

EVALUATION OF SPORTS PHARMACY IN TURKEY AND NORTH CYPRUS AS A NEW IMPORTANT FIELD FOR PHARMACISTS

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ABSTRACT

Sports have substantial socioeconomic and political importance worldwide and are today considered to be an integral part of society. In the world, almost all people are doing sports. Participation in sports and exercise is undertaken at all levels, from amateur enthusiasts to elite athletes.

Pharmacists are the drug experts who know contraindications, usages and side effects of drugs very well. People can have problem related with sports like injury, muscle pain, sprain etc. For these conditions, pharmacist is one of the closest counseling person for patient. Sports pharmacy can be defined as area that is related with sports and pharmacist.

Doping is the one of the biggest problem in sport activity for Turkey, North Cyprus and for other countries. Some athletes do doping unconsciously. Pharmacists know all effects of drugs and they can control and inform the athletes about drugs that have doping effects. For decreasing these problems, sport pharmacists are needed in Turkey, North Cyprus and in other countries.

Athletes who are representing us at olympics have their own doctor, physiotherapist and coach. Moreover, they also need pharmacists. There is a growing need for specialist pharmacists in the area of sport and exercise.

The specialty of sports pharmacy covers, awareness of drugs in sports in the community, medicine & industry for both performance modification and the prevention and treatment of disease, knowledge of therapeutic use of drugs in sports and how pharmacist interventions can support sports related illness or injury, use of pharmacotherapy to prevent sport-related illness or injury and maintain well-being, safe and rational use of nutrition and supplements to optimise performance.

This research is the first study about sports pharmacy in Turkey and North Cyprus. The aim of the study was to increase awareness of pharmacists about sports pharmacy which is a new area for them. Moreover, in this study two survey were applied to pharmacists and pharmacy students and together with these surveys, awareness of pharmacists and pharmacy students were determined.

Key Words: Sports Pharmacy, Doping, Role of Pharmacist

INTRODUCTION

Sports have substantial socioeconomic and political importance worldwide and are today considered to be an integral part of society. Participation in sports and exercise is undertaken at all levels, from amateur enthusiasts to elite athletes.

Pharmacists can be the first port of call for people engaging in sports who require advice on drug treatment or general health care. However, few pharmacy programs incorporate sports pharmacy as part of the curriculum. As illustrated by studies, pharmacy students in Japan (Saito et al. 2013) and Syria (El-Hammadi and Hunien 2013) did not have sufficient learning opportunities concerning doping in sports. Pharmacy graduates can, therefore, lack knowledge and skills about doping and anti-doping in sports and be ill-equipped to provide advice on safe, effective, and legal use of drugs for athletes.

Pharmacists are frequently approached by people who engage in sport and exercise for advice about drug treatment or on general healthcare associated with their participation in sport. There is a growing need for specialist pharmacists in the area of sports and exercise in order to fulfil this valuable healthcare role. These specialists may be described as sports pharmacists. The specialty of Sports Pharmacy covers, awareness of drugs in sport in the community, medicine & industry for both performance modification and the prevention and treatment of disease, knowledge of therapeutic use of drugs in sports and how pharmacist interventions can support sports related illness or injury, use of pharmacotherapy to prevent sport-related illness or injury and maintain well-being, safe and rational use of nutrition and supplements to optimise performance. Sports pharmacy aims to highlight the emerging role of the pharmacist in the area of sports medicine. The aim of the study is to emphasize the importance of pharmacist's involvement at international sporting events including the Commonwealth and Olympic Games.

The aim of the present study was to collect and examine all the important information available, to make the concept of sports pharmacy accessible to everyone and to raise the awareness of the pharmacists about this topic, which is expected to become very important in the future. It has been planned that the sports pharmacy is designed to be an important sub-field so as to help to understand and develop this concept.

The present study was undertaken to understand the level of sport pharmacy well in order to force the new important concept 'sport pharmacist' and to develop an effective awareness in this subject. Parallel to the aims of the study, two types of surveys were applied to pharmacists pharmacy students.

GENERAL INFORMATION

Sports and Pharmacist

People who are doing sports can have health problem such as muscle pain, injuries. Athletes who do the sports professionally can also have health problems and they may need to use drugs. In these conditions, they need to use medicines. Pharmacist is the person who knows the medicines very well and is expert of the drugs therapeutic uses, adverse effects, drug interactions with drugs, foods, etc. Athletes don't know if a drug has a doping effect or not but pharmacists do have this general information. Pharmacists know the effects of drugs in the body very well. Because of these reasons, pharmacists and athletes should be in the same area similar to an athlete's doctor, athlete's coach. There is also a new term which is sports pharmacy but this term hasn't improved yet in all countries.

Sports Pharmacy

Sports Pharmacy is becoming important as a specialist field that is beginning to develop all over the world. Sports pharmacy can be defined as a science that examines the effects of sports on human health, the products used for athletes in this respect and the pharmaceutical products useful for reducing the harmful effects of the interactions of the drugs to be used in a possible situation and how their production should be. With such a broad scope, sports pharmacy will also be able to offer new career opportunities on behalf of our profession. Protecting and maintaining athletes' health is a team work. An application model is ideal where health professionals such as sports physicians, sports pharmacists, physiotherapists, conditioners and masseurs should interact with each other. We have observed that some countries have a special interest in this issue and that they have achieved much more successful results because of accepting the title of Sports Pharmacy as an effective specialty. Countries such as the United States, Britain, Japan and Canada have achieved significant sporting achievements internationally. Of course, the contributions of the services provided by a wide range of healthcare providers, as well as systematic and planned study programs, are of course very important. The most important topic is timing in sports. With the right timing, the most appropriate steps can be planned for many sporting concepts such as injury, recovery, development, prevention.

Role of Sports Pharmacist

Pharmacists can help athletes by giving information about banned drugs and monitoring doping tests and can help to prevent test mistakes and help to prevent doping.

Another way pharmacists can help athletes who are subject to drug testing is to promote them to get in contact with their sports governing associations to ensure that their medications and supplements are not banned.

If athletes do need a banned drug for legitimate medical reason, pharmacist can suggest them to go their sports governing associations and apply for an exception (Meghan 2016).

Within the scope of protective and preventive health services, it is the basic duty of the pharmacists to specialize in sports pharmacy, to lead the sports in the right way in the lives of the individuals.

On the other hand, it is among the duties of sports pharmacists to provide consultancy services on Food Supplements and Performance enhancing products, which are preferred to increase the quality of life and to support the continuity of being healthy.

Another important topic is the use of medicines in sports and the control of situations that can arise due to conscious or unconscious drug usage. The most tragic results of doping practices and prevention is also the interest and knowledge of sports pharmacists.

Sportsman Health Consultancy services, which can be presented in a more conscious and qualified manner in our pharmacies, will be able to support the development of conscious athletes. In addition to determine which products or supplements can be used by the athletes, sports pharmacists also can give information to sportsman about the products or medicines that should not be used. Integrating pharmacy sciences will be of utter benefit to the prevention of banned substance use and doping control in the field of sports and athletic health, an area where science and technology can be used most efficiently. The main factor in choosing non-irreversible ways for the athletes was determined as lack of knowledge and unconsciousness. Support consultancy services offered by sports pharmacists will be able to prevent undesirable effects and consequences.

Countries that have sports pharmacist

Japan

Japan Anti Doping Agency(JADA) launched the “Sports Pharmacists System” in partnership with the Japan Pharmaceutical Association in 2009. The Sports Pharmacist System is to certify the qualified pharmacists who are trained to have accurate knowledge in anti-doping and who can provide the appropriate information on medicine and the effects of drugs on health. Those certified pharmacists are also expected to provide anti-doping education program to the athletes particularly from the pharmaceutical perspective.

They start educating athletes from primary school. By this way, conscious athletes are raised. They have web site and in this website they have educational videos and subjects.

JADA Eligibility for Sports Pharmacist

- A fully-qualified and licensed pharmacist
- No age restriction
- The applicants should complete both “Basic” and “Practical” courses delivered by JADA and obtain the required minimum score in the exam
- Required for annual seminar course and recertification

Certification Program in Japan

The qualified sports pharmacist must annually take part in a practical lecture course in order to maintain a certification.

For certification renewal, before the certification expires, the sports pharmacists need to take both “Basic” and “Practical” lectures and also obtain the minimum score in the examination.

How sports pharmacist work in Japan

- Available for 24 hours, either via telephone, fax or email
- At local drug store/pharmacist across Japan – face to face accessibility to the knowledge of prohibited substances and anti-doping regulations
- Web searching system. JADA web site allows anyone to look for the closest Sports Pharmacists

Azerbaijan

European Olympics Games and Baku Islamic Solidarity games are the most recent examples for pharmacy applications in sports. In 2015; European Olympic Committees Medical and Antidoping Commission were created. There were two Athlete Villages for the Baku 2015 Games, each containing a comprehensive array of medicines to provide the medicine requirements of accredited athletes, team officials, European Games Family, and other residents of the Villages. The main pharmacy in the Baku Athlete Village was operated in a similar style as an outpatient dispensary and was the co-ordinating point of medicine supply for the athlete and spectator medical facilities at all venues. The operation period of the service was 28 days between 3rd June and 30th June 2015, which started at the opening of the Athlete Village and ended at the close. The service to spectators covered 17 days of Games competition. The pharmacy was staffed by 9 pharmacists: 7 local Azerbaijan pharmacists and 2 international pharmacists with experience of delivering pharmacy services at previous Olympic and Commonwealth Games. The Baku Polyclinic Pharmacy was situated in a purpose-built polyclinic located in the athletes’ residential area. The pharmacies dispensed prescriptions written by Baku European Games Olympic Committee (BEGOC) doctors and

also by around 233 visiting team doctors from the 41 different countries that had a medical practitioner as one of their officials. Pharmacy clinical services provided the medicine needs for 6000 athletes of 50 countries who competed in 253 events across 20 sports in 16 competition venues (Baku 2015). Mark Stuart is the pharmacist for the International Olympic Committee (IOC) Medical Commission and European Olympic Committees (EOC) Medical and Anti-Doping Commission. He is a pharmacist specialised in pharmacy and medical services for international multi-sport games and is registered in the UK, Australia and Azerbaijan. He has worked with medical and anti-doping services for numerous Olympic, Paralympic, European and Commonwealth Games as part of the organising committee. He is presently the pharmacist member of the International Olympic Committee Medical Commission and European Olympic Committees Medical and Anti-Doping Commission, and current member of the World Anti-Doping Agency Prohibited List Committee. He is also the UK editor for the GlobalDro online athlete resource for drugs in sport. Table-1 represents the list of countries where sports pharmacy specialty have been applied and the Table-2 gives the future locations for sport pharmacy application area.

Table 1: List of countries that have applied sports pharmacy.

2000	Sydney - Olympic Games
2002	Manchester – Commonwealth Games
2004	Athens – Olympic Games
2006	Turin – Olympic Winter Games
2006	Melbourne - Commonwealth Games
2008	Beijing – Olympic and Paralympic Games
2014	Glasgow
2015	Baku – European Games
2016	Rio
2017	Baku – Islamic Solidarity Games

Table 2: Future places for sport pharmacy application area.

2020	Tokyo – Summer Olympics
2022	Qatar – FIFA World Cup

Qatar

Qatar is contributing to Pharmacy in a global significance. It is developing the pharmacy workforce in various events. Qatar is holding FIFA World Cup 2022. This is leading to a significant development in the area of pharmacy and sports pharmacy not only regionally, but also as globally (Awaisu et al. 2015).

Rio

In Rio 2016, Mark Stuart had been closely involved in a number of activities, including selecting 300 medicines for the formulary, advising on the design of the premises, establishing a governance framework for the pharmacy service and providing training to pharmacists and other healthcare professionals on drugs in sport. He had visited Rio in 2015 during the test events to advise on the safe management of drugs at the competition venues for rowing and at beach volleyball in a stadium built on Copacabana Beach.

During the Olympic Games in August 2016, he was responsible for overseeing the governance aspects of the pharmacy services on behalf of the IOC Medical Commission Games Group. He had also monitor patterns of medicines usage by athletes and spectators to assist public health surveillance.

Additionally, he had inspected doping control stations at Olympic venues to ensure that the operations are being run in accordance to the World Anti-Doping Agency regulations, and support athletes undergoing the IOC Therapeutic Use Exemption process if they require banned drugs for legitimate therapeutic use (Stuart M, 2016).

Slovenia

Slovenia is also one of the countries that supports sports pharmacy. Slovenia has a website in the related area which is called SLOADO. Their aim is to create a generation accompanying athletes and achieve their goals without the use of prohibited substances and methods. SLOADO committed to ensuring the conditions for fair play and doping-free sports and to support effective education and information. The guiding principle of the educational program, and the information is to protect the spirit of sports from doping and establishing an environment that promotes and enhances sports without the doping among athletes who want to compete free of banned substances.

According to these examples, commission for Olympic Games in Turkey and North Cyprus can be created and sports pharmacists should be the part of the team comprising athletes' doctors, coach, physiotherapist etc...

Inclusion of sports pharmacists in the team would have the following advantages:

- Increase in the trust and knowledge of athletes related with anti-doping and Prohibited List
- To engage with the athletes to understand their needs
- Athletes can have face-to-face conversation at the hospital, pharmacy or drug store across Turkey and North Cyprus.

- Since the certification is publicly recognised, the quality and standard can be sustained and consistency in information can be managed.

Doping-Antidoping

What is doping and doping substances?

Doping is known to be the serious issue for athletes. This makes it important for pharmacists to have further interaction with the athletes to ensure their drug safety. Education is considered to be one of the crucial roles of sports pharmacy and these pharmacists are specialized in the usage of the drug by the athletes. We investigated the interests and comprehension of the students of pharmacy in terms of drug usage, doping, and supplement usage by using various questionnaire. This investigation was done to know students' understanding of sports pharmacy as part of their higher educational program. The investigation resulted in a negative attitude of the students towards doping and drug usage by the athletes. However, out of all the students, only sixteen percent of them attended the lectures. In addition, thirty percent of the students did know that few drugs might contain over-the-counter drugs. Whereas about seventy percent of the students had a positive image and interest. Only one third of the respondents thought the supplement as food and they attained their information from unreliable media. More education on such issue would enlighten students about sports pharmacy and make their scope broader for further studies and research.

Doping applies to athletes in all forms, regardless of the athlete's age, or the level of their play and it is also a social problem mainly among young generations in most of the countries.

The reasons that doping is prohibited are;

- 1) The value of the posts is taken away,
- 2) The fundamentals of sports spirit and principles is harmed,
- 3) It causes harm to your health, and
- 4) Source of drugs may cause abuse which is a harmful effect for people.

The public along with the athletes needs to have general knowledge about doping and its effects. However, due to a limitation in information about doping, such a knowledge of the public is limited. It is necessary for pharmacists who are specialists in drug usage and have many opportunities to administer drugs to the general public to participate in anti-doping activities in the role of "sports pharmacists."

There are two variations of doping: Intentional and unintentional doping which is done by the athlete's due to lack of knowledge regarding this matter. Doping substances are classified into three categories: Permanently prohibited ones which include anabolic androgenic steroids or peptide hormones, growth factors. Another one comprises substances prohibited for the

competition, like optical isomers or glucocorticosteroids and the last category includes substances, such as alcohol or beta-blockers that are banned in a specific sports. Since ephedrine and pseudoephedrine, which are components of Ma Huang, are banned in competition and are often compounded in combination cold remedies, athletes must take extra precaution regarding their usage. However, few violations of doping occur due to ephedrine or pseudoephedrine, since the athletes do not have entire knowledge of doping violation. Although all sportsmen and athletes are required to understand and recognize World Anti-Doping Code (WADC), it is tough to do so. Hence, it become the responsibility of the sport's pharmacist to help these professionals regarding the issue (Saito et al., 2013).

Substances or drug related doping are generally grouped under 3 titles:

1. Drugs for blood and blood circulation and cardiac system
2. Drugs for central nervous system (Stimulant type drugs)
3. Drugs affecting protein and cell metabolism

First two group drugs mostly show sudden and short effect but they are dangerous.

World Anti Doping Agency

The World Anti-Doping Agency (WADA) was founded in 1999, in Switzerland to promote, coordinate and, monitor drug usage in sports. The organization was created by the International Olympic Committee (IOC) in Canada. The committee has been adopted by more than 600 Sports organizations throughout the world. WADA is funded by various national governments and the IOC. The main activities of the agency include scientific research, education, development of anti-doping capacities, and monitoring the World Anti-Doping codes. It is also enforced by the UNESCO International Convention against Doping in Sports. Prohibited drug list is established each year by WADA.

Sports supplements that are used today

Use of performance-enhancing supplements occurs at all levels of sports, from recreational athletes to professional athletes. Although some supplements do increase athletic performance, many have no proven benefits and have side effects.

Nutritional supplements are categorized into the following categories:

I. Apparently Effective.

Ergogenic supplements which are categorized in this category;

- 1) Buffer agents
- 2) Creatine
- 3) Caffeine
- 4) Nitric Oxide.

- II. Possibly Effective.
- III. Too Early To Tell.
- IV. Apparently Ineffective.

Given the widespread use of performance enhancing supplements, physicians, and dietitians should be prepared to counsel athletes about their effectiveness, safety and legality. Supplements have been divided into several sub-groups such as those claimed to increase endurance performance, strength/size adaptations or boost general health. There is however considerable evidence behind the effectiveness of caffeine, creatine, nitrates, beta alanine, antioxidants and vitamin and therefore these have been given special consideration.

Energy drink usage by athletes

Energy drink is a type of beverage that contains stimulant drugs, usually including caffeine, which is marketed as providing mental and physical stimulation. Energy drinks are widely used today. Energy drinks has become an indispensable drink for those who are particularly busy with adrenaline buffs and sporting activities. Energy drinks contain caffeine, taurine, amino acids, glucuronolactone, sugar or other sweeteners and herbal extracts. Also, they contain inositol, ginseng, vitamin complexes, guarana, carnitine, etc. in different proportions. Some of the energy drinks produced today include poppy seed extract. Taurine is an amino acid. In times of stress and intense physical activity, the body may suffer taurine loss. Like taurine, caffeine and glucuronolactone also give energy to the body. However, continuous use of these substances has harmful effects on the body. In energy drinks, there are substances that are mixed with blood quickly. The stimulant effect of these substances in our bodies occurs in a short time and gives an energy to our body. However, this benefit can be transformed into a permanent wound in the future.

Energy Drink Contents

Caffeine; has a moderately stimulating effect on the central nervous system, depending on the amount consumed. When taken at 40 mg, it usually improves the mood, causing energy, alertness and increased ability to concentrate (Harland 2000). Caffeine intake causes an acute increase in heart rate and blood pressure (Tofler 2001). The most important effect of caffeine on the gastrointestinal tract is that it increases the secretion of acid, leading to symptoms such as gastritis and reflux (IFICF 2008). Caffeine decreases insulin sensitivity and increases the risk of type 2 Diabetes Mellitus (Lee 2005).

Taurine; is one of amino acids containing thiol. In a normal diet, the amount of taurine is 40-400 mg/day. Taurine is found in the central nervous system at different densities in both neurons and glial cells. It is the free amino acid that is mostly found in the skeletal and heart

muscle cell (Kendler 1989). Taurine decreases the anxiety by increasing gamma amino butyric acid level. It also increases the level of dopamine so has a positive effect on locomotor activity (Eppler 1999).

Glucuronolactone; is a product of glucose metabolism that is synthesized in the liver. Glucuronolactone which is found in energy drinks is synthetic. There is no scientific evidence that glucuronolactone has a detoxifying effect, but there is no indication that it may have harmful effects as well.

Inositol; enhances the sensitivity of nerve cells to serotonin and the signal level in the brain of serotonin. Low inositol levels associate with depression, anxiety or panic attacks. 200 mg daily is sufficient for the body. High dose caffeine use (> 500 mg/day) reduces the inositol level in the body (Wehr 1990).

Guarana; is the seed of the '*Paullinia cupana*' plant that grows in South America. It is the richest source of caffeine in the world. Apart from caffeine, it contains theobromine, theophylline and tannin. Clinical trials have shown that theophylline stimulates the heart and central nervous system, increases attention and relieves fatigue. It also has a strong diuretic activity and is useful in the treatment of asthma as it reduces bronchospasm (Pizza 1999).

Ginseng; is derived from the roots of *Panax ginseng* and *Panax quinquefolius* plant. It increases energy, libido, body resistance and memory. The daily dose is 300-400 mg of root extract (Attele 1999).

B vitamins and glucose; are water soluble. One liter of Red Bull contains 150 mg of B vitamins, any excess of which could be readily excreted by a normally functioning renal system. Upon ingestion, glucose is either utilized as an energy substrate or stored in the liver and muscles. The ingestion of 108g of carbohydrate (4 cans of Red Bull) should not represent a problem for the kidneys. The exception is the diabetic population for whom such an amount of glucose could cause glycosuria (presence of glucose in urine) and the accompanying excessive water loss into the urine with resultant dehydration (Lewis 2013).

Diuretic effect of the most common energy drink ingredients are;

B vitamins and glucose

Glucuronolactone

Taurine

Caffeine

Side Effect of Energy Drinks

Several studies and several reports from international societies have described the possible negative effects that the habitual consumption of energy drinks may have on health. To date

there is little information on the adverse effects that acute ingestion of energy drinks may have on the physical performance and perceived fatigue of athletes (Mora-Rodriguez and Pallarés 2014).

Using surveys to evaluate the adverse effects of energy drinks found that 120mL of the marketed Redline Xtreme energy drink (~2.0mg/kg of caffeine) considerably improved the participants' subjective feelings of energy and focus, while no differences were detected for the feelings of fatigue and alertness. These data are dependent with the findings of who found that recreationally active subjects consuming a commercial energy drink (caffeine dose not reported) felt greater focus and energy as well as less fatigue (compared to a placebo treatment) before and during a time-to-exhaustion test. These positive effects disappeared immediately after exercise. Similarly, the mood state scores for vigor were significantly greater and fatigue scores significantly lower 60min after the ingestion of a noncommercial, self-prepared, sugar-free energydrink(5mg/kgofcaffeine) compared to a placebo drink.

In sports events lasting longer than half a day, the negative side effects generated by the ingestion of a sufficient amount of energy drink to ensure caffeine doses higher than 6mg/kg in the mornings, and 3mg/kg in the afternoons, could neutralize the ergogenic effects of caffeine and result in decreased physical performance (Lewis 2013).

Risk groups for energy drinks;

- ✓ Patient who has cardiovascular disorders
- ✓ Pregnant woman
- ✓ Who are making nutritional diet
- ✓ Children
- ✓ Alcohol users
- ✓ And people who are interested in sports or athletes are in the big risk group.

These people should not use energy drinks because energy drinks are very harmful for these groups and mostly for the athletes.

MATERIALS AND METHODS

In this study, two different surveys were carried out. Survey one was filled out by pharmacy students who are registered to Eastern Mediterranean University. Second survey was filled out by 50 community pharmacists who work in North Cyprus and Turkey. The aim of the second survey was to analyse and evaluate the current attitude of pharmacist related with sports pharmacy in North Cyprus and Turkey. Both surveys are shown in Table-3 ,Table-4.

Table 3: Question of Survey 1.

<p>1. Would you like to include sports pharmacy in your education curriculum? <input type="checkbox"/> Yes <input type="checkbox"/> No If your answer is YES, please answer to second and third question.</p> <p>1. I would like to take sports pharmacy as a; <input type="checkbox"/> Main Course <input type="checkbox"/> Area Elective</p> <p>2. How many hours per week do you want to take the sports pharmacy course? <input type="checkbox"/> 1 hour <input type="checkbox"/> 2 hour <input type="checkbox"/> 3 hour <input type="checkbox"/> 4 hour</p> <p>3. Would you like to do make a career in sports pharmacy? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>4. Would you like to take sports pharmacy as a master's course? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>

Table 4: Question of survey 2

<p>1. Gender <input type="checkbox"/> Female <input type="checkbox"/> Male</p> <p>2. Age <input type="checkbox"/> 22-28 <input type="checkbox"/> 28-34 <input type="checkbox"/> 34-40 <input type="checkbox"/> More than 40</p> <p>4. Have you heard sports pharmacy before? <input type="checkbox"/> Yes <input type="checkbox"/> No If the answer is YES, where and how did you hear? <input type="checkbox"/> Congress <input type="checkbox"/> Web page <input type="checkbox"/> Professional Publications <input type="checkbox"/> Social Media <input type="checkbox"/> Others</p> <p>5. What is your level of knowledge about athletic products? <input type="checkbox"/> Very good <input type="checkbox"/> Good <input type="checkbox"/> Medium <input type="checkbox"/> Less</p> <p>6. Do you think athlete's products are healthy? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I am not sure</p> <p>7. Do you have any sources about the content and activity of athletes' products? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes but insufficient</p> <p>8. Do your resources support the counseling services you offer? <input type="checkbox"/> It supports more. <input type="checkbox"/> Supported enough. <input type="checkbox"/> Partially supported. <input type="checkbox"/> It does not support in any way and it is insufficient. <input type="checkbox"/> Other (Please specify).....</p> <p>9. From whom and where do you get help for information on athletes' products? <input type="checkbox"/> Doctor <input type="checkbox"/> Nutritionist <input type="checkbox"/> Coach <input type="checkbox"/> Internet <input type="checkbox"/> Magazines and books <input type="checkbox"/> Television <input type="checkbox"/> Other (Please specify).....</p> <p>10. Which of the following would you prefer to get more up-to-date and more qualified information about athletes' products? <input type="checkbox"/> From the web presentations of instructors <input type="checkbox"/> From Congress <input type="checkbox"/> From TEB trainings <input type="checkbox"/> Professional training programs <input type="checkbox"/> Other (Please specify).....</p> <p>11. Mark the following proposals as true or false.</p> <p>● Protein powders are suitable for every athlete. True () False ()</p> <p>● Excessive consumption of amino acid containing supplement products causes acute gastrointestinal system disorders such as severe stomach aches and diarrhea. True () False ()</p> <p>● Long term use of amino acids can lead to liver and kidney problems. True () False ()</p> <p>● Athletes can use any kind of medication. True () False ()</p> <p>● Analgesics and similar medicines have no effect on nutritional benefits. True () False ()</p> <p>● It is important for health to know the harmful effects of additives in energy drinks to health. True () False ()</p> <p>● Amphetamine is not a doping agent. True () False ()</p>	<p>3. How long have you been pharmacist? <input type="checkbox"/> 1-4 year <input type="checkbox"/> 4-8 year <input type="checkbox"/> 8-12 year <input type="checkbox"/> More than 12 year</p>
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- Neurological and psychostimulant drugs (eg Concerta, Nootropil, Ritaline ... etc) have no effect on the athletic doping analysis.

True () False ()

- It is important for athletes to know whether food supplements interact with over-the-counter medicines.

True () False ()

- Adolescent athletes should not use any supplement.

True () False ()

- Some OTC drugs may show doping effect.

True () False ()

- Herbal products never show doping effect.

True () False ()

12. Do you have information at the basic level about definitions such as ergogenic product / substance method?

() Yes () No

13. Do you sell supplement support products?

() Yes () No

Protein bars	YES	NO
Whey protein	YES	NO

14. If your answer is yes, which supplements do you sell?

L-arginine	YES	NO
L-carnitine	YES	NO
L-glutamine	YES	NO
CLA	YES	NO
BCAA	YES	NO
Creatin	YES	NO

15. Do you support non-prescription drug anabolizine medication?

() Yes () No

16. Does the consumer choose their own athletic products?

() Yes () No

17. Do you provide counseling service for sportsman's products?

() Yes () No

18. Did you use your pharmacist identity to indicate that you did not recommend the athlete product and that it was not appropriate to use it?

() Yes () No

19. How effective is the advanced consulting service provided by the customer for the sale of athletes' products?

() Very efficient () Effective

() Partially effective () Ineffective

20. Do you keep records about the products you sell?

() Yes () No

21. Would you like to have a registration system?

() Yes () No

22. Mark drugs with doping effect on table below

	YES	NO
Xanax(Alprazolam)		
Ventolin(salbutamol)		
Diamorfin HCl (diamorfin)		
Beloc Zok(metoprolol)		
Tamoxifen(tamoxifen)		
Aldactone(spironolactone)		

Source for the 22nd question: <https://play.google.com/store/apps/details?id=tr.gov.saglik.sporcusagligi>

RESULTS

Results of Survey 1 for students

The results of questions for survey 1 were shown in Figure1-6.

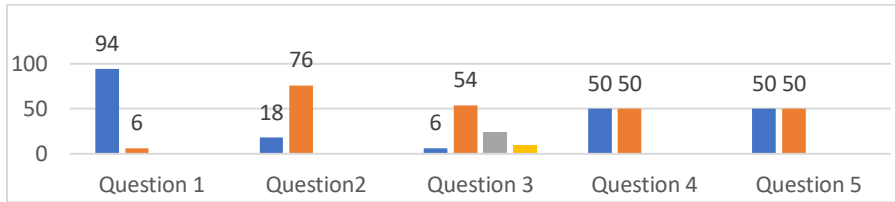


Figure 1: All result of the student survey questions (%).

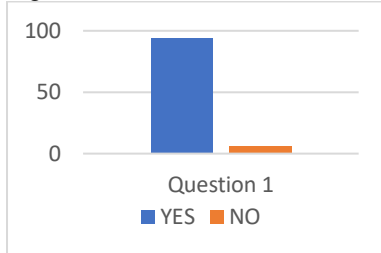


Figure 2: Answers for question 1 (%).

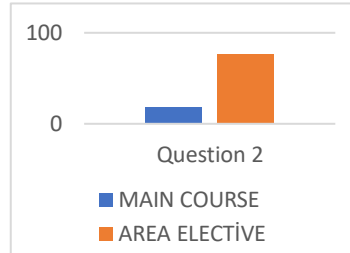


Figure 3: Answers for question 2 (%).

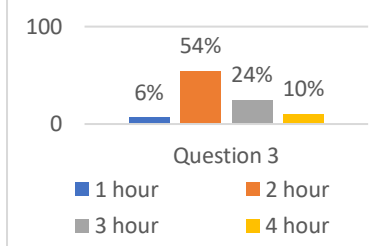


Figure 4: Answers for question 3.

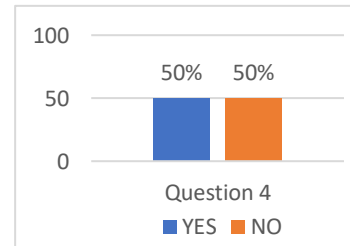


Figure 5: Answers for question 4.

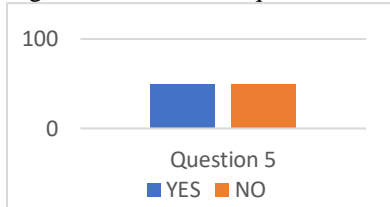


Figure 6: Answers for question 5 (%).

Results of Survey 2

Results of the questions of survey 2 were shown in figure7-10.

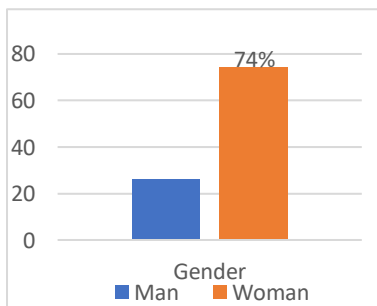


Figure 7: Gender of pharmacists.

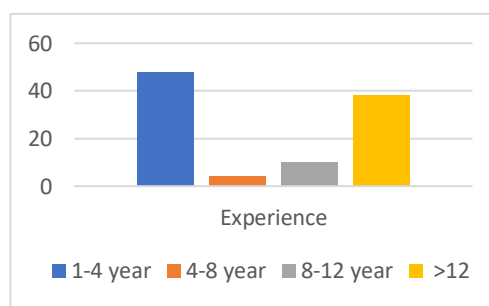


Figure 8: Experience of pharmacists (%).

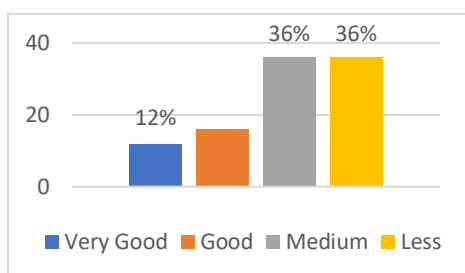


Figure 9: Knowledge about sports pharmacy.

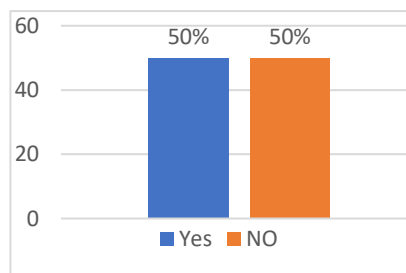


Figure 10: Knowledge about athletic products.

DISCUSSION and CONCLUSION

94% of the pharmacy students participated in the survey responded positively to the participation of sports pharmacy in the education curriculum. Although sports pharmacy is a new field, the number of students considering a career in this field is 50%. This is a relatively meaningful outcome for an area that is very new to our country yet and where even official application areas do not become evident.

On the other hand, community pharmacy is the most preferred application area of the pharmacy profession in current conditions. In this sense, 50% is even more meaningful given the presence of a significant number of career plans on community pharmacy. As a result of this determination, it becomes even more meaningful that the sports pharmacy course is chosen as an elective course not as a main course. Sports pharmacy counseling can be provided by seminars and vocational training in pharmacies. The rate of preference of sports pharmacy given as master's degree program was determined as 50% by Cypriot and Turkish pharmacy students. Like the other countries such as Japan, Azerbaijan and others, sports pharmacy can be planned as a career in Turkey and North Cyprus. As a result, pharmacy students were found to be interested in sports pharmacy and sports pharmacy should be regarded as an area that can be integrated into existing pharmacy applications with a 2-3-hour training program and it is of interest.

25 pharmacists had no idea about sports pharmacy but other 25 pharmacists had heard sports pharmacy before via social media, seminars and other web pages. 12% of pharmacists who are interested in athletic products in relation to athletes' health are very well informed about their athletic products. 36% of the respondents pointed out the importance of sports pharmacy in that they had very little information on athletic health products and 36% state that information levels were moderate. 48% of participants were found to have 1-4 years of experience, 4% have 4-8 years of experience, 10% have 8-12 years of experience and 38% have more than 12 years of professional experience. We observed that the 56% of pharmacists over 34 years who had

professional experience over 8 years do not have any idea about the subject at the moment. The fact that the younger generation is more relevant and knowledgeable about the subject can be evaluated in terms of the professional future. The pharmacy profession is composed of many components. The professional responsibilities of pharmacists are quite extensive and increasing day by day. The process becomes even more difficult when many legal responsibilities and practices that need to be followed are added. Our pharmacists at the beginning of their professional career can still be interested in new titles without intensifying their involvement in this spiral.

In the 25-person group, who had ideas and knowledge about sports pharmacy, congresses, professional publications, internet and social media were reported to be influential by 40%, 24% and 68% of students, respectively. The effectiveness of the social media has been emphasized once more with these survey findings. 24% of the pharmacists rated the athletes' products as unhealthy. Paracelsus told that "All things are poison, and nothing is without poison, the dosage alone makes it so a thing is not a poison." In parallel to the saying of Paracelsus, we can tell that sports supplements are not unhealthy. The important thing is dose and usage way as Paracelsus said. 38% of pharmacists were not sure about the subject. It is necessary to treat athletes' products in a very broad scope. The judgement should be done by evaluating negative or positive effects on health by dividing it into main groups as nutritional supplement, ergogenic, performance enhancing, doping effective substances, prohibited substances or methods.

42% of the participants did not consider the available resources to be inadequate. We do not have a sufficient number of domestic and foreign sources about sports sciences and pharmacy applications. It is absolutely necessary to update the existing sources with updated information. When the existing resources were questioned about the extent to which our pharmacists support their counseling services, the result also supports the previous inquiry. 50% are partially supported where as 22% did not support it at all. A total of 72% of students pointed out that the group resource deficiency or insufficiency was too high. In Japan there is a certificate program for pharmacist and we can apply this education program in our country and our pharmacists can give counseling to their customers who are interested with sport.

The study population was questioned in order to obtain information about the athlete's products. We have found that a total of 42 applications heard about it from physicians, dietitians and coaches. In addition, web sources, TV, books and magazines were identified as the vehicles of awareness by 43 respondents. It should not be forgotten that many different methods can be

applied to reach the information, but the important thing is that the accuracy of the information obtained and the reliability are questioned.

Occupational training, congress information sharing and training programs within the academy of TEB. Information preferred by our participants has not been updated. Significantly, in view of the pharmacists online training required. New generation education practices and classical education processes blended.

Ergogenic products covers ingredients that have suitable usage and proper planning group for performance, Professional and high-level athletes. This definition has to be embraced and included to our consulting field. Thirty pharmacists reported that they were selling their ergogenic substance / product in their pharmacy while 20 participants reported that they did not sell these products. However, in the previous questionnaire, 30 participants reported that they had no knowledge of the ergogenic product / substance. In this case, we can tell that such products are generally available on demand in pharmacies. In terms of athletes' health, an inquiry was made about the sale of prescription drugs from the pharmacy of anabolizan products, which is a very important subject title. 6 participants indicated that they approve this operation. When scientific approach to the subject is required, we suggest that anabolic products should be used under the expert control and absolutely appropriate dose terms in terms of development and performance balancing of high level athletes and that optimal planning should be done in terms of toxicity and side effect. The preference for non-prescription delivery of these group products with a high impact capacity and high likelihood of side effects should never be a commercial concern. This current state is a engrossing for us pharmacists. Pharmacists like us have to be very active about the subject that concerns human life and usage of drugs without control. This subject has to be controlled properly. The correct application that pharmacists are not only chosen for product supply by making product identification with information on the internet or stuffing with the remote is the right method of application when the pharmacist has more say in this area as necessary.

According to the survey results, most of the pharmacists do not know that the doping effect of commonly sold drugs such as aldactone, beloc zok, ventolin and tamoxifen. In this regard, we can make our pharmacists aware about doping by making training courses. Because pharmacists are the first person who communicate patient much more than other health service worker by giving consultancy service we can make patient and athletes aware about doping.

Awareness is lower than in other countries, but the awareness of pharmacists is not bad, even though sport pharmacy is a newly emerging issue in our country. It is a fact that the awareness

of our pharmacists and the training programs to be done will increase. This awareness can be further increased by establishing a website like Japan, Slovenia and other countries.

CONCLUSION

Sports pharmacy is a new but very important area for pharmacists and athletes. By looking at the countries who have sports pharmacist in their country we can see that their athletes more successful than our athletes. Athletes do not know all the doping substances but they have pharmacist who know these substances and athletes can ask to their sport pharmacist everything about their drugs. By this way they reduce to use of unconscious doping substances. Also with educational program for athletes they learn the the harmful effect of the materials. Sport is the one way to introduce country to other countries. If our athletes do doping that means our country doesn't known with good sentences. But with sports pharmacy area we can educate our athletes and we can make seminars for athletes about clean sports.

This study is the first awareness work done in the field. This study has shown that;

- Pharmacy students and pharmacists are interested about this area.
- By using the methods and application which is used in other countries we can start sport pharmacy in our country.
- We can apply the similarity of the practice in Japan to cultivate conscious athletes in our country.
- We must increase awareness by organizing trainings and seminars for pharmacists.
- We must train our coaches to raise awareness in sports colleges.
- We should give training to the students about the athletic products by cooperating with the pharmacy faculties.
- We can establish sports pharmacy in cooperation with the Ministry of Sports, the Ministry of Health and Turkish Pharmacists Association.

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