

What is doping? Opinions, knowledge and attitudes towards the use of substances among sport recreational environment participants

INTELLECTUAL OUTPUT 1

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1. INTRODUCTION

Historically, doping contrast efforts have been focused on the detection and deterrence of illegal substances in elite competitive sport and implied essentially testing programmes and eventually assigning sporting sanctions. Nowadays, next to the importance of doping control at elite level, there is a growing realization in the EU that such rules and programs need to be backed by wider efforts to prevent the establishment of a pro-doping culture mainly outside elite contexts, specifically in recreational environments, where youngsters are usually not aware of its consequences and dangers (Backhouse, 2014).

Several studies show that from 0.6% to 5% of adolescents use illegal Performance and Appearance Enhancing Substances (PAES) (Mallia, Lucidi, Zelli, & Violani, 2013). These kinds of substances can be catalogued in two types:

- Uncontrolled PAES, that can be purchased without any restriction or legal sanction (i.e., protein formulas, creatine, amino-acids, minerals, and vitamins);
- Controlled PAES, that include hormonal substances like anabolic androgenic steroids and other testosterone derivatives, growth hormone and insulin growth factor, erythropoietin, and psychoactive substances.

Controlled PAES use are regulated by law. They are mostly known as “doping substances” and are prohibited in elite and competitive sports, according to the World Anti-Doping Agency (WADA).

Despite existing policies and regulations, the use of controlled PAES/doping substances has become increasingly popular among non-athletes over the last decade, especially among the youngest (Lazuras et al., 2017) (Pope et al., 2014). The nonmedical use of controlled PAES has become more common among non-athletes and more used by recreational exercisers (Parkinson and Evans, 2006; Kanayama et al., 2010). These data represent a very serious “alarm bell” also because the uncontrolled use of controlled PAES has been associated with a wide range of adverse mental and physical problems (e.g., depression, anxiety, body shape problems like dismorphophobia). This risk can be even more pronounced among younger users (Quaglio et al., 2009).

One of the most worrying fact is that controlled PAES/doping in the past was more frequently used among older rather than younger adolescents (Johnston et al., 2007), but nowadays it has been spreading across all levels of sports and it is going to involve people as young as 12 years (Dunn and White, 2011).

1.1 Preliminary need analysis

Some recent studies about doping in sport (we'll now refer to controlled PAES as doping), both at institutional (i.e. European Study on Doping Prevention, 2014) and academic level (Dunn & White, 2011; Barkoukis, Kartali, Lazuras, & Tsorbatzoudis, 2016), prove that doping use is constantly increasing, particularly in sports practiced in recreational environments (i.e., gym, or non-structured sport activities). This is particularly alarming because the presence of youth in such contexts is getting more and more frequent. So, according to the Barkoukis and colleagues' study, "There is a need to fight doping at grassroots levels, and to implement anti-doping interventions involving wider social groups (e.g., amateur athletes)" (Barkoukis et al., 2016, p. 2). This is mainly because, summarizing the authors' study, doping tends to be used more in non-athletes and adolescents target groups, thus making these populations more susceptible to drug and substances abuse, and contributing to the establishment of a "pro-doping culture" that needs to be contrasted.

Moreover, according to the WADA final report "Determinants of Doping Intentions in Sports", personal attitudes and motivational orientations can lead adolescents toward doping use within recreational sport because young people often don't consider doping as unethical. The document suggests that, in order to

contrast the establishment of a pro-doping culture in recreational sport environments, it is crucial to educate youth on ethical behaviours and to work on their attitudes and motivational orientation toward sport (Tsorbazoudis, 2009) and any widespread awareness campaign would require a clear and careful shared planning among different stakeholders.

1.2 The DRAWS methodology and innovative bottom-up approach

In such a scenario, the DRAWS project significantly addresses the goal of combating doping in recreational environments (focusing on adolescents aged 14-19) by proposing a set of activities and EDU-communicational tools that aim at preventing the creation of a pro-doping culture within this target group.

An innovative approach to this issue is adopted in DRAWS as compared to other funded projects on the same issue: as a matter of fact, a bottom-up approach directly involving the target group in the different project activities is the project characteristic allowing active and direct participation of young participants, their contributions, inputs, feelings and motivations being key to the development of tailored training materials and edu-communication tools, thus setting a change of paradigm in the anti-doping scenario.

The present Report describes in detail the first project milestone: Data Collection conceived to better understand knowledge, attitudes, opinions and implicit or explicit motivational orientation towards the use of controlled or uncontrolled Performance and Appearance Enhancing Substances (PAES) which are the core topic of the project.

2. PARTNERS

The project involves Partner organizations from East and Mediterranean regions of Europe that have been touched by doping scandals in the past and therefore are particularly interested in fighting and preventing the establishment of a pro-doping culture among young sport participants. Moreover, the Consortium involves organizations with different roles within the sport industry, which proves to be very useful in implementing actions as effective as possible. In detail, Partners belong to the following sectors:

- recreational sport organizations whose daily work is addressed to the target group (youth participants in recreational sport), namely:
 - **Český svaz aerobiku a fitness (FISAF)** plays a fundamental role in implementing activities of the project as is the only partner in the Consortium able to involve the fitness area in the implementation of the project (i.e., gyms, fitness centre, and other recreational environments).
 - **Levski - Sport for All (LSFA) and Hask Mladost (HKML)** are multi-sport associations have direct contact with the target group of young recreational environments sport participants and they can significantly contribute to successfully achieve the implementation of the planned

activities; in addition, being part of the European Multi-sport Club Association (EMCA) they will deeply contribute to an additional dissemination of the project intellectual output;

- Unions of sport federations and National Olympic Committees that are very active in the field of doping prevention and education of youth athletes, i.e.:
 - **the Latvian Sports Federation's Council (LSFC)** is a member of the Anti- Doping Committee and it is part of the Latvian Doping Prevention network reaching all levels (Elite, Competitive and Recreational sport) working in close connection with the Ministry of Education and Science, the Ministry of Health, the Latvian Olympic Committee, Latvian Paralympic Committee and the Latvian Sports For All Association. Moreover, LSFC has a very strong experience in the field of communication and could support effectively project communication and dissemination;
 - **the Lithuanian Union of Sport Federations (LUSF)** will be able to reach a great number of recreational sport organizations and their members, effectively identifying the target group and ensuring greater impact in terms of dissemination; moreover, the LUSF has specific competence in supervising and monitoring the dissemination of the tools created in the project;

- **the Italian National Olympic Committee (CONI)** has a very detailed regulation on the subject of doping and has already developed wide-ranging youth information campaigns for the protection of health in sporting activities and doping prevention, especially in public and private schools of every type and level, in co- operation with public authorities. Moreover, CONI has a very strong network of schools and sport organizations at recreational level and could effectively take part to many of the activities of the project;
 - **LEGA PRO**, has a network of 57 amateurs soccer clubs - involving as “members” more than 10.000 youth sport practitioners - spreading throughout the Italian territory. Next to this main activity, Lega Pro also manages a number of projects dedicated to sport integrity dissemination among youth, in schools and affiliated soccer clubs, in the following areas: sport ethic, security during sport competitions, integrity in sport and contrast of match-fixing and a project dedicated to youth and adults with cognitive-relational disability.
- a well known International institution that works in the dissemination of sport integrity and values:
- **International Olympic Truce Centre (IOCT)**, will effectively collect many declarations of interests/support/sponsorship of the project from external

organizations, national and international Authorities, NOGs interested in sport integrity diffusion among sport, Sport Foundations, firms, Ministries of Youth/Sport/School as it is a very well-known organization in the field of sport integrity and values promotion;

- an academic leader with strong experience in the field of integrity in sport and a deep knowledge of training and educating sport actors:

- **Università Cattolica del Sacro Cuore (UCSC)** holds a strong experience in the field of sport integrity and specifically doping prevention, thanks to a strong network of collaborators. Moreover, thanks to the participation in a number of national and international projects, UCSC also has developed a solid expertise in project management and research-driven evidence-based training actions in all its phases (building, development, implementation and evaluation) especially with sport actors. Therefore, UCSC will guarantee a maximum scientific quality in the elaboration of both methodology and tools that will be created with the direct involvement of all partners.

3. THE THEORETICAL FRAMEWORK

Sport is a complex phenomenon originated by intertwined personal and individual traits, group dynamics and history, organizational and socio-cultural characteristics.

In this project, we adopted a psychosocial approach, suitable to understand those psychological, social, contextual, and cultural factors that are related to people's behaviours, and in our case, PAES use. This approach refers to well-established socio-ecological models of health behaviours (Sallis, Owen, & Fisher, 2008). These models consider multiple levels of influence on specific health habits and interactions of risk and protective factors across these different levels (Figure 1). Ecological models of health behaviour emphasize the environmental and policy contexts of behaviour, while incorporating influences at the individual (e.g., psychological factors such as individual attitudes) and social (e.g., perceived social norms in regard to what is considered an acceptable behaviour in groups that are important to the individual) levels.

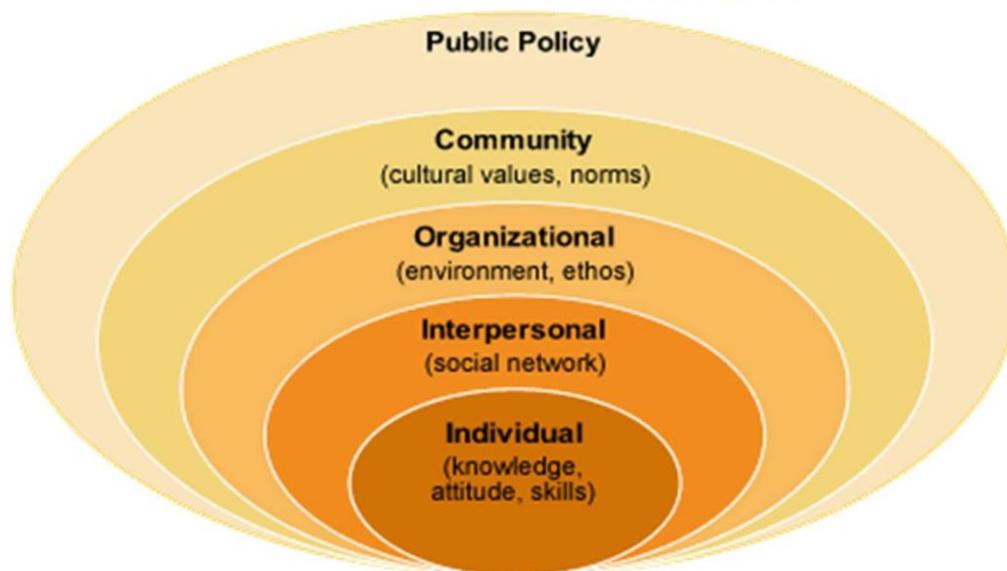


Figure 1. Levels of influence in socio-ecological models

Accordingly, multi-level interventions that attempt to tackle factors at different levels should be most effective in behaviour change. This means that research and interventions should not only address factors related to the individual, but that aspects related to social relationships with key figures in adolescents' life, including parents and coaches, and factors related to contexts where individuals live and practice sport (e.g., sport club cultures) are important to consider.

3.1 Literature review

The use of Performance and Appearance Enhancing Substances (PAES) is a major issue in elite competitive sports and a growing public health problem among amateur and recreational athletes (Dunn, Thomas, Swift, & Burns, 2012; FAIR, 2019).

Research has generally addressed this issue among talented athletes who face pressures to achieve results as they aspire to a career at an elite level (Bloodworth, Petróczi, Bailey, Pearce, & McNamee, 2012). However, the reality of adolescents practicing sport in exercise and amateur sport settings is likely to be different. For example, athletic performance enhancement may represent a key goal of many doping users, though many others may use doping to improve their physical appearance and body shape instead (Zelli, Lucidi, & Mallia, 2010). In addition, the lack of antidoping controls in low-level competitions or non-competitive settings may further contribute to reducing knowledge and risk perception of banned substances (FAIR, 2019).

Studying adolescents is of particular importance because doping may be particularly harmful to their developing body (Thiblin & Petersson, 2005), but also because lifestyles and health-related behaviours that are established at a young



age tend to persist during adulthood (Wium, Breivik, & Wold, 2015). To this end, even the use of relatively harmless nutritional supplements may bear implications once adulthood is reached. The gateway hypothesis proposes that individuals become increasingly involved in drugs in stages and in sequences (Kandel, 1975). In the sport context, those who engage in legal performance-enhancement practices represent an ‘at-risk’ group for transition toward banned substances. Despite the criticisms, this hypothesis has received support from the research. Among competitive athletes, doping use has been found to be more prevalent among nutritional supplement users compared with nonusers (Backhouse, Whitaker, & Petróczi, 2013), and this association appears to be related to attitudes towards performance enhancement and motivations related to achievement goals (Barkoukis, Lazuras, Ourda, & Tsorbatzoudis, 2020).

3.2 PAES use in recreational sport settings

Following extensive research focusing on elite and professional athletes' PAES use (Blank, Kopp, Niedermeier, Schnitzer, & Schobersberger, 2016), recent years have seen a rise in the number of studies focusing on recreational athletes. Recreational sport is any "sport, exercise and physical activity which takes place in low-level competitive or non-competitive environments and engages



individuals at sport events, fitness centres, sport and leisure clubs, and outdoor-based activities" (European Commission as reported in FAIR, 2019, p. 12).

PAES use in recreational sport is increasing at all levels and age groups as part of societal and cultural process of medicalization and substance-enhanced lifestyle and sport practice (Pedersen, 2010). Athletes' self-reported reasons for taking PAESs are mainly related to achieving better performance and win competitions, improving their physical appearance, perceived external pressure (e.g., from fellow athletes or trainers), and fear that competitors have a chemically or medically enhanced, unfair advantage (Petróczi & Aidman, 2008). As mentioned, in recreational settings, the link between doping use and performance enhancement may well not be as straightforward and depend on the setting and sport. Aesthetic goals may be primary over the desire to improve physical capacity, especially in specific settings such as gyms and fitness culture (Christiansen, Vinther, & Liokaftos, 2017; Coquet, Roussel, & Ohl, 2018).

Research focusing on adolescent non-elite athletes is limited. A study in Germany found both recreational athletes and competitive athletes performed poorly on a knowledge test regarding doping, thus demonstrating widespread lack of knowledge on the issue (Wanjek, Rosendahl, Strauss, & Gabriel, 2007). Doping



use and attitudes have been found to be meaningfully interacting with more general values in sport such as attitudes toward cheating (Mudrak, Slepicka, & Slepickova, 2018). Other studies have addressed doping use with respect to body dissatisfaction and motivational drives to achieve certain societal ideals revolving around thinness and muscularity, and how these interact with attitudes towards PAES use. These studies found a positive relationship between perception of masculinity and muscularity, body image concerns, use of nutritional supplements, and attitudes towards the use of doping (Nilsson, Spak, Marklund, Baigi, & Allebeck, 2005; Yager & O'Dea, 2014; Zelli et al., 2010). Lazuras et al. (2017) suggested that the use of PAESs among young exercisers can be explained by an underlying competitive sport' mindset whereby the focus is on immediate performance improvement and reaching short-terms goals, paired by the downplay of the long-term and harmful effects of doping use.



4. RESEARCH OBJECTIVES AND OVERALL DESIGN

In light of the abovementioned literature gaps, DRAWS aimed to provide a better understanding of European adolescents' attitudes and representations of the use of controlled and uncontrolled PAES in recreational sport settings. Having a nuanced understanding of the target population's perspective on this issue is crucial to inform future targeted educational antidoping campaigns and prevention programmes.

For these reasons, we conducted a study using both a qualitative in-depth and a quantitative extensive approach. More specifically, a sequential exploratory mixed methods design (Ivankova, Creswell, & Stick, 2006) was used whereby qualitative data is collected first to explore the issue before conducting an extensive survey. CONI and UCSC collaborated in conducting the qualitative study with Italian adolescents, whereas all partners contributed to the quantitative study by collecting survey data among adolescents in their respective countries. Ethical approval for this study was obtained from the Università Cattolica del Sacro Cuore institutional review board.



Annex 1

The qualitative data collection



The present qualitative study examined perspectives of controlled and uncontrolled PAES among adolescents practicing sport in recreational sport settings. We were interested in facilitating the emergence of spontaneous knowledge and attitudes from our adolescent participants.

1. Method

Focus group interviews were chosen for data collection. This group technique offers an in-depth understanding of participants' perspective. This enables researchers to uncover personal attitudes and beliefs that other research methods (i.e., questionnaires) cannot replicate. In a focus group setting, respondents tend to have a more natural relationship, which encourages a better dialogue. Additionally, due to the continuous interaction and exchanges between participants, focus groups also encourage better group discussions and increased debate. Not only does this keep participants interested and engaged, but it also enables them to really talk and discuss, unlocking new insights that would otherwise remain undisclosed. Another benefit of focus groups is that they allow moderators to follow the discussion flow and probe respondents for more in-depth answers when needed (i.e., semi-structured interviews). Despite our initial intent to conduct face-to-face interviews, we were forced to switch to the online



format because of the Covid-19 health emergency that started in early 2020. This choice turned out to be advantageous because it removed geographical barriers and allowed us to reach a more diverse sample at a national level. Online methodologies are also a good way to interact with younger audiences.

Eight focus group interviews were conducted with a total of 40 participants between June and October 2020. Each focus group was conducted by a researcher with training and expertise in qualitative research. A research assistant was present to take notes. Each session lasted approximately 1.5 hours and consisted of four to six participants.

Discussions used a standardized script with broad questions followed by open-ended prompts. The interview topic guide was first pilot tested to ensure it was understandable and sound from the adolescents' perspective. It aimed to explore sport practice motivation, the meaning of ‘success’ in sport, and habits with regards to food intake and supplements (uncontrolled PAES) related to their sport activity. After spontaneous responses to a brainstorming session, participants were provided with a definition of controlled and uncontrolled PAES, and prompted to discuss their attitudes, knowledge sources of information (media, club, school,



etc.), and experience in talking with significant others (e.g., coaches, family member, peers) about this topic. Participants were prompted to think about scenarios of situations at risk of doping (e.g., desire to recover quickly from an injury) drawn from the literature (Whitaker, Long, Petróczi, & Backhouse, 2014).

2. Participants

Participants were recruited either by direct approach, or through their coaches or physical education teachers, with parental consent required for all participants under the age of 18. No incentive for participation was offered. Inclusion criteria were age between 14 and 19 years and practicing sport at a recreational level at least once a week. Individuals receiving any form of compensation for doing sport were excluded. Eligible participants were invited using a maximum variability theoretical sampling strategy (Palinkas et al., 2015) aiming at achieving variability in (a) age, (b) gender, and (c) primary sport practiced. A total of 40 participants were involved.

Forty percent of participants were female (N = 16) and mean age was 16.7, SD = 1.54, range 14 – 19 years. The majority were enrolled in secondary school (92.5%). Participants lived in four different regions in Northern (N = 17), Central (N = 20) and Southern (N = 3) Italy.



Participants practiced 14 different sports, with football (28%), athletics (15%) and basketball (10%) being the most represented. Other sports were, for example, water polo, tennis, fitness, swimming, and gymnastics.

3. Data analysis

Interviews were digitally recorded and transcribed verbatim. NVivo 11 was used to support data management and analysis. A matrix that included both theory-driven codes, as well as those related to emerging themes was finalized and used to code all interviews. A thematic analysis of the transcripts was conducted (Braun & Clarke, 2012). Initial coding was broad, inclusive and linked to the topic guide. These were then broken into sub codes, and finally, codes were sorted into common and discrepant themes.

4. Results

The main results of the content analysis carried out are presented below.

For the sake of clarity, the analyses are subdivided into thematic areas; a general summary of the main results of the qualitative research phase is presented in a final paragraph of Annex 1.



4.1 Motivation for practicing sport

Participants described what motivated them to practice sport (Figure 1).

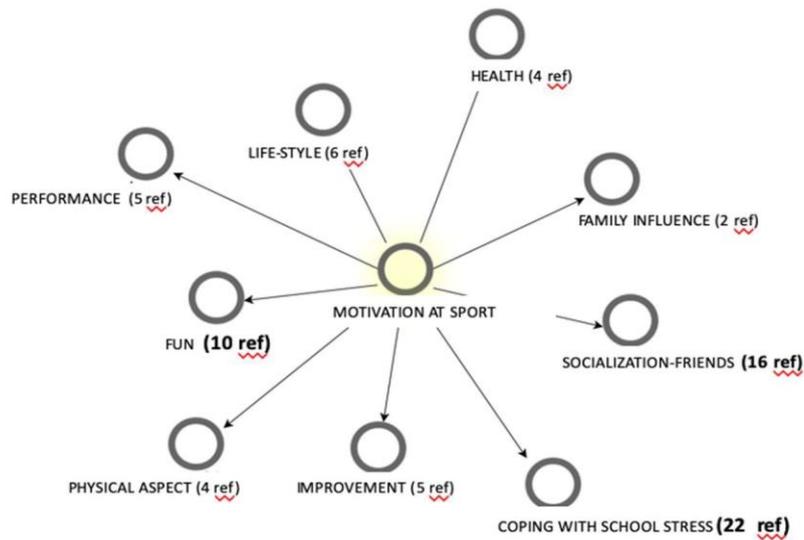


Figure 1. Adolescents' motivations to play sport

Motivations revolved around enjoyment, coping with stress from school, and socialization.

- "There is fun above all, as in all sports' (FG 5).
- "Going out for those two hours of sport is a liberation" (FG1)
- "It's that moment of fun, that moment when I get away from my school commitments.
- "The locker room is fundamental, in my opinion it's like a second family, let's say, among boys like that we are friends not just teammates" (FG 3)

- "Overcoming shyness, because before playing football and being part of a group like a team, I was very shy, but now playing football has helped me open up and become more social (FG 4)

A few mentioned doing sport as part of a healthy lifestyle, whereas competing against others / performing was relatively low on their priorities.

- "To me it is really an important in life just to feel good about yourself" (FG 5)
- "To me as well the competition is a very important and also the improvement in the competition." (FG 2)

These motivations reflect the nature of our target group which consists of amateur athletes. Only a few participants practiced sport with greater intensity.

4.2 What does “success” in sport mean?

Next, the representation of success in sport for the adolescents involved was investigated. Figure 2 depicts the main categories attached to the meaning of success in sport that emerged from the data analysis.



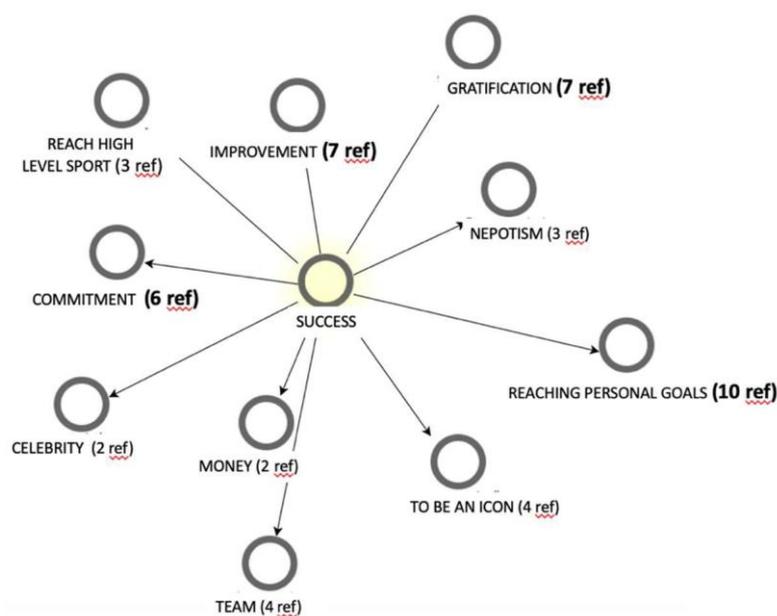


Figure 2: Meaning of success in sport

Success was often reported as a rational and individual component of sport.

Success was indeed most frequently defined by participants as:

- improvement: "I think winning is important and fulfilling but improving is more so." (FG 6)
- individual gratification: "To me success is gratification. If I go and play a football game with my friends and I win, it's a satisfaction" (FG 7).
- commitment in the sport practice: "it means commitment but a lot of commitment" (FG 5)
- achieving personal goals: "achieving your goals, overcoming your limits. If they are also the limits of others, it makes you happier" (FG 6)

Meanings more related to notoriety also emerged: becoming a celebrity "being known for being the strongest among all" (FG 4), making money "success is when you get a lot of money" (FG 4) and becoming an icon "success is being a role model for someone smaller or I don't know for a lot of people" (FG 5).

A lack of far-reaching dreams (e.g., make it to the Olympics) emerged from our focus groups, but rather an unfair vision of achieving success, such as the nepotism phenomenon " it's all like that in the end, all knowledge." (FG4)

4.3 Diet and nutritional habits

Dietary habits varied extensively: most participants reported having a self-managed diet (15 ref): paying attention to food combinations, and the timing of intake in relation to training and competition times.

- "I have a fairly balanced diet; I don't really pay a lot of attention to it, but of course I try to limit fat or junk food most of the times. Usually, it's more or less pasta for lunch and then carbohydrates and then meat and protein for dinner" (FG 5)



- "Before a competition, I eat a banana or protein like a protein bar. I have 6- 7 meals a day. I like to have some yoghurt, so I never have an empty stomach, let's say to keep the body working". (FG5)

Some participants reported that they refer to nutrition experts for a controlled diet (5 Ref).

- "I follow a diet which differs on training and rest days, where there are more carbohydrates on the training day. I follow this diet, I went to a nutritionist." (FG3)

Uncontrolled PAES in the form of supplements (e.g., vitamins, minerals) were often considered a natural part of any athlete's diet, and participants reported they were often recommended by doctors and nutritionists for health issues.

- "I've always taken supplements because I have a lot of allergies to fruit so I started taking them before I did sport to supplement those vitamins that I can't get through fruit, so I grew up with these things." (FG 1)

4.4 PAES attitudes and knowledge

Participants brainstormed on PAES resulting in the following map:



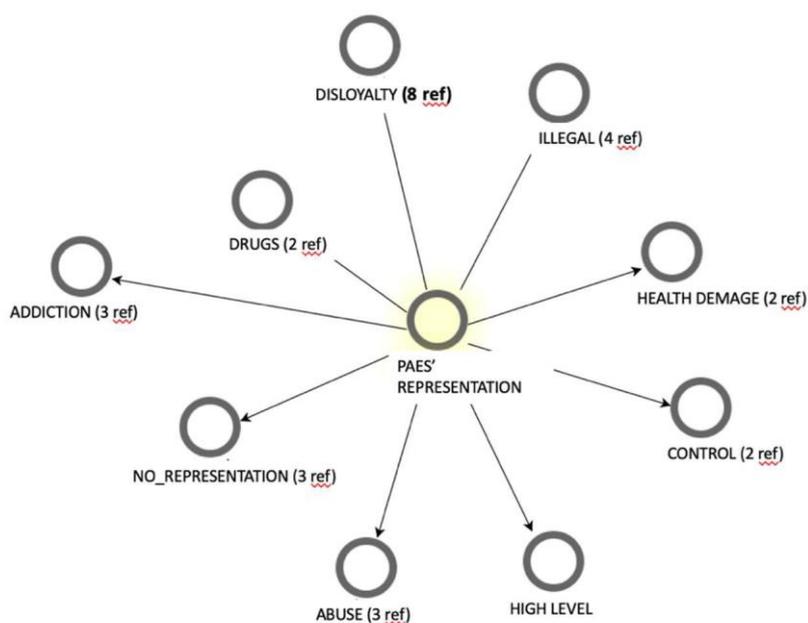


Figure 3. Representation of PAES

Narratives and ideas related to doping and illicit substances prevailed over uncontrolled legal substances.

Controlled PAES (doping) seems a highly sensitive topic for adolescents. It was difficult to engage them in a meaningful discussion (e.g., defensive attitude, stereotypical comments).

The representations that emerged revolved around:

- disloyalty: "a person who lacks certain principles because if he believes that an unfair victory comes before certain principles and physical health because if you achieve goals by using doping but you take away the chance

to other people who have struggled cleanly instead, you disrespect those who work harder than you and would have deserved a certain outcome more." (FG 1)

- illegality: "it's something you have to do under the table, it's just that the way you buy these substances is also different" (FG 2)
- addiction and drugs: " in my opinion it becomes a real addiction, you can't do without it, in my opinion even outside of training and sporting life you take these substances." (FG3)
- abuse: "Then there are those who abuse or use substances that are not consistent with sport." (FG 1)
- health damage: "I think the actual damage to the body, if some substances are banned, I think they are also bad for you, let's say." (FG 2)
- Antidoping control: "a good friend of mine who plays at national level is much more careful about these things than I am "I can't take this because they control me, I have to be careful" (FG4).

After an initial brainstorming session, participants were asked to explain the types of substances taken to promote sporting performance that they were familiar with. The table below displays prevalence of the substances mentioned



by participants.

TYPE OF SUBSTANCES	N° OF REFERENCES
Anabolic steroid	2
Energy drinks	5
Coffee	2
Warming creams	1
Supplements (vitamins magnesium, potassium)	21
medicines (e.g., pain killers, anti-inflammatory)	7
Proteins	3
Steroids	1

In this second round of brainstorming, after participants were prompted with a definition of controlled and uncontrolled PAES, supplements and over-the-counter medicines (e.g., pain killers, anti-inflammatory) were mentioned as well.



Interestingly, such substances were perceived as natural, safe, and acceptable in sport:

- “Supplements are natural and safe. Doping substances are artificial and unsafe” (FG7).

Un-controlled PAES are highly normalized, many participants take supplements regularly.

Participants were also prompted to discuss their knowledge and sources of information about the topic. Results show adolescents know very little about uncontrolled PAES, “it's a bit a forgotten topic, because there aren't that many people you hear that use it but because it's a hidden thing”. (FG 3).

They reported having looked for information online or that they tend to trust people around them who encourage them to take them. The main sources of information include:

- news of doping cases: "when you hear about a famous person who has used substances (...) Because the rest of it is not even mentioned. Like when Sharapova in tennis had used substances and was stopped, or even



Errani (Italian tennis player), they talked about it but I don't even know what substances they used.” (FG 3)

- comparison with peers: "Actually my teammates and acquaintances use them, I've seen them take them, but I don't care too much about it because I consider them pretty useless for me now.” (FG 2)
- internet: “I search the web, also in scientific journals” (FG 5)
- leaflets: "I read it on the little box that says doping." (FG 6)

Participants also reported their experience of talking with significant others about this topic:

- coaches: "maybe we talk more with the athletic trainer, with the coach as well, but more with the athletic trainer and the physiotherapist, those roles." (FG 5)
- family members: “when these cases come up maybe I talk to my parents about it.” (FG 3)
- peers: "it happens very often that these things - not doping but the legal one let's say - is a quite common topic in the locker room. There's always a joke going on about who's taking protein after the game or before training" (FG 2).



About controlled PAES (Doping) they don't know so much. Sources of information vary: schoolteachers, coaches, news cases of professional athletes.

4.5 Attitudes toward using doping

The following is a map of the meanings that emerged from the discussion with respect to perceived reasons for using doping substances.

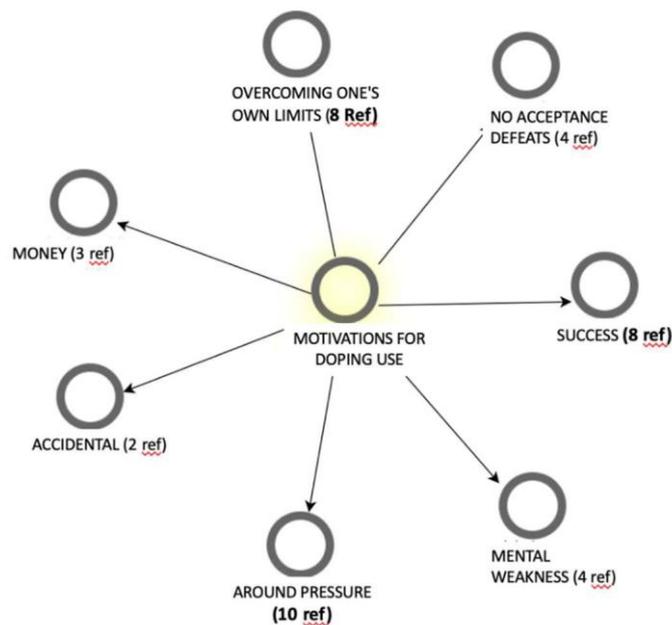


Figure 4. Perceived reasons to use doping substances

The most frequent reasons identified by adolescents as related to the use of controlled PAES (doping) were:

- Financial and social pressure to the athlete: “When it comes to money, there are people who, compared to the player himself, such as managers or

president, have a purpose and earn from the victories, so maybe they don't force the players, but maybe they just throw it out there.” (FG1)

- the desire to achieve success: “may use these substances in order to improve performance and to obviously win a race, to achieve a goal” (FG5)
- the need to overcome one's limits: “Maybe one also feels burdened by not being able to cross that threshold.” (FG 2)
- mental weakness of athletes: “I see it as a thing for weak people” (FG 6)
- Failure to accept defeat: “they are people who do not accept defeat” (FG 3)



5. Summary analysis

Introducing issues around lifestyle, food and supplements proved helpful to stimulate a more general discussion involving PAES use. Overall, our adolescent participants were not fully aware of the differences between certain types of substances, their effects, and the distinction between licit and illicit substances. Reflection in the group, however, allowed us to get a better understanding of their representations on this topic.

In summary, we can report that specific knowledge on licit and illicit PAES is scarce. Starting from more general reflections on the meaning of sport for oneself and one's peers, as well as facilitating a broader reflection on nutritional habits, has made it possible to approach the topic gradually.



ANNEX 2

THE QUANTITATIVE DATA COLLECTION



The aim of the Quantitative Data collection was to obtain a sound database of opinions, attitudes, experiences, and motivational orientations on PAES use among young participants in recreational sport environments. Such data will be used to implement both the tailored training interventions (WP3), the comic stripes (WP4) and the final Report (WP7).

1. Method

An extensive and structured questionnaire was circulated among a wide audience of adolescents in project partners' countries. Questionnaire development was guided by preliminary results of the qualitative study results. Data was collected using the Qualtrics online survey provider. This is a professional tool allowing a joint management of the data and providing an array of services to registered users that improved for data collection and management. Mr. Matteo Bovis, from CONI, was the Qualtrics Platform Administrator, and a National Administrator has been nominated for each Partner Country. National administrators were responsible of translating the questionnaire into national languages, recruiting participants, and collecting parents' consent, managing the data collection and transmitting them anonymously to the Scientific Committee for data analysis.



According to the Helsinki principle for ethical research and GDPR guidelines, participants, or their parents if underage, were given information sheets and privacy statements and required to provide their consent before completing the survey. The information sheet described the research study aims, their rights as participants (e.g., withdrawal) and procedures for data collection and storage. All procedures were consisted with GDPR guidelines. In the Guidelines drawn up to support the work of the National Administrators we recommended the use of the “anonymize” function on Qualtrics platform to make unrecognizable the personal data before sharing the questionnaire responses with the Scientific Committee for analysis.

All procedures were approved by the Ethics committee of the Psychology Department of the Università Cattolica del Sacro Cuore.

1.1 Target groups

Eligibility criteria were being 14 to 19 years and practicing recreational sport at least once per week in any setting (Deelen, Ettema, & Kamphuis, 2018):

- sport practiced in sports clubs (amateur competition level)
- sport practiced in organized contexts, but outside sports clubs (e.g., gyms, swimming pools)



- sport practiced in informal contexts, such as public spaces (e.g., road cycling, running, etc.).

1.2 Recruitment

Participants were recruited by contacting sports clubs and schools that were part of the Partners network as well as direct contacts to recruit people in non-organized sports environment. The impact of Covid-19 pandemic over schools, clubs and gyms was unfavourable to the smooth running of the activities, especially with regard to the information sheets and privacy statements collection, thus causing further delay in the set roadmap.

In the months of September and October 2020, the questionnaire took its final form, was uploaded to the Qualtrics platform and on 10 November data collection started.

2. Measures

The survey included a description of the DRAWS project followed by items to collect data on participants' socio-demographic characteristics (e.g., gender, age, country of residence), sport practiced (e.g., type and frequency of primary sport), and some psychosocial variables including motivations in doing sport, social and



contextual factors (i.e., characteristics of the relationship with their peers, coach/trainer, and family), perceptions revolving around body image and physical appearance, and perspectives of diet and PAES use in sport. The survey also included a measure of Social desirability which allows collecting more reliable information when addressing a sensitive topic as it is in our case. The questionnaire is attached to this report as a supplemental document.

2.1 Socio-demographic characteristics. Participants completed items on gender, age, primary occupation (student, worker), country of residence, and whether their family of origin was from a country other than the country they currently lived in.

2.2 Sport practice. Participants completed items on their primary sport including the frequency they practiced it and the setting (i.e., Sport or school club/ Non-club organized settings/ Informal settings) (Deelen et al., 2018), the number of years of practice, and whether they participated in any competitions (e.g., local leagues, tournaments, federal championships, city run races). For screening purposes, participants were asked whether they got any salary or other forms of financial compensation (receiving money for playing) for playing



sport and they practiced sport with the goal of becoming a professional athlete in the future. Lastly, they were asked to report on their physical health and whether they were injured while doing sport and had to be treated by a doctor or nurse during the past 12 months.

2.3 Motivations in doing sport. We used the Goal Content for Exercise Questionnaire (GCEQ) (Sebire, Standage, & Vansteenkiste, 2008). Based on Self-determination theory (Deci & Ryan, 2000) this scale distinguishes between intrinsic and extrinsic goals. It consists of 20 items and factors tapping intrinsic (social affiliation, health management, and skill development) and extrinsic (social recognition and image) goals.

- Social Affiliation (e.g., “To connect with others in a meaningful manner”)
- Body image improvement (e.g., “To improve the look of my overall body shape”)
- Health Management (e.g., “To increase my resistance to illness and disease”)
- Social Recognition (e.g., “To be well thought of by others”)
- Skill Development (e.g., “To acquire new exercise skills”)

Answers were scored on a seven-point Likert scale, ranging from one (Not at all important) to seven (Extremely important).



2.4 Orientation to success in sport. We used the Task and Ego Orientation in Sport Questionnaire (TEOSC)(Walling & Duda, 1995). It consists of 16 items and two dimensions as follows:

- Ego orientation (e.g., “I can do better than the others”)
- Task orientation (e.g., “I do something I couldn't do before”)

Answers were scored on a seven-point Likert scale, ranging from one (Strongly disagree) to seven (Strongly agree).For brevity, the questionnaire was reduced to eight items by selecting the each dimension' four items with highest saturation as found by Walling and Duda (1995).

The following three measures refer to social and contextual factors, more specifically the characteristics of the relationship with their peers, coach/trainer, and family.

2.4.1 Peers. We used the Peer Motivational Climate in Youth Sport (PMCYs) (Ntoumanis & Vazou, 2005) to measure the quality of the relationships and climate in the team or group of peers adolescents practiced sport with. It consists of 21 items and five dimensions as follows:

- Improvement (e.g., “Help each other improve”)
- Relatedness support (e.g., “Encourage their teammates to try their hardest”)



- Effort (e.g., “Work together to improve the skills they don’t do well”)
- Intra-team competition (e.g., “Encourage each other to outplay their teammates”)
- Intra-team conflict (e.g., “Make negative comments that put their teammates down”).

Answers were scored on a seven-point Likert scale, ranging from one (Strongly disagree) to seven (Strongly agree).

2.4.2 Coach/trainer. We used the Coach – Athlete Relationship Questionnaire (CART-Q)(Jowett & Ntoumanis, 2004). It consists of 11 items and three dimensions as follows:

- Closeness (e.g., “I trust my coach/trainer”)
- Commitment (e.g., “I feel committed to my coach/trainer”)
- Complementarity (e.g., “When I am coached by my coach/trainer, I am ready to do my best”)

Answers were scored on a seven-point Likert scale, ranging from one (Strongly disagree) to seven (Strongly agree).

2.4.3 Family. We used the revised version of the Parent – Initiated motivational climate questionnaire (PIMCQ-2)(White, 1998). Participants are prompted as follows: "Think about the parent or other family member most involved in the sport you practice". It consists of 12 items and three dimensions as follows:



- Learning/enjoyment (e.g., “Is most satisfied when I learn something new”)
- Worry-conducive (e.g., “Makes me worried about failing”)
- Success-without-effort (e.g., “Looks satisfied when I win without effort”)

Answers were scored on a seven-point Likert scale, ranging from one (Strongly disagree) to seven (Strongly agree).

For brevity, the questionnaire was reduced by removing five items from the learning/enjoyment dimension and one from the worry-conducive dimension. As no information was available on factor saturation, items to be removed were randomly selected.

2.5 Perceptions of body image and physical appearance. We used the Sociocultural Attitudes Towards Appearance Questionnaire - 4 Revised (SATAQ-4R) (Schaefer, Harriger, Heinberg, Soderberg, & Kevin Thompson, 2017). The female and male versions of this scale were collapsed into a single 21-item six-dimension scale as follows:

- Internalisation

Thin/Low Body Fat (e.g., “I want my body to look very thin”)

Muscular (e.g., “It is important for me to look muscular”)



General Attractiveness (e.g., “I don’t really think much about my appearance”)

- Pressures:

Family (e.g., “I feel pressure from family members to look thinner”)

Peers (e.g., “I feel pressure from my peers to improve my appearance”)

Media (e.g., “I feel pressure from the media to look in better shape”)

Answers were scored on a seven-point Likert scale, ranging from one (Strongly disagree) to seven (Strongly agree).

2.6 Perspectives on diet and PAES in sport

Participants were asked whether they had ever received personalised nutrition advice from a qualified sports nutritionist or dietitian.

Items of diet habits when doing sport were developed ad hoc by UCSC and CONI team. Examples are: “I only eat commercial balanced meals as per dietary prescriptions”, and “My diet helps me improve my sport performance”.

Answers were scored on a seven-point Likert scale, ranging from one (Strongly disagree) to seven (Strongly agree).



2.7 Perspectives on Sport supplements and over the counter medicines.

We used the Sports Supplements Beliefs Scale (SSBS) (Hurst, Foad, Coleman, & Beedie, 2017). Participants were prompted to respond to what extent they agreed with the statements about sport supplements. The SSBS consists of six items and a single dimension (e.g., “Supplements improve one’s performance”). The following four ad hoc items were added: “Help recover faster after training or a competition/game”, “Supplements contribute to my food supply”, “Regular use of supplements can have negative health consequences”, “Regular use of supplements can possibly lead an athlete to the use of illicit substances (i.e., doping) in the future” (item adapted from (Barkoukis, Lazuras, Lucidi, & Tsorbatzoudis, 2015). Wording of items was revised from first to third person to reflect the reality that many adolescents do not use these substances (i.e., my performance turned into one’s performance).

Answers were scored on a seven-point Likert scale, ranging from one (Strongly disagree) to seven (Strongly agree).

2.7.1 Normative perceptions. We used a single item (“How many people of your age - practising the same sport as you - do you think they would be willing to use sport supplements”) to measure perceived prevalence of supplement use.



Answers were scored on a five-point Likert scale, ranging from one (None) to five (All of them).

Perceived approval of significant others (club manager, coach/trainer, peers, family) was measured by prompting participants as follow: “What the following people you know think about the use of sport supplements to improve sport performance or physical appearance?”. Answers were scored on a five-point Likert scale, ranging from one (Very much against supplements) to five (Very much in favour of supplements). The same was asked in regard to over-the-counter medicines, such as such as anti-inflammatory or pain killers, in sport.

Perspectives on over-the-counter (OTC)medicines were measured using a single ad-hoc items (“Do you think that the regular use of over-the-counter medicines, such as such as anti-inflammatory or pain killers, in sport can have negative health consequences?”), followed by four different response options (1 = Definitely not; 2 = Somehow not; 3 = Somehow yes; 4 = Definitely yes).

2.7.2 Use of supplements and over-the-counter medicines in sport.

Participants’ use of nutritional supplements was measured with a single question (“Have you ever used any legal nutritional sport supplement with the aim of enhancing your athletic performance or improving your physical appearance?”), followed by four different response options (1 = No, I have never used legal



nutritional supplements; 2 = Yes, I have used legal nutritional supplements once, but not ever since; 3 = Yes, I use legal nutritional supplements occasionally; 4 = Yes, I use legal nutritional supplements systematically) (Barkoukis et al., 2015).

Participants' use of over-the-counter medicines was measured using three ad-hoc items referring to scenarios based. Participants were prompted as follows: “When doing sport, have you ever used any over the counter medicines, such as such as anti-inflammatory or pain killers, in the following situations?”. The three situations were “You were in pain after a game or training”, “Before a game or training, so that you could play without pain”, and “Before a game or training, just in case you were in pain during or after it”, followed by four different response options (1 = Never; 2 = Occasionally; 3 = Often; 4 = Regularly).

2.8 Perspectives on controlled PAES

The following section include measures of different aspects related to controlled PAES.

2.8.1 Prototype perceptions of doping user

Based on methods and findings of previous research and theory (Whitaker, Long, Petróczi, & Backhouse, 2012; Whitaker et al., 2014), we developed a list of adjectives that may describe the prototypical image of a doping user among adolescents. Participants were prompted as follows: “The following questions



concern your images of people. For example, we all have an image of what distinguishes the typical movie star (“rich and pretty”) or the typical grandmother (“sweet and frail”). We all know, however, that not all movie stars or all grandmothers correspond exactly with these pictures – but many of them share some typical characteristics. Imagine now the typical person of about your age who uses doping substances. I think, such a person is in general is:”. Using a semantic differential approach, we provided participants with a list of 39 polarised adjectives (e.g., responsible - irresponsible). The characteristics of the prototype will be drawn by selecting those adjectives where responses were polarised towards either end.

Based on the prototype willingness model that argue for the importance of the extent individuals favourably and closely to them perceive the prototype (Whitaker et al., 2014), the list was followed by two further questions: “How favourable do you evaluate, all in all, this type of person” (0 = highly unfavourable to 100 = highly favourable), and “To what extent do you believe the characteristics you perceive to describe this type of person also describe yourself?” (1 = Definitely not to 4 = Definitely yes).

2.8.2 Reasons for not using doping (12 items)

We used a revised version of the measure used by (Lazuras et al., 2017). The



scale consists of 12 items on a single dimension. Participants were prompted as follows: “There are reasons why people DO NOT use doping substances. Indicate to what extent each of the statement reflect a reason people do not use doping”, followed by five different response options (1 = Definitely false to 5 = Definitely true). Wording of items was revised from first to third person to reflect the reality that many adolescents do not use these substances (i.e., from I to they worry about possible side effects on my health).

2.8.3 Normative perceptions

We used a single item (“How many people of your age - practising the same sport as you - you think they would be willing to use doping substances?”) to measure perceived prevalence of doping use. Answers were scored on a five-point Likert scale, ranging from one (None) to five (All of them).

Perceived approval of significant others (club manager, coach/trainer, peers, family) was measured by prompting participants as follow: “What the following people you know think about the use of illegal doping substances to improve sport performance or physical appearance?”. Answers were scored on a five-point Likert scale, ranging from one (Very much against doping) to five (Very much in favour of doping).



2.8.4 Doping susceptibility

Based on findings of previous research and theory (Barkoukis et al., 2015), we preferred measuring doping susceptibility over expressed intentions to use doping because susceptibility is thought to be superior in reducing the risk for reporting bias (i.e., under-report). Doping susceptibility can be defined as the absence of a firm resolution not to engage in doping activities or to give any consideration at all to an offer to do so.

Participants were prompted as follows: “You were offered a banned/illicit performance-enhancing substance under medical supervision at low or no financial cost and the banned performance-enhancing substance could make a significant difference to your performance and was currently not detectable. How much consideration would you give to the offer?”. Participants were asked to respond based on six scenarios (e.g., A fellow athlete suggests that you use a doping substance) using a four-point Likert scale, ranging from one (None at all) to four (A lot of consideration).

2.8.5 Social desirability

We used the Balanced Inventory of Desirable Responding Short Form (BIDR-16) (Hart, Ritchie, Hepper, & Gebauer, 2015) which consists of 16 items and two dimensions as follows:



- Impression Management (e.g., “I never regret my decisions”)
- Self-Deceptive enhancement (e.g., “There have been occasions when I have taken advantage of someone”, reversed).

Answers were scored on a seven-point Likert scale, ranging from one (Strongly disagree) to seven (Strongly agree).

For brevity, the questionnaire was reduced by removing the four items that saturated the least their factor from each dimension.

3. Data analyses

We conducted descriptive statistics on all variables. Calculations were completed using IBM SPSS Statistics version 20 (IBM Corporation, New York, USA).

A series of hierarchical logistic regressions were performed, controlling for social desirability (step 1) to ascertain the effects of socio-demographics (gender and age) and sport setting variables (step 2), Ego and Task orientations in Sport (TEOSC) (step 3) on the likelihood that participants demonstrated doping susceptibility, as defined as giving at least little consideration to the offer in any scenario. In step 4, we tested the moderation effect of social and contextual variables (five peer climate, three relationship-with-coach/trainer and three dimensions of relationship-with-parents) on the relation between Ego orientation and susceptibility.



We also conducted a series of one-way Analysis of Covariance (ANCOVA) with:

(a) variables related to attitudes, normative perceptions and use of uncontrolled (supplements and OTC medicines) and controlled (doping) PAES as dependent variables; (b) doping susceptibility as two (no Vs. at least little susceptibility) levels of the independent variable; and (c) social desirability as the covariate.

4. Results

The survey was completed by 936 individuals across all partner countries. After screening against eligibility criteria (i.e., age between 14 and 19 years, practicing sport recreationally at least once a week), 409 valid questionnaires were used for data analyses: Legapro, CONI, UCSC (Italy) N = 101; Levsky (Bulgaria) N = 68; LSFC (Latvia) N = 149; LUSF (Lithuania) N = 10; Fisaf (Czech Republic) N = 52; Olympic Truce (Greece) N = 29.

4.1 Socio-demographic characteristics and sport practice

Participants had a mean age of 16.2 years (SD = 2.28, range 14–19) and 51.6% were female, 47.7% were male and 0.7% preferred not to disclose their gender identity. The majority was enrolled in secondary school (95.6%; N = 387) and lived



in the country where data was originally collected by project partners (e.g., Greece for data collected by Olympic truce). About 10% (N = 42) reported a migrant background (i.e., they or their family of origin, at least one parent, were from a country other than the country they currently live in).

Sports practiced varied with Football (28.4%), Basketball (13.2%), Fitness (in the gym) (12.2%), Martial art, boxing, wrestling (6.6%), Athletics (track and field, etc.) (5.9%), Volleyball (4.6%), and Dance sports (4.2%) representing the most common. Almost half (49.5%) also practiced a second sport regularly.

71.0% practiced sport in sports clubs, 18.9% in organised contexts, but outside sports clubs (e.g., gyms, swimming pools), and 10.1% in informal contests, such as public spaces (e.g., road cycling, running, etc.).

The majority (59.7%) reported having played their primary sport for at least seven years. In respect to frequency of practice, 4.4% reported once a week, 11.0% twice a week, 39.4% 3 to 4 times a week, 35.0% 5 to 6 times a week, and 10.3 every day. 61.1% took part in some form of competition (local leagues, tournaments, federal championships, city run races) regularly, 22.0% occasionally, and 16.9% did not.

The great majority (84.6%) reported their physical health was good or excellent, 13.2% fair and 2.2% poor. 38.5% reported they had been injured at least once over



the past 12 months.

4.2 Descriptive statistics of key variables

Motivations for doing sport, as measured by the Goal Content for Exercise Questionnaire (GCEQ), indicate participants practiced sport primarily for intrinsic motivations, including developing their skills and health management, whereas extrinsic motivations (i.e., social recognition) were reported as the least important motive (Figure 1).

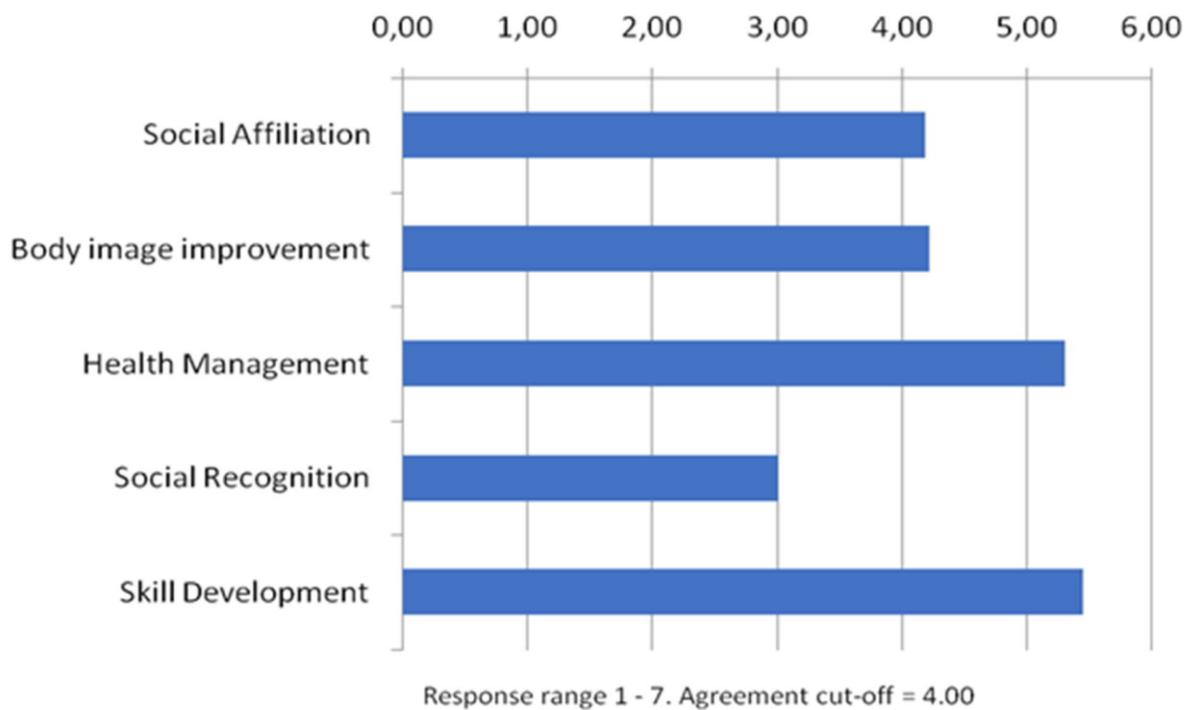


Figure 1. Motivates for doing sport

In regard to orientation towards success in sport (Task and Ego Orientation in Sport Questionnaire, TEOSC), participants reported a dominant task orientation (i.e., learning new skills) over an ego orientation (i.e., being better than others).

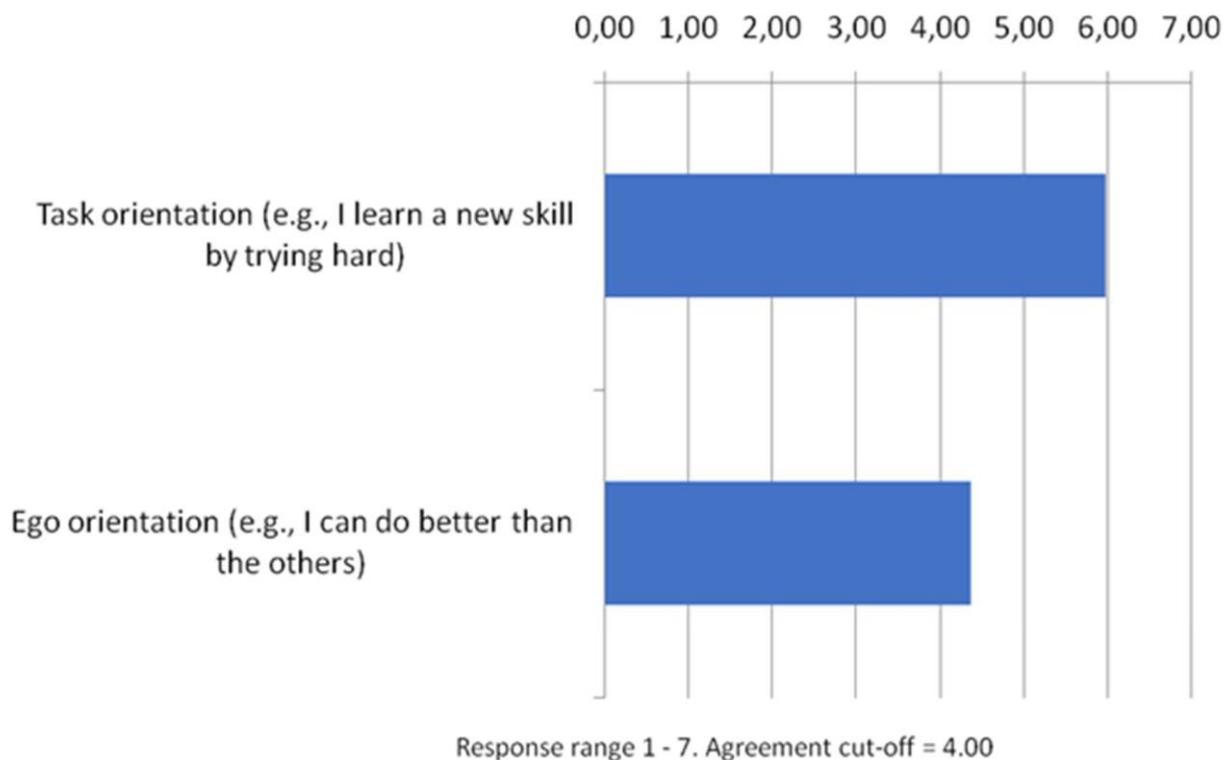


Figure 2. Orientation towards success



For those who played sport in a team or with others (N = 364), the motivational climate (Peer Motivational Climate in Youth Sport, PMCYS) reported was characterised by effort, improvement, reciprocal support, to a lesser extent by competition within the team/group, and there was a general disagreement that their team/group was characterised by conflict (Figure 3).

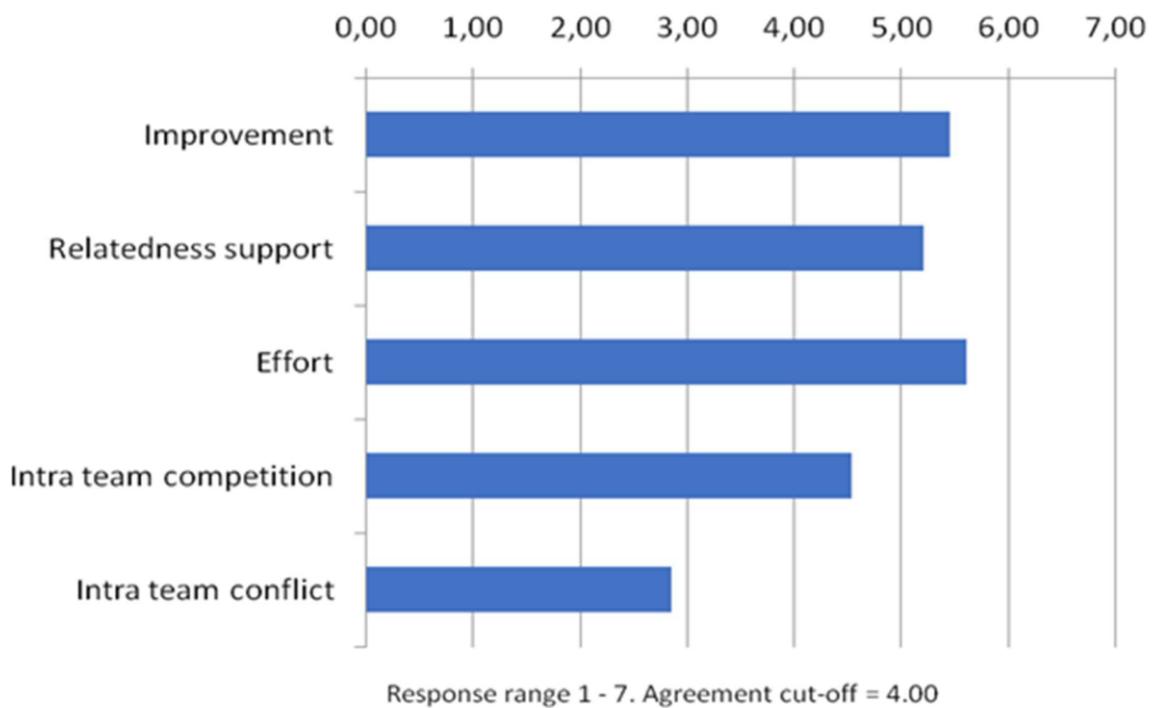


Figure 3. Peer motivational climate



For those who had a coach or trainer (N = 344), participants generally reported feeling close to their coach, committed to him or her, and complementary in their relationship (Coach – Athlete Relationship Questionnaire, CART-Q) (Figure 4).

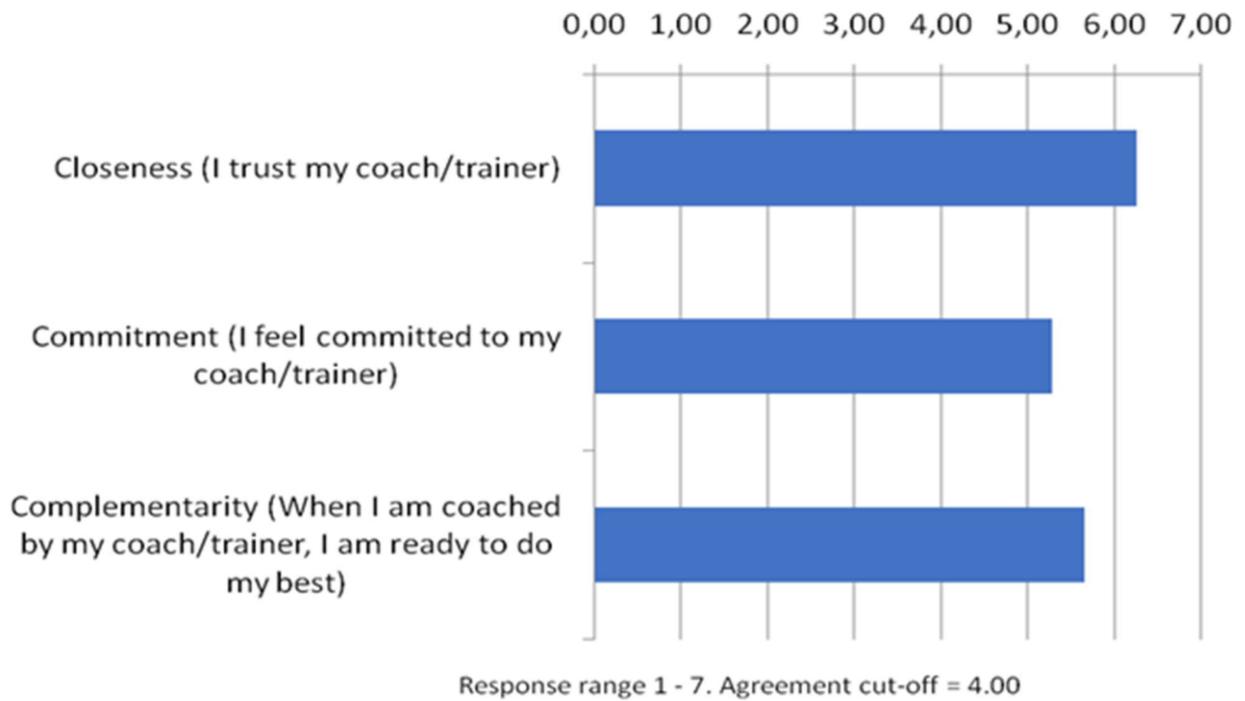


Figure 4. Coach – Athlete Relationship



Participants reported a relationship with their parents as characterised by enjoyment for learning new skills, and much less by a worry-conductive attitude or a focus towards succeeding without effort (Parent – initiated motivational climate questionnaire, PIMCQ-2) (Figure 5).

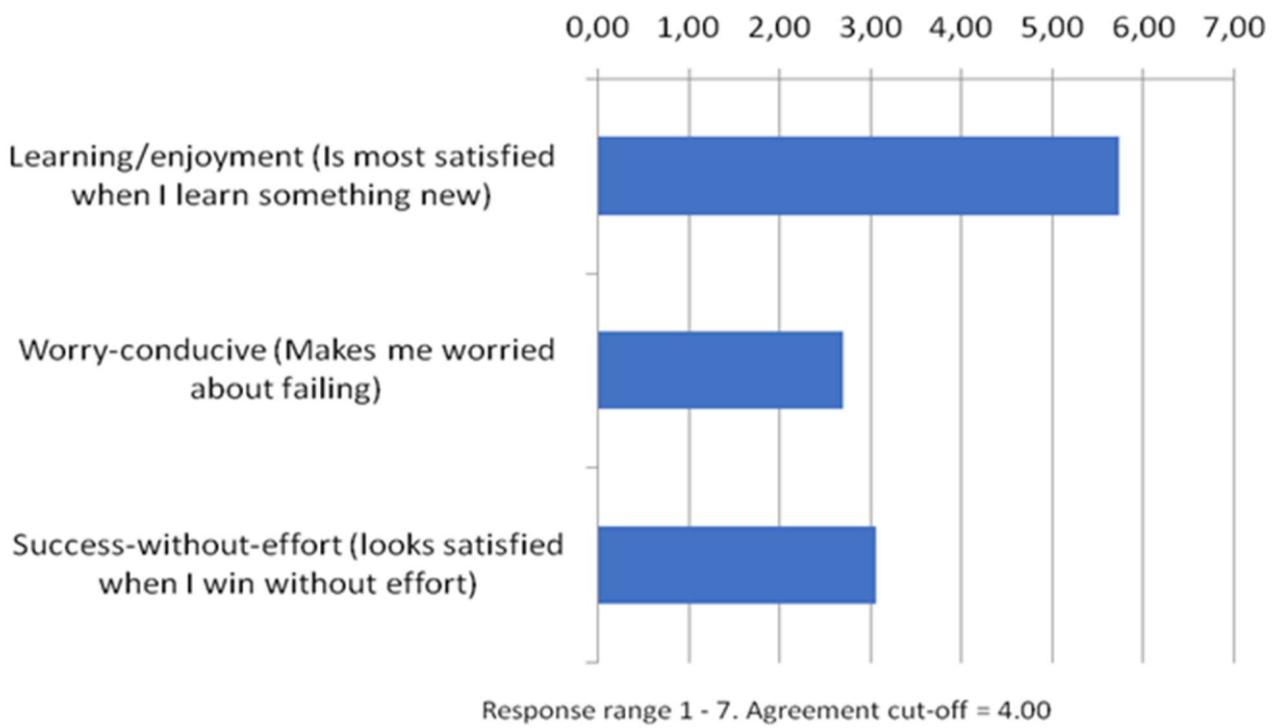


Figure 5. Parent – initiated motivational climate

In regard to drivers of body image/physical appearance and source of pressure (Sociocultural Attitudes Towards Appearance Questionnaire - 4 Revised, SATAQ- 4R), participants reported greatest internalised motivations towards



being attractive in general, and to a lesser extent to be thin (I want my body to look very thin) and muscular (It is important for me to look muscular). In regard to source of pressure, overall, participants denied receiving any of it from their families, peers or media.

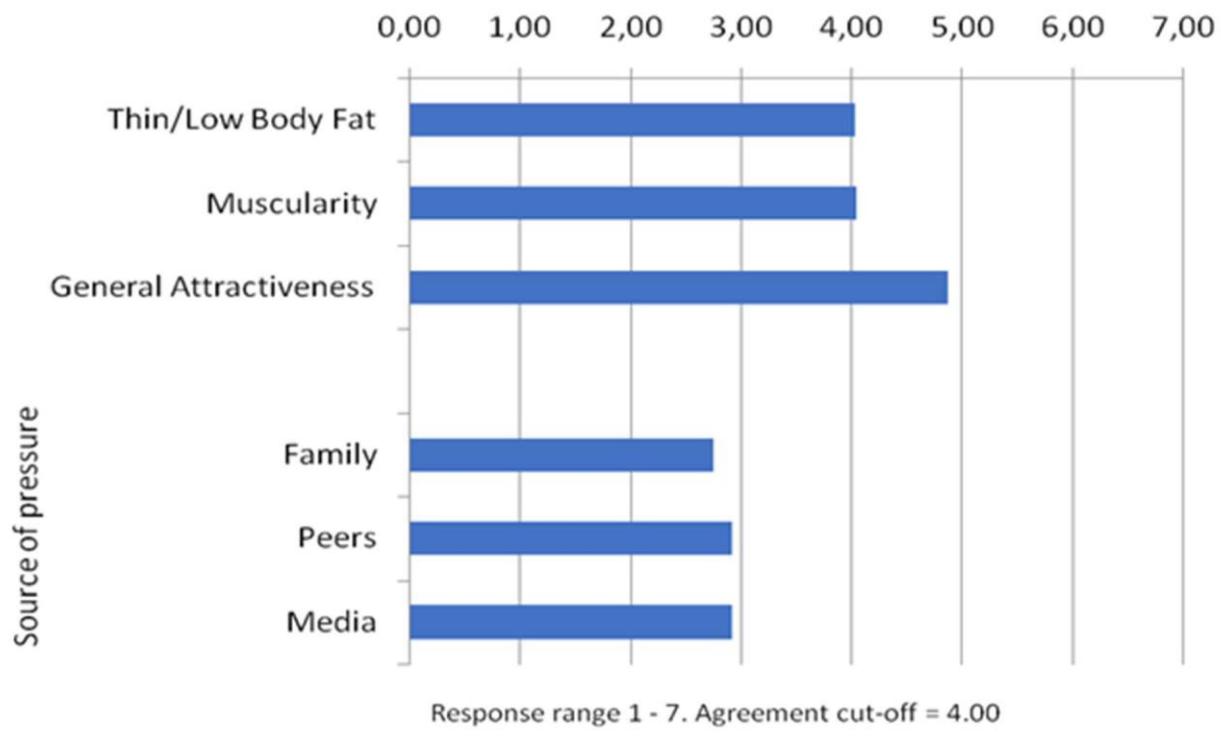


Figure 6. Drivers of body image/physical appearance

4.3 Perspectives on diet and uncontrolled PAES

In regard to perspectives of diet in sport, 5.2% reported receiving professional advice on diet systematically and 12.6% occasionally. Participants reported adapting their diet to achieve their goals in terms of performance, post-exercise



recovery, and physical appearance.

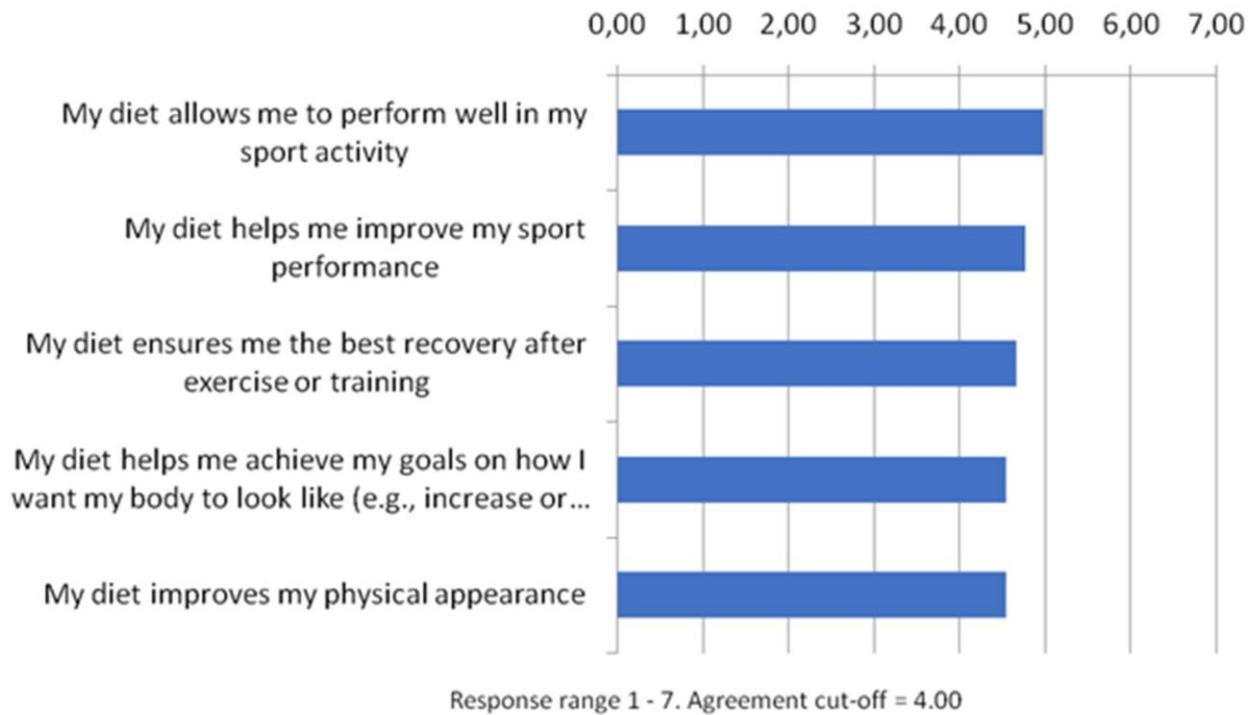


Figure 7. Perspectives of diet in sport

Legal nutritional sport supplements often make part of adolescents’ diet: 21.5% used supplements occasionally, 4.3% regularly. Overall, attitudes towards the advantages of using supplements were not positive as demonstrated by the mean value of the SSSB (Sports Supplements Beliefs Scale) scale. When asked about supplements, participants agreed they help recover faster after training, but also can have negative health consequences possibly lead to the use of illicit substances.



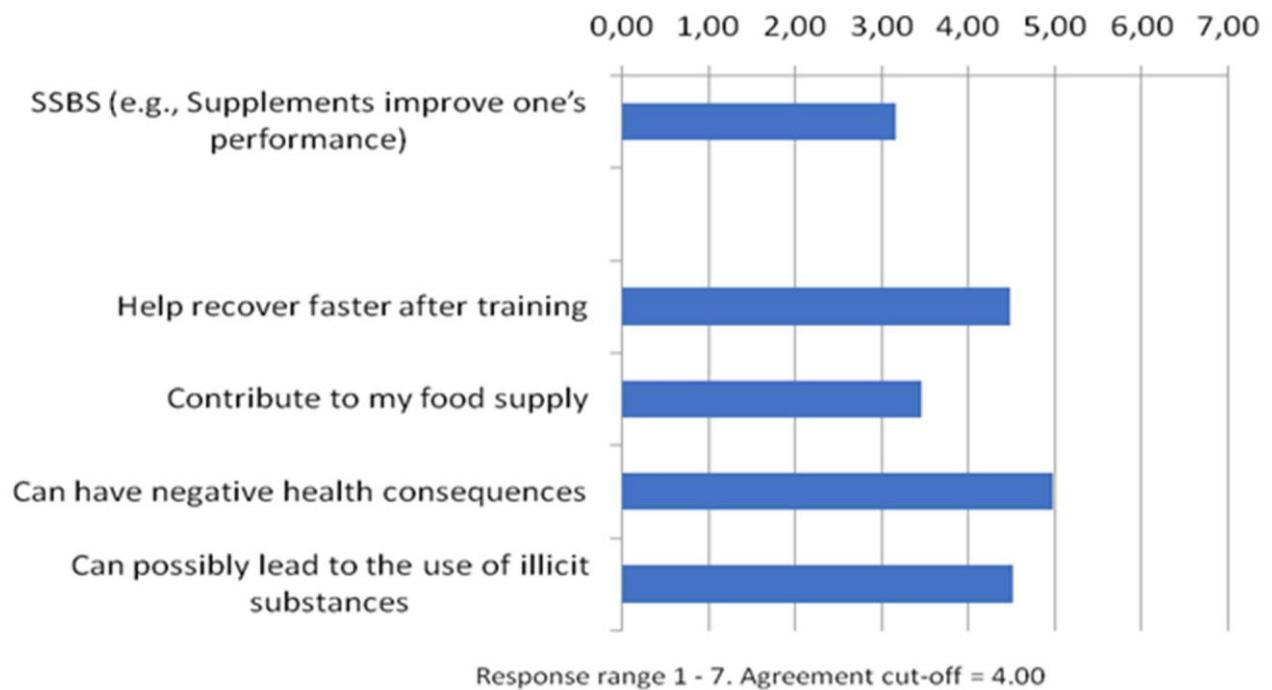


Figure 8. Perspectives of supplements

Normative perceptions indicate 20.5% believed at least half of their peers would be willing to use supplements. Participants believed one out of three of their fellow athletes would be in favour of supplement use, and about 20% that family members and their coach did so as well. Figure 9 shows that perceived approval of social referents is generally higher for over-the-counter (OTC) medicines, such as such as anti-inflammatory or pain killers, than supplements.

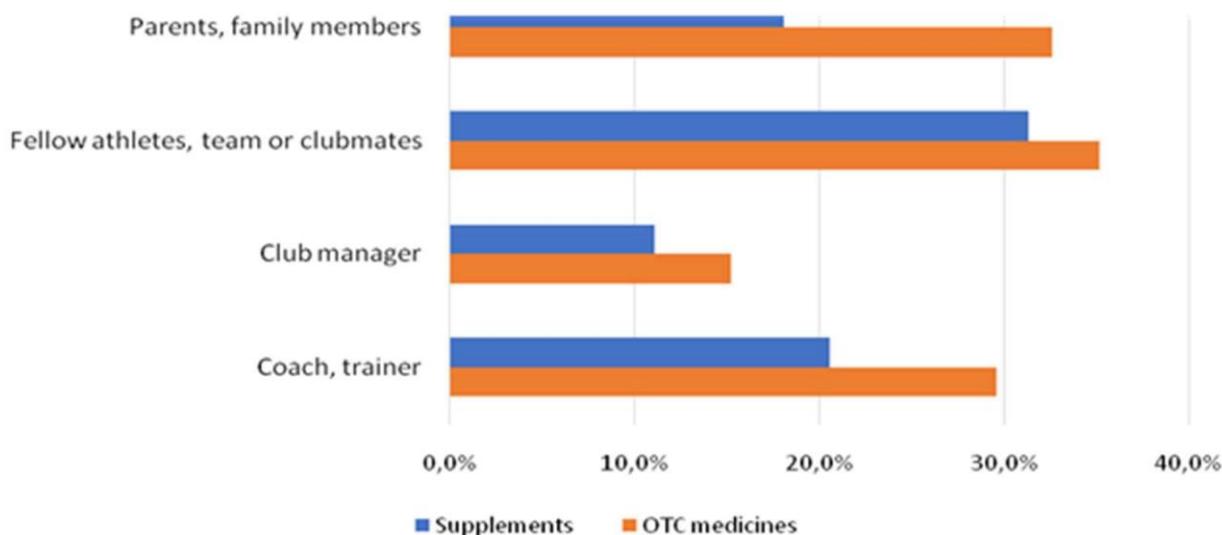


Figure 9. Perceived approval of supplement use by referents

Interestingly, more than two out of three (68.9%) participants believed that regular use of OTC medicines in sport can have negative health consequences. Participants were then asked in what circumstances they used OTC medicines: 9.5% reported frequent (often or regular) OTC medicines use when in pain after a game or training, 8.3% before a game or training in order to play without pain, and 5% before a game or training, just in case they were in pain during or after it. This demonstrates there is a small but significant minority of adolescent athletes that make regular use of medicines when doing sport and that in some cases it even precedes exercising or playing in the expectation of being in pain afterwards.

4.4 Perspectives on controlled PAES

4.4.1 Perceptions of adolescent doping user prototype

As described in the method section, we used a semantic differential approach and a list of 39 polarised adjectives (e.g., responsible - irresponsible) to develop the image that participants had of the typical person of about their age who uses doping substances. Figure 10 displays adjectives that scored close to one of the poles (i.e., those adjectives that had the highest or the lowest mean) organized conceptually into three dimensions: fair/unfair play (blue dots), responsibility towards oneself and own health or lack of it (green dots), and naturality/artificiality (orange dot). Doping users were perceived as motivated to win at all costs and unfair towards others and disrespectful of rules, irresponsible and not health conscious, and not being natural.

Overall, this prototype was not seen favourably (mean = 35.8 out of 100) and the overwhelming majority of participants did not feel the characteristics that described this type of person also described them: 91.6% definitely or somehow not.



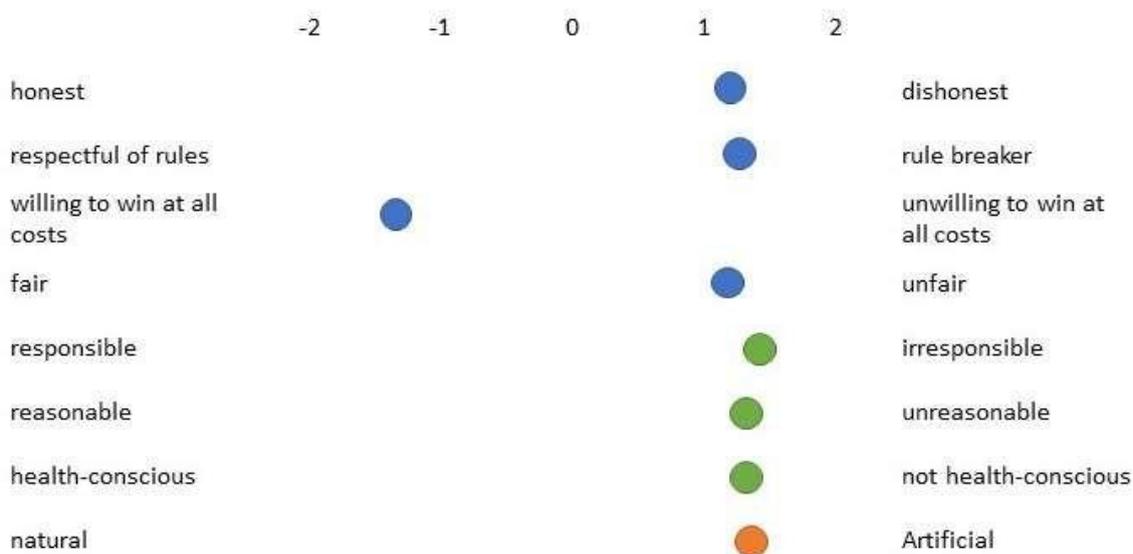


Figure 10. Eight most polarised adjectives to describe the doping user prototype

Figure 11 shows that participants the most important reasons for not using doping are fear of side effects, legal consequences lack of need of it, a feeling that they would get an unfair advantage over opponents thus not allowing them to see what they could do naturally, and disapproval by significant others they trust. Lack of access to doping, insufficient financial resources, and lack of knowledge of the substances were considered reasons of much lower importance.

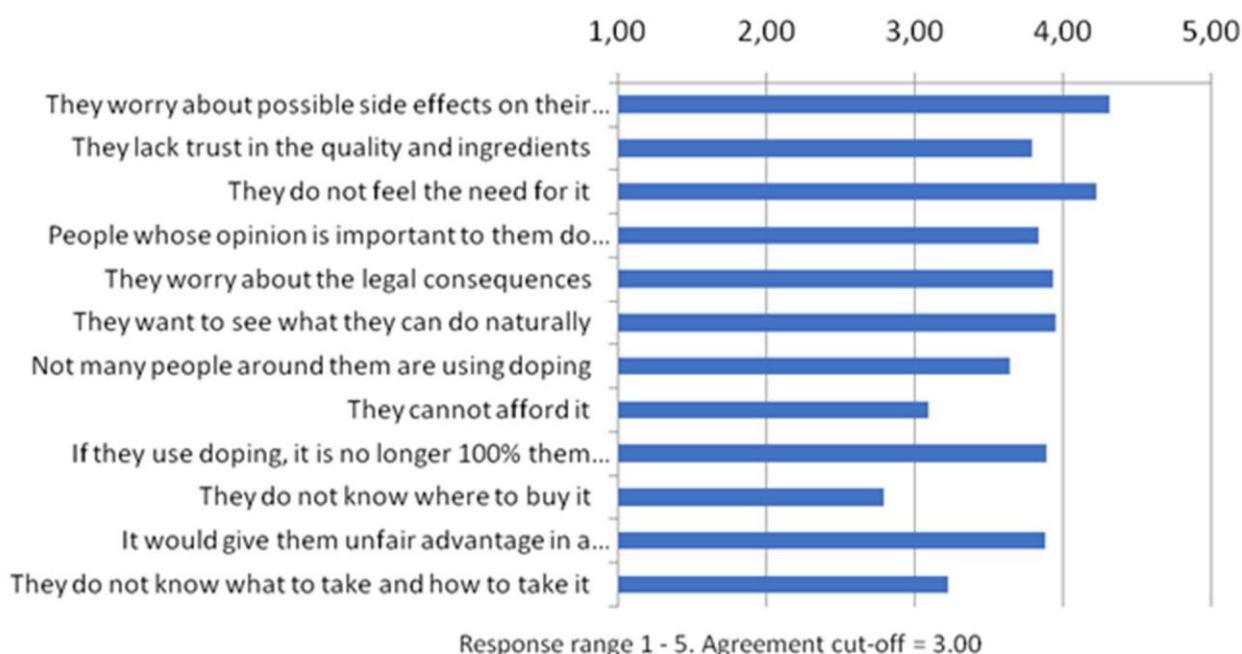


Figure 11. Perception of reasons for NOT using doping

In regard to normative perceptions, 4.6% believed at least half of their peers would be willing to use doping, and the remaining participants were equally split into those that thought that doping is not used by any of their peers (47.4%) and those who perceived a few did (47.9%). Figure 12 shows that a tiny minority of participants believed social referents in their life would be in favour of doping use.

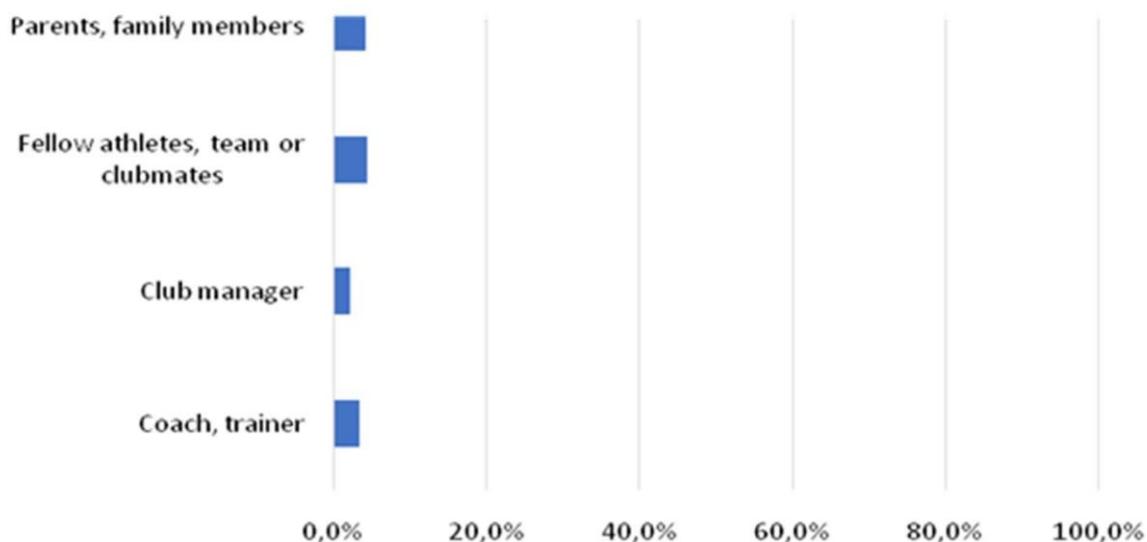


Figure 12. Perceived approval of doping use by referents

Figure 13 displays results on doping susceptibility, defined as the absence of a firm resolution not to engage in doping activities or to give any consideration at all to an offer to do so. Participants were asked to respond based on six scenarios in which they were offered a banned/illicit performance-enhancing substance with the least risk possible (i.e., under medical supervision and not detectable) and with the expectation to make a significant difference to their performance. As it can be seen, the scenarios where willingness was greatest were post-injury recover, pressure from their coach or family member, conformity to doping-using peers (but not pressure from them), and the desire to change one's physical appearance.

56.1% would give at least little consideration in any situation, 26.8% some and 8.6% a lot.

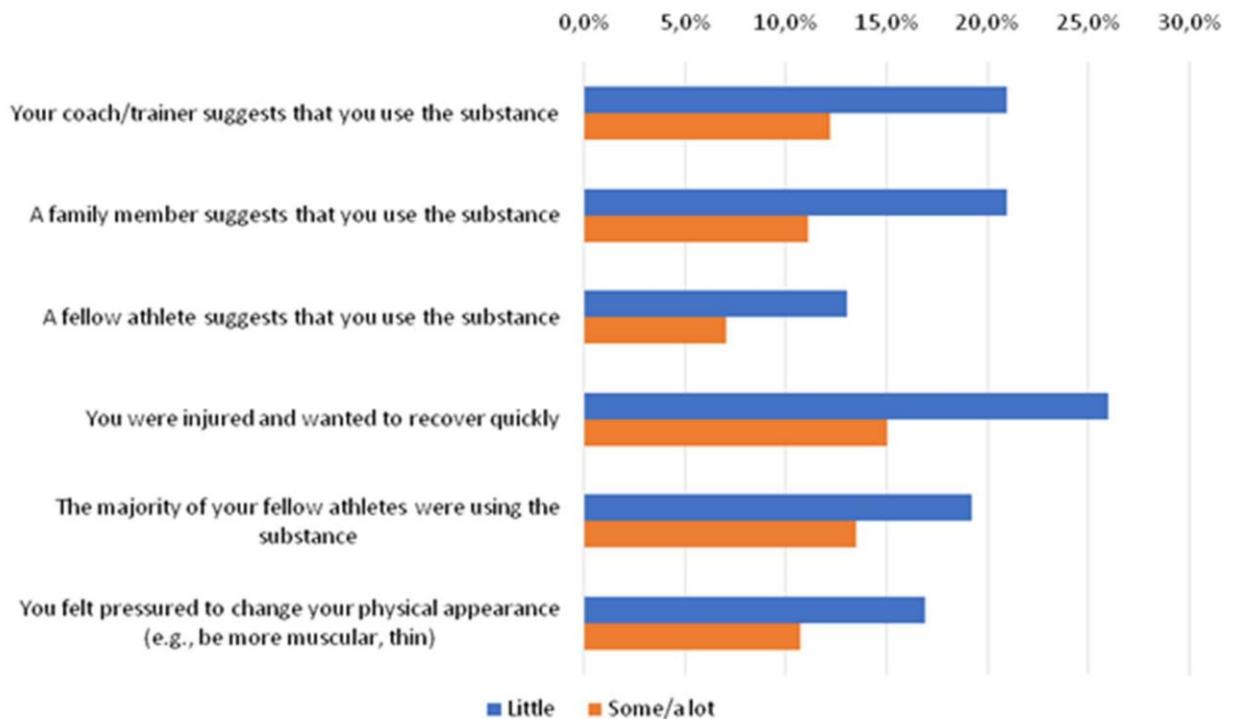


Figure 13. Proportion of participants that would give little or some/a lot consideration to doping under different circumstances

4.4.2 Individual and social/contextual predictors of doping susceptibility

Table 1 displays results of the hierarchical logistical regression to predict doping susceptibility. Only model 3 and 4 are reported. In model 4, only significant moderation effects are reported. All models were statistically significant. Model 3 explained 15.9% of the variance, while model 4 19.9% (Nagelkerke R²) of the

variance in doping susceptibility. After controlling for the effect of social desirability, no socio-demographic nor sport setting related variable resulted significant, whereas increasing scores in Ego orientation (i.e., success understood as being better than others) were associated with an increased likelihood of being susceptible to doping.

Moderation analyses indicate that a motivational climate characterised by the desire to work with fellow athletes to improve and gain new skills (Peer Motivational Climate in Youth Sport – effort dimension) reduced the association positive association between ego orientation and susceptibility. Conversely, a relationship with parents characterised by fear of failing (Parent – initiated motivational climate questionnaire - worry-conducive dimension) increased the association positive association between ego orientation and susceptibility. In other words, these two social/family factors represent respectively a protective and a risk factors towards doping susceptibility in addition to adolescents' individual orientation towards success in sport.

Table 1. Hierarchical logistic regression models for doping susceptibility

	Model 3		Model 4	
	B	OR	B	OR
Constant	2.148		1.186	
Social desirability	-.631***	.532	-.584***	.558
Gender (male)	.322	1.380	.249	1.283
Age	-.036	.965	-.050	.951
Sport setting (club)				
Organised settings	-.133	.876	-.288	.750
Informal settings	.288	1.333	.144	1.155
TEOSC_TS (task orientation)	-.018	.982	.155	1.167
TEOSC_EGO (ego orientation)	.234**	1.264	.518*	1.678
TEOSC_EGO*Peer Motivational climate (effort)			-.074*	.929
TEOSC_EGO*Parent-initiated motivational climate (worry conductive)			.047*	1.049
Hosmer and Lemeshow Test ^a (p)	4.089		16.269*	
Model X ² (p)	43.316***		49.214***	
Nagelkerke R ²	0.159		0.199	

Note. Dependent variable: susceptibility to doping (coded as 1), non-susceptibility to doping (coded as 0).
OR: odds ratio

^a Hosmer–Lemeshow statistics indicates a poor fit if the significance value is less than 0.05.

*p < .05, **p < .01, ***p < .001.

4.4.3 Differences between doping susceptible and non-susceptible adolescents

Table 1 displays results of the series of one-way Analysis of Covariance (ANCOVA) comparing doping susceptible and non-susceptible participants, controlling for social desirability.

Results indicate susceptible participants had more favourable beliefs in regard to supplement use in sport (Sport Supplement Belief Scale), perceived a larger proportion of peers were using supplements (descriptive norms), and greater approval from their coach/trainer and peers. No significant difference was found in regard to frequency of supplement use.

We found no difference across groups in regard to variables related to OTC medicines, though susceptible participants were more likely to use these substances before exercising or a competition to play without pain.

Conversely, several differences were found in the expected direction in regard to the strength of reasons for not using doping, descriptive and injunctive norms.

Table 2. Analyses of covariance for doping susceptibility

Dependent variables	Non susceptible (N = 169) ^a	Susceptible (N = 216)	F	Partial η^2	Direction of difference
	Mean (SD)	Mean (SD)			
Sport supplements					
Positive believes on supplements (SSBS)	2.76 (1.29)	3.42 (1.28)	14.039***	.036	+
Descriptive norms (peers)	2.32 (1.04)	2.52 (0.96)	4.479*	.012	+
Injunctive norms (coach)	2.45 (1.12)	2.88 (1.11)	6.912**	.020	+
Injunctive norms (peers)	2.78 (1.15)	3.08 (1.02)	4.510*	.034	+
Injunctive norms (family)	2.23 (1.17)	2.54 (1.16)	3.782	.010	=
Frequency of use	1.71 (0.95)	1.69 (0.93)	0.014	.000	=
OTC medicines					
Injunctive norms (coach)	2.78 (1.13)	3.03 (1.13)	0.938	.003	=
Injunctive norms (peers)	2.95 (1.13)	3.27 (1.06)	2.696	.008	=
Injunctive norms (family)	2.81 (1.19)	2.96 (1.19)	0.111	.000	=
Perceived negative consequences	2.83 (0.92)	2.88 (0.78)	0.859	.002	=
Post exercise use	1.61 (0.62)	1.72 (0.75)	2.184	.006	=
Pre-exercise use w/ pain	1.29 (0.52)	1.50 (0.66)	3.081**	.022	+
Post exercise use w/ pain	1.33 (0.55)	1.44 (0.66)	1.437	.004	=
Doping					
Strength of reasons for not using doping	3.84 (0.58)	3.63 (0.48)	8.799**	.023	-
Descriptive norms (peers)	1.46 (0.58)	1.68 (0.62)	9.782**	.025	+
Injunctive norms (coach)	1.18 (0.50)	1.63 (1.00)	10.605***	.043	+
Injunctive norms (peers)	1.39 (0.70)	1.89 (1.03)	19.041***	.051	+
Injunctive norms (family)	1.18 (0.51)	1.49 (0.92)	10.960**	.029	+

Note. ^a Numerosity may vary because of missing values or because the item does not apply to some participants (e.g., not having a coach/trainer)

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

5. Discussion and conclusions

PAES use in recreational sport is increasing at all levels and age groups as part of societal and cultural process of medicalization and substance-enhanced lifestyle and sport practice (Pedersen, 2010).

The novelty of this study lies in examining the reality of adolescents practicing sport in exercise and amateur sport settings. Indeed, previous research has generally addressed this issue among talented athletes who face pressures to achieve results as they aspire to a career at an elite level (Bloodworth et al., 2012). This study collected survey data from a large sample of adolescents from partner countries. The sample was gender-balanced and included a variety of sports practiced. Most participants practiced sport in sports clubs, though at an amateur level. This is also demonstrated by the fact that participants reported greater intrinsic motivations for doing sport, namely the desire to develop new skills and stay healthy, and how they define “success” in sport.

Legal nutritional sport supplements often make part of adolescents’ diet: 21.5% used supplements occasionally, 4.3% regularly. However, consistently with results of our qualitative study, attitudes towards these substances are ambivalent or neutral. Their usefulness is generally acknowledged (e.g., to recover faster after training), but participants also feared long-term health negative consequences,

including possibly leading to the use of illicit substances over time. This line of thought is consistent with the much debated gateway hypothesis which proposes that those who engage in legal performance-enhancement practices represent an ‘at-risk’ group for transition toward banned substances (Backhouse et al., 2013). In regard to over-the-counter (OTC) medicines, such as such as anti-inflammatory or pain killers, our results indicate that a small but significant minority of adolescent athletes make regular use of medicines when doing sport and in some cases intake even precedes exercising or playing in the expectation of being in pain afterwards. In addition, perceived approval of social referents (coach/trainer, peers and family members) is generally higher for OTC medicines than supplements. This is despite the prevalent perceptions among participants that regular use of OTC medicines in sport can have negative health consequences. In other words, despite widespread recognition that misuse of these substances may have negative consequences on the long run, there is a lot of approval to their use even in adolescence.

OTC medicine use in recreational sport and its relations to doping use has received relatively little attention from research. Our results suggest this is an important area that should be further investigated.

The prototype of the adolescent doping user was seen unfavourably, different from oneself, and characterised by negative traits, including a motivation to win at all costs and unfairness towards others and disrespect of rules, irresponsibility and lack of health consciousness, and artificiality. These three main features of adolescents' representation of the doping user are largely consistent with those found in our focus group study, but are innovative to previous studies which focused on adult and/or professional athletes samples (Whitaker et al., 2014). For adolescent recreational athlete, athletic performance enhancement may not represent a key goal of many doping users, though many others may use doping to improve their physical appearance and body shape instead (Zelli et al., 2010). However, this comes with health consequences as their representation of the doping user demonstrates. In addition, the idea of doping as an artificial substance is interesting and deserves further attention.

Doping normative perceptions (i.e., perception of the proportion of peers use doping) are broadly consistent with results of epidemiological studies indicating actual doping use is low among adolescents (e.g., Mallia et al., 2013;(Shah, Janssen, Le Nézet, & Spilka, 2019). Perceived disapproval from important people in adolescents' life (coach/trainer, peers and family) is high.

In spite of that, we were struck by the result that participants reported some degree of susceptibility to doping use: 56.1% would give at least little consideration in any situation, 26.8% some and 8.6% a lot. This is an important result suggesting that, under certain circumstances (e.g., post-injury recover, conformity to using peers, desire to change one's physical appearance), there might be chances to initiate doping use. This is alarming as the nonmedical use of controlled PAES has become more common among non-athletes and more used by recreational exercisers (Parkinson and Evans, 2006; Kanayama et al., 2010), but also points out to the fact that “pro-doping cultures” may be rooted in adolescence even if actual use starts later in life during adulthood (Barkoukis et al., 2016).

Overall, the social environment made of their peers, coaches/trainers and family members was generally reported as characterised by strong bonds, reciprocity and little conflict. This is important, because results of our analyses suggest that some social/family factors represent protective/risk factors towards doping susceptibility in addition to adolescents' individual orientation towards success in sport. The importance of underlying competitive sport mindset had been already examined in research (Lazuras et al., 2017) though the interaction with social/contextual factors had not. More specifically, our results show that a motivational climate characterised by the desire to work with fellow athletes to improve and gain new

skills was protective, whereas a relationship with parents characterised by judgement and fear of failure increased doping susceptibility. Importantly, these results are consistent with our study's socio-ecological framework which considers multiple levels of influence on specific health habits and interactions of risk and protective factors across these different levels (Sallis et al., 2008).

Lastly, our results also indicate that susceptible participants had more favourable beliefs in regard to supplement use in sport (Sport Supplement Belief Scale), perceived a larger proportion of peers were using supplements (descriptive norms), and greater approval from their coach/trainer and peers. No significant difference was found in regard to frequency of supplement use. We found no difference across groups on variables related to OTC medicines, though susceptible participants were more likely to use these substances before exercising or a competition to play without pain. Conversely, several differences were found in the expected direction in regard to the strength of reasons for not using doping, descriptive and injunctive norms. Our results are broadly consistent with those of previous studies suggesting a link between supplements and controlled PAES whereby the two are associated with biased reasoning (e.g., favourable attitudes and normative perceptions) patterns in favour of doping use (Barkoukis et al., 2015).

6. References

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