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Original Articles

Self-perception of the dentist regarding the risk of prescribing drugs capable of incurring doping

Autopercepção do dentista sobre o risco da prescrição de fármacos capazes de incorrer em doping

Autopercepción del dentista respecto al riesgo de prescribir medicamentos que puedan inducir al dopaje

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Keywords
Athletes;
Doping;
Medications;
Dentist.

ABSTRACT
Athletes are subject to rules related to anti-doping. The objective of this study was to assess the level of knowledge of dentists regarding doping. A questionnaire was sent via social media to dentists, including questions related to doping and the care of athlete patients. The results indicate that 48% have provided dental care to athletes, and 24% feel confident in treating athlete patients without compromising them in a potential doping test. Only 40% of respondents are aware of the biotransformation of medications used in their practices, and only 12% are familiar with the WADA code, demonstrating an ambiguous level of knowledge. Dentists have a limited level of knowledge regarding self-perception of athlete patient care and the concepts of doping.

Palavras-chave:
Atletas;
Doping;
Medicamentos;
Dentistas.

RESUMO
Atletas estão sujeitos a regras relacionadas à antidopagem. O objetivo deste estudo foi avaliar o nível de conhecimento de dentistas sobre doping. Um questionário foi enviado pelas redes sociais para dentistas, incluindo perguntas relacionadas ao doping e ao atendimento de pacientes atletas. Os resultados indicam que 48% já prestaram atendimento odontológico a atletas e 24% se sentem confiantes em tratar pacientes atletas sem comprometer sua segurança em um possível teste antidoping. Apenas 40% dos participantes têm conhecimento sobre a biotransformação de medicamentos utilizados em suas práticas e somente 12% estão familiarizados com o código da WADA, demonstrando um nível de conhecimento ambíguo. Os dentistas apresentam um nível limitado de conhecimento em relação à autopercepção sobre o atendimento a pacientes atletas e os conceitos de doping.

Palabras clave:
Atletas;
Dopaje;
Medicamentos;
Dentistas.

RESUMEN
Atletas estão sujetos a regras relacionadas con antidopaje. El objetivo de este estudio es conocer el nivel de conocimiento de los dentistas sobre el dopaje. Un cuestionario enviado a través de redes sociales para dentistas, incluidas preguntas relacionadas con el dopaje y la atención de pacientes atletas. Los resultados indican que el 48% prestará atención odontológica a los atletas y el 24% se siente confiante en el tratamiento de pacientes atletas sin comprometerse con su seguridad en una prueba antidopaje posible. Apenas el 40% de los participantes tienen conocimiento sobre la biotransformación de medicamentos utilizados en sus prácticas y el 12% están familiarizados con el código de la AMA, demostrando un nivel de conocimiento ambiguo. Los dentistas presentan un nivel limitado de conocimiento en relación con la autopercepción sobre la atención a pacientes atletas y los conocimientos de dopaje.

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INTRODUCTION

The use of substances capable of altering the body's response to a stimulus predates human civilization. One category that seeks this type of response is the athlete, to enhance their strength, performance, agility, or weight loss. This practice can be characterized as doping, as it aims to improve physical and/or mental performance through artificial means. After several widespread doping scandals in many sports and the feeling of losing the battle against doping, sports, government, and civil society entities joined forces to create the World Anti-Doping Agency (WADA), aiming to centralize rules and monitor the inappropriate use of substances by athletes (Rodríguez Arce and Winkelman, 2021; Nutt et al., 2010; Mudrak et al., 2018; WADA, 2021; Dotson and Brown, 2007; Cantelmo et al., 2020; Baoutina, 2020; Atkinson and Kahn, 2020).

The diversity of substances available on the market today is vast. Anabolic steroids can stimulate muscle growth and, consequently, increase endurance, reduce fatigue, increase the fatigue threshold, accelerate recovery from physical injuries, and enhance the effects of stimulants. These stimulants induce increased cardiac activity and metabolism, potentially lowering the pain threshold and achieving the same effects as adrenaline. Masking agents, such as diuretics, are used to hinder the detection of doping agents (Dubin, 1990; Todd and Todd, 2001; Resende et al., 2017; Pitsiladis et al., 2024).

Most healthcare professionals are unfamiliar with the legal aspects of doping and may not be prepared for emergency and urgent interventions or for instruction on the risk of a positive anti-doping control test. Whenever an athlete seeks healthcare, the professional must know how to determine the appropriate treatment to preserve not only the health but also the professional integrity of this unique patient. Doping cases often occur accidentally due to improper prescription (Yonamine et al., 2004; Anderson, 2011; Uzuelli, 2012; Walpurgis et al., 2020; WADA, 2021).

Among healthcare professionals, dentists frequently perform emergency procedures, which often necessitates prescribing medication for the athlete. The role of the dentist in the multidisciplinary team of a sports organization is of great value, and their knowledge of medicinal substances that can lead to doping. This study raises a topic of great importance for the dental, scientific, and sports communities, as it measures the dentist's self-perceived level of knowledge regarding the risk of doping in their medication prescriptions (Uzuelli, 2012; Jural et al., 2021).

Thus, the objective of the present study was to assess the level of knowledge of dentists regarding doping in the care of athlete patients.

MATERIALS AND METHODS

A questionnaire was developed and sent to dentists duly registered with their professional association.

The questionnaire was sent in Google Forms (2025) format through social media contemplating the following questions:

a) Have you ever treated athletes in your office?
b) Are you confident enough to treat athletes in an emergency setting without compromising them in a potential doping test?
c) Are you familiar with the WADA International Anti-Doping Code?
d) Are you familiar with the biotransformation of medications used in your office?

This study was approved by the Ethics Committee of the School of Dentistry of the University of São Paulo under CAEE number: 30413720.0.0000.0075.

The responses were correlated for statistical analysis.

SAMPLE CALCULATION

For the sample calculation, a simple random sample without replacement (SRS) was assumed, in which the elementary sampling unit is the dentist. According to Bolfarine and Oliveira Bussab (2005), the sample calculation indicated the need for 196 responses to ensure a 95% confidence level and a 5% margin of error. This study included 221 completed questionnaires, with Bonferroni corrections for each proposed crossover.

RESULTS

Tests a) and b) in Table 1 were significant because they presented $p < 0.041$ (which is the 5% level corrected by the Bonferroni method for 4 tests)

The c test in Table 2 was significant because it presents $p < 0.041$ (which is the 5% level corrected by the Bonferroni method for 4 tests)

The e test in Table 3 was significant because it presents $p < 0.041$ (which is the 5% level corrected by the Bonferroni method for 4 tests).

DISCUSSION

Only recently has the role of dentistry gained greater notoriety in sports, which explains the scarcity of studies on doping within this topic. To change this scenario, this research conducted a specific questionnaire that was formulated and sent to dentists from various specialties. 221 responses were obtained (Atkinson and Kahn, 2020).

This study found relevant data on the contrast between dentists' perceptions and knowledge regarding doping. When asked about having treated athletes, 48% responded that they had, and 24% indicated that they felt confident in this type of care, without committing them to doping. When correlating the responses to the same questions, it was observed that only 17.2% of respondents had treated athletes and felt safe in this type of care. That is, of the 48% who had treated athletes, only 17.2% expressed true confidence in this type of care.

Table 1. Correlation between questions a*, b*, c* and d*.

Variable	Categories	N. of cases	a* Have you ever seen athletes?		P (2-tailed *t* test)
			Yes 106 (48.00%)	No 115 (52.00%)	
b* Are athletes provided with safe care without compromising them with doping?	Yes	= 53 (24.00%)	38 (17.20%)	68 (30.75%)	**0.00007**
	No	= 168 (76.00%)	15 (6.80%)	100 (45.25%)	
c*Know the WADA code?	Yes	= 26 (11.80%)	20 (9.05%)	86 (38.90%)	**0.00165**
	No	= 195 (88.20%)	6 (2.70%)	109 (49.30%)	
d* Are you aware of the biotransformation of prescribed (administered) medications?	Yes	= 88 (39.80%)	42 (19.00%)	64 (29.00%)	0.95434
	No	= 133 (60.20%)	46 (20.80%)	69 (31.20%)	

Bonferroni correction. 0.5%12= 0.041.

Table 2. Correlation between questions b*, c* and d*.

Variable	Categories	N. of cases	c) Know the WADA code?		P (2-tailed *t* test)
			Yes 26 (12.00%)	No 195 (88.00%)	
b) Are athletes safely served without compromising them with doping?	Yes	= 53 (24.00%)	17 (7.70%))	36 (16.30%)	**0.00001**
	No	= 168 (76.00%)	9 (4.10%)	159 (71.9%)	
d) Are you familiar with the biotransformation of prescribed (administered) medications?	Yes	= 88 (39.80%)	17 (7.70%)	71 (32.10%)	**0.00458**
	No	= 133 (60.20%)	9 (4.10%)	124 (56.10%)	

Table 3. Correlation of questions b* and d*

Variable	Categories	N. of cases	d) Are you familiar with the biotransformation of prescription drugs?		P (2-tailed *t* test)
			Yes 88 (40.00%)	No 133 (60.00%)	
b) Are athletes safely served without compromising them with doping?	Yes	= 53 (24.00%)	31 (14.00%)	57 (25.80%)	**0.00145**
	No	= 168 (76.00%)	22 (10.00%)	111 (50.20%)	

N= 221. P < 0.05. Bonferroni < 0.041.

Regarding knowledge of the WADA code, 11.8% responded affirmatively, and of the 48% who had already treated athletes, only 9.0% of them were familiar with the rules of this code. Knowledge of the WADA code should be the guiding principle for working with athletes, but 195 (88.2%) had no knowledge of it, and 168 (76.00%) did not feel confident in treating athletes. This means that 36 (16.30%) of the interviewees felt confident in providing care, even without knowledge of the WADA code. This is a clear contradiction, as it does not seem safe to treat athletes without knowledge of this code. Of the 88 (39.80%) who said they had knowledge about the biotransformation of prescribed medications, only 17 (7.70%) had knowledge of the WADA code, a worrying fact, given that 48% of the interviewees had already treated athletes. The last two correlated questions were safety in treating athletes and knowledge of the biotransformation of prescribed medications. Only 14.0% of respondents demonstrated this mutual knowledge.

The paper by Berard et al. (2020), observed results similar to those described in the present study, with 83.5% of dentists reporting no knowledge of drugs that can be administered to athlete patients without a risk of doping, and 41.1% reporting having already treated athletes. In the present study, similar results were found, with 48% of respondents responding that they had already treated athletes, and 24% saying they felt confident treating athletes in an emergency setting without compromising them in a potential doping test. It is worth noting that the number of dental appointments for athletes tends to be underestimated, largely due to the understanding of what constitutes an athlete. At this point, professional athletes (who are paid to play sports) represent a small portion of the population, but when this perception is extended to amateur athletes (who can even undergo doping tests), the numbers tend to be much higher (Catlin et al., 2008). In dentists' own medical histories, it is quite difficult to determine whether the patient is an amateur or professional athlete.

The study by Jural et al. (2021), assessed the level of knowledge among dentists in Brazil through a questionnaire with 12 stimulated questions and measured the results according to a score from 1 to 12. The average score was 4.19 points, demonstrating the very low level of dentists' knowledge regarding doping. Due to methodological differences—one stimulated and the other spontaneous—the discussion between our study and that of Jural et al. (2021), was compromised. However, it is relevant research, along the same lines, providing scientific evidence in the area of interest (Kragt et al., 2019; Gleaves et al., 2021).

All of this data clearly demonstrates the need for scientific dissemination for athletes, professionals, and the general public.

As a suggestion for future studies, studies could be conducted that include the participation of other healthcare professionals regarding doping knowledge, not just dentists.

CONCLUSION

It can be concluded that dentists have a limited level of knowledge regarding their self perception of athlete patient care and the concepts of doping.

FUNDING

Not applicable.

CONFLICTS OF INTEREST

The authors confirm that they have no conflict of interest.

DATA AVAILABILITY

Not applicable.

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