z = 1.53$, $p = 0.127$). Average academic load was negatively but non-significantly related to injury risk (OR = 0.94, 95% CI 0.88–1.01, $\beta = -0.06$, $z = -1.70$, $p = 0.089$), as was work load (OR = 1.01, 95% CI 0.98–1.04, $\beta = 0.009$, $z = 0.55$, $p = 0.581$).

3.3.2 Illnesses

Results of the multivariate binary logistic regression revealed that higher training load was significantly associated with greater illness risk: each additional hour of training increased the odds of illness by 23% (OR = 1.23, 95% CI 1.04–1.50; $\beta = 0.21$; $z = 2.23$; $p = 0.026$). Competition load displayed an even stronger positive association (OR = 37.00, 95% CI 7.71–222.68; $\beta = 3.61$; $z = 4.25$; $p < 0.001$). In contrast, academic load (OR = 0.95, 95% CI 0.84–1.04; $\beta = -0.05$; $z = -1.03$; $p = 0.305$) and work load (OR = 0.99, 95% CI 0.95–1.03; $\beta = -0.01$; $z = -0.45$; $p = 0.656$) were not significantly related to illness occurrence.

3.4 Psychosocial load

When comparing athletes who sustained injuries to those who did not, a statistically significant difference was observed for LESCA total scores (Injured vs. non-injured: 7.94 ± 17.54 vs. 3.57 ± 9.56 ; $U = 3,993$, $Z = 2.047$, $p = 0.041$). However, LESCA positive scores ($U = 3,556$, $Z = 0.541$, $p = 0.589$) and LESCA negative scores ($U = 2,910$, $Z = -1.942$, $p = 0.051$) showed no statistically significant differences.

In comparisons between athletes who reported illness and those who did not, statistically significant differences emerged for LESCA negative scores (Ill vs. healthy: -5.77 ± 10.06 vs. -2.40 ± 7.10 ; $U = 2,497.5$, $Z = -2.506$, $p = 0.012$) and LESCA total scores (Ill vs. healthy: 9.53 ± 17.04 vs. 6.0 ± 15.58 ; $U = 3,769.5$, $Z = 2.396$, $p = 0.017$). LESCA positive scores ($U = 3,346.5$, $Z = 0.931$, $p = 0.352$) did not differ significantly between these groups.

Weak to moderate associations were observed between LESCA scores and number of health problems. Specifically, for the total number of health problems, LESCA negative scores showed a moderate association ($r = 0.36$, $p < 0.001$), while LESCA total scores showed a weak association ($r = 0.33$, $p < 0.001$). Similarly, weak associations were found between LESCA scores and the total number of injuries: LESCA negative scores ($r = 0.33$,

$p < 0.001$) and LESCA total scores ($r = 0.30$, $p < 0.001$). Finally, for the total number of illnesses, LESCA negative scores ($r = 0.20$, $p = 0.005$) and LESCA total scores ($r = 0.19$, $p = 0.007$) also demonstrated weak associations.

4 Discussion

The aim of this study was to investigate the relationship between various domains of load—physical (training and competition), dual career (academic/work), and overall load—and the occurrence of injuries and illnesses in elite male handball players. Additionally, the study explored the role of psychosocial stressors, measured by the LESCA questionnaire, and health problems in athletes.

Our findings support the assumption that greater training and overall load is associated with increased injury risk, while higher training and competition load is associated with increased illness risk. Notably, the regression analysis highlighted training load as a key risk factor: each additional hour of training was associated with a 33% increase in injury odds and a 23% increase in illness odds.

4.1 Physical load and health problems

These results support the fact that excessive physical stress can lead to fatigue, impair recovery and body's repair mechanisms and subsequently increase susceptibility to injuries (1, 27). Without sufficient recovery between training sessions, microtrauma can accumulate, ultimately increasing injury risk. Moreover, high training loads can also affect immune function by altering immune efficiency. At rest, trained athletes often show lower circulating leukocyte counts compared to non-athletes (28, 29), while repeated elevation of stress hormones (especially glucocorticoids) caused by ongoing intense exercise can induce cumulative immunosuppression (30). When recovery is insufficient, athletes may enter a prolonged "open window" of reduced immunity, increasing their vulnerability to illness (31).

Competition load showed a strong and significant association with illness occurrence, likely due to the elevated physiological and psychological demands of matches. Match play involves greater emotional arousal, intensity, physical contact and exposure to airborne pathogens compared to training—all of which may compromise immune function (5). Physiological stress from competition triggers immune responses similar to those seen in infections — such as elevated circulating leukocytes, with these effects being dependent on exercise intensity and duration (32). In our cohort, the majority of reported illnesses were indeed viral infections (26), further supporting this physiological explanation and previous findings (33). In team sports like handball, where close physical contact is unavoidable during matches, this transient immune suppression, combined with increased pathogen exposure, likely accounts for the observed strong association between higher competition load and illness occurrence.

4.2 Dual-career load and health problems

Interestingly, our results did not support the assumption that athletes with greater academic or work-related commitments face higher risks of injury or illness. Dual-career athletes did not report higher health problem rates than their peers who focus solely on sport, and no significant differences were observed across academic periods such as exam or pedagogical phases. This finding challenges the commonly held assumption that dual-career athletes are particularly vulnerable due to cumulative stress and time pressure (9, 10). One possible explanation lies in the protective role of structured dual-career pathways, where engagement in academics may offer psychological distance from the demands of sport, enhance identity development, resilience, coping strategies, life balance and reduce emotional overinvestment in athletic success (34–36). It is possible that athletes who successfully balance dual careers have developed superior self-regulation, time management, and coping strategies, buffering the impact of stress on their physical health (37). Furthermore, athletes investing less time in academic activities have more capacity to increase physical training, potentially leading to overreaching or insufficient recovery.

While Slovenian handball players in this study appeared to manage their sport and non-sport demands effectively, showing no increased risk of health problems related to dual-career engagement, further comparative data from similar elite handball populations across Europe are needed to contextualize these findings more broadly. Interestingly, our results contrast with findings from previous studies on student-athletes in other countries. For example, Hamlin and colleagues (11) reported increased injury risk during academic exam periods among New Zealand student-athletes from various sports, and similar trends were observed in U.S. collegiate football athletes (13), where periods of high academic stress were linked to elevated injury and illness risk. However, methodological differences between studies limit the extent to which direct comparisons can be made. Unlike our study, which implemented weekly self-reported surveillance and recorded 316 health problems over one competitive season (26), Hamlin and colleagues relied on injury and illness reports from medical staff, potentially missing subclinical or unreported cases. As a result, only 259 health problems were recorded across four years. These differences underline the importance of standardized surveillance methods in sports injury research and highlight the uniqueness of our study in capturing a more complete picture of athlete health within a dual-career handball context.

4.3 Psychosocial load and health problems

Our findings indicate that injured athletes had significantly higher total LESCA scores than non-injured athletes, indicating a potential association between cumulative life stress and injury risk. Although the effect size may be modest, this finding aligns with previous research suggesting that elevated life stress can

increase the likelihood of injuries, possibly through mechanisms such as attentional disruption, muscle tension, or compromised immune function (12, 30). The role of psychosocial factors in injury risk has been highlighted in models such as Andersen and Williams' Stress-Injury Model (15), which identifies key psychosocial predictors: personality, history of stressors, and coping resources. Among these, perceived stress—especially from negative life events—has been identified as the most robust predictor (3). More specifically, major (e.g., negative life event stress) as well as minor (e.g., daily hassles) negative life events have been found to increase the likelihood of becoming injured among football players (1) and female team-sport players (38). Our results similarly suggest that not only major negative events but the total burden of life stress contributes to athlete's injury risk.

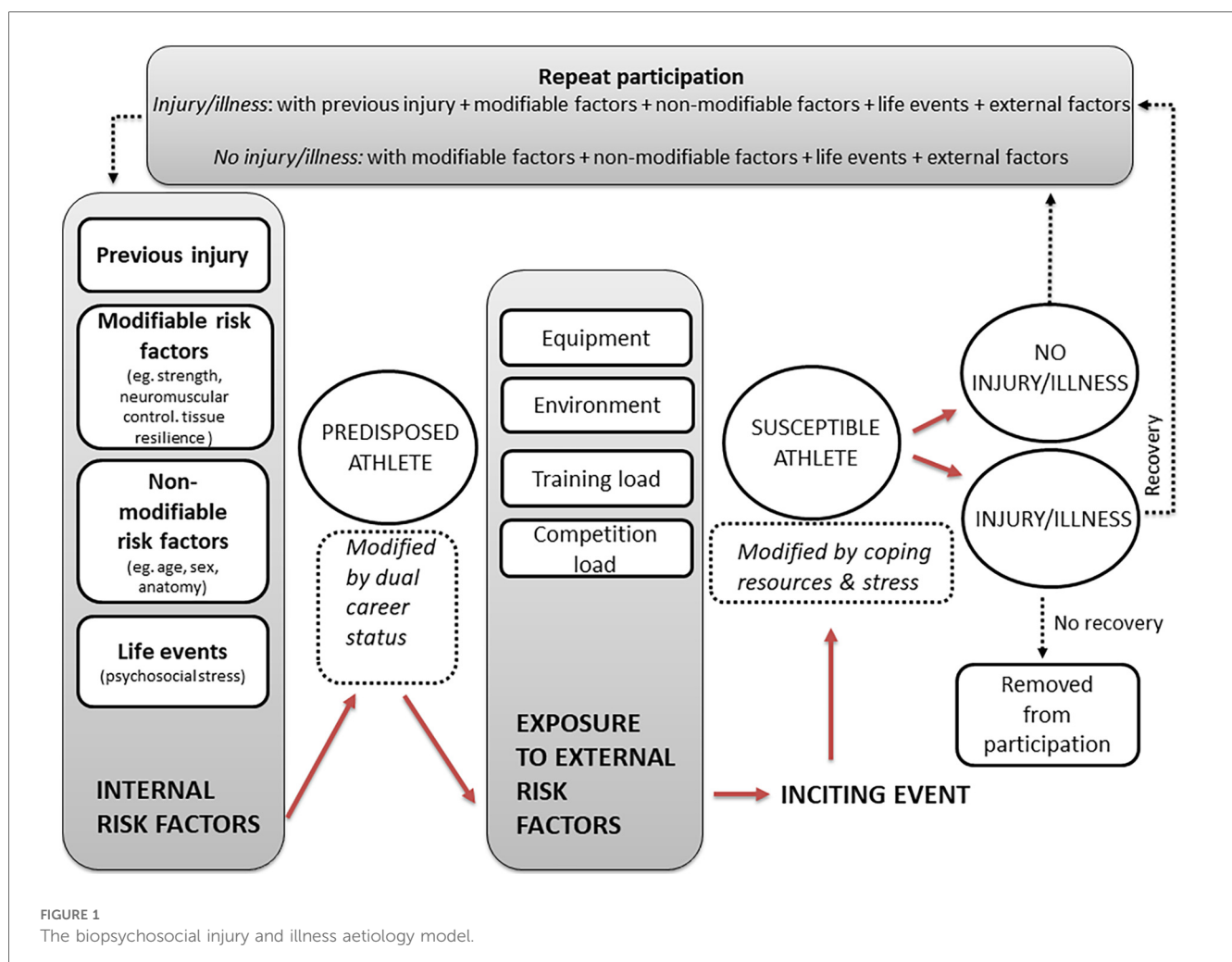
Athletes who reported illness exhibited significantly higher negative LESCA scores and total scores than those who remained healthy, indicating that negative life events, in particular, may contribute to vulnerability to illness. This finding is consistent with psychoneuroimmunological theories, which propose that chronic or intense negative stressors can impair immune system function and increase susceptibility to infections or other illness-related outcomes (12, 30, 32).

4.4 Conceptual model of different aspects of load as risk factors for injury and illness

The results of the present study allow for the update of Meeuwisse and colleagues' Dynamic, recursive athletic injury aetiology model (39) and The workload—injury aetiology model (27) in terms of how various forms of load (physical, dual-career, psychosocial) influence injury and illness risk in athletes (Figure 1). Compared to previous models, this version incorporates dual-career and psychosocial factors not traditionally emphasized, providing a more holistic understanding of athlete's susceptibility to injury and illness.

At the core of the model are individual modifiable and non-modifiable *predisposing internal risk factors* (such as previous injury, neuromuscular control, strength, age and sex), which shape the athlete's baseline susceptibility. In addition, *psychosocial stress*, operationalized via the occurrence of negative life events emerged as a weak to moderate predictor of injury and illness.

Exposure to *external risk factors* in the form of equipment, environment and load plays a central role in determining whether an athlete transitions from a "predisposed" to a "susceptible" state. In particular:



- *Training load* was a significant predictor of both injury and illness.
- *Competition load* showed a strong relationship with illness risk although it was not significant for injury.
- In contrast, *academic load* and *work load* were not associated with greater risk, and in fact, academic load showed trends toward a protective effect, therefore it was placed as a moderating factor in the model.

After an inciting event, the model includes feedback loops: participation in sport can either lead to injury/illness, triggering recovery and return to participation or removal from participation.

From an applied perspective, this model underscores the effects of physical, dual-career, and psychosocial factors in shaping athlete health outcomes and highlights the importance of balanced load management and psychosocial support in injury prevention strategies. While physical load—particularly training and competition—emerged as the most robust predictor of injury and illness, this does not negate the importance of understanding each athlete's full context. Mismanagement of load not only increases the risk of health problems but also contributes to long-term pain, scholarship loss, and psychological distress at the individual level (40). At the organizational level, injuries result in poorer team performance and higher financial costs for clubs and health systems (41).

Both injury and illness appear to be influenced by the presence, type and number of life stressors. These insights highlight the value of individualized training planning, integrated medical support, and psychosocial resources to help athletes maintain health and performance across both sporting and academic domains. Integrating life stress assessments into athlete monitoring may help identify individuals at greater risk for health problems and inform more holistic prevention strategies that might reduce injury and illness occurrence in athletes.

4.5 Limitations and future directions

This study has several important strengths that contribute to the understanding of how different loads influence injury and illness risk in elite handball players. One of the primary strengths lies in the comprehensive monitoring of physical, dual-career and psychosocial loads across an entire competitive season. Unlike many studies that focus solely on training or competition loads, this research includes academic and work loads, alongside with life events, which provides a more holistic picture of athletes' total burden. The inclusion of dual-career loads is particularly relevant in contexts like Slovenia, where many elite athletes must manage academic or employment responsibilities alongside their sports career. Moreover, the weekly self-reporting design enabled a consistent and longitudinal collection of data.

However, several limitations should be acknowledged. First, due to the sample including only athletes from the top Slovenian handball league, this might affect the generalizability of findings to broader athletic populations, including female athletes, youth players, or those from different sports or cultural settings.

Second, all load variables and health problems were self-reported using weekly questionnaires. While this approach allows for consistent longitudinal monitoring, it is prone to recall bias and dishonest reporting. Objective methods, such as GPS tracking or heart rate monitoring would improve the accuracy of load assessment. Moreover, the composite variable—overall load was calculated as the unweighted sum of hours across training, competition, academic, and occupational activities. This assumes equal impact of different load types, which may not accurately reflect their distinct physiological and psychological effects.

To address these limitations, future studies should aim to include more diverse samples, incorporating female athletes, youth players, and international comparisons to explore how different cultural and structural factors shape dual-career demands and health. Future research should explore potential mediators and moderators of the stress-health relationship, such as personality traits, coping mechanisms, and training load, as well as the timing and perceived controllability of stressors. A long-term prospectively designed studies would also be valuable to assess causality and the relationship between life stress and health outcomes over numerous seasons.

5 Conclusion

Building on existing dynamic models of injury risk, our findings suggest that in elite handball athletes, training and competition loads are key modifiable risk factors for both injury and illness. Moreover, dual-career loads do not contribute to greater injury/illness risk but may rather, through enhanced psychosocial balance, represent a protective factor. Both the quantity and emotional tone of life events contribute to athlete health risks. While negative life events appear to be associated with illness, the overall volume of life changes—regardless of whether they are positive or negative—emerges as a significant factor in injury risk. This underscores the importance of monitoring not only physical loads but also the broader psychosocial context in which athletes live and perform. Our results support the development of an integrated biopsychosocial model of athlete's health, where sports- and non-sports-related loads, together with life events shape an athlete's vulnerability to injury and illness.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by National Medical Ethics Committee of Slovenia, Ministry of Health Slovenia. The studies were conducted in accordance with the local legislation and institutional requirements. The participants

provided their written informed consent to participate in this study.

Author contributions

KD: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Visualization, Writing – original draft. AP: Methodology, Writing – review & editing. KS: Supervision, Writing – review & editing. MD: Funding acquisition, Supervision, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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