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Measuring the Perceptions of Pharmacy Students of Doping Prevention: Case Study of a Pakistani Universities

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Abstract: Doping in sports has become a serious problem throughout the globe, which poses a threat to athlete's physical and moral health. Providing sportspersons awareness of negative health consequences and counseling services to dopers can help eradicate doping in sports. Since Pharmacists are professionals who study medicine need to possess adequate knowledge, positive attitude, and motivation to play their role to contribute doping prevention. This study assessed the perceptions regarding knowledge, attitude, and role of pharmacy students of Pakistani universities. Three hundred and one students of doctor of pharmacy participated in survey. Descriptive statistics was employed to calculate frequency and percentages of responses using SPSS version 22.0. Results showed that majority of the students were unaware of the legal status of main substances. Significant majority knew that players use doping drugs to improve sports performance and build muscles. Approximately one-fourth participants had negative attitude towards doping. These findings suggests that contents or courses related to banned or permitted substances, doping and ethics, health and doping drugs should be introduced in the doctor of pharmacy programs in universities of Pakistan. Particularly, curriculum wing Higher Education Commission of Pakistan can actively play its role by suggesting doping courses in Pakistani universities. This may help reduce doping use in Pakistan that lead to promote fairplay and good health of athletes.

Keywords: Sports Doping, Pharmacy Curriculum, Doping Prevention, Doping Education

1. INTRODUCATION

Usage of drugs has become a prominent feature of sport from club to international level, non-elite to elite level, and amateur or recreational sport to commercialized sport (Ge, 2008). Pakistan has had several successes in international sports events particularly in cricket and field hockey. Although the exact status of doping practices in sports in Pakistan is unknown, however, some media reports highlighted the existence of doping practices in some prominent world class athletes particularly in cricket in Pakistan (Bandyopadhyay, 2007) (Ramoni, 2011). (Charlish, 2007) In addition, the prevalence of doping practices has also been reported in fitness industry in Pakistan (Usman, 2015). These findings explores that, unlike other countries of the world, doping is also a serious concern in Pakistan.

It is evident that athletes use several ways of doping in sports such as steroids, erythropoietin, and growth and hormones (Tentori, and 2007). In addition, the use of stimulants, blood doping, diuretics, and beta-blockers also has been included in doping practices (Fitch, 2012) Occurrence of several negative health consequences found to link with abuse of banned substances. For example, many health problems (cardiovascular diseases (Deligiannis, 2006), liver dysfunction, and behavioral disorders) were suggested to occur as result of abuse of steroids (Lamb, 1983) (Sjöqvist, *et al.,* 2008) In addition, testicular atrophy in men, tendon injuries, increased blood pressure, kidney and liver diseases, and gynaecomastia were also found to link with doping practices (Korkia, *et al.,*1997) Others reported cerebral sinus thrombosis (Lage, 2002) risk of stroke (Frankle, *et al.,*1988) and even reports of death cases (Hausmann, *et al.,*1998) These findings showed that use of doping has adverse effects for health and well-being of athletes.

Keeping in view the dangerous effects of doping on athletes health and unethical advantages in competitions, several measures has been suggesting taking by the authorities. Those measures include doping-testing, introducing severe penalties for players who involved in violation of doping control rules, launching education campaigns, spreading awareness regarding dangerous health related consequences of doping, and encouraging the researchers to conduct surveys and studies on the topics of doping. Instead of these efforts for eradication of usage of banned substances in sports, this goal remains unachievable until now. Even the intensity and volume of this problem is still on the rise. The severity of this issue suggests intensifying the efforts with focusing on introducing polices that help to cope with utilization of banned drugs and doping-like attitudes. It poses a severe challenge for health related professional such as doctors, pharmacists, and nutritionists, and sport organizations.

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Specifically, several agents have been suggesting as target population as part of doping education campaigns such as doctors, coaches, players, nutritionists, and pharmacists. In this regard, pharmacists can play an important role in controlling prohibited substances by providing the athletes treatment, counseling and advising services (Ambrose, 2004). The role of pharmacists has become more critical because the numbers of performance enhancing substances are increasing day by day that result in increasing the lists of prohibited substances by sports governing bodies. In addition, they can spreading awareness among public, parents, media, and athletes regarding side-effects of banned substances and drugs, performing monitoring services for medication, and coordinating with doping control bodies (Ambrose, 2011) as well as acting as sport pharmacists (Ambrose, 2008)In recent years, the role of pharmacists is advanced towards the provision doping free medicines to athletes participating Olympics (Stuart, 2012) In addition, reports indicated that there are incidences in which pharmacists were requested to prescribe performance enhancing drugs [19]. Moreover, it is generally acknowledged that pharmacists are considered among the experts that have comprehensive knowledge of the biochemical formulas of various drugs and substances. In essence, involvement of pharmacists seem essential in the struggle for achieving the goal of clean sport or fair-play by eradicating use of performance enhancing substances in sport.

For this purpose, the pharmacists should be adequately equipped with essential knowledge, expertise, and behavior through a systematic education programs during their professional training in universities. However, studies have shown that there is inadequate doping related knowledge among the students of pharmacy classes. For example, Auersperger, Topič (Auersperger, 2012) found that approximately half of the pharmacist exhibited no knowledge about the definition of doping and poor knowledge about doping control agencies such as WADA. Others reported presence of negative attitude towards doping practices and lack of knowledge about banned and doping substances in pharmacy students (Saito, 2013).. These findings highlight that even though the great importance of pharmacist in controlling banned drugs in sport, however, they are not equipped with sufficient knowledge and appropriate attitudes to cope with the challenge of doping control. In addition, there is extreme lacking of such kind of investigations and most of those studies are conducted mainly in advanced countries (Auersperger, 2012) (Saito, 2013). (Laure, *et al.,*2000). On the other hand, it is evident that findings concerning knowledge and attitudes towards sports doping of certain population or professionals in one country cannot be generalized for other countries. As, it has been suggested that various countries are differed with respect to their potential and capacity to implement doping controlling policies, launching awareness programs, education curricula's for pharmacy programs, and the involvement of pharmacy professionals in the fight against doping.

In addition, the existence of doping practices is not limited to advanced nations only. Its prevalence is also evident in under developing countries (Ge, 2008) and even in Pakistan (Charlish, 2007). Importantly, no information exists regarding current statues of education practices for pharmacy students regarding doping and performance enhancing drugs in the Pakistan. Because, to date, as per our knowledge, there is no study exists that explored the information on this issue. Hence, there is need of replication of studies explored the role of pharmacy students based on assessment of their knowledge, believes, and willingness to play their role against doping.

Therefore, the purpose of this study is to explore the current status of education practices with regard to sports doping among pharmacy students at university level. The results of this study may contribute to formulate some policy regarding inclusion of doping related courses and contents in the curriculum of future pharmacists. This may help to fight against doping in sports in Pakistan.

2. METHODS

Participants

Three hundred and one students of pharmacy departments from two Pakistani universities voluntarily took part in this study. An equal number of students were recruited from year one, two, three, four, and five, because the program of Doctor of Pharmacy consists of five years. Ethics board of the university concerned approved the study. Prior to data collection, the participants informed about the purpose of the study. It was assured to all participants that the information obtained from them will be kept completely confidential. They were also informed about their right to withdraw from participation of the study.

Instrument

A modified version of the doping questionnaire previously used by El-Hammadi and Hunien [22] was administered for data collection. This questionnaire was consisted of 2 pages, 26 items, and five constructs. Demographic information such as gender, age, and year of study was included in construct one. Constructed two comprised of nine items that were related to knowledge about doping substances. In addition, four items were included in construct three to know about the aim of doping substances usage. However, four items in construct four were related to attitude towards banned substances. There were four questions in construct five

those were related to general views about doping. Lastly, there were two questions at the end of questionnaire concerning exposure to doping use and factors influencing doping behavior.

Procedure

The investigators contacted with the chair and faculty members of pharmacy department, explained the purpose of the study, and asked for their cooperation for administration of questionnaire among the students of their department. Following obtaining consents of the chair, the investigator personally visited the classes, explained the study purpose, provided the instructions, received informed consents, and distributed the questionnaires among the participants. They were not allowed to take the questionnaire outside the class or their home and residential, because this procedure decreases the return rate of the questionnaire. The participants were required to fill the questionnaire with their honest opinion and return it to the investigator immediately after completing it. Questionnaires were given only those students who were voluntarily willing to participate in the survey. Those students, who were not willing to participate in this study, were not given the questionnaire. Thus, the response rate was 100 percent. The participants were requested to take the time that is enough to fill up the questionnaire with ease and comfort. In particular, they were asked to show their honest opinion while filling up the questionnaire. In addition, the participants were allowed to ask any kind of question regarding filling up the questionnaire. The participants took approximately 20 to 25 minutes to complete and return the questionnaire to the investigators. Following receiving back the completed questionnaires, the investigators paid words of thanks in response to their participation in the study. During the whole process of questionnaire distribution, provision of instructions to participants by investigator, and receiving back the completed questionnaires, one faculty member from pharmacy department, and two assistant investigators remained present on the occasion to co-app with the main investigator.

Data Analysis

To analyze the data, frequency and percentages were calculated for each response using SPSS software.

RESULTS

The knowledge of participants regarding sports doping assessed by asking them to show their knowledge about nine three permitted and six prohibited substances. The analysis concerning knowledge of pharmacy students about permitted substances indicated that majority of the participants considered permitted substances such as amino acids (67%), energy drinks (82%), and vitamins (75%) as prohibited. The results regarding information about prohibited substances revealed that approximately 85% of the respondents did not know that Diuretics and β-blockers were doping substances in sports. However, 75 % of the respondents knew that Anabolic steroids, Growth hormones, and Stimulants were performance-enhancing drugs. Additionally, slightly more than one third of the participants knew that Narcotics were doping in sports.

Table 1knowledge about doping substances

Substance	Agree	Disagree	Not sure
Amino acids (AAs)	67.1	16.4	15.5
Anabolic (masculine)	75.3	16.4	7.5
Diuretics	16.4	56.9	24.0
Energy drinks	82.6	11.8	3.9
Growth hormone	75.7	14.1	8.6
Narcotics	36.2	46.7	12.5
Stimulants (such as amphetamine)	77.0	11.5	8.9
Vitamins	75.7	18.1	5.6
β-blockers	17.8	45.1	33.9

The data concerning aim of doping use revealed that the most important goal is enhancing sports performance because 80 percent students was in agreement of this view. Moreover, according to the views of the students, it was found that building a muscle mass, choosing the easy way to attain physical abilities, and imitating others, were the second (67%), third (48%), and least (32%) preferences of doping use in sport, respectively.

Table 2 Motives of using Doping

Motives of Doping Use	SDA %	DA %	N %	A %	SA %
Develop a muscular body	5.9	15.1	10.5	46.1	22.0
Improve performance in sport competitions	4.9	7.2	6.9	47.4	33.6
Select the easy choice instead of investing required effort to attain physical abilities	4.6	20.7	25.3	33.2	15.5
Follow the dopers as a model	7.6	22.7	35.5	28.6	4.6

With regard to attitude towards using prohibited substances, the opinion of almost two third of the participants were against the statement that using prohibited substances is ethically valid act. Similar percentages of participants did not agree upon showing respect for users of prohibited substances. Whereas less than one quarter respondent considered the doping usage as ethical deed. In addition, slightly more than two third of the participants were aware of side effects of doping substances. On the other hand, approximately one quarter of the participants did not have knowledge about adverse effects of doping. Alarmingly, less than half portion of participants (40 %) considered the doping substances as harmless for health if used occasionally.

Table 4.Responses of participants regarding their Anti-doping views

Anti-doping views	SDA %	DA %	N %	A %	SA %
I can possibly take prohibited substance in the future	36.5	37.8	12.2	11.2	2.3
I like to advise others not to use doping agents	4.6	8.6	16.1	40.8	29.9
Spreading knowledge concerning negative health consequences of using doping substances can contribute to reduce their usage	3.6	3.3	10.2	44.1	38.8
Pharmacists should spread awareness regarding negative health consequences of doping usage	3.0	2.0	3.6	26.3	65.1

Table 3, Responses of participants regarding their attitude towards doping

Attitude Towards Doing	SDA %	DA %	N %	A %	SA %
Using doping substances is ethically valid deed	33.6	35.2	12.2	16.1	2.6
I respect dopers	34.2	32.9	20.4	10.9	1.6
Using doping substances can negatively affect the health of dopers	7.2	11.8	11.8	47.4	21.7
Using doping substances for only a few days is not injurious to health	8.2	32.6	20.1	32.9	5.9

Regarding students behaviors towards anti-doping and the importance of spreading awareness to fight against doping practices, the analysis demonstrated that only a few number of participants (13%) had tendency towards taking banned substances in the future. Approximately three quarter of the students had no tendency to use banned substances in the future. In contrast, higher than two third of the respondents tended to suggest others to refrain from taking banned substances. In addition, a vast majority of the participants (82%) strongly agreed or agreed on the statement that prevalence of doping practices can be reduced through spreading awareness regarding side effects of doping. Most importantly, a highest proportion (91%) of the respondents supported the statement that pharmacists can play an important role in spreading awareness regarding negative health consequences of using banned substances. The results regarding contact with performance enhancing substances demonstrated that 10 % of the participants confessed that they had taken the banned drugs in the past. Lastly, it revealed that media and friends, followed by sport mates and coaches were the most contributing factors in prevalence of doping practices.

3. DISCUSSIONS

This study conducted among students of Bachelor of Pharmacy with the aim of assessing their perceptions concerning status of current level of information, attitude, anti-doping thoughts, and their role for elimination of doping practices in the context of Pak. Findings emerged from the analysis presented here.

The findings revealed that the students of Bachelor of Pharmacy program (PharmB) demonstrated inadequate knowledge about permitted and prohibited substances in sport. Because more than three fourth proportions of the participants did not know that amino acids, energy drinks, and vitamins are not include in Prohibited list. In addition, higher than similar proportion of them stated Diuretics and β-blockers as permitted substances. Majority of the Pharmacy students displayed correct knowledge concerning legal status of three substances including Anabolic steroids, Growth hormones, and Stimulants.

The findings of this study regarding knowledge about doping substances are similar, to some extent, with the study conducted by (El-Hammadi and Hunien 2013) among Syrian pharmacy students. Findings of that study revealed that a vast majority of the students (90%) did not know that the substances such as β-blockers, narcotics, and narcotics had doping effects and included in the prohibited list. In addition, more than half of the participants of that study found to have incorrect knowledge about permitted substance. In addition, Awaisu, Mottram (Awaisu, 2015) found that pharmacy students exhibited poor knowledge about banned substances in sport. However, the results this study showed that a larger proportion of the participants (85%) stated that banned substances such as Diuretics and β-blockers as permitted substances. This shows a worse status of knowledge in pharmacy students regarding doping substances.

The reasons behind this result might be that the students of Bachelor of Pharmacy in Pakistan did not teach about performance enhancing and side effects of these substances with reference to sport. Although these students study the influence of these substance on human health and their therapeutic use, however, they might unaware of sports performance related effects of many drugs. Another reason of poor knowledge might be that the lack of sporting culture in Pakistan compared with other countries. The sport culture in Pakistan less commercialized and has less media coverage and covers only one sport such as cricket only. In addition, the chances of being a host for major international sports tournaments are very rare. In these circumstances, fewer cases of doping practices reported in media and thus student's population has rare concern and interest about doping related issues.

This discussion point to the fact that incorporation of doping related contents in the study program of

pharmacy is essentially crucial to enhance their knowledge for sports doping. In light of some suggestions indicating the significant role of pharmacists in controlling doping practices, it has become a matter of serious concern to equip the pharmacy graduates with essential knowledge about performance enhancing and doping effects of certain substances. In addition, they should have potential knowledge about the short term and long term negative effects of certain substances on athlete's physical and mental health. Furthermore, the prevalence of addiction related behaviors because of unsafe usage of drugs and supplements in fitness industry and sports setting requires appropriate amount of drugs for therapeutic purposes. This increases the responsibility of pharmacy students to have proper knowledge of influences of drugs use in sport and fitness industry. These objectives can achieved only including some doping related contents in the courses/modules of pharmacy education programs in universities.

The findings concerning purpose of using banned substance revealed that improving sports performance were among the most prominent aim among the reasons of doping use. The possible reason behind this opinion might be that sport media has attracted a wide range of population and generated great interest to watch sports specifically cricket in south Asian countries (Beech, 2005)Watching cricket matches on TV and playing cricket has become a prominent feature of sport culture in these countries (Croft, 2005) (Dimeo, and Kay, 2004)Specifically, cricket has become extremely, commercialized, mediatized, and professionalized in Pakistan.. This domination of cricket sport in media and playing places left less room for other sports such as bodybuilding, wrestling, and weight lifting that require big muscles mass (Crick, 2009). Moreover, fitness industry, gym culture, and power sport is less famous in south Asian countries. Since, building muscle mass is a prominent feature of power sport, gyms and fitness industry. These facts might collectively played the role in spreading awareness regarding doping and its relationship with sports performance rather than awareness related to muscle mass and doping. . Sports performance as compare with physical appearance has more importance among young population in Pakistan. Therefore, due to these facts, it is possibility that the students of pharmacy study program were less aware about the aim of doping to build muscle mass as compare to the aim of enhancing sport performance.

Findings related to attitude of pharmacy students regarding doping use are mix. Majority of the students showed negative attitude towards users of banned substances. The reasons of this finding might be that pharmacy students respect the anti-doping regulations. On the other hand, more than one third of the participants (40%) believed that using doping is not dangerous for health if used rarely. The tendency to consider usage of banned substances occasionally may be because, and using doping drugs for therapeutic purposes generally accepted in medical practice. Another reason may be that pharmacy students had not specific knowledge about the legislature and penalties related to usage of banned substances by athletes. Thus, although their general attitudes are generally negative towards doping practices, however, it seems that they do not consider doping as intensively serious problem and issue of great concern for players and athletes. This discussion stresses that pharmacy students need to equip with specific knowledge about doping related legislature and penalties associated with doping violations.

Findings further revealed that remarkable majority of the participants showed negative attitude towards doping practices. This may be that the majority of students included in this study perceived doping like behavior as anti-social, unethical, and dangerous for general health and well-being. Similarly, they strongly recognized the effectiveness of role of pharmacists in minimizing doping practices. This finding is in line with the results of a study conducted in retail pharmacists in France. Vast majority of the participants were in the favor of effective role of pharmacists in anti-doping efforts in France. In addition, another study found that one third of pharmacists showed their intentions to play their role to eradicate doping and realized the need for understanding measures that should be taken to control doping. These findings likely to suggest that doping controlling authorities, sports federations and organizations, should conceder the engagement of pharmacists in the campaign of doping prevention. The policy makers should define the form, role, and status of these health professionals in overall doping controlling system in Pakistan.

Alarmingly, a considerable proportion of the participants either had previous contact with doping substances (13%) or tended to use doping substances (10%) in the future. This finding seems in accordance with the results of past research indicating that approximately 12% (Yesalis, and Bahrke, 2000) and 2.8 % in Sweden (Nilsson, 2001)and 15.1% in Germany (Gabriel, 2007) of the young aged individuals tended to take prohibited substances. This trend poses a serious challenge for endeavors of doping controlling authorities to eradicate doping and their education campaigns to raise awareness towards negative health effects of doping in Pakistan. It also suggested reviewing curricula of pharmacy study programs in Pakistani universities with the aim of fostering zero-tolerance for doping use in prospective pharmacists.

Lastly, it found that media, followed by friends appeared to be the most powerful factor to stimulate usage of doping substances. This suggests that the doping controlling authorities should involve media and sports coaches in the campaign of doping prevention.

Based on above discussions, it can concluded that they possess inadequate knowledge of legal status about banned substances, do not completely aware of short-term side effects of doping drugs, and have some tolerance towards doping use. This conclusion put forward following recommendations for making effective and efficient doping prevention policy in Pakistan.

1. Sport organizing bodies and doping controlling agencies should work in collaboration with Higher education Commission, Pakistan (HEC) to launch doping prevention education programs in universities through pharmacy departments.

2. Since, HEC is sole authority for providing funding and recommending curricula for all universities of Pakistan, hence this organization should play its role to recommend courses and contents concerning doping related drugs and legal status of certain drugs.

3. HEC should launch a national wide doping awareness campaign through holding conferences, workshops, seminars for pharmacists and university sports related individuals.

4. Doping controlling agencies in Pakistan incorporate pharmacists in their doping prevention programs.

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