

Attitudes toward Anti-Doping Education among Coaches of Youth Athletes

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Abstract

Objective: This study aimed to conduct a survey of coaches of youth athletes (e.g. middle school, high school, and university students) on the current state of and their attitudes toward anti-doping education, and on their level of familiarity with sports pharmacists (pharmacists with specialized knowledge on doping). A secondary aim was to examine the future directions of anti-doping education, including the roles of sports coaches and points at which they may intervene to resolve these issues.

Methods: Sports coaches who taught health and physical education or coached extracurricular activities were asked to complete a questionnaire. In addition to general information such as the respondent's age, their affiliated educational organization, number of years' experience of teaching and/or coaching, the types of sports they were involved in, and their level of athletic competition, data were collected on participants' experience with anti-doping education, their degree of familiarity with sport pharmacists, and their attitudes concerning the necessity of anti-doping education and sports pharmacists.

Results: Responses were obtained from 211 coaches. In response to a question that asked about their level of familiarity with sports pharmacists, 62.1% of the respondents said that they did not know of this profession. In response to a question on whether or not they had experience conducting classes on anti-doping, only 32.6% of coaches (n=31) said that they had such experience. On the other hand, responses to a question that asked about the necessity of anti-doping lectures showed that over 90% of coaches felt that they were needed. Furthermore, in response to questions on whether or not they would like to make use of anti-doping teaching materials, should they be available, approximately 90% of coaches said that they would.

Conclusion: Although coaches of youth athletes recognize the importance of anti-doping education, only a few coaches actually deliver such education. The results also revealed that coaches' level of familiarity with sports pharmacists was low. In the future, activities aiming to disseminate knowledge on anti-doping practices, not only to athletes but also to their coaches, will be necessary; these could include measures such as holding seminars and developing anti-doping teaching materials.

Keywords Anti-doping; Drugs; Youth athletes; Careless ingestion; Sports pharmacists; Anti-doping education; Coaching

Introduction

With the hosting of the Tokyo Olympics/Paralympics looming in 2020, Japanese citizens are becoming increasingly interested in sports [1]. At the same time, the prevention of doping (the use of performance-enhancing drugs) is regarded as one of the most important issues in the world of sports.

Despite the fact that the rate of positive tests for doping is said to be lower among Japanese athletes than in other countries, the number of such cases is not decreasing; rather, more violators of doping regulations have been identified every year [2-9]. The most common instances of doping violations in Japan involve athletes ingesting drugs banned by the World Anti-Doping Association (WADA) without being

aware of their status - so-called "careless ingestion" - rather than ingesting them intentionally [10,11]. In recent years, drug tests have been conducted not only during international competitions but even during those in which youths may take part, such as national athletic meets and the national Japanese championships in each sport. This development has led to youth athletes, who may be enrolled in middle school, high school, or university, also facing the risk of a doping violation, especially a careless violation; thus, this is no longer an issue that should concern only top Japanese athletes.

In 2009, a sports pharmacy qualification was introduced in Japan, with the objective of preventing doping through this type of careless ingestion. Certified sports pharmacist is a status that can be awarded when a qualified pharmacist completes a designated course (consisting of material relating to anti-doping measures) as stipulated by the Japan Anti-Doping Agency (JADA)[12]. The work of a sports pharmacist principally includes providing consultations on banned drugs to

athletes, providing information and awareness-raising activities on the topic of anti-doping to sports teams, providing school-based education geared toward national athletic meets, and anti-doping advocacy activity. A past study that examined the effects of anti-doping education conducted by sports pharmacists has confirmed the efficacy of this approach [13], meaning that the scope of operation of this system is anticipated to be extended in the future.

Youth athletes often have strong, trusting relationships with their guardians and sports coaches [14]. As a result, they are believed to be impacted by them in various ways. In previous studies that have asked youth athletes about whom they consult on the subject of drugs [15-17], who provides them with anti-doping education, and whom they regard as qualified to do so, a higher percentage of respondents have said that they ask their team staff members, such as coaches and trainers, than those who report consulting doctors and experts (e.g. pharmacists). Furthermore, the World Anti-Doping Code was revised in 2015 [18], with the addition of regulations pertaining to those involved in doping violations, as well as those affecting the violators themselves. This means that sports coaches are now held responsible to a greater extent than they had previously been in instances of doping violations.

However, there have not been many studies examining the attitudes of sports coaches toward anti-doping education. Therefore, the present study recruited teaching staff members, team managers, coaches, and trainers (collectively referred to as "sports coaches") who were engaged in training and sports instruction in sports science departments or sports clubs involving middle school, high school, and university students, in order to conduct a survey on the current state of and attitudes towards anti-doping education and sports coaches' level of familiarity with sports pharmacists. The aim was to elucidate the future tasks required of anti-doping education and to examine the roles of sports coaches and opportunities for them to intervene in resolving the relevant issues.

Materials and Methods

Survey methodology

Sports coaches who taught health and physical education or instructed sports club activities, and who were affiliated with a university (one of sixteen faculty departments) or with a middle or high school (one of 25 schools) within Tokyo were recruited to participate in a survey questionnaire. This was commissioned by Seed Planning Inc., and respondents were asked to respond online. If this was difficult, they were asked to provide answers to the same questions on a paper-based survey. Responses were provided anonymously using a multiple-choice format, with the respondent selecting an answer (or answers) from the options provided for each question. Depending on the question, the respondents were asked to write down their answer. The survey consisted of a total of 24 questions. Questions 1-8 asked about the basic attributes of the respondents, including their age, educational institution, years of coaching, experience of coaching extracurricular activities, roles in which they had experience, sports they had instructed, and their athletic competition level.

The sports instructed by the survey participants were categorized into individual and team sports, while participants' level of athletic competition was divided into two categories depending on their experiences of entering competitions at a national level or higher. Questions 9-18 asked about their experience of providing anti-doping

education and how familiar they were with sports pharmacists. Questions 19-24 surveyed the respondent's attitudes, such as how necessary they believed anti-doping education and sports pharmacists to be.

Data analysis

Analyses were conducted using simple tabulation of the response frequencies for each item. Furthermore, the χ^2 test was used to compare levels of experience of being consulted on doping, levels of familiarity with sports pharmacists, and opinions on the necessity of doping lectures, the necessity of anti-doping lectures by sports pharmacists for youth athletes, and the necessity of anti-doping lectures by sports pharmacists for coaches, in terms of how each of these was associated with number of years of instructing experience, sports instructed, and athletic competition level. SPSS Statistics v. 25 was used to conduct this analysis, with the threshold for significance set at 5%.

Ethical considerations

At the beginning of the survey, the respondent was provided with details on the purpose of this study, the confidentiality of their personal information, and the fact that they were free to decline to participate if they so choose.

Additionally, this study followed the Helsinki Declaration on medical research involving human subjects, and was conducted with the approval of the Nihon University's School of Pharmacy Ethics Review Committee (approval number: 17-012).

Results

Background of respondents

A total of 211 respondents agreed to participate in this research and provided responses to the survey. General information on the participants is presented in Table 1, a simple tabulation of the results for each item in Table 2, and the results of χ^2 tests in Table 3. In regard to age, the highest percentage of respondents fell into the 30-39 bracket (n=74, 35.1%), followed by the 20-29 bracket (n=62, 29.4%).

The most common type of affiliated educational institution was a high school (n=133, 63%), followed by a university (n=43, 20.4%). The most common range of years of experience working as a coach was 1-10 years (n=112, 53.1%), followed by 11-20 years (n=54, 25.6%).

In response to the question on whether or not they had experience in delivering extracurricular activities or sports, 85.3% of respondents said that they had such experience. When the coaches who reported having such experience were asked what their role had been, the most common response was the role of manager (n=97, 53.9%), followed by coach (n=59, 32.8%).

In regard to the question of what type of sports were coached by those with coaching experience, 39.4% (n=71) reported that they had coached an individual sport and 60.6% (n=109) said they coached a team sport. Responses to the question on sporting achievement showed that 41.1% (n=74) reported having experience of competing at a national athletic meet or a higher level, with 58.9% (n=106) saying they had not done so.

Question	Response	Frequency (n)	Percentage (%)
Age (years)	20–29	62	29.4
	30–39	74	35.1
	40–49	37	17.5
	50–59	28	13.3
	60+	10	4.7
Educational Institution	Elementary school	1	0.5
	Middle school	26	12.3
	High school	133	63
	Vocational school	0	0
	University	43	20.4
	Club	1	0.5
	Boy Scouts	7	3.3
Years of Teaching Experience	0–10	112	53.1
	11–20	54	25.6
	21–30	27	12.8
	31+	18	8.5
Experience of Coaching	Yes	180	85.3
	No	31	14.7
Role	Manager	97	53.9
	Coach	59	32.8
	Trainer	1	0.6
	Staff	1	0.6
	Other	22	12.2
Type of Sports	Individual	71	39.4
	Team	109	60.6
Level of Sporting	National meets or higher	74	41.1
Achievement	Have not entered a national meet	106	58.9

Table 1: Participants' general information.

Implementation of anti-doping education and attitudes toward sports pharmacists

In response to the question about their experience of delivering classes or lectures relating to health and physical education and exercise, 45% (n=95) of coaches said they had done so, while 55% (n=116) said that they had not. When those coaches who reported having done so were asked whether or not they had had the experience of delivering a class on anti-doping practices, 32.6% (n=31) responded that they had done so. When those coaches who reported having experience of delivering an anti-doping class were asked about the

duration of the class, 22.6% reported that the duration was about 15 minutes, 22.6% responded that it was about 30 minutes, 16.1% about 45 minutes, 25.8% about 60 minutes, and 12.9% over 60 minutes. Furthermore, responses to the question (with the option to select multiple responses) on the methods used to collect information when delivering anti-doping classes showed that textbooks and books were the most common information source (used by 90.3% of respondents), followed by the homepages of WADA and JADA (58.1%).

In response to the question (answered by all coaches) on whether or not they had been consulted about doping by youth athletes, 14.2% (n=30) said they had, while 85.8% (n=181) said they had not. The percentage of coaches who had experienced being consulted about doping increased with the number of years working as a coach (p<0.05). There was no relationship between type of sports or athletic competition level and whether coaches had experience of being consulted on this topic. Those coaches who reported having experience of being consulted about doping were asked how they responded at the time; the responses showed that most responded using their own knowledge (33.3%), while the next largest proportion reported searching for information on their own and then responding (26.7%). There were no coaches who reported consulting a pharmacist in this situation.

When all coaches were asked about their level of familiarity with sports pharmacists, 13.7% (n=29) said that they were aware of them (e.g., they knew what their role entailed in detail), 24.2% said that they knew a little (they had heard of the profession before), and 62.1% said that they had never heard of them before. Coaches with more years of experience tended to be more likely to know at least a little about sports pharmacists (p<0.05). There was no relationship between coaches' level of familiarity with sports pharmacists and their type of sports or level of athletic competition. When those coaches who reported knowing at least a little about sports pharmacists were asked whether they had any experience of interacting with them, 23.8% said they had, while 76.3% (n=61) said they had not.

Attitudes regarding the necessity of anti-doping education and sports pharmacists

In response to the question on the necessity of anti-doping lectures, 49.8% and 41.7% of coaches said that they strongly agreed or slightly agreed that these were necessary, respectively, showing that over 90% of coaches recognized the necessity of anti-doping lectures. Furthermore, coaches with a longer history of providing instruction tended to think that anti-doping lectures were more important (p<0.05), while coaches of individual sports also tended to regard anti-doping lectures as necessary to a greater extent than coaches of team sports (p<0.05).

Question	Response	Frequency (n)	Percentage (%)
Currently in charge of classes	Yes	95	45
	No	116	55
Experience of holding lectures on doping ^a	Experience	31	32.6
	No experience	64	67.4
Duration of lectures on doping	About 15 minutes	7	22.6
	About 30 minutes	7	22.6

	About 45 minutes	5	16.1	Lectures on doping are necessary	Strongly agree	105	49.8
	About 60 minutes	8	25.8		Slightly agree	88	41.7
	60+ minutes	4	12.9		Slightly disagree	14	6.6
			Disagree		4	1.9	
Sources of information used when giving lectures on doping^{ab}	Books such as textbooks	28	90.3	Would like to deliver special lectures created by sports pharmacists for students if available	Strongly agree	82	38.9
	Homepage of WADA/JADA	18	58.1		Slightly agree	101	47.9
	Homepage of Japan Sport Association	14	45.2		Slightly disagree	23	10.9
	Homepage of Japan Pharmaceutical Association	3	9.7		Disagree	5	2.4
	Pharmacist	3	9.7	Would like to attend special lectures by sports pharmacists for teachers if available	Strongly agree	95	45
	Doctor	4	12.9		Slightly agree	95	45
	Participated in a workshop	11	35.5		Slightly disagree	17	8.1
	Other	4	12.9		Disagree	4	1.9
Experience of being consulted about doping	Experience	30	14.2	What do you seek from sports pharmacists?^b	Education	135	64
	No experience	181	85.8		Immediate consultation on doping for students	101	47.9
Response when consulted about doping^a	Used own knowledge	10	33.3		Immediate consultation on doping for teachers	129	61.1
	Searched for information	8	26.7		Immediate consultation on doping for guardians	53	25.1
	Asked a pharmacist	0	0		Other	3	1.4
	Asked a doctor	3	10		Nothing	18	8.5
	Asked other teachers	1	3.3	Would like to use texts on doping if available	Strongly agree	84	39.8
	Other	8	26.7		Slightly agree	93	44.1
Level of familiarity with sports pharmacists	Aware (familiar with their roles and activities)	29	13.7		Slightly disagree	29	13.7
	Know a little (heard of the profession)	51	24.2		Disagree	5	2.4
	Unfamiliar (first time hearing of the profession)	131	62.1	What content should be incorporated into doping education?^b	Content on drugs	137	64.9
Experience of interacting with a sports pharmacist^a	Experience	19	23.8		Content on nutrition/supplements	166	78.7
	No experience	61	76.3		Content on ethics	95	45
How interaction with a sports pharmacist came about^a	Acquainted with a sports pharmacist	1	5.3		Content on fair play	107	50.7
	Found online	1	5.3		Content on health (e.g. smoking)	55	26.1
	Was introduced to one	6	31.6		Content on self-affirmation	51	24.2
	Consulted by phone	0	0		Information about the life of an athlete after committing a doping violation	124	58.8
	Other	11	57.9	Other	4	1.9	
Nature of interaction with a sports pharmacist^a	Asked them to deliver a lecture for students	7	36.8	Note: a) Question asked only of those who responded positively to the relevant preceding question.			
	Heard them speak at a seminar for teachers	7	36.8	b) Multiple responses to the question were allowed.			
	Asked them about doping	2	10.5				
	Other	3	15.8				

Table 2: Simple tabulation of response frequencies for each question.

We got responses from 211 young athlete coaches.

In response to the question of whether or not they would like to deliver classes or lectures for youth athletes created by sports pharmacists, if available, 38.9% and 47.9% of respondents said that they strongly agreed and slightly agreed that they would, respectively. When asked whether they would like to attend seminars and workshops for coaches delivered by sports pharmacists, if available, 45% and a further 45% of coaches said that they strongly agreed and slightly agreed that they would, respectively, indicating that the opportunity for coaches to acquire knowledge on doping issues was important to them. On the question of whether or not they would like to consult texts (for example, “texts by pharmacists”) on anti-doping issues in the future, should they be available, 39.8% and 44.1% said that they strongly agreed or slightly agreed that they would, respectively.

In response to the question on what they would want for a sports pharmacist (with the option to select multiple responses), 64% of coaches said that they would want education for youth athletes, with 61.7% saying they wanted coaches to be able to quickly obtain anti-doping question to the sports pharmacist. In response to the question on the material that should be incorporated into anti-doping education (again with the option to select multiple responses), the most common response selected was information on nutrition and supplements (78.7%), followed by information on drugs (64.9%), and then information on what happens to athletes who have been caught doping (58.8%).

		Total		No of years working as an instructor								p
		n	%	0-10	%	11-20	%	21-30	%	31+	%	
Experience of being consulted about doping	Experience	30	14.2	9	30.00	9	30.00	6	20.00	6	20.00	0.05
	No experience	181	85.8	103	56.9	45	24.9	21	11.6	12	6.6	
Level of familiarity with sports pharmacists	Aware	29	13.7	12	41.4	5	17.2	5	17.2	7	24.1	0.05
	Know a little	51	24.2	25	49.00	13	25.5	7	13.7	6	11.8	
	Unfamiliar	131	62.1	75	57.3	36	27.5	15	11.5	5	3.8	
Lectures on doping are necessary	Strongly agree	105	49.8	55	52.4	25	23.8	13	12.4	12	11.4	0.05
	Slightly agree	88	41.7	52	59.1	18	20.5	13	14.8	5	5.7	
	Slightly disagree	14	6.6	5	35.7	7	50.00	1	7.1	1	7.1	
	Disagree	4	1.9	0	0.00	4	100.00	0	0.00	0	0.00	
Would like to deliver lectures created by sports pharmacists for students	Strongly agree	82	38.9	57	56.4	26	25.7	13	12.9	5	5.00	
	Slightly agree	101	47.9	43	52.4	19	23.2	10	12.2	10	12.2	ns
	Slightly disagree	23	10.9	11	47.8	6	26.1	3	13.00	3	13.00	
	Disagree	5	2.4	1	20.00	3	60.00	1	20.00	0	0.00	
Would like to attend lectures by sports pharmacists for instructors	Strongly agree	95	45	51	53.7	24	25.3	10	10.5	10	10.5	ns
	Slightly agree	95	45	53	55.8	23	24.2	14	14.7	5	5.3	
	Slightly disagree	17	8.1	8	47.1	3	17.6	3	17.6	3	17.6	
	Disagree	4	1.9	0	0.00	4	100.00	0	0	0	0.00	
		Type of sports				Level of sporting competition						
		Individual	%	Team	%	p	Entered national meets or higher	%	Have not entered a national meet	%	p	
Experience of being consulted about doping	Experience	11	36.7	15	50	ns	9	30.00	17	56.7	ns	
	No experience	60	33.1	94	51.9		65	35.9	89	49.2		
Level of familiarity with sports pharmacists	Aware	10	34.5	11	37.9	ns	11	37.9	10	34.5	ns	
	Know a little	18	35.3	29	56.9		18	35.3	29	56.9		

	Unfamiliar	43	32.8	69	52.7		45	34.4	67	51.1		
Lectures on doping are necessary	Strongly agree	30	28.6	60	57.1	0.05	42	40.00	48	45.7	ns	
	Slightly agree	38	43.2	38	43.2		26	29.5	50	56.8		
	Slightly disagree	1	7.1	9	64.3		4	28.6	6	42.9		
	Disagree	2	50.00	2	50.00		2	50.00	2	50.00		
Would like to deliver lectures created by sports pharmacists for students	Strongly agree	25	30.5	43	52.4	ns	33	40.2	35	42.7	ns	
	Slightly agree	37	30.6	50	49.5		33	32.7	54	53.3		
	Slightly disagree	7	30.4	13	56.5		5	21.7	15	65.2		
	Disagree	2	40	3	60		3	60	2	40		
Would like to attend lectures by sports pharmacists for instructors	Strongly agree	32	33.7	48	50.5	ns	34	35.8	46	48.4	ns	
	Slightly agree	32	33.7	48	50.5		33	34.7	47	49.5		
	Slightly disagree	6	35.3	10	58.8		5	29.4	11	64.7		
	Disagree	1	25.00	3	75.00		2	50.00	2	50.00		

Table 3: Results of χ^2 tests of associations between attitudes toward anti-doping education and other variables.

Relationship between the presence of doping advice, awareness of sports pharmacist, necessity of doping lecture, necessity of sports pharmacist's doping lecture for young athletes, guidance on sports pharmacist's need for A/D lecture for coaches' history, guidance competition, and competition level.

Discussion

In this study, a survey was conducted on the attitudes of sports coaches, mainly those working in high schools and universities, toward anti-doping education. This study obtaining responses from 211 of them.

First, in regard to the question to coaches who delivered health and physical education on whether they had experience of delivering an anti-doping lecture, over 65% of respondents reported that they did not have such experience. When sports coaches who had experience of providing anti-doping education were asked about how much time they allotted to this activity, a rather wide distribution of responses was obtained. These findings indicate that the number of coaches who currently deliver anti-doping education is low, and that the amount of time spent on this is at the discretion of the individual coach. The Ministry of Education, Culture, Sports, Science, and Technology and the Sports Agency have advocated for the importance of anti-doping education, even within school education [19], indicating that enhancement of educational resources will be necessary in the future, including standardization of the curriculum.

In response to the question, answered by all coaches, of whether or not they had had the experience of being consulted about doping by youth athletes, over 10% of coaches reported that they had experienced this. When those coaches who had been consulted about doping were asked how they had responded, over half reported either that they responded with their own knowledge or that they searched for information first. Although the hypothesis had been that coaches who

had competed at a higher level would be more likely to have been consulted, no relationship was observed between competition level and experience of being consulted. Detailed information on what the coaches were consulted about in regard to doping was not collected in the present study but given that regulations on doping and banned substances are revised on an annual basis, the coaches' provision of responses based on their own knowledge carries a risk of leading to doping violations, unless the coach is continuously exposed to information about doping. In reality, there have been many cases in which a substance was ingested without either the athlete or the staff members on their team knowing that it had been designated as banned. This indicates that both athletes and sports coaches need to recognize the importance of consulting with specialists such as sports pharmacists about doping.

In regard to the question asked of all coaches about their level of familiarity with sports pharmacists, over 60% reported that they did not know about them, while only 10% were familiar with the roles and activities of sports pharmacists, and not just the name of the profession. The efficacy of sports pharmacists has been confirmed in previous studies [13], with a future task being to increase coaches' knowledge of the role of sports pharmacists in protecting youth athletes from doping. Furthermore, the results showed that coaches with a longer experience of working in the field had a greater level of familiarity with sports pharmacists. This leads to the conclusion that measures will need to be taken to increase coaches' familiarity with this profession, so that even young coaches with fewer years of experience are aware of this role, such as by incorporating content about doping into the teaching curriculum.

In this study, over 90% of all coaches found anti-doping lectures to be necessary. The importance of anti-doping education has been discussed not only in Japan but also internationally [13,20-25], and the results of this research further recognize the importance of anti-doping

education. Coaches of individual sports felt more strongly that anti-doping lessons were necessary than did coaches of team sports. This disparity could be driven by the fact that most of the sports in which athletes receive penalties for doping violations are individual sports. In response to the question on whether or not they would like to have a sports pharmacist deliver lectures to their youth athletes, over 80% of the coaches said that they would. Further, when asked whether or not they would like to attend a lecture for coaches delivered by a sports pharmacist, 90% of coaches said that they would. Past studies have also reported that there are many coaches who feel the need to acquire knowledge on anti-doping practices and on the relevant experts [26,27]; the present study also supports this finding. In response to the question asking what they would like from a sports pharmacist, over 60% of coaches responded that they would like to receive education. These results clarified that sports coaches recognize the importance of obtaining information from sports pharmacists who possess expert knowledge on doping avoidance. Therefore, seminars involving active participation, given by sports pharmacists, should be conducted in the future.

Following their responses on the necessity of anti-doping education by experts, around 90% of coaches reported that they would like to use anti-doping teaching materials, should these be available. In response to the question on the content that should be incorporated into anti-doping education (with the option to select multiple responses), the most popular selections, in order, were 1) nutrition/supplements, 2) drugs, 3) life for an athlete following a doping violation, and 4) the spirit of fair play. These results showed that rather than preferring to educate youth athletes only on drugs and anti-doping practices, sports coaches also viewed information on nutrition and supplements, and in some cases, awareness of the risks and dangers of violating doping regulations, as additionally necessary. In corroboration of this notion, there have been reports that there is a strong relationship between knowledge on sports nutrition and awareness of the risks of doping violations [28,29]. For this reason, when considering anti-doping education and the instructional material used in this, it is necessary for coaches to collaborate to a greater extent with other professionals. These collaborators should include not only sports pharmacists, but also sports doctors [20], nationally certified nutritionists who possess knowledge on nutrition and supplements, and researchers and educators who study ethics.

Overall, the above results revealed that in order to protect youth athletes from drug violations, coaches themselves should actively participate in seminars on anti-doping practices in order to acquire the necessary knowledge, and should recognize the expertise of sports pharmacists. Since the Sports Ministry suggested the importance of anti-doping education for youth athletes, research on the degree of interest in doping and the educational situation of the coaches of youth athletes in our country was not found as far as the authors' investigation. Thus, as a coach of young athletes who wish to be the top athletes, I found a large gap between the degree of interest in the importance of anti-doping education and its implementation rate (although the degree of interest is high, the rate of education implementation is low).

Through the delivery of education to youth athletes using anti-doping teaching materials with standardized instructional content, a cycle may be created in which coaches have greater knowledge of and interest in anti-doping practices, which may in turn lead to coaches conferring with experts in the event that they are consulted by athletes about doping. We believe that this cycle of events will be necessary to

eradicate drug use violations. In this research, we got the most number of answers from the coaches of high school athletes, but from now on we think that it is necessary to increase the number of responses of college athlete coaches to increase the sample size. Moreover, through surveys including more detailed items (nutrition, ethics, and dangerous drugs) that the coaches consider important for anti-doping education, it is important to help coaches to develop anti-doping teaching materials.

Conclusion

In this study, a survey on the attitudes of sports coaches toward anti-doping education was conducted. The results showed that although sports coaches recognize the importance of anti-doping education, both their rate of providing such education and their level of familiarity with sports pharmacists were low. It is important that not only youth athletes but also sport coaches themselves actively participate in seminars on anti-doping topics and other relevant events, in order to heighten their understanding of doping avoidance and their familiarity with the profession of sports pharmacy. Additionally, greater levels of collaboration with other professionals, including sports pharmacists and nationally certified nutritionists, is believed to be important in protecting youth athletes from doping violations. A task for the future is to develop anti-doping teaching materials and examine their effects.

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