

Reflexive thematic analysis qualitative analysis of substance abuse in physical fitness tests related to physical education college entrance examinations among non-athlete students

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This study aimed to determine the associated factors to doping behavior among non-athlete adolescents. We qualitatively explored experiences of 23 participants who have taken physical fitness tests for admitting physical education college, and 16 of them were analyzed through a research process of conceptual framework based on thematic analysis. The personal factors contributing were: win-at-all-costs, FOMO and herd mentality, dispositional risk taking, and seeking self-confidence externally. Social factors were: obeying coaches, no involvement of parents, and school culture. Environmental factors were: successful entrance to college, lack of anti-doping restrictions, and no educational sessions of anti-doping. In conclusion, being ignorant and neglected by any anti-doping agency, goal oriented, moral disengagement, and being abetted by coach were the main determinants to substance-abuse behavior among adolescent students. Policy changing and education for students and coaches, along with enhancing the involvement of parents, are proposed as effective way to promote clean sport in schools.

KEY WORDS: Adolescent, Non-athlete student, Doping, Danabol, physical education, physical fitness test

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1. Introduction

In sport, the term “doping” refers to the use of substances and drugs or practices banned by the World Anti-Doping Agency (WADA) (Madigan et al., 2016). It has been common for athletes, including adolescents to adopt doping to illegally improve their performance (Andreff, 2016). Such behaviour has more recently spread from competitive sports to schools and communities, resulting in the practice among non-athlete adolescents in the physical fitness tests for physical education (PE) college entrance examinations (Lazuras et al., 2017). Although recent advances in understanding doping behaviour, PE students as a big number of sport-related population are still overlooked (Cornelia Blank et al., 2016). Regarding the conceptual models to construct doping behaviour, a series of correlates are mainly drawn from the theory of planned behaviour framework (Ntoumanis et al., 2014). Actually, decisions to dope reflect a complex interplay of multiple factors, such as sociocultural, socioeconomic, and personality impacts (Petróczi et al., 2008). Especially amongst adolescents, they tend to be more vulnerable to close surrounding (such as coach, family, and peer) and social pressure comparing with adults (Ntoumanis et al., 2014). Doping practice occurs within a system, personal aspects influenced by social and environmental context, which can generalize to non-athlete students, forming a systemic model to understand doping behaviour (Johnson, 2011). An expanded understanding of all these salient factors involved in doping phenomenon will benefit further evidence-based preventive strategy and policy making.

In competitive sports, adolescent athletes use doping for various reasons. Obtaining a competitive advantage and improving physical attractiveness have been suggested as two major motivations (Mudrak et al., 2018). Other personal factors include win-at-all-costs (Duda et al., 2022), fear of failure (C Blank et al., 2015), less self-confidence (Cornelia Blank et al., 2016), stress and anxiety (Rousselet et al., 2017), and recovery (Didymus et al., 2020). Coaches encouraging or abetting adolescents use prohibited substances due to economic rewards (Bloodworth et al., 2010) and key performance indicator (KPI) policies (Patterson et al., 2016). The high expectations comes from parents makes more pressure on adolescents to have the intention of doping (Madigan et al., 2016). The doping climate created by peers is also a risk factor (Petróczi et al., 2008). In addition, with the advent of the Internet information explosion era, adolescents are required to have enough critical thinking skills to absorb the right information and resist the wrong, which is called media literacy (Lucidi et al., 2017). In conclusion, a mixture of psychological, social, and environmental factors predisposes doping behaviour.

The situation of substance abuse among high school students is severe evidently (Pannoni, 2014). Wanjek et al. (2006) founded that approximately 20% non-athlete students indicated use of prohibited substances from the WADA list, which was even higher than that of recreational and competitive athletes (Wanjek et al., 2007). CHINADA reported anti-doping rule violations among non-athlete students in admission to university yearly (CHINADA, 2021). However, studies focusing on this population as well as context of doping behaviour are very rare. Adolescent students who take the physical fitness tests for PE-related college entrance examinations are not trying to become professional athletes, but to be PE teachers, coaches, or sport-related co-workers in their future careers (Deng et al., 2022). The only report to the potential doping purpose was to improve sport performance with friends stated as the provider (Wanjek et al., 2007). Experiences of students who ever involved into substance abuse, personal aspects, and environmental context should be explored to make this phenomenon clear and to develop the theory of doping behaviour. As future PE teachers and coaches, the practice of doping among PE students should be prevented.

There are many studies on doping in adolescent athletes, but very few on substance abuse in non-competitive school sports. The doping behaviour of school student is a complex process influenced by multiple risk factors which can be interacted to the decision of doping. Therefore, this study aimed to understand the current situation and the factors contributing to substance abuse among non-athlete students. The findings from the present study provide information to assist the implementation of effective measures to prevent doping, to promote clean sport, and to develop sustainable sport and fair play.

2. Methods

Reflexive thematic analysis (TA) was identified as an exceptional approach to examine substance-abuse behaviour among non-athlete students, and the potential influencing environmental conditions in this study. TA is one of the most commonly used form of qualitative research, to identify, to analyze, and to report patterns (themes) within data (Braun et al., 2019). TA was categorized into three broad types: coding reliability, reflexive, and codebook approaches (Braun et al., 2019). A reflexive TA was conducted, and the complex, interactive, and creative it offers is remarkable (Trainor et al., 2021). It requires a reflexive researcher to unpacking, analyzing, and reflecting upon one's position, one's interaction with the data, and one's role in the production of knowledge, and then much more to be gained (Hill et

al., 2021). The labeled concepts and organized categories developed during the coding procedure enabled to provide a full picture of substance abuse, producing a generalist perspective among non-athlete students.

2.1 PARTICIPANTS

The principles of maximum difference and information saturation were applied during recruitment of 23 participants (Guest *et al.*, 2020). After the reflective and thoughtful engagement with the data, seven participants (two men and five women) were excluded who claimed to haven't used any drugs on their own or witnessing others, and even more insisted there was no drugs abuse in physical fitness tests. Thus, data from the remaining 16 participants (12 males and four females) were systematically reflected and analyzed in the subsequent research process. Similarities in codes and patterns were noticed after the sixth interview. Data saturation occurred after the 12th interview and the story of substance abuse among adolescents in physical fitness tests was being constructed. The research questions could also be answered using the data attained. Considering the principle of maximum difference, four more participants were included further to cover three more cities in which participants underwent training and tests.

All 16 participants were over 18 years of age, second- or third-year undergraduates in PE teacher training programs when interviewed. They were not sport training students in high school and had no specific sport discipline to develop at a professional level. They had general exercise skills with motivation to become PE teachers and sport-related co-workers. Therefore, all participants were trained to take the physical fitness tests of the National College Entrance Examination (NCEE) in their last year of senior high school. Participants were located in six cities of China at the time of the examination, and there were one to six interviewees for each city. Generally, the physical fitness tests used in the competitive entry process were: 100-meter run, 800-meter run, long jump, and shot put, managed by the province, determining 50% of the total score. The other half of the score was derived from tests, in a standardized set of subjects, held nationally. Basically, students are selected and admitted to their intended universities in descending order of total score, with a fixed admission quota for each province. Ethical approval for this study was granted by Hebei Normal University and all participants were fully informed about the purpose and content of the study and provided their consent. Due to the concerns of potential barriers to recruitment and to interview, the process was confidential, identifiable in-

formation for each participant was not recorded, and the data collected were anonymous. Participants had all rights to withdraw at any stage of the study.

2.2 PROCEDURE

The interview was conducted by two researchers: one as the major interviewer and the other acting as the note-taker. The location for the interview was chosen by the interviewee, to create an enabling environment where participants could feel comfortable and express themselves freely without concerns. The content was recorded on an audio tape recorder with the permission of the participant. To ensure confidentiality and anonymity, no personal identification was recorded except an ID assigned to each participant prior to the interview.

2.3 SEMI-STRUCTURED INTERVIEW

Individual face-to-face semi-structured interviews were conducted accordingly. The interviewer posed the core question about “sharing your story of substance use” first and then guided the interviewees to describe substance abuse of their own or that they had observed in others. The exact substances used and further details, as well as the method of consumption of these substances, were then followed up. Due to the nature of semi-structured interviews, the exact words used and the order of the follow-up inquiries varied with each participant. Probes and prompts were included as required and deviations from the main probes were allowed as this helped the participants to explain particular points in detail when sharing their experiences. The semi-structured interview also helped to avoid unnecessary diversions. This method has been applied in qualitative research relevant to banned substances issues before (Engelberg et al., 2016). The themes of the interview involved the following pivotal content:

1. The participant’s story of substance use when training for the physical fitness tests in the last year of high school;
2. The details, process, and context of substance use;
3. Initiating factors leading to the decision-making;
4. Knowledge about doping.

2.4 DATA ANALYSIS AND INTERPRETATION

A reflexive TA was used to determine the motivation for and potential contributing factors to substance abuse among adolescents. Data were sorted

out after the sixth interview, and then analyzed after each interview as Braun and colleagues suggested (Braun et al., 2021).

Reflexive TA consisted by six recursive phases: familiarization with the data; encode the data; generating initial themes; reviewing and developing themes; refining, defining and naming themes; and writing up. All interview recordings were verbatim transcribed into Word files which were imported into NVivo 10. Two researchers (KW and YFQ) first familiarized themselves with the data by listening to the recording and immerse themselves in the transcripts. During this process preliminary ideas recorded by coders. Significant sentence was marked, and note was taken for general coding. The code was simplified and refined in the second round of coding. During this process, three researchers (KW, YFQ and FFL) compared the codes collated by the two coders. Different definitions of the same code are discussed, such as “group think” were modified to “FOMO and herd mentality” (Woolf et al., 2021). All codes were sorted into categories to generate tentative themes and subthemes. The initial five themes became three with some themes being combined in the refinement stage. Then a thematic map was created by researchers to clarify the relationships between codes, category and theme. Finally, the data set was reviewed to ensure the three themes could well present over all story about substance abuse in adolescent.

2.5 TRUSTWORTHINESS OF QUALITATIVE FINDINGS

Trustworthiness was established using three approaches: percentage of agreement, peer review, and member check. These steps to ensure credibility, coupled with the detailed analysis of the interviews as described above, helped to minimize the weaknesses that could result from relying on only one source of data.

Percentage agreement was the most commonly used measure of inter-rater and intra-rater reliability. The interviews were assigned to the two researchers (KW and YFQ), who were instructed to record the codes they thought best reflecting the meaning of participants. This process was conducted independently. The level of agreement between the two coders was calculated 0.73 which was above the 0.7 minimum threshold (Cohen, 1960).

For the peer review process, codes and emergent categories are given to three reviewers (MJW, CSL, and CZK) for assessment. The credibility of the research was also confirmed.

Member checks were conducted by consulting participants to determine whether the results accurately reflected their experience. Four participants

(No. 8, 9, 13, and 23) responded to the member checking process, and confirmed that the theoretical propositions that emerged from the study were representative of their experiences.

3. Results

The interviews with each participant were grounded into three main themes as follows (the detailed encoding is shown in Table I:

1. Description of the drug used;
2. Effects of the drug used;
3. Factors initiating drug-usage behaviour.

TABLE I
Thematic Analysis - Based Sub-Category, Category and Theme Encoding of Interviews About Substance Use Among Non-Athlete Adolescents

Theme	Category	Sub-category
Description of substance used	Who use it	By oneself, By witnessing others
	Period of use	One-off, Episodic
	Substances used, by self-report	Dianabol, Measures to increase hemoglobin, Supplement
	Appearance	Red, White, Pink, Blue, Yellow Capsule, Tablet, Powder, Pill, Liquid
	Method of consumption	Oral tablet/capsule, Diluted with water, Injection
	Source	Coach, Peers, Administrative personnel
Effect of substance used	Effect	No effect, No obvious effect, Excitement, Strength enhancement, Chronic fatigue, Bad flexibility, Masculinization, Acne
	Stigmatization	Students in one city being suspected of substance use by others
Identified initiating factors	Personal	Win-at-all costs, FOMO and herd mentality, Reducing stress and anxiety, Dispositional risk taking, Seeking increased self-confidence externally, To boost recovery from exercise, To enhance recovery from injury
	Social	Obeying coach, Coach's stress on KPIs, No involvement of parents, School culture, traditions and norms
	Environmental	Successful entrance to a college, Successful entrance to a better college, Low motivation to learn, Lack of anti-doping restrictions and tests in the exam, Economic rewards, No educational anti-doping sessions, Media

KPI: Key Performance Indicator.

3.1 THE SUBSTANCES USED BY NON-ATHLETE STUDENTS

All participants except one in the final data-analysis samples took drugs themselves or witnessed others using drugs in a planned way. One participant (No. 20), who neither admitted nor denied usage, was included as he could describe the process of using dianabol specifically and clearly. Drugs were used either as one-off doses when taking the physical fitness tests for PE college entrance examinations, or episodically when preparing for the tests. The participants described their use of dianabol:

I used it [dianabol] an hour or half an hour before the examination. I used it only once. (No. 15)

I admitted that I used dianabol in my third year of high school. It was a kind of red tablet. ...I took it for about three months, 80% of the students [teammates] were pushed to do so while they knew nothing about what exactly they [multiple substances] were. (No. 3)

Students who reported using drugs themselves also witnessed fellow students using them. In most cases, students used multiple substances and could not recognize each one. In some cases, students referred to the drug as a “supplement” which revealed that they had limited knowledge of doping. The names of the drugs reported were dianabol, injections to increase hemoglobin, or supplements. Eventually, the term “unknown drugs” was used in the latter cases as this was self-reported behaviour that happened in the past and we could not confirm what had been used. As one student stated:

Yes! There were various colors, white and red, as well as pink. Someone [teammate] used white powder, diluted with water to drink. I don't know what were they [unknown substance]. ...They [teammates] were always using supplements, but not me because I didn't want to spend money on it. I didn't know the brand of that small tablet [supplements], I don't know what's that white tablet. Anyway, there were many kinds, white, red, and pink. (No. 8)

All participants were able to describe the appearances of drugs used specifically as colored capsules or tablets, taken orally. For example, one student stated “*It was powder, taken in the capsule. Um, we had been taking this [unknown drug] diluted with water for two months before the exam. (No. 2)*”.

The unknown drugs were offered by their coach in private. Unused drugs would be sold to other peers. The source of drugs could also be administrative personnel who worked in the high school. As students stated:

We used it privately. That's um..., some students might use, the others might not. I don't know, I don't know what it [unknown drug] was. We were informed by our coach to his personal office to get all these stuffs. My best teammate and I were not willing to take such drugs, we didn't want to use it.

A lot of drugs there, tablets, capsules. But we didn't know what those were, we had no idea. My coach sent messages separately to each student to [come to] his personal office, offering such drugs. He met us one by one, individually. (No. 18).

3.2 EFFECT OF DRUG USED

When talking about the specific effect of using drug on a one-off basis, most students stated that there was no or no obvious enhancement in performance when they took the physical fitness tests. One student stated.

"I guess the capsule and powder I've had on that day [physical fitness tests] might be doping, because we took them right on that day. I think it should be drugs, but it didn't work, no effect. That was weird. (No. 4)". Sometimes there were side effects: as one student said, *"...shot put and 800-meter run in the afternoon. Before the exam, my coach gave me some powder, two capsules, and a few pills... The coach just told us that these drugs would improve our endurance ability... I took them after warm-up... But nothing special. My performance even decreased rather than increased. (No. 4)".*

With regard to drugs used episodically, strength enhancement was achieved, but complications with unexpected chronic fatigue and low motivation to train, bad flexibility, masculinization, and acne.

I felt my strength increased when training, for example, 45 kg was my maximum strength when squat, and 50 kg was very easy after taking those drugs. I felt my strength increased. (No. 3)

Sometimes, very tired, kind of fatigued, I don't know how to say, anyway, it was very tired ...I felt that it was tired after training when using the substances. There was lack of motivation to train after a period of using such drugs. ...some muscles were out of control, very stiff when I ran even if my strength increased. Once you took drugs, acne would grow quickly, just a few tablets, would be a lot of acne on the face. (No. 3)

Legs were very tired, very sore and swollen, muscle fibers became tense, may be muscle fiber thickening after having dianabol? I don't know. (No. 6)

I didn't take dianabol, but my teammate did. Girls had sprouted beards. Really, a girl with a beard. I don't know what happened to boys. For girls ... beards and hair grew more than before. Body changed greatly after using such drugs. This has a great impact. (No. 14)

Stigmatization was present to some extent, as one city was frequently mentioned where students were suspected of using dianabol. *"Doping was used in many cities I heard, especially in [name of the city] which was a city*

that used doping openly. It was heard that girls grew beards after taking [drug]. But I don't know whether it's true. (No. 15)".

3.3 INITIATING FACTORS FOR DRUG USE

Personal Factors

The desire to win emerged as a major reason for using drugs, regardless of the cost, in student athletes. Apparently, better performance in the physical fitness tests and higher total scores enabling entry to preferred colleges were the main motivations for drug use in this investigation. Therefore, goal-orientation was an important contributor to substance abuse behaviours (Ehrnborg et al., 2009). Participants noted that *"No one wants to be the last! (No. 9)"* and *"As athletes always want to win in the competition, we seek enhancement of performance by any way that may work. (No. 15)"*. Furthermore, protective factors were quite weak regarding the deterrent to drugs. Most of the non-athlete students acknowledged the potential health risks of doping, such as the side effects of dianabol. Individual personality traits such as dispositional risk-taking increased the likelihood of such behaviour: one student said *"Yes. But we just know that there is an existing possibility to harm the body, not 100%. Um, so, um, I think I can take it [drug]. (No. 2)"*. In addition, anti-doping control testing as a deterrent is not currently available for physical fitness tests.

I come from [name of the city]. ...my coach would suggest using protein supplements if I was too thin. And I admit that I used dianabol when high school. It was red tablets. The main ingredient in dianabol is testosterone, but small amounts, a kind of androgen. It violates the spirit of sport, which I talked about with my teacher after entering the university. Because what we got was exam-oriented education in high school. You are not qualified to enter university if you don't get good scores. In addition, there wasn't any supervision on doping abuse. To sum up, the "benefit" of doping outweighs the risk. (No. 19)

FOMO, "fear of missing out", was characterized by a desire to stay continually connected with what others were doing. Under the perception that "everybody does it", silent pressure was put on students to dope to compete on a perceived equal footing. *"There were no other options, anyway, everyone bought it [drug]. (No. 1)"*. *"If this [drug] can really improve performance, then, knowing that others have taken it but I don't, this makes me feel at a disadvantage. (No. 17)"*. FOMO was associated with worsening anxiety and students

were made to resort to drugs, seeking for self-confidence externally. One student noted: *“I used it [dianabol] only once before the tests, yeah, rarely, I felt it would give me some guarantee in spirit. (No. 15)”*.

Boosting recovery from training or from injury was another contributor to substance-use behaviour. The perceived effect of using substances was to delay the onset of exhaustion during training and to boost recovery after training. *“It was kind of delayed fatigue, getting tired later, yeah. I think my coach asked me to use drugs in order to get better recovery. (No. 20)”*. There were cases in which students used drugs to relieve pain as they were getting injured before the tests: *“I heard that someone [teammate] was injured before the tests and used doping in order to relieve the pain. (No. 15)”*.

Social factors

Coaches played an important role in drug use by adolescents. Similar to athletes, non-athlete students have faith in their coach's decisions. As one student stated: *“Well, the coach said nothing about what kind of impact this drug would have on the body except being helpful to the examination. Well, I would choose to trust him. Ah, the coach was my beacon light, I always felt his decision was right. (No. 2)”*.

Some adolescent students said it was hard to say no to their coach because of a sense of duty or a desire to remain in favor with the coach. *“There were also some, a small number of people [teammates] paid for the drug to keep a good relationship with coaches. Because at that time, to most of us, if the coach asked us to buy this and pointed that this was good for tests, I had no reason to refuse, really. He wouldn't explain the harm of these drugs. Mostly we had no reason to refuse. (No. 3)”*. There is another similar illustration: *“Because, after all, if the coach recommended, I would be embarrassed to refuse, sometimes. That's, umm, some teammates brought it [drug], because of their relationship with the coach. (No. 19)”*.

Students further explained that their coaches were under the stress of KPI policies created by the administration departments of high schools, as more students successfully entering college meant more rewards and further career promotions for the coach. If drug use was part of the culture and tradition of a high school, coaches tended to adhere to that norm.

Coaches cared about training methods, diet, and supplements. If the training methods and supplements were changed, resulting in low rates [of admission] to colleges, coaches would be blamed. All mistakes [are] attributed to coaches. The rate of entering colleges was high using [dianabol] in the past few

years, there was a norm, and it was definitely risky to stop it [dianabol]. They [coaches] could not take the risk. (No. 19)

The participants also pointed out that coaches may have recommended drugs to adolescent students because of the extra income that drug supply can provide.

To be honest, he [the coach] purchased dianabol for us. There are many types of drugs with many effects, right! But he only ordered dianabol, effective for someone but no effect to others. I felt that there may be some conflict of interests. The dianabol was sold to us at 4 or 5 dollars per tablet, and there were 300-400 students in our team. That is just my opinion, I think. (No. 3)

It was surprising that participants rarely mentioned their parents' involvement in the decision and behaviour in drug-taking. As one student stated: *"In my opinion, no one talked about it. No one discussed with their family whether to use [dianabol] or not. It's okay. I was over sixteen. I could make the decision myself. (No. 19)"*.

Environmental factors

Participants in the present study identified NCEE as the most important step in life for high school students: *"only once in a lifetime (No. 1)"* and *"determinant of entire life (No. 17)"*. As one student noted: *"National College Entrance Examination! It must be passed to go to a college. Win or lose, no one wants to be a loser, as far as I understand. In order to get qualification to enter a college, after all, everyone wants to be admitted to an ideal university for living a better life in the future. (No. 17)"*.

Several participants also stated that they had not much interest in sport or PE-related careers in the future. They received training to prepare for the physical fitness tests, which accounted for half of the total score. This revealed an imbalance between their low motivation to train but high expectations of entering an ideal college.

Training is hard. I trained because this enabled less effort in learning other subjects. Yeah! I had also a negative attitude during training in my second year of high school. I knew that I would be admitted to an ideal university through sport. The main reason was to get admission to the university (No. 2).

Students provided a signed form promising they would not engage in doping when examination, but there were no follow-up anti-doping tests. This meant that there was no cost attached to drug abuse. Students also considered that: *"There are many students taking the physical fitness test, so it's difficult to test urine. If doping testing is really carried out, it would be very*

expensive to organize the tests. Oh, anyway, the supervision of doping violation is ineffective (No. 4)".

Participants could not clearly differentiate between doping and supplements during the interviews. There was a lack of education on anti-doping for students, their coaches, and administrative personnel in high school, which meant that anti-doping education had no role. One student commented "Well, I think this is, coaches and adolescent students knew nothing about doping, just like my high school, there was little anti-doping education, the coach just told you to do that, so it is natural to dope to improve performance. Yes! (No. 1)".

Participants learned about doping mainly from the Internet and media. For example: "I like sports games. Track and field is my major. The teacher does not allow the phone, to learn more knowledge, we surf the Internet to get relevant information through mobile phones secretly, and then we learn about doping. (No. 17)".

4. Discussion

The major purpose of this study was to determine the motivation for and contributing factors to doping behaviour among non-athlete students. In China, over 660,000 high school students take the physical fitness tests for NCEE every year (estimated from data of five typical provinces in 2021). This is a large sport-related population, who aim to be PE teachers, coaches, or sport-related co-workers in the future. Substance abuse would become a vicious circle when they became PE teachers if they still accepted such behaviour. Thus, our present findings have answered following three questions: why adolescents used drugs, what happened after illegal using, and what is the further solution, which have far-reaching implications for the prevention of doping among adolescents, and for promoting clean sports and sustainable fair play in sport for the younger generation.

4.1 WHY DID NON-ATHLETE STUDENTS DECIDE TO USE DRUGS?

Students were ignorant and neglected

Ignorance was an important reason for drug abuse among non-athlete adolescents. As a special sector of the population, non-athlete students had been neglected by the sport-related anti-doping agencies. They were ill-in-

formed on doping and most of them did not have any anti-doping education in high school. Most students could not distinguish between prohibited substances and healthy supplements. It was surprising that some students still took substances when they knew they were drugs. Although the health concerns of doping were mentioned, they believed that taking it only once was less harmful to health than expected, which was partly the result of lack of knowledge about doping. This finding echoed previous research. In accordance to Erikson's study, exposure to formal anti-doping education was lacking and a blanket admission of not being aware of the banned substances – just knowing that there was such a thing as a 'banned list' (Erickson et al., 2015). Many researchers believed that better knowledge could help students to avoid engaging in doping (Dincer et al., 2013; Jovanov et al., 2019; Sagoe et al., 2016).

Goal-orientation

Goal-oriented values in non-athlete students resulted in devoting themselves to certain goals regardless of the cost. In our study, most participants said that they would be willing to engage in doping in order to achieve their goals, such as successful entrance to a college or to a better college. In previous studies targeting athletes, goal- or task-orientation was found to be a double-edged sword. Li and colleagues suggested that task-orientation might provide protection from doping. Athletes were found to be willing to obey the rules and preferred to succeed through their own efforts (Li et al., 2022). However, task-orientation seemed to be an augmenting factor, since doping was used as a tool to achieve an end, although it is against standards as sportsmen but necessary to ensure success in competition (Petróczi, 2007). Our finding agreed with Kirby et al. that maintaining a more diversified value system seemed to be an effective way to resist the temptation to use doping (Kirby et al., 2011).

Moral disengagement

Moral disengagement was another determinant of substance-abuse behaviour. Some students in this study believed that the use of prohibited substances only once in a lifetime was allowed. This is defined as a form of moral disengagement, with mechanisms to minimise or ignore the consequences when individuals commit a transgression in order to obtain personal goals (Engelberg et al., 2015). The less self-regulatory efficacy athletes have, the

more morally disengaged they tend to be (Grimau et al., 2021; Mallia et al., 2016). Therefore, 'FOMO and herd mentality', 'reducing stress and anxiety', and 'seeking enhanced self-confidence' are likely to result in attitudes favorable to drug use and being more susceptible to substance abuse behaviour. Our findings also supported previous assertions that the moral values of students were related to their substance abuse behaviours (Engelberg et al., 2015; Petar et al., 2020). In competitive sports, anti-doping activities have been enforced due to concerns for athletes' health and fair play. After almost half a century of evolution, it has become a moral crusade for preserving lofty values in the competitive world (Hunt et al., 2012; Verner et al., 2014). The use of prohibited substances has been condemned as cheating (Petróczi et al., 2015).

Coaches' influence on doping

Coaches encouraged students to use drugs rather than preventing such behaviour were founded in our results, and even provided drugs to non-athlete students. Petróczi et al. (2017) pointed out that better performance was not only important to the athletes' livelihoods, but also to those (coaches) who encouraged them (Petróczi et al., 2017). Better performance meant more students successfully entering college, which helped with coaching KPI scores. No coaches were interviewed in this study. Based on students' views, substance abuse behaviour has become the tradition and norm in high schools and coaches tend to be facilitators of this. Most of current PE college students would like to be PE teachers or coaches. Therefore, any intervention would be likely to impact on the behaviour of future coaches. Research has supported the protective influence of coaches in relation to doping due to their closeness or importance to athletes (Kirby et al., 2011). Coaches are also aware of their potential anti-doping power, and they should use their influence positively to aid doping prevention (S. H Backhouse et al., 2016). The WADA Code indicates that a coach will be punished if they violate anti-doping policies, including encouraging, assisting, aiding, abetting, or covering up the use of prohibited substances or methods, as well as trafficking, possessing, administering prohibited substances, or any other type of complicity involving an attempted or actual anti-doping rule violation (WADA, 2021). Unfortunately, the role of coaches in our study was unaffected as there are no anti-doping rules for school sport in China at present.

4.2 WHAT HAPPENED TO NON-ATHLETE STUDENTS AFTER USING DRUGS?

Side effects on health

Some side effects after doping were described by adolescent students. One-off doping appeared to have no performance-enhancement effects, according to the students surveyed. Motivational aspects such as feeling more relaxed, seeking increased self-confidence, and releasing stress were mentioned, while others claimed that doping created only an outrageous feeling to make you just marching through the workouts without a fear. We could not confirm whether some students really had no idea about side effects or whether their goal-orientation led them to ignore them. Obviously, health concerns were not seen to be deterrents to substance abuse which was in accordance with previous studies (Engelberg et al., 2015; Malek et al., 2014). The founder of modern Olympism, Coubertin, stated that scorn for potential danger was an essential characteristic in sportspersons (Norbert, 2000). Some students suffered side effects of doping, such as excessive beard and hair growth, acne, masculinization, and unexpected fatigue. However, the side effects of drugs on physical wellbeing are more than that, as Albano et al. (2021) pointed out that the doping can impair all organs, tissues, and body functions, especially the cardiovascular, liver, and reproductive systems (Albano et al., 2021).

Low motivation for training

Some students in our study indicated that a contributory factor for taking part in training was low motivation to learn. They tended to spend more time in physical training, resulting in less time for learning and sitting in the classroom. So, sport was not their natural interest. The less motivation for physical training they had, the more likely they were to accept doping (Kirby et al., 2011). Conversely, in Erickson's study, participants who has enough motivation to train and enjoy the pleasure of exercise is associated with less risk of doping (Erickson et al., 2015). Secondly, doping had a further negative effect on training motivation. Doping gave students a psychological boost and made them feel invincible (Engelberg et al., 2015). Such students preferred to improve their performance by doping rather than through hard work. As a result, a negative training climate tended to develop progressively.

Stigmatization

In this study, students from one city were treated as a group suspected to be dopers. Hard training and efforts to engage in clean competition would not be recognized, who might face unexpected problems in their relationships with students from other cities when entering college. Doping among non-athletes causes stigmatization as it does in competitive sports (Dimeo, 2016). In professional sport, stigma can be a deterrence to doping. Once an athlete has been caught by an anti-doping authority or exposed to the public as a doper, there is a stigma attached not only to the athlete but also to the athlete's coach, team, and region. Stigmatization is a process that prevents an individual being fully accepted in society because of socially acknowledged discrediting factors (Skillings, 2020). Being associated with doping was considered to be associated with but not limited to blemishes of individual character, impacting on reputation, and social relationships.

4.3 HOW DO THE FINDINGS OF THIS STUDY CONTRIBUTE TO SOLVE THE PROBLEM?

Strengthen multi-structured supervision

There is an urgent need for an effective detection and deterrence approach (Elbe et al., 2017), although Codella et al. pointed out that detection-deterrence did not address the problems in adolescent non-athlete students due to the expensive testing fees (Codella et al., 2019). In practice, even testing a relatively need for supervision and deterrence of doping in non-athlete students in the physical fitness tests, as substance abuse behaviour was far more than individual case and could have severe consequence. The absence of anti-doping rules and strategies played a key role, based on our findings. Instead of leaving high school sport unsupervised, strategies to reduce the potential for doping should be considered by PE-related high schools, communities, provinces, and the whole country as well. Punishment for positive anti-doping tests may small percentage of competitors would contribute significantly to discouraging doping (S.H Backhouse et al., 2014). An online whistle blowing platform similar to WADA, allowing individuals to report any violations, could also be developed in China if testing deterrence could be not enforced among large number of students.

Education for non-athlete students

Our results emphasized that non-athlete students were ill-informed, single goal oriented, and morally disengaged in the absence of education

about doping in high school. Accordingly, an anti-doping intervention is highly recommended, focusing on the enhancement of students' basic anti-doping knowledge, and the establishment of multiple life goals and a strong moral stance against doping behaviour. Traditional anti-doping education programs providing basic knowledge about anti-doping have been proved workable to a certain extent (Deng et al., 2022). More recent studies have emphasized introducing the concept of morality into anti-doping education programs to encourage the development of strong attitudes against doping and to avoid moral disengagement (Li et al., 2022; Petróczi et al., 2017). Codella and colleagues created a cultural shift in young people by conducting anti-doping seminars in high schools in Italy (Codella et al., 2019). In addition, interventions involving self-affirmation may enhance the effectiveness of anti-doping education (Barkoukis et al., 2020). In our study, some participants pointed out that the Internet was a channel for them to learn about doping. When students are faced with information online, their ability to selection, understand, question, evaluate, and speculate is important. Media literacy interventions should thus also be considered, with the aim of involving non-athlete students in re-conceptualizing what realistic objectives might be with respect to sport performance and the pursuit of personal esthetic goals through sport (Lucidi et al., 2017). The provision of the WADA Code and related information on the Web could be effective and useful.

Education for coaches

In sport, coaches strongly influence athletes' attitudes toward doping (Moston et al., 2015). The contextual environment created by the coach especially influences the motivation and subsequent behaviour of athletes (Barkoukis et al., 2019; Grimau et al., 2022; Grimau et al., 2021). In this study, the coach was often the source of the drugs used by students. Considering this, anti-doping education must become a basic part of the coaching education process and it should be backed with strict compliance legislation (Engelberg et al., 2019). If a coach's morals and values are in favor of doping, then their athletes' doping intentions and behaviours are influenced accordingly (Barkoukis et al., 2019). Recent research showed that if athletes and coaches have positive moral values, this can reduce the prevalence of doping (Kavussanu et al., 2019). For this reason, Mazanov et al. suggested that the moral ethical component of education should be more heavily emphasized, explaining the moral basis of anti-doping behaviour so that coaches can make the right judg-

ments about their behaviour (Mazanov et al., 2013). Alternatively, developing a stronger professional ethic for coaches may help mitigate the risk (Mazanov et al., 2013). The acceptance and practice of the current WADA Code should be made a compulsory component of coach training and education. Further research targeting the coaches of non-athlete students should be conducted.

Enhance the involvement of parents

Adolescents reported relatively low levels of communication with their parents on the topic of doping. Parents play a key role from an athlete's earliest days in terms of attitudes to doping, directly or indirectly establishing their initial moral position (Bloodworth et al., 2010). Thus, they should be involved in the decision-making of adolescent students throughout the whole process of training, to have an ongoing influence on attitudes, experiences, and behaviours relating to doping. In previous studies in sports, parents taking a positive and supportive role influenced their children's decisions to stay away from doping (Erickson et al., 2017). In contrast, Chan's study pointed out that parents' desire to win puts pressure on students (Chan et al., 2014). As we obtained limited information about parents in our study, whether this approach has the potential to improve students' anti-doping behaviour should be further investigated.

5. Conclusion

Doping in non-competitive school sport is severe. Threats to health and fair play among non-athlete adolescent students were noted. Being ill-informed and neglected by anti-doping agencies, goal oriented, morally disengaged, and abetted by coaches were the main contributory factors to doping behaviour in adolescent students. There is an urgent need for better supervision and deterrence of doping in physical fitness tests, as the absence of anti-doping regulations and policies has played a key role in its prevalence. Education of students, their coaches, and enhancing the involvement of parents have been proposed as an effective way to prevent doping in school sports. As a special sector of the sport-related population, the findings for PE students may have far-reaching implications for the prevention of doping and for promoting clean sport and sustainable fair play for future generations.

6. Limitations

Although the study offered information on the current situation and contributory factors to doping among adolescents in China, it had several limitations. First, what the adolescents had used were not confirmed, when they talked about “drugs/unknown substances”, as they had used them some years ago. Second, participants may hesitate to provide details as the drug/substance used was illegal. Third, there were few female participants and the findings may not adequately represent the experiences of female PE students. Finally, coaches or parents were not directly interviewed, and the viewpoints came from the interviews with students who were adolescents at the time of their drug use.

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