

Anti-Doping Knowledge and Opinions of South African Pharmacists and General Practitioners

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Abstract

Objective: Despite the prevalence of doping in sport and the need for doping prevention strategies, information about doping awareness among medical professionals is limited. The aim of this pilot study was to investigate the knowledge and attitude of South African pharmacists (Ps) and general practitioners (GPs) towards doping in sports.

Methods: An online survey questionnaire was completed by 98 Ps and 201 GPs the questionnaire incorporated a range of questions that probed the participant's knowledge and attitudes regarding doping in sport.

Results: The study findings revealed that both Ps and GPs admitted a poor knowledge of doping-related matters and lacked doping-specific training (>80% of both GPs and Ps had not received any formal training and/or attended any courses or workshops specific to doping in sport). Over 88% of all respondents felt that they were not adequately trained for the role of doping prevention in sport and more than 92% felt that they required further training in relation to doping in sport issues

Conclusions: Although Ps fared slightly better when questioned about their knowledge of certain doping related-topics, overall it was evident that both groups would benefit from additional training that would focus on expanding their knowledge of prohibited substances and the associated legislature to the possible benefit of their patients.

Keywords: Doping; Sport; Prohibited substances; South African health professionals; Doping-specific knowledge; Doping-specific training; Doping prevention

Introduction

The earliest records of doping in sport originate from the Ancient Olympic Games [1]. Today, more so than ever before, elite athletes are motivated to utilise prohibited substances in order to enhance their performance, and by implication their social and psychological standing [2]. The financial rewards associated with sporting success are also significant, and these too may drive elite sportsmen and women to consider the use of prohibited substances. Of course the use thereof is not confined to the elite ranks, and many would argue that the abuse of performance enhancing drugs is just as prevalent, if not more so, in amateur athletes, especially in sports requiring explosiveness and power or significant muscle hypertrophy such as in bodybuilding. The use of doping agents is thus no longer a problem restricted to elite sports but has become a public-health concern [3].

The ethical, legislative and health consequences associated with doping are generally well known; however, despite efforts of the World Anti-Doping Agency (WADA) and numerous national anti-doping organizations, the practice continues [4]. It is arguable that this trend will continue and with professional athletes acquiring increasingly more lucrative deals both on and off the field, it is understandable that

the professional athlete of tomorrow may perceive the value of sport to be something significantly different to those who came before them [5]. An increase in the abuse of prohibited substances amongst sport participants would require a more concerted effort on behalf of, amongst others, healthcare practitioners to adequately deal with the 'predicament'. One would naturally assume that medical doctors and pharmacists would play pivotal roles in the fight against doping in sport and that they would be perfectly positioned to educate, advise and direct both elite and recreational athletes on matters pertaining to doping. Backhouse and McKenna [4] reviewed six studies from five different European countries (France, UK, Italy, Greece, Ireland) that investigated the medical practitioners' knowledge, attitudes and beliefs towards doping in sport. Overall they found that there was a consensus amongst medical practitioners that they have a role to play in doping preventions however, doping agent knowledge amongst this group was found to be limited. This highlighted the need to review medical professionals' education and professional development in relation to doping in sport. Evidently very little has been published on the topic. To this end, the purpose of the present exploratory study was to investigate the knowledge and attitude of South African pharmacists and general practitioners towards doping in sports.

Methods

Permission was granted to adapt the same questionnaire that was administered to Irish medical practitioners in a study investigating their knowledge, attitudes and beliefs towards doping in sport [6]. A link to the online survey was emailed to all general practitioners registered with the South African Medical Association. Similarly, the Pharmaceutical Society of South Africa emailed the link to all pharmacists who were members of the society. The link to the survey was embedded within the body of the email that invited the healthcare practitioner to participate in the study. On clicking on the link the participant was directed to the questionnaire hosted on Survey Monkey. The participant was required to provide electronic consent before he/she could begin the questionnaire and the survey remained open for 10 days. Ethics approval for the study was granted by the Faculty of Science and Agriculture's Ethics Committee at the University of Zululand.

Results

Of the ~5000 pharmacists that were emailed the invitation to participate in the study, 98 responded (~2% response rate) and of the ~7000 general practitioners that were emailed the link, 201 responded (~3% response rate). Of the 201 general practitioners, 171 completed the entire questionnaire. The average age of the pharmacists group was 44 ± 12y (range 24-73y) and 57% were female. Forty-six percent of the pharmacists indicated that they participated in sport on a regular basis and 12% indicated that they were connected with a sports team as an advisor. The average age of the general practitioner group was 43 ± 13y (range 22-75y) and 65% were male. Similar to the pharmacists, 46% of the general practitioners indicated that they participated in sports on a regular basis, and 15% indicated that they were connected to a sports team as the team doctor or as an advisor. Tables 1 and 2 display the response percentage frequencies by the General Practitioners (GPs) and Pharmacists (Ps) to the questions posed in the survey.

From the responses it is evident that the majority (>80%) of both GPs and Ps had not received any formal training and/or attended any courses or workshops specific to doping in sport (Table 1). The majority of GPs and Ps were also unaware (>35%) or not sure (>30%) of the South African drug testing procedures that are followed for collection of blood or urine from an athlete (Table 1). In addition over 83% of both GPs and Ps thought that doping in sport at school level is on the increase in South Africa (Table 1). More than 94% of all respondents agreed that it is not acceptable for doctors to prescribe anabolic steroids for non-medical indications and more than 98% felt

that pharmacists/GPs have a role to play in the prevention of doping in sport (Table 1). However, over 88% of all respondents felt that they were not adequately trained for this role (prevention of doping in sport) and more than 92% felt that they required further training in relation to doping in sport issues (Table 1). Both GP and P respondents stated that, if approached by an athlete for medication, they would consult the Monthly Index of Medical Specialties (MIMS) (>62% of all respondents), closely followed by drugfreesport.com (>48% of all respondents) (Table 2). The majority of all the respondents agreed that family members/friends (>77%), team members (>97%), doctors (>83%), pharmacists (>77%), drug dealers (>93%), sport scientists (>60%), the internet (>95%) as well as gym trainers and gym staff (>93%) are all potential sources of prohibited drugs for athletes however, significantly more GPs compared to Ps (88.4% vs 77.4%) agreed that pharmacists may be a potential source (X2 (1, N = 98) = 5.7, p < 0.05) (Table 2). When queried about their knowledge of the following topics, the majority of both GPs and Ps indicated that they had a either a poor knowledge; masking agents (>59%), prohibited methods of administration (>48%), Therapeutic Use Exemption (TUE) (>45%) and the restriction on prescription of systemic corticosteroids before and during competitive sport (>38%), or a fair knowledge; doping agents (>39%), effects of doping agents on athletic performance (>41%) and medical risks associated with the most commonly used doping agents (>35%) (Table 2). However, with regards to the sources of information addressing the prescription guidelines for athletes, differences in the knowledge rating between GPs and Ps was evident with the majority of GPs (41.4%) having indicated a poor knowledge and the majority of Ps (38.3%) having indicated a fair knowledge (X2 (3, N = 98) = 17.9, p < 0.005).

Significant differences in the responses between GPs and Ps were noted for a number of the survey questions. Only 35.4% of GP respondents stated that they possessed a copy of the current List of Substances Prohibited in Sport compared to 56.1% of P respondents (X2 (1, N = 98) = 11.3, p < 0.005). 75.5% of P respondents did not think that the current initiatives to discourage doping in sport are effective compared to 51.5% of GPs (40.4% are not sure) (X2 (2, N = 98) = 16.3, p < 0.005). Differences in responses were also evident with regards to the level of sport that healthcare professionals should start considering the use of a TUE with 68.1% of Ps having indicated that this should occur at school level competition compared to 40.9% of GPs (48.0% were not sure) (X2 (3, N = 98) = 19.2, p < 0.005). A significantly greater percentage of P respondents compared to GP respondents (63.4% vs 50.0%) indicated that they have been consulted for advice on doping (X2 (1, N = 98) = 4.4, p < 0.05).

General practitioner's (GPs) vs. pharmacists (Ps)		Frequency (%)		X2	P
		GPs	Ps		
During your undergraduate studies did you receive training on doping in sport related issues?	Yes	13.2	19.4	1.9	0.17
	No	86.8	80.6		
Have you completed any specific courses or workshops on doping in sport outside of your "formal" training?	Yes	10.2	10.3	0.002	0.969
	No	89.8	89.7		
Are you aware of any South African based resources and/or institutions available to help combat the fight against drugs in sport?	Yes	42.3	44.9	0.2	0.677
	No	57.7	55.1		

Do you possess a copy of the current List of Substances Prohibited in Sport?	Yes	35.4	56.1	11.3	<0.005*
	No	64.6	43.9		
Are you aware of the South African drug testing procedures that are followed for collection of blood or urine from an athlete?	Yes	21.8	23.4	4.5	0.107
	No	47.7	35.1		
	Not sure	30.5	41.5		
Do you think the current initiatives to discourage doping in sport are effective?	Yes	8.8	7.4	16.3	<0.005*
	No	51.5	75.5		
	Not sure	40.4	17.1		
Do you believe that doping in sport at school level is on the increase in South Africa?	Yes	83	87.2	1.2	0.54
	No	0.6	0		
	Not sure	16.4	12.8		
At what level of sport do healthcare professionals need to start considering the use of a TUE?	School competition level	40.9	68.1	19.2	<0.005*
	Provincial competition level	9.9	8.5		
	National competition level	1.2	1.1		
	Not sure	48	22.3		
Have you ever been consulted for advice on doping?	Yes	50	63.4	4.4	0.037*
	No	50	36.6		
Have you ever felt that medication you may have prescribed/dispensed for legitimate reasons was really used by an athlete to improve sporting performance?	Yes	6.5	12.9	3	0.083*
	No	93.5	87.1		
Do you think it is acceptable for doctors to prescribe anabolic steroids for non-medical indications?	Yes	5.4	2.2	1.5	0.217
	No	94.6	97.8		
Do you feel that pharmacists/GPs have a role to play in the prevention of doping in sport?	Yes	98.2	98.9	0.2	0.655
	No	1.8	1.1		
Do you feel that you are adequately trained for this role (prevention of doping in sport)?	Yes	11.9	8.6	0.7	0.409
	No	88.1	91.4		
Do you feel that you require further training in relation to doping in sport issues?	Yes	92.3	95.7	1.2	0.281
	No	7.7	4.3		

Table 1: Response percentage frequencies by the General Practitioners (GPs) and Pharmacists (Ps) to the questions posed in the survey and results of Pearson X2 statistical analyses.

General practitioner's (GPs) vs. pharmacists (Ps)		Frequency (%)		X2	P
		GPs	Ps		
If approached by an athlete for medication, which of the following sources would you consult?	MIMS	68.4	62.8	6.7	0.465
	WADA	11.1	14.9		

	SAIDS: Hard copy of the prohibited, permitted and restricted drugs in booklet form		22.2	25.5		
	SAIDS: Electronic copy of the prohibited, permitted and restricted drugs available online		38	36.2		
	SAIDS: Medication checklist available online		18.7	18.1		
	SAIDS: Modiste for cellphones		0.6	3.2		
	SAIDS: iPhone application		8.2	8.5		
	www.drugfreesport.com		48.5	58.1		
Please state if you agree or disagree that the following are potential sources of prohibited drugs for athletes:	Family members	Agree	77.5	79.6	2.1	0.149
		Disagree	22.5	20.4		
	Team members / friends	Agree	97.1	98.9	0.9	0.342
		Disagree	2.9	1.1		
	Doctors	Agree	86.7	83.9	0.4	0.527
		Disagree	13.3	16.1		
	Pharmacists	Agree	88.4	77.4	5.7	0.018*
		Disagree	11.6	22.6		
	Drug dealers	Agree	94.2	93.5	0.1	0.825
		Disagree	5.8	6.5		
	Sport scientists	Agree	60.8	66.3	0.8	0.384
		Disagree	39.2	33.7		
	Internet	Agree	95.4	96.8	2.2	0.138
		Disagree	4.6	3.2		
	Gym trainer/gym staff	Agree	93.7	97.9	2.3	0.129
		Disagree	6.3	2.1		
	Veterinarian	Agree	59.6	40.4	0.02	0.884
		Disagree	58.1	41.9		
Please rate your knowledge on the following topics:	Doping agents	Poor	37.4	29.8	16.1	<0.005*
		Fair	39.7	43.6		
		Good	18.4	24.5		
		Very good	4.6	2.1		
	Masking agents	Poor	70.7	59.6	4.2	0.242
		Fair	19	27.7		
		Good	7.6	10.6		
		Very good	2.9	2.1		
	Sources of information addressing the prescription guidelines for athletes	Poor	41.1	16	17.9	<0.005*
		Fair	26.9	38.3		
		Good	22.9	30.9		

	Prohibited methods of administration	Very good	9.1	14.9	1.9	0.586
		Poor	52	48.9		
		Fair	29.1	35.1		
		Good	12.6	12.8		
		Very good	6.3	3.2		
	Effects of doping agents on athletic performance	Poor	30.1	23.4	1.9	0.602
		Fair	41.6	48.9		
		Good	23.7	22.3		
		Very good	4.6	5.3		
	Medical risks associated with the most commonly used doping agents	Poor	31.4	19.4	4.7	0.194
		Fair	35.4	44.1		
		Good	28	30.1		
		Very good	5.1	6.5		
	Therapeutic Use Exemption (TUE)	Poor	54.6	45.2	3.1	0.381
		Fair	24.7	34.4		
		Good	16.7	17.2		
		Very good	4	3.2		
	The restriction on prescription of systemic corticosteroids before and during competitive sport	Poor	38.7	38	0.7	0.865
		Fair	38.7	34.8		
		Good	16.8	20.7		
Very good		5.8	6.5			

Table 2: Response percentage frequencies by the General Practitioners (GPs) and Pharmacists (Ps) to the questions posed in the survey and results of Pearson X2 statistical analyses.

Discussion

The aim of this study was to determine the self-reported opinions, attitudes knowledge, and training of South African pharmacists and general practitioners in a pilot study in matters related to doping in sport. The main finding of this pilot study was that both South African pharmacists and general practitioners (GPs) have insufficient doping-related knowledge and lack doping-specific training.

In terms of the formal training of the South African GPs and pharmacists it is apparent that doping in sport doesn't receive attention in the undergraduate medicine and pharmacy curricula, with 80% of the pharmacists and 86% of the GPs having indicated that no training was received during their studies. Furthermore, nearly 90% of the participants in both groups had never attended a workshop or obtained any other training on doping in sport outside of their university education. It is unclear if this trend represents a lack of available courses or workshops on the topic, or if the practitioners themselves don't perceive the issue to be as important as other clinical education topics. However, a study conducted in Japan that investigated pharmacy students' interests and comprehension regarding drug usage, doping and supplement intake also indicated that the students did not have opportunities to learn about doping and

supplement intake (with only 16% of the students attending lectures by specialists on doping) and that their basic knowledge regarding doping was limited [7]. In our study, >92% of all respondents (i.e. GPs and pharmacists) indicated that they require further training in doping-related issues thus confirming that the training they have received is not sufficient. Indeed, although more than 98% of the respondents in both groups felt that pharmacists/GPs have a role to play in the prevention of doping in sport, over 88% of all respondents felt that they are not adequately trained for this role. Laure and Kriebitzsch-Lejeune [8] reported similar findings in their study that investigated the knowledge and attitudes of retail pharmacists in France which showed that 91% of respondents thought that a pharmacist has a role to play in doping prevention, but 74% considered themselves badly or very badly prepared to do so. Similarly, Woods and Moynihan [6] reported that, out of 24% of their Irish GP sample who were employed by a sport, only half reported receiving appropriate training in doping-related matters. Both WADA and the South African Institute for Drug Free Sport (SAIDS) have educational online resources available that include anti-doping information and a list of prohibited substances. Additionally, drugfreesport.org.za includes an online medication check that allows both athletes and medical practitioners to identify whether a certain medication falls under the prohibited or the permitted drugs/

substances list. Despite these efforts however, the majority of medical practitioners still feel not sufficiently educated in this area.

Only 45% of the pharmacists and 42% of the GPs were aware of any South African based resources or institutions available to combat the fight against drugs in sport. This is also reflected in the sources that practitioners consult in order to obtain information on athletes seeking medication (i.e. >62% of all respondents would consult MIMS and >48% would consult drugfreesport.com). Clearly the material available from the SAIDS is under utilised relative to other sources of information. It also appears as if, despite the availability of the information, practitioners are not keeping up to date with the current list of prohibited substances and less than a quarter of all practitioners are aware of the South African drug testing procedures that are followed for collection of blood or urine from an athlete. Significantly fewer GPs (39%) than pharmacists (58%) indicated that they possessed the then current WADA List of Prohibited Substances. The percentage of GPs in possession of the current list of prohibited substances is marginally better than that report by the Irish medical practitioners (33%) (Woods and Moynihan, [6]) but substantially worse than figures reported in the French study (73%) [9]. The pharmacist and GP respondents in this study also differed with regards to their perceptions on whether the current initiatives to discourage doping in sport are effective with a greater percentage of the pharmacist respondents in this study (75%) having stated that they are ineffective as compared to the GP respondents (52%). However, it is likely that this difference is due to GPs not being aware of the initiatives per se and thus not being able to comment on how effective they have been (40% of GP respondents indicated that they were not sure). Comparatively, 56% of the Irish medical practitioners believed that the Irish Sports Council's efforts to discourage doping in sport were ineffective (Woods and Moynihan, [6]). Similarly, when probing the attitudes of our respondents towards the prevalence of doping in sport at school level, the vast majority (over 83% of both GPs and Ps) thought that doping in sport at school level is on the increase in South Africa.

Therapeutic use exemptions (TUE) allow an athlete to use a prohibited substance if there is a legitimate reason for its use [10]. On confirming that the medication requires a TUE, athletes submit a TUE form to the South African Institute for Drug Free Sport (SAIDS) where after a panel of experts selected by the SAIDS reviews your request and will grant a TUE if: 1. Your health will be significantly impaired if you do not take the substance; 2. The substance does not enhance your performance beyond what brings you back to normal health; 3. There are no alternative treatments available. In the case of a denied request, you will be informed of the reasons and have the right to appeal the decision. The SAIDS anti-doping rules apply to all persons who: 1. Are members of a National Sports Federation of South Africa, regardless of where they reside or are situated; 2. Are members of a National Sports Federation's affiliated members, clubs, teams, associations or leagues; 3. Participate in any capacity in any activity organized, held, convened or authorized by a National Sports Federation of South Africa or its affiliated members, clubs, teams, associations or leagues; and 4. Participate in any capacity in any activity organized, convened or authorized by a National Event organization, or a national league not affiliated with a National Sports Federation". (SAIDS, 2014). The SAIDS anti-doping rules also govern minors.

Nearly half (48%) of the GPs in the current study were unsure of whether TUE's should be considered at school level competition and significantly more pharmacists than GPs (62% vs 40%) thought that the implementation of TUEs should occur at school level competition.

This may be a reflection of their overall poor knowledge of TUEs. By in large the practitioners self-rated knowledge on specific topics fell into the poor or fair categories (e.g. 70% of GPs rated their knowledge of masking agents as poor) with GPs indicating that they lacked knowledge in more areas than pharmacists (e.g. the majority of GPs stated that they had a poor knowledge of sources of information addressing the prescription guidelines for athletes whereas the majority of pharmacists indicated a fair knowledge).

The main limitation in this pilot study is the poor response rate from the mailing list of both GP's and P's. It is indeed a finding from this pilot study per se, that the response rate was so low. This finding might reflect a general apathy for questionnaire type surveys or apathy for doping related matters. If the latter is the case, it is interesting to speculate that the findings from this pilot study might be in fact under-representing the extent of the problem. However, despite the poor response rates, the absolute number of respondents (sample size) compares favorably with the majority of studies reviewed in the paper by Backhouse and McKenna [4]. With the exception of one large study in which 751 general practitioners were surveyed [6], the mean sample size of the remaining 5 studies in the review is 156 ± 44 .

Furthermore, the results of this pilot study (as well as others in the literature) be they under-represented or not, point to insufficient knowledge and training with a clear need for increased efforts in education of medical professionals. This highlights a need for the development of doping-specific educational programs for South African health professionals. An effective approach would be to include doping-specific education in the undergraduate curriculum of both pharmacists and GPs as well to provide incentives for ongoing professional training in the area.

Conclusion

This is the first study to investigate and compare the knowledge, attitudes and training of GPs and pharmacists with regards to sports doping in South Africa. Despite the continuing rise in the abuse of prohibited substances amongst sport participants, the findings from our study indicate that, both doping-related knowledge and doping-specific training amongst South African pharmacists, and to a larger extent GPs, is considerably lacking. The role of these professionals in the fight against doping in sports is pivotal both with regards to athlete education and monitoring. The results of this study clearly demonstrate that there is a need for doping-specific programs that target South African healthcare practitioners in order to better equip them to deal with the challenges of doping in sport.

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