Design and validation process for the attitudes scale towards academic doping in university students (EADA-EU)

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Summary

Introduction: Academic doping, cognitive enhancement or neuro-enhancement, understood as the use of substances, including medications without a medical prescription, to improve academic performance has reached to the classrooms of the higher educational system, and is considered a public health problem. This study aimed to develop and validate a tool to assess attitudes towards the use of substances to enhance academic performance among university students.
Material and method: A questionnaire was created based on previous studies conducted in several European countries and the content was validated by a committee of experts, followed by an analysis of its reliability and construct validity. In this phase, a sample of 245 students from the University of Zaragoza was used. The validation process included exploratory and confirmatory factor analyses.
Results: The initial exploratory factor analysis (EFA) suggested a 12-item model, which was later reduced to 10 items to improve the fit indices. The confirmatory factor analysis (CFA) fit indices were adequate for the 10-item model (CFI >0,9; IFI >0,9; RMSEA <0,08). The final scale, named the Academic Doping Attitudes Scale for University Students (ADAS-US), includes two dimensions: "Ethics and Academic Justice" (Cronbach's alpha = 0,796) and "External Factors and Academic Well-being" (Cronbach's alpha = 0,703).
Conclusions: The main conclusions indicate that the ADAS-US is a valid and reliable instrument for measuring attitudes towards the use of substances to enhance academic performance. This instrument can be useful for designing and implementing specific educational interventions aimed at preventing academic doping, promoting an ethical and healthy academic environment.

Key words:
Academic doping. Cognitive enhancement. Higher education. Instrument validation. Psychoactive substances.

Proceso de diseño y validación de la escala de actitudes hacia el dopaje académico en estudiantes universitarios (EADA-EU)

Resumen

Introducción: El dopaje académico, mejora cognitiva o neuro-mejora, entendido como la utilización de sustancias, incluyendo medicamentos sin prescripción médica, para mejorar el rendimiento académico ha llegado a las aulas del sistema educativo, siendo ya considerado un problema de salud pública. Este estudio tuvo como objetivo desarrollar y validar una herramienta para evaluar las actitudes hacia el consumo de sustancias para la mejora del rendimiento académico en estudiantes universitarios.
Material y método: Se creó un cuestionario basado en estudios previos realizados en varios países europeos, validándose inicialmente su contenido a través de un comité de expertos, y posteriormente analizando su fiabilidad y validez de constructo. En esta fase se utilizó una muestra de 245 estudiantes de la universidad de Zaragoza. El proceso de validación incluyó análisis factoriales exploratorios y confirmatorios.
Resultados: El análisis factorial exploratorio (AFE) inicial sugirió un modelo de 12 ítems, que posteriormente se redujo a 10 ítems para mejorar la bondad de ajuste. Los indicadores de ajuste del análisis factorial confirmatorio (AFC) fueron adecuados para el modelo de 10 ítems (CFI >0,9; IFI > 0,9; RMSEA <0,08). La escala final, denominada Escala de Actitudes hacia el Dopaje Académico en Estudiantes Universitarios (EADA-EU), incluye dos dimensiones: "Ética y justicia académica" (α de Cronbach = 0,796) y "Factores externos y bienestar académico" (α de Cronbach = 0,703).
Conclusiones: Las principales conclusiones indican que la EADA-EU es un instrumento válido y fiable para medir las actitudes hacia el consumo de sustancias para la mejora del rendimiento académico. Este instrumento puede ser útil para diseñar y aplicar intervenciones educativas específicas orientadas a la prevención del dopaje académico, promoviendo un entorno académico ético y saludable.

Palabras clave:
Dopaje académico. Mejora cognitiva. Educación superior. Validación de instrumentos. Sustancias psicoactivas.

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Introduction

The term *doping* is associated with the use of prohibited substances to improve performance. The Spanish Royal Academy (RAE) defines the term doping as the "administration of drugs or stimulants to artificially enhance performance by the body, sometimes with harmful effects to health"[1]. Doping has spread into other fields of performance besides sport, such as the workplace, academia, etc. Hence the terms *academic doping, cognitive improvement* or *neuro-improvement*, which refer to the use of substances, including non-medical prescription drugs, to improve academic performance[2]. This type of substance consumption is already considered a public health problem[3].

Despite the lack of evidence to show that these substances improve specific activities[4], their use may include various intentions based on the need of the consumer, such as prolonging study hours without encountering fatigue, reducing the number of sleep hours required per day, maintaining concentration in a more sustained and effective manner or improving memory capacity[5]. The most commonly used substances are atomoxetine (Atamax), modafinil (Modiodal) and methylphenidate (Rubifen), which act on the nervous system to alter cognitive, emotional or behavioural functions, and, more specifically, the substances called nootropics or *smart drugs*, psychoactive substances the pharmacological effect of which is to specifically improve what are referred to as higher cognitive functions[6]. Substances that might seem more widespread in principle, such as creatine or energy drinks, which contain caffeine and taurine (Red Bull, Burn, Monster, CocaCola Energy, etc.), also seem to have certain potential for use in academic doping. It has been suggested that the use of creatine may increase cognitive function due to its metabolic function[7], while energy drinks would be used for their stimulating effect. The consumption of energy drinks has increased significantly among Spanish students and were included in the latest "Alcohol, Tobacco and Illegal Drugs in Spain" report in 2023 from the Spanish government as psychoactive substances on a par with tobacco, alcohol and cannabis, with a noticeable impact on academic performance and behaviour[8]. According to this report, 37.7% of students aged 12 and 13 consume these substances. This figure rises in older students, with close on 50% of 18-year-old students consuming them.

Studies in other countries report on the consumption of substances for academic performance improvement both at school and at university. 15% of secondary school students in Sweden consume these substances, and up to 30% in South Africa. 67% of university students in the United Kingdom and Ireland[11] consumed or had consumed such substances. In Australia[12], 50.6% admitted to having taken one cognitive enhancement substance or another at some point in their life. In the United States[13], there are data on the prevalence of stimulants that suggest a figure between 5 and 35%.

The data clearly show that academic doping is present in our classrooms and, although the use of such substances has not objectively shown a significant improvement in performance, consumers do indeed perceive a subjective performance boost[14]. The users of these cognitive enhancers tend to better accept their use by others, as well as to consider it fair, especially in cases of students with inferior academic performance[15]. However, the uncontrolled use of these substances can lead to demotivation and commitment in those who do not consume them, as well as possible conflicts in teamwork activities[16]. Drug-induced cognitive improvement poses both ethical and public health-related challenges[17] given that their use over the medium and long term may lead to dependency, as well as neurological or cardiovascular disorders[3], or metabolic and endocrine disorders in the case of energy drinks due to their high sugar content[18]. Furthermore, many users do not consider themselves to be consuming drugs. This worsens the lack of knowledge about their side effects, especially with those that are manufactured and distributed illegally[19], with some people even faking symptoms to receive prescriptions[20]. In the case of energy drinks, links have been found between excessive consumption and the abuse of other substances in secondary school students[21].

Back in 2006, it was reported that doping with central nervous system stimulants poses major risks to public health and that prevention measures should be adopted proactively[22]. In recent decades, the World Anti-Doping Agency has been promoting education programmes to combat this phenomenon through education rather than penalties[23,24]. More recent studies show that the attitudes, beliefs and knowledge around doping impact their use and are an important predictor for the intention to use prohibited substances. The design of educational programmes and actions therefore requires an initial assessment of the situation, from which contexts for preventive action can be defined[23,25-31]. The doping decision is a complex issue and a psychological process that involves environmental and social cognitive factors[32,33].

Knowing the attitudes, as well as the level of knowledge, around doping and anti-doping practices and regulations is therefore important as, to a great extent, they determine the ability to adopt a critical position regarding this practice[34]. Various studies determine a lack of widespread knowledge among university students about performance enhancing substances, which may cause those students to adopt a permissive attitude towards the consumption of this kind of substances[35]. The literature also suggests that students around the world seem willing to consider ingesting substances to improve their academic performance and there is a lack of training about doping within university programmes, both in sport and in academics, thereby neglecting the role of these programmes to raise awareness or regulate[36,37]. As a result, there is a real need to implement effective educational programmes to close this knowledge gap and improve knowledge and awareness among university students about performance enhancing substances and their ethical and health implications.

Questionnaires are the most commonly used tools in studies. The most commonly used questionnaire in sports doping is the Performance Enhancement Attitude Scale (PEAS)[33], a scale translated into more than 20 languages and used in 82 empirical studies in 24 countries[38]. An adaptation and validation with satisfactory results exists in Spanish[24]. No-

netheless, few studies exist in terms of academic doping, fewer on young athletes at a school level and even fewer on university students[35,39-42]. These studies on attitudes among university students towards the use of academic performance enhancing substances suggest discrepancies between students based on their environment. For example, 3 out of 4 students in the United Kingdom answered that the use of this type of substances seemed unfair to them[37], while 80% of students in Germany displayed positive attitudes towards their consumption and would consider their use[43]. On the other hand, Australian students are concerned by both the possible lack of effectiveness and the appearance of adverse reactions[44]. The possible reasons for their use include a lack of information and knowledge, competitiveness, pressure and demands from modern society[10,45-47].

Having tools that enable the systematic assessment of attitudes towards academic doping in education would allow for the regular review of different groups of students as a first step towards the design of educational actions aimed at its prevention. Hence, the goal of this study was to create and validate a suitable tool for assessing attitudes towards the consumption of academic performance enhancing substances in Spanish university students based on the hypothesis that the Attitudes Scale towards Academic Doping in University Students (EADA-EU) is a valid and reliable tool for assessing attitudes towards the consumption of academic performance enhancing substances in Spanish university students.

Material and Method

Study Perspective

This paper presents the process to create and validate an *ad hoc* tool for measuring attitudes towards the consumption of academic performance enhancing substances in university students based on the questions from studies on similar populations conducted in Germany[39], the Netherlands[40], Portugal[41] and Switzerland[42].

Panel of Experts

Due to the lack of an instrument suitable for the purpose of this study, a panel of experts consisting of five university professors was set up. The following criteria for inclusion were applied: be a university professor with expertise in the construction of questionnaires; and/or have been teaching a subject related to the purpose of the study for at least five years.

Description of the Study Sample

245 questionnaires from the student body at the University of Zaragoza were analysed. The average age of participants was 21.64 years (SD = 4.18). There was a slightly higher number of female respondents based on the gender distribution; 137 (55.9%). Based on the province of residence, the majority of answers were received from students from the province of Zaragoza (82.9%). Most respondents were studying degrees in Physical Exercise and Sport Science (26.9%), Medicine (24.1%) and Nursing (22%), while the highest number of respondents were in the second year of their studies; 97 (39.6%) (Table 1).

Table 1. Descriptive analysis of the sociodemographic variables of the sample.

Variable	Category	n (%)
Gender	Mujer	137 (55.9%)
	Hombre	108 (44.1%)
Town/City	Huesca	37 (15.1%)
	Teruel	5 (2%)
	Zaragoza	203 (82.9%)
Study Programme	Medicine	59 (24.1%)
	Physical Exercise and Sports Science	66 (26.9%)
	Physiotherapy	35 (14.3%)
	Master in Biomedical Engineering	1 (0.4%)
	Nutrition	7 (2.9%)
	Law	2 (0.8%)
	Nursing	54 (22%)
	Primary Education	10 (4.1%)
	Occupational Therapy	1 (0.4%)
	Optics and Optometry	2 (0.8%)
	Industrial Engineering	5 (2%)
	Dietetics + Physical Exercise and Sports Science	3 (1.2%)
Academic Year	1	7 (2.9%)
	2	97 (42.4%)
	3	70 (28.6%)
	4	67 (27.3%)
	5	4 (1.6%)

Ethical Issues

This text has been made possible thanks to the institutional support provided by the Competitive Call for Proposals for Teaching Innovation Projects by the University of Zaragoza (PI_DTOST) within the category of "Social Innovation Programme" (PISOC) in 2023, with reference ID 5063 and entitled "Knowledge, attitudes and beliefs on doping among students at the University of Zaragoza". The project was approved by the person responsible for the Data Protection unit of the University of Zaragoza under Ref. Nº RAT 2023-158 and by the Research Ethics Committee of the Region of Aragón (CEICA) on 31/05/2023 and Minutes Nº 11/2023. All participants were duly informed of the purposes of the study, permission was requested from all of them and, following their informed consent, the fieldwork was conducted through a self-administered online questionnaire via the Google-Forms platform. All the data were collected anonymously and the information was analysed in aggregate form. The design considered current Spanish legislation governing personal data protection[48], and the ethical principles of the American Psychological Association[49] and the principles enshrined in the Declaration of Helsinki[50] were followed in the various stages of the research.

Questionnaire and Development of Items

The instrument subject to this paper was the design and validation of the questionnaire for measuring attitudes towards the consumption of academic performance enhancing substances among university students. The initial version of the scale, produced following qualitative work that respected the guidelines indicated by Carretero-Dios and Pérez[51] and Muñiz and Fonseca-Pedrero[52], on the creation of research instruments, was made up of 12 items. To further specify the items, a set of questions was selected based on their relevance in terms of the content and their application feasibility[52]. The questions included following the literature review in the construct were related to: ethics, academic justice, academic wellbeing and external factors. In order to fine tune both the content validity and instrument applicability, the first version was subject to a twofold filtering process. First of all, five experts in the field of academic performance enhancing substance consumption and with experience in working with questionnaires took part in an analysis and adaptation of the items via a five-point Likert scale, with values from 1 (strongest disagreement) to 5 (strongest agreement). The minimum and maximum values for the questionnaire are 10 and 50 points, respectively. At two sessions, the experts assessed whether the items were well written for the population of interest and whether each item suitably represented the various questions included in the instrument. The criteria used for accepting an item required that at least 75% or more of the experts had made an overall assessment of the item equal to or greater than 4 and that no expert had given an assessment of under 3 to the item. A total of 12 items passed the judgement of the experts (Table 2). A Likert scale was used for responding to the items, with options ranging from 1 (totally disagree) to 5 (totally agree). Given that items 3, 4, 5, 6, 8, 10, 11 and 12 refer to potentially undesirable attitudes, an inverse calculation was proposed.

The time required for completing the questionnaire was approximately 10 minutes.

Statistical Analysis

Assessment of the questionnaire model followed the standard procedure for validating quantitative self-reports[53]. An exploratory factor analysis (EFA) was performed first and then a confirmatory factor analysis (CFA). A statistical analysis of the items was conducted before the procedure. The average, standard deviation, asymmetry, kurtosis, correlation coefficient and reliability, if the item was eliminated, were calculated. The EFA was performed subsequently. Suitability of the matrix for performing the EFA was tested with the Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity. The EFA consisted of estimation via the principal axis method of factor extraction[54] and Varimax rotation.

Table 2. Initial proposal for the tool with 12 and 10 items. Rotated component matrix (Varimax rotation) for both models.

	12 items		10 items	
	Dim1	Dim2	Dim1	Dim2
Item 1: The use of academic performance enhancing substances should be persecuted by academic institutions.	0.785	0.057	0.787	-0.044
Item 2: It would be fair to establish "anti-academic doping checks and measures", especially in entrance exams (such as EVAU/MIR-EIR-PIR/civil service entrance exams).	0.869	-0.008	0.884	0.042
Item 3: Recreational drugs help unwind, enabling improved academic performance during study hours.	-0.179	0.614	-0.206	0.587
Item 4: Students who use academic performance enhancing substances should not feel guilty given that there are no laws about them.	0.476	0.514	-	-
Item 5: Students receive regular peer pressure to take substances that improve academic performance.	-0.217	0.539	-0.198	0.569
Item 6: The mental health problems stemming from academic frustration are more harmful than the consequences of using academic performance enhancing substances.	-0.036	0.643	-0.028	0.659
Item 7: Academic institutions should guarantee equality in assessment exams.	0.590	0.123	0.627	-0.072
Item 8: The media exaggerate the "academic doping" issue.	0.176	0.617	0.179	0.636
Item 9: "Academic doping" should be considered as academic fraud, on a par with plagiarism in work or premeditated copying in exams.	0.802	0.000	0.809	0.017
Item 10: "Academic doping" is an inevitable consequence of the academic demands from university education.	-0.024	0.669	-0.025	0.681
Item 11: Improving academic performance through substances is not cheating because everybody does it.	0.346	0.638	0.347	0.667
Item 12: Only the quality of academic performance reflected in exam results should be considered, not how it was achieved.	0.515	0.402	-	-
% Explained Variance	48.73%		51.09%	

The Kaiser criterion[55] was applied to identify the most suitable number of factors to recover, while a parallel analysis[56] was performed to confirm the number of factors. Reliability of the resulting instrument was then calculated using Cronbach's alpha coefficient. The CFA was then performed. Maximum likelihood (ML) estimation was the method used for this purpose. To assess correctness of the adjustment, the following indicators were revised: the value χ^2 divided by degrees of freedom (χ^2/gl), the Comparative Fit Index (CFI), the Incremental Fit Index (IFI), the standardized root mean square residual (SRMR) and the root mean square error of approximation (RMSEA)[57,58]. As optimal suitability criterion for the proposed model, values of less than 5 in the χ^2/gl quotient, higher than 0.9 in CFI and IFI and less than 0.08 in RMSEA[59,60] were considered. Finally, and given that elimination of two of the 12 items originally created was proposed, both the Akaike Information Criterion (AIC) and the Expected Cross Validation Index (ECVI) were included, understanding in this case that the model with lower values in both tests corresponds to a greater suitability[61].

Results

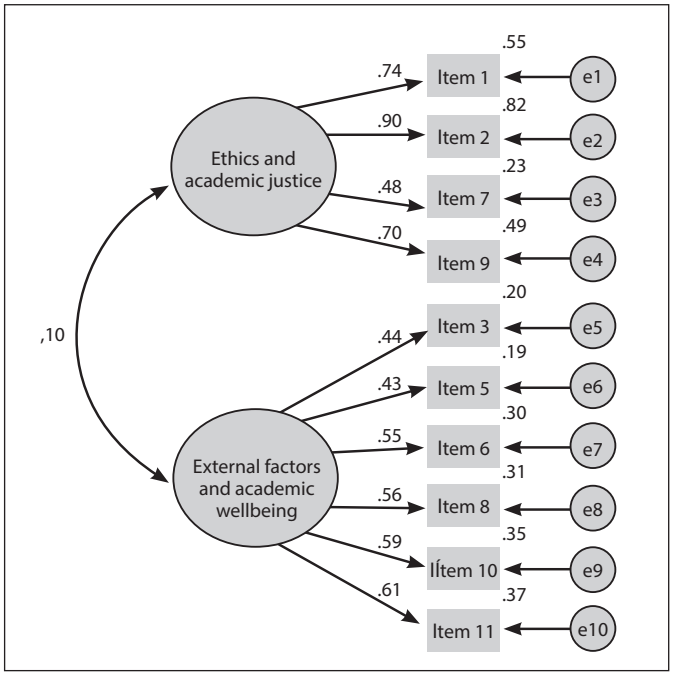
Exploratory Factor Analysis

LThe results from the EFA in the KMO test = 0.794 (P <0.001), meaning that the sample (n = 245) is considered suitable for continuing with the EFA. A matrix EFA was performed using Varimax rotation to recover the factors with inherent values of over 1. The result was that two factors are above 1, explaining a total of the 48.72% of the variance. At this point, it was observed that items 4 and 12 were behaving similarly in both dimensions, so the EFA was repeated after removing them. The results from the model with 10 items were KMO = 0.770 (P <0.001), and an explanation of the variance of 51.09%, meaning it was decided to continue assessing both models (Table 2).

Confirmatory Factor Analysis

Subsequently, the factor distribution obtained in the EFA was analysed for both models using CFA. This produced suitable adjustment correctness values, with CFI and IFI values above 0.9 and RMR values below 0.09 and RMSEA values below 0.08, respectively, for the model with 10 items. Meanwhile, the proposed model with 12 items produced CFI and IFI values above 0.8 but lower than 0.9, and RMR and RMSEA values above 0.1. Furthermore, the AIC and ECVI values were lower in the model with 10 items (Table 3), suggesting the model with 12 items be discarded from this point and the reliability analysis be continued with only the model with 10 items and two dimensions (Figure 1).

Figure 1. Graphic model of two factors and distribution of the items.



Reliability Analysis

Finally, reliability was analysed for each one of the dimensions proposed by the CFA, obtaining a value of a = 0.796 for dimension 1 (items 1, 2, 7 and 9), and a value of a = 0.703 for dimension 2 (items 3, 5, 6, 8, 10 and 11). Furthermore, the Alpha value was analysed after removing each item. Only the removal of item 7 increased the Alpha value for dimension 1 to a = 0.821, so it was decided to maintain the item. Removal of any other item reduced the test value.

Definition and Nomenclature of the Dimensions

The questionnaire was finally made up of 10 items distributed over two dimensions (Table 4), to which the following denominations were given based on the coherence and semantic grouping of the expressions:

Dimension 1, which finally consisted of 4 phrases (items 1, 2, 7 and 9), was called "Ethics and Academic Justice" because it was considered that it encompassed those statements that, according to the respondent, should be the ideals considered by academic institutions and assessors in pursuit of justice in assessment processes.

Dimension 2, which finally consisted of 6 phrases (items 3, 5, 6, 8, 10 and 11) was called "External Factors and Academic Wellbeing" because

Table 3. CFA values.

Model	X^2	gl	X^2/gl	CFI	IFI	RMR	RMSEA	AIC	ECVI
12 items	191.828	53	3.619	0.816	0.819	0.110	0.104	265.828	1.089
10 items	82.975	34	2.440	0.913	0.915	0.086	0.077	144.975	0.594

Table 4. Final proposal for the tool with 10 items and 2 dimensions.

1. The use of academic performance enhancing substances should be persecuted by academic institutions.
2. It would be fair to establish "anti-academic doping checks and measures", especially in entrance exams (such as EVAU/MIR-EIR-PIR/civil service entrance exams).
3. *Recreational drugs help unwind, enabling improved academic performance during study hours.*
5. *Students receive regular peer pressure to take substances that improve academic performance.*
6. *The mental health problems stemming from academic frustration are more harmful than the consequences of using academic performance enhancing substances.*
7. Academic institutions should guarantee equality in assessment exams.
8. *The media exaggerate the "academic doping" issue.*
9. *"Academic doping" should be considered as academic fraud, on a par with plagiarism in work or premeditated copying in exams.*
10. *"Academic doping" is an inevitable consequence of the academic demands from university education.*
11. *Improving academic performance through substances is not cheating because everybody does it.*

Items in italics correspond to Dimension 2 "External factors and academic wellbeing".

it was considered that it encompassed those statements relating to the perception of the external pressures encountered in the educational environment, the impact from the media and the possible consequences from worsening academic performance.

Discussion

This study began with the intention to develop a valid and reliable tool for assessing attitudes towards academic performance enhancing substance consumption among university students. Although the first proposal of 12 statements produced suitable values in the EFA, it was observed that the model with 10 statements proved more suitable in the CFA. Hence, the adjustment correctness values of the model with 10 items corresponded to that suggested by literature for considering the adjustment to be suitable: χ^2/gl less than 3, CFI and IFI above 0.9, SRMR under 0.09 and RMSEA under 0.08. On the other hand, the model with 12 statements produced poorer adjustment correctness indices: χ^2/gl between 3 and 5, CFI and IFI under 0.9, and both SRMR and RMSEA above 0.162. Although the current interpretation trend would be not to discard a priori a model that does not meet the set values considered as traditionally suitable in the CFA[63,64], the possibility of comparing the two models using the AIC and ECVI values enabled selection of the model that behaved best in terms of correctness adjustment.

Given that students from all over the world seem willing to consider ingesting substances to improve their academic performance[36], having tools that enable observation of their attitudes in this regard represents a first step towards fostering education based on values. According to Sharif, *et al.,* the attitude of students towards "academic doping" substances and their possible benefits is mostly based on anecdotal and possibly biased information obtained from the media, the Internet and friends[36]. It can be seen that the issue is not dealt with sufficiently in the study plans of modern universities, which can be understood as an interprofessional or interdisciplinary learning opportunity from a public health perspective[65].

Furthermore, Shaw suggested that one of the most fascinating topics in the field of neuroethics is precisely that of cognitive improvement through the use of drugs[3]. The fact that the debate surrounding these substances has been fundamentally focused on the potential of cognitive enhancers to help those with cognitive deficiencies, their use as performance enhancers in otherwise healthy people suggests approaching the topic as cosmetic neuropsychopharmacology[3,66].

At any event, we understand that the use of doping substances could be reduced if the level of awareness among students were raised, emphasising that the ingestion of these substances can pose a safety risk, especially in vulnerable individuals. The impacts of ingesting this kind of substances can include tolerance, dependency, abstinence syndrome, cardiovascular and neurological disorders, and even risk of death from overdose in individuals with a lower perception of the risk[3].

Limitations

The main limitation of this study can be found in where the sample of students was taken from, given that most of the participants came from programmes related to the field of health or sport. This limitation can be understood from a twofold perspective given that, on the one hand, they are programmes with high cut-off requirements for access to them and that students on these programmes have a high level of awareness about issues tied to assessment justice. On the other hand, content is taught on these programmes related to the risks of consuming various substances, to their persecution from a competition perspective and to the consequences of their long-term consumption. Nonetheless, we understand that these limitations should not affect the construction and dimensionality of the tool. In any case, it would be convenient to broaden the profile of respondents in future projects so as to confirm the usefulness of the scale in students from other branches of knowledge.

Future Perspectives

The results obtained will enable efforts to begin on raising awareness among university students, mainly future professionals in the fields

of Health and Physical Exercise and Sport Science, about the importance of having suitable knowledge about sports and/or academic doping in order to generate an opinion about their effects on health based on scientific evidence and to create an opinion, belief and attitude of rejection towards the consumption of this type of substances, not only among the high-performing athlete population or students on programmes involving significant cognitive burdens but also in sport and academic society at large.

This study should be a first step towards identifying the reality among the university population and subsequently enabling, as the case may be, educational actions aimed at providing information, education on values and building a culture against their consumption in any field, whether sports, social or academic.

The inclusion of training on substance consumption in university study plans can be understood as an interprofessional or interdisciplinary learning opportunity from a public health perspective. The use of doping substances could be reduced if the level of awareness among students were raised, emphasising that the ingestion of these substances can pose a safety risk, especially in vulnerable individuals.

The development of specific education programmes and actions within university degree programmes based on the specific needs of the student body profile on those programmes is a challenge that universities should consider in the interest of fostering not only the academic success of students but also their personal and social development in the healthiest way possible.

Conclusion

Despite the limitations of this project, the findings obtained allow us to state that the Attitudes Scale towards Academic Doping in University Students (EADA-EU) is a valid and reliable tool for measuring attitudes towards academic performance enhancing substance consumption among university students with a reliability value higher than 0.7. The bidimensional construction and short structure make it an easily applicable tool for assessing the situation among university students with regard to said attitudes. Conducting this assessment and relating it to substance consumption for the purpose of improving academic performance will enable the future consideration of designing and applying specific educational actions, were they to become necessary, from a perspective of value-based education aimed at developing a prevention culture against the risks of consuming potentially harmful substances for the health of this population group while also promoting the development of an ethical and healthy academic environment capable of fostering overall wellbeing and academic success among students.

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Conflict of Interest

The authors declare no conflict of interest whatsoever.

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