

THE RELATION BETWEEN AN ANTI-DOPING EDUCATION PROGRAM AND RISK FACTORS FOR DOPING SUBSTANCES USE

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Abstract. Sports education has the role of promoting ethical values and behaviors, thus contributing to the protection of athletes and the development of sports activities. Its necessity is indisputable given that the anti-doping tests carried out at the national level, in different categories of athletes, have highlighted violations of the anti-doping rules, including at the junior level. For this reason, between April and May 2023, a study was conducted that aimed to highlight the influence of risk factors for doping behavior at the level of junior athletes (14-16 years old), in relation to the effectiveness of an anti-doping education program. The study was conducted at the National College Emil Racoviță from Bucharest, with 22 student-athletes, practitioners of various sports disciplines. From the analysis of the obtained data it resulted the fact that a series of accumulated knowledge and learned behavioral characteristics do not provide sufficient support in the anti-doping fight or consistent positive changes in the attitude to resist the temptation to use banned substances. Under certain conditions and under the influence of the entourage, especially the coach, athletes show an average willingness to use prohibited substances. The results of this intervention show us that there is a need for the development of a future anti-doping educational curriculum, for the training of the moral skills necessary for athletes to resist the temptation to use prohibited substances in sports.

Keywords: education; sport; anti-doping; active-participatory methods.

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Introduction

The threats to sports ethics are numerous, but the one related to the consumption of prohibited substances attracts more and more attention due to the impact on the health of athletes, but also the social, economic and legal consequences of such behavior. This phenomenon attracted the attention of sports federations, as well as other organizations in the field, which proposed to make a common front in the fight against the phenomenon of doping and the issue of athletes' mental health (Kazlauskas & Hasan, 2010; Mountjoy et al., 2024). It is the reason why they assume considerable educational roles and interventions by which they discourage the adoption of decisions with a major negative impact on the lives of athletes. Through education, ethical values and behaviors are promoted in sport, thus contributing to ensuring an appropriate sports environment. At the same time, it is considered that a complex approach to this phenomenon, which includes education, is necessary to ensure the

sustainability of clean sport (IANS, 2024). This approach must be present in athletes of different ages and training levels, in parallel with the optimization of anti-doping testing strategies (Orr et al., 2010; Dvorak et al., 2014; Deng et al., 2022).

The qualitative improvement of the level of sports education is absolutely necessary in the context of complex changes in family life, community, multicultural society and globalization. A quality education means a different approach, by involving specialists of different categories, practitioners of physical exercises, but also educational partners, starting with parents, civil society, the media and the community, in joint projects aimed at sustainable procurement.

In this educational sense, ethics, the system of values (fair play, performance, rules, equal opportunities, respect, health, the joy of effort, and respect for others), help athletes to become aware of the consequences of their behavior on others, but on the society as well. The importance of ethics from the point of view of preventing deviant behavior is also recognized: early specialization and early exclusion or abandonment, doping and risks to life and/or health, violence (of spectators and athletes alike), corruption. On the other hand, all these aspects must be studied in relation to the psychological variables of athletes, in temporal evolution (Ntoumanis et al., 2014; Kavussanu et al., 2022). Special attention is paid to the motivation and performance goals that athletes have, because the need to improve performance, as well as expectations regarding rewards can constitute psychological variables particularly important in triggering the consumption behavior of prohibited substances (Barkoukis et al., 2020). Certain studies have also highlighted the relationship between the motivational climate and the moral behavior of athletes (Hoppen & Sukys, 2024). Similarly, cheating behavior correlates positively with attitude towards the use of prohibited substances (Nicholls et al., 2020; Hoppen & Sukys, 2024).

Most of the time, we find the classic paradigm in sports, which emphasizes the lecturer, the act of getting informed, the imposition of knowledge, and professors' authority. The athletes are given a passive role, that of listening, being polite, recording and reproducing the lecturer's speech. As a response to this approach, we identify the contemporary paradigm, centered on the athlete and learning experiences. From the traditional pedagogy, we have moved to a pedagogy that makes the athlete more responsible in the process of his own learning and training. Discovery learning is a complex teaching-learning strategy that provides the opportunity to acquire knowledge through personal, independent effort. Athletes, thanks to this method, are becoming more and more subjects of education. Thus, they explore, reconstruct, rediscover, and reach generalization, recreation, and the acquisition of new knowledge, through their own efforts.

The interactive methods are focused on the subject and the activity, emphasize the development of thinking, especially critical thinking, encourage participation, initiative and creativity, develop a specialist-sports framework partnership, stimulate multidirectional communication and formative assessment. Subjects help each other learn by sharing ideas, learn how to learn, express themselves freely, and work in teams. Currently, the focus is on interactive pedagogy that values cognitive and practical activity, the interactions and confrontations of ideas that appear in the learning process. On the other hand, it is recommended that actions to prevent anti-doping behavior respect the specifics of the sports discipline practiced by them (García-Martí et al., 2022). Bodybuilders, footballers, cyclists

have other information requirements, compared to the active population, who do not participate in competitions (Mohamed et al., 2013; Skrzypiec-Spring et al., 2024).

From the practice of anti-doping education carried out so far in Romania, we have found that athletes do not have enough information, do not ask for advice or do not make correct decisions, reasons for which positive cases of doping appear, among the most diverse. Experience from other countries indicates that an appropriate curriculum appears effective in improving young athletes' moral judgments regarding external influences that may enhance performance and doping. Furthermore, it shows that appropriate educational intervention increases the interest and engagement in moral reasoning of young athletes regarding external influences that can enhance performance and provides invaluable knowledge for the development of moral reasoning (Barkoukis, 2019).

The research carried out at National Antidoping Agency (ANAD) between the years 2008 - 2010 (Vâjială et al., 2010), regarding the risk of consumption shows that it is very high among junior athletes, especially those in the second, third and lower places, and that the athletes they have the greatest confidence in the doctor and trainer. Young and adult athletes are "role models" for juniors and, precisely for that reason, anti-doping education is very important for this age segment. Even if they reject the idea of doping in others, when it comes to their self-image (both physical and mental) they are willing to resort to banned substances. Considering this risk, it is recommended to establish more psychological counseling centers for athletes and as many psychologist positions as possible in sports clubs. A wider popularization of anti-doping regulations is necessary for athletes up to 18 years of age and, especially, for boys' groups. Following the studies carried out, ANAD Romania groups the risk factors into three groups (Table 1).

Table 1. ANAD risk factor model (2007)

1. Individuals	2. Social	3. Situational
1.1. Traits and personality types	2.1. Belonging group: Family,	3.1. Competition and the need for performance
1.2. Performance motivation; victory at any cost	Class or professional unit, Leisure group Sports team, Sports club	3.2. Rivalry, perceived as a threat
1.3. Self-image	2.2. Social environment - mass media, civil society; social representations of sport and the status of athletes	3.3. Uncertainty factors of the competitive space
1.4. Specific attitudes		
1.5. Level of culture and education		

Even though the athletes suggested that anti-doping education was not a factor influencing their decision whether or not to use banned substances, most agreed that anti-doping education was useful in that it informed them about policies and procedures: *I think that the information was good in this way... it gave me a clear understanding of what to look out for when taking medication and supplements.*

These results suggest that the traditional emphasis on education, testing and sanctions in anti-doping campaigns appears to be an influencing factor on individual decisions about the use of banned substances. The individual's personal and moral standards and the influence of their psycho-social environment appear to be the key factors underlying athletes' decision to doping.

However, this moral reasoning seems to be more complex than "it's just against the rules, so I won't do it". This was illustrated by athletes' suggestion that they would not take legal substances solely to achieve a performance-enhancing effect, even if they were permitted. Furthermore, athletes described the shame that would be associated with doping and this was largely described in terms of moral emotion and failure to comply with the norms and expectations of their social group. The ability to influence the "moral compass" of athletes would appear to be an effective way to influence decision-making regarding the use of banned substances in sport.

Methodology

Aim

The study aimed to highlight the weight of risk factors for the consumption of prohibited substances, at the level of junior athletes (14-16 years old), in relation to the effects of providing an anti-doping education program using active-participatory methods. This aim can be implemented through participation in an anti-doping education program, which can significantly influence athletes' attitude towards the consumption of prohibited substances.

Hypothesis

H1: The more consistent the athletes' knowledge about doping, the more their opinions/feedback will be favorable (athletes will be against doping).

H2: The deeper the athletes' knowledge of doping, the more consistent the athletes' attitude against doping.

Participants

The study was carried out with the help of 22 student-athletes, 9th graders, mosaic (different sports), from the National College *Emil Racoviță* from Bucharest. The level of performance is illustrated by the participation in the National Championship (18 athletes), World Championship (2 athletes), County Championship and Municipal Championship (2 athletes). 18 athletes did not achieve notable performances, one athlete achieved international titles and three athletes achieved national titles. The main sports represented have been swimming, polo, and diving. Most athletes (82%) have never been tested for doping, 14% have been tested 1-5 times and 4% have been tested more than 5 times.

Instrument

Knowledge, behaviors and attitudes tests. In the study, the Anti-doping Education Program Effectiveness Evaluation Questionnaire - SECTION A (applied before the educational program) and SECTION B (applied before and after the educational program) were applied. The questionnaire (Barkoukis et al., 2023) was designed within the project *A test of the effectiveness of the SafeYou program in four countries. A randomised control trial (WADA 2021-2023)*, where one from the authors (C. Berbecaru) was a team member. For the research

presented in this article, the Romanian version of the questionnaire was applied and only few questions were included.

From section A were analyzed eight items: age, gender, years of previous sport experience, competition level, best performance, participation in anti-doping education lessons (yes/no), providers of anti-doping education, number of inclusions in anti-doping testing sample.

From section B, were included in this research:

- 6 items about antidoping knowledge (false/true and I don't know answers);
- 4 items about the attitudes in relation to doping use (on a 7-point Likert scale);
- 13 items reflected options in relation with doping use (on a 7-point Likert scale);
- 6 items for moral disengagement in relation with the doping use (on a 7-point Likert scale);
- 6 items for the intention to use doping substances (on a 7-point Likert scale);
- 6 items for the resistance to doping temptations (on a 7-point Likert scale);
- 4 items about the intention to be involved in the anti-doping activities (on a 7-point Likert scale);
- 8 items about willingness to use doping (on a 7-point Likert scale).

Procedure

The anti-doping education program was realized during the period April - May 2023, during 12 lessons, conducted with a frequency of 2 lessons/week, which had the following themes:

- Ethical considerations of doping in sports (2 lessons);
- The need for doping control in sports (2 lessons);
- Do you know the dietary supplements and medications you take and their health risks? (2 lessons);
- Social influence and Doping (2 lessons);
- Doping is not a quick fix for performance (2 lessons);
- Keep yourself more than clean! The Role of Athletes in Protecting Clean Sport (2 lessons).

The program used interactive techniques (reciprocal questioning, one-minute paper, idea tree), collaborative and question-based responsibility education techniques related to the theme of the lessons.

Data analysis

CFA Path Factor Analysis consisted of the use of structural equation models (Structural Equation Modeling - SEM). Because the model estimates saturations, it allowed the calculation of a series of fit indices that highlighted the results obtained from the evaluation of the anti-doping education program.

The Correlation coefficient was used to measure the strength and direction of association that exists between two variables measured on an ordinal or nominal scale. This one ranges between -1 and +1 and provides information about the correlation between two variables. Thus, $0.3 < r < 0.5$ or $-0.5 < r < -0.3$ expresses small positive or negative correlation; $0.5 < r < 0.7$ or $-0.7 < r < -0.5$ expresses average positive or negative correlation; $r > 0.7$ or $r < -0.7$ expresses high positive or negative correlation, according to Colton rules (Akoglu, 2018).

Cronbach's Alpha coefficient measured the internal consistency or reliability of a set of variables/ questions that are part of a questionnaire. It was applied to determine whether the questions asked consistently measured the target variable. Specialists use 0.7 as a reference value (minimum threshold) for Cronbach's Alpha, which can range from 0 to 1. At this level and above, the items are sufficiently consistent to indicate that the measurement (questionnaire) is reliable.

Results

The distributions of the variables are not similar to the normal curve - Kurtosis and Skewness have high values, not in the range [-1.96; 1.96] (Hahs-Vaughn & Lomax, 2020) Thus, we applied non-parametric tests for data analysis.

Factor analysis. In order to verify our hypotheses, CFA Path factor analysis has been applied. In the analysis we kept only the variables that do not show multicollinearity and that favor a strong model. Details of the analyzed items appear in Table 2.

Table 2. *Model variables – description*

Variables	Items	Description
Knowledge	Label	If a nutritional supplement contains a prohibited substance, this will always be stated on the label.
	List	The National Anti-Doping Organization has a list of supplements that are 100% guaranteed to be free of banned substances.
	Urine sample	Athletes can only be sanctioned if they have a positive urine test.
	Verification	I have checked my supplements, food and/or energy drinks to see if they contain banned substances.
	Pills	I have checked whether my medicines contain prohibited substances.
Feedback	Informed	Seek anti-doping information/advice from club staff or medical professionals.
	Feedback1	... Do you understand/recognize the health risks associated with doping?
	Feedback2	... Do you understand/accept the importance of abstaining from doping (why doping should be avoided)?
	Feedback3	... Do you understand/recognize the importance of protecting clean sport by reporting doping violations?
Resistance to doping	Feedback4	... Do you understand/accept the moral concerns about doping?
	T2dop_ consid2	At one point, I briefly considered using a banned performance-enhancing substance.
	T2dop_ attit7	Wrong choice – Right choice
	T2dop_ attit8	Unacceptable – Acceptable
	T2resist_ dop4	Your coach was the one who asked you to dope.
	T2resist_ dop6	You thought it was the only way to help your team succeed.

The CFA analysis resulted in a model with 2 formative variables (Knowledge and Doping Resistance) and a reflective variable (Feedback) (Figure 1). LF (loading factor) represents the loading factor for each item. The higher the loading factor, the greater the influence of that factor on the athlete's attitude towards the use of prohibited substances.

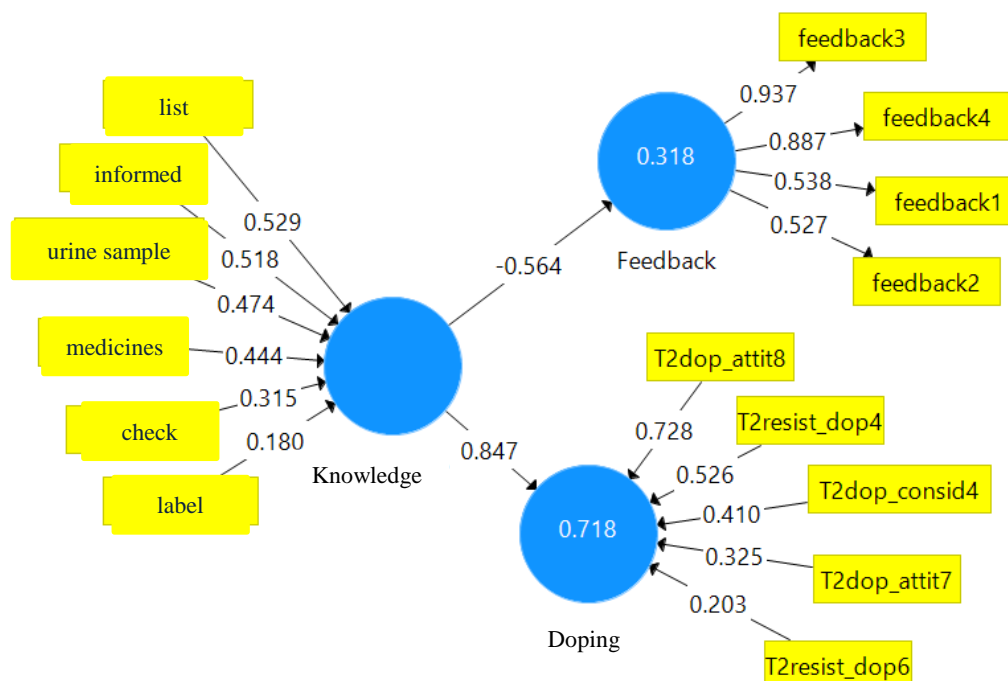


Figure 1. R Square Coefficient, Path Coefficients and Weight of Variables (LF=loading factors)

At initial testing no significant correlations were found between variables. At final testing (Figure 1), as far as the coefficients of the model are concerned, the formative variable **Knowledge** consists of 6 items: list (LF=0.529), informed (LF=0.518), urine sample (LF=0.474), medicines (LF=0.444), check (LF=0.315), and label (LF=0.180). In our case, it is observed that the athletes have accumulated knowledge regarding, above all, the list of supplements that are 100% guaranteed not to contain prohibited substances (according to ANAD). They understood that they need to seek anti-doping information/advice from club officials or medical personnel, believe that "Athletes can only be sanctioned if they have a positive urine test" and learned how to check if ingested drugs contain prohibited substances. Details of these items (LF) appear in Figure 1.

The **Feedback** formative variable consists of 4 items that evaluate the feedback received following the implementation of the program: Feedback3 (LF=0.937), Feedback4 (LF=0.887), Feedback1 (LF=0.538), and Feedback2 (LF=0.527). Although very high values of the loading factors are obtained (approaching the threshold of 1), the athletes are neutral or in weak agreement regarding the importance of protecting clean sport by reporting doping violations and accepts the moral concerns of doping. To some extent, they recognize the health risks associated with the use of doping and accept the importance of abstaining from doping (see Figure 1).

Doping consists of 5 items that reflect opinions and attitudes regarding doping: Testing2 availability for anti-doping education 8 (LF=0.728), Testing2 resistance to doping4 (LF=0.526), Testing2 I am thinking of using 4 (LF= 0.410), Testing2 agreement for the use of doping7 (LF=0.410), Testing2 resistance to doping6 (LF=0.203). From the analysis, it appears that athletes find doping acceptable and occasionally consider using a banned substance to

enhance performance because other athletes use it. If the coach were to ask them to dope, they consider doping to be a fair choice to a small extent, especially when they think it is the only way to help their team.

The coefficient Path Knowledge - Feedback (-0.564) (Figure 1) demonstrates that the degree of information and knowledge accumulated after the anti-doping program did not sufficiently change their attitude (feedback) regarding the importance of refraining from doping, the associated risks, reporting of deviations.

The Coefficient Path Knowledge - Doping (0.847) (Figure 1) denotes that although they know the risks and consequences, athletes consider doping in different situations to increase performance, when asked by the coach, to help the team.

A very strong and positive correlation is observed between the variables of the model: Knowledge and Doping (0.847) and average negative correlation between Knowledge and Feedback (-0.564), Doping and Feedback (-0.537), which confirms the previous statements. The consistency of our model was based on the validation steps provided in Table 3. All variables show high values that provide reliability to the model. Thus, Composite Reliability (CR>0.6), Cronbach Alpha (CA), rho_A (> 0.7 - acceptable value) and AVE (>0.5). We note that only rho_A is calculated for Knowledge and Doping because they are formative variables.

Table 3. *Correlation between variables*

	Knowledge	Doping	Feedback
Knowledge	1		
Doping	0.847	1	
Feedback	-0.564	-0.537	1

Power of the model. The R Square value (0.718) denotes the high correlation between the variables, while the Adjusted R Square reveals that only 70.4% of the variance of the dependent variable Doping is explained by the variance of the items of the independent variable Knowledge (Table 4). R Square Adjusted reveals that only 28.4% of the variance of the dependent variable Feedback is explained by the variance of the items of the independent variable Knowledge.

Table 4. *R Square coefficient*

	R Square	R Square Adjusted
Doping	0.718	0.704
Feedback	0.318	0.284

The Chi-Square value of the estimated model is greater than the minimum acceptable value of the saturated model, so our model is suitable to explain the influence between the variables (Table 5).

Table 5. *Chi Square coefficient*

	Saturated pattern	Estimated model
Chi-Square	129,448	129,820

Multicollinearity analysis. The variance inflation factor (VIF) of each variable was calculated using a 95% bootstrapping procedure to check the significance of the variables. All values under 5 express extremely low collinearity. In our case, the model is adequately designed, there being no multicollinearity.

1. *The opinion on doping*

Table 6. *Correlation matrix between items - opinion regarding doping*

	dop_ opin1	dop_ opin2	dop_ opin3	dop_ opin4	dop_ opin5	dop_ opin6	dop_ opin7	dop_ opin8	dop_ opin9	dop_o pin10	dop_o pin11	dop_o pin12	dop_o pin13
dop_o pin1	1,000	.279	.617	.098	.025	-.075	-.301	-.247	.272	-.047	.370	.186	.061
dop_o pin2	.279	1,000	.476	.324	-.050	.361	.128	.087	.190	.074	.387	.219	.194
dop_o pin3	.617	.476	1,000	.004	.094	.186	-.164	-.329	.259	.310	.450	.403	.132
dop_o pin4	.098	.324	.004	1,000	.219	.117	.162	.194	-.013	-.079	.190	.142	-.026
dop_o pin5	.025	-.050	.094	.219	1,000	.694	.684	.620	.018	.130	.114	.265	-.158
dop_o pin6	-.075	.361	.186	.117	.694	1,000	.804	.734	-.014	.084	.200	.046	-.160
dop_o pin7	-.301	.128	-.164	.162	.684	.804	1,000	.898	.019	.057	.137	.170	-.089
dop_o pin8	-.247	.087	-.329	.194	.620	.734	.898	1,000	-.041	-.131	.009	-.072	-.241
dop_o pin9	.272	.190	.259	-.013	.018	-.014	.019	-.041	1,000	.568	.526	.554	.266
dop_o pin10	-.047	.074	.310	-.079	.130	.084	.057	-.131	.568	1,000	.573	.751	.268
dop_o pin11	.370	.387	.450	.190	.114	.200	.137	.009	.526	.573	1,000	.734	.470
dop_o pin12	.186	.219	.403	.142	.265	.046	.170	-.072	.554	.751	.734	1,000	.519
dop_o pin13	.061	.194	.132	-.026	-.158	-.160	-.089	-.241	.266	.268	.470	.519	1,000

Thus, we observe that the strongest correlations occur between:

- dop_opin6 (chronic diseases) correlates strongly with dop_opin7 (social interactions), dop_opin8 (serious diseases);
- dop_opin10 (career success) correlates with dop_opin11 (medium) (performance), dop_opin12 (strong) (sponsorship).

2. Willingness to use prohibited substances

According to Table 7, it can be noticed that:

- willingness to use doping 1 (need to finance specific training) correlates very strongly with willingness to use doping 7 (confidence in one's own strength) and willingness to use doping 8 (inclusion in the main group of athletes);
- willingness to use doping 2 (low performance) correlates with willingness to use doping 5 (strong) (acceptance of group behavior);
- willingness to use doping 3 (competition) strongly correlates with willingness to use doping 7 (self-confidence).

Table 7. Correlation matrix between items - willingness to use doping

	willing1	willing2	willing3	willing4	willing5	willing6	willing7	willing8
willing1	1,000	.200	.673	.378	.254	.320	.759	.887
willing2	.200	1,000	.594	.058	.822	-.160	.242	.179
willing3	.673	.594	1,000	-.100	.594	-.056	.788	.620
willing4	.378	.058	-.100	1,000	-.019	.090	.120	.222
willing5	.254	.822	.594	-.019	1,000	.006	.242	.157
willing6	.320	-.160	-.056	.090	.006	1,000	.355	.169
willing7	.759	.242	.788	.120	.242	.355	1,000	.612
willing8	.887	.179	.620	.222	.157	.169	.612	1,000

3. Resistance to doping

According to Table 8, it is obvious that all the items correlate very strongly with each other. This correlation indicates that resistance to the use of prohibited substances is strongly influenced by the athlete's environment.

Table 8. Correlation matrix between items – resistance to doping

	resist_dop1	resist_dop2	resist_dop3	resist_dop4	resist_dop5	resist_dop6
resist_dop1	1,000	.760	.914	.900	.951	.949
resist_dop2	.760	1,000	.885	.781	.859	.794
resist_dop3	.914	.885	1,000	.878	.907	.933
resist_dop4	.900	.781	.878	1,000	.891	.936
resist_dop5	.951	.859	.907	.891	1,000	.949
resist_dop6	.949	.794	.933	.936	.949	1,000

4. The attitude towards doping

From Table 9, it can be seen that the strongest correlations are recorded between:

- consent for doping 4 correlates with consent for doping 7 (strong), a fact that indicates the association between the consideration of the consumption of prohibited substances as a component of sports ethics;
- consent for doping 6 and consent for doping 7 correlates with consent for the use of doping 8 (strong), which indicates that athletes are aware of the danger to health and the violation of ethics in the case of the use of prohibited substances.

Table 9. Correlation matrix between items – attitude towards doping

	dop_attit1	dop_attit2	dop_attit3	dop_attit4	dop_attit5	dop_attit6	dop_attit7	dop_attit8
dop_attit1	1,000	.415	.745	.392	.276	.327	.588	.393
dop_attit2	.415	1,000	.565	.587	.210	.352	.649	.591
dop_attit3	.745	.565	1,000	.377	.379	.372	.555	.436
dop_attit4	.392	.587	.377	1,000	.269	.103	.787	.471
dop_attit5	.276	.210	.379	.269	1,000	.050	.413	.332
dop_attit6	.327	.352	.372	.103	.050	1,000	.264	.709
dop_attit7	.588	.649	.555	.787	.413	.264	1,000	.745
dop_attit8	.393	.591	.436	.471	.332	.709	.745	1,000

5. Promotion of sports values

From Table 10, it becomes clear that availability for anti-doping education 1 (values) correlates strongly with availability for anti-doping education 2 (education).

Table 10. Correlation matrix between items – promotion of sports values

	sup_cleanspo1	sup_cleanspo2	sup_cleanspo3	sup_cleanspo4
sup_cleanspo1	1,000	.772	.358	.086
sup_cleanspo2	.772	1,000	.161	.092
sup_cleanspo3	.358	.161	1,000	.460
sup_cleanspo4	.086	.092	.460	1,000

6. Feedback on the program

From Table 11, it can be noticed that Feedback 3 (reporting attitude) strongly correlates with Feedback 4 (strong) (morality), which allows us to state that athletes participating in the program accept involvement in behaviors supporting clean sport.

Table 11. *Correlation matrix between items – feedback on the training program*

	feedback1	feedback2	feedback3	feedback4
feedback1	1,000	.600	.230	.435
feedback2	.600	1,000	.588	.621
feedback3	.230	.588	1,000	.773
feedback4	.435	.621	.773	1,000

$\alpha = 0.05$; two-tailed

Discussions and conclusion

Following the results obtained, it was found that the program had an effect on the knowledge gained by the athletes and on some of the variables associated with the attitude towards the consumption of doping substances. Athletes have gained knowledge about, in particular, the list of supplements that are 100% guaranteed to be free of banned substances presented by the national anti-doping organization. They have learned that they must seek anti-doping information/advice from club or medical personnel and they have learned that they must check that ingested drugs contain prohibited substances.

Athletes do not support the protection of clean sports by reporting doping violations, although they agree that such behavior reflects the level of morality of the athletes. To some extent, they do recognize the health risks associated with the use of doping and accept the importance of abstaining from doping. However, athletes consider doping acceptable and occasionally consider using a banned performance-enhancing substance because other athletes use them. If the coach asks them to dope, they see doping as the right choice, especially when they think it's the only way to help your team succeed.

The acquired knowledge has not sufficiently changed their opinion regarding the importance of refraining from doping, they have not sufficiently understood the risks associated with the consumption of prohibited substances, as well as the willingness to engage in misconduct reporting behaviors. This pattern shows that the degree of information and knowledge gained after the anti-doping program did not change their attitude towards the use of prohibited substances, although they did change their opinions in some respects. Most athletes state that it did not help their course. However, we believe that the responses of these athletes indicate an attitude of bravery because they do not want to accept the negative effects of doping. This fact can be seen from the second path of the model, which shows that information and accumulated knowledge strongly positively influence resistance to doping. We face a situation of cognitive dissonance (athletes have certain opinions, but express the opposite).

We believe that athletes have a predominantly correct attitude towards doping, but still inconsistent and poorly formed. Under limited conditions, many of them are willing to use a banned substance if it increased your chances of getting a professional contract or funding, if they had a poor performance, if they had an injury and need to recover fast, if peers did so, and the competition were not fair, if given to them by someone they trust (e.g. coach, friend, teammate, family member), etc. Acquired knowledge and learned behavioral characteristics do

not provide sufficient support for athletes in the anti-doping fight to be confident that they could resist the temptation to use banned substances.

We can also add that the intervention program has not been very effective in understanding/recognizing the health risks associated with doping, understanding/accepting the importance of abstinence (why doping should be avoided) from doping, understanding/recognizing the importance of protecting clean sport by reporting misconduct of doping, understanding/accepting the moral concerns related to doping.

We can draw the conclusion that student athletes must *revise their attitude* towards doping. Many believe that doping is just a way to "maximize one's potential", that they cannot be blamed for doping if their peers pressure them to do it, and that compared to the illegal things people do in everyday life with today, doping in sports is not very serious.

Thus, in borderline conditions many athletes are willing to use a banned substance if it increased their chances of getting a contract or professional funding, if they had a poor performance, if they suffered an injury and needed to recover fast, if peers did so, and the competition were not fair, if given to them by someone they trust (e.g. coach, friend, teammate, family member), etc.

After the test we can conclude that the athletes did not improve their attitude about doping, considering it as a trivial fact, although they became more informed in the last 4 weeks about the content of banned substances from supplements, food and/or energy drinks consumed and sought anti-doping advice from other athletes on the team, coaches, doctors, official anti-doping sources (e.g. WADA, ANAD). Significant program effects were recorded on the level of temptation to use prohibited substances.

Since the literature suggests (Barkoukis et al., 2019; Deng et al., 2022) that moral development and moral reasoning have the strongest impact in deterring the decision to use prohibited performance-enhancing substances, moral development should be a vital concern and goal in adolescent sport.

The literature shows (Ntoumanis et al., 2014) that athletes score significantly lower than non-athletes in solving hypothetical moral dilemmas in the context of doping in sports. If this is true, current anti-doping education programs underestimate the influence of moral development on decision-making about banned substances.

The results of this intervention show us, as well as specialized studies (Dvorak et al., 2014; Kavussanu et al., 2022) that there is a need for the development of the future anti-doping educational curriculum, especially the challenge of making a deliberate effort to equip athletes with the moral skills necessary to navigate the issue of doping in sports. It is easier to create attitudes and habits from younger ages than to change behaviors at older ages. In this context, it is important that anti-doping education starts early.

Within educational activity, the assistant staff of the athletes must also be involved: coaches, trainers, doctors, technical staff, officials and last but not least, the parents. To a large extent, the school must also be involved because it plays an extremely important role in preparing the student athlete so that the integration into society is as healthy as possible.

Following the activities carried out with high school sports students in the 9th grade, we claim that they have the age, intellectual level and skills necessary to assimilate the information in the anti-doping field. They should possess a portfolio of anti-doping knowledge, anti-doping attitudes, and assumed anti-doping behavior that will enable them to compete confidently and

successfully cope with established anti-doping rules and increasing performance in sports competitions.

Given that there are already anti-doping programs for students, future coaches or teachers of physical education and sports, the introduction of an anti-doping program would be timely and necessary. Student athletes do not have thorough information, the necessary anti-doping knowledge, most of them have empirical knowledge, but they show interest in knowing information about anti-doping activity.

We can state that more than 12 lessons are needed to strengthen the anti-doping attitudes of athletes. A sustained educational intervention that can have long-term effects on them is definitely required. Constant interventions, an anti-doping school curriculum are needed to repair the "moral compass" of junior athletes, if this already exists or to support them in building one.

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