

RESEARCH ON ANTI- DOPING PRACTICES IN EASTERN EUROPE



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EXECUTIVE SUMMARY

The Be Clean, Be Fit research project provides an in-depth analysis of doping practices among recreational athletes in four Southeast European countries: Serbia, Bulgaria, Greece, and North Macedonia. This comparative study, conducted through a structured and anonymized survey with 400 gym users (100 per country), seeks to understand the prevalence of doping substance use, the motivations behind such behavior, the level of awareness regarding health risks and legal implications, and the broader cultural and regulatory landscape affecting recreational sport.

The research revealed significant discrepancies in doping prevalence across the region. Greece emerged as a country of particular concern, with nearly one-third of surveyed recreational athletes admitting past use of doping substances, and over 20 percent reporting current use. These figures stand in stark contrast to the other countries, where reported current use remained under 3 percent, although indications of underreporting or lack of trust in institutional mechanisms may be present, especially in Serbia and Bulgaria. Anabolic steroids were identified as the most commonly used substances across all countries, followed by growth hormones, stimulants, and diuretics. The predominant motivations for doping among recreational athletes centered on increasing muscle mass, enhancing physical appearance, boosting fitness levels, and, to a lesser extent, facilitating weight loss.

In Serbia, the anti-doping framework is highly developed, with the Anti-Doping Agency of Serbia (ADAS) recognized internationally for its compliance with the World Anti-Doping Code. Serbia is one of the few countries in the region where recreational athletes are formally included under anti-doping regulations, and where testing, although not systematic, has been carried out in gym settings. A strong institutional collaboration exists between ADAS and the Serbian Association for Recreation and Fitness (SARF), which is also responsible for licensing fitness professionals and clubs.

This collaboration has resulted in the implementation of public awareness campaigns, most notably the "Fitness YES, Doping NO" initiative, targeting the fitness community through social media and event-based outreach.

Bulgaria, by contrast, has a well-structured anti-doping system for professional athletes, managed by the national Anti-Doping Centre (ADC). However, the country lacks regulatory oversight and structured educational programs aimed at the recreational sector. While knowledge of doping substances is relatively high among gym-goers, past use is also significantly higher than in Serbia and North Macedonia, and the use of diuretics appears to be particularly prevalent. Importantly, there are no ongoing campaigns or systematic efforts to educate the recreational population on the risks of doping or to deter its use, despite the widespread availability of substances via gyms, the black market, and online platforms.

Greece presents the most complex case. Despite a strong legal alignment with the World Anti-Doping Code and the presence of the Hellenic Anti-Doping Organization (HADA), the recreational sport sector remains largely unregulated. The findings suggest a normalization of doping behaviors among certain demographics, particularly those influenced by aesthetic culture and performance-driven motivations. Trainers and peer groups play a notable role in the dissemination and recommendation of substances, and there is a striking contradiction between the high levels of reported doping use and the strong public support for anti-doping campaigns. Most participants in Greece recognize doping as illegal, yet few consider it immoral, and an overwhelming majority are unwilling to report its use to authorities.

In North Macedonia, the situation is evolving. The country recently adopted a comprehensive Law on the Fight Against Doping in Sport, establishing an independent National Anti-Doping Organization (NADO MKD) aligned with international standards. While this legal framework formally includes recreational athletes, implementation is still in its early stages. There is no nationwide educational or awareness campaign targeting gyms or amateur sports clubs.

Nonetheless, the inclusion of fitness and recreational athletes under the legal definition of “sport” marks a critical step toward a more inclusive anti-doping strategy. Social media and online marketing were identified as key channels through which supplements and potentially harmful substances are promoted, often by influencers or fitness personalities, particularly among younger gym-goers.

Across all four countries, the research reveals a gap between theoretical knowledge and practical behavior. While the majority of respondents claimed to know what constitutes doping, significant portions were unaware of the health risks of substances like diuretics. Moreover, while internet platforms and television were the most cited sources of information on doping, the role of trainers, gym communities, and informal peer networks remains influential. A common finding across all countries was the general reluctance to report doping, even among those who support anti-doping initiatives, highlighting a pervasive culture of silence or normalization.

The Be Clean, Be Fit project underscores the urgent need for comprehensive, evidence-based, and inclusive anti-doping strategies that extend beyond elite sport and into the rapidly growing world of recreational fitness. National anti-doping agencies, health ministries, and fitness associations must work collaboratively to expand prevention efforts, develop targeted education campaigns, regulate supplement markets, and build trust in institutional mechanisms. The findings offer not only a diagnostic overview of current practices but also a foundation upon which policy and practice can evolve to promote clean sport and safeguard the health and integrity of all athletes, regardless of their level of competition.

INTRODUCTION

Across Southeast Europe, sport plays a vital role in shaping healthier lives, stronger communities, and more inclusive societies. From local gyms and amateur competitions to informal fitness groups, recreational sport has become a defining part of everyday life for thousands of people in our region. Yet, alongside its many benefits, a growing and often overlooked challenge is emerging — the spread of doping practices among non-professional athletes.

The Be Clean, Be Fit project was initiated from a shared regional concern: that the use of performance- and image-enhancing substances is no longer confined to elite sport. Instead, these practices are quietly taking root in fitness centers, among recreational athletes, and even among young people, influenced by body image pressures, misinformation, and unregulated supplement markets. As organizations and individuals committed to the integrity and health of sport, we felt a responsibility to better understand this trend and to act.

This research — carried out in Serbia, Bulgaria, Greece, and North Macedonia — is one of the first joint efforts to systematically explore doping behaviors in the recreational sector across national borders. It captures not only how widespread these practices are, but also why they occur, who influences them, and how different policy and education systems are responding. The findings are as urgent as they are revealing: high levels of past and current doping use in some countries, lack of awareness of health risks in others, and a common gap in tailored educational campaigns for amateur athletes.

What unites us in the region is both the challenge and the opportunity. The challenge lies in bridging the divide between professional sport regulation and the largely unregulated world of recreational fitness. The opportunity lies in working together — as practitioners, educators, and institutions — to raise awareness, build capacity, and promote a culture of clean sport from the grassroots up. This means not only aligning legal frameworks, but also creating positive alternatives, trustworthy sources of information, and supportive communities where health and fairness are prioritised.

Be Clean, Be Fit is more than a project. It is a regional wake-up call — a reminder that the values of integrity, respect, and well-being must be protected at all levels of sport. It is also a model of cooperation, showing how shared challenges can be addressed more effectively when we work together. My hope is that this research will serve as a catalyst for deeper collaboration, policy innovation, and long-term cultural change across Southeast Europe.

Magdalena Spasovska

Founder of North Macedonia Active

TABLE OF CONTENTS

SERBIA	9
Recreative sport in Serbia	10
BULGARIA	17
Recreative sport in Bulgaria	18
GREECE	21
Recreative sport in Greece	22
NORTH MACEDONIA	24
Recreative sport in North Macedonia	25
Methodology for Research on Doping Substances Usage Among Recreational Athletes in Gyms Across Serbia, Bulgaria, Greece, and North Macedonia	29
RESULTS	36
1.Serbia	37
2. Bulgaria	44
3. Greece	51
4.North Macedonia	58
Average doping use and knowledge among recreational athletes across four Balkan countries	66
Discussion	73
Participant Profile and Context	73
Doping Knowledge vs. Reported Use	73
The Greek Anomaly: Prevalence and Potential Explanations	74
Substance Choices and Motivations	74
Diuretics: A Specific Concern	75
Sources of Influence and Information	75
Attitudes, Ethics, and Reporting Behaviour	75
Limitations	76
Conclusion and Implications	76
Literature used	77

Research Content per country

Serbia

Bulgaria

Greece

North Macedonia

Serbia

The Republic of Serbia is a signatory to the International Convention against Doping in Sports from 2005. This convention, in addition to being signed, was also ratified by the adoption of the Law on Confirmation of the International Convention against Doping in Sports ("Official Gazette of RS - International Agreements", No. 38/2009).

The Republic of Serbia has fully created the conditions for fulfilling the obligations from this convention, primarily by passing national legislation in the area of the fight against doping in sport, and then by creating and constantly improving the conditions for this fight.

The first law that regulated this area and established the Anti-Doping Agency of the Republic of Serbia (ADAS) was the Law on Prevention of Doping in Sports from 2005. The currently valid Law on the Prevention of Doping in Sports was adopted in 2014, and in 2021, its changes were made in order to harmonize it with the World Anti-Doping Code and international standards that are in effect from January 1, 2021.

The law fully regulates and enables cooperation between national and international organizations in the field of combating doping, regulates the exchange of information and establishes the obligation for all sports subjects in the Republic of Serbia to harmonize their work and rules with the International Convention against Doping in Sports, the World Anti-Doping Code and international standards of the World Anti-Doping Agency.

Accordingly, the Anti-Doping Agency of the Republic of Serbia is recognized by the World Anti-Doping Agency as an organization whose work and rules are fully aligned with the World Anti-Doping Code and International standards.

ADAS is the national anti-doping agency whose role is to preserve clean sport, the integrity of sport and protect the clean athlete. ADAS on the territory of the Republic of Serbia carries out the following activities: doping control of athletes in competition, doping control outside competition, appointment of doping control officers, cooperation with WADA accredited laboratories, results management, education, doping control of horses, administration of the National Registered Test Group, administration of Exemptions for application in therapeutic purposes (TUE), administration of the ADAMS database, cooperation with national and international sports federations, cooperation with the World Anti-Doping Agency (WADA) as well as other activities related to legal regulations regarding the prevention of doping in sports. ADAS independently organized doping controls at over 200 international competitions held in Serbia. In a period of 17 years, ADAS conducted 12,614 doping controls. ADAS doping controllers performed doping controls at the biggest sports competitions such as the Olympic Games in Vancouver, London, Rio de Janeiro, PyeongChang and the first European Olympic Games in Baku. Within the "Peer Education" project, over 10,000 primary and secondary school students in Serbia were educated.

Among others, they participated in the implementation of doping controls at several winter and summer Olympic Games. Within the borders of the Republic of Serbia, the Anti-Doping Agency cooperates with national sports federations, the police, the judiciary and the prosecutor's office, in the field of combating doping. The Law on the Prevention of Doping in Sports recognizes two criminal offenses punishable by prison terms: facilitation of doping and trafficking and production of doping agents. The Anti-Doping Agency also cooperates with the Ministry of Health, the Agency for Medicines and Medical Devices, and the Faculty of Pharmacy. Cooperation between other state bodies and the Anti-Doping Agency takes place directly, but also through the existence of the National Council for the Prevention of Negative Phenomena in Sports and the Council for Sports.

Laws and regulations:

- Law on ratification of international convention against doping in sport
- Law on Prevention of Doping in Sports
- 2021 World Anti-Doping Code
- WADA Prohibited list
- WADA International standards



Recreative sport in Serbia

The Serbian Association for Recreation and Fitness (SARF) serves as the official national umbrella organization for the fitness sector in Serbia. It functions as a central coordinating body that brings together all key actors within the fitness industry, including fitness clubs, professional trainers and instructors, manufacturers and distributors of exercise equipment and supplements, as well as academic institutions involved in sports and physical education. Through its integrative role, the Association facilitates collaboration and development across the sector, ensuring coherence in standards, education, and professional practice.

SARF is formally recognized by the Ministry of Sports of the Republic of Serbia, and its status is confirmed within the Rules on National Branch Sports Federations in the fields of recreational fitness, aerobics, and recreational sports. This recognition grants the Association a significant role in shaping the national policy and professional landscape in recreational sport and fitness.

Currently, the Serbian Association for Recreation and Fitness comprises close to 400 member clubs from various regions across the country, making it one of the most representative bodies in the sector. In addition to its institutional and regulatory functions, the Association is also active in publishing. Since 2010, it has produced *Fitness Management International*, a specialized licensed magazine dedicated to fitness industry trends, professional development, and policy updates. Through this publication, SARF contributes to the continuous education of fitness professionals and the dissemination of best practices in recreational and health-oriented sport.

Work Permits – Licences

According to the Law on Sports, sports clubs and employees in the field of sport and recreation must have a license issued by the competent national branch association. For the recreational fitness, aerobic (and other group of aerobic program) and recreational sports work permits are issued by the Serbian Association for Recreation and Fitness.

Education & Professional Training

SARF is implementing an attractive and modern program of professional training of fitness trainers in accordance with the Law on Sports of the Republic of Serbia and the Rules on the nomenclature of sports professions and vocations. Successful completion of these programs involves obtaining appropriate certificate which is fully legally valid and enables its holder to work in the field of fitness and recreation.

The Serbian Recreational Association organizes a wide range of activities aimed at promoting fitness, health, and active lifestyles. Key events include the prestigious European Fitness Congress and the dynamic Fit Spot initiative, which offers seminars, workshops, and races to engage the community in healthy living. The association fosters international cooperation through collaborative projects and celebrates excellence in the field with its Annual Awards. The Fitness & Health Expo (BELFIS) serves as a flagship event, showcasing the latest trends and innovations in the fitness and wellness industry.

Recreative sport in Serbia

Doping substances in recreational sports often overlap with those found in professional sports, but their use may be driven by different motivations such as aesthetic goals, enhanced performance. Below are common categories of doping substances present in recreational sports in Serbia:

1. Anabolic Agents
2. Hormones and Metabolic modulators
3. Stimulants
4. Narcotics
5. Diuretics and Masking Agents
6. Cannabinoids
7. Peptide Hormones and Growth Factors
8. Recreational Drugs

Doping substances in Serbia are available online, in gyms and Fitness centres, pharmacies, blak market

- ***Doping substances are available online.*** Websites, social media platforms, and online forums can facilitate the purchase of performance-enhancing drugs (PEDs), including anabolic steroids, stimulants, and peptides.
- ***Risks:*** Online purchases carry significant risks due to the potential for counterfeit, contaminated, or mislabeled products. Law enforcement occasionally targets illegal sales, but the online market remains difficult to regulate.

Gyms and Fitness Centers

- ***Gyms as a source of doping substances:*** Some gyms and fitness centers, particularly those with a strong bodybuilding culture, may facilitate access to illegal substances. These substances are often sold informally by trainers or other gym members.
- ***Risks:*** There is a lack of quality control, and users often receive inappropriate or dangerous dosage advice from unqualified individuals.

Pharmacies and Prescription Regulations

- ***Strict Regulations:*** In Serbia, many substances classified as doping agents are regulated under prescription-only rules. These include anabolic steroids, growth hormones, and strong stimulants.
- ***Prescription Requirements:*** Doctors can prescribe these substances for legitimate medical reasons, such as hormonal deficiencies or specific health conditions. However, prescriptions for performance enhancement are not legally permissible.
- ***Abuse of Prescriptions:*** There are concerns about "prescription shopping," where individuals attempt to obtain multiple prescriptions from different doctors. However, the Serbian healthcare system has mechanisms to track prescriptions and reduce abuse.

Recreative sport in Serbia

Black Market and Illegal Sources

- **Underground Labs:** There is a presence of underground laboratories that manufacture and distribute PEDs illegally.
- **The distribution in gyms** is usually part of a black market network, making it illegal and unregulated.
- **Smuggling:** Doping substances are also smuggled into Serbia from neighboring countries where controls might be less stringent.

Legal and Regulatory Environment

- **Law on the Prevention of Doping in Sports:** Serbia has specific anti-doping legislation that criminalizes the unauthorized distribution and use of doping substances, particularly in sports contexts.
- **Criminal Penalties:** Those caught distributing or administering doping substances without authorization can face fines and imprisonment.

In Serbia, the legal framework addressing doping in sport extends explicitly to recreational athletes through two key laws: the Law on the Prevention of Doping in Sports and the Law on Sports (Zakon o sportu).

The Law on the Prevention of Doping in Sports contains clearly defined criminal provisions that target specific doping-related offenses. Articles 38 and 39 of this law outline two felonies: the first concerns the act of enabling the use of doping substances, while the second addresses the unauthorized production and circulation of such substances. These provisions not only aim to penalize individual offenders but also serve as a legal mechanism to disrupt broader distribution networks and supply chains. By aligning its legislation with international anti-doping norms, Serbia reinforces its commitment to preserving the integrity of sport and protecting athletes at all levels of participation.

Complementing this is the Law on Sports, which incorporates anti-doping provisions that apply to all athletes, including recreational participants, provided they are involved in organized sporting competitions. This law underscores the necessity of compliance with global anti-doping standards, particularly those developed by the World Anti-Doping Agency (WADA). In doing so, it establishes a normative foundation that integrates Serbia's national sport governance with international expectations, ensuring that anti-doping principles are upheld not only in professional sport but also in the increasingly active and diverse recreational sport sector.

Recreational Athletes and Anti-Doping Testing

- Recreational athletes are not routinely tested for doping unless they participate in events sanctioned by national sports federations or international competitions.
- By the Law on the Prevention of Doping in Sports in Serbia recreational athletes can be tested

Education campaigns about risk of doping in gyms, fitness clubs are applying regularly in Serbia. Prevention programs and cooperation between Serbian Association for Recreation and Fitness and Antidoping agency of Serbia are carried out throughout the years.

Important program of cooperation between our two organization was awareness raising program. Awareness raising programs are primarily aimed to recreational athletes and their support staff in fitness gyms. The purpose of the awareness raising program is to encourage participants to actively participate and exchange opinions or views on the fight against doping through various activities (quiz, informative material, promotional products, etc.). Awareness-raising programs that are implemented at gyms and events for recreational athletes and the general sports public are primarily intended to promote the fight against doping and to familiarize participants with the national anti-doping program.

Serbian Association for Recreation and Fitness participated at Sport fair, Fitness fair, different races and events where we provided participants with educational material such is brochures, leaflets. Information is also provided through the ADAS website, where we provide all key information to recreational athletes and support staff in the field of national and global doping problems and antidoping fight. Social networks (Facebook, Instagram and Twitter) are mainly used to share information with the general sports public, and occasionally for various campaigns.

One part of Awareness raising program was campaign on social networks predominantly Instagram with the name “Fitness YES, Doping NO”. Specifically, recreational athletes educated trough this way of communication about side effect of doping substances, especially anabolic/steroids. Also, information where provided about health risks of supplements that which are used extensively in population of recreational athletes. This campaign was very well implemented and very well done. Content created by us was shared on the Instagram profile of ADAS and Serbian Association for Recreation and Fitness as well as gyms that are members of the Serbian Association for Recreation and Fitness.

On this way we informed recreational athletes about the health consequences of using prohibited substances.

Bering in mind activities and responsibilities of ADAS and Serbian Association for Recreation and Fitness and Law against doping in sport in Serbia we started with performing doping test on recreational athletes in gyms and clubs. It is also one of the ways of deterrence of recreational athletes from the use of prohibited doping substances.

Recreative sport in Serbia

The use of performance-enhancing substances has increasingly spread from elite sports into recreational fitness and amateur athletics, posing health risks and threatening the integrity of fair play. To address this issue, a comprehensive, research-informed approach focused on education, professional collaboration, community engagement, and regulation is essential.

Educational campaigns should clearly communicate the dangers of doping while promoting the benefits of natural performance through proper training and nutrition. These campaigns may include infographics, videos, and other materials, and be supported by workshops for athletes, coaches, and trainers. Such events create space for dialogue on banned substances, safe supplementation, and healthy alternatives. Partnering with trusted fitness influencers can further amplify these messages and normalize clean sport practices.

Fitness professionals have a central role in shaping athlete behavior and should be trained to recognize the signs of doping and suggest safe, legal alternatives. Establishing referral systems within gyms can connect athletes with certified experts in nutrition, sports psychology, and physical conditioning, offering guidance that discourages harmful substance use.

At the community level, peer support groups and athlete-led initiatives can help build a culture of clean sport. By sharing experiences and encouraging positive choices, these networks promote fair play and reinforce healthy values.

Anonymous reporting mechanisms can serve as a safeguard, allowing individuals to report doping-related concerns without fear. These should be coupled with awareness efforts about athletes' rights and responsibilities.

Finally, promoting natural performance methods—through accessible training programs, strength and conditioning routines, and personalized nutrition counseling—provides recreational athletes with safe and sustainable paths to progress. In this way, health, ethics, and athletic achievement remain closely aligned.

The integration of technology and digital platforms adds a powerful dimension to anti-doping strategies in recreational sport. Mobile applications and dedicated websites can offer quick, user-friendly tools for athletes to verify whether a substance is banned or potentially harmful. These platforms should be regularly updated and promoted across fitness communities. In parallel, social media campaigns can play a vital role in disseminating anti-doping messages, raising awareness, and sharing real stories about the physical, emotional, and ethical consequences of doping. These narratives, when authentic and relatable, have the potential to shift attitudes and inspire behavior change, especially among younger and more digitally engaged audiences.

Recreative sport in Serbia

To reinforce these efforts, incentive-based approaches should be introduced. Recognizing and rewarding recreational athletes, trainers, and gyms that consistently promote clean sport can create a positive feedback loop and inspire others to follow. Clean sport certification programs for gyms, trainers, and sports clubs can formalize this commitment, giving credibility and visibility to those who meet clearly defined ethical and health-based criteria.

A long-term, sustainable strategy is crucial for lasting impact. Anti-doping policies and interventions should be continuously reviewed and adapted to reflect emerging trends, challenges, and patterns of substance use in recreational sport. Ongoing research can help refine the approach and ensure relevance across diverse populations and disciplines. Moreover, prevention efforts should not be episodic. Education and outreach programs need to be consistent, embedded in the culture of recreational sport, and supported by institutional backing and resources.



Effective prevention also requires a set of robust measures targeting both the supply and demand sides of doping. Increasing public awareness about the health risks of performance-enhancing substances is essential, as is introducing testing protocols—even on a random basis—for larger recreational competitions. Regulatory efforts must focus on restricting access to unregulated supplements and performance-enhancing drugs, ensuring that consumers are protected from misleading claims and harmful substances. Just as important is the availability of support systems. Athletes dealing with body image issues, performance pressure, or previous substance use should have access to counseling and professional support.

By identifying the substances most commonly used and understanding the motivations behind their use, stakeholders—from fitness professionals and sports organizations to policymakers—can implement targeted, evidence-based interventions. In doing so, they contribute to a recreational sport culture rooted in health, fairness, and long-term personal growth.

Bulgaria

Bulgaria's anti-doping system is designed to fully align with international standards, offering a comprehensive and coordinated approach to the prevention, detection, and control of doping in sport.

The country's regulatory foundation is set by the Regulations on Anti-Doping Activities, which entered into force on 1 January 2021. These regulations are harmonized with the World Anti-Doping Code, the UNESCO International Convention against Doping in Sport, and the Council of Europe's Anti-Doping Convention. They are applicable to all Bulgarian sports organizations, athletes, athlete support personnel, foreign athletes residing or competing in Bulgaria, and any individuals engaged in anti-doping processes. The regulations emphasize key principles such as proportionality in the imposition of sanctions and the safeguarding of human rights.

Bulgaria's institutional framework is anchored by the Anti-Doping Centre (ADC), which functions as the country's National Anti-Doping Organization (NADO). As an independent and specialized public body, the ADC is tasked with implementing anti-doping measures across the national sports system. Its work is guided by the World Anti-Doping Code and related International Standards, and is carried out in the public interest.

The ADC's core responsibilities include:

- **Education and Awareness:** Delivering structured education programs for athletes, coaches, medical personnel, and other stakeholders, focusing on the values of clean sport, the dangers of prohibited substances and methods, and the rights and responsibilities of all involved.
- **Testing and Investigations:** Conducting both in-competition and out-of-competition testing, utilizing targeted approaches based on risk assessment, and investigating potential violations of anti-doping rules.
- **Therapeutic Use Exemptions (TUEs):** Reviewing and authorizing the use of prohibited substances or methods for athletes with legitimate medical needs.
- **Collaboration:** Working closely with domestic and international bodies, including law enforcement, governmental agencies, and international anti-doping organizations, to strengthen cooperation and enhance the overall effectiveness of anti-doping efforts.

This integrated framework demonstrates Bulgaria's commitment to promoting fairness, safeguarding athlete health, and upholding the integrity of sport.

Recreative sport in Bulgaria

The use of performance-enhancing substances in recreational sports in Bulgaria has become a growing public health concern, with a variety of substances being misused to improve appearance, strength, or athletic performance. These substances are often consumed without medical supervision, posing serious health risks and undermining the integrity of sport. Among the most commonly used categories are anabolic agents, peptide hormones, beta-2 agonists, hormone and metabolic modulators, and glucocorticoids.

Anabolic agents, particularly Anabolic Androgenic Steroids (AAS), are among the most frequently misused substances in recreational settings. These synthetic derivatives of testosterone are known for their muscle-building and performance-enhancing properties. Commonly detected compounds include nandrolone, chlorodehydromethyltestosterone, stanozolol, and methandienone. In addition to these, other agents with similar anabolic effects—such as clenbuterol and Selective Androgen Receptor Modulators (SARMs)—have also gained popularity among gym users seeking rapid physical transformation.

Another group of substances includes peptide hormones, growth factors, and related compounds, which are used to stimulate natural processes such as red blood cell production and tissue growth. Erythropoietin (EPO) and (hGH). Gonadotropins, such as human chorionic gonadotropin (hCG), are also misused to stimulate endogenous testosterone production

Beta-2 agonists, such as salbutamol and formoterol, although primarily used for their bronchodilator properties in the treatment of asthma, are also sought after for their potential anabolic effects and fat-burning capabilities.

Additionally, a range of hormone and metabolic modulators is frequently encountered. These include testosterone and its derivatives, such as testosterone isocaproate, as well as aromatase inhibitors and Selective Estrogen Receptor Modulators (SERMs). Metabolic modulators like meldonium—famously implicated in several doping cases in Eastern Europe, including Bulgaria—are used to influence energy metabolism, despite being banned in sport.

Many of these substances are available through prescription in Bulgarian pharmacies; however, a significant number are also accessed illicitly. The black market, particularly within gyms and unregulated supplement shops, remains a major source of doping substances for recreational users. This dual availability—both legal and illicit—complicates efforts to regulate use and protect public health.

Source: National anti-doping documentation and reports from the Bulgarian Anti-Doping Centre (ADC), aligned with the World Anti-Doping Agency (WADA) Prohibited List.

Recreative sport in Bulgaria

Compliance and Enforcement

Bulgaria enforces strict compliance measures to uphold the integrity of its anti-doping program:

- Public funding is withheld from sports organizations and individuals who do not comply with anti-doping regulations and related legal instruments. This policy ensures that only those adhering to clean sport principles receive financial support.
- The ADC oversees the results management process for potential anti-doping rule violations. Cases are reviewed by an independent Disciplinary Committee, which conducts hearings and imposes appropriate sanctions. This committee operates independently from sports organizations, the government, and the ADC itself, ensuring impartiality in its proceedings.



Historically, Bulgarian sports, particularly weightlifting, have faced challenges related to doping. Notably, the country's weightlifting federation was banned from participating in the 2016 Rio Olympics due to multiple doping offenses.

In response to such issues, Bulgaria has strengthened its anti-doping regulations and enforcement mechanisms to restore the integrity of its sports.

In summary, Bulgaria's anti-doping regulations are comprehensive and align with international standards. Through the efforts of the Anti-Doping Centre and strict compliance measures, the country strives to maintain a fair and equitable sporting environment, addressing challenges proactively to uphold the principles of clean sport.

Recreative sport in Bulgaria

The primary legislation governing anti-doping activities in Bulgaria is the Regulations on Anti-Doping Activities, which came into effect on January 1, 2021. This legal framework is focused exclusively on professional athletes and does not extend to the recreational or amateur sports sectors. At present, there is no specific law or regulation addressing doping among recreational athletes.

With regard to amateur athletes, the sector remains largely unregulated in terms of anti-doping oversight. Additionally, Bulgaria does not currently implement any systematic education campaigns targeting the risks of doping in gyms, fitness clubs, or amateur sports leagues.



To effectively address the growing issue of doping in Bulgaria, it is imperative to consider the criminalization of its use and distribution—an approach that has not yet been adopted. The harmful effects of doping substances can be comparable to, or even more severe than, those associated with illegal narcotics. Given this, doping should be treated with equal seriousness under the law.

Law enforcement agencies should be empowered with clear legal authority to monitor, investigate, and prevent the illegal distribution and use of doping substances, as they do with controlled drugs. Without such powers, the supply chain and black-market circulation remain largely unchecked.

In parallel, comprehensive public education campaigns are urgently needed to raise awareness of the health risks associated with doping, particularly among youth and teenagers, who represent the most vulnerable demographic.

Greece

Greece has a structured approach to regulating doping in sports, largely in line with international standards. The country adheres to the World Anti-Doping Code (WADA), which sets out a global framework for anti-doping regulations. This means, that Greece has implemented domestic laws and regulations that are consistent with international protocols for preventing and punishing doping in sports.

The Hellenic National Anti-Doping Organization (HADA) is responsible for enforcing anti-doping measures in Greece. HADA's role includes testing athletes, educating them about the dangers and rules regarding doping, and imposing sanctions in case of violations. They also cooperate with international bodies like WADA to maintain compliance with global anti-doping standards.

Regular testing is carried out for athletes across various levels, from professional to amateur. This includes random drug tests during competitions and out-of-competition testing. In recent years, Greece has made efforts to enhance the transparency of its testing procedures and increase the number of athletes tested, though challenges remain in terms of resources and public awareness.

Doping violations in Greece can result in severe penalties, including suspensions from competition, disqualification from results, and financial fines. In some cases, athletes may face a lifetime ban from the sport, depending on the severity of the infraction. The regulations are designed to act as a deterrent to ensure fair competition and athlete safety.

Doping regulations in Greece are well-aligned with international standards, but challenges remain in terms of resources, awareness, and the pressures athletes face.

Meanwhile, recreational sports are becoming more popular, with outdoor activities and fitness culture growing in prominence. However, the full potential of recreational sports in Greece has yet to be realized due to accessibility issues and infrastructural gaps. Overall, there is a clear trend toward more active and healthy lifestyles, driven by a combination of cultural shifts, urban development, and government support.

In Greece, as in many other countries, the use of performance-enhancing substances in recreational sports, while less common than in elite sports, is still a concern. Athletes and fitness enthusiasts in recreational sports may resort to doping for various reasons, such as improving physical appearance, increasing performance, or accelerating recovery.

The use of doping substances in recreational sports in Greece, as elsewhere, is primarily concentrated among individuals looking to enhance their performance or physical appearance rapidly. Common substances include anabolic steroids, stimulants, EPO, prohormones, and diuretics.

Recreative sport in Greece

While the focus may be less on elite competition, the potential health risks associated with these substances—such as cardiovascular issues, hormonal imbalances, and organ damage—remain a significant concern. Education, regulation, and greater awareness are crucial in mitigating the misuse of these substances and ensuring a healthier approach to recreational sports.

The ease of access to doping substances in Greece is somewhat similar to that in other countries, although local factors such as legal enforcement, the availability of certain substances, and the popularity of certain sports can influence how easily individuals can acquire them.

In summary, while doping substances are illegal in Greece without proper medical supervision or prescription, they remain relatively accessible, especially within certain communities. Online markets, underground gym networks, and the misuse of prescription drugs all contribute to the availability of substances like anabolic steroids, HGH, stimulants, and SARMs. Greece's regulatory bodies, such as the Hellenic National Anti-Doping Organization (HADA), are working to combat this issue, but challenges in enforcement, especially in informal settings and the online market, persist. As such, those seeking these substances for recreational use often have multiple avenues for access, though doing so poses significant risks to health, legality, and safety.

In Greece, recreational athletes (amateurs) are generally not subject to the same strict regulations as professional athletes, but there are still some rules and guidelines that can apply depending on the sport or activity.

Recreational athletes in Greece are primarily governed by the rules of the sport's national federation, with certain medical requirements and safety measures in place. While the regulations are less stringent for amateurs compared to professionals, they still ensure the safety and fair play of participants. It's important to check specific rules for each sport or event, as they may vary depending on the level of competition and whether the event is officially recognized.

In Greece, there are ongoing efforts to raise awareness about the risks of doping, especially in professional sports. However, when it comes to gyms, fitness clubs, and amateur leagues, the educational campaigns tend to be less visible, though they do exist in some forms.

While there are anti-doping education efforts in Greece, particularly from national organizations like ESKA, the level of awareness and campaigns aimed at recreational athletes in gyms, fitness clubs, and amateur leagues can vary widely. In competitive and high-performance environments, the education and awareness are more prominent, but for the average gym-goer or amateur athlete, anti-doping messages are not always as strongly emphasized. However, as doping concerns grow across all levels of sport, there is increasing recognition of the need to extend educational campaigns to the wider fitness and amateur sports community.

Recreative sport in Greece

Educational initiatives

Regarding doping risks, the focus is often more prominent in professional sports rather than in gyms, fitness clubs, or amateur leagues. However, efforts do exist, and some organizations are working to raise awareness among recreational athletes.

Although anti-doping education in Greece is more prominently featured in professional sports, there are growing efforts to extend awareness to recreational athletes, especially through the work of organizations like ESKA. However, in gyms, fitness clubs, and amateur leagues, education about doping risks is still relatively limited. Some gyms and personal trainers are proactive in addressing this issue, but it is not universally enforced. The most significant education efforts for recreational athletes come from national anti-doping campaigns, federations, and occasionally through media.

Combating doping in recreational sports, gyms, and amateur leagues requires a coordinated strategy focused on education, regulation, and community engagement. By fostering a culture of integrity, implementing clear policies in fitness settings, and promoting awareness through media and influencer partnerships, doping can be reduced across all levels. Regular coach training and ongoing anti-doping education will further support a safer, fairer, and more sustainable sporting environment.



Addressing the issue of doping requires a multi-pronged and sustained effort. Key recommendations include organizing workshops and seminars for athletes, launching public awareness campaigns, and promoting natural, health-based alternatives to performance enhancement. Education, regulation, and community engagement are essential pillars of this strategy. By fostering a culture of integrity, enforcing clear anti-doping policies in gyms and amateur leagues, and engaging the public through media and partnerships with trusted influencers, Greece can effectively reduce doping across all levels of sport. Regular training for coaches, a focus on ethical competition, and continuous education efforts will contribute to a safer, fairer, and more sustainable sporting environment for both professional and recreational athletes.

North Macedonia

According to the obligations arising from the International Convention against Doping in Sport of UNESCO, which our country signed in 2008, and in accordance with the European Convention on the Prevention of Doping in Sport of the Council of Europe, the National Anti-Doping Commission was established in 2008 by the Government, within the Agency for Youth and Sport of North Macedonia, with the aim to act as the National Anti-Doping Organization (NADO MKD). In accordance with Article 20.5.1 of the Code, NADO MKD has the specific authority and responsibility to be independent in its operational decisions and activities from sports and the government. The anti-doping rules were adopted and implemented from 01.01.2021, in accordance with the competencies of the Macedonian NADO aligned with the Code of the World Anti-Doping Agency (WADA), as part of the continuous efforts of the Macedonian NADO to eradicate doping in sports in North Macedonia.

From the moment of the ratification of the UNESCO Convention until today, the legal framework regarding the fight against doping in sport has significantly changed at the international level, and the vast majority of countries in the world have adopted their own laws for the prevention of doping in sport. On 28.02.2024, the Assembly of the Republic of North Macedonia, through a legal procedure, adopted the "Law on the Fight Against Doping in Sport and Its Prevention" for the purpose of establishing an independent state body - the National Anti-Doping Organization of the Republic of North Macedonia (NADO MKD).

NADO MKD carries out the following activities on the territory of North Macedonia: doping controls of athletes during competition, doping controls outside of competition, appointment of doping controllers, cooperation with WADA-accredited laboratories, cooperation with WADA, national and international federations, result management, anti-doping education, administration of the national registered testing pool, administration of therapeutic use exemptions, administration with ADAMS, as well as other activities related to legal regulations for doping prevention in sport.

According to the Anti-Doping Rules of NADO MKD, which derive from the provisions of the World Anti-Doping Code, the segment of athletes engaged in sports recreation is included.

As stated in the Anti-Doping Rules of NADO MKD, anti-doping programs aim to protect the health of athletes and provide them the opportunity to achieve human excellence without the use of prohibited substances and methods. Anti-doping programs ensure the integrity of sport in terms of respect for rules, other competitors, fair competition, an equal playing field, and the value of clean sport in the world. With such an established legal framework, no field analysis has been conducted so far, which would include a comprehensive analysis of the number of male and female athletes practicing sports-recreational programs and fitness programs.

Recreative sport in North Macedonia

In North Macedonia, the state body responsible for sport grants permits for organizing sports activities under the national Law on Sports. However, challenges persist in regulating recreational sports, particularly in environments with limited oversight, such as gyms and fitness centers.

Recreational athletes—both adults and adolescents—frequently turn to dietary supplements with the aim of increasing muscle mass, reducing body fat, and enhancing workout results. The use of such supplements is becoming increasingly widespread in fitness settings, despite limited and often unreliable information about their safety and effectiveness. A major concern is the potential contamination or adulteration of these products with prohibited substances during production.

Findings from North Macedonia indicate that doping substance use is most common among recreational athletes training in fitness centers and bodybuilding environments. Substances such as anabolic steroids, human growth hormone, diuretics, and stimulants are often used to accelerate physical transformation. Among adolescents, the use of performance-enhancing substances is frequently motivated by a desire to improve physical appearance and gain self-confidence. In many cases, individuals follow structured "cycles" involving a combination of substances, often under informal guidance from personal trainers who promise quick and visible results.

These practices are particularly prevalent in larger, commercially successful fitness clubs in North Macedonia, where membership is high and global fitness trends are closely followed. Such clubs are often seen as exclusive and trendsetting spaces, contributing to the normalization—and in some cases, promotion—of enhancement practices. This creates a culture in which the pursuit of aesthetic ideals may override considerations of health, ethics, and long-term well-being, particularly among younger recreational athletes.

To effectively address these challenges, North Macedonia needs a comprehensive national strategy that includes regulation, prevention, and education targeting the recreational sports sector. This strategy should involve the development of specific legislation or policy frameworks that extend anti-doping regulations to gyms, fitness centers, and amateur sports settings. Mandatory training and certification for personal trainers, regular inspections of supplement sales in fitness facilities, and the introduction of anonymous reporting mechanisms could serve as practical tools to reduce the prevalence of doping. Equally important is the launch of nationwide awareness campaigns—particularly targeting youth—that highlight the health risks of doping and promote natural, sustainable approaches to fitness. Collaboration between health authorities, educational institutions, and the sports community will be essential in fostering a culture of clean sport and informed decision-making.

Recreative sport in North Macedonia

According to an evaluation of the National Strategy for Gender Equality conducted over the past three years (2022-2024), it has been established that a greater number of girls and women are joining sports clubs that operate under specialized programs, including those for pregnant women and elderly women. So far, based on our knowledge, no doping substances are being used in these clubs within the territory of our country.

With the growing popularity of online shopping, the internet is increasingly becoming a medium for selling products such as various medicines, supplements, and even doping substances. Nowadays, all these products are easily accessible through various online platforms, including company-based websites, e-commerce platforms, online pharmacies, online auction sites, classified ads, discussion forums, blogs, and social media. The borderless nature of the internet makes it difficult to authenticate sellers and ensure the safety and quality of products. All products are widely available to consumers—through the internet. We are all witnesses to products being advertised by well-known individuals, so-called influencers on social media, while business owners also engage fitness instructors to make the product more appealing to those who exercise. Advertisements for health and beauty products, various supplements, cosmetic products, and detox teas are also easily accessible.



In the Republic of North Macedonia, as of October 2021, a total of 7,021 different supplements had been registered. However, the dangers lurking behind the screen, hidden in the false world of the "perfect" body, are real.

According to Article 3 of the "Law on Combating and Preventing Doping in Sport," doping is a violation of one or more anti-doping rules, in accordance with the Code and the Anti-Doping Rules of NADO MKD. Furthermore, it applies to "all citizens engaged in sports-recreational activities who are citizens or, by law, residents of the Republic."

Recreative sport in North Macedonia

In the Anti-Doping Rules of NADO MKD, within the section outlining the scope of these anti-doping regulations, it is stated that, in addition to others, they also apply to:

"(5) *Recreational athletes*, i.e., any person who engages in or participates in sports or fitness activities for recreational purposes, but who would not otherwise compete in competitions or events organized, recognized, or hosted by a National Federation, or any affiliated or unaffiliated association, organization, club, team, or league, and who, within five (5) years before committing any anti-doping rule violation, was not an international-level athlete (as defined by each International Federation in accordance with the International Standard for Testing and Investigations); or a national-level athlete (as defined by NADO MKD or another National Anti-Doping Organization in accordance with the International Standard for Testing and Investigations); who does not represent North Macedonia or any other country in an open international event; or is not included in any testing pool or other information registry maintained by any International Federation, NADO MKD, or another National Anti-Doping Organization."

According to Article 2 of this law, sport, in the context of this legislation, is an activity encompassing all forms of sports activities for athletes of all ages, as well as sports-recreational activities for citizens. This, in itself, indicates that all athletes who are members of sports clubs, regardless of their professional or amateur status, including those engaged in sports-recreational activities, are subject to specific rules.

Anti-doping educational campaigns on the risks of doping have not been implemented in fitness clubs and amateur leagues across the territory of North Macedonia. We believe that expanding anti-doping education to these target groups is crucial for raising awareness, preventing doping, and preserving the health of recreational athletes and amateurs.



Recreative sport in North Macedonia

Measures for preventing doping play a crucial role in protecting individuals both within and outside the context of elite sport through:

- Ensuring the rights of everyone, both athletes and others, for their safety and health;
- Preserving the principles of integrity and transparency, for which consistency in sports competitions must be ensured and the image of sport must be preserved;
- Special attention must be given to the most vulnerable individuals, especially children, who may engage in high-level sports;
- Establishing an effective system for monitoring the health of athletes, particularly specialized medical, psychological, and informational services;
- Adopting directives for the protection of young athletes, especially those aiming to pursue professional sports;
- Encouraging research on athletes' health and continuously monitoring the situation;
- Increasing and fully utilizing police and judicial cooperation programs;
- Incorporating conditions regarding doping and its prohibition in contracts signed by athletes in sports clubs;
- Intensifying efforts to identify doping substances, detection methods, the health consequences of doping, and doping as a socio-economic phenomenon;
- Mobilizing education, professional training, and youth programs for information and training;
- Programs to raise awareness and prevention, and developing measures for public health policy;
- Adopting and sharing national action plans against doping in sport, aimed at ensuring coordination among all relevant parties;
- Continuing the existing trend across EU countries to introduce criminal laws against the trafficking of doping substances through organized networks or strengthening existing regulations.

Methodology for Research on Doping Substances Usage Among Recreational Athletes in Gyms Across Serbia, Bulgaria, Greece, and North Macedonia

Research Objectives

The primary objective of this research is to assess the use of doping substances among recreational athletes in gyms in four countries: Serbia, Bulgaria, Greece, and North Macedonia. Specific objectives include:

- Identifying the prevalence and type of doping substance use among recreational athletes.
- Assessing their knowledge of doping substances and their harmful health effects.
- Understanding the attitudes towards doping and reasons for the use of doping substances.

Study Design

The research adopts a cross-sectional survey design to gather data from recreational athletes across the four countries.

Participants

- **Target Population and Inclusion Criteria:** Recreational athletes who regularly exercise in gyms.
- **Sample Size:** A total of 400 participants (100 from each country). Participants recruited from different gyms to encompass different types of recreative athletes.

Instrument

The research instrument is a structured questionnaire designed specifically for this study with 31 questions, covering the following areas:

- **Demographic data:** Sex, Age, Education, Frequency of exercise, and if they exercise alone or with coach.
- **Doping Substance Use:** Past and current usage, types of substances used.
- **Knowledge:** Awareness of doping substances, understanding of health risks and legal implications.
- **Motivations:** Reasons for considering or using doping substances, perceived benefits, and social influences.

The questionnaire was piloted in a gym in Serbia to ensure clarity, relevance, and reliability. Following the pilot, it has to be translated into Serbian, Bulgarian, Greek, and North Macedonian, maintaining linguistic and cultural accuracy through back-translation.

Data Collection

- **Procedure:** Participants will be recruited from selected gyms using convenience sampling. The questionnaire will be administered in a self-completed, anonymous format on the devices (tablet, mobile phone) which belongs to interviewer. No identifying information will be collected to ensure the privacy and confidentiality of participants.
- **Locations:** Gyms will be selected in urban and semi-urban areas to ensure diverse representation.
- **Timeline:** Data collection will be conducted over a one-month period in each country.

Ethical Considerations

- **Informed Consent:** All participants will receive details information about the research objectives. They will be informed that filling questionnaire will be considered as their consent.
- **Confidentiality:** No identifying data will be collected, and responses will be anonymized.

Data Analysis

- **Descriptive Statistics:** Prevalence rates, mean knowledge scores, and demographic breakdowns.

Limitations

- The reliance on self-reported data may introduce social desirability bias.
- The convenience sampling method may limit the generalizability of findings.

Dissemination of Results

- Findings will be presented at relevant scientific conferences and published in peer-reviewed journals. The results will also be shared with gyms and local authorities to inform doping prevention initiatives.

- Questionnaire on the use of doping substances among recreational athletes

Q1: How old are you?

- _____

Q2: What gender are you?

- Male
- Female
- I don't want to make a statement

Q3: Do you practice alone or with a trainer?

- Alone
- With trainer
- Alone but using online advice

Q4: What level of education have you completed?

- Primary
- Secondary
- Two years post-secondary
- University

Q5: How often do you exercise?

- Multiple times every day
- Every day
- More than 3 times per week
- 2 to 3 times per week
- 1 per week
- 1 to 2 per month

Q6: Do you know which substances are considered as a doping?

- I know
- I don't know

Q7: Have you ever used doping substances in the past?

- Yes, I am
- No, I am not
- I don't want to make a statement

Q8: Are you currently using doping substances?

- Yes
- No
- I don't want to make a statement

Q9: If your answer to the previous two questions is "YES", why do you use doping substances?

- To lose weight
- To increase fitness
- To increase muscle mass
- To look better
- Faster recovery
- In order to increase the duration of training
- Other

Q10: If you have taken doping substances, what are the substances that you used or still using to increase athletic performance?

- Anabolic agents
- Prohormones
- Peptide hormones
- Growth hormone
- Stimulants
- Insulin
- Hard and light drugs

Q11: Have you ever used a diuretic to lose weight?

- Yes
- No

Q12: Are you informed about the side effects of using diuretics?

- Yes
- No

Q13: If you have used or still using doping, who advised you to do so?

-
- Trainer
- Other gym users
- Family
- Friends
- Nobody
- I don't want to make a statement

Q14: Do you know someone who uses doping?

- I know
- I don't know
- I don't want to make a statement

Q15: Do you know someone who had side effects from the use of doping substances?

- I know
- I don't know
- I don't want to make a statement

Q16: Do you think that the use of doping is illegal?

- Yes
- No
- I don't want to make a statement

Q17: Do you think that using doping is immoral?

- Yes
- No
- I don't want to make a statement

Q18: Do you believe that steroids can be bought in pharmacies?

- Yes
- No
- I don't know

Q19: Would you support the anti-doping campaign?

- Yes
- No
- I don't want to make a statement

Q20: How did you first learn about doping?

- TV
- Internet
- Gym
- Trainer
- Online forums
- Scientific articles
- Other

Q21: Would you report someone using doping to the competent anti-doping institution?

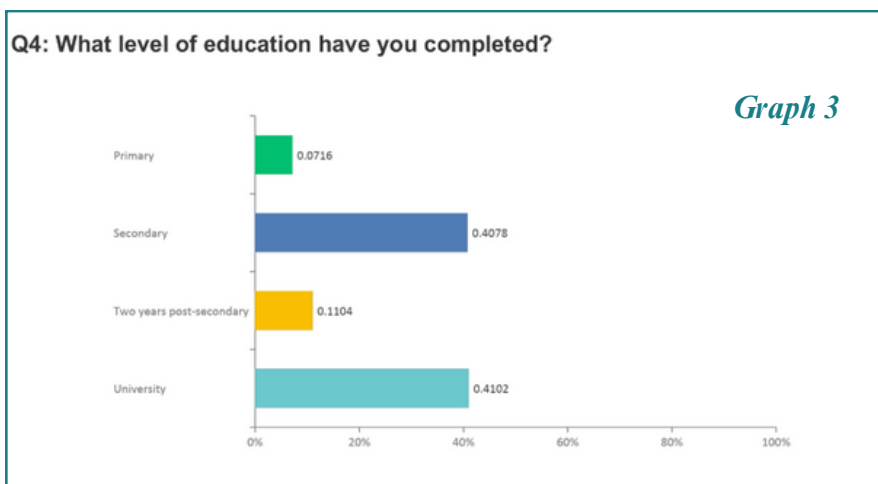
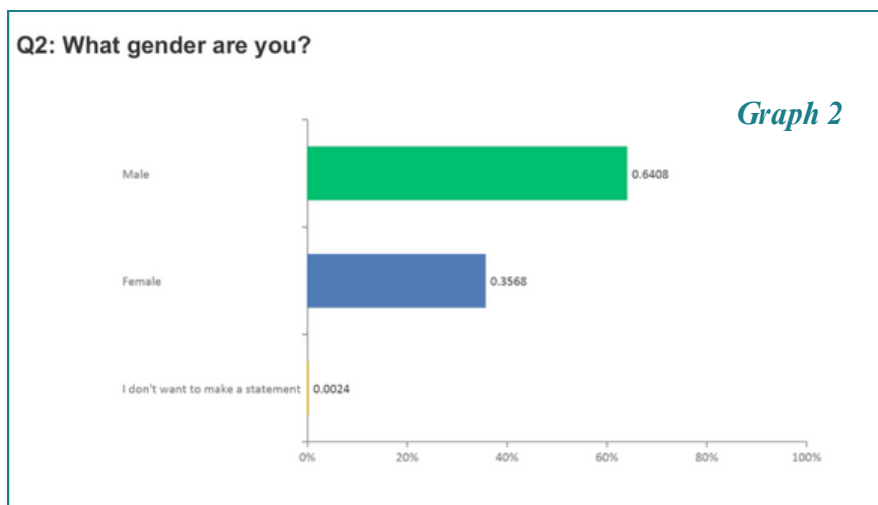
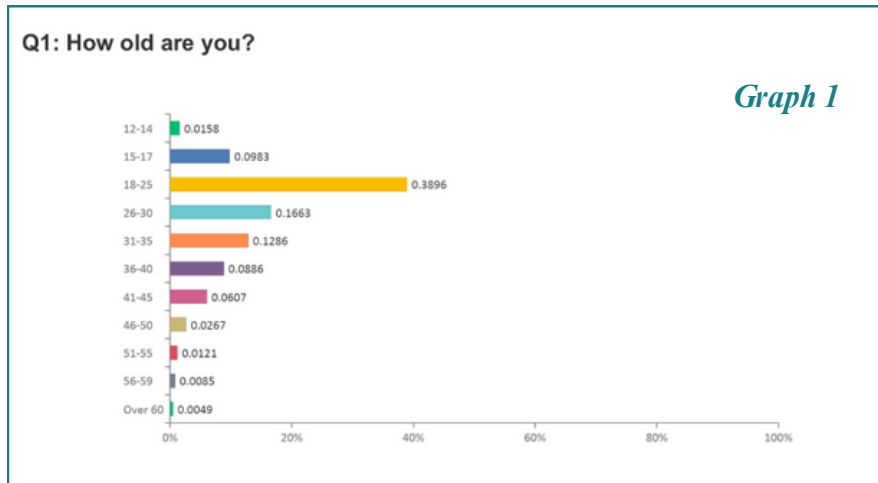
- Yes
- No
- I don't know



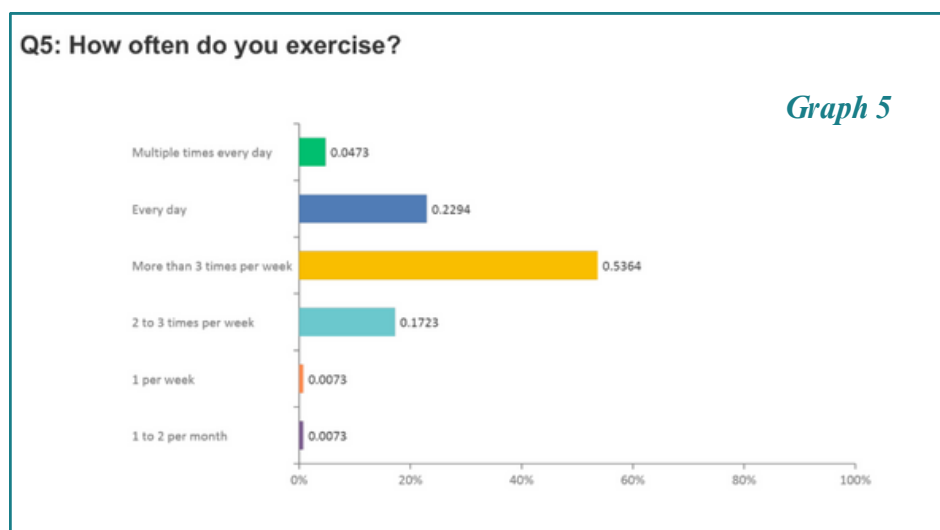
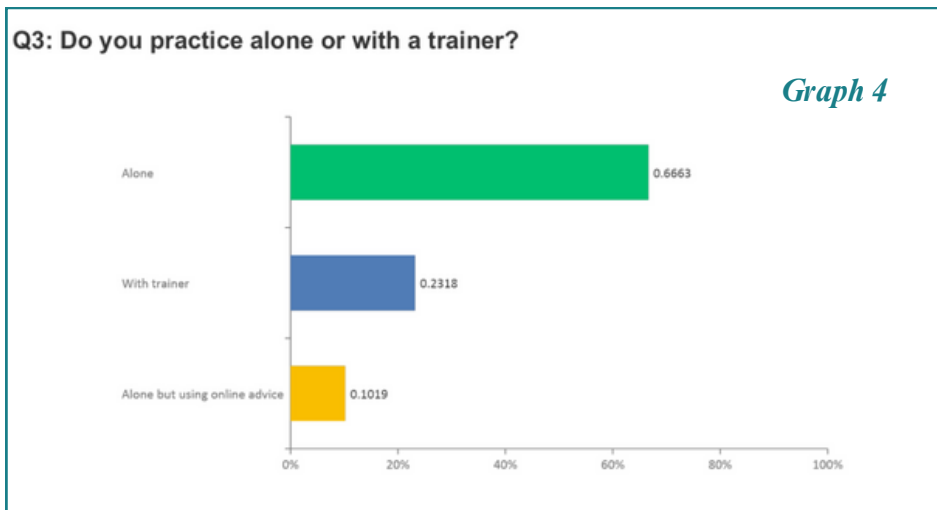
Results

Serbia

The demographics in Serbia (Q1, Q2, Q4) show the largest age group is 18-25 (38.96%), followed by 26-30 (16.63%) and 31-35 (12.86%), indicating a younger skew compared to North Macedonia, with more representation in the 15-17 bracket (9.83%). There is a clear male majority (64.08% Male vs. 35.68% Female). Education levels are high but more balanced than North Macedonia, with University (41.02%) and Secondary (40.78%) almost equal, and a higher percentage with Primary education (7.16%). This sample is younger, more male-dominated, and has a diverse but still high educational background compared to North Macedonia.



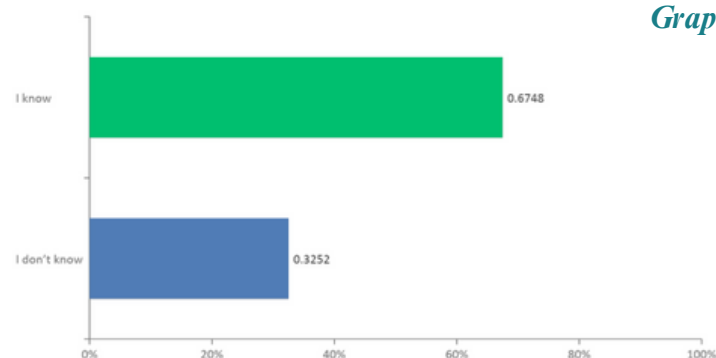
Regarding exercise habits (Q3, Q5), a strong majority in Serbia train alone (66.63%), significantly higher than in North Macedonia. Fewer use trainers (23.18%) or online advice (10.19%). Exercise is very frequent: 53.64% train more than 3 times per week, and 22.94% train daily, a much higher daily percentage than in North Macedonia. Serbian respondents appear highly committed to frequent training, often independently, which could mean less external guidance on topics like doping.



Doping knowledge and use in Serbia (Q6, Q7, Q8, Q9, Q10) show good general knowledge (Q6), with 67.48% claiming to know what constitutes doping (higher than North Macedonia). Reported past use (Q7) is slightly lower than North Macedonia (5.46%), but with a higher refusal rate (3.03%). Reported current use (Q8) is higher than North Macedonia (2.31%), again with a higher refusal rate (2.43%), suggesting potential underreporting.

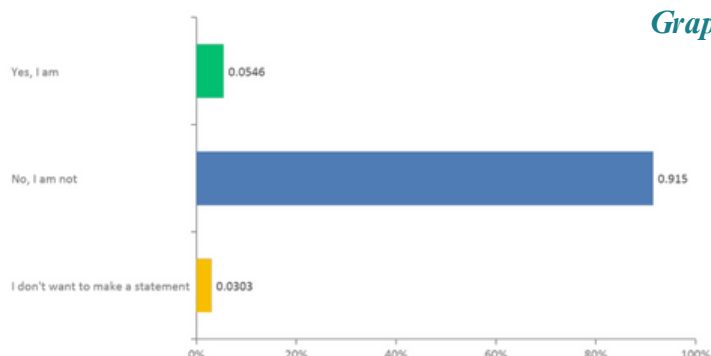
Q6: Do you know which substances are considered as a doping?

Graph 6



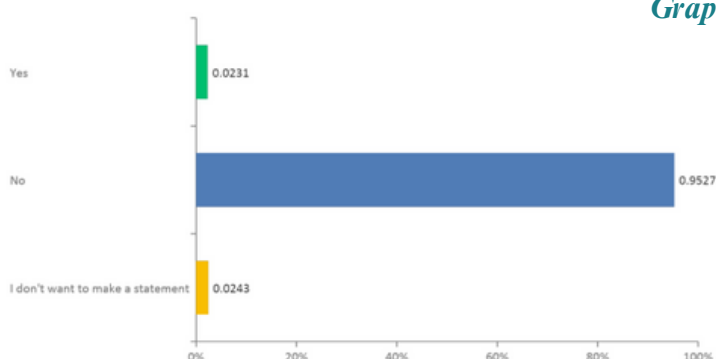
Q7: Have you ever used doping substances in the past?

Graph 7



Q8: Are you currently using doping substances?

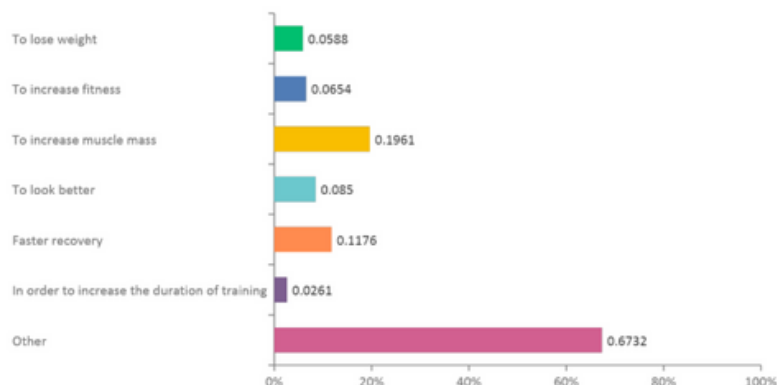
Graph 8



Among users, “Other” reasons (Q9) dominate massively (67.32%), making it difficult to pinpoint primary motivations without clarification. Specified reasons include increasing muscle mass (19.61%), faster recovery (11.76%), and looking better (8.50%). Anabolic agents are the most common substance (Q10) at 55.26%, but a broader reported spectrum includes stimulants (21.05%), hard/light drugs (19.74%), and growth hormone (15.79%). Despite better knowledge, reported current use is slightly higher, and the range of substances appears wider.

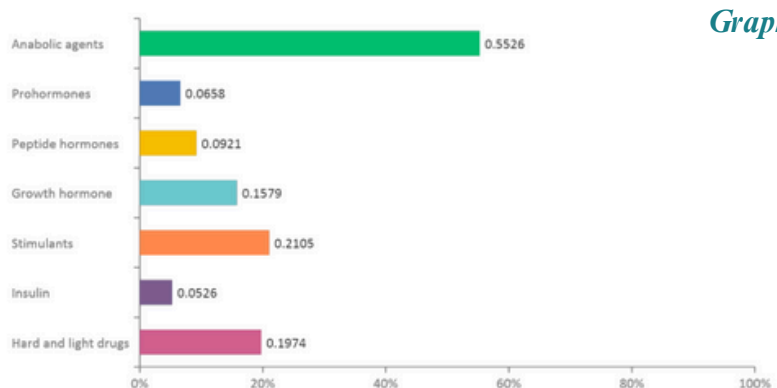
Q9: If your answer to the previous two questions is "YES", why do you use doping substances?

Graph 9



Q10: If you have taken doping substances, what are the substances that you used or still using to increase athletic performance?

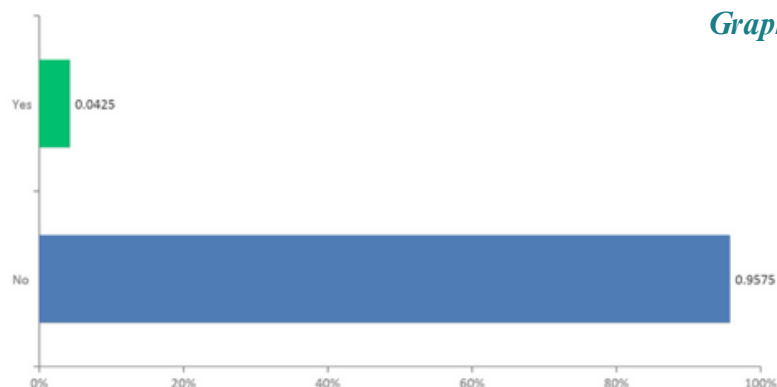
Graph 10



Diuretic use (Q11) is lower than in North Macedonia (4.25%), but knowledge of side effects (Q12) is worryingly low, with a majority (53.64%) not informed. While use seems less common, this lack of risk awareness is a significant concern.

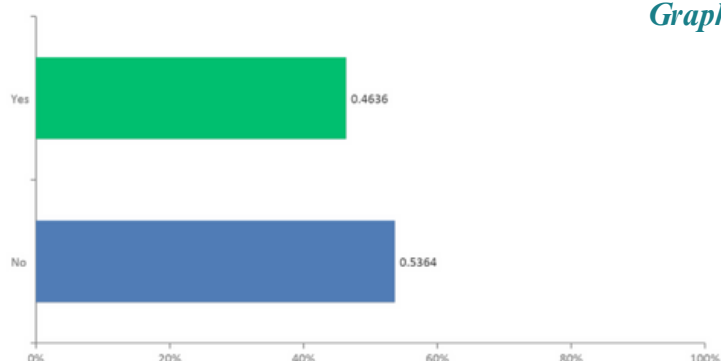
Q11: Have you ever used a diuretic to lose weight?

Graph 11



Q12: Are you informed about the side effects of using diuretics?

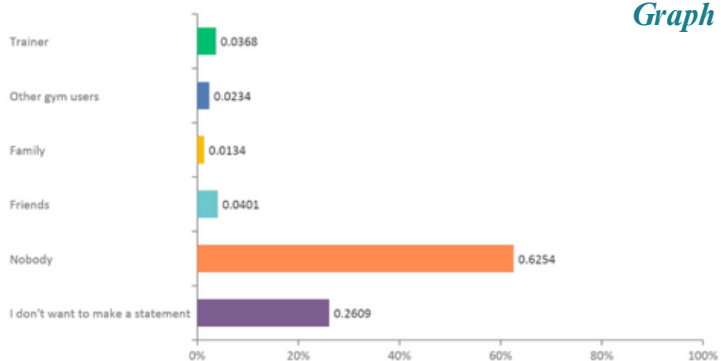
Graph 12



Influence and awareness patterns (Q13, Q14, Q15) show that, similar to North Macedonia, most users claim nobody advised them (Q13) (62.54%). However, the refusal rate (“I don’t want to make a statement”) for this question is very high (26.09%), suggesting reluctance to disclose sources. Friends (4.01%) and trainers (3.68%) are minor influences. Awareness of others using doping (Q14) (36.89%) and experiencing side effects (Q15) (26.33%) is slightly lower than in North Macedonia but still significant. The high refusal rate regarding advice sources is striking.

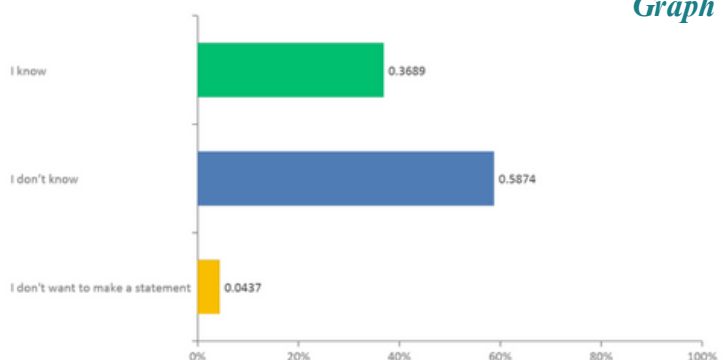
Q13: If you have used or still using doping, who advised you to do so?

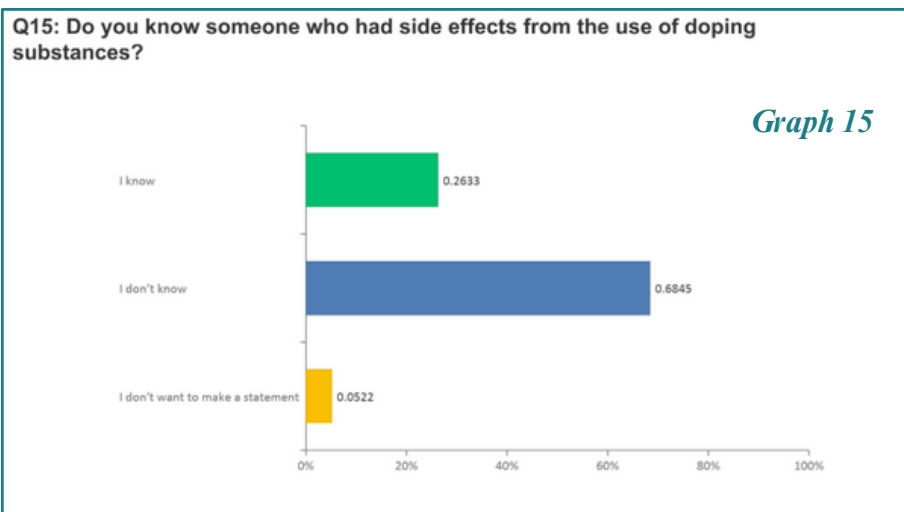
Graph 13



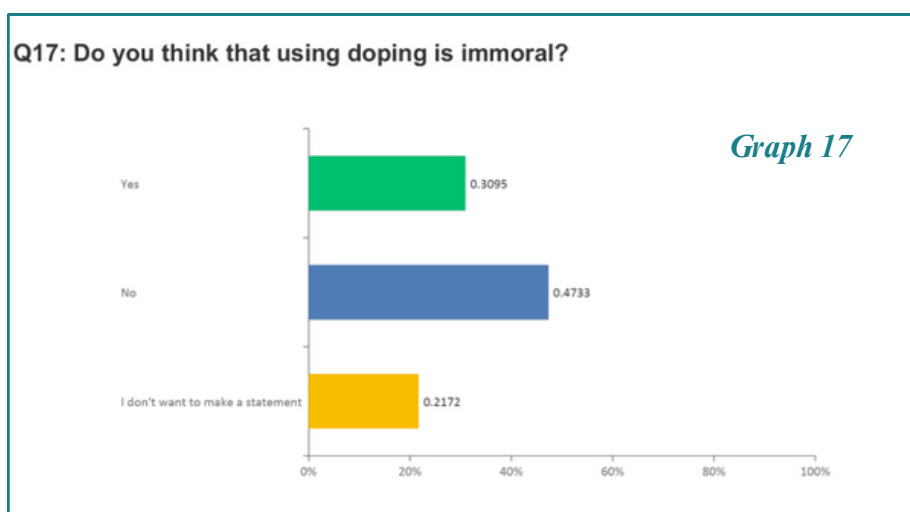
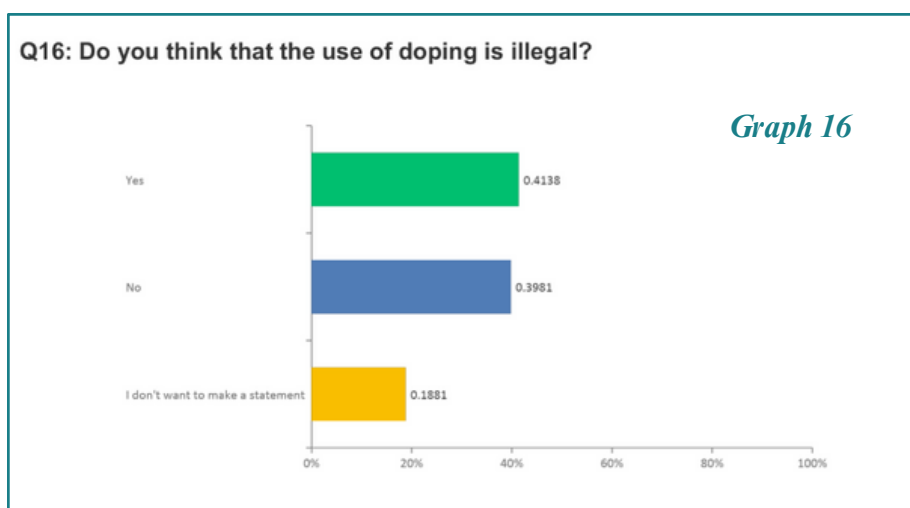
Q14: Do you know someone who uses doping?

Graph 14



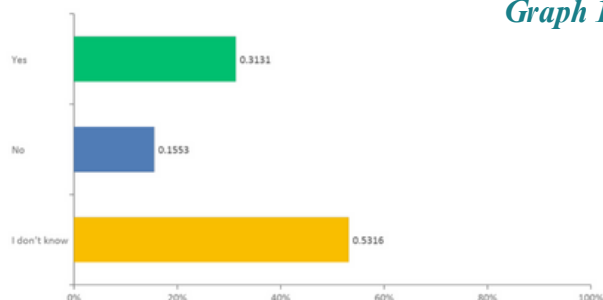


Attitudes and beliefs in Serbia (Q16, Q17, Q18, Q19, Q21) are marked by division and uncertainty. Roughly equal numbers see doping as illegal (Q16) (41.38%) or not illegal (39.81%), with a high refusal/don't know rate (18.81%). Opinions on morality (Q17) lean towards not immoral (47.33% No vs. 30.95% Yes), with a very high refusal rate (21.72%). Uncertainty about steroid availability in pharmacies (Q18) is high (53.16% don't know), though more believe they are available (31.31%) than not (15.53%).



Q18: Do you believe that steroids can be bought in pharmacies?

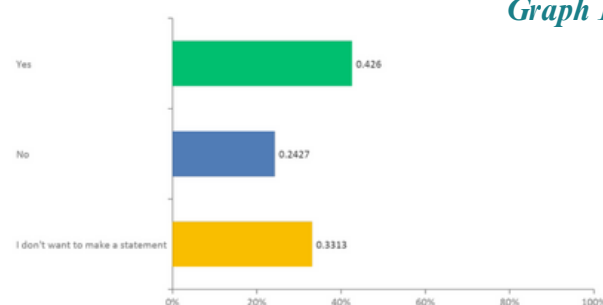
Graph 18



Support for anti-doping campaigns (Q19) is notably lower than in North Macedonia (42.60%), with high opposition (24.27%) and a very high refusal rate (33.13%). Similar to North Macedonia, willingness to report users (Q21) is very low (11.77%), with high refusal (50.36%) and uncertainty (37.86%). This significant ambiguity and reluctance to state opinions could indicate topic sensitivity, lack of strong opinions, or distrust. The low support for anti-doping campaigns is particularly notable.

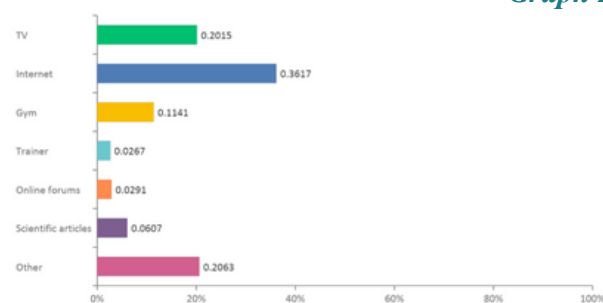
Q19: Would you support the anti-doping campaign?

Graph 19



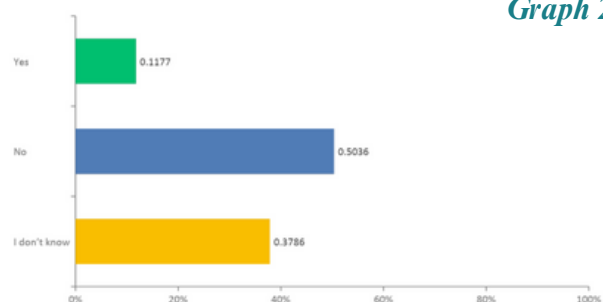
Q20: How did you first learn about doping?

Graph 20



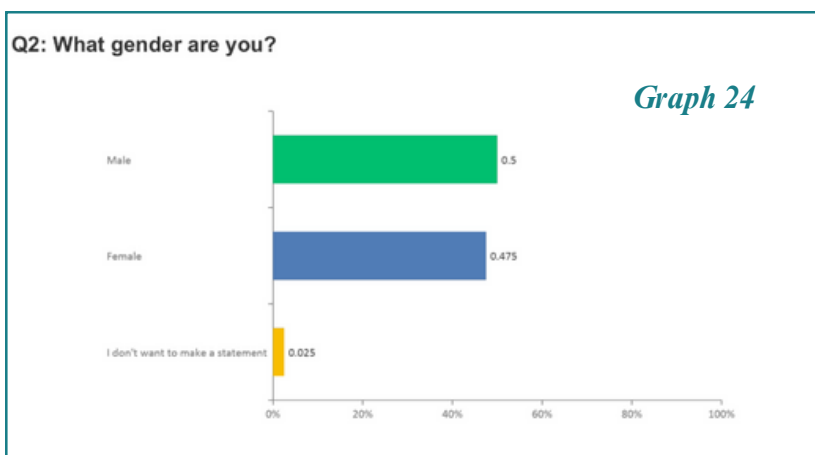
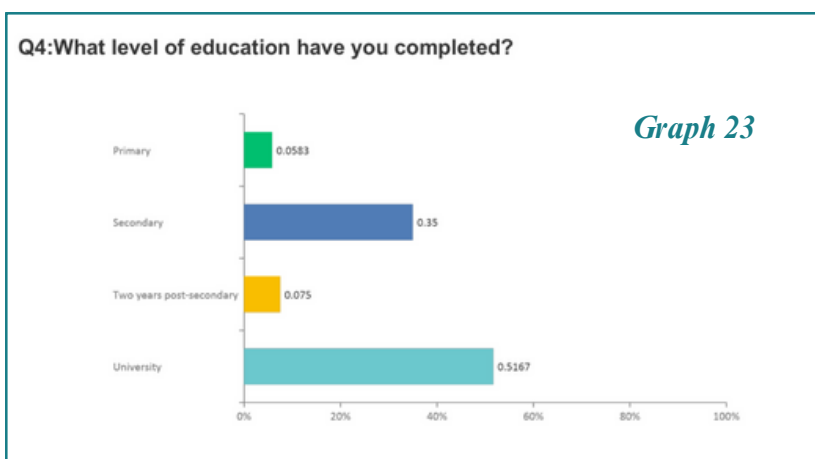
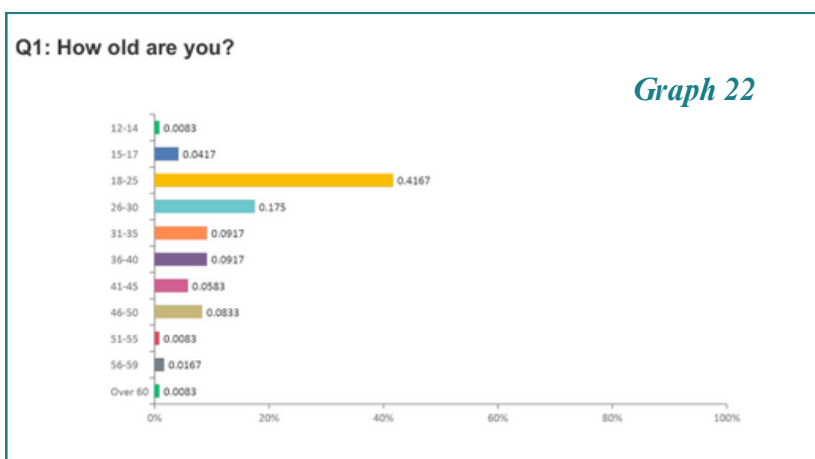
Q21: Would you report someone using doping to the competent anti-doping institution?

Graph 21

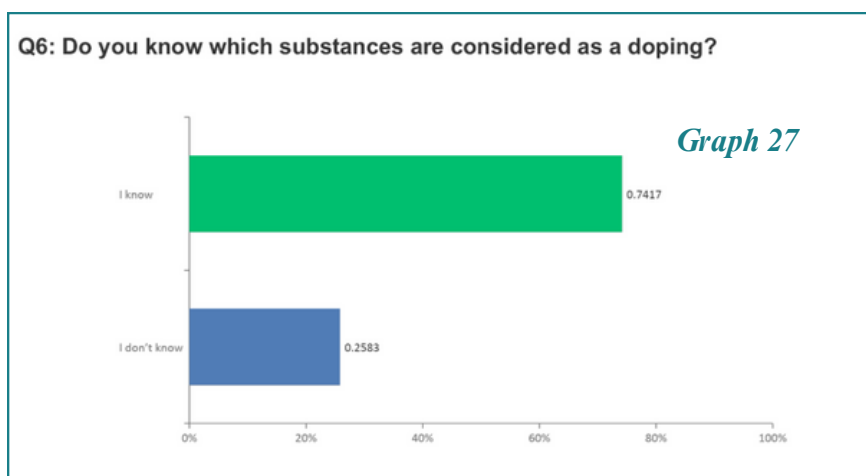
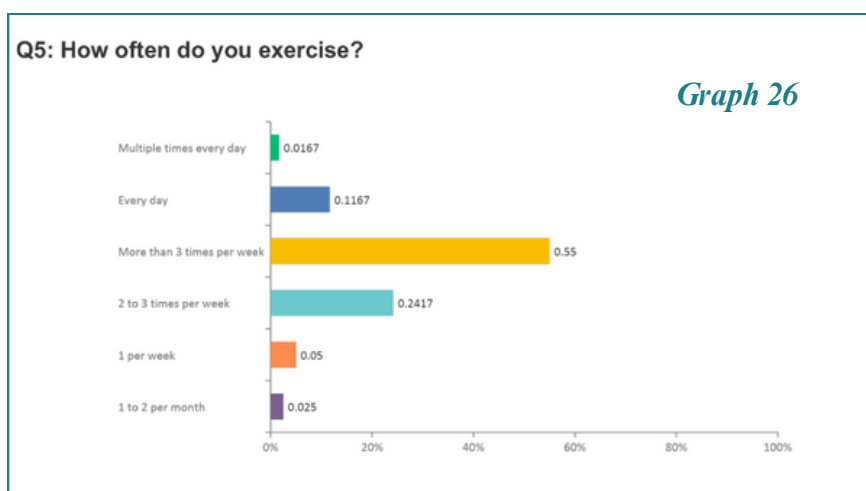
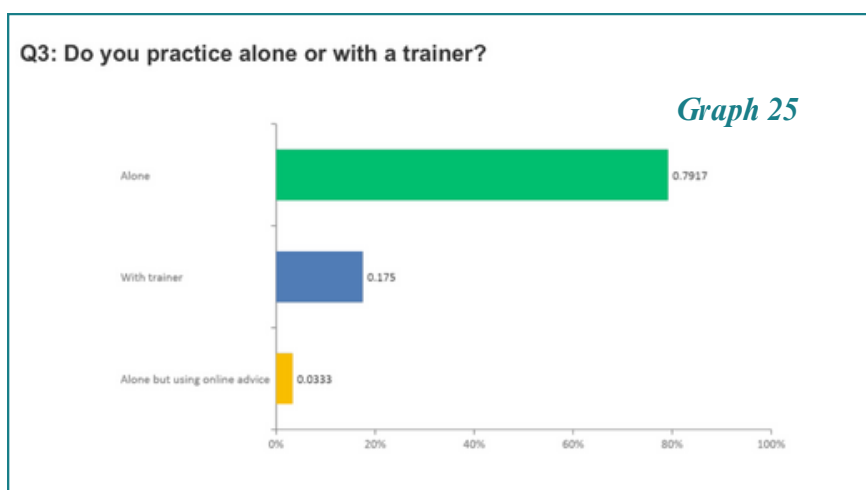


Bulgaria

The Bulgarian sample demographics (Q1, Q2, Q4) show the largest age group is 18-25 (41.67%), similar to Serbia, followed by 26-30 (17.50%), with representation across older brackets too. Gender is relatively balanced (50.00% Male, 47.50% Female), with a small refusal rate (2.50%). Education is high, with a majority holding University degrees (51.67%), followed by Secondary (35.00%). The sample consists mainly of educated young adults, similar to the other countries, but with a more balanced gender distribution than Serbia.



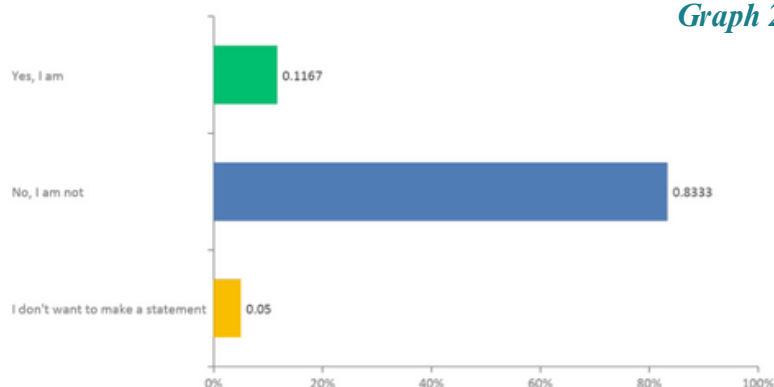
Exercise habits (Q3, Q5) show an overwhelming majority training alone (79.17%), the highest percentage among the four countries. Very few use trainers (17.50%) or online advice (3.33%). Most exercise frequently (55.00% more than 3 times per week, 11.67% daily). This indicates a very independent group of exercisers with high commitment but minimal reliance on external guidance. Bulgaria shows the highest level of doping knowledge (Q6) among the four countries, with 74.17% stating they know what constitutes doping.



Regarding use (Q7, Q8, Q9, Q10), reported past use (Q7) is the highest among the first three countries (11.67%), with a 5.00% refusal rate. Reported current use (Q8) is low (1.67%), similar to Serbia, but with a higher refusal rate (7.50%), which might mask higher actual prevalence. Motivations for use (Q9) are varied: faster recovery (20.59%) and increasing muscle mass (20.59%) lead slightly, followed by fitness (17.65%), looking better (17.65%), and weight loss (11.76%). “Other” is significant (38.24%) but less dominant than in Serbia. Anabolic agents are most common (Q10) at 44.00% but less dominant than in North Macedonia. Growth hormone (32.00%), peptide hormones (24.00%), prohormones (16.00%), and stimulants (16.00%) show significant reported use, with notably no reported use of hard/light drugs. Despite high knowledge, past use is highest, and the substance profile shows considerable use of various hormones.

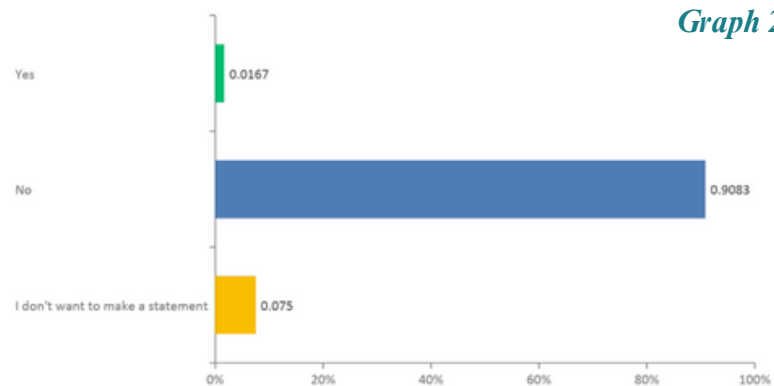
Q7: Have you ever used doping substances in the past?

Graph 28

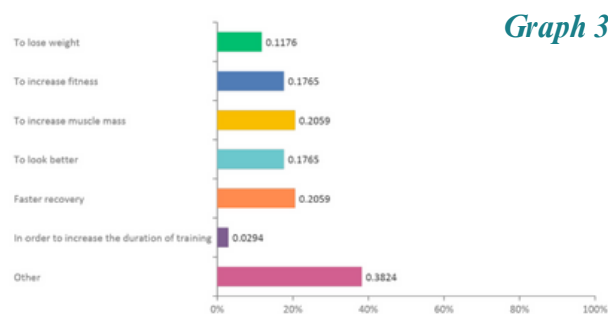


Q8: Are you currently using doping substances?

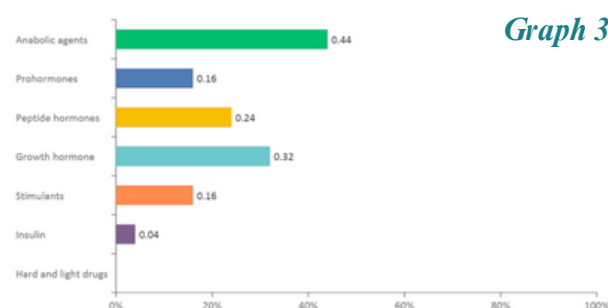
Graph 29



Q9: If your answer to the previous two questions is "YES", why do you use doping substances?

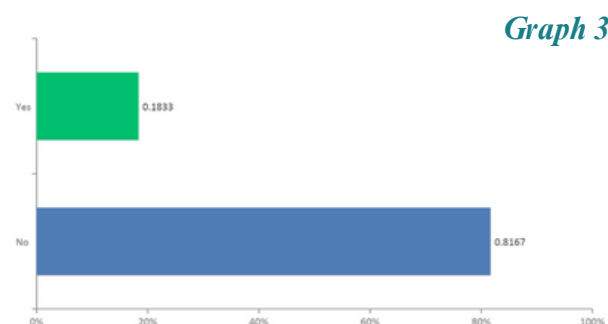


Q10: If you have taken doping substances, what are the substances that you used or still using to increase athletic performance?

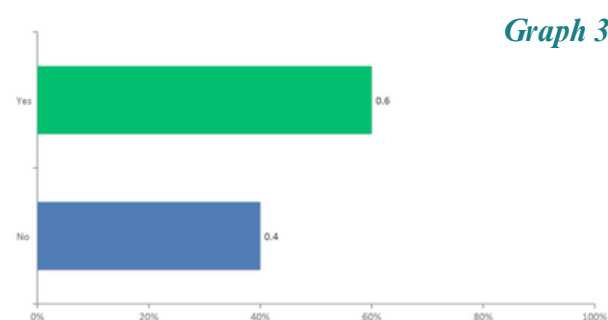


Diuretic use (Q11) is the highest reported among the four countries (18.33%). Knowledge of side effects (Q12) is relatively good, with 60.00% informed, better than in Serbia or North Macedonia, but a significant minority (40%) remains uninformed. Diuretic use appears more prevalent, and while risk awareness is better, it's not universal.

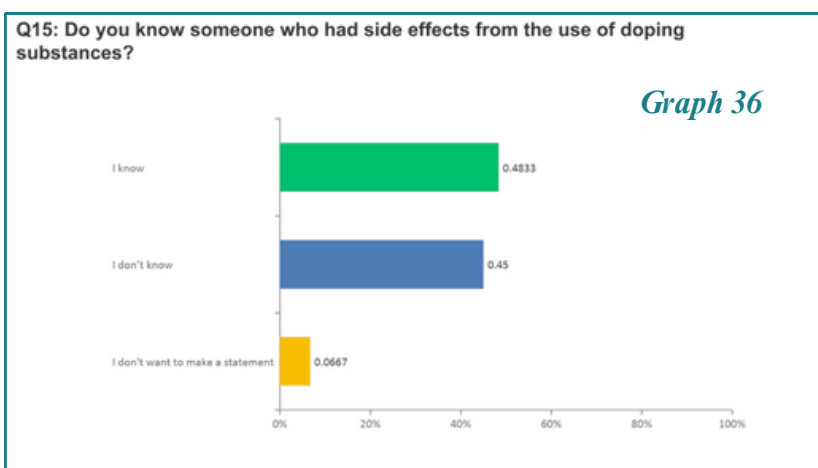
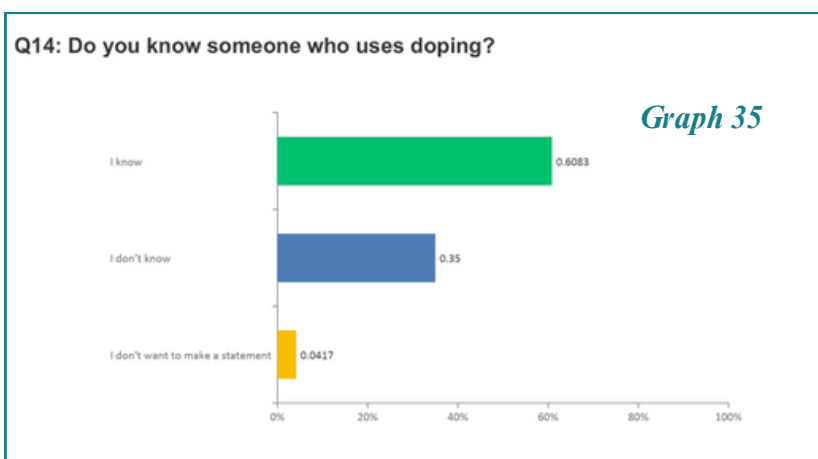
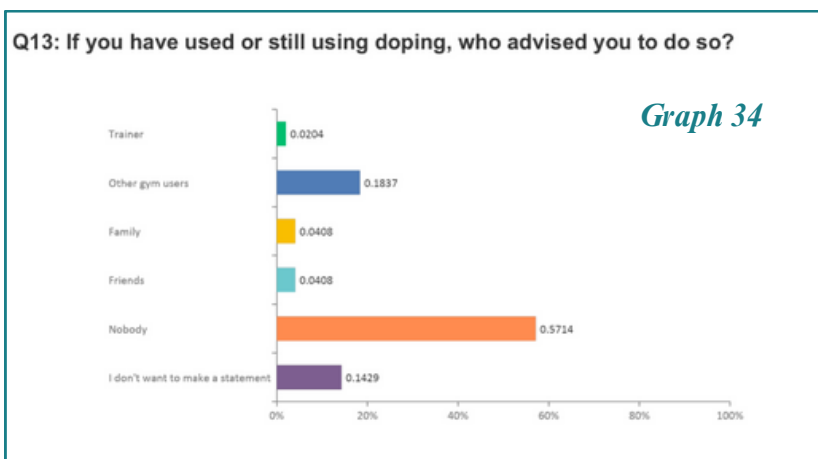
Q11: Have you ever used a diuretic to lose weight?



Q12: Are you informed about the side effects of using diuretics?



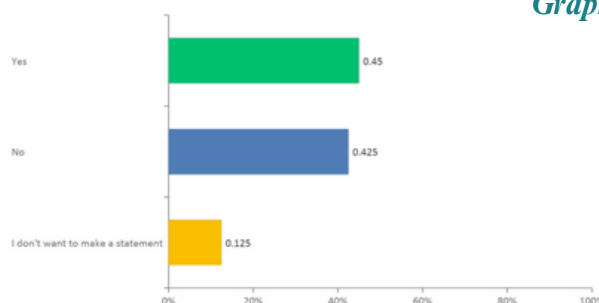
Regarding influence and awareness (Q13, Q14, Q15), “Nobody” is the most common answer for advice source (Q13) at 57.14%. However, “Other gym users” (18.37%) have a more notable influence compared to other countries. Family and Friends also appear (4.08% each), and the refusal rate is moderate (14.29%). Awareness of others using doping (Q14) is very high (60.83%), the highest among the first three countries, as is awareness of side effects in others (Q15) (48.33%). While self-reliance is claimed, peer influence seems more relevant here, and awareness of doping and its consequences is particularly high.



Attitudes and beliefs (Q16, Q17, Q18, Q19, Q21) show divided opinion on legality (Q16), similar to Serbia, with roughly equal numbers seeing it as illegal (45.00%) or not illegal (42.50%), and a moderate refusal rate (12.50%). Opinions on morality (Q17) lean slightly towards immoral (46.67% Yes vs. 40.00% No), differing from Serbia and North Macedonia, with a refusal rate of 13.33%. Opinion on pharmacy availability (Q18) is divided: a significant portion believes they are available (41.67%), while many believe they are not (35.00%) or don't know (23.33%). Anti-doping support (Q19) is good (60.00%), similar to North Macedonia, but with a higher refusal rate (25.00%). Willingness to report users (Q21) is the highest among the four countries (33.33%), although still only a third, with high refusal (30.83%) and uncertainty (35.83%). Ambiguity persists regarding legality, though there's a slight lean towards viewing doping as immoral. Belief in pharmacy availability is higher. Support for anti-doping is present, and willingness to report, while low overall, is notably higher than in North Macedonia and Serbia.

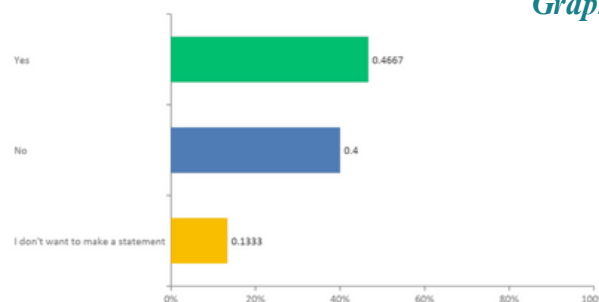
Q16: Do you think that the use of doping is illegal?

Graph 37



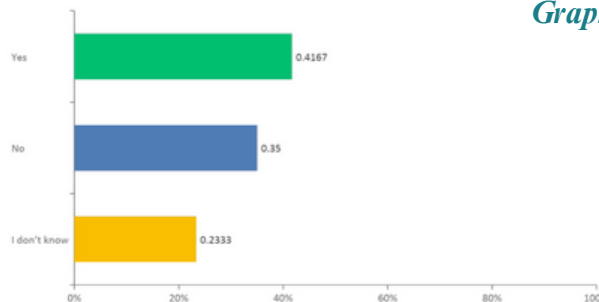
Q17: Do you think that using doping is immoral?

Graph 38



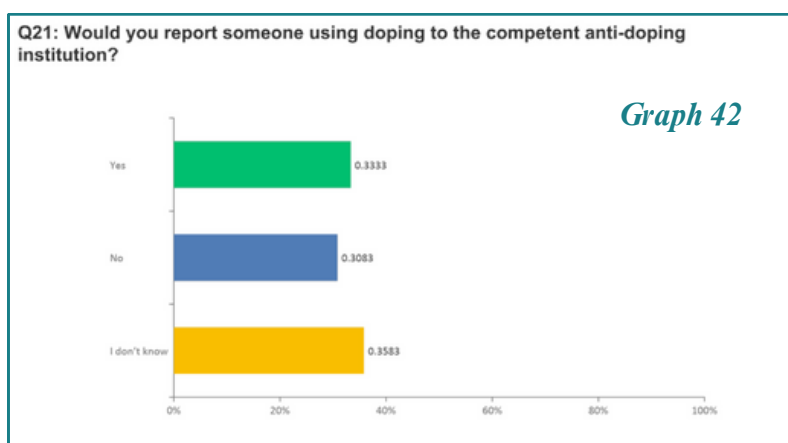
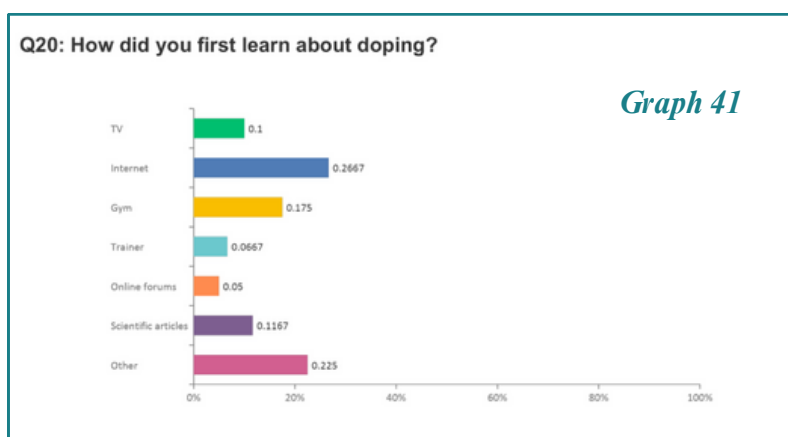
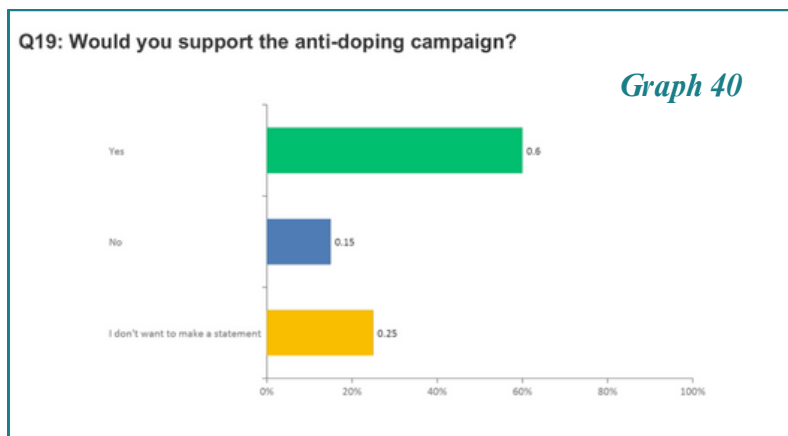
Q18: Do you believe that steroids can be bought in pharmacies?

Graph 39



Bulgaria

Information sources (Q20) are diverse in Bulgaria. The Internet leads (26.67%) but less dominantly. TV is lower (10.00%). The gym (17.50%), scientific articles (11.67%), and “Other” (22.50%) play larger roles compared to the other countries. Trainers (6.67%) and online forums (5.00%) are also mentioned. Information comes from a wider array, with the gym environment and scientific articles being more prominent.

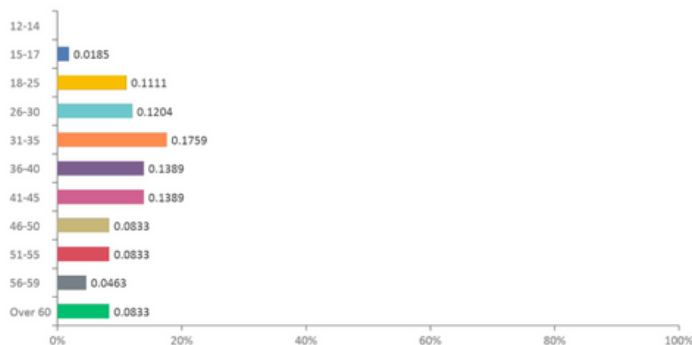


In summary for Bulgaria, this sample is highly educated, trains independently (Q3), and possesses the highest knowledge about doping (Q6). Reported past use (Q7) is the highest among the first three countries, and diuretic use (Q11) is most prevalent. A wide range of substances (Q10) is reported. Awareness of doping use (Q14) and side effects (Q15) in others is very high. Attitudes (Q16, Q17) are somewhat divided, but there's slightly more inclination to see doping as immoral and a higher (though still limited) willingness to report users (Q21) compared to North Macedonia and Serbia.

The Greek sample's demographics (Q1, Q2, Q4) show a broader age distribution skewing slightly older than the other countries, with significant representation in the 31-35 (17.59%), 36-40 (13.89%), and 41-45 (13.89%) brackets, and even those over 50 make up roughly 21%. The 18-25 group is smaller (11.11%). There's a clear male majority (64.81% Male vs. 35.19% Female), similar to Serbia. Education is very high, with 72.22% holding University degrees and 26.85% having two years post-secondary education; almost none have only primary or secondary. The Greek sample is older on average, predominantly male, and extremely highly educated.

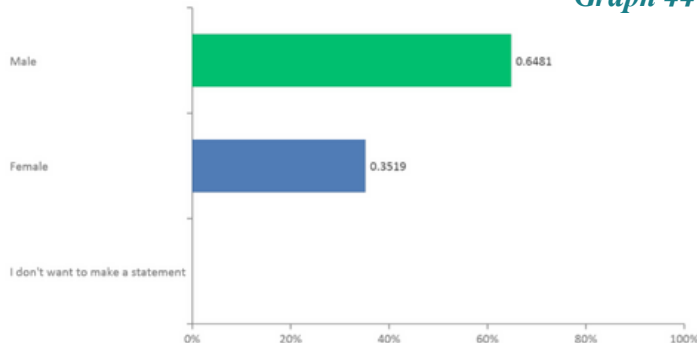
Q1: How old are you?

Graph 43



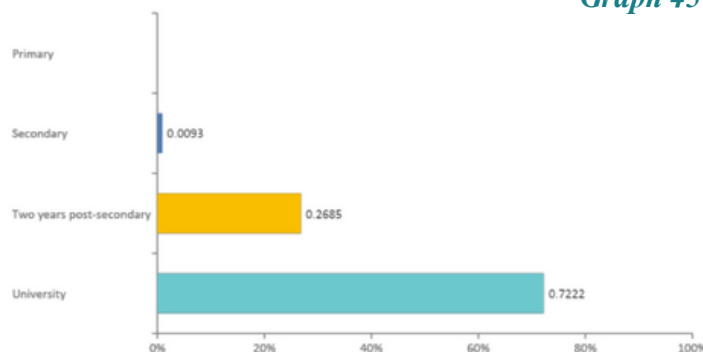
Q2: What gender are you?

Graph 44

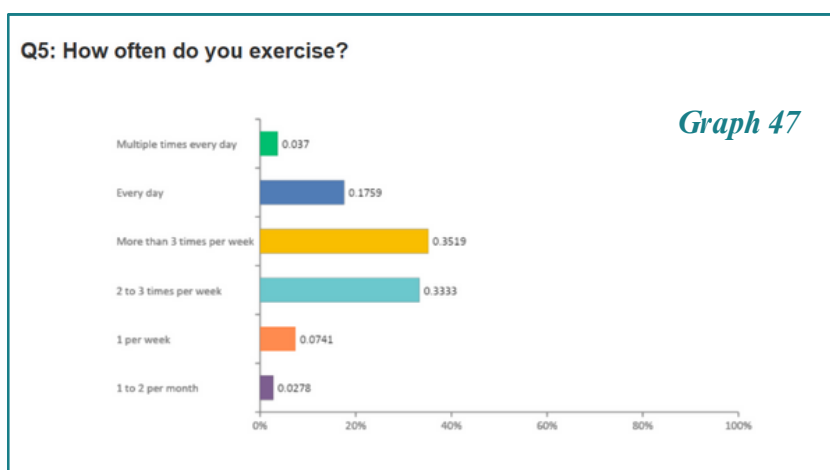
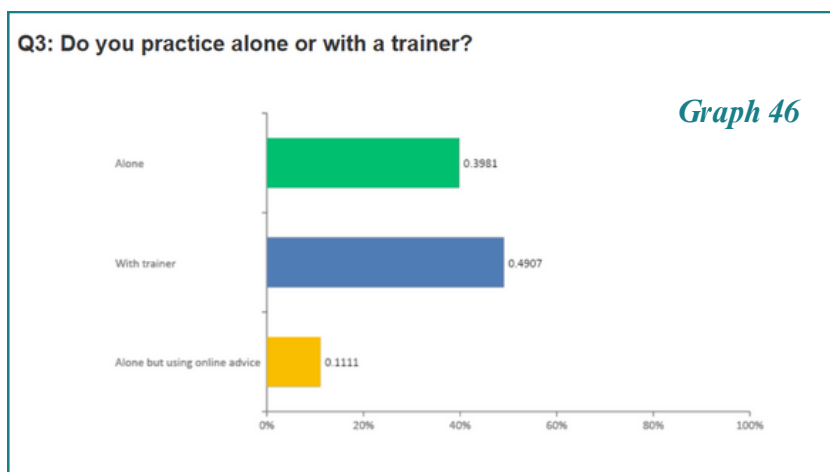


Q4: What level of education have you completed?

Graph 45



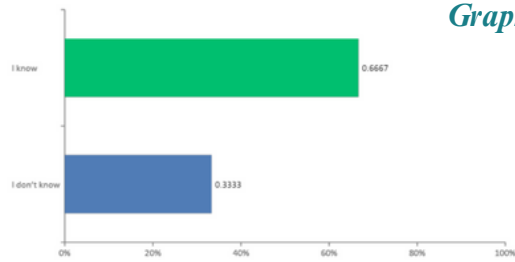
Exercise habits in Greece (Q3, Q5) contrast with the others, as a near majority use a trainer (49.07%). Fewer train alone (39.81%), and a small group uses online advice (11.11%). Exercise frequency is high but slightly lower than Serbia/Bulgaria, with more than 3 times per week (35.19%) and 2- 3 times per week (33.33%) being the largest groups, though daily exercise (17.59%) is still common. The high reliance on trainers could imply more structured guidance but also potentially more influence regarding substances.



Regarding doping knowledge and use (Q6, Q7, Q8, Q9, Q10), knowledge (Q6) is good (66.67% know what doping is), similar to Serbia. However, reported past use (Q7) is significantly higher than the other three countries (32.41%). Most strikingly, reported current use (Q8) is exceptionally high at 20.37%, dramatically different from the ~1-2% in the other nations. This is the most significant finding and divergence. Potential explanations include higher actual prevalence, greater honesty, different understanding of “doping”, sampling bias, or cultural differences towards enhancement substances. Motivations among users (Q9) are primarily driven by aesthetics and performance: increasing muscle mass (54.84%) and looking better (35.48%) dominate, with increasing fitness (25.81%) also significant. Weight loss is minimal (3.23%), and “Other” reasons are low (9.68%). Anabolic agents are highly dominant substances used (Q10) at 83.87%, similar to North Macedonia, and growth hormone use is also very high (32.26%). Other substances are reported by smaller percentages. The substance profile points heavily towards anabolics and growth hormone for muscle gain and appearance.

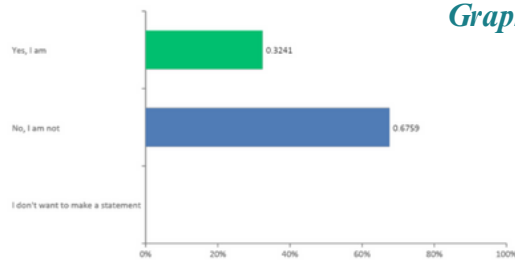
Q6: Do you know which substances are considered as a doping?

Graph 48



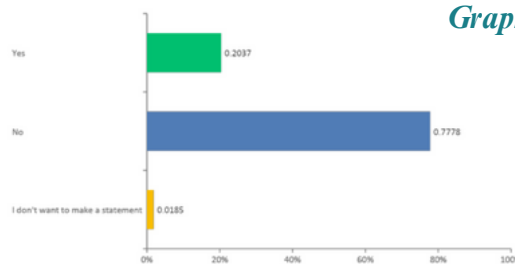
Q7: Have you ever used doping substances in the past?

Graph 49



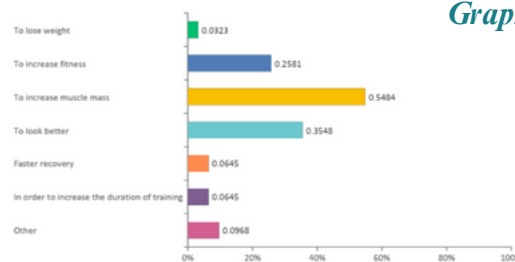
Q8: Are you currently using doping substances?

Graph 50



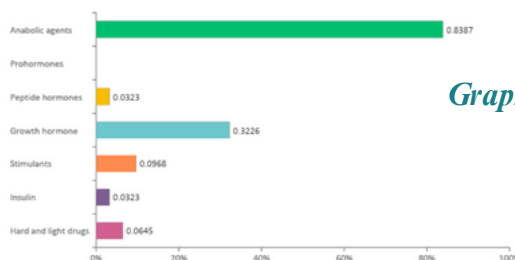
Q9: If your answer to the previous two questions is "YES", why do you use doping substances?

Graph 51

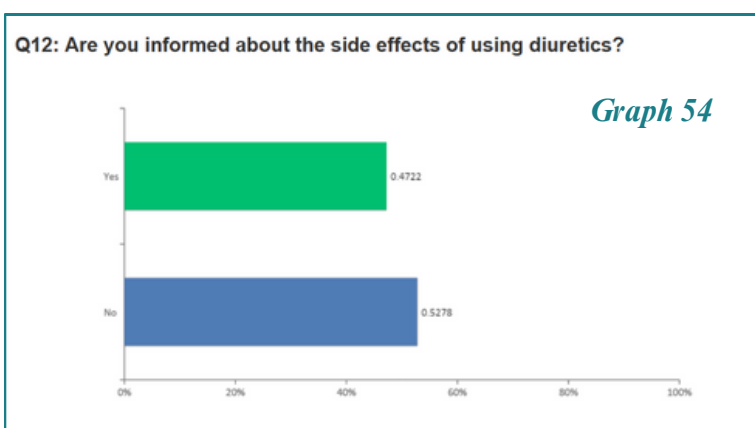
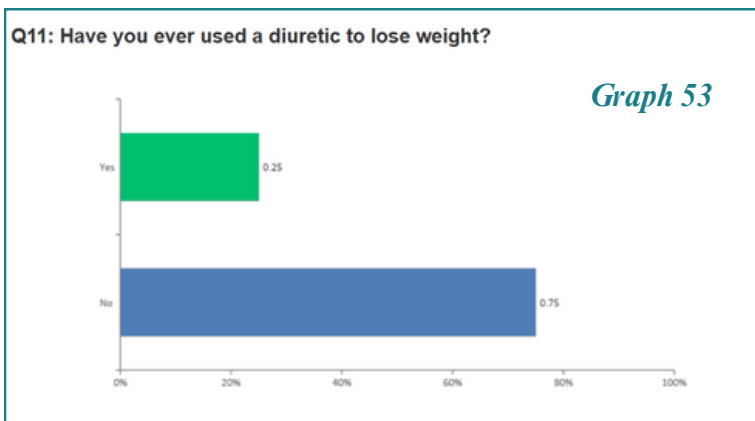


Q10: If you have taken doping substances, what are the substances that you used or still using to increase athletic performance?

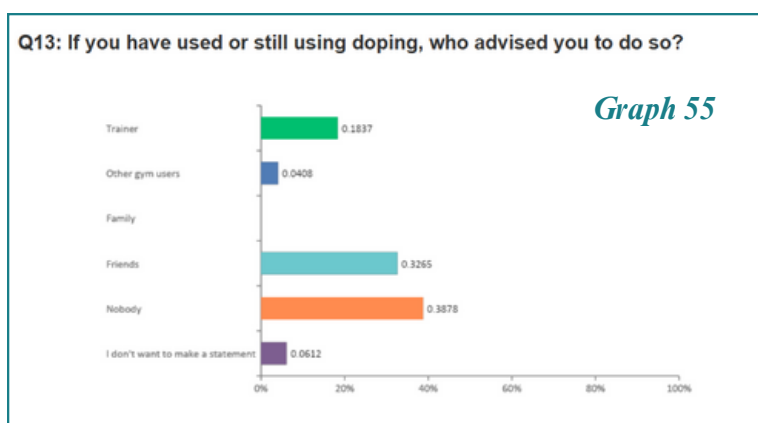
Graph 52



Diuretic use reported in Greece (Q11) is very high (25.00%), significantly higher than any other country. Yet, knowledge of side effects (Q12) is surprisingly low given the high use, with a majority (52.78%) not informed, the lowest awareness level across all countries. This combination presents a serious health concern.

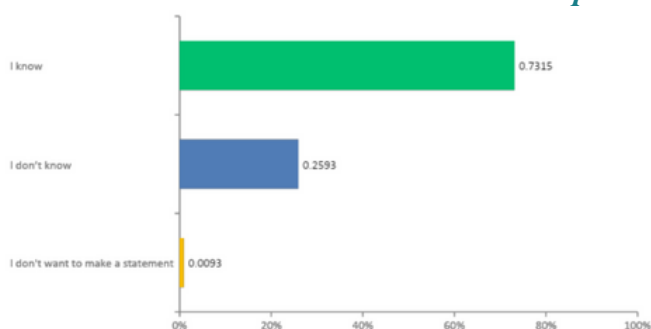


Influence and awareness patterns (Q13, Q14, Q15) differ in Greece. While “Nobody” is still a significant advice source (Q13) at 38.78%, “Friends” (32.65%) are a major source, much more so than elsewhere. “Trainers” (18.37%) also play a more substantial role compared to NMK/SRB/BUL. “Other gym users” are less influential (4.08%). Awareness of others using doping (Q14) is extremely high (73.15%), correlating with high self-reported use, as is awareness of side effects in others (Q15) (62.04%). Social networks and trainers appear significant channels for doping advice, reinforcing the impression of high prevalence.



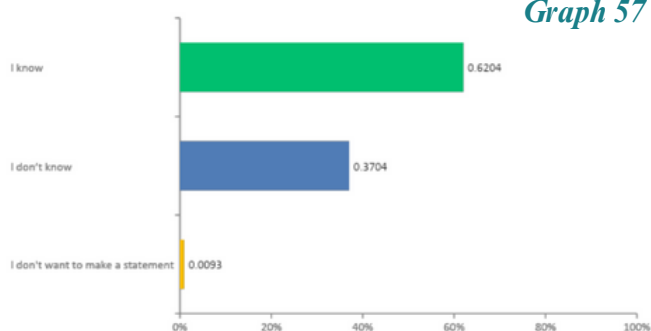
Q14: Do you know someone who uses doping?

Graph 56



Q15: Do you know someone who had side effects from the use of doping substances?

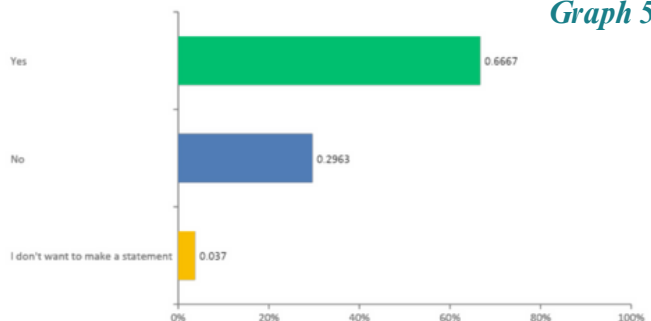
Graph 57



Attitudes and beliefs in Greece (Q16, Q17, Q18, Q19, Q21) show striking contradictions. A strong majority considers doping illegal (Q16) (66.67%), the highest among all countries. However, opinions lean towards it not being immoral (Q17) (51.85% No vs. 42.59% Yes), contrasting with the illegality perception. Uncertainty about pharmacy availability (Q18) is high (52.78% don't know), similar to Serbia, though more believe they are available (31.48%) than not (15.74%). Support for anti-doping campaigns (Q19) is very strong (85.19%), the highest by far. Paradoxically, willingness to report users (Q21) is extremely low (4.63%), the lowest of all countries, despite high anti-doping support, with a large majority (66.67%) explicitly stating they would not report. This suggests a complex attitude where doping might be seen as rule-breaking but socially acceptable or necessary, leading to theoretical support for anti-doping but practical non-compliance.

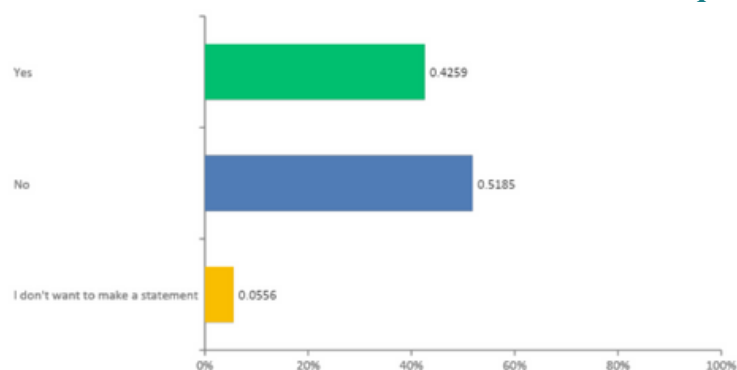
Q16: Do you think that the use of doping is illegal?

Graph 58



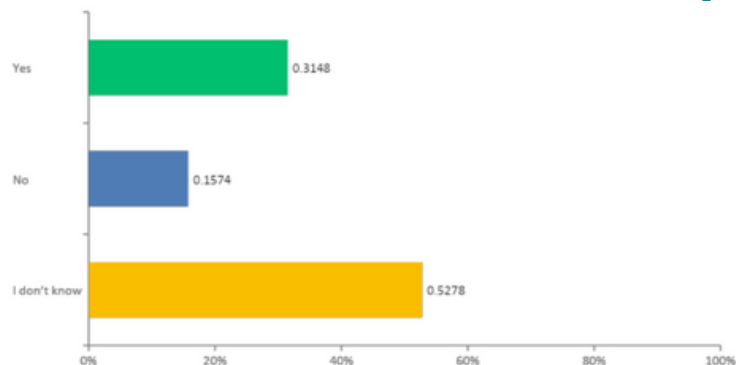
Q17: Do you think that using doping is immoral?

Graph 59



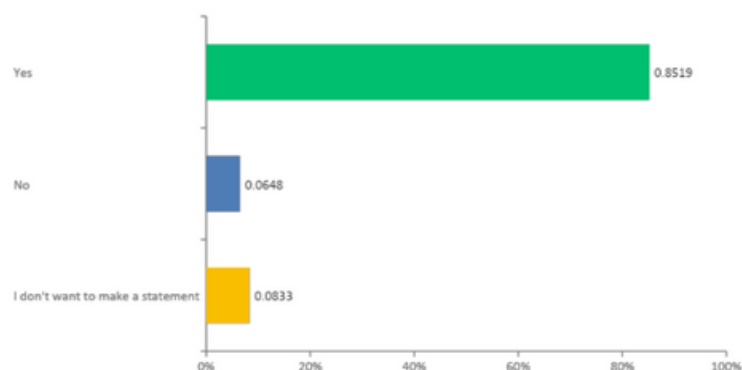
Q18: Do you believe that steroids can be bought in pharmacies?

Graph 60



Q19: Would you support the anti-doping campaign?

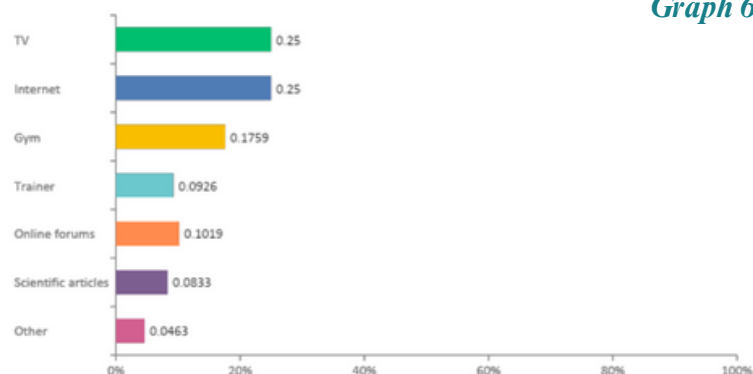
Graph 61



Information sources in Greece (Q20) are balanced: TV (25.00%) and Internet (25.00%) lead, followed by Gym (17.59%), Online forums (10.19%), Trainer (9.26%), and Scientific articles (8.33%). Multiple channels contribute relatively evenly, with trainers being a more significant source here.

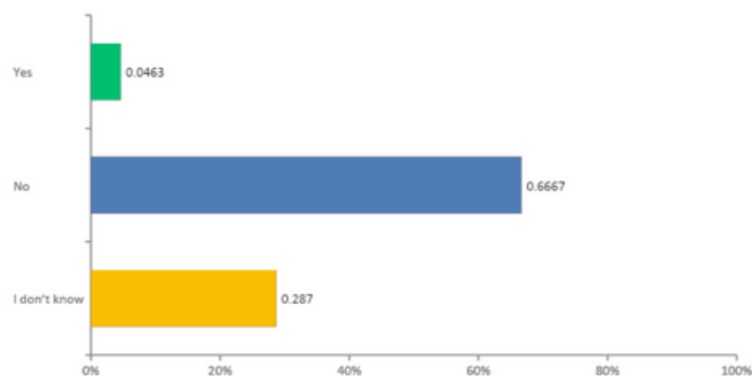
Q20: How did you first learn about doping?

Graph 62



Q21: Would you report someone using doping to the competent anti-doping institution?

Graph 63



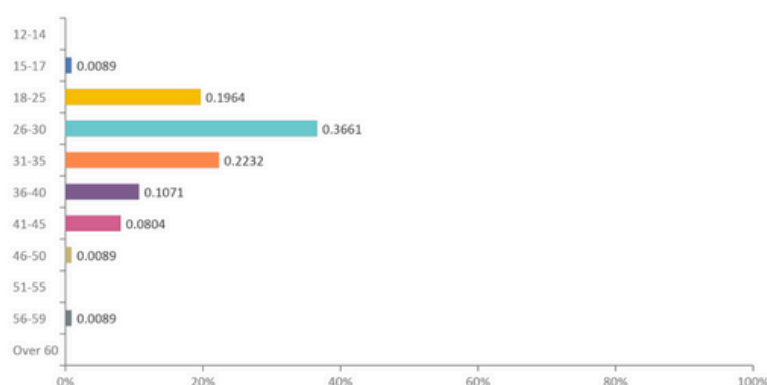
In summary for Greece, the sample stands out dramatically due to exceptionally high self-reported rates of past (Q7, 32%) and current (Q8, 20%) doping use, and very high diuretic use (Q11, 25%). This contrasts starkly with the other Balkan countries. The sample is older, highly educated, male-dominated (Q2), and often uses trainers (Q3). Motivations (Q9) focus on muscle gain and aesthetics, with anabolic agents and growth hormone being primary substances (Q10). Friends and trainers are more significant sources of advice (Q13). Awareness of doping (Q14) and side effects (Q15) in others is pervasive. Paradoxically, this group shows the strongest support for anti-doping campaigns (Q19) and belief in doping's illegality (Q16), yet has the absolute lowest willingness to report users (Q21) and a tendency not to view use as immoral (Q17). These high reported rates and contradictions warrant further investigation.

North Macedonia

Regarding demographics (Q1, Q2, Q4), the largest group of respondents in North Macedonia falls within the 26-30 age bracket (36.61%), followed by 31-35 (22.32%) and 18-25 (19.64%), suggesting the sample primarily consists of young to middle-aged adults actively engaged in recreation. Very few participants were under 18 or over 45. There is a slight female majority (54.46% Female vs. 45.54% Male). The sample is highly educated, with 83.04% holding a university degree and only a very small fraction having primary or secondary education as their highest level. This high education level might correlate with better access to information but doesn't necessarily prevent doping use, and the age distribution aligns with common gym-going demographics.

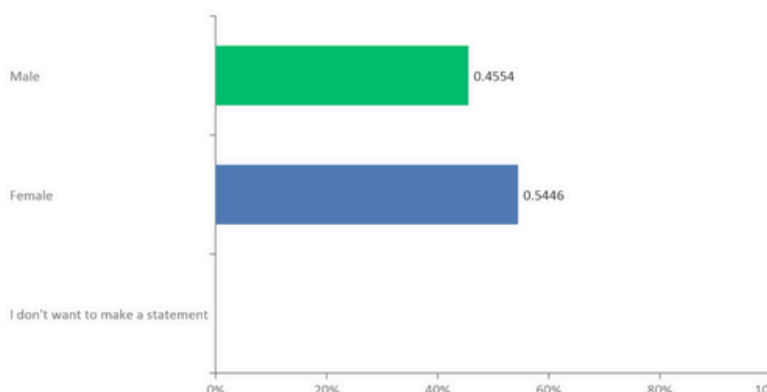
Q1: How old are you?

Graph 64



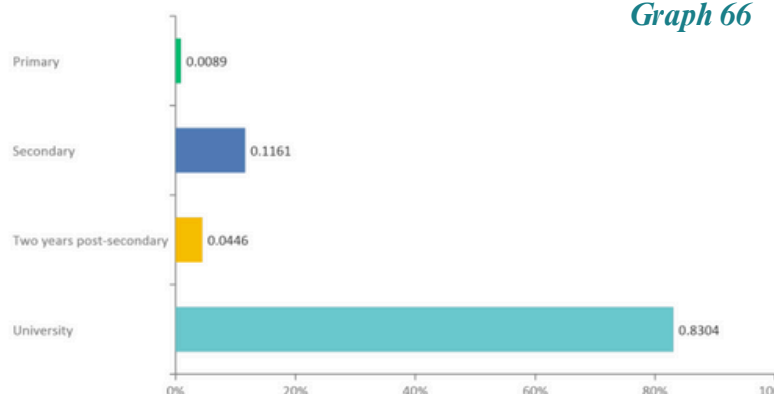
Q2: What gender are you?

Graph 65



Q4: What level of education have you completed?

Graph 66

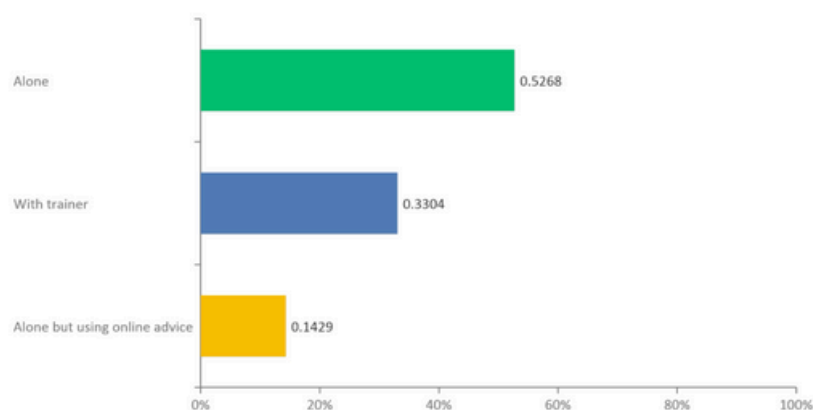


North Macedonia

In terms of exercise habits (Q3, Q5), a majority train alone (52.68%), while a significant portion uses a trainer (33.04%), and a smaller group relies on online advice (14.29%). Most exercise frequently, with 54.46% training more than 3 times per week and 33.04% training 2-3 times per week. Daily exercise is less common (7.14%), and infrequent exercise is rare. The high frequency of exercise indicates a committed group of recreational athletes. The significant number training alone might mean less direct professional supervision regarding substances.

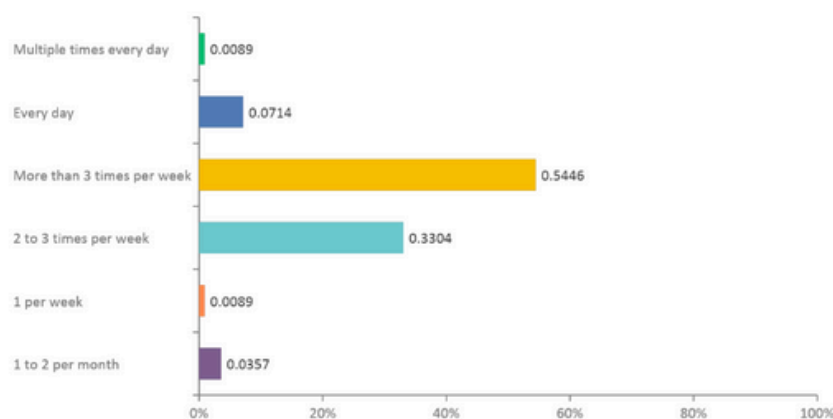
Q3: Do you practice alone or with a trainer?

Graph 67



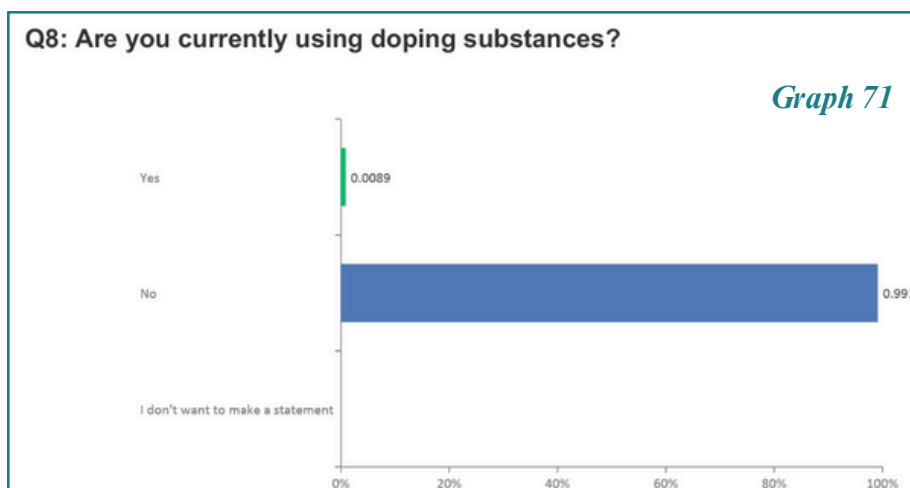
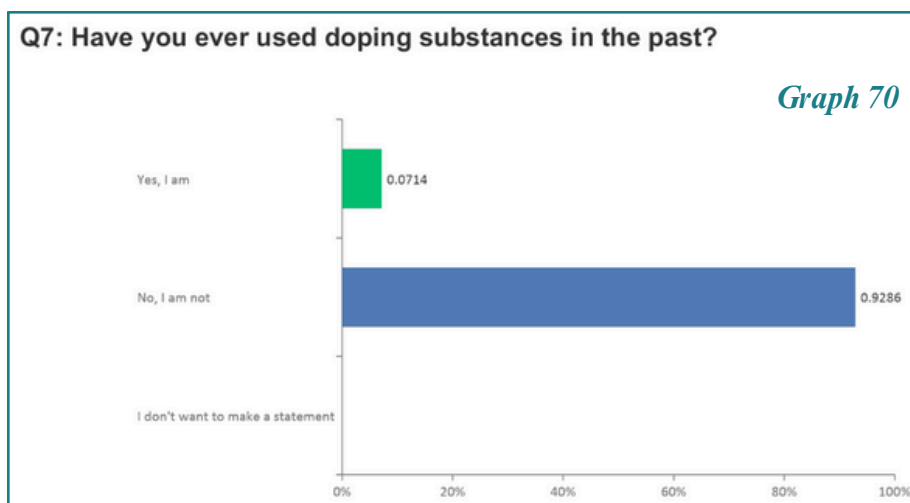
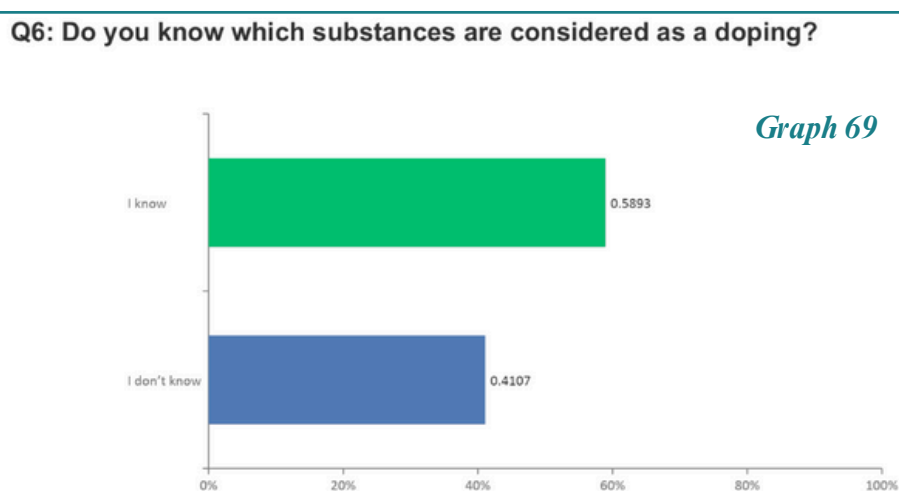
Q5: How often do you exercise?

Graph 68



North Macedonia

Concerning doping knowledge and use (Q6, Q7, Q8, Q9, Q10), a moderate majority (58.93%) claim to know which substances are considered doping (Q6), but a substantial minority (41.07%) admit they do not know, which is a concern. A small percentage (7.14%) admit to having used doping substances in the past (Q7), while reported current use is very low (0.89%, Q8). Among those who reported use (past or present), the primary stated reasons (Q9) are increasing muscle mass (41.67%), losing weight (33.33%), looking better (25.00%), and increasing fitness (25.00%). “Other” reasons were also significant (58.33%), indicating motivations not captured by the specific options and warranting further investigation.

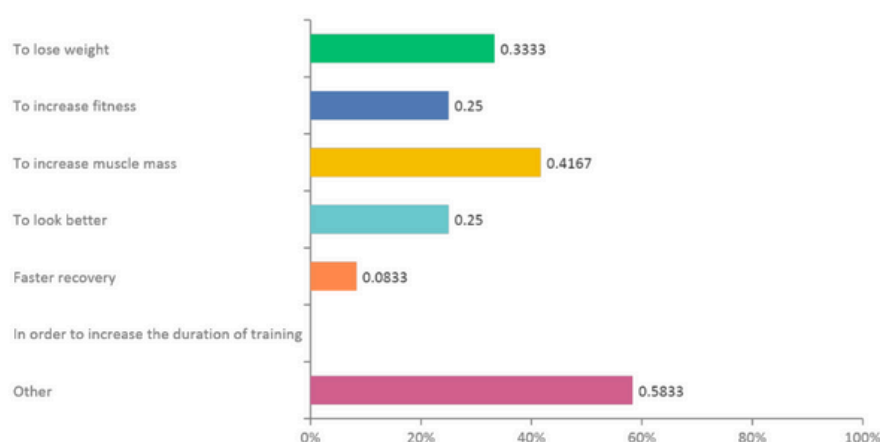


North Macedonia

Anabolic agents are overwhelmingly the most reported substance category used (Q10) at 85.71%, with peptide hormones, growth hormone, and hard/light drugs mentioned by a smaller fraction (14.29% each). While reported current use is minimal, past use is slightly higher, suggesting some experimentation or discontinued use. Motivations are mixed but lean towards physique enhancement and performance, and the dominance of anabolic agents aligns with common patterns in recreational settings.

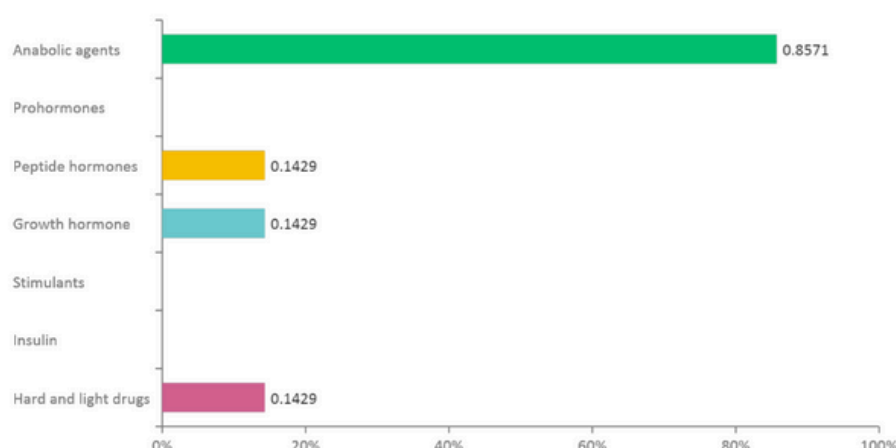
Q9: If your answer to the previous two questions is "YES", why do you use doping substances?

Graph 72

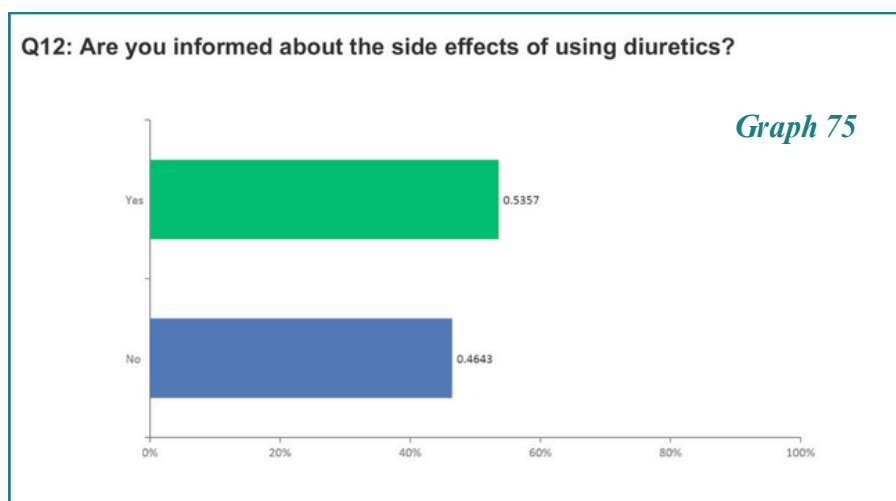
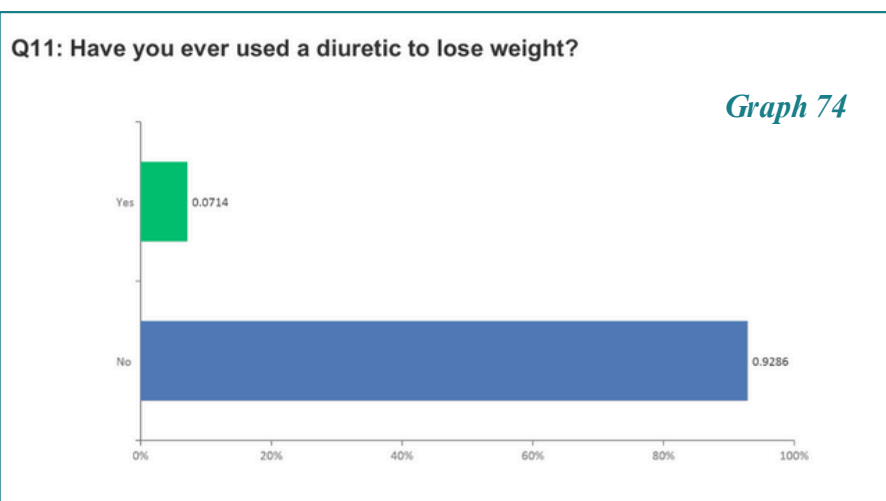


Q10: If you have taken doping substances, what are the substances that you used or still using to increase athletic performance?

Graph 73

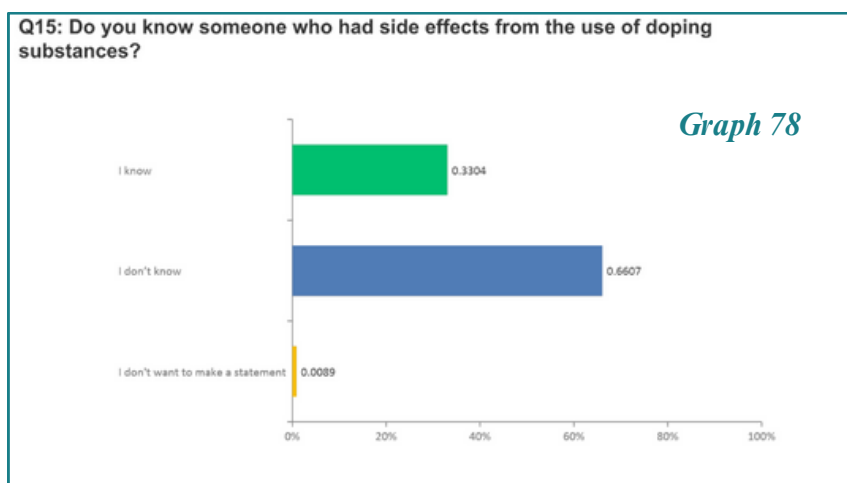
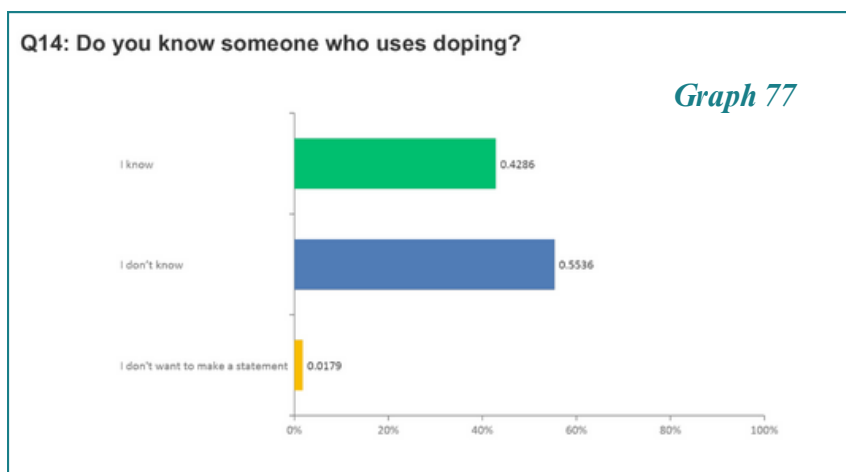
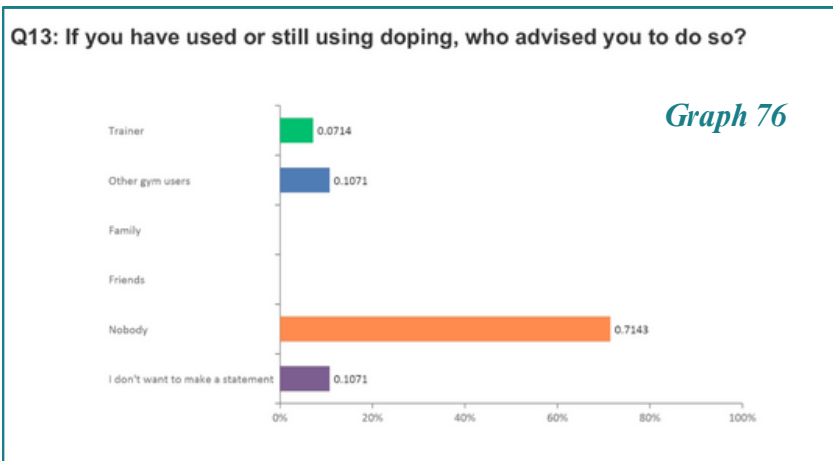


Regarding diuretics (Q11, Q12), 7.14% reported using them to lose weight (Q11), mirroring the percentage of past doping users. Awareness of diuretic side effects (Q12) is split almost evenly (53.57% Yes, 46.43% No). Diuretic use for weight loss is present but not widespread, and the lack of awareness regarding side effects in nearly half the sample is concerning given potential health risks.



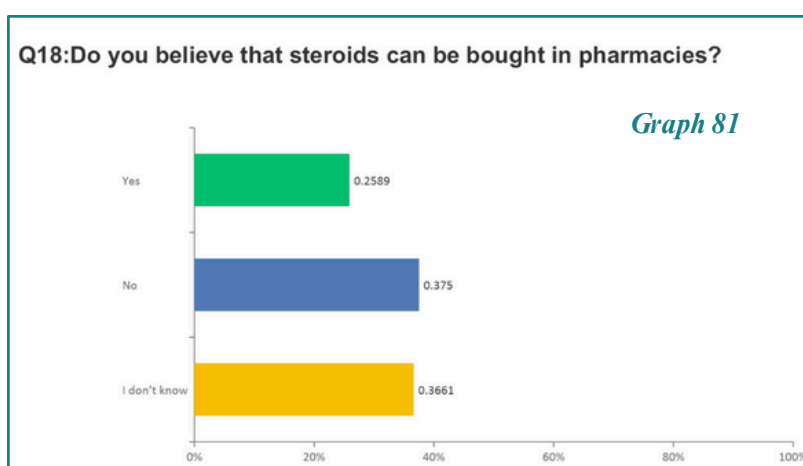
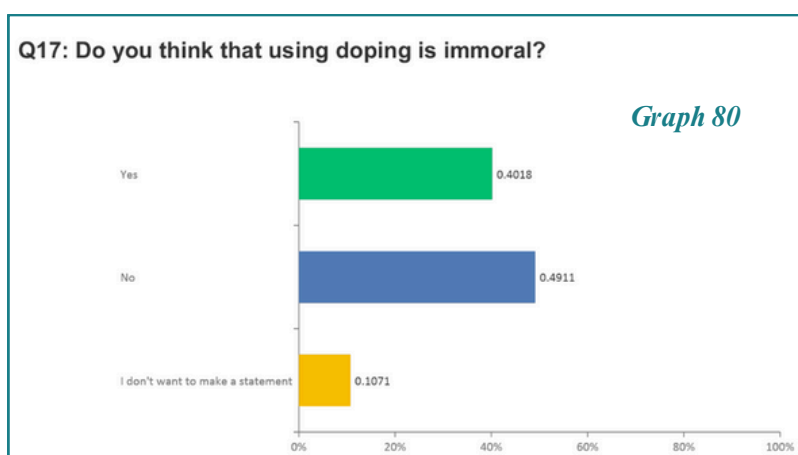
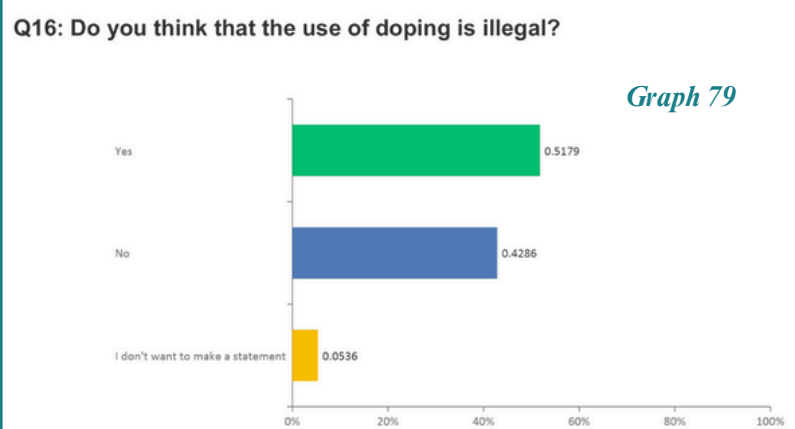
North Macedonia

Looking at influence and awareness (Q13, Q14, Q15), the vast majority of users (71.43%) stated nobody advised them to use doping substances (Q13). Trainers (7.14%) and other gym users (10.71%) played minor roles, while a notable portion (10.71%) preferred not to state. 42.86% know someone who uses doping (Q14), and 33.04% know someone who experienced side effects (Q15). Users largely claim personal initiative for doping, though underreporting external influence is possible. Awareness of doping in their social/gym circles is substantial, as is awareness of associated side effects, even if personal reported use is low.



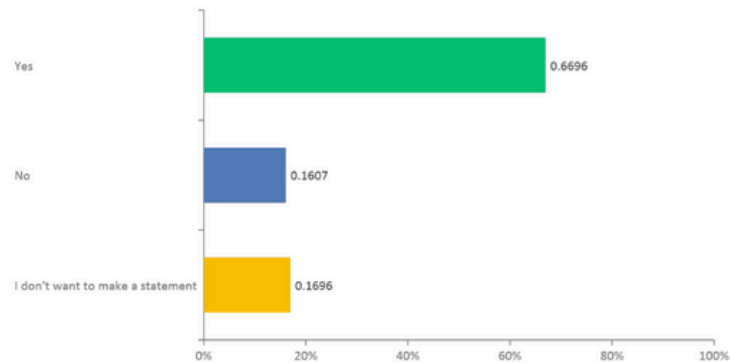
North Macedonia

Attitudes and beliefs about doping (Q16, Q17, Q18, Q19, Q21) show significant ambiguity. Views are split on legality (Q16), with a slight majority considering it illegal (51.79%) but a large minority disagreeing (42.86%). Similarly, opinions on morality (Q17) are divided but lean towards not immoral (49.11% No vs. 40.18% Yes), with a significant portion (10.71%) not stating. Most believe steroids are not available in pharmacies (Q18) (37.50%) or don't know (36.61%), while only 25.89% think they are. A strong majority (66.96%) support anti-doping campaigns (Q19). However, despite supporting campaigns, very few (11.61%) would report a user (Q21); half (50.89%) explicitly would not, and many are unsure (37.50%). This suggests a “live and let live” attitude or fear of repercussions, indicating that principled support doesn't translate into enforcement willingness. Beliefs about pharmacy availability might reflect regulations or lack of knowledge.



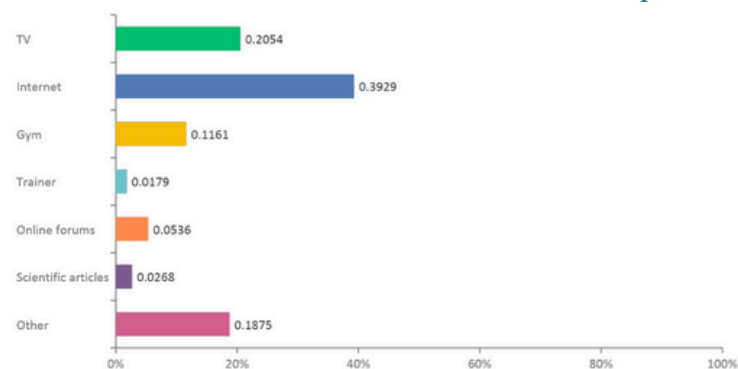
Q19: Would you support the anti-doping campaign?

Graph 82



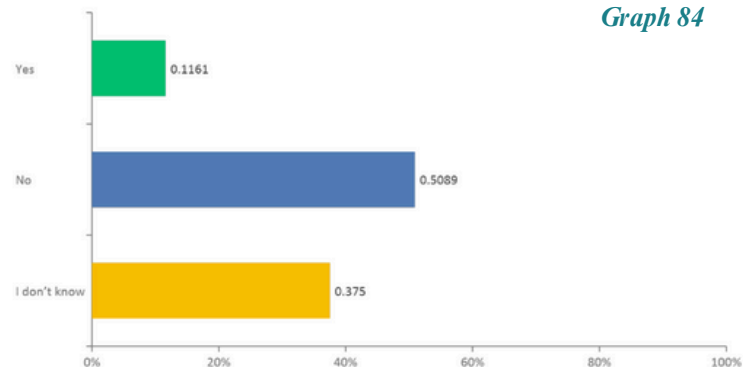
Q20: How did you first learn about doping?

Graph 83



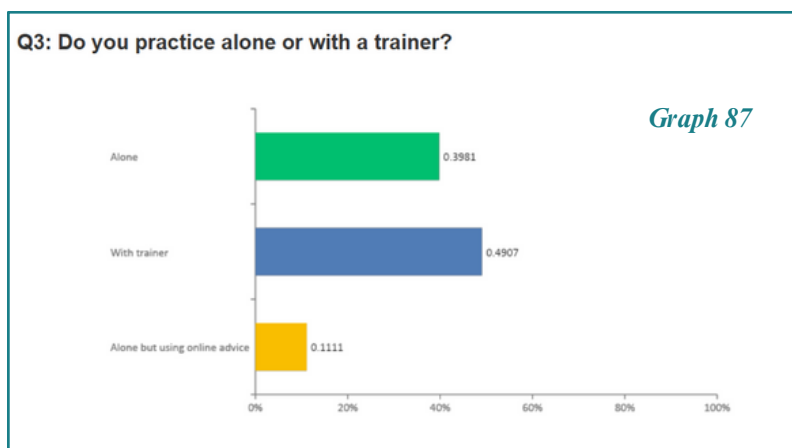
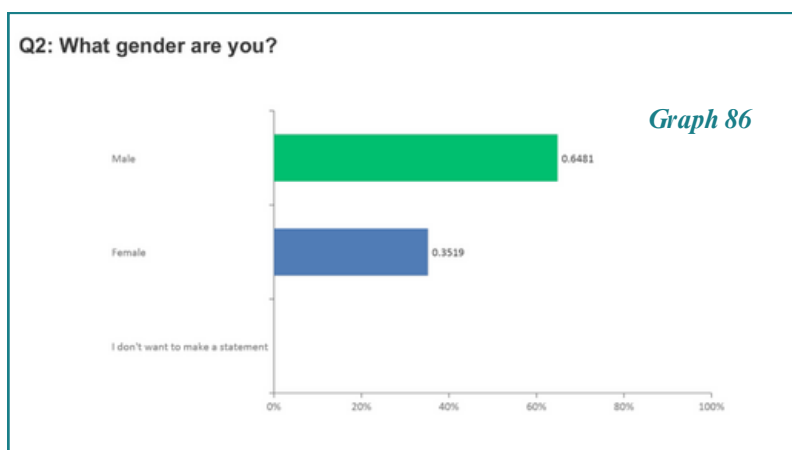
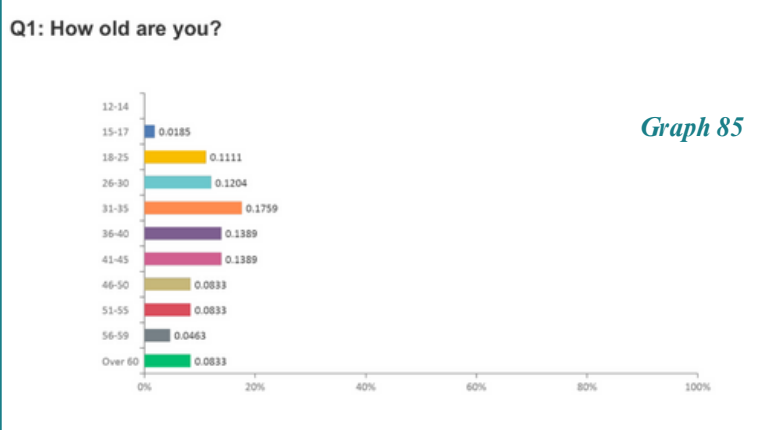
Q21 - Would you report someone using doping to the competent anti-doping institution?

Graph 84



Average doping use and knowledge among recreational athletes across four Balkan countries

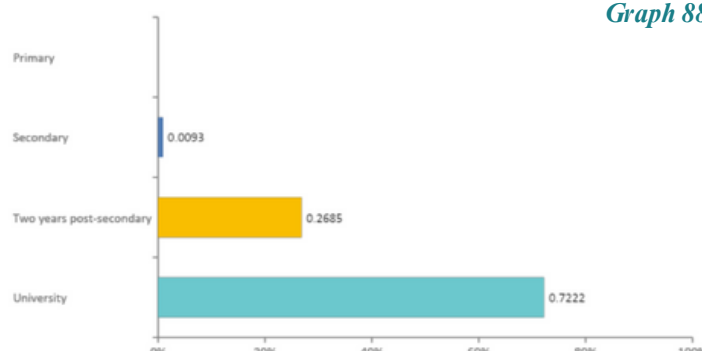
The age distribution of participants (Q1) indicates that most recreational athletes are young adults, with the largest group aged between 18-25 years (27.85%), followed by 26-30 years (20.70%) and 31-35 years (15.49%). Participants over 60 years represent only a small percentage (2.41%). Regarding gender (Q2), males slightly outnumber females, comprising 56.11% of the sample, while females account for 43.21%, and a small percentage chose not to specify (0.69%). Analysis of training methods (Q3) shows most participants exercise alone (59.57%), while nearly a third train with a professional trainer (30.70%), and approximately 10% practice alone but rely on online advice. Educational levels (Q4) reveal a high proportion of university-educated individuals (61.99%). Secondary education is completed by 22.08%, two years post-secondary by 12.46%, and primary education by 3.47%. Exercise frequency (Q5) is generally high, with nearly half the participants (49.57%) exercising more than three times per week. Daily exercisers represent 14.84%, while those training 2-3 times per week account for 26.94%.



Average doping use and knowledge among recreational athletes across four Balkan countries

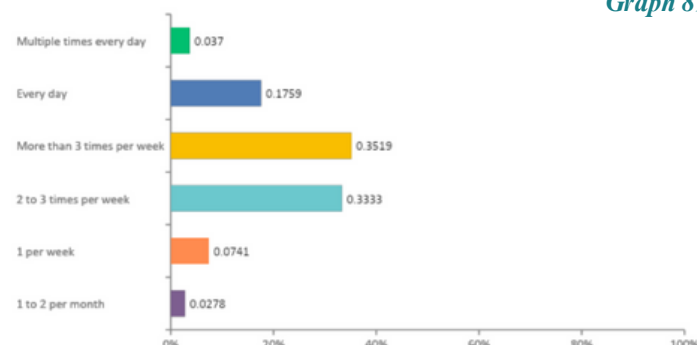
Q4: What level of education have you completed?

Graph 88



Q5: How often do you exercise?

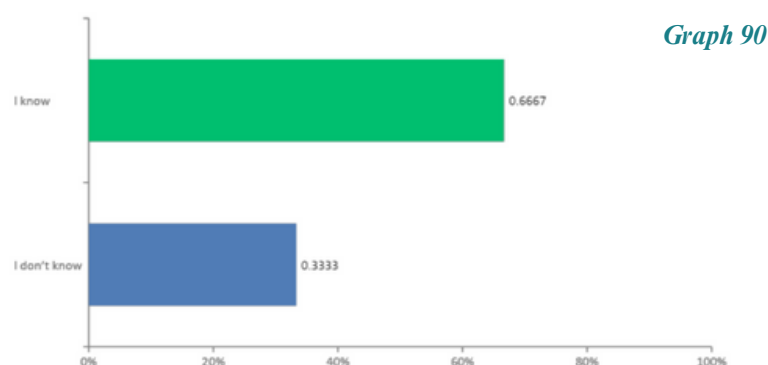
Graph 89



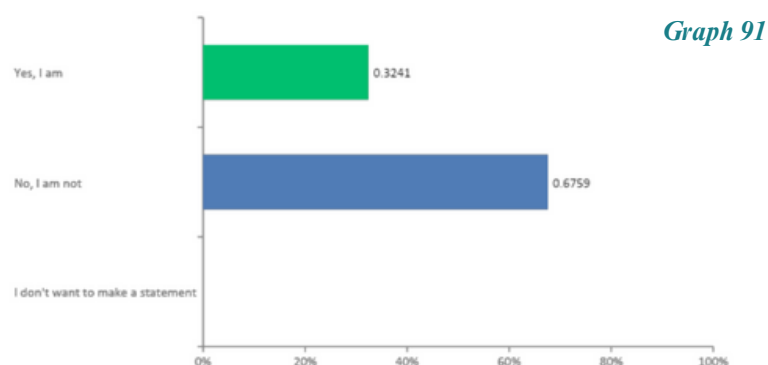
Knowledge of doping substances (Q6) is prevalent, with 66.81% of respondents claiming awareness, although a significant proportion (33.19%) report lacking this knowledge. Data on substance use shows that past doping usage (Q7) is relatively high, with 14.17% admitting previous use, where as the majority (83.82%) state they have never used doping substances. Current doping usage (Q8) is lower, with only 6.31% acknowledging present use, while the vast majority (90.75%) denies current doping practices. Among those reporting doping substance use (past or present), the primary motivations cited (Q9) include increasing muscle mass (34.18%) and improving appearance (21.66%). Other frequent reasons were increasing fitness (18.75%) and weight loss (13.55%). A notable percentage of respondents (43.39%) also cited unspecified “other” reasons. The types of doping substances most commonly reported (Q10) were anabolic agents (67.21%), followed by growth hormone (23.59%) and peptide hormones (12.68%). Stimulants (11.68%) and prohormones (5.65%) were also mentioned.

Average doping use and knowledge among recreational athletes across four Balkan countries

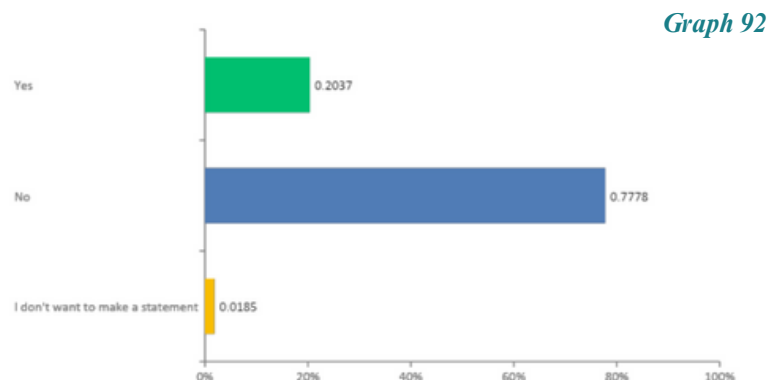
Q6: Do you know which substances are considered as a doping?



Q7: Have you ever used doping substances in the past?

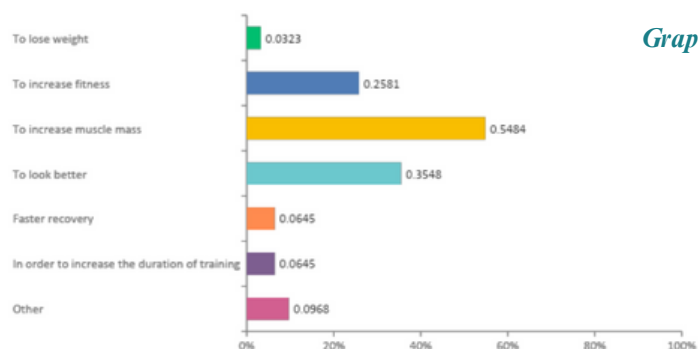


Q8: Are you currently using doping substances?



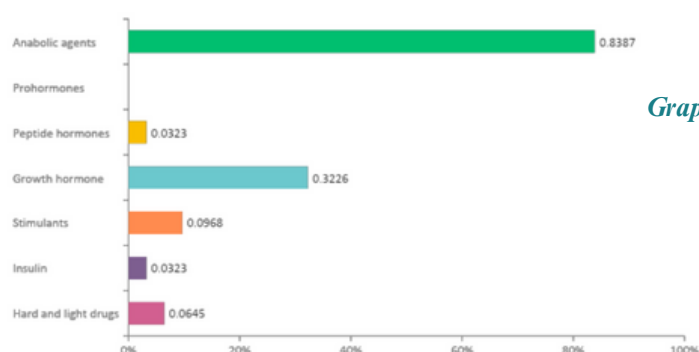
Average doping use and knowledge among recreational athletes across four Balkan countries

Q9: If your answer to the previous two questions is "YES", why do you use doping substances?



Graph 93

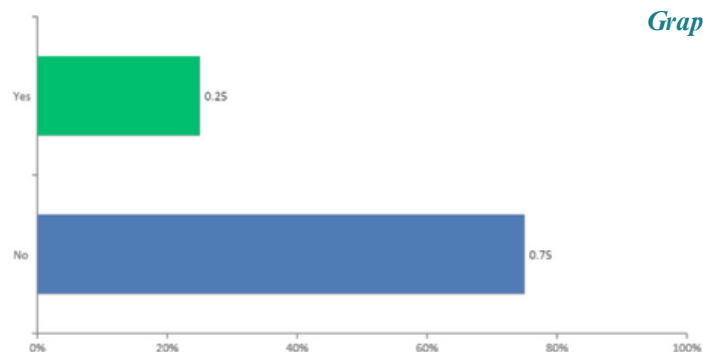
Q10: If you have taken doping substances, what are the substances that you used or still using to increase athletic performance?



Graph 94

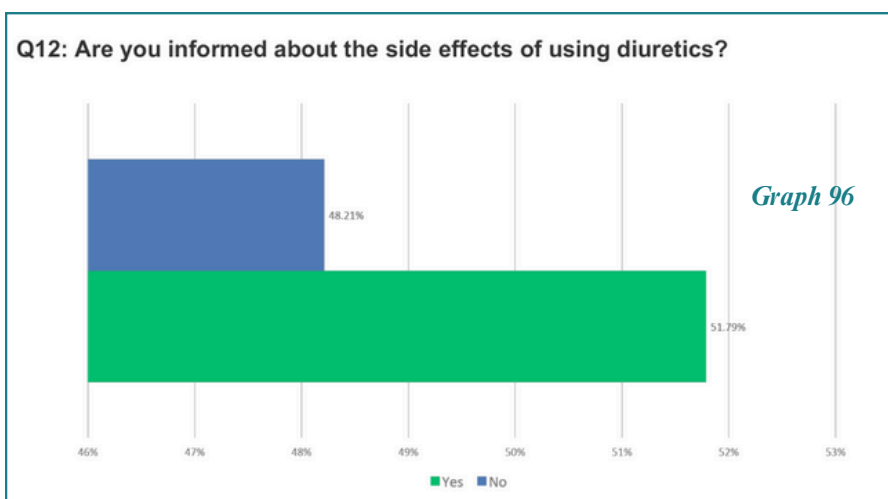
Regarding diuretics specifically, use for weight loss (Q11) was reported by 13.68% of participants, while most (86.32%) deny having used them for this purpose. Awareness of diuretics' side effects (Q12) is nearly evenly split across the sample, with slightly more respondents informed (51.79%) than uninformed (48.21%).

Q11: Have you ever used a diuretic to lose weight?

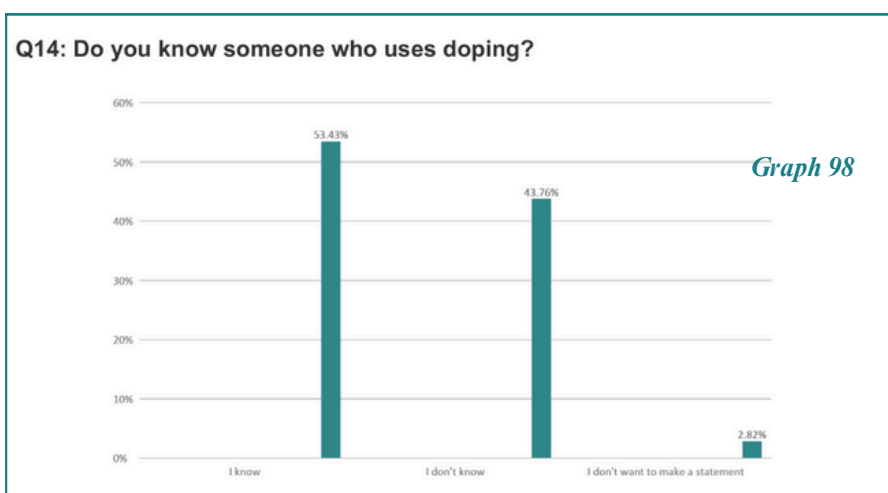
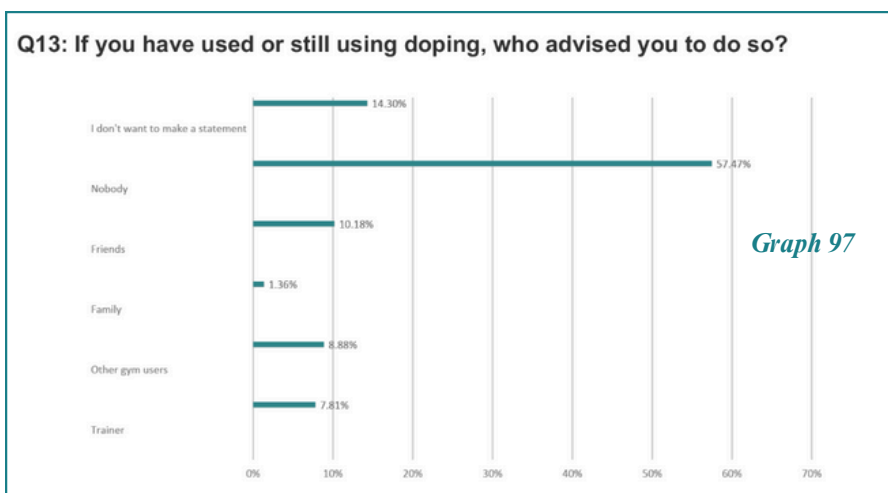


Graph 95

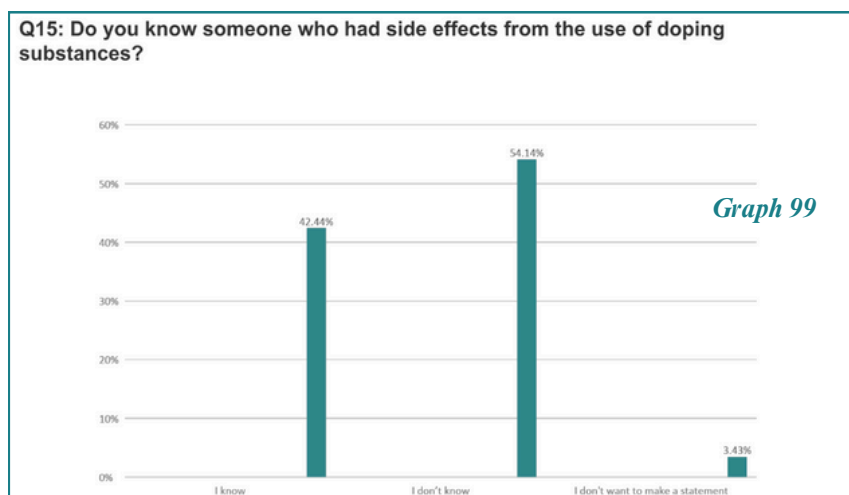
Average doping use and knowledge among recreational athletes across four Balkan countries



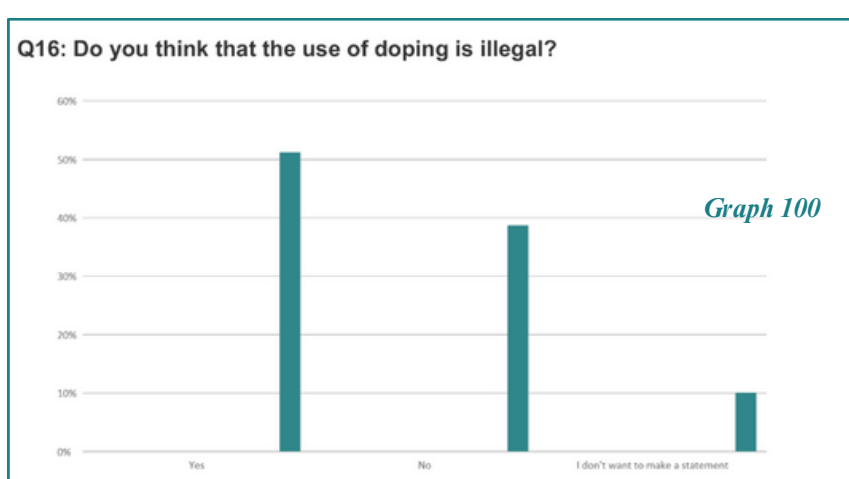
When exploring influences and awareness within the participants' environment, most users (57.47%) reported receiving no advice regarding doping (Q13). However, friends (10.19%), other gym users (8.88%), and trainers (7.81%) were mentioned as notable sources of advice. Knowledge about others using doping substances (Q14) is significant, with 53.43% acknowledging knowing someone who dopes, compared to 43.76% who do not. Awareness of doping side effects experienced by others (Q15) is also substantial, with 42.44% knowing someone affected, though a majority (54.14%) do not know anyone impacted by side effects.



Average doping use and knowledge among recreational athletes across four Balkan countries

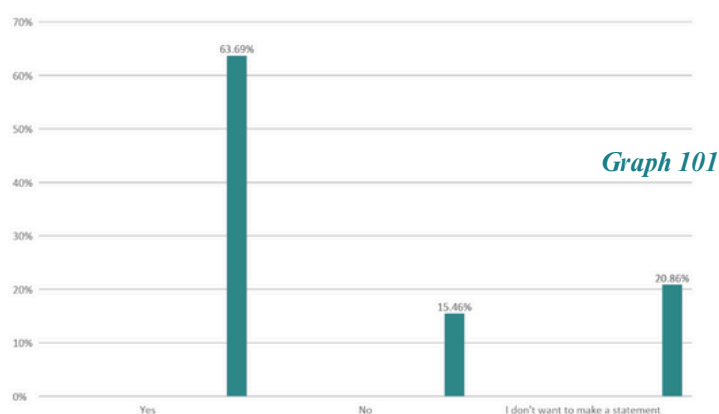


Attitudes towards doping reveal some ambivalence. Slightly over half (51.21%) believe doping is illegal (Q16), whereas a significant minority (38.70%) does not consider it illegal. Views toward the morality of doping (Q17) are mixed; 40.10% view doping as immoral, while a higher percentage (47.07%) do not regard it as immoral. There is considerable uncertainty regarding the availability of steroids in pharmacies (Q18): 32.59% believe steroids can be bought there, but 41.47% are unsure. Despite these mixed views, support for anti-doping campaigns (Q19) is generally strong, with 63.69% willing to support such initiatives, and only 15.46% explicitly refusing support. Participants primarily learned about doping (Q20) from the Internet (31.78%), followed by TV (18.92%) and gyms (14.53%). Trainers and scientific literature were less common sources. Finally, reluctance to report doping use to authorities (Q21) is notable; only 15.34% would report users, while almost half (49.69%) explicitly would not, and 34.97% remain uncertain.

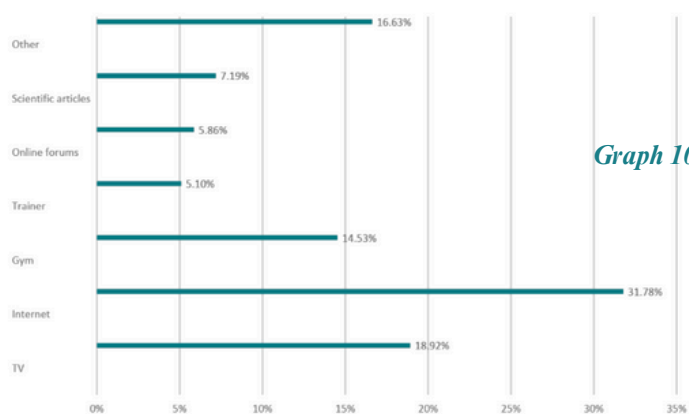


Average doping use and knowledge among recreational athletes across four Balkan countries

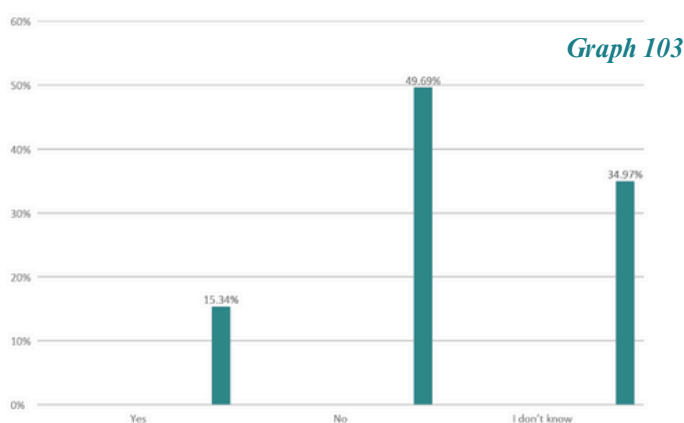
Q19: Would you support the anti-doping campaign?



Q20: How did you first learn about doping?



Q21: Would you report someone using doping to the competent anti-doping institution?



This study aimed to explore doping knowledge, attitudes, and self-reported use among recreational athletes across four Balkan countries: North Macedonia, Serbia, Bulgaria, and Greece. The findings reveal a complex picture characterized by both shared trends and significant national variations, particularly concerning the prevalence of doping use.

Participant Profile and Context

Across all four nations, the participants largely fit the profile of young to middle-aged adults (Q1), predominantly possessing higher education qualifications (Q4), and demonstrating a strong commitment to regular exercise (Q5). This profile suggests a population group that is potentially health-conscious and capable of accessing information, yet also potentially exposed to or interested in methods for enhancing physical performance or appearance, common drivers in recreational fitness environments. While demographics were broadly similar, variations existed, such as a more pronounced male majority in Serbia and Greece (Q2), a slightly older average age in the Greek sample (Q1), and differing preferences for training alone versus with a trainer (Q3), with Greek participants showing a much higher reliance on trainers. These nuances in demographics and training habits might subtly influence exposure to doping substances, sources of information, and social norms surrounding their use within specific national contexts.

Doping Knowledge vs. Reported Use

A generally moderate-to-high level of self-reported knowledge about which substances constitute doping was observed (Q6), particularly in Bulgaria where nearly three-quarters claimed awareness. However, this knowledge did not uniformly correlate with low usage rates. While North Macedonia, Serbia, and Bulgaria reported low current use rates (around 1-2%, Q8), Greece reported a strikingly high current use rate exceeding 20%. This divergence underscores that simply knowing what doping is does not equate to abstention, and other factors heavily influence the decision to use performance-enhancing substances. The significant minority in all countries (around one-third overall) admitting lack of knowledge (Q6) also highlights a persistent need for basic education.

The most dramatic finding is the exceptionally high self-reported doping prevalence in Greece, both for past (Q7: 32%) and current use (Q8: 20%), compared to the other surveyed nations. While acknowledging the inherent limitation of self-reported data, which likely underestimates true prevalence due to social desirability bias across all samples, the magnitude of the difference reported by Greek participants demands specific attention. Several potential factors, individually or in combination, might contribute to this discrepancy:

- **Higher Actual Prevalence:** Doping use might genuinely be more widespread within the sampled Greek recreational athlete population, possibly due to differing cultural attitudes towards body image and performance enhancement, greater substance availability, or more established social norms favoring use within certain fitness circles.
- **Reporting Differences:** Greek respondents might have been more candid or less hesitant to admit substance use compared to their counterparts in other countries. Alternatively, subtle differences in survey administration or perceived anonymity could have influenced responses.
- **Sampling Bias:** The specific gyms or recruitment methods used in Greece might have inadvertently targeted a sub-population with higher-than-average doping usage rates.
- **Definitional Interpretation:** While less likely given the similar Q6 results and the focus on classic PEDs in Q10 responses (anabolics, GH), a slightly broader interpretation of “doping” cannot be entirely excluded without further clarification. Resolving this requires further investigation, potentially employing different methodologies (e.g., qualitative interviews, indirect questioning techniques) to understand the underlying reasons for this pronounced difference.

Substance Choices and Motivations

The prevalence of anabolic agents (Q10) as the most commonly reported substance category across all countries aligns with the frequently cited motivations (Q9) of increasing muscle mass and improving appearance, particularly dominant in Greece. This suggests a strong focus on aesthetic enhancement within these recreational settings. Variations were noted: Greece and Bulgaria showed significant reported use of growth hormone, perhaps indicating more advanced users or different physique goals. Serbia reported a wider mix including stimulants and hard/light drugs, potentially suggesting some overlap between performance enhancement and recreational drug use patterns in that sample. The importance of “faster recovery” as a motivation in Bulgaria (Q9) might correlate with different training intensities or goals compared to other nations.

Diuretics: A Specific Concern

The use of diuretics for weight loss (Q11) presented another area of concern, particularly given its high prevalence in Greece (25%) and Bulgaria (18%). Compounding this was the poor awareness of associated side effects (Q12), especially in Greece and Serbia where roughly half the respondents were uninformed. This combination of relatively high use and low risk awareness signifies a potential public health issue needing targeted educational intervention.

Sources of Influence and Information

The study revealed interesting differences in perceived sources of advice for doping use (Q13). While athletes in North Macedonia, Serbia, and Bulgaria predominantly claimed self-initiation (“Nobody” advised them), respondents in Greece reported significant influence from friends (32.65%) and trainers (18.37%). This suggests that social networks and fitness professionals may play a more pivotal role in decisions around doping in the Greek context, offering potential avenues for intervention. Across all nations, the Internet emerged as the primary source of information (Q20), emphasizing the critical need for accessible, accurate, and credible online resources regarding performance-enhancing substances and their risks.

Attitudes, Ethics, and Reporting Behaviour

Attitudes towards doping were complex and often contradictory. Ambiguity surrounded the perceived legality (Q16) and morality (Q17) of doping, particularly in Serbia and Bulgaria where opinions were sharply divided. Greece presented a significant paradox: respondents there were most likely to deem doping illegal (Q16) and showed the strongest support for anti-doping campaigns (Q19), yet simultaneously reported the highest usage rates (Q8) and the absolute lowest willingness to report others (Q21). This disconnect might reflect cognitive dissonance, a normalization of doping within their specific environment despite acknowledging its rule-breaking nature, or a belief that doping is necessary to achieve desired results. Crucially, the low willingness to report users (Q21) was a consistent theme across all four countries, representing a major obstacle for implementing effective anti-doping measures within recreational sport environments. It suggests a prevailing culture of non-interference or perhaps fear of social repercussions.

The primary limitation remains the reliance on self-reported data, susceptible to social desirability bias and potential underreporting of sensitive behaviours like doping use. Cross-country comparisons should also consider potential cultural nuances in interpreting questions and varying levels of trust in survey confidentiality. Sampling methods, while aimed at recreational athletes in gyms, might not perfectly represent the entire population of recreational exercisers in each country.

Conclusion and Implications

In conclusion, while recreational athletes across these four European nations share characteristics like high education and commitment to exercise, significant differences exist in their doping-related knowledge, attitudes, influences, and critically, their reported prevalence of use.

The extremely high rates reported in Greece stand in stark contrast to North Macedonia, Serbia, and Bulgaria, highlighting a phenomenon requiring urgent further exploration. A consistent and concerning finding across all countries is the substantial gap between theoretical support for anti-doping principles and the practical reluctance to engage in reporting behaviours, coupled with knowledge deficits regarding the risks of certain substances like diuretics.

These findings have important implications for anti-doping policy and education in recreational settings. A one-size-fits-all approach may be ineffective; strategies likely need tailoring to address specific national contexts, prevalence rates, dominant substances, key influencers (like peers and trainers in Greece), and identified knowledge gaps. Efforts must focus not only on providing information (especially via trusted online channels) but also on addressing the underlying attitudes, social norms, and perceived pressures that contribute to doping use.

Bridging the gap between stated anti-doping support and the unwillingness to report requires fostering environments where athletes feel safe and motivated to uphold clean sport principles. Further research, including qualitative studies, is essential to delve deeper into the prevalence of use of doping substances and the pervasive attitude-behaviour inconsistencies observed across the region.

National Anti-Doping Organizations:

- Anti-Doping Agency of Serbia (ADAS): <https://www.adas.org.rs>
- Bulgarian Anti-Doping Centre: <https://anti-doping.government.bg/en/>
- Hellenic Anti-Doping Organization (HADA): <https://eokan.gr/enhttps://anti-doping.government.bg+1MDPI+1eokan.kmaxweb.eu+2eokan.gr+2eokan.gr+2>

International Conventions and Standards:

- UNESCO International Convention against Doping in Sport: <https://www.unesco.org/en/convention-against-doping-sport>
- Council of Europe Anti-Doping Convention (ETS No. 135): <https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/135>
- World Anti-Doping Code 2021 (WADA): <https://www.wada-ama.org/en/resources/world-anti-doping-code-and-international-standards/world-anti-doping-codeUNESCO+1UNESCO+1Portalwada-ama.org>

European Union Policy and Strategy Documents:

- EU Work Plan for Sport 2021–2024: <https://www.europarl.europa.eu/cmsdata/281132/European%20Union%20Work%20Plan%20for%20Sport.pdf>
- White Paper on Sport (COM(2007) 391 final): <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=legisum%3A135010>
- Tackling Doping in Sport (SEC(2007) 935): <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52007SC0935>
- Study on Doping Prevention Measures in Recreational Sport: https://ec.europa.eu/assets/eac/sport/news/2014/docs/doping-prevention-report_en.pdf
- Erasmus+ Programme Guide – Sport Chapter: <https://erasmus-plus.ec.europa.eu/erasmus-programme-guide>
- EU Youth Strategy 2019–2027: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52018DC0269>
- European Parliament Resolution on the European Dimension in Sport (P7_TA(2012)0025): https://www.europarl.europa.eu/doceo/document/TA-7-2012-0025_EN.pdf
- Green Paper: Promoting Healthy Diets and Physical Activity (COM(2005) 637 final): <https://eur-lex.europa.eu/EN/legal-content/summary/green-paper-on-promoting-healthy-diets-and-physical-activity.html?fromSummary=29>
- EU Action Plan on Childhood Obesity 2014–2020: https://health.ec.europa.eu/publications/eu-action-plan-childhood-obesity-2014-2020_enEuropean ParliamentEUR-Lex+1EUR-Lex+1European CommissionErasmus+EUR-LexPublic Health

Additional Resources:

- Anti-Doping e-Learning Platform (ADeL) – WADA: <https://adel.wada-ama.org/>
- Anti-Doping Measures Targeting Fitness and Gym Users – Council of Europe Study: <https://rm.coe.int/t-do-2024-09-en-recreational-sport-final-report/1680aefe17>