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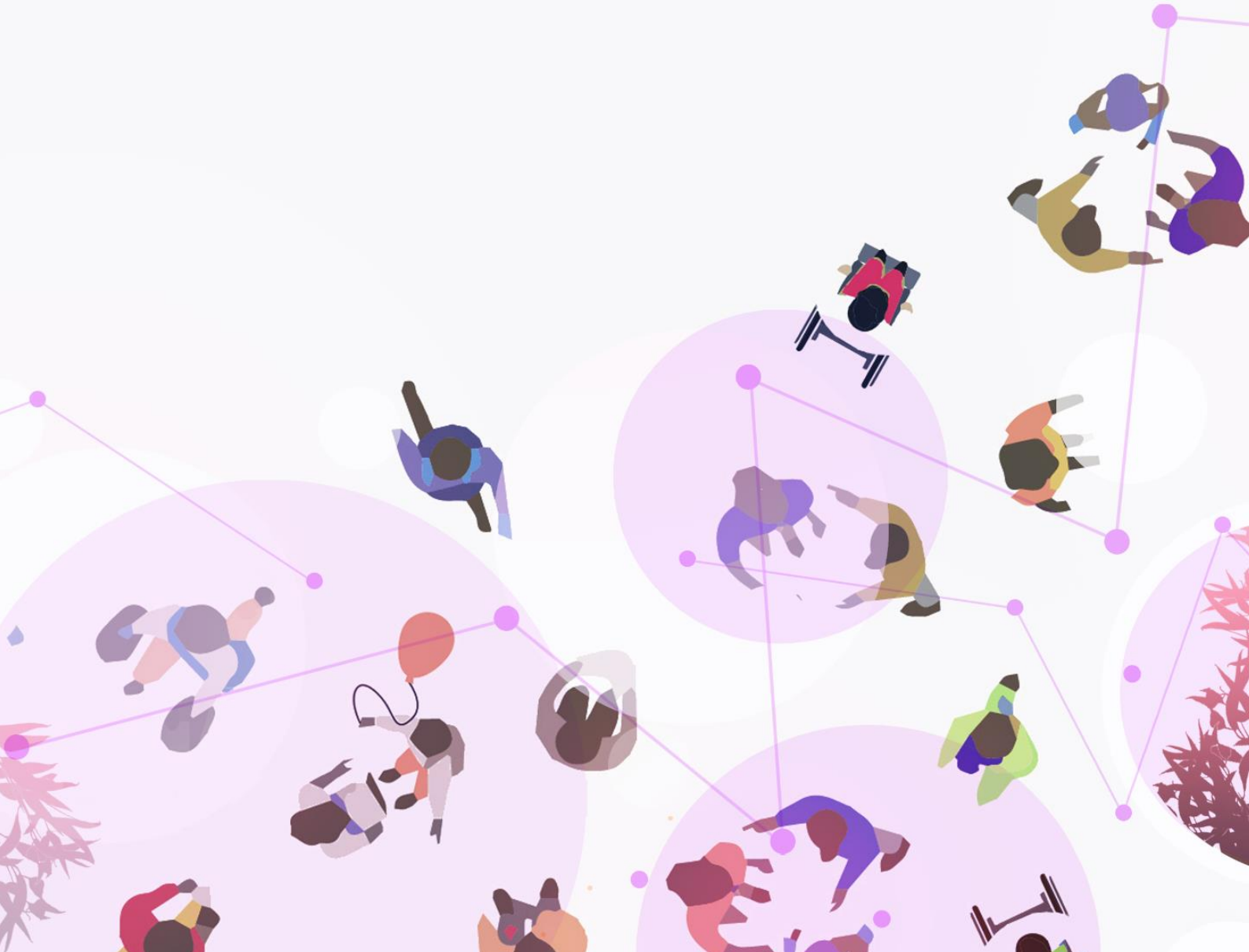
Health Community LAB

Co-creating wellness promotion in sport: a Health Community Lab to prevent feeding and eating disorders in adolescence

REPORT



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This document has sought to adopt inclusive language that respects gender differences. However, when it was not possible to find a stylistically appropriate neutral formulation, the masculine form was used, in accordance with traditional Italian linguistic conventions.

Executive Summary

In recent years, there has been a **worrying increase in eating disorders** (EDs), as evidenced by regional data on emergency room visits, hospital admissions and discharges, with particularly significant consequences for adolescents involved in sports (Ministry of Health, 2024).

Scientific literature highlights **the crucial role of coaches** in shaping the sporting environment and in preventing or amplifying risk factors related to FEDs. However, in Italy, training courses dedicated to this topic are still limited.

In this context, the Tuscany Health Ecosystem (THE) – as part of the PNRR, Spoke 10 'Population Health' – has promoted a ***Health Community Lab (HCL)*** focused on District 2 of Florence, with the aim of co-creating, together with sports clubs, parents, coaches and health professionals, a prototype training course for the prevention of FEDs in sport. HCLs are **co-creation** initiatives developed in collaboration with local stakeholders in the Tuscany region.

The objective of this HCL is to **support the co-creation of a prototype training course aimed at sports associations and clubs** with a focus on District 2 of Florence. The HCL is part of the programme of integrated prevention and early action to prevent FEDs, promoted by the Meyer IRCCS University Hospital, the Azienda USL Toscana Centro and the Società della Salute of Florence, in collaboration with the Regional and Territorial School Office of Florence, the Department of Health Sciences of the University of Florence and the Primary Care Pediatrician services.

Through a review of the literature, interviews with experts and three workshops involving coaches, parents and sports managers, the HCL has enabled the co-creation of a **training course specifically for coaches, which aimed to:**

- help coaches recognise early signs of distress;
- promote educational relationships and positive communication;
- strengthen skills to create healthy and inclusive sporting environments.

The main recommendations that emerged concern: the introduction of **annual training courses** for coaches and technical staff; the inclusion of **guidelines** on risk and protective factors in sports regulations; and the **evaluation of coaches also based on the well-being of athletes**. In line with the WHO model of *the Health Promoting Sports Coach*, it is also proposed to adopt **shared operational tools** (e.g. checklists) and periodic information sessions for athletes and families.

The co-creation process has shown that the direct involvement of coaches, managers and parents promotes **awareness, the sharing of experiences and the development of concrete solutions** to promote well-being and prevention in sport.

Key Messages

- **The crucial role of coaches in preventing FEDs**: coaches play a decisive role in preventing FEDs, especially in pre-adolescents. Their training and awareness are essential for promoting healthy, inclusive and well-being-oriented sporting environments.
- **Risks associated with high-pressure sporting environments:** sporting contexts that are heavily focused on performance and results can increase the risk of FEDs developing in young athletes. The main sources of pressure include family expectations, peer comparisons, unrealistic aesthetic models and demeaning communication styles.
- **Protective and relational factors:** empathy, listening, valuing the process rather than the result, and respecting uniqueness are the main protective factors for preventing FEDs and supporting the balanced growth of young athletes.
- **Co-creation as a lever for change:** the participatory process conducted with coaches, managers and parents has fostered the shared construction of concrete solutions, increasing awareness of the roles and real needs of the local area and laying the foundations for more effective and deeply rooted interventions.
- **Towards a structured and sustainable training model**: the prototype training course developed, based on local evidence and needs, strengthens coaches' relational, communication and observation skills in line with the WHO *Health Promoting Sports Coach* model. The stable integration of annual training courses and the creation of reference figures for well-being in sports clubs can consolidate the network between the sports and health systems, making interventions more lasting and sustainable.

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1. Introduction

The programme of integrated prevention and early action measures to prevent and address feeding and eating disorders (FEDs) - promoted by the Meyer IRCCS University Hospital, the Azienda USL Toscana Centro and the Società della Salute di Firenze, in collaboration with the Regional and Territorial School Office of Florence, the Department of Health Sciences of the University of Florence and Primary Care Pediatrician - is a project that integrates schools, families and sports organisations to promote prevention, early recognition and timely treatment of cases.

In recent years, there has been a worrying increase in the number of young people developing feeding and eating disorders (FEDs), with particularly significant consequences for adolescents involved in sports activities (Ministry of Health, 2024). Despite growing attention to the phenomenon, the literature and experience in the field show a scarcity of studies and, above all, of structured training courses aimed at those involved – parents, educators, teachers and sports operators. In this context, coaches play a central role in their daily relationships with athletes and are key figures in the prevention and early detection of signs of distress. It is therefore essential to provide them with the appropriate tools and skills to recognise risks and promote a healthy relationship with the body and performance.

The project implements universal, selective and targeted prevention actions, in line with existing care pathways at local and hospital level, to reduce the risk of developing pathological conditions, anticipate their recognition through targeted screening and encourage early intervention starting with primary care services. After baseline assessment with EAT-26 screening of all 11-13-year-olds in neighbourhood schools, the programme activates universal prevention interventions: training for teachers on life skills, FED and emotional regulation; interactive classroom workshops to reinforce these skills; awareness-raising meetings for families on risk factors, warning signs and stigma; training courses for educators and coaches of local sports clubs on the link between competition, well-being and FED with a particular focus on sports that emphasise weight or physical appearance.

In this context, the Health Community Lab (HCL), which has been set up, aims to support the co-creation of a prototype training course aimed at sports associations and clubs with a focus on District 2 of Florence.

The Tuscany Health Ecosystem and the Health Community Lab

The *Tuscany Health Ecosystem* (*THE*) is a research project promoted **by the Tuscany Region and all Tuscan universities,** including the University of Florence, funded by the MUR (Ministry of University and Research) through the National Recovery and Resilience Plan (PNRR funded by the European Union - Next Generation EU, Mission 4, Component 2, CUP B83C22003920001). THE has been **divided into 10 macro research themes,** assigned to the spokes, all related to life sciences issues. In particular, spoke 10 has been named 'Population Health'. The universities, public and private bodies participating in spoke 10 (Scuola Superiore Sant'Anna, University of Florence, University of Pisa, University of Siena, University for Foreigners of Siena, Dedalus spa) aimed to **integrate**

methods and tools to improve the ability to implement the innovations that will be introduced in the coming years in our health service, especially through the involvement of the population and the community.

The Department of Economics and Management (DISEI), together with the Department of Architecture (DIDA), the Department of Education, Languages, Intercultural Studies, Literature and Psychology (FORLILPSI), and the Department of Health Sciences (DSS), conducted research in the field of *'Community engagement and social innovation for health and well-being of individuals and* territories'**,** developing the **Health Community Lab (HCL)** methodology**,** i.e. a collaborative space involving citizens, institutions, businesses and universities to **co-create innovative solutions dedicated to the health and well-being of a community or territory.** As part of the project, each HCL developed and tested the methodology in different contexts (for further information, see Biggeri et al. 2025a and Biggeri et al. 2025b), specifically testing certain parts of the process. The HCLs have therefore made it possible to **verify and refine the methodology through concrete cases,** even though these are **partial applications,** limited to specific areas, problems or themes of intervention.

The project developed and presented in this report aims to focus on an area that complements the other interventions proposed in the area, emphasising a context of choice for the creation of social relationships and salutogenesis, typical elements of adolescence, namely the sporting environment. Sport plays a strategic role in the health and well-being of young people; therefore, it is important that the interventions identified in the context of combating FEDs are also extended to sports associations. Although the adoption of co-creation processes in sports practice is still limited, it is strongly recommended by various related disciplines, such as public health, physical activity research, sports sociology and sports psychology (Smith et al., 2023). For this reason, the project has the following objectives:

- To support the co-creation of training sessions for educators, coaches, instructors and managers of sports associations in order to train and raise awareness on the topics of FEDs prevention, the relationship between competition and well-being, the negative effects of risky practices and attitudes in the sporting environment, and the importance of promoting the concept of the uniqueness of the individual, to help boys and girls achieve greater awareness and acceptance of themselves and their bodies.
- Strengthening protective environments and improving the ability to recognise the early signs of possible FEDs among young people.
- Encourage open dialogue between role models and young people to identify those at risk at an early stage.

The primary recipients of the intervention will be educators, coaches, instructors and managers of sports associations/clubs operating in District 2 of Florence, with athletes mainly

residing in the same urban area. The secondary recipients will be boys and girls aged primarily between 11 and 13 years old residing in District 2 who are involved in sports activities.

2. Feeding and Eating Disorders

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5)[1], Feeding and Eating Disorders (FED) are characterised by a persistent eating or feeding behaviour disturbance that leads to an alteration in food consumption or absorption and significantly compromises physical health or psychosocial functioning. Diagnostic criteria are provided for conditions such as anorexia nervosa, bulimia nervosa, binge eating disorder, and avoidant/restrictive food intake disorder (American Psychiatric Association, 2013). One noteworthy aspect of these disorders is that, unlike other psychiatric conditions, they can have serious physical consequences and even pose a direct risk to life. In most other psychiatric disorders, mortality is more often related to suicidal behaviour or other dangerous conduct, whereas in eating disorders, the body itself can undergo progressive weakening which, if left untreated, can critically compromise the functioning of vital organs. This data underlines the importance of early recognition and timely intervention.

In line with international diagnostic criteria, the National Health Service is also organising its own care pathways. In the Tuscany Region, the regional Diagnostic Therapeutic Care Pathway (PDTA) for Feeding and Eating Disorders has been defined and approved by Resolution No. 155 of 17 February 2025. The document aims to outline a multidisciplinary clinical care pathway, structured by levels of intensity (stepped care) and according to the hub and spoke model, in order to try to guarantee patients and their families appropriate and timely access; to strengthen and standardise the network of dedicated services; to share criteria and map existing resources in order to improve the quality of care provided. The model classifies levels of care intensity, from outpatient care to highly complex hospitalisations, promoting early, multidisciplinary and continuous care.

2.1 Epidemiology

Among competitive athletes of both sexes, the entire spectrum of disorders described in the DSM-5 is more prevalent overall than in the non-athletic population. A 2013 literature review (Bratland-Sanda and Sundgot-Borgen, 2013) reports a lower prevalence of these disorders among male athletes than among female athletes. In a study analysing gender differences between different sports, a higher prevalence of EDs was reported among females who participate in endurance or aesthetic sports and among males who participate in weight-class sports (wrestling, boxing) (Schaal et al, 2011). Conversely, studies on adolescents in competitive sports have not found differences between different types of sports, probably because, having been in the sporting environment for less time, they have had less exposure to factors such as pressure to diet or judgement from their peers. It should be noted that many of these studies are based on self-assessment tests, which may be influenced by respondents underestimating the problem. In some studies, a higher prevalence of EDs was found among participants in the control groups than among adolescent athletes (Sundgot-Borgen et al, 2011). Finally, an accurate representation of the problem is made difficult by the great heterogeneity of the assessment tools used and the definitions (Bratland-Sanda and Sundgot-Borgen, 2013).

[1] DSM-5, Diagnostic and Statistical Manual of Mental Disorders, fifth edition, is published by the American Psychiatric Association and is the main international classification system for the diagnosis of mental disorders.

Some information on FEDs in the age group covered by the workshop, ranging from 11 to 13 years, is provided by a focus published by the Ministry of Health, which analyses the prevalence of such disorders in young people up to the age of 25, using data from emergency room admissions (EMUR-PS) and hospital discharges (SDO). However, there is no data available for the age group of interest from the National Mental Health Information System. Based on data on emergency room admissions, there has been an increase in the percentage of emergency room admissions for eating disorders from 2019 (2.5%) to 2021 (5.7%). In terms of outcomes, there has been an increase in both hospitalisations (10.09% in 2019 vs 16.38% in 2021) and transfers to other healthcare facilities (11.39% in 2019 vs 20.00% in 2021). There has also been an increase in the proportion of hospital admissions refused (1.45% in 2019 vs 8.57% in 2021) (Ministry of Health, 2024).

The prevalence data for adolescents in Tuscany were obtained from the EDIT (Epidemiology of Road Accident Determinants) survey conducted in 2022 in Tuscany on a sample of 8,564 adolescents aged between 14 and 19, and therefore do not report on the age group of interest to this Lab. According to this survey, the percentage prevalence of young people who have consulted specialists at least once for eating-related problems in the territory of the Azienda USL Toscana Centro (Central Tuscany Local Health Authority) is 23.62% (95% CI 23.29 - 23.94), which is statistically higher than the prevalence recorded in the Tuscany Region (22.59%, 95% CI 22.37 - 22.81). Despite this, the prevalence of students with an eating disorder, assessed according to the Scoff scale (Morgan et al, 2000), is 31.68% (95% CI 31.34 - 32.02), significantly lower than the regional figure (33.98%, 95% CI 33.75 - 34.22). Finally, there is also a higher prevalence of students who report engaging in physical activity for at least one hour a day, 5-7 days a week (25.03%, 95% CI 25.03 - 25.10 vs 24.2%, 95% CI 24.17 - 24.22). As regards hospital discharges, there has been a general increase in discharges due to FEDs (11.8% in 2019 vs 17.3% in 2021), and in absolute terms, this phenomenon affects females more than males. In fact, in 2021, in the 11-13 age group, 97 males and 1,002 females were discharged with a diagnosis of FEDs. Looking at all discharges for mental disorders, FEDs increased (8.3% in 2019 vs 11.8% in 2021); among ED diagnoses, the largest increase was observed for anorexia nervosa (48.3% in 2019 vs 58.7% in 2021) (Tuscany Regional Health Agency, 2022).

Adolescent athletes are much more vulnerable than adults to the physical consequences of EDs due to high energy expenditure and high nutrient requirements due to sports activity and age. The risks associated with these disorders can include (Kontele and Vassilakou, 2021):

- Low energy availability, due to an imbalance between calorie intake and consumption, making residual energy inadequate for normal physiological functions. Athletes may often find themselves in this situation due to higher calorie expenditure from physical exercise and lower calorie intake through food. The consequences can lead to problems with the cardiovascular, endocrine, skeletal and reproductive systems.
- Reduced intake of macro- and micronutrients, which can reduce the physiological ability to form bone, maintain muscle mass, repair damaged tissue, and recover from injuries. Specifically, glycogen stores would not be adequately replenished due to low carbohydrate intake, and protein requirements would also increase, as protein would be used as an alternative form of energy. Micronutrients are also necessary for bone and muscle tissue formation, red blood cell regeneration, and the regulation of energy-producing metabolic pathways.

- Reduced bone mass density, as adolescence is the critical period for bone growth, and 90% of bone mass density is achieved during this period. Adequate density is achieved through proper nutrition, certain movements, and moderate physical activity with the use of weights.
- Dehydration, as restricting fluid intake is used in an attempt to lose weight and, therefore, to gain a perceived advantage in certain competitions or to qualify for lower weight classes. An athlete's hydration not only has an impact on physical performance, but an unsatisfactory level can cause dysregulation in thermoregulation with a possible increase in body temperature and greater susceptibility to heat stroke, as well as a reduction in strength and endurance. In addition, it can have consequences on muscle tissue and the central nervous system.

2.2 Risk factors

The same 2013 review mentioned above (Bratland-Sanda and Sundgot-Borgen, 2013) lists a number of general and sports-related risk factors. At present, the lack of prospective studies makes it impossible to determine certain risk factors, but the scientific literature suggests multifactorial causes, with risk factors that can be summarised as follows:

Predisposing factors	*Biological factors*	Genetics
	Psychological factors	Body dissatisfaction, low self-esteem, personal characteristics (perfectionism)
	Sociocultural factors	Peer pressure, media influence, history of bullying
Triggering factors	Negative comments about one's physical appearance	
	Traumatic experiences	
Maintaining factors	Seeking approval from one's coach	
	Physiological consequences of fasting	
	Initial success	

Table 1 - Risk factors.

Risk factors related to sport include frequent body weight regulation, pressure to lose weight, personal characteristics, early onset of sport-specific training, injuries, coach behaviour, and strict rules. For athletes in sports where thinness is encouraged, reducing body mass can improve performance: if, in the early stages, weight loss leads to an actual improvement in performance, this can lead to a vicious circle in which continuous dieting to lose weight can be a risk factor for EDs. Some of the characteristics sought by coaches, such as perfectionism,

a high propensity to achieve goals, and excessive training, can also be found in individuals who develop eating disorders. Starting sport-specific training at an early age can be problematic, as there is a possibility of choosing a sport that is not suited to one's physical condition, and pubertal changes can therefore have unpredictable effects on performance.

3. Relationship between the sporting environment and FEDs

3.1 The role of coaches on athletes' FEDs

Much of the existing literature, particularly international literature (Kontele and Vassilakou, 2021; Heffner et al., 2006; Cereda, 2015; Benetton and Visentin, 2021), highlights the importance of coaches in preventing FEDs, emphasising the impact they have on the development of athletes' identity and social education. In fact, it appears that the type of environment provided by sports coaches can reduce or increase the risk of developing EDs: for example, a training style focused on performance, results and body weight increases anxiety related to body image and personal identity.

As we have seen, FEDs involve several intertwined factors, such as socio-cultural, psychological, family, biological and genetic components. In the case of athletes in particular, the risk factors for developing FEDs are due to high competition, which starts from a young age in sports courses, weight category rules, and pressure from the sporting environment, where comments from coaches, judges, and teammates often concern weight and physical characteristics (Kontele and Vassilakou, 2021). Furthermore, a study by Danaher and Curley (2014) highlights how coaches tend to give nutritional advice on fluid requirements, dietary supplementation, weight management, nutrition during training, pre-competition diet, and recovery diet, all areas that could be potentially harmful to athletes' health and in which their training is poor.

3.2 FEDs training for coaches

For these reasons, many studies emphasise the importance of specific training for sports coaches on certain topics, including nutrition (Corley and Demarest-Litchford, 1990; Jacob et al., 2019). Couture et al. (2015) used questionnaires to analyse coaches' knowledge of nutrition in different secondary schools, dividing sports where 'leanness is important' (e.g. cheerleading, swimming, gymnastics) from those where 'leanness is less important' (e.g. football). No significant difference in nutritional knowledge was observed between coaches of 'leanness' and 'non-leanness' sports, or between men and women. However, coaches with certification performed better than those without certification, reinforcing the importance of specific training courses.

The pedagogical and educational qualifications of sports coaches should not be underestimated either. Physical and motor education and sports education should not be identified solely with the quantification of results achieved and the measurement of a person's value in numerical terms. There is a need for increasingly qualified professionals who, coordinating with facilities and services, act specifically to meet current and increasingly diverse needs (Cereda, 2015; Benetton and Visentin, 2021). The pedagogical dimension of care within sporting contexts also seems to be gaining relevance, through greater attention to the role of coaches in the training and self-training process of athletes and to educational actions that promote self-care. Following recent scandals involving psychological and emotional abuse in Italian gymnastics, the importance of developing and implementing initiatives aimed at promoting and protecting the well-being of athletes has been emphasised, involving all members of the technical staff, including sports psychologists and social and health workers, in a coordinated manner (Petrini, 2023).

3.3 Existing resources for coaches

Despite the growing importance of training on FEDs, few training courses for coaches in Italy on this topic have been identified, either through the available academic literature or through research on online sources. The courses for coaches reviewed, whether in person or online, promoted by third sector associations, generally cover the following topics: understanding symptoms and signs, understanding risks, supporting athletes, seeking help by contacting families, doctors and psychologists, keeping informed and training, diagnosis of eating disorders, causes and triggers, medical and psychiatric complications, and the role of different professionals in treatment.

The National Athletic Trainers' Association (NATA) provides the following guidelines for developing a network of collaborative relationships and strategies to prevent, detect and address EDs (Bonci et al., 2008):

> *If FED is suspected, the initial intervention should be facilitated by an authoritative figure who has the best relationship with the athlete. The facilitator should be prepared to (1) approach the athlete with sensitivity and respect, while complying with disclosure regulations regarding patient confidentiality; (2) point out specific observations of concern; (3) expect denial, anger and/or resistance; and (4) have readily accessible expertise for consultation and/or timely referral.*

One example of existing training in Italy is the course promoted by the association 'Ali di Vita', operating in Selvazzano Dentro (PD), a non-profit voluntary organisation established in February 2016 with the aim of preventing and raising awareness of eating disorders. The association organises interactive training courses for educators, teachers, sports coaches and parents, involving healthcare professionals who are experts in the field. The course content is described as follows:

- Diagnosis of Eating Disorders
- Causes and triggers
- Nutrition and the brain
- Acquisition pattern
- Body weight distribution in the population
- Psychiatric Symptoms in EDs
- Medical complications
- Professionals qualified to treat EDs

In order to identify training interventions for sports coaches, the research group also developed a protocol and conducted a scoping review, currently being drafted, entitled 'Educational Interventions for Sports Coaches in Young Athletes' Health Promotion: A Scoping Review'. The protocol is registered on the Open Science Framework (OSF) with DOI 10.17605/OSF.IO/DZJQA.

The research question posed was: Which types of health promotion educational interventions are available for sports coaches working with athletes under 18 years old in extracurricular sports clubs or associations?

The bibliographic search was carried out in the EMBASE, ERIC, CINAHL and PubMed databases. A total of 2,592 abstracts were identified, of which 100 were duplicates and were therefore eliminated. Of the remaining 2,492 articles, 2,435 were excluded because they did

not meet the inclusion criteria. The 57 selected articles were examined in full text and, of these, 49 did not meet the pre-established criteria. This left 8 studies, from which data were subsequently extracted. The training interventions, carried out in different countries (Australia, UK, USA, Canada), covered various topics including mental health, accident prevention and smoking prevention, with a duration ranging from 5 days to 3 months. These interventions demonstrated several benefits, such as improved health literacy and knowledge among coaches.

4. Methodology

HCLs are based on the concept and rules of *the Living Lab*[2] (Leminen et al., 2012), i.e. an innovation environment in which citizens, businesses, universities and public bodies co-create innovative solutions and apply them in real-life situations. Each HCL represents an innovation project in which these actors collaborate, co-create and implement initiatives and solutions related to the health and well-being of a specific community[3]. The main theoretical reference is the perspective of sustainable human development (Biggeri et al. 2023), which recognises the centrality of the individual and the community in transformation processes and is based on five pillars - *productivity, equity, environmental sustainability, participation & empowerment, human security* - while emphasising the role of human *collective agency,* which is expressed through interactions between different social actors and guides transitions towards sustainability.

What is Agency?

In the capability approach, developed by Amartya Sen (1999), development and well-being are defined not in terms of wealth or resources, but in terms of real freedoms. This approach deals with three main concepts:

- **Capability (Real Opportunities and Abilities):** These are the real opportunities/abilities and substantial freedom that a person has to do and be what they have reason to value (e.g. having the opportunity to be healthy, to access quality social and health services, to be educated (in health literacy), to participate in decision-making).
- **Functionings:** These are the states and actions that an individual actually performs (e.g. being well nourished, participating in a debate).
- **Agency:** This is the ability of individuals to act and bring about change based on their own goals concerning their own well-being and that of others.

The approach emphasises that **participation** (in politics and various decision-making processes) has intrinsic and instrumental value, as it expands human freedoms and individual and collective empowerment. Capabilities are highly dependent on conversion factors that are personal, territorial and contextual (similar to the social determinants of health), making the removal of local barriers crucial for full well-being.

[2] According to the European Network of Living Labs (ENoLL), *Living Labs* are *'[...] user-centred, open innovation ecosystems based on a systematic user co-creation approach, integrating research and innovation processes in real-life communities and settings*'. *See:* https://enoll.org.
[3] For further information on HCLs, see Biggeri et *al.* 2025a.

The methodology is divided into three phases:

1. *Preliminary phase*: begins with the identification of needs related to a specific health or well-being issue (*conceptualisation*), followed by a context analysis in which key stakeholders[4] and key actors to be involved in the subsequent phases are identified and data useful for the successful implementation phase (*context analysis and planning*) is collected.
2. *Implementation phase*: consists of the co-creation of a prototype together with the stakeholders identified in the previous phase (*design*).
3. *Evaluation phase*: this involves evaluating the process, the prototype created, as well as the dissemination, possible scalability and maintenance over time of the solutions developed, with particular attention to their sustainability.

The structure of the paragraph follows the three operational phases of the project: preliminary phase, implementation phase and evaluation phase, providing details for each phase on the activities carried out, the actors involved, and the data collection and analysis techniques used. Section 4.1 is dedicated to the design of the study, while sub-sections 4.1.1, 4.1.2 and 4.1.3 present the three phases of the project respectively. Each phase is analysed from both an operational and methodological point of view in order to provide a clear and systematic overview of the participatory process undertaken. A short final section is dedicated to ethical aspects.

What is co-creation?

Co-creation is an approach based on **active collaboration between a plurality of stakeholders** (Vargas et al., 2022), aimed at **the creative resolution of shared problems** (McCaffrey et al., 2025; Messiha et al., 2023). This process develops throughout all stages of the initiative, from the exploration and identification of needs or critical issues to the design, implementation and evaluation of solutions or interventions.

In recent years, co-creation has become increasingly important in the context of strengthening health systems. In its global strategy for integrated health services 2016-2026, the World Health Organisation (WHO) promotes a co-creative process for the development of integrated and people-centred health services through the involvement of governments, service providers and citizens (WHO, 2015). Co-creation therefore plays a central role in this area, as **the challenges faced by contemporary public systems, often characterised by increasing social complexity, require the active involvement of a wide range of social actors in public governance (**Torfing & Ansell, 2021).

What is the difference between co-planning, co-design and co-creation?

[4] A stakeholder is an individual, group of people or organisation actively involved in an initiative, whose interests are negatively or positively affected by the outcome of the implementation or progress of the initiative, and whose actions or reactions in turn influence the stages or completion of a project or the fate of an organisation. See: https://dictionary.cambridge.org/dictionary/english/stakeholder.

Co-programming and co-design (Art. 55, Legislative Decree 11/2017) are structured and regulated forms of public-third sector or public-citizen collaboration, while co-creation is a more recent and broader concept that takes on a wider, horizontal and participatory dimension involving all stakeholders - users, communities, professionals, institutions and research.

- **Co-planning** refers to the phase in which administrations and other actors jointly identify needs, priorities, methods of intervention and resources.
- **Co-design** concerns the next phase, in which the actors involved define and implement specific projects or interventions on the basis of shared planning.
- **Co-creation** goes even further: it involves the participation of all actors from conception, design, implementation and evaluation, with the aim of generating solutions together.

Co-creation is also applied in the field of education. In this context, the design of a course and its content are planned jointly, integrating different perspectives into the educational process (Bovill et al., 2016). This type of collaboration not only enhances the learning process, but also promotes the development of more inclusive educational practices, ensuring that learners' experiences and needs are adequately considered. Involving learners in co-creation transforms them from passive recipients of education to co-creators of their own educational path, thus improving the overall quality of learning (Könings et al., 2021) and promoting the empowerment of all participants (Bovill, 2020).

In healthcare, co-creation is widely used to develop interventions that better respond to the needs and priorities of recipients (Fusco et al. 2023), but the scientific literature on the co-creation of health education interventions is still limited (Könings et al., 2021). A number of studies have been conducted on the co-creation of Massive Open Online Courses (MOOCs), highlighting how collaboration with end users, particularly pregnant women or cancer patients, can significantly improve the effectiveness of the co-created educational tool. The co-creation of these courses allows for the development of personalised educational interventions, which are not only more accepted by users but also more effective in meeting their specific needs (Perestelo-Perez et al., 2020; Alvarez-Pérez et al., 2022; 2023).

4.1 Study design

Following the HCL approach, the study was divided into three main phases. In the first phase (preliminary phase), a review of the literature on FED in the sporting environment, the role of coaches and existing courses for coaches on FED and sporting well-being was conducted, in addition to interviews with experts, with the aim of gaining a detailed understanding of the context, challenges and actors to be involved. In the second phase, three co-creative workshops were conducted with coaches, sports managers and parents from sports associations in Q2. Based on the data collected, a training course was structured for coaches and sports managers in Q2. In the final phase, the workshops were evaluated using a questionnaire.

HCL phase	Prototype creation activities	Actors involved			
		Public actors	Private actors	Research institutions	Civil society
Preliminary phase	Conception	x		x	
	Context analysis and planning	x	x	x	
Implementation phase	Design	x	x	x	x
Evaluation phase	Distribution/ Dissemination	x	x		
	Evaluation	x		x	
	Maintenance	x			

Table 2 - Stakeholders involved in the phases of this HCL (elaborated from Laurisz et al. 2023).

4.1.1 Preliminary phase

A narrative review of the literature on FEDs in the sporting environment, the role of coaches and existing courses for coaches on FEDs and sporting well-being was conducted and shared with the stakeholders involved in the project (SdS, AOU Meyer IRCCS, Azienda USL Toscana Centro, Società della Salute di Firenze and UNIFI). Thanks to the preliminary results of the review, the working group identified the thematic areas to be explored in depth with a view to structuring the course. In order to explore the thematic areas in more detail and structure the co-creative workshops, three semi-structured interviews lasting 1-2 hours were conducted with experts in the field: a child neuropsychiatrist, a sports doctor and a doctor specialising in health promotion. Each interview was transcribed (verbatim) and analysed using thematic analysis. The approach adopted was iterative, involving subsequent discussion with stakeholders to integrate the results and finalise the design of the co-creative workshops. The information gathered from the interviews also guided the selection of participants for the co-creation workshops, which involved managers, coaches and parents from sports associations in Q2.

4.1.2 Implementation phase

The Florence Health Authority recruited, identified and invited sports associations in District 2 to participate in the project. Four associations joined, committing to involve at least two parents, two coaches and two managers each. The participating sports associations were offered a certificate of participation.

The co-creative workshops were held through three focus groups (FG) (Kitzinger, 1995), each lasting two hours. To ensure in-depth discussion and encourage free expression among participants, the workshops were organised into homogeneous groups by role (coaches, managers and parents). This methodological choice made it possible to explore the specific perspectives of each category in a targeted manner, avoiding inhibition dynamics due to the presence of figures with different roles. Although homogeneous in terms of role, the groups included participants from four different sports clubs in District 2, thus ensuring a variety of experiences and points of view.

The three workshops were held in May 2024 in the evening at a school in District 2 to facilitate participation and were conducted by a facilitator and two observers. A total of 29 people participated in the three FGs. Ten people took part in the FG involving coaches, equally divided between women and men (5 and 5). Eight people participated in the focus group for managers: seven men and one woman. Finally, 11 women participated in the focus group for parents (Table 3). In this regard, it is interesting to note that the composition of the groups reflects a significant gender difference in participation among the different categories involved, with a clear prevalence of women among parents and men among managers.

Workshop	No. of participants	Gender	Average age	Age range	Age	Role
1	10	5F/5M	42	23-67	4<35 4 35-65 1 > 65	Coaches
2	8	1F/7M	55 years	38-73	0 <35 7 35-65 1 > 65	Executives
3	11	11F/0M	50	43-55	0 <35 11 35-65 0 > 65	Parents

Table 3 - Participants in the implementation phase.

Initially, participants were involved in two different icebreaking activities, divided into small groups pre-organised by the facilitators:

- Parents: constructing a map of children's empathy (Grey et al. 2010).
- Managers: constructing a map of coaches' empathy.
- Coaches: analysis and discussion of case studies.

Subsequently, semi-structured FGs were conducted around three main themes: the pressure that young people and coaches experience in the sporting environment, the skills coaches need to create an environment that promotes well-being, and the strategies implemented in sports associations that have proven effective. This part of the workshop was recorded and transcribed verbatim.

The data were then re-processed by the stakeholders involved in the project who structured it (SdS in Florence, AOU Meyer IRCCS, Azienda USL Toscana Centro and UNIFI).

4.1.3 Evaluation phase

During the workshops, participants were given two online questionnaires to complete at the beginning and end of the meetings. The questionnaire aimed to detect changes in participants' perception of agency and to assess their level of satisfaction with the experience. Each response was recorded using an anonymous code. The three areas assessed were as follows:

- Perception of factors influencing the development of FEDs;
- Assessment of participants' agency;
- Satisfaction with participation.

Responses were coded using 5-point Likert scales. The concept of agency refers to an individual's ability to act deliberately to pursue goals that they have reason to value (Biggeri & Ferrannini, 2014). In other words, a person is an agent (agency) when they are able to make autonomous decisions and actively influence their own life and the surrounding reality, based on their own values, preferences and goals (Crocker & Robeyns, 2009).

4.2 Data analysis

4.2.1 Analysis of workshops and course structure

We analysed the activities carried out in the workshops, identified the emerging categories and summarised the results. The focus groups were analysed using thematic analysis. Initially, the transcripts were coded by three researchers, and then, after discussion, the main themes were defined. The results obtained were then shared with the other stakeholders involved in the project in order to structure the training course for coaches.

The questionnaire was analysed according to the different dimensions assessed. We estimated the average 'agency' values according to the validated scale and performed a t-test on the measurements before and after the workshops. In the same way, we highlighted the pre- and post-workshop differences in the individual items relating to the factors influencing the development of FEDs, in order to assess possible changes in participants' perceptions of this issue. The level of satisfaction was calculated only at the end of the workshops.

4.3 Ethical Protocol

All participants received oral and written information about the study, its objective, research design and privacy, with the opportunity to ask questions and withdraw from the study at any time. Written informed consent was obtained prior to their inclusion in the study.

5. Expert opinions: interviews with professionals in the field

The interviews conducted with health professionals provided a comprehensive and in-depth picture of FEDs, offering a detailed overview of its constituent dimensions and main clinical, psychological and social implications.

During the interviews, a worrying increase in the number of young people developing FEDs was highlighted, with particularly significant consequences for adolescents involved in sports. In these individuals, increased energy and nutritional requirements make the body more vulnerable to the effects of prolonged dietary restrictions, with possible repercussions on physical development and growth.

EDs are complex pathological conditions that can profoundly affect a person's overall well-being and alter their psychosocial functioning. For this reason, experts emphasise the need for an integrated and multidisciplinary approach to effectively address the prevention, diagnosis and management of EDs.

5.1 Risk factors

Experts have identified a number of factors that influence the development of FEDs in sport. Some of these, defined as risk factors, increase the likelihood of athletes developing such disorders, making careful and continuous monitoring necessary. Others, known as protective factors, play a key role in safeguarding the health and well-being of individuals at risk or already affected by FEDs, and should therefore be promoted and encouraged. Interviews show that EDs frequently occur in contexts where external pressures, high expectations and dysfunctional behavioural patterns negatively influence the individual's relationship with their body and food. There are, therefore, specific risk factors related to performance, self-esteem building, emulation mechanisms and the specificities of individual sports that can favour the onset of EDs, especially among young athletes.

5.1.1 Environmental factors: performance

According to experts, many sporting environments focus excessively on athletes' performance, neglecting their overall progress and the development of their personal abilities. Experts note that stress, although a fundamental resource for the body to respond to certain external stimuli and ensure adequate performance, becomes problematic when there is an imbalance between the demands imposed and the perception of actual response capabilities. In particular, when athletes are required to perform beyond their abilities, a misalignment occurs that transforms stress from a positive factor into a highly negative element for the balance, well-being and health of individuals. It is therefore necessary to reduce the emphasis on success and define individual goals aimed at improvement. For example, evaluating the technical or behavioural progress of athletes rather than simply their ranking in competitions.

> *"[...] risk factors: a stressful environment, excessive performance demands, feeling alone, feeling overly burdened by the expectations of external figures (coaches, parents or others). [...] having to stand out, be the best, respond appropriately, feeling judged; these are all risk factors that need to be addressed preventively by acting on the environment."*
>
> (Health Promotion Specialist)

5.1.2 Psychological factors: self-esteem

Young athletes' self-esteem can become fragile when they receive negative comments about their bodies or performance from teammates, coaches or other figures of reference. The child neuropsychiatrist highlights a strong correlation between eating disorders and low self-esteem, especially in high-performance sports environments, where athletes tend to consider their abilities as the main indicator of their value as a person. At the developmental age of the workshop's target group (11-13 years old), self-esteem is still forming: low levels of self-esteem can therefore be a significant risk factor. At this stage of development, children are particularly vulnerable to external influences and struggle to filter out unconstructive comments and evaluate themselves positively, regardless of their results.

> *[...] eating disorders have a lot to do with self-esteem, and therefore with a dysfunctional mode of adaptation [...] where there is low self-esteem, in any environment where high performance is required, (you are faced) with having to prove whether you are good or not. So if the athlete is able to distinguish between 'I am good at sport', 'I played well or badly today', but 'regardless of how I played, I am valuable as a person', then in this case we can get through it. If, on the other hand, especially during childhood, when we say that we are sensitive to the judgement of others because our self-esteem is not yet established, it can come out, and this is one of the risk factors, that my sporting performance affects whether I am worthy or not as a person.*
>
> (Child neuropsychiatrist)

5.1.3 Sociocultural factors: emulation

The analysis of the interviews also shows that socio-cultural factors represent a risk in the development of FEDs in sporting environments. Young athletes are strongly influenced by the aesthetic models that predominate in society, in the sport they practise and in the media, which they try to conform to so as not to feel different or inadequate. The spread of unrealistic physical standards through social media platforms has a significant impact on coaches and athletes, prompting coaches to focus more on physicality rather than technical skills or the needs of athletes. In response, athletes may feel pressured to achieve certain aesthetic standards, which can lead them to develop a distorted perception of their own bodies, fuelling insecurities and dysfunctional behaviours. This is especially true in sports that require specific physical characteristics that can influence athletes' approach to their body image. Some sports encourage the development of a robust body structure to meet the demands of the game, while others place greater emphasis on physical lightness. The low self-esteem and sense of inadequacy that sometimes result from such pressures are determining factors in the development of psychological and eating disorders, making these demands a significant risk factor. It is therefore essential to promote discussions about the dangers of aesthetic stereotypes and emulation, using examples of athletes who do not meet traditional physical standards and are still successful.

> *'The biggest risk factor is emulation. Especially in certain [disciplines], [...], such as dance sport and gymnastics. [...] In rugby, they want them not to be robust, but fat. [...] And why do they need this, especially when they are small, to be more competitive [...] on the contrary, if we look at sports such as gymnastics, rhythmic rather than artistic, it is the exact opposite. Or in dance, it is very widespread, especially among girls, so there they create the exact [opposite] problem. And unfortunately, the problem exists."*

(Sports Doctor)

5.2 Protective factors: awareness, empathy, enjoyment and sport as a resource

In the sporting context, certain elements can act as protective factors, contributing not only to the physical well-being of athletes, but also to their psychological and social well-being. Cooperation, empathy, respect for one's own limits and a playful approach to sport are fundamental components in creating an environment that promotes the health and balanced development of young people, helping to prevent the onset of FEDs. As experts point out, it is vital to help athletes understand that the real goal of sport is not so much to compete with others as to improve oneself. To this end, it is necessary to promote an approach that encourages self-exploration and exploration of one's own body, while fully respecting one's inclinations and abilities. This perspective shifts the focus from external competition to individual progress, fostering the development of self-confidence and promoting healthy self-assessment. Recognising the uniqueness of each athlete and respecting their limits promotes an inclusive environment, where everyone feels welcomed and valued for who they are.

> *"So, if the push is that you don't need to learn respect for others, don't learn about your own body, in the sense of knowing your own limits [this is a problem]. Because everyone has [unique] characteristics, so you're good at doing this, you're good at doing that, and you're not good at doing that. But [what makes the difference is] making it clear that at that moment it's not the victory that counts but [...] the fun [...]'.*
>
> (Child neuropsychiatrist)

Secondly, the interviews highlight the importance of the relationships that young athletes establish with their teammates and with professionals in the sports sector. Experts agree that coaches' interpersonal skills, appropriate conflict management and the adoption of constructive and non-devaluing communication are crucial protective factors that can prevent or reduce the risk of developing eating disorders.

> *"There are 10 life skills [...] including all those interpersonal skills that can actually help a person, [...] conflict management, stress management, and communicating in a certain way rather than another. [...] Or not being overbearing in language, not overwhelming others, speaking in an orderly manner. So let's say, this whole sphere here, the relational one, communication management, conflict management [...]'.*
>
> (Health Promotion Specialist)

Finally, the recreational value of sport should not be overlooked, especially in younger age groups. Prioritising play and socialisation helps athletes establish a more balanced and positive relationship with physical activity and their own bodies, reducing performance-related pressures.

> *"That is, for me, up to that age, they should have fun, they should not compete [...]. They should lose, they should all play together in teams. They should be there even if they are not good. In fact, the less good they are, the less adequate they are, in terms of body weight, the more we should include them in the group and the more we should let them*

play. So this is another risk, i.e. focusing on performance rather than enjoyment. This is the first thing we should tell instructors and coaches."

(Sports Doctor)

5.3 Manifestations of FEDs

In view of the risk factors and protective factors discussed above, the interviews explored a number of warning signs that could help coaches and other sports professionals recognise potentially risky situations. The timely identification of an eating disorder is, in fact, essential in order to intercept and begin a course of treatment and support as soon as possible.

Experts have identified several warning signs, including: isolation from the group, expressing feelings of inadequacy by comparing oneself to others, requesting more intense or different training than teammates, sudden changes in weight and eating habits, refusal to participate in extra-curricular activities organised by the team, persistent mood swings and obsession with results. It is important to emphasise that these signs should not be considered as rigid criteria, but as useful indicators for monitoring any risk situations and intervening when necessary.

"So, mood swings, for example, you can see immediately if a child is smiling and then becomes sad, or if they are irritable and get angry more easily. Changes in behaviour and attitude, not participating in the fun or competitive parts of training. Another sign is recent weight changes. These must always be observed and monitored, including recent weight changes."

(Child neuropsychiatrist)

5.4 Support tools and local resources

During the interviews, the experts provided a detailed analysis of the resources and professionals available in the area who can be contacted in cases of suspected eating disorders. The first step in the diagnosis and intervention process is generally taken by the general practitioner or paediatrician (up to the age of 14, with the possibility of extension to 16), who is responsible for assessing whether further tests or examinations are necessary. If the GP or paediatrician considers further investigation to be appropriate, subsequent steps are taken to refer patients to specialist facilities depending on the complexity of the case. If the condition is not serious, the patient can access an outpatient service, where an initial assessment is carried out by a psychiatrist or child neuropsychiatrist. For children under the age of 14, the point of reference is the child neuropsychiatrist, while for patients over that age, the choice between a psychiatrist and a neuropsychiatrist is made on the basis of clinical assessment. The specialist determines whether the patient has an eating disorder and, if so, initiates a support network that may be outpatient or consultative if the disorder is mild, or may involve a day centre or hospital if the condition is more severe. In addition, experts have identified a number of professionals who can be consulted in cases of FEDs, including nutritionists, psychiatrists, psychologists and mental coaches, who are sometimes directly involved in sports clubs. Nutritionists play a key role, not only in dietary management but also in health education, thus becoming a central figure in the prevention of eating disorders. Psychological intervention, focused on strengthening self-esteem, is equally important in supporting young athletes in distinguishing their value from their performance, thus promoting

the development of a positive self-image. Finally, the sports doctor is an essential figure throughout the entire process, monitoring the overall health and well-being of athletes.

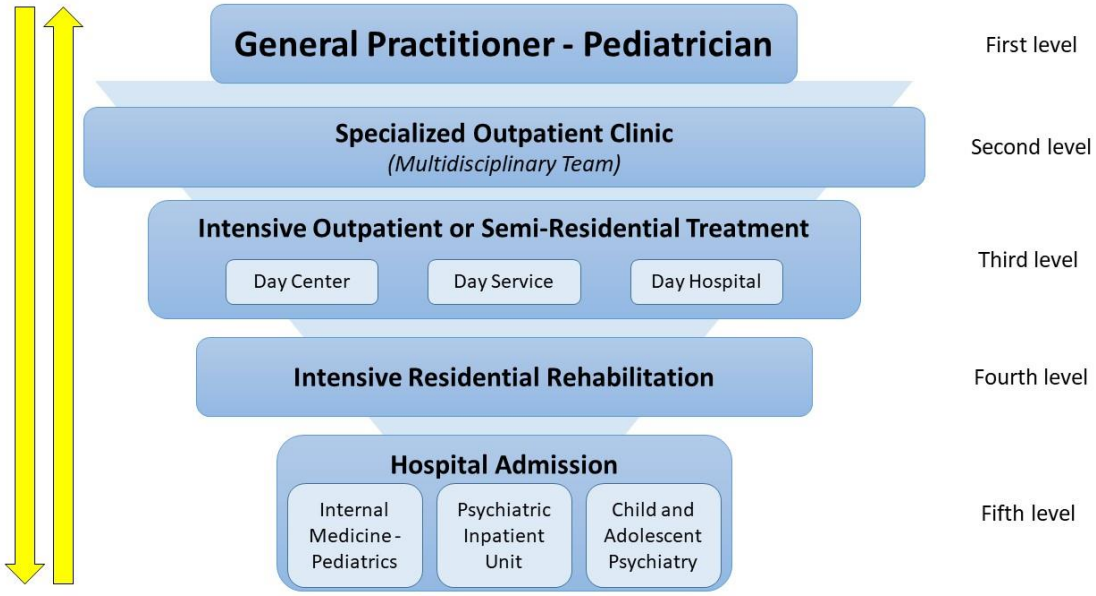

Figure 1 - Regional Diagnostic Therapeutic Care Pathway (PDTA) for FEDs - Tuscany Region (2025).

5.5 Expert recommendations

In conclusion, the experts provided valuable suggestions regarding the management of FEDs in sports, identifying issues of particular relevance to be explored in the training programme for coaches.

Firstly, the experts emphasise that the role of the coach extends far beyond the technical and physical preparation of athletes. When it comes to EDs, coaches face complex challenges that involve not only the coordination of athletic performance, but also the psychological and relational aspects of athletes. In this context, the quality of communication, the management of physical changes and the approach to conflicts become crucial elements that require specific skills, awareness and sensitivity.

> *"The role he can play with his students goes beyond teaching them that specific sport and the technical rules and strategies for practising it [...] it is an educational one: he is a role model who is listened to by the children. Since he is listened to so much, it is important that he also conveys other educational messages that are not strictly related to the sport itself but to other things."*
>
> (Health Promotion Specialist)

For this reason, it is essential that sports professionals, particularly coaches, establish a relationship with athletes based on listening, trust and mutual respect. A relationship of this nature allows young people to perceive the sporting environment as a safe and welcoming space, where they can express themselves freely and practise sport in an informed manner, sheltered from external influences and any form of pressure or imposition, whether from their families or their social environment.

With this in mind, experts believe it is essential to devote part of the training programme to strengthening coaches' communication and interpersonal skills, encouraging them to acquire strategies and techniques that promote respect, listening and support for athletes. It is essential that coaches recognise their educational role and understand the importance of the messages they convey, as well as how they express them. They must be fully aware of the negative effects of using overly critical or disparaging language and the impact that words can have on self-esteem and emotions, particularly during the most delicate stages of young people's development.

> *'Then perhaps a minimum amount of training [...] should [...] [cover] communication, communication techniques. So if I send a devaluing message, I need to know what I'm getting. [The same goes for] words that have an important impact on young people. So perhaps the communication part can be useful in these training courses: giving them ideas for effective communication that takes into account [...] respect for boys [...] and girls [as well as] managing emotions."*
>
> (Child neuropsychiatrist)

A second aspect emphasised by the experts concerns the importance of awareness, which must be cultivated in both athletes and coaches. On the one hand, it is essential that coaches develop the ability to observe their athletes carefully and systematically in order to promptly pick up on any signs of distress, whether physical, emotional or behavioural. The attitude to adopt in these cases must be based on discretion and respect for individual sensitivity, so as to encourage genuine dialogue. In this process, it is necessary not to minimise or underestimate the concerns expressed by young people, as a superficial attitude could compromise the relationship of trust that has been established and make timely and effective intervention more difficult.

> *'So one thing I want to say, one thing that must be understood, is that you must never underestimate. No, because when someone says to you, "Look, I'm not feeling well right now," you want to respond, "Oh, never mind, it'll pass," which is what parents do, what everyone does. But no, never do that. Firstly, the child will never talk to you again if you underestimate them. Secondly, the child may be happy if you underestimate them because they can continue to lose weight, but by the time you take action, it will be too late."*
>
> (Child neuropsychiatrist)

On the other hand, it is equally important for coaches to develop greater awareness of themselves and the context in which they operate. Often, they find themselves at the centre of divergent and sometimes conflicting demands from families, managers or the sporting environment in general, which can generate significant pressure. If this pressure is not recognised and managed consciously, it risks being unknowingly transmitted to the athletes, contributing to a climate of tension and fuelling dysfunctional relationship dynamics. Understanding the mechanisms of the so-called 'stress chain', in which performance anxiety and obsession with results generate a climate of widespread tension, is a fundamental step in breaking these vicious circles and promoting a more peaceful and wellness-oriented sporting environment. The training course therefore represents an important opportunity to increase coaches' awareness not only of the needs and fragilities of athletes, but also of their own

emotional and relational dynamics, providing useful tools for recognising and managing stress, improving their educational approach and fostering a positive growth environment.

> *Yes, then there is also this aspect of the 'stress chain', where it is clear that the team must win because the parents are putting pressure on them, etc., etc., and then a vicious circle is created. So, in the training, explain these mechanisms and how they are created.*
>
> (Child neuropsychiatrist)

The experts conclude by highlighting that promoting proper nutrition education is a crucial element in the prevention of eating disorders in sport. It is important to promote healthy eating habits, referring to simple and accessible guidelines, such as the food pyramid, and discouraging restrictive practices focused exclusively on calorie control. To this end, it is useful to implement information initiatives within gyms and sports clubs, through the distribution of educational materials and awareness campaigns, with the aim of promoting a culture of prevention and well-being among young athletes.

6. Co-creative workshops with coaches, parents and managers

Interviews with experts provided valuable insights into FEDs in sport, proving fundamental in outlining a clear and in-depth picture of the development of this phenomenon. This evidence made it possible to identify topics of particular relevance, which were subsequently explored in depth during co-creative workshops organised with coaches and managers of sports clubs in Florence's District 2, and with the parents of young athletes enrolled in these associations.

6.1 Ice-breaking activity results

The Empathy Map is a useful tool for understanding certain aspects of the experiences and lives of a target group. In this case, it was used as an icebreaker to explore the perspectives of coaches and athletes. The table below summarises the results of the activity, which identified the social pressures, relational dynamics and expectations that can influence the relationship with the body and sporting performance. The elements identified were then explored in greater depth in the Focus Groups.

	Coaches	**Athletes**
What do they see around them?	Models of success through social media	Models of perfection and stereotypes. Constant media exposure. Judgement from others. Advertising.
What are they saying?	Constructive criticism of the athlete Empathise with the athlete Encouragement sharing with parents	Judgements about one's own body/body image Comparison with other bodies and behaviours
What do they do?	They keep up to date They train It is a point of reference for athletes even on issues not strictly related to sport	Study Sport Social relations Use of social media
What do they feel?	Criticism Requests for clarification and discussion regarding failures Sharing with other coaches	Requests to conform to peers. Comments on teammates' abilities and body image.
What do they think and feel?	They want to grow professionally and demonstrate their competence, win, support the growth of athletes, be kept up to date and supported by the club. Are they afraid of losing athletes and dealing with parents, failing and being judged by coaches and parents?	Desire for acceptance by the group, to be successful, not to disappoint expectations, to be approved. Fear: anxiety about being isolated and not being liked. About not being good enough. Fear of failure.

Table 4 - Empathy Map Results

The case studies were used with the coaches to highlight some of the behaviours that could be implemented once FEDs are suspected.

Behaviours to implement
Assessment of training load
Discussion with the athlete and their loved ones
Focus on balance and not just performance
Establish an empathetic relationship

Table 5 - Results of the case study activities

6.2 Pressures

During the interviews, the experts repeatedly emphasised that pressures are one of the main risk factors associated with FEDs in sport. On the one hand, high performance expectations place significant pressure on young athletes, creating a competitive environment that risks compromising the educational and value-based aspects of sport, reducing it to a logic of constant comparison and competition with others. At the same time, coaches are also exposed to significant pressure from a variety of stakeholders, including parents, managers and sports clubs, who often have divergent and sometimes irreconcilable demands. In light of these considerations, the workshops discussed the dynamics that contribute to fuelling these pressures, gathering the testimonies and perceptions of those who work in the field on a daily basis.

6.2.1 Pressure to perform

The workshops revealed that obsession with performance and results is one of the main factors fuelling pressure on athletes and coaches. Parents, coaches and sports managers agree that excessive emphasis on performance can cause high levels of anxiety and stress, thus increasing the risk of developing FEDs. The desire to win, often at the expense of the recreational and educational aspects that should characterise sport, creates a competitive atmosphere that can compromise young people's psychological well-being and negatively affect group dynamics within the team.

> *"For me, as far as my daughter is concerned, the pressure she feels [is] 'Since you can, you must. That is, in the sense [that] you have the physical characteristics to do well, and therefore [you must do well].'"*
>
> (Parent)

On the other hand, coaches also report being under intense pressure to achieve significant results and meet set targets in order to obtain a positive evaluation from the sports clubs they work for. This encourages them to focus their entire training method on the success of the children in competition, thus neglecting their overall experience within the sporting environment. A more empathetic approach that pays greater attention to the relationship with

athletes would, on the other hand, prove to be more effective and more in tune with the training needs of young people.

6.2.2 Social pressure

During the workshops, many coaches emphasise that social pressures, together with emulation, are significant risk factors associated with the development of FEDs in the sporting context. Young athletes often feel pressured to conform to predefined aesthetic models and pursue goals that do not reflect their own inclinations in order to meet social and, in some cases, family expectations. The pressure resulting from these expectations can have negative effects, influencing aspects such as nutrition and leading young people to follow unbalanced diets and engage in harmful eating behaviours.

> *"Often in this age group, they are also pushed by their parents [...]. So often it's not even them [who want to stand out], and they do it to please their parents, to please their coach. And so they often experience stress, [which] then leads them to these situations. And where do they pay for it? They pay for it, for example, in their eating habits."*
>
> (Coach)

Emulation is at the root of the constant comparison between athletes, who strive to match or surpass the performance of their peers. In this regard, parents report that their children often feel dissatisfied with their bodies and try to change them to avoid feeling inadequate or different. Constant comparison with teammates and the aesthetic models imposed by society can generate a sense of inadequacy, fuelling psychological disorders related to self-esteem and body image.

> *'She is dissatisfied with her body because she says she doesn't feel strong enough and [wants] to be more muscular. She starts eating a low-calorie diet, which is low in fat and carbohydrates, and increases her protein intake on her own, without asking anyone for advice. She starts comparing herself to her teammates, showing herself to be, let's say, inferior, inadequate. So even this way of comparing herself to her teammates is quite indicative that something is wrong."*
>
> (Coach)

6.3 The role of the coach: challenges and opportunities

As discussed in the interviews with experts, the coach plays a fundamentally important educational role in the sporting context. During the workshops, we explored this topic further to identify the main characteristics associated with the role of the coach and the most significant challenges they face on a daily basis.

6.3.1 Challenges

Relationship management: in the workshops, the complexity of the role of coaches emerged, as they are often caught between the divergent demands of managers, parents and athletes. This multiplicity of expectations not only overloads them, but also makes it difficult to respond adequately to the needs of each party, resulting in increased levels of stress and anxiety.

'And parents, anyway, are a bit strange, because you can never keep them happy. [...] So, just to say, outside of this specific case, the role of these figures [coaches] must be supported. Precisely because it is not easy to be a coach and satisfy you, who may need your child to feel included, him, who instead needs to be managed in terms of nutrition, the other, who wants a sporting experience that will lead him, perhaps even (to compete), (etc.)."

(Parent)

Lack of specific training and limitations of the role: managers and parents emphasise that coaches, as role models for athletes, should be able to recognise the early signs of distress and refer athletes to qualified professionals, without however replacing them. However, many coaches are not adequately trained to deal with complex issues, such as eating disorders or psychological difficulties, which require highly specialised skills. This leads to the risk of communication errors or inappropriate interventions, with potentially counterproductive effects. This training gap highlights the need for specific support to enable coaches to deal more effectively with relational challenges and to collaborate with external experts.

As parents, we sometimes find it much more difficult (to recognise that there is a problem); even when we are aware of the problem, we reject it, in my opinion. Obviously, the coach cannot take responsibility for this, but I believe they have an important role in being able to recognise it clearly. Of course, [...] then the coach needs to be supported by other figures who can help them understand the problem in its entirety.

(Parent)

Pressure on results and communication difficulties: coaches are often judged on the sporting results of their athletes, a factor that can lead them to neglect aspects related to learning and individual development. An excessive focus on competitive goals precludes the possibility of recognising and responding to the emotional needs of young people, hindering the creation of an empathetic relationship. This approach risks creating a relational detachment, pushing coaches to adopt critical or devaluing language, rather than fostering positive and supportive dialogue. Coaches' communication difficulties thus contribute to fuelling young people's insecurities, both physical and performance-related, hindering the acceptance of physiological changes typical of the developmental stage experienced by the workshop's target group (11-13 years old), such as the onset of menstruation and its implications.

'There is a lack of communication in everything, in terms of nutrition and also in terms of the girls' emotions. Now, it seems to me that most of them are girls and that in this age group, perhaps, they are a little more sensitive [...]. In my opinion, there is a lack of a proactive attitude towards the girls. Explaining what is happening, even in relation to possible call-ups: 'We chose you because maybe... I don't know... you've been more willing this week', 'I've seen that you've been more proactive'. [...] There is a lack of dialogue, a lack of communication in every area. [...] I'm a little sorry because you can tell children everything. I don't think there are things they don't understand, the important thing is to tell them well (the things).'

(Parent)

6.3.2 Opportunities

In light of the main difficulties that emerged regarding the role of coaches, most workshop participants, together with the experts interviewed, agree that one of the essential skills a coach should possess is the ability to communicate effectively with athletes. This skill is

essential for promptly identifying potentially risky situations, understanding the contexts in which young athletes express discomfort, and referring them to the appropriate professionals.

> *"Definitely talk to the young person individually to try to understand if there is a problem related to the group, the coach or the family. Then, since they are minors, you need to talk to their family. So, try to understand if there are problems within the family, or if they have arisen at school or elsewhere. And then also with the group, even if at that age it is difficult to have a direct conversation with young people of this age group."*
>
> (Coach)

Secondly, it is important for coaches to pay particular attention to the integration and inclusion of young athletes, organising socialising opportunities and ensuring that everyone feels comfortable, regardless of their abilities or group dynamics. Coaches are called upon to actively promote and defend fundamental values such as solidarity, cooperation and empathy, which are significant predictors against the development of FEDs.

> *"[...] our goal is this: to create a social environment, a pleasant atmosphere where young people enjoy coming. Then comes performance."*
>
> (Coach)

Finally, the coach has a responsibility to listen to the young people, taking what they say seriously and never underestimating their difficulties. When an athlete shows signs of physical or psychological distress, it is essential that the coach recognises the importance of these signals, even when they are not obvious or are minimised by the person concerned. Not ignoring or trivialising discomfort can be crucial in dealing with sensitive situations, such as eating disorders or emotional issues, and in helping young athletes manage their limits without pushing themselves beyond what is healthy for their well-being.

> *"In fact, in my opinion, the coach should listen to all the girls individually at least once every six months. Active listening, a chat."*
>
> (Parent)

6.4 Specificity of sports disciplines: risks and opportunities

The specific characteristics of sporting activities can represent risk factors or protective elements in the development of FEDs. Group dynamics, the rules of each sport, expectations regarding performance and those related to physical appearance have a significant influence on the mental and physical well-being of athletes. During the workshops, diverse perspectives emerged regarding the benefits and critical issues associated with various sports disciplines.

On the one hand, coaches emphasise that team sports, by their very nature, promote socialisation, facilitating collaboration and mutual support among young people. Being part of a team helps to limit episodes of isolation and feelings of inadequacy, providing important social and emotional support.

> *'Mine is a team sport, so I have an advantage over those who play individual sports, because team sports are, in a way, meant to bring people together. And in any case, you can somehow camouflage isolated incidents with the help of your teammates. So I*

encourage my teammates to help even the weakest ones, right? In individual sports, it's a little more difficult to do something like that [...]'.

(Water polo coach)

On the other hand, some parents report experiences that contradict this view, pointing out that, sometimes, individual sports offer greater cohesion than team sports. This is especially true in disciplines such as athletics, where, although young people compete individually, their results contribute to the overall success of the sports club. In this sense, it is observed that individual competition tends to reduce tensions between teammates and strengthen their relationships, creating a healthy and cooperative sporting environment.

'[...] in athletics, we have the advantage and, at the same time, the disadvantage that performance is objective. [...] Often, a youngster is compared to a measurement they have achieved, a time they have achieved. So, you say, 'That one is strong', 'That one is rubbish'. Maybe others think that, but we coaches may not. But they can still feel the weight of this. [...] In my opinion, the most important thing is to find alternative incentives. Perhaps in our case it is easier from this point of view than in other sports, perhaps less so when they are more team-based. But make them understand that if you come last in a heat and you've done a good time, it's better than coming first in a heat where there are perhaps less talented kids. We work hard on this aspect, to make them understand that it is more important to beat themselves than to compete with others... there will be time for that later. When you succeed in this, they also have more fun and are able to enjoy it in a truly satisfying way. Then, when they understand this, they are also happy for their teammates' improvements."

(Athletics coach)

Nevertheless, individual sports require greater self-discipline, as competition takes place on a personal level and you are entirely responsible for the results you achieve, whether successful or unsuccessful. This factor can certainly increase performance-related stress compared to team sports, where responsibilities are shared.

Another aspect that emerged from the workshops concerns competitiveness. The managers interviewed pointed out that introducing competitiveness at an early age can be a significant risk factor for the development of psychological and eating disorders, as it increases performance expectations and the risk of negative self-evaluation. Conversely, postponing entry into competitive sport until young athletes are more aware allows the fun aspect of sport to be prioritised, which is a key protective factor in preventing such problems.

"In some sports, unfortunately, competitiveness comes early. In volleyball, competition begins at the age of 14. Some athletes play more and some play less. When the serious championships begin, some children just sit on the bench and watch. That's why you have to be clear. Hypercompetitiveness makes you lose out if you're not at the top!"

(Manager)

6.5 Suggestions and ideas for the training course

Workshop participants provided numerous suggestions, both for strengthening FEDs prevention strategies in sport and for the content to be covered in the training course for coaches. Based on their personal experience and perceptions, most respondents believe that organising extra-curricular activities, such as dinners, group outings, etc., contributes significantly to improving the collective well-being of the team and individual athletes. Such activities foster a relaxed atmosphere that allows for informal interaction with the children and their parents, facilitating dialogue and maintaining an active channel of communication that is useful for meeting individual and group needs.

> *"[...] to see if everything is going well, maybe organise some extra things, not competitions, but dinners: one at the beginning of the year, one in the middle of the year, one at the end of the year. Where maybe there's a moment where you're with the kids, and a moment where the parents are there, and then maybe the parent comes to pick up their child [...] maybe you chat, see if everything's okay, if there's a problem, you make yourself known."*
>
> (Coach)

Nutrition education was also a widely discussed topic, as it is recognised as fundamental to the well-being of young athletes. On the one hand, parents would like to receive information and guidelines from sports clubs, containing practical advice on how to manage their children's nutrition properly. Support of this kind, if properly structured, would provide families with the tools they need to make more informed and healthier food choices.

> *"I'm not saying we should deny them snacks, but we should also explain how to eat before a match, in a structured way, of course. How to have a post-match snack [...]. In short, a culture that is not limited to denying that they can eat. [...] In fact, I would find it very useful to discuss this in depth with the children, not just limiting them, but giving them structured, supported suggestions from those who do this job, so that they can eat properly."*
>
> (Parent)

On the other hand, coaches and managers believe that greater attention to nutrition education, both in schools and in families, would be particularly effective in promoting a healthy and positive culture among young people. Investing in the dissemination of proper nutrition education would help improve overall health and promote the physical and mental well-being of athletes.

> *"Because I would like to ask you to intervene, even [...] in middle school canteens, but also in high school cafeterias. Because when you see [...] that during break time, so many foods are provided that are, let's say, completely unsuitable... indeed often harmful... it is clear that... for example"*
>
> (Coach)

Finally, having information about the services available in the local area is essential for effectively supporting athletes and their families. As stated by the managers, knowing the area and the opportunities offered by local resources can be a great help. Knowing where the relevant services are located, even at a general level, allows you to find your way around better and access useful support for the well-being of athletes and the management of their needs.

> *"So also knowing what the local area is like, what the possibilities might be. I don't know, surely knowing where the main points of reference are could help."*

(Manager)

With regard to the training course, the workshops revealed that the main topics to be covered include communication, interpersonal skills and empathy. It is essential that coaches enrich their technical skills with communication and empathy skills in order to support young athletes in their development in a conscious and responsible manner. The main objective is to create a sporting environment that promotes well-being, thus helping to reduce the risk of developing psychological and eating disorders. Therefore, coaches should adopt a caring and listening approach, operating with the awareness that every young person, at the end of training, 'must go home happier than when they arrived' (Manager).

> *'Perhaps point out to the coach what might be wrong communication methods to avoid him saying things he doesn't mean [from time to time].*
>
> (Manager)

Furthermore, in line with what experts have highlighted, the issue of awareness plays a central role and deserves adequate attention within the training course. It is important to raise coaches' awareness of the influence that aesthetic models and social pressures can exert, not only on young athletes, but also on themselves. Understanding the impact of these dynamics is essential for adopting a more conscious and balanced educational approach. Recognising how these influences can affect one's training style and expectations of athletes is an essential step in fostering a healthy, welcoming sporting environment that is truly oriented towards the overall well-being of the individual.

> *"Social media also influences the behaviour of coaches, because especially in this age group, which you have as a reference, they are all young people. So they live off the same things that these kids live off."*
>
> (Manager)

6.6 Experiences and solutions adopted

In conversations with stakeholders, a number of 'good practices' were identified that highlight effective approaches to accompanying and supporting young athletes, which have already been adopted in various contexts. Some coaches, for example, emphasise the importance of explaining the objective of each exercise to the young people, highlighting how this practice helps to reduce anxiety and pressure on athletes, thus promoting a more peaceful, calm and motivating environment.

> *'As far as athletes are concerned, I have found it very beneficial to explain the purpose of each exercise every time I have them do it [...] this reassures the young person a lot, also in terms of expectations'.*
>
> (Coach)

Some parents report, however, that several sports clubs where their children train have set up reference groups composed of professionals, such as psychologists and nutritionists, with the aim of supporting young athletes and their families. These groups organise regular meetings on topics related to psychological well-being and nutrition education, offering practical support

to anyone who, for personal interest or specific needs, wishes to receive guidance or further information.

> *"Here, in a [volleyball club I know], they have set up a group of reference people available to teams. In short, if someone has problems [...] including psychological problems related to food, for example. They organised days and evenings dedicated to the children and invited them. In short, it was clearly for all the teams, but anyone who wanted to go could attend, including parents."*
>
> (Parent)

Managers have confirmed that regular initiatives dedicated to nutrition education are particularly appreciated by families, as nutrition is often perceived as a complex and difficult issue to manage. These meetings are a key opportunity to provide clear information and practical tools, answering parents' questions and promoting more informed food choices to support the health and well-being of young athletes.

> *"We hold regular [nutrition] meetings. Many families ask us what to give their children, so we organise these meetings with people who can help in some way, because it is a difficult issue."*
>
> (Manager)

7. Questionnaire results

Through questionnaires administered before and after the workshops, participants were asked to assess the importance of various risk factors in the sporting context. The analysis showed that, initially, parents and coaches attributed greater importance to factors such as expectations related to weight and physical appearance – particularly felt by parents – while sports managers tended to underestimate the impact of many variables, with the exception of criticism and negative comments about the body, which were perceived as important by everyone.

After the workshops, there was a general increase in the assessment of the importance of all factors, a sign that the experience promoted greater awareness. Interestingly, in contrast, the perception of the relevance of two factors – performance pressure and body criticism – decreased slightly, albeit not significantly (Figure 2).

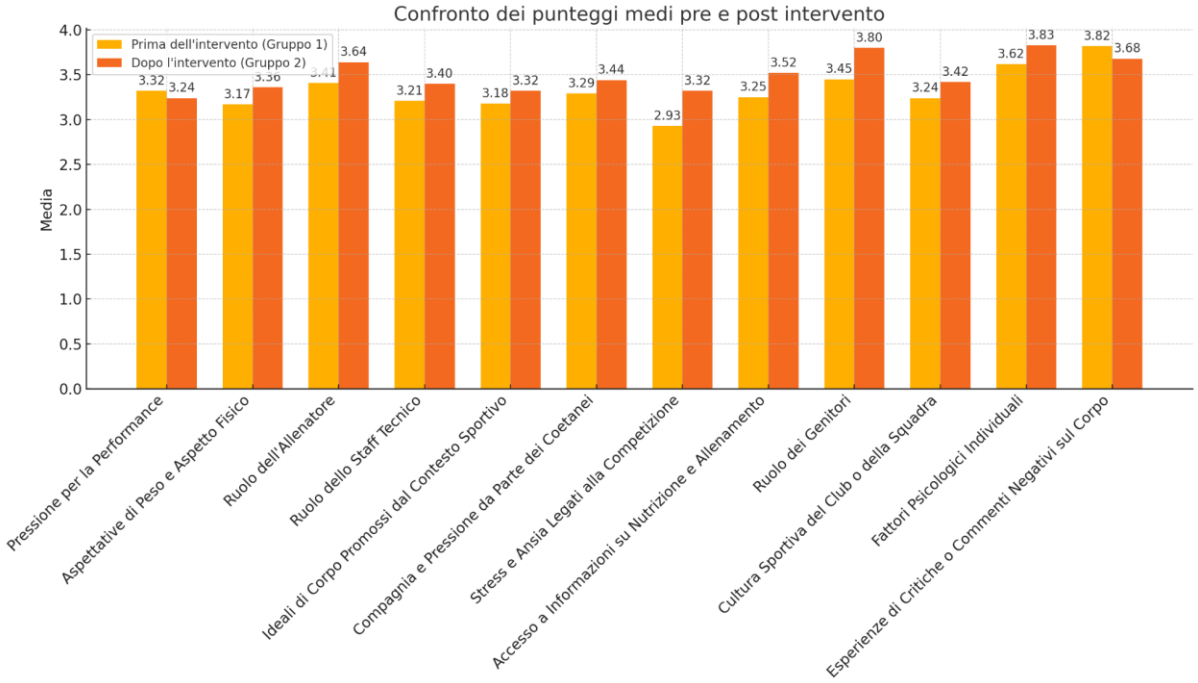

Figure 2 - Average score of factors influencing FEDs before and after the workshops

The increase in general awareness is a positive sign of the implicit training effectiveness of the workshops. The slight reduction in some scores may indicate a process of critical re-evaluation by participants, who may have recognised greater complexity in the genesis of FEDs. The construct of Agency was assessed to understand how much participants perceived they could play an active role in their own context. The responses show an increase in average scores after the workshops, although this did not reach statistical significance. Although the increase is not marked, the data suggest that the workshops stimulated reflection on participants' roles and responsibilities in promoting healthier sporting environments. This is particularly relevant in view of the future training phase planned for the project (Figure 3).

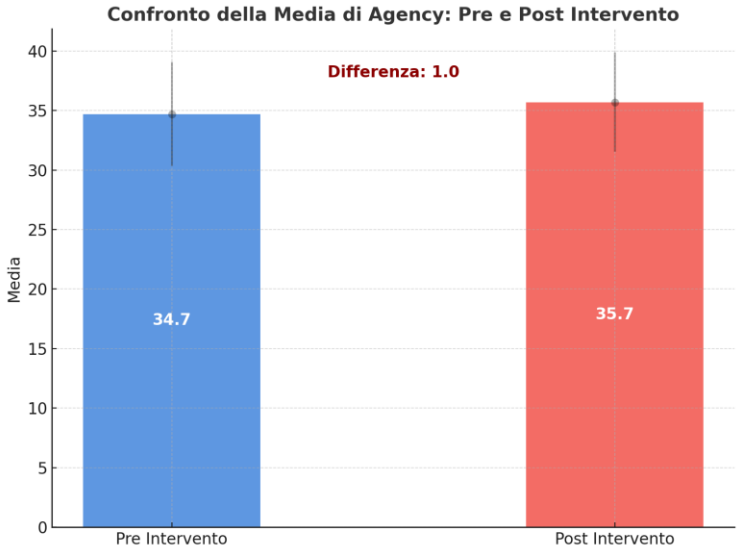

Figure 3 - Average Agency scale score before and after the workshops

Finally, the level of satisfaction expressed at the end of the workshops is generally high. The most appreciated aspects concern the relational and emotional dimension of the experience: participants enjoyed the exchange with other stakeholders and the atmosphere of listening and collaboration. The educational component, although evaluated positively, received a slightly lower score (Figure 4).

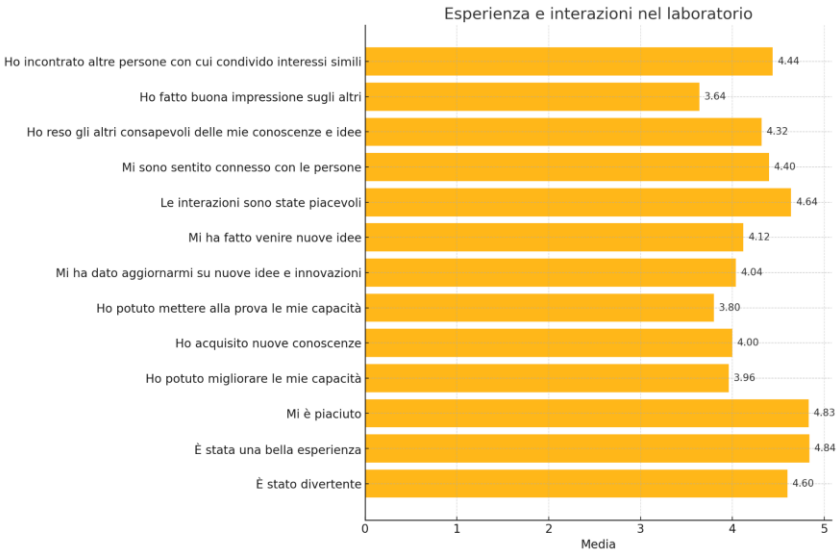

Figure 4 - Level of satisfaction after the workshops.

This result is consistent with the exploratory and participatory nature of the course. The actual training will follow this listening phase, and it is important that the sense of emotional and community involvement is maintained in the subsequent steps.

8. The training course

The co-creative activity led to a shared definition of the main training content to be included in the course for coaches and sports managers. In particular, these are:

- consolidating awareness of the positive resources to be valued in young people for the promotion of well-being in the sporting context;
- consolidating the ability to observe and recognise relational and communicative dynamics with and among young people, in order to promote positive and effective ones;
- raising awareness of the relationship between competition and well-being and the negative effects that certain practices/attitudes in sport have on health;
- strengthening knowledge of FEDs and risk factors related to sport;
- increasing the ability to identify warning signs to be taken into account for the early recognition of FEDs;
- present the services and alliances/networks to be strengthened in the area to promote the prevention and management of FEDs.

The course was held over two days, 11 October 2025 and 8 November 2025, at Villa Bracci Rovezzano. A total of 20 people took part over the two days.

The meetings, each lasting three hours, included an introduction to 'Nutriamoci di Benessere' (Let's Feed on Well-being), a presentation of the results of the co-creation process, a sharing of experiences in accordance with the Tuscany Region's Sports Ethics Charter, the study of clinical cases, and educational training on FEDs.

At the end of the training course, a learning questionnaire was administered. The questions in the questionnaire focused mainly on two areas. The first concerned the critical aspects observed by participants in the sporting context that can affect the well-being of adolescents and, in some cases, represent risk factors for the development of FEDs. The second focused on ways to actively involve sports clubs in promoting adolescent well-being, including concrete initiatives and proposals.

The participants responded consistently to the information provided during the course, demonstrating that they had acquired significant knowledge. This confirms the importance of training courses for sports professionals, highlighting how such interventions can promote greater awareness and capacity to promote adolescent well-being.

9. Conclusions

FEDs are increasing at an alarming rate, as confirmed by regional data showing an increase in emergency room visits, hospital admissions and discharges, particularly in the 11-13 age group (Ministry of Health, 2024). In this context, the sporting environment plays an ambivalent role: on the one hand, it can be an important protective factor, promoting well-being, socialisation and personal development; on the other hand, if characterised by pressures related to performance, weight and body image, it can contribute to the onset of EDs, especially in adolescence.

The research conducted as part of the project clearly confirmed both of these aspects. Co-creation, which involved health professionals, coaches, managers and parents, proved to be an effective tool for identifying the main critical issues, stimulating knowledge sharing and identifying concrete strategies for promoting well-being in sport.

Despite the high level of participation and strong involvement demonstrated during the co-creation workshops — which highlighted a real interest in the topic and a perceived need for discussion — participation in the training course subsequently offered was very limited. Due to the limited participation in the first edition of the training course, a meeting was held with District 2, attended by two sports clubs and two schools, to define shared strategies for involvement and promotion of the programme. This discussion led to the participation of the working and research group in the District 2 Sports Festival, organised annually with the aim of presenting various sports clubs and disciplines. In the case of 'Nutriamoci di Benessere', the event served to raise awareness and re-establish contact with clubs, coaches and parents (Figures 5, 6, 7).

Figures 5, 6, 7 - 'Nutriamoci di Benessere' stand in the Niccolò Galli Garden, (FI) during the Sports Festival, 9-13 September 2025.

It should be noted that the training course was co-created with the course participants, taking into account their suggestions in terms of content, methods and timetables. However, when the course was implemented, the response was limited. This discrepancy can be attributed to several factors: on the one hand, the difficulty for coaches and managers to find time to devote to training, despite their initial interest; on the other hand, it is possible that the transition from a participatory and informal experience (such as focus groups) to a more structured training programme reduced interest or the perception of immediate usefulness. This highlights how crucial it is in sporting contexts not only to involve stakeholders in the design process, but also to experiment with more integrated, flexible training formats that are embedded in the daily life of sports clubs.

Co-creation continues to be a powerful lever for generating awareness and motivation, but for this to translate into stable and lasting participation, more work is needed on timing, communication and the forms of intervention. The iterative process that characterises co-creation has made it possible to continue the project through further discussions with institutions, health professionals and sports clubs in order to identify other ways of implementing the training and dissemination course.

9.1 Implications for the future

In light of the conclusions that emerged from the co-creation process, it is important to identify some strategic implications for the future. One of the main actions to consider is the possibility of integrating targeted training courses at the beginning of each sporting year, aimed specifically at coaches and technical staff of sports clubs. These courses should focus on effective communication with young people, self-image management and early recognition of warning signs of FEDs, promoting prevention and well-being.

In line with recent WHO guidelines on the 'Health Promoting Sports Coach' model, a structured and shared methodology could be adopted to promote health in sport. This methodology includes checklists to be used before, during and after training sessions and competitions, as well as concrete strategies to strengthen the skills of coaches and the awareness of young athletes and their families. In addition, periodic information sessions could be planned directly for young athletes and their families, taking advantage of already scheduled sporting events and using appropriate and participatory training methods, incorporated into the routine of sports clubs.

It should also be noted that internal communication within sports clubs is often poorly structured; the introduction of a wellness representative could, in the long term, be an effective way of improving coordination with health institutions and prevention projects in the area. This figure, with liaison and facilitation functions, could help to ensure the continuity of initiatives, while promoting the dissemination of good practices and the construction of stable collaboration networks between the sporting world and the local health system.

The participatory methodologies used during the project clearly showed greater involvement when coaches and sports clubs were directly called upon to contribute and co-create the programmes. It is therefore important to continue to favour tools such as focus groups and workshop sessions to encourage active participation and deeper engagement. By using the model proposed by the WHO as a reference and maintaining the participatory approach tested, it will be possible to promote a widespread culture of awareness and prevention, contributing to the physical and psychological well-being of young athletes.

The Future of HCL

HCLs were created to activate shared and sustainable innovation processes, in which the community and stakeholders become protagonists. Their purpose is not to co-create temporary solutions, but to leave the responsibility and capacity to carry them forward over time in the hands of the community. Each HCL therefore aims to build autonomy and collective *agency*, encouraging the creation of local networks capable of keeping alive and regenerating the change produced.

To ensure that these local experiences do not remain isolated initiatives but become structural policies and stable tools for innovation in the regional healthcare system, a further step is necessary: the creation of *the Health Community Hub* (HC HUB).

The HC HUB represents the evolutionary perspective of HCLs: a regional platform for coordination, learning and enhancement, capable of ensuring methodological consistency, disseminating and replicating innovations, and integrating results into healthcare system policies and services. Without such an institutional and political framework, HCLs would risk remaining episodic experiments, whereas their potential is to become permanent drivers of systemic innovation, serving the health and well-being of Tuscan communities.

Bibliography

Ali di vita Onlus. (2018). Eating Disorders. Medical and psychological aspects. Interactive training course for educators, teachers, sports coaches, parents. https://www.alidivita.org/2018/02/2018-marzoaprile-corso-di-formazione.html

Álvarez-Pérez, Y., Perestelo-Pérez, L., Rivero-Santanta, A., Torres-Castaño, A., Toledo-Chávarri, A., Duarte-Díaz, A., & Ic-Health Project Consortium. (2022). Co-creation of massive open online courses to improve digital health literacy in pregnant and lactating women. International Journal of Environmental Research and Public Health, 19(2), 913.

Álvarez-Pérez Y, Duarte-Díaz A, Toledo-Chávarri A, Abt-Sacks A, Ramos-García V, Torres-Castaño A, Rivero-Santana A, Perestelo-Pérez L. Digital Health Literacy and Person-Centred Care: Co-Creation of a Massive Open Online Course for Women with Breast Cancer. International Journal of Environmental Research and Public Health. 2023; 20(5):3922. https://doi.org/10.3390/ijerph20053922

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Ansell, C., & Torfing, J. (2021). Co-creation: the new kid on the block in public governance. Policy & Politics, 49(2), 211-230.

Arnaldi, S., Crabu, S., & Magaudda, P. (2022). Co-creation and responsibility in grassroots technoscientific innovation. ETEROTOPIE, 1-211.

Benetton, M., & Visentin, S. (2021). Inclusive physical activity and sport. Pedagogical reflections and teaching strategies for universal motor experiences (Vol. 7, pp. 1-223). Guerini scientifica. https://www.research.unipd.it/handle/11577/3388022

Bennett, C. J., Barber, C., Rose, E., Palermo, C., & Dart, J. (2024). Supporting nutrition and dietetics students' relationships with food and body image: Adopting a co- created curricula approach. Nutrition & Dietetics, 81(3), 306-315.

Biggeri M., Betti E., Boffo V., Bonaccorsi G., Caruso E., Gallo P., Lingua V., Menicagli D., Setola N. (2025a) Health Community Lab: a co-creation model for social and health innovation in Tuscany. Florence University Press. Florence.

Biggeri, M., Betti, E., Boffo, V., Bonaccorsi, G., Caruso, E., Lingua, V., Gallo, P., Setola, N., Menicagli, D., & Zagli, F. (2025b). *Contribution of the Health Community Lab to Permanent Observatory* (Deliverable, Tuscany Health Ecosystem – Spoke 10).

Biggeri M., Ferrannini A., Lodi L., Cammeo J., Francescutto A. (2023). *The "winds of change": the SPES framework on Sustainable Human Development. SPES Working paper no. 2.1, SPES project – Sustainability Performances, Evidence and Scenarios.* Florence: University of Florence. Available at: https://www.sustainabilityperformances.eu/publications-deliverables/

Biggeri, M., & Ferrannini, A. (2014). Sustainable human development: A new territorial and people-centred perspective. Palgrave Macmillan London. https://doi.org/10.1057/9781137380296.

Bonci, C. M., Bonci, L. J., Granger, L. R., Johnson, C. L., Malina, R. M., Milne, L. W., ... & Vanderbunt, E. M. (2008). National Athletic Trainers' Association Position Statement: Preventing, Detecting, and Managing Disordered Eating in Athletes. Journal of Athletic Training, 43(1), 80-108. https://doi.org/10.4085/1062-6050-43.1.80

Bovill, C. (2020). Co-creation in learning and teaching: The case for a whole-class approach in higher education. Higher Education, 79(6), 1023-1037.

Bovill, C., Cook-Sather, A., Felten, P., Millard, L., & Moore-Cherry, N. (2016). Addressing potential challenges in co-creating learning and teaching: Overcoming resistance, navigating institutional norms, and ensuring inclusivity in student–staff partnerships. Higher Education, 71, 195-208.

Bratland-Sanda, S., & Sundgot-Borgen, J. (2013). Eating disorders in athletes: Overview of prevalence, risk factors and recommendations for prevention and treatment. European Journal of Sport Science, 13(5), 499–508. https://doi.org/10.1080/17461391.2012.740504

Centro DCA di Bari (N.D.). 5 tips for coaches on how to identify eating disorders in athletes. https://www.centrodca.it/5-consigli-per-gli-allenatori-su-come-individuare-disturbi-alimentari-negli-atleti/

Cereda, F. (2015). Qualification, training and profession of sports instructors in national and European contexts. Lifelong Lifewide Learning, 11(26), 1-9. https://doi.org/10.19241/lll.v10i26.173

Clifford, L., Tyler, R., Knowles, Z., Ashworth, E., Boddy, L., Foweather, L., & Fairclough, S. J. (2023). Co-creation of a school-based motor competence and mental health intervention: Move Well, Feel Good. Children, 10(8), 1403.

Couture, S., Lamarche, B., Morissette, E., Provencher, V., Valois, P., Goulet, C., & Drapeau, V. (2015). Evaluation of sports nutrition knowledge and recommendations among high school coaches. International Journal of Sport Nutrition and Exercise Metabolism, 25(4), 326-334. https://doi.org/10.1123/ijsnem.2014-0195

Crocker, D. A., & Robeyns, I. (2009). Capability and agency. Amartya Sen, 60-90.

Danaher, K., & Curley, T. (2014). Nutrition knowledge and practices of varsity coaches at a Canadian university. Canadian Journal of Dietetic Practice and Research, 75(4), 210-213. https://doi.org/10.3148/cjdpr-2014-021

Dollinger, M., Lodge, J., & Coates, H. (2018). Co-creation in higher education: Towards a conceptual model. Journal of Marketing for Higher Education, 28(2), 210-231.

Italian Gymnastics Federation and Auxologico IRCCS Foundation. (2022). Eating and nutritional disorders in sport: FGI and Auxologico IRCCS join forces to promote research and prevention. https://www.federginnastica.it/news/27248-disturbi-alimentari-e-della-nutrizione-nello-sport-fgi-e-auxologico-irccs-insieme-per-promuovere-ricerca-e-prevenzione.html

Focus on Feeding and Eating Disorders in young people up to 25 years of age in the three-year period 2019-2021. (2024). Ministry of Health. Retrieved 25 September 2024, from https://www.salute.gov.it/portale/documentazione/p6_2_2_1.jsp?lingua=italiano&id=3423

Fusco, F., Marsilio, M., & Guglielmetti, C. (2023). Co-creation in healthcare: Framing the outcomes and their determinants. Journal of Service Management, 34(6), 1-26.

Corley, G., & Demarest-Litchford, M. (1990). Nutrition knowledge and dietary practices of college coaches. Journal of the American Dietetic Association, 90(5), 705-709. https://doi.org/10.1016/S0002-8223(21)01607-2

Gray D, Brown S, Macanufo J. Empathy Map. Gamestorming – A playbook for innovators, rulebreakers and changemakers. Sebastopol: O'Reilly Media Inc.; 2010. 65–66.

Grindell, C., Coates, E., Croot, L., & O'Cathain, A. (2022). The use of co-production, co-design and co-creation to mobilise knowledge in the management of health conditions: A systematic review. BMC Health Services Research, 22(1), 877.

Heffner, J. L., Ogles, B. M., Gold, E., Marsden, K., & Johnson, M. (2003). Nutrition and eating in female college athletes: A survey of coaches. Eating Disorders, 11(3), 209–220. https://doi.org/10.1080/10640260390218666

The behaviours, habits and lifestyles of the adolescent population in Tuscany before and during the COVID-19 pandemic. (2022). Retrieved 25 September 2024, from https://www.ars.toscana.it/images/pubblicazioni/Rapporti/2022/Libro_Edit_2022xweb_24_11xweb_def.pdf

Jacob, R., Couture, S., Lamarche, B., Provencher, V., Morissette, É., Valois, P., Goulet, C., & Drapeau, V. (2019). Determinants of coaches' intentions to provide different recommendations on sports nutrition to their athletes. Journal of the International Society of Sports Nutrition, 16(1), 57. https://doi.org/10.1186/s12970-019-0311-x

Kitzinger J. (1995). Qualitative research. Introducing focus groups. BMJ (Clinical research ed.), 311(7000), 299–302. https://doi.org/10.1136/bmj.311.7000.299

Kontele, I., & Vassilakou, T. (2021). Nutritional risks among adolescent athletes with disordered eating. Children (Basel, Switzerland), 8(8), 715. https://doi.org/10.3390/children8080715

Könings, K. D., Mordang, S., Smeenk, F., Stassen, L., & Ramani, S. (2021). Learner involvement in the co-creation of teaching and learning: AMEE Guide No. 138. Medical Teacher, 43(8), 924-936.

La vita Oltre Lo specchio Onlus. (2022). Body & food project. Promoting a positive body image.

Laurisz, N., Ćwiklicki, M., Żabiński, M., Canestrino, R., & Magliocca, P. (2023). The stakeholders' involvement in healthcare 4.0 services provision: The perspective of co-creation. International Journal of Environmental Research and Public Health, 20(3), 2416.

Leminen, S., Westerlund, M., & Nyström, A. G. (2012). Living labs as open-innovation networks. Technology Innovation Management Review, 2(9), 6-11.

Martinsen, M., Bratland-Sanda, S., Eriksson, A. K., & Sundgot-Borgen, J. (2010). Dieting to win or to be thin? A study of dieting and disordered eating among adolescent elite athletes

and non-athlete controls. British Journal of Sports Medicine, 44(1), 70–76. https://doi.org/10.1136/bjsm.2009.068668

Messiha, K., Chinapaw, M. J. M., Ket, H. C. F. F., et al. (2023). Systematic review of contemporary theories used for co-creation. Journal of Public Health, 45(3), 723–737. https://doi.org/10.1093/pubmed/fdad046

McCaffrey, L., McCann, B., Giné-Garriga, M., et al. (2025). Co-creation experiences among adults in diverse contexts. Public Health, 238, 29–36. https://doi.org/10.1016/j.puhe.2024.11.002

Morgan, J. F., Reid, F., & Lacey, J. H. (2000). The SCOFF questionnaire: A new screening tool for eating disorders. The Western Journal of Medicine, 172(3), 164–165. https://doi.org/10.1136/ewjm.172.3.164

Nguyen, H. T., Marques, P., & Benneworth, P. (2022). Living labs: Challenging and changing the smart city power relations? Technological Forecasting and Social Change, 183, 121866.

World Health Organisation. (2015). WHO global strategy on people-centred and integrated health services: Executive summary (No. WHO/HIS/SDS/2015.20). World Health Organisation.

World Health Organisation. (2024) Be an empowering and supportive coach: Health Promoting Sports Coach implementation guidehttps://www.who.int/europe/publications/i/item/WHO-EURO-2024-10391-50163-75563

Regional Diagnostic Therapeutic Care Pathway (PDTA) for feeding and eating disorders - Tuscany Region (2025). https://www301.regione.toscana.it/bancadati/atti/Contenuto.xml?id=5456032&nomeFile=Delibera_n.155_del_17-02-2025-Allegato-A

Perestelo-Perez, L., Torres-Castaño, A., González-González, C., Álvarez-Perez, Y., Toledo-Chavarri, A., Wagner, A., & IC Project Consortium. (2020). IC-Health project: Development of MOOCs to promote digital health literacy: First results and future challenges. Sustainability, 12(16), 6642.

Petrini, M. (2023). The practice of care in sports contexts. Between a sense of limits and the pursuit of well-being. Journal of Health Care Education in Practice, 5(1), 71-81. https://doi.org/10.14658/PUPJ-jhcep-2023-1-8

Portuguez-Castro, M. (2023). Exploring the potential of open innovation for co-creation in entrepreneurship: A systematic literature review. Administrative Sciences, 13(9), 198.

Rubio, M. A., Mosquera, D., Blanco, M., Montes, F., Finck, C., Duval, M., & Sarmiento, O. L. (2022). Cross-sector co-creation of a community-based physical activity programme for breast cancer survivors in Colombia. Health Promotion International, 37(3), daac073.

Schaal, K., Tafflet, M., Nassif, H., Thibault, V., Pichard, C., Alcotte, M., Guillet, T., El Helou, N., Berthelot, G., Simon, S., & Toussaint, J. F. (2011). Psychological balance in high-level athletes: gender-based differences and sport-specific patterns. PloS one, 6(5), e19007. https://doi.org/10.1371/journal.pone.0019007

Smith, B., Williams, O., Bone, L., & Collective, T. M. S. W. C. P. (2023). Co-production: A resource to guide co-producing research in the sport, exercise, and health sciences. Qualitative Research in Sport, Exercise and Health, 15(2), 159-187.

Sundgot-Borgen, J., & Torstveit, M. K. (2004). Prevalence of eating disorders in elite athletes is higher than in the general population. Clinical Journal of Sport Medicine, 14(1), 25–32. https://doi.org/10.1097/00042752-200401000-00005

Sundgot-Borgen J, Garthe I. Elite athletes in aesthetic and Olympic weight-class sports and the challenge of body weight and body compositions. J Sports Sci. 2011;29 Suppl 1:S101-14. doi: 10.1080/02640414.2011.565783. Epub 24 May 2011. PMID: 21500080.

Vargas, C., Whelan, J., Brimblecombe, J., & Allender, S. (2022). Co-creation, co-design, co-production for public health. Public Health Research & Practice, 32(2), 3222211. https://doi.org/10.17061/phrp3222211