

Anti-Doping Agency of Kenya -Kenyatta University -World Anti-Doping Agency

DOPING KNOWLEDGE, PREVALENCE, AND PREDISPOSING FACTORS AMONG ATHLETES IN DOMINANT OLYMPIC SPORTS IN KENYA

A REPORT COMPILED FOR WORLD ANTI-DOPING AGENCY (WADA)

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ABBREVIATIONS AND ACRONYMS

ADAK	Anti-Doping Agency of Kenya
ADOS	Anti-Doping Organizations
WA	World Athletics
AIU	Athletic Integrity Unit
GoK	Government of Kenya
KNBS	Kenya National Bureau of Statistics
NACOSTI	National Commission for Science Technology and Innovation
ОТС	Over-the-Counter Medicine
PDB	Predisposing factors of Behaviour
PEAS	Performance Enhancement Attitude Scale
PEDs	Performance Enhancing Drugs
PES	Performance enhancing substances.
POMP	Percentage of Maximum Possible
SPSS	Statistical Package for the Social Science
ТРВ	Theory of Planned Behavior
TUE	Therapeutic Use Exemptions
WADA	World Anti-Doping Agency
WCA	World Championships in Athletics

OPERATIONAL DEFINITION OF TERMS

Anabolic Steroids: Refers to laboratory-synthesized substances that alter the human testosterone hormone.

Competition: A contest involving one or more people trying to win a race or a match.

Dominant Olympic sport: This will refer to sporting activities that are recognized in Olympics as a major event.

Doping attitude: Refers to one's reservations and beliefs regarding the use of banned performance enhancing substances.

Doping predisposing factors: Refers to physiological, financial, cultural, environmental and social issues that may predispose and make athletes use performance enhancing substances and methods.

Doping: Doping is defined as the occurrence of one or more of the anti-doping rule violations set forth in Article 2.1 through Article 2.11 of the Code.

Elite Athlete: Refer to Kenyan athletes who have competed at National and International levels.

In-Competition: The period starting at 2300 hours, the day before an athlete takes part in a competition.

Knowledge: Refers to an athlete's awareness of the existing rules and regulations governing doping and methods that have been listed as prohibited.

Out-of-Competition: The period when the athlete is not talking part in a competition including training period.

Performance-enhancing: Use of prohibited substances/drugs by an athlete with the sole intention of improving sports performance.

Prevalence: Refers to the frequency of the use of performance enhancing substances by elite athletes.

Prohibited Substance: Any substance or class of substances so described on the Prohibited List.

Team Sport: Refers to sport where two or more players on the same side compete with their opponents.

Vulnerable Person: Any athlete who is prone and likely to be predisposed to the violation of doping rules given his/her circumstances.

EXECUTIVE SUMMARY

The Government of Kenya passed the Kenya Anti-Doping Act cap 5 of 2016 and established the Anti-Doping Agency of Kenya (ADAK) whose mandate is to provide awareness creation; value-based education and doping control in Kenya. Despite these efforts, doping cases (real or suspected) involving Kenyan athletes continue to be reported. Therefore, the objectives of the study were to examine the extent of use of performance-enhancing substances (PES), as well as doping knowledge, predisposing factors, vulnerability, and moderating sociodemographic factors amongst athletes in dominant Olympic sports in Kenya. Using a crosssectional analytical design and questionnaires, 338 sampled athletes participated in the study. The findings of the study indicated that about half of the athletes considered doping as a problem, 21.9% of athletes self-reported having used performance-enhancing substances, while 36.1% of the athletes were aware of a colleague or friend who has used a performance enhancing substance. Findings revealed self-reported doping is the same across the dominant Olympic sports in Kenya (p = .679). Doping risk factors because of political (p = 0.01) and cultural (p = 0.047) factors significantly varied across the four reviewed Olympic sports in Kenya. In addition, male athletes doping risk is exacerbated by financial reasons (p = 0.043). Multiple regression showed that financial and cultural factors predicted doping behavior of athletes in dominant Olympic sports in Kenya (B=0.666, p=0.010; B=0.522, p < 0.001). It was also established that athletes in the dominant Olympic Sports in Kenya have a sparse and irregular knowledge of prohibited performance-enhancing substances and manipulation, negative attitudes toward doping but perceive to have low vulnerability towards doping. The study concluded that self-reported doping in dominant Olympic sports in Kenya is similar and that the doping behavior is largely precipitated by political, cultural and financial factors. The study recommends that anti-doping policies should largely address political, financial, and cultural factors that influence the same. Additionally, a multifaced approach be employed with obligations of the Government, Sports Administrators, ADAK, Sports Federations, Sports Councils, and the National Governing bodies of sport on promoting Anti-Doping behavior in Kenya.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Sport has gained reasonable acceptance and has both intrinsic and extrinsic benefits. Some of the intrinsic benefits include; improved health and well-being while extrinsic value contributes to education, social cohesion, community safety, peace, social-economic empowerment, gender equity, and other development indicators that extend beyond the sporting field (Mudrak et al., 2018). Various International bodies and states view sport as the perfect development tool because it can be easily implemented, is cost-effective, and has a unique potential to attract the youth in deprived settings (Smith & Stavros, 2020). The recognition of the economic benefits of sports has promoted the vice of using prohibited performance-enhancing drugs among athletes.

World Anti-Doping Agency (WADA) regulation states that an athlete is considered to have engaged in doping when he or she violates one or more of the Anti-Doping rules (Gandert, 2019). The likelihood of doping varies in different sports, countries, continents, and levels of competition (Ulrich et al., 2018). For example, the likelihood of doping in competitive sports is estimated to be between 0% to 73% (Gleaves et al., 2021). A survey with international athletes established high levels of doping prevalence of 43.6% and 57.1% for athletes who participated in the 2011 World Championships in Athletics (Petroczi, 2022). Studies investigating doping behaviours have presented varying results on doping prevalence but this has been linked to different approaches (methodology, measures) used by different studies making it a challenge to generalize the findings (Gleaves et al., 2021). For example, Australia and Spain, doping prevalence is estimated to be 20.9% and 14%-16% as reported by coaches and athletes while in Denmark, Germany, and Netherlands, a prevalence of 26% -31% has been reported (Elbe & Pitsch, 2018; Orr et al., 2018). Another study reported doping prevalence in the context of sport specific from 2003 to 2015 based on WADA testing figures found that the prevalence was $3.0\% \pm 0.6\%$ in weightlifting, $2.0\% \pm 0.5\%$ in rugby, and $2.9\% \pm 0.6\%$ in

boxing (Aguilar et al., 2020). In Africa, the prevalence of doping in different competitions was estimated to be 5-26% in Nigeria (Adegboyega, 2012; Olanipekun & Adegboyega, 2014) (Gradidge et al., 2011; Ijadunola et al., 2018) 3.9% in Uganda (Muwonge et al., 2015) while limited studies from Kenya investigating the subject but Chebet (2014) and Boit et al. (2014) estimated doping prevalence of prohibited PESs among long- and middle-distance professional athletes to be (4%-38%). Generally, there is discrepancy in reporting of doping prevalence leading to mixed results on the subject which affect viability of the findings to anti-doping practitioners.

The prevalence of doping has produced mixed statistics, a situation largely attributed to the vulnerability of athletes in their context (Faiss et al., 2020) and different reporting (Gleaves et al., 2021). Vulnerability in doping occurs within the context of the nuances of individual decision-making in sports and the situational factors involved. Doping vulnerability is influenced by multiple factors including personal, social, emotional, and situational circumstances. Thus, these multiple influences must be considered when investigating doping in sports (Overbye et al., 2013).

Doping prevalence is also considered to be dependent on the type of sport. For example, track and field athletes have been reported to engage more in doping as compared to those in other elite sports (Aguilar-Navarro, et al., 2020; Al Ghobain, 2017). Similarly, doping in individual sports has largely been found to be higher than in team sports (Boardley et al., 2015; Faiss et al., 2020). This has been attributed to the fear of letting down teammates in team sports (Aguilar-Navarro et al., 2020). In Western countries, several studies have been carried out on doping prevalence (Elbe & Pitsch, 2018; Mottram & Chester, 2018) and reported different prevalence rates across various sports. The reviewed literature particularly in Africa and Kenya shows a dearth of information on the prevalence rates of doping in dominant Olympic sports (athletics, rugby, boxing, weightlifting) where more focus is on athletics highlighting imbalanced evidence on the subject. Knowledge of performance-enhancing substances influences the attitudes of athletes and athlete entourage towards doping (Stamm et al., 2014) where doping has been reported to be more prevalent among athletes than non-athletes (Kiss et al., 2019). In a study involving Jamaican student-athletes including boxing, it was established that participants had 41.6% knowledge about performance-enhancing substances (Turfus et al., 2019). Another research showed athletes who represented Olympic sports in Australia, Canada, the UK, and the USA had 30-40% knowledge about prohibited drugs specifically the over counter medications which some having been removed from WADA Prohibited List in 2004 (Mottram et al., 2008). Although the two studies represent athletes from diverse sport professional, study timelines, and regions, the findings demonstrate that athletes still have insufficient doping knowledge highlighting the need for different approaches to resolve the low doping knowledge. At the same time, reports show that non-athletes, amateur, and professional athletes have different doping attitudes (Kaoche, 2019). For example, in Kenya, positive attitudes toward doping were exhibited among youthful long-distance runners (Ogama, 2019) while elite and collegiate athletes have been reported to have negative attitudes toward doping (Chebet, 2014; Kamenju et al., 2016). In Kenya, there are few studies on athletes doping knowledge in other dominant Olympic sports like rugby, boxing, and weightlifting which could lead to misrepresentation and misinterpretation of athletes doping knowledge in the country.

Several factors predispose athletes to engage in doping and are broadly categorized into pull factors and push factors. 'Push' factors are incentives present in the current situation, which lead athletes towards doping (e.g. fear of failure), while 'pull' factors are the perceived future beneficial effects or rewards associated with doping (e.g. the belief doping will lead to enhanced performances) (Kegelaers et al., 2018). Predisposing factors are further categorized into financial factors (Allen et al., 2015), psychological factors (Barkoukis, 2016), social factors/psychosocial level (Chen et al., 2017), cultural and environmental factors (Chan et al., 2020) and behavioral factors (Mudrak et al., 2018). The potential doping behavior (PDB)

attributed to the predisposing factors varies based on several socio-demographic factors and types of sports. For example, doping susceptibility is more likely among male than female athletes (Morente-Sánchez & Zabala, 2013; Mottram & Chester, 2018; Sekulic et al., 2017). The high likelihood of males engaging in doping than female athletes is associated with their high perception that there are doping practices in their sport (Sekulic et al., 2017). Doping has also been established to vary based on the type of sports and level of competition (Mottram & Chester, 2018), with some sports such as athletics and international competitions seen as contributing to the worsening of the doping practice. The religiousness of athletes is also considered an important doping factor that determines the attitude of athletes toward doping (Zvan et al., 2017). Other factors such as psychological, for instance, perfectionism and desire for recognition, and social factors such as being in contact with individuals who use doping increase athletes' exposure to doping (Zucchetti et al., 2018).

Predisposing factors influence doping in different perspectives with culture being viewed as an important context. For example, Ulrich et al. (2018) showed that doping is more prevalent in Eastern Europe than in Western Europe. Allen et al. (2015) revealed that doping differs between individual and team sports, with individual sports reporting a higher prevalence in Scotland.

Doping predisposing factors motivate athletes to use performance-enhancing substances when they are vulnerable (Whitaker et al., 2017). In the lifetime of an athlete's career, tipping points are always experienced by the athletes and during such period athletes are vulnerable to doping. Tipping points are normally associated with situations involving performance challenges, injury problems, financial points in athletes' personal life, and the doping environment (Barkoukis, 2016). These situations vary for team sports and individual sports, with some situations being more pronounced in individual sports than in team sports (Boardley et al., 2015).

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Kenya as a member of the international sporting community has had tremendous success in several sports. Kenya formed the Anti-Doping Agency to stamp its authority by ensuring that there is a body responsible for running the program in the country. The Agency has continued to revamp its testing, education, and results management program. According to the WADA report of 2018, Kenya has remained compliance to the world Anti-Doping Code. Most astounding performances have been witnessed on the track and field, especially in the Olympics and World Championships. For example, since 1956 (her first entry into the Olympic Games) the country has managed to win over 140 medals in the Olympics. These performances have pulled in colossal sums of money and fame for our athletes hence tempting some into doping. Despite the marked success in the Olympics, some athletes who have participated in the Games have not been spared of any blushes by the doping conundrum (WADA, 2016). The reported cases of positive doping tests have shown that the menace is deeply entrenched in Kenyan sports, far much more than what is in the public domain. Additionally, a handful of studies (Chebet, 2014; Ogama & Sakwa, 2019) have investigated the doping prevalence and predisposing factors of dominant Olympic sports in Kenya outside the realm of cultural and economic factors. Therefore, this study assessed the predisposing factors associated with doping and its prevalence in dominant Olympic sports in Kenya.

1.2 Statement of the Problem

There is varying doping prevalence in sports due multiple and complex nature of the practice. Athletics is reported to have the highest doping rates of 43.6% and 57.1% for athletes participating international competitions (Petroczi et al., 2022) and $3.0\% \pm 0.6\%$ in weightlifting, $2.0\% \pm 0.5\%$ in rugby, and $2.9\% \pm 0.6\%$ in boxing (Aguilar et al., 2020). In Africa, the doping prevalence in Nigeria is approximately 5%-26% (Adegboyega, 2012; Ajayi & Olanipekun, 2014) and in Cameroon 8%-10% (Ama et al., 2003). In Kenya, doping prevalence in athletics is estimated to be 4% -38% (Boit et al., 2014; Chebet, 2014). However, since 2016 Athletic Integrity Unit (AIU), the body responsible for combating ethical

misconduct within athletics ranks Kenyan athletes as the third most at risk of doping in Africa (Berkely, 2022) and categorized in Class A of countries whose athletes are most likely to cheat in the sport. This happens when anti-doping regulators such as ADAK, anti-doping researchers, and educators continue to implement new strategies such as providing e-learning to support anti-doping education for athletes, seminars, and collaboration between sports federations and healthcare practitioners (Standard Sports, 2022). Despite the mentioned interventions, over 200 athletes from different sports (athletics, boxing, rugby) have failed doping between 2004 and 2023 (ADAK, 2023). Local studies link financial incentives, athletes' support personnel, and ignorance on doping regulations as among the reasons for Kenya athletes' involvement in doping (Chebet, 2014; Ogama & Sakwa, 2019, WADA, 2018). The evidence from these studies has been applied to support the claim for the requirement of rigorous anti-doping education for athletes and ASPs and tightening registration rules for sports federations, training camps, and agents to curb doping in the country. Yet, as recent evidence reveal doping in Kenya continues to rise and now spreading from predominant athletics to sports such as boxing, rugby, and weightlifting (WADA, 2018) an indication that there are other factors leading to the current trend of doping in the country.

Understanding the key drivers of doping in the dominant sports in Kenya will allow the application of ideal measures (policy, partnership, education) that would lead to the intended change and reduction of doping in the country. Therefore, knowing the prevalence rates and predisposing factors of doping among athletes in dominant Olympic sports in Kenya presents anti-doping regulators and educators with a chance to develop informed anti-doping measures that are sport specific and guided by local evidence. Additionally, investigating the self-reported doping and predisposing factors of doping in dominant Olympic sports in Kenya provides information in an area that has been less studied locally hence bringing forth insight that can inform the dynamic nature of doping from a different perspective. Therefore, there

was a need to assess the Knowledge, prevalence levels and predisposing factors of doping in dominant Olympic sports in Kenya.

1.3 Purpose of the study

The purpose of the project was to assess doping knowledge, prevalence and predisposing factors among athletes in dominant Olympic Sports in Kenya.

1.4. Objectives of the Study

The study was guided by the following objectives:

- To investigate prevalence of performance enhancing substance amongst athletes in dominant Olympic sports in Kenya.
- To establish the predisposing factors of doping behaviour (PDB) among athletes in dominant Olympic sports in Kenya.
- 3. To examine knowledge on the World Anti-Doping Agency (WADA) list of prohibited substances among athletes in dominant Olympic sports in Kenya.
- To examine attitudes towards doping among athletes in dominant Olympic sports in Kenya.
- To analyse vulnerability towards doping amongst athletes in dominant Olympic sports in Kenya.
- To examine whether selected demographic factors moderated doping prevalence, predisposing factors, knowledge, attitude and vulnerability of athletes in dominant Olympic sports in Kenya.

1.5 Research Questions

The study was out to address the following questions:

 What is the extent of performance enhancing substance use amongst athletes in dominant Olympic sports in Kenya?

- 2. What are the predisposing factors of doping behaviour (PDB) among athletes in dominant Olympic sports in Kenya?
- 3. What is the extent of the knowledge of athletes on the World Anti-Doping Agency (WADA) prohibited substances in Olympic dominant sports in Kenya?
- 4. What are the attitudes of athletes in Olympic dominants sports towards doping in Kenya?
- 5. What is the extent of doping vulnerability of athletes in Olympic dominants sports towards doping in Kenya?

1.6 Hypotheses of the Study

The following hypotheses were used for testing.

 H_01 . Doping behavior among dominant Olympic sports in Kenya is not significantly influenced by precipitating factors of physiological factors, political factors, financial factors, cultural factors, and individual factors behavior.

 H_02 : Doping prevalence, predisposing factors, knowledge, attitude and vulnerability of athletes do not significantly differ based on selected demographic factors (gender, type of sport, age, title held, level of education, annual income) of athletes in dominant Olympic sports in Kenya.

1.7 Significance of the Study

Key research findings exhibited by this research have contributed to knowledge on doping control and education to minimize or possibly eradicate doping in Kenya. The findings assist the Anti-Doping Agency of Kenya (ADAK) on where to direct resources in intelligence testing and Anti-Doping education. The findings from this study will help to increase the effectiveness of education programs by targeting the athletes' predisposing factors and this will increase the chances of detecting doping thus deterring athletes from the menace in different sports in Kenya. The study finding contributes to knowledge that can be used to amend/improve the WADA protocols, especially for developing countries where there is a paucity of relevant data.

Further, the findings of the study have offered more insights on what befell athletes who are facing charges due to the use of prohibited PES and thus helping in understanding the situations and environment that surrounds the decision to dope. Through these, ADOs are better positioned to develop specific anti-doping control strategies in different sports disciplines in Kenya. The study findings have offered more insights into both internal and external factors that influence doping attitudes among athletes in Kenya. These findings are helpful to anti-doping organisations in Kenya in developing a range of measures that sports stakeholders can employ to discourage young athletes from using PESs in Kenya. The study also contributes to the sparse literature on the doping prevalence and predisposing factors among athletes in dominant Olympic sports in Kenya.

1.8 Delimitations of the Study

The participants were delimited to registered elite athletes who participated in selected Olympic sports (Athletics, boxing, rugby, and weightlifting) in Kenya. The study was delimited to the predisposing factors of physiological, economic, social, cultural, environmental, and behavioural factors.

1.9 Limitations of the Study

The unavailability of up-to-date, registration records of athletes at the National Sports Federations and County Governments was a limiting factor in carrying out this research. To address this, the information used as the sampling frame was enhanced with data from athletes' training camps across the country to get the best estimate. The other limitation that the study faced relates to low knowledge levels on doping issues and low literacy levels among a majority of athletes in Kenya. This was addressed by verbally translating the questions to Kiswahili during questionnaire administration for ease of understanding for the athletes. Additionally, the use of self-reported doping approach may be susceptible to reporting bias and participating athletes fear of repercussion. As such caution when interpreting the findings related to selfreported doping is therefore important. Cross-sectional research design and questionnaire limitations, for example, time dependency of research cross-sectional design implying the findings cannot be used to inform the trend of doping prevalence and predisposing factors as well as the social desirability response attributed with survey questionnaires were considered before and during the study. It was acknowledged that the study intended to bring forward insight regarding the current status of the subject and inform anti-doping regulators, and educators and guide future studies.

1.10 Assumptions of the Study

In carrying out this study, it was assumed that intentional doping is practiced by all athletes vulnerable to doping behavior. It was also assumed that athletes had been exposed to information on banned substances by WADA. The study assumed that athletes had formed attitudes towards doping and with different factors contributed to attitude formation.

1.11Theoretical and Conceptual Framework

1.11.1Theoretical Framework

Several models/theories have been developed to explain the prevalence of doping and identify factors that influence doping behavior. An integrative theory of planned behavior (TPB) was employed in this study because it accounts for the extent of doping as well as factors that lead to both doping and intentions/attitudes. TPB helped to describe holistically how intentional, unintentional behaviors and attitude predicts doping intentions among athletes in dominant Olympic sports in Kenya. The theory guided contextual analysis by helping the study identify the complex system of elements influencing doping behavior among athletes in dominant Olympic sports in Kenya.

1.11.2 Integrative Model Theory of Planned Behaviour

The integrative theoretical model emerged from TPB in early 2000 due to the limitations of the TPB. The theory of planned behavior is a social-cognitive theory that explains intentional

behavior and is viewed as one that emerges from the theory of reasoned action which looks at how attitudes and intentions affect one's actions (Whitaker et al., 2014). The theory of planned behavior was limited in predicting behavior holistically thus the integrated model that distinguishes between distal and proximal influences on doping intentions and behavior was developed (Backhouse et al., 2013).

Based on this model, behavior is a proximal or distal outcome of attitude, intention, perceived behavioral control, and subjective norm. Attitudes look at how one responds when performing a specified behavior, subjective norms refer to the pressure that persons perceive from others to either or not be involved in a targeted behavior while perceived behavioral control involves one's evaluation of the capability and ability to perform the behavior in question (Madigan et al., 2019). Resultantly, it reflects weaknesses in the previous behavioral performances. Perceived behavioral control, subjective norms, and attitudes influence behavior by affecting one's intention thus, intents are proximal predictors of an individual's doping behavior (Ntoumanis et al., 2014).

The purpose of this theory is to describe the complex system of elements influencing doping behavior. Notably, the model shows the differences in the ultimate influence of proximal and distal components on doping behavior. Broader contextual variables like community characteristics and social structure, personality, and biological influences are the ultimate causes of behavior. Distal influences reveal narrower features of the environment and individual, including self-determination, societal norms, values, and goals. Finally, immediate and proximal predictors of behavior comprise values such as sportsmanship orientations and moral values, self-efficacy, attitudes, and social norms (Barkoukis et al., 2013).

The theory provides grounding to the study as its premise on proximal and distal factors serves to account for the predisposing factors of doping. A situation that only serves to increase the doping prevalence amongst elite professional athletes because the theory affirms that ultimately doping behavior flows from proximal and distant factors. The theory further strengthens the links between attitudes, knowledge, predisposing factors, and the prevalence of doping behavior. The integrative model approaches thus provide a theoretical basis for understanding the predisposing factors, attitudes towards doping, vulnerability to doping, and prevalence of doping in Kenya.

1.11.3 Conceptual Framework

This study was guided by the concept of doping risk factors (Kabiri et al., 2020; Kiss et al., 2019; Sekulic et al., 2017). The model (Figure 1) illustrates the objectives of the study, where independent predisposing factors include; Physiological, financial, social and individual factors, these factors are influenced by a mediated pathway of knowledge of prohibited substances, factors influencing vulnerability to dope, and built attitudes towards doping. they are compounded by moderating sociodemographic factors making these situations likely to push athletes to doping behaviour hence increasing the prevalence of doping. Prevalence is the dependent variable in this study.

Independent Variables

Dependent Variable



Figure 1: Conceptual Framework Model adopted from Kabiri et al. (2020), Kiss et al. (2019) and Sekulic et al. (2017)

The conceptual framework shows the relationship between independent factors which include predisposing factors, Mediating factor of Doping Attitude, Knowledge of banned substances, and Vulnerability, influencing the prevalence of doping as a dependent factor.

CHAPTER TWO: LITERATURE REVIEW

2.1 Prevalence of Doping among Elite Athletes

Prohibited performance-enhancing substances (PESs) are the prohibited substances and methods listed by WADA and their use is referred to as "doping." Elite athletes have been found to use prohibited PES and methods in mixed and varying levels based on the methods used for data collection. The studies which have used self-reported measures (Bird et al., 2016; Campian et al., 2018) suggest that doping prevalence is approximately between 10% to 40% among professional athletes in their lifetime (Blank et al., 2017; Emran et al., 2014; Faiss et al., 2020). Nevertheless, doping among Iranian 180 professional athletes returns a prevalence of between 27% to 67% (Kabiri et al., 2020).

Self-reported inquiries have formed the majority of studies conducted on the use of prohibited PES in Europe, with doping prevalence varying from one country to the other (Elbe & Pitsch, 2018; Hon et al., 2015). For example, amongst Danish elite athletes, a prevalence of between 26-30.6% has been established amongst 246 athletes (Elbe & Pitsch, 2018). Similarly, among professional elite athletes in Germany, the prevalence of prohibited PES use of between 26% to 48% was reported from a sample size of 204 (Hon et al., 2015). However, seasoned athletes in Germany registered a low doping prevalence, with between 10-35% of 165 sample size reporting that they have used doping within an athletics season (Mottram & Chester, 2018).

Relatively high use of prohibited PEDs has been reported in most countries in South East Europe, with countries such as Greece and Cyprus reporting doping prevalence of above 30% (Nolte et al., 2014). In the UK, a PES use of 15-20% has been reported in a study conducted amongst 196 elite athletes in team and individual sports. However, in most of these studies, bodybuilders have reported more prohibited PES use than field and track athletes. Prohibited substance use among field and track athletes only has reported a doping prevalence of less than 20% (Tavares et al., 2020). In another study on blood testing among 309 elite track and field

athletes participating in the 2011 and 2013 world championships, a frequency of 18% was reported for the former in the Danish study (Ulrich et al., 2018).

In Africa, few studies have been conducted on prohibited PES use amongst elite athletes. For example, in Nigeria, two cross-sectional studies on doping prevalence amongst elite athletes (Adegboyega, 2012; Olanipekun & Adegboyega, 2014) revealed a doping prevalence rate of 5-26% for the study with a sample size of 289. Another study conducted among African amateur footballers in Cameroon reported a doping prevalence of between 8-10% (Ama et al., 2003). In Kenya, Kamenju et al., (2016) reported low usage of PES amongst 696 athletes in training teachers' colleges. Similarly, Chebet (2014) and Boit et al., (2014) reported a low prevalence of prohibited PES among 180 elite athletes and 204 athletes respectively in Kenya. Limited studies have been conducted in Africa and Kenya, with existing studies focusing on athletics while ignoring other sporting disciplines.

2.2 Predisposing Factors Influencing Doping in Different Sports

Evidence suggests that doping is commonly practiced in competitive sports. Previous studies have implicated psychological, physiological, financial, environmental (political, social/cultural factors), and personal factors as the main predisposing factors in doping (Aguilar-Navarro et al., 2020; Allen et al., 2015; Elbe & Pitsch, 2018; Lazuras et al., 2010).

Concerning psychological factors, athletes' dope when they are under high pressure from internal or external sources to perform. Athletes are also susceptible to risk-taking behavior, which psychologically increases the predisposition of using outlawed-enhancing substances (Barkoukis, 2016). Low self-esteem is another psychological push factor that forces athletes to dope to enhance their self-image. Undesired life events are also perceived as another factor at a psychological level. Critical adverse life events (such as childbearing and injury amongst others) and the subsequent struggles to handle such events often facilitate doping (Coleman, 2018).

At the athlete's level, physiological factors are linked with the assumption that prohibited PESs improve physical attributes like strength, speed, agility, and endurance. Therefore, athletes may dope to improve their body image or some mental functions like thinking more clearly, increasing focus, and their overall satisfaction and happiness in sports. The need for a stepping-stone effect among athletes has been cited as a push factor for doping intention (Kegelaers et al., 2018). Athlete support personnel is mentioned by (Backhouse et al., 2013) as one of the stepping stones to prohibited PES use amongst athletes.

The push factors at the psychosocial level are divided into micro and macro/meso-level factors. The micro-level involves environmental factors close to the athlete while the meso level entails cultural or organizational influences. At the micro-level, the first push factor includes direct influencers such as physicians, coaches, parents as well as other athletes, and people who can influence athletes to engage in doping, provide essential information on doping, and aid the sportspersons to obtain the prohibited PESs, or even assist in administering the substances. The sporting world provides a wide socialization context that involves a confluence of definitions, associations, reinforcement, and imitation (Rodek et al., 2013).

Cross-sectional studies conducted in Europe between 367-501 athletes have shown that the coach is instrumental in introducing athletes to doping (Sekulic et al., 2017; Ulrich et al., 2018). Team managers, coaches, teammates, friends, and family members are often seen as sources of doping knowledge. Coaches are the most significant persons in terms of influencing the decision of athletes in the sport, and especially in shaping their psychological behaviors and experience (Ntoumanis et al., 2014). At the macro and meso-levels, pressure from the media is one of the main push factors. Increases in media pressure enhance the likelihood of doping as athletes are under more pressure to perform. Once the media overemphasizes performance, the absence of attention to the process that improves performance increases criticism of the below-performance of runners (Orr et al., 2018).

Indirect influences like comparison with other athletes are another second push factor at the micro-level. Here, the sportspersons assume that other athletes are outperforming them because of the use of PEDs. The false consensus effect amongst athletes emanates from athletes' belief that doping is widely accepted hence there is a need for them to fit within the "accepted culture". This is a belief among the athletes that make them use prohibited PESs as they believe that it is the only way to remain at the bar with others (Jalleh et al., 2014).

At the financial level, sportspersons are compelled towards doping by the financial pressures inherent in athletics, for example, pleasing sponsor and the urge to be the best by not losing any race (Kegelaers et al., 2018). Here, athletes use the available or impeding financial incentives to make a cost-benefit analysis. Doping costs are seen as only having a minimal effect on the prevalence of doping, based on the amounts that race organizers award athletes. The higher the prize money the more likely an athlete will be motivated even with the knowledge of prevailing costs.

Indeed Ogama and Sakwa, (2019) in research amongst 385 elite athletes in middle- and longdistance events found that economic factors of prize money, sponsorship deals, individual financial status, and family financial standing, boosting economic and economic depression contribute to doping amongst middle- and long-distance runners in Kenya. Similarly, Gitonga (2018) in his study on 385 professional field and track athletes showed that financial incentives are a major contributing factor to doping prevalence in Kenya. Nonetheless, these studies have largely focused on middle and long-distance running at the expense of other sports and so the results cannot be generalized to other Olympic sports in Kenya.

The political milieu, the legislative and cultural system, the availability of drugs, the discovery of new drugs as well as the permitted alternatives like herbs, nutritional supplements, and minerals are the main environmental factors associated with doping (Morente-Sánchez & Zabala, 2013). The importance associated with success in sports as rewards makes the athletes

prepare for sports by all means possible. As a result, athletes can be compelled to dope by the state due to the global recognition that comes with good performance (Mottram & Chester, 2018). Decriminalization or criminalization of PEDs drugs only raises the level of use through the distribution mechanism (Platonov, 2016). The culture of the community of athletes and the nation at large has been shown to influence doping in the past (Overbye et al., 2013). A related factor is a desire to win national honors and awards which put athletes under undue pressure. This pressure influences runners' athletes to use PE drugs (Rodek et al., 2013)

Some studies have established the significance of various predisposing factors on doping behavior among athletes. In this regard, Gitonga, (2018) established that predisposing factors associated with doping range from physiological, financial, political/governance, cultural, and individual/personal factors. In Kenya, prize money and financial pressure have also been cited as one of the main incentives for middle and long-distance athletes to dope in Kenya (Ogama & Sakwa, 2019). These studies underscore the importance of different predisposing factors in the doping behavior of athletes. However, they fail to account for predisposing factors specific to various Olympic sports in Kenya hence the need for the current study.

2.3 Knowledge on WADA Prohibited Substances.

Elite athletes are expected to be knowledgeable on various banned substances in the sport they are participating in. To this extent, WADA has engaged different Anti-Doping Organizations (ADOS) to create more awareness among amateur and elite athletes. Despite the efforts by WADA on creating awareness, the knowledge level of banned substances is varied (Zeigler-Hill & Shackelford, 2020).

A study of 1925 Australian athletes' knowledge of the WADA Prohibited Substances List and PESs demonstrated that most sportspersons believed that they had some awareness of banned PES (Orr et al., 2018). Over 50% of the athletes in Australia reported having received information on prohibited substances. In regard to specific knowledge of the different banned

substances, Australian athletes demonstrated relatively poor knowledge of the non-prohibited and prohibited therapeutic drugs.

Research conducted in Jamaica amongst 356 high school students on knowledge of supplements as WADA-prohibited substances also reported low knowledge (Tirfus et al., 2019). The study showed a paucity of knowledge, as 41.6% of athletes had self-reported knowledge, athletes scored an average of 38% for the knowledge component and only 2/10 banned substances (steroids and 7 stimulants) exhibited correct responses from at least 50% of all the athletes.

Knowledge regarding prohibited therapeutic drugs ranged between 30 and 40 percent in a study conducted among 198 athletes in Germany (Mottram et al., 2008). Unlike prohibited PES, the lack of emphasis on therapeutic substances in drug education and athletes (especially adolescent sportspersons) may be an indication of a low level of awareness of medications (Nolte et al., 2014). Beyond the knowledge of prohibited PES among athletes, other studies on the awareness of practitioners of drugs on the prohibited list show that most physicians have limited knowledge of the prohibited lists (Dunn et al., 2012; Khidir & Mahmoud, 2018).

Insufficient knowledge of over-the-counter products (OTC) product status has also been reported among athletes in developing countries (Boardley et al., 2015; Campian et al., 2018). For instance, from a sample of 267 athletes, only 25% of them properly reported knowledge of OTC products (Bird et al., 2016), which shows unfamiliarity with the substance. This situation further highlights the need for more research on athletes' knowledge of banned substances. One of the main reasons that led athletes to unintentional doping is occasioned by poor knowledge of prohibited PES. Moreover, athletes' poor knowledge is also evident in their belief that some prohibited recreational substances such as heroin, amphetamines, ecstasy, and cocaine are always banned in competition only. This serves to show that athletes' knowledge

varies on banned substances depending on in-competition or out-of-competition context (Allen et al., 2015), hence the need for this study.

In Africa, studies have shown mixed findings on doping knowledge among athletes. For instance, Muwonge et al. (2015) noted that the majority of Ugandan athletes were knowledgeable about doping substances. This is contrary to findings that most athletes are not knowledgeable about banned substances in Sudan from 165 elite athletes (Khidir & Mahmoud, 2018). In Nigeria, 268 professional athletes were reported to have moderate knowledge of different banned substances, with their knowledge limited to only some doping substances (Akindutire et al., 2012).

In Kenya, a third of athletes were reported to have high knowledge of prohibited substances, with the remaining athletes having low to moderate knowledge of prohibited substances (WADA, 2016). There are also reports that middle and long-distance athletes have moderate knowledge of doping (Boit et al., 2014; Chebet, 2014). These studies show that a greater percentage of African athletes have low to moderate information regarding banned substances. This raises concerns about the vulnerability of athletes to unintentional and inadvertent doping due to their lack of knowledge of prohibited substances.

2.4 Athletes Attitudes towards doping

The attitudes that athletes form toward doping determine their doping behavior. Research on athletes from various sports suggests that perfectionism may be related to an individual's attitudes toward doping. For example, Moston, (2015) study on 169 amateurs in the USA found that bodybuilders had high levels of positive attitudes towards doping. In bodybuilding, doping is a widely used practice and part of the culture when these athletes train and compete due to the perceived benefits of doping on athletes' aesthetics. Similarly, Madigan et al. (2019) in research carried out amongst 179 junior athletes found that perfectionistic strivings are a positive predictor of PES use.

Psychological and social dimensions have been found to be related to the athlete's attitudes towards doping. In this regard (Zeigler-Hill & Shackelford, 2020) showed that both psychological and social dimensions influence doping attitudes such that athletes with external motivation have a high chance of engaging in doping and thus a positive attitude. Locally, studies have been carried out to determine doping attitudes among athletes (Chebet, 2014; Kamenju et al., 2016; Ogama, 2019; Rintaugu & Mwangi, 2021). For example, Chebet, (2014) noted that athletes have a negative attitude towards doping while (Kamenju et al., 2016; Rintaugu & Mwangi, 2016) reported that athletes in teacher training colleges have a negative attitude towards doping. Doping attitudes among middle long-distance runners in Kenya are largely negative based on research conducted amongst 385 athletes in middle and long-distance events (Ogama, 2019). Existing studies in Kenya and beyond have focused on either individual or team sports while not including both sports as was the case in the current study.

2.5 Athletes Vulnerability to Doping

Athletes are compelled to dope to fulfill their desire/goals of competition such as maintaining/meeting performance standards and obtaining funds (Barkoukis et al., 2019). The inability to meet the set targets and perform under pressure set personal best and record distances/times throughout, especially after a period of dominance, often compels athletes to dope (Bird et al., 2016). The significance of meeting standards to receive invites to major sporting events is some situations that make athletes vulnerable to doping (Horcajo et al., 2019).

In some sports such as Rugby, the need to prolong careers has been cited as circumstances that may make athletes vulnerable to doping. Other situations that may push players to dope relate to their renewal of contracts and selection issues. This is compelling to players with families and with the potential ending of a contract having huge implications for family sustenance (Overbye et al., 2013).

Suffering an injury is another situation that may tip athletes over the edge of doping. A study on 236 athletes in team sports in the UK suggested that some sports such as rugby are one of the toughest competitions, with athletes periodically suffering from injury (Platonov, 2016). During such injury, some athletes go through psychological pressures that may only serve to expose them to doping. For instance, an athlete who suffers from an injury a few months before the Olympics is more likely to be under pressure than an athlete who suffer from an injury a few months before a national championship (Whitaker et al., 2017). Athletes who were recovering from injury and in need of recovering lost time were more vulnerable to doping in Kenya (Ogama, 2019).

Athletes' networks can also create unnecessary pressure for athletes to dope. In particular, peers and coaches can create pressure implicitly due to expectations placed on athletes. The belief that any of their colleague or friends is doping has been cited as one of the situations that may easily push athletes to dope. Some athletes also want to dope in an environment where doping is common, and one way of making doping common is through friends and colleagues participating in it (Whitaker et al., 2017).

2.6 Demographic Factors and Doping

Personal factors or socio-demographic factors are also associated with doping intentions and likelihood. Gitonga (2018) reported that personal factors are predisposing factors to doping among Kenyan athletes.

2.6.1 Gender of Athletes

Gender has also been shown to be a significant mediator of doping behavior. For instance, in most sports, males are more prone to PEDs use in comparison to women. For instance, Sekulic et al. (2016) when investigating gender differences in team sports found that the prevalence of potential doping behavior is higher in males. Similarly, Tavares et al. (2020) reported that male athletes are generally more permissive to doping behaviour than females. This is further
supported by the findings of Collomp et al. (2022) revealed lower use of prohibited substances in female athletes as compared to male athletes, with significantly fewer anabolic agents, hormone and metabolic modulators, and cannabinoids. The existing gender differences in doping tendencies can be explained by two important factors: the self-perception of the presence of doping in the sport; and factors of hesitation against doping (Stankovic et al., 2022). However, Muwonge et al. (2017) established that gender is not a significant determinant for doping substance use, with almost an equal proportion of male and female athletes reporting doping substance use.

2.6.2 Level of Education

Education level has also been linked with doping likelihood, with more educated athletes showing doping likelihood as compared to low-educated athletes (Ntoumanis et al., 2014). Other global systematic studies have shown that low education is likely to lead to doping as opposed to a high level of education (Akindutire et al., 2012; Al Ghobain, 2017). The level of education has been found to be a predictor of prohibited substance use. Higher education was found to be negatively related to the use of performance-enhancing substances in a systematic study conducted in the European Union (Sagoe et al., 2015). A study conducted among amateur and professional bodybuilders in Portugal showed that a low level of education is associated with a high prevalence of PES use (Tavares et al., 2022).

Low education levels could make individuals less conscious of the negative implications of prohibited PES use, leading to the use of such substances.

2.6.3 Sports Category

Belonging to a sports context has also been shown to relate to the use of PES. Two separate meta-analyses found that individual sports athletes were more likely to dope than athletes from team sports. Sagoe et al. (2015) found a prevalence of 32.3% among athletes and only 1.2% among non-athletes, while Ntoumanis et al. (2014) found that the prevalence varied between

different kinds of athletes, with gym users more likely than competitive athletes to report illegal PES use. In a compilation of the use of muscle-enhancing substances in the general population of Danish men aged 15–60 and the group training in fitness centers, the prevalence more than doubled in the group who trained in fitness centers (Singhammer & Ibsen, 2010).

The nature of sports is a significant mediator in the doping behavior of athletes. Muwonge et al. (2017) in their study conducted amongst Ugandan professional and amateur athletes participating in team and individual sports reported more supplement use in basketball and rugby sports than in volleyball, athletics, cycling, netball, boxing, and football sports. Kamenju, (2014) also reported that the sports category predicts doping likelihood with field and track athletes showing more doping likelihood than ball game sports among college student athletes in Kenya.

2.6.4 Age Category

Age is considered as a predisposing factor in doping behavior. Older athletes have been reported to have more permissive attitudes toward doping in comparison to younger athletes for professional athletes participating in individual sports in the UK (Boardley et al., 2015). Muwonge et al. (2017) reported no significant difference between younger and older athletes doping behavior in a study conducted in Uganda amongst amateur and professional Ugandan athletes from nine sports: seven major league team sports (football, basketball, football, rugby, boxing, weight lifting, and netball) and two individual sports (athletics and cycling). A study by Kamenju (2014) amongst 696 college athletes also reported no significant difference in the number of male and female athletes who use PES.

2.6.5 Title of Athletes

Sports characteristics inevitably influence the use of performance-enhancing substances. For instance, Hayward et al. (2022) in their study conducted amongst athletes participating in the Olympics from Asia and Europe established that desire for an Olympic title pushes athletes to

engage in doping behavior. Watson et al. (2022) also established in a study conducted amongst elite athletes in the USA that the pressure to participate and compete in international sports events puts athletes under pressure to use performance-enhancing substances.

2.6.6 Income Level of Athletes

Regarding the income level of athletes, Terreros et al. (2022) investigated the effect of income per capita as a predictor for doping prevalence in Africa, Asia, and Europe. From 1236 athletes in team and individual sports. The study findings demonstrated that low per capita income amongst athletes is linked to a greater likelihood of doping. Ogama (2019) in her study conducted amongst 385 middle- and long-distance runners demonstrated that athletes with international titles are more prone to doping as opposed to athletes with national titles.

2.7 Summary of Literature Review

Extant literature shows that research studies have been conducted on the extent of the use of prohibited PES among amateur and elite athletes. Conversely, most of these studies were conducted in developed countries. Doping predisposing factors amongst athletes are associated with several factors ranging from physiological, financial, psychological, social, and environmental factors. However, limited studies have been conducted in Africa on predisposing factors and the prevalence of PES amongst elite athletes participating in Olympic sports. Knowledge of banned substances has been revealed to be varied in developed countries as opposed to Africa where such studies are few. Literature shows that doping attitude among athletes in Africa is largely negative (Adegboyega, 2012; Olanipekun & Adegboyega, 2014; Cheber, 2014), with few studies focusing specifically on dominant sports, more so in Kenya. A number of situations have also been established to make athletes vulnerable to doping. The bulk of the studies on doping vulnerability have been focused on developed countries (Bird et al., 2016; Whitaker et al., 2017), with little information on vulnerability to doping in Africa or Kenya. Socio-demographic factors have also been linked to doping. Nonetheless, the existing

studies have not fully examined the mediating role of demographic factors, predisposing factors, doping attitudes, doping prevalence, and doping vulnerability.

CHAPTER THREE: METHODOLOGY

3.1 Research Design

This study used a cross-sectional analytical design. The design was appropriate for this study because it facilitated the collection of data at once and enabled comparing different variables concurrently (Creswell, 2014) making it cost-effective. This design is useful to the study for the reason that it allowed for the investigation of prevalence and predisposing factors. The design also allowed the researcher to find out the relationship between the independent and dependent variables of the study to provide prevalence rates as well as relationships between variables. The cross-sectional analytical design in the study involved the application of quantitative data collection through structured questionnaires.

3.2 Location of the Study

Data was collected in the Counties of Nairobi, Nakuru, Uasin-Gishu, Kakamega, Kisumu, Elgeyo Marakwet, Nandi, and Mombasa. According to the mapping report conducted by the Anti-Doping Agency of Kenya in 2018, these counties produced the majority of athletes in the sports of rugby, athletics, boxing, and weightlifting in Kenya.

3.3 Target Population

According to the ADAK mapping report of 2018, the population of athletes in Nairobi, Nakuru, Uasin Gishu, Kakamega, Kisumu, Elgeyo Marakwet, Nandi, and Mombasa Counties in the targeted sports disciplines is 13,107. This number includes both registered and unregistered athletes. In these particular counties, the study targeted a total of 8,240 athletes registered with different federations of dominant Olympic sports such as athletics, rugby, weightlifting, and boxing. These dominant sports were selected because Kenya has been presenting teams from these disciplines to the Olympics and nearly all doping cases in Kenya have been linked to them.

3.4 Inclusion and Exclusion

3.4.1 Inclusion Criteria

The study included athletes from dominant Olympic disciplines in Kenya. Amongst athletes in dominant Olympic disciplines, the study only included athletes who have participated in National and International athletics competitions.

3.4.2 Exclusion Criteria

The study excluded sports disciplines which are not Olympic sports and athletes who have not participated in at least one National athletics competition in Kenya. Athletes who have failed doping tests or those under WADA sanctions were also excluded from participating.

3.5 Sample and Sampling Technique

The study utilized purposive sampling and stratified sampling procedures. Purposive sampling was used to ensure that all the required strata (dominant Olympic sports) were incorporated into the study. Some of the targeted sports such as boxing and weightlifting have very small populations in comparison to rugby and athletics making purposive sampling appropriate to ensure the researcher can get the required number of respondents (Creswell, 2014). A stratified sampling technique was applied to ensure equal representation of the participants in the sports discipline of athletics and rugby. Additionally, due to the sensitivity of the area under investigation, convenient sampling was used to select the participants. It was only possible to work with those athletes who were comfortable offering sensitive information about themselves as well as the sport.

The sample size for the study was calculated using WADA Social Science Research Package for Anti-Doping Organizations (Donovan et al., 2015). The formula is based on the absolute size of the population. A total of 8,240 registered athletes from the selected sports were to take part in the survey. The total population of athletes from dominant sports was used to calculate the sample size. For a 95% confidence level, the estimated appropriate sample size was 365

athletes. An equal proportion from each stratum (sport) was selected with each strata having 91 respondents. However, because weightlifting had only 50 as the population, all the weightlifters were selected, with the remaining portion added to middle and long-distance runners as they had the largest population. To cater for drop-outs due to unforeseen circumstances, the researcher added 5% to each sample size selected from each sports discipline.

Sport Disciplines	Population	Sample Size				
Athletics	6000	133				
Rugby	2010	91				
Boxing	180	91				
Weightlifting	50	50				
Total	8240	365				

 Table 3.1: Sample Size of Athletes from Dominant Olympic Sports

3.6 Instruments of Data Collection

Questionnaires were used as the main instruments in this study.

3.6.1 Questionnaires

The questionnaire adopted from previous studies (Gitonga, 2018; Hon et al., 2015; Kabiri et al., 2020; Lazuras et al., 2010) and WADA Social Science Research Package for Anti-Doping Organizations were used in the study. The questionnaire had six sections (A, B, C, D, E, F) where Section A sought the sporting background and demographic characteristics of the respondents such as age, gender, sport, competition/playing experience, the highest level of competition, titles, level of competition, income from participation in sport and annual income. Section B comprised 8 items derived from the WADA instrument on the prevalence of performance-enhancing substances. Example questions from this section were "Have you ever used performance-enhancing substances", "Have you ever heard of colleagues who use

performance-enhancing substances", "To what extent do you consider there is a doping practice in your sport." This section was adopted from previous local studies and had been validated with a score of above 0.7 (Chebet, 2014; Gitonga, 2018).

Section C sought information on knowledge of the WADA Prohibited List and banned substances. This had 5 categorized items adopted from a study in Australia (Orr et al., 2018). The adopted questionnaire for knowledge on banned substances had response options which included; 1) banned at all times; 2) banned in-competition only; 3) don't know the banned status according to the (WADA, 2019) Prohibited Substances List); or 4) leave blank to indicate 'not banned'. Test-retest reliability of the instrument showed moderate-to-perfect test-retest reliability (Zvan et al., 2017). Responses for each substance were subsequently scored where frequency and percentage for each category calculated providing results used to identify levels of athletes correct knowledge.

Section D had 52 items measuring predisposing factors for doping. The items were subclassified into five, physiological, financial, political, cultural/social, and individual factors. The physiological factors category had 9 items, for example, "Demands required in the sport", "Power required" in the sport influence athletes doping vulnerability. Financial factors had 9 items, for example, "My sport has attractive rewards, "My sport has good incentives". Political factors had 14 statements, for example, "There are no policies to regulate doping in federations", "Our federation has a weak governance". Cultural/social factors had 10 items, example, "In my sport, somebody cannot win without doping", "Athlete support personnel in my sport are not bothered by doping". Individual factors were assessed using 10 items, sample questions, "Doping is allowed for weight management in my sport", "I want to be famous in my sport". Questions from this section were derived from the WADA Risk assessment questionnaire that was scored via 5-point Likert-based scores ranging from Very likely (VL) to Not Sure (NS) (Donovan et al., 2015). The responses were scored through the scores of 1 =

Very likely (VL), 2 = Likely (L), 3 = Not likely (NL), 4 =Very Unlikely (VU), and 5 = Not Sure (NS).

Section E investigated participants' attitude toward doping which was assessed using the validated Performance Enhancement Attitude Scale (PEAS) (Kiss et al., 2019). This version comprised seventeen items' statements weighted on a 6-point Likert scale from 1 = "strongly disagree", 2 = disagree, Neutral =3, 4 = Agree, and 5 = Strongly Agree. The measure demonstrated validity and reliability in previous studies that have all reported Cronchbach Alpha values ranging from 0.73 to 0.923 (Moston et al., 2015; Nicholls et al., 2017).

Section F comprised 9 items to measure the vulnerability of athletes towards doping. This was borrowed from a doping vulnerability instrument developed in the UK (Whitaker et al., 2014; Whitaker et al., 2017). The instrument has choice responses: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree. The instrument test-retest reliability in past research (Whitaker et al., 2014; Whitaker et al., 2017) revealed acceptable reliability scores (above 0.7) and hence it was suitable for this study.

3.6.2 Validity of the Questionnaire

To ensure the validity of the instruments, the content validity of the research instruments was tested to ensure that the instrument gathered the information the study is supposed to collect. The questionnaire was validated by a panel of experts competent in research methods and doping. These involved supervisors and lecturers in the Department of Physical Education and Exercise Science of Kenyatta University and their valuable observations and suggestions were included in the questionnaire development, more so on the structure and contents of questions to include.

3.6.3 Reliability of the Questionnaire

To determine the reliability, the test-retest method was used during a pilot study. This involved the administration of a questionnaire to 40 athletes from training camps in Nairobi and Ngong

towns. However, these athletes were not included in the main study. The researcher recruited the pilot participants using purposive sampling techniques. Their responses were subjected to the Pearson correlation coefficient and a reliability of 0.7 was achieved and considered adequate for the study. The reliability index of the instruments was within the range reported in previous studies (Aguilar-Navarro, Salinero, et al., 2020; Blank et al., 2017; Campian et al., 2018; Kabiri et al., 2020).

3.6.4 Pretesting of Study Instruments

Before collecting data, the researcher carried out a pilot study that involved middle and longdistance runners, rugby, boxing, and weightlifting athletes. These athletes were not picked to take part in the main study. The pilot study involved 10% of the study sample as suggested by Creswell (2014) and therefore a sample size of 40 athletes. From the findings, a reliability test of between 0.71 was reported hence the questionnaire was reliable. In addition, the researcher took this opportunity to train 6 research assistants who took part in the study. They were trained on the purpose of the study and this included paying special attention to a good understanding of the research instrument as shown in Appendix E.

3.7 Data Collection Procedures

A request to involve athletes was written and submitted to respective sport federations for authorization. Once the approval was given, the coaches of the various training camps for each selected sports discipline were used as an intermediary between the researcher and athletes. The coaches were briefed about the study's purpose, objectives, and significance and then presented them to the athletes before the request to involve them as respondents was made. Once athletes via their coaches agreed to participate in the study, the researchers visited the training camps on a mutually agreed date. Questionnaires were administered through face-toface interviews involving the use of computer assisted technology in athletes' training venues. The use of this technology was prompted by its advantage in ensuring Covid-19 protocols were adhered to in interviewing process. This technique was also preferred because some of the athletes may have had low level of education, and this method allowed for clarification and explanation to the athletes in cases where there was need. Data was collected from October to November 2021. A total of 365 questionnaires were administered by trained research assistants.

3.8 Data Analysis

IBM-SPSS Version 24 Corporation, Armonk, NY, USA was used as the main data analysis tool for this study. The analysis methods applied were descriptive statistics specifically frequencies, percentages, percentage of maximum possible scores (POMP), mean, and standard deviation (SD). Inferential statistics used were the Kruskal Wallis test and Mann-Whitney test to compare the doping prevalence, predisposing factors, doping attitudes, and doping vulnerability with selected socio-demographic factors. Mann-Whitney U tests were used to compare the doping prevalence, predisposing factors, doping vulnerability, and attitude against the gender hypothesis, H02a. Kruskal-Wallis H, on the other hand, was used to compare doping prevalence predisposing factors, doping vulnerability, and attitude against the gender hypothesis, H02a. Kruskal-Wallis H, on the other hand, was used to compare doping prevalence predisposing factors, doping vulnerability, and attitude against the gender hypothesis, H02a. Kruskal-Wallis H, on the other hand, was used to compare doping prevalence predisposing factors, doping vulnerability, and attitude against the gender hypothesis, H02a. Kruskal-Wallis H, on the other hand, was used to compare doping prevalence predisposing factors, doping vulnerability, and attitude against other demographic factors age, type of sport, title held, level of education, annual income, sub-hypotheses, H02b - H02f.

Pairwise comparison with Dunn's post hoc with Bonferroni correction was used to determine significant factors for the Kruskal Wallis test while post-hoc z-test on the adjusted residuals with Bonferroni correction was used to determine significant factors for Mann-Whitney U tests. Binary logistic regressions were used to analyse the predisposing factors occasioning doping prevalence, sub-hypotheses H01a - H01e. All preliminary assumptions of binary logistic regression such as multicollinearity were performed to ensure the robustness of the test.

3.9 Logistic and Ethical Considerations

After approval of the proposal by Kenyatta University Graduate School, the researcher sought Ethical Approval from Kenyatta University Ethics Review Board approval number PKU-2267/11409 and thereafter sought a research permit from the National Commission for Science, Technology and Innovation (NACOSTI) Reference Number Nacosti-/21/11/591. Using a research permit from NACOSTI, the researcher sought permission from the four Federations. All the ethical issues relating to informed consent and confidentiality were assented to by the participants. The respondents were guaranteed their confidentiality and thus no respondent was required to give his or her identity. All data acquired from the respondents was managed privately and confidentiality was maintained. Information on the nature and purpose of the study was expounded to the respondents as a means of providing sufficient information before they decide to participate.

CHAPTER FOUR: RESULTS

4.1 Response Rate

Out of the sampled 365 study participants, a total of 338 responses were received and included in the final data analyses leading to an overall response rate of 92.6%. Further breakdown of the response rate according to the dominant Olympic sports in the study revealed that all four sports disciplines had response rates of above 80%, with the athletics domain having the highest response rate (96.99%) while weightlifting had the lowest response rate at 80.39%. This is represented in table 4.1.

Table 4.1:Response rate

Response Rate	Frequency	Percentage
Filled Questionnaire	338	92.61
Athletics	129	96.99%
Rugby	87	95.60%
Boxing	81	89.01
Weightlifting	50	80.39
Non-Filled Questionnaire	27	7.39
Total	365	100

4.2 Demographic Characteristics of the Participants

This sub-section provides an overview of the demographic information of the respondents. The demographic information of the respondents include age, gender, level of education, annual income and income from sport participation. The age of the participants is presented in Table

4.2

Table 4.2:	Age	of the	Partici	pants
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Age	Frequency	Percentage	
18-24 years	171	51.2	
25-30years	117	35	
31-35 years	25	7.5	
36-40 years	14	4.2	
Above 40 years	7	2.1	
Total	334	100	

Results in Table 4.2 indicate that majority of respondents (n=171, 51.2%) are in the age distribution of 18-24 years followed by those in the age category of 25-30 years (n = 112, 35%), age category 31-35 years (n = 25, 7.5%), age category of 36-40 years (n= 14, 4.2%) and older than 40 years age category (n =7, 2.1%). The gender of the respondents is presented in Table 4.3.

Table 4.3:	Gender	Distribution	of P	Particip	ants
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Gender	Frequency	Percent	
Female	101	29.9	
Male	237	70.1	
Total	338	100	

Results in Table 4.3 show that 101 (29.88%) of the participants were female while 237 (70.12%) were male. The level of education of participants is presented in Table 4.4.

Table 4.4: Highest Level of Education of Participants

Highest Level of Education	Frequency	Percent
No school at all	5	1.5
Primary	53	15.7
Secondary	136	40.2
College	73	21.6
University	71	21
Total	338	100

The results in Table 4.4 indicate that most of the respondents had secondary level of education (n = 136, 40.2%) followed by those with college level of education (n = 73, 21.6%), university level of education (n = 71, 21%) and primary level of education (n = 53, 15.7%). The annual income of the athletes from all sources is presented in Table 4.5.

Table 4.5: Annual Income from All Sources of the Participants

Income (Ksh)	Frequency	Percent
Less than 100,000	26	7.7
100,000 to 500,000	256	75.7
500,000 to 1,000,000	32	9.5
1,000,000 to 5,000,000	14	4.1
Above 5,000,000	10	3
Total	338	100

The results in Table 4.5 show that majority of athletes have an annual income of 100,000 to 500,000 (n=256, 75.7%) while those earning between 500,000 to 1,000,000 (n= 32) and less than 100,000 (n =26) accounted for 9.5% and 7.7% respectively. Only 14 athletes (4.1%) are earning between 1,000,000 and 5,000,000, with 10 athletes (3%) earning above Ksh 5,000,000. Athletes' income from participation in sports is presented in Table 4.6.

 Table 4.6: Income for Participation in Sports by Athletes

Income for Participation in Sport	Frequency	Percent
About half my income from sport	21	6.2
All or almost all of my income from sport	6	1.8
More than half from sport, but not all my income	12	3.6
No income at all from sport	107	31.7
Occasional income from sport	162	47.9
Regular income from sport	30	8.9
Total	338	100

Results in Table 4.6 show that most of the athletes derive occasional incomes from sports (n =162, 47.9%) followed by athletes who derive no income at all from sports (n =107, 31.7%). Also 21 (6.2%) participants received half of their income from sports while 30 athletes (8.9%) reported to receiving regular income from sports. In addition, 12 (3.6%) athletes reported that they receive more than half but not all income while 6 (1.8%) athletes reported to receiving almost all income from sports.

4.3 Prevalence of Performance Enhancing Substance use amongst Athletes in Dominant Olympic Sports in Kenya

Objective one of the study sought to establish the extent of use of performance enhancing substances amongst athletes in dominant Olympic sports. The research question, what is the extent of performance enhancing substance use amongst athletes in dominant Olympic sports in Kenya. Participating athletes were asked if they ever used performance enhancing substances which was explained to them prior to responding to the questionnaire that PES encompassed of substances and methods outlined in WADA prohibited list. This was examined through a Yes or No question where participated athletes self-reported on whether they have ever used performance enhancing substances either ignorantly or purposely and whether they were awareness of a colleague who uses PES and whether doping in sports is a problem among the athletes in their respective sport. The results are presented in Tables 4.7 and 4.8.

		All s	ports	Ath	letics	Rı	ıgby	Bo	oxing	Weigl	htlifting	
		n	%	n	%	n	%	n	%	n	%	р
No		264	78.1	107	82.9	75	86.2	55	67.9	27	65.9	
Yes		74	21.9	22	17.1	12	13.8	26	32.1	14	34.1	0.004
Total		338	100	129	100	87	100	81	100	41	100	
	NO	183	77.2	62	82.7	54	84.4	45	69.2	22	66.7	
Males	YES	54	22.8	13	17.3	10	15.6	20	30.8	11	33.3	
	Total	237	100	75	100	64	100	65	100	33	100	0.544
	NO	81	80.2	45	83.3	21	91.3	10	62.5	5	62.5	
Females	YES	20	19.8	9	16.7	2	8.7	6	37.5	3	37.5	

Table 4.7: Ever Used PES Ignorantly or Purposely

Total	101	100	54	100	23	100	16	100	8	100
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Awareness	Frequency	Percentage	
No	216	63.9	
Yes	122	36.1	
Total	338	100	

Table 4.8: Aware of a Colleague who uses PES

Table 4.7 shows that 74 athletes (21.9% self-reported doping in the sample) admitted to use prohibited PES. Most athletes were from the weightlifting (34.1%; 14) and boxing (32.1%; 26) disciplines and self-reported doping rate significantly vary across the four investigated sport disciplines (p = 0.004). Table 4.7 also indicates that many males 54 (22.8%) compared to female athletes 20(19.8%) admitted having used prohibited PES but the self-reported doping rate were statistically the same (p = 0.544).

On the question of whether they know a colleague who uses prohibited PES, 122 (36.1%) of responded athletes from dominant Olympic sports in Kenya were affirmative (Table 4.8). This implies that the current estimated self-reported doping in the sample of prohibited PES use in Kenya dominant Olympic sports is 21.9% and 36.1% of their colleagues use PES.

Doping Problem	Frequency	Percent
Doping is a major problem in my sport	112	33.1
Doping is a problem to a good extent	53	15.7
Doping problem is neither high nor low	29	8.6
Doping is a problem to a low extent	30	8.9
Doping is not a problem in my sport	114	33.7
Total	338	100

Table 4.9: Doping Problem

Athletes were asked whether they perceived doping as a problem in their sport. Table 4.9 reveals that more than a third of the respondents (112, 33.1%) felt that doping is a major problem in their sports but 53 (15.7%) perceived doping to be a problem to a good extent.

However, 114 (33.7%) respondents felt doping is not a problem in their sport. This shows varying perception of doping among athletes in dominant Olympic sports in Kenya.

Table 4.10 shows prohibited performance enhancing substances used in the last 12 months.

	Athletics		Rugby		Boxing		Weightl	ifting	All spor	ts
	Count	%	count	%	count	%	count	%	count	%
Population level	36	27.1	23	25.3	17	18.7	16	32.0	92	27.2
Stimulants	22	13.6	16	16.7	12	25.0	10	15.4	60	16.2
Beta blockers	21	13.0	12	12.5	8	16.7	9	13.8	50	13.5
Narcotics	14	8.6	10	10.4	10	20.8	9	13.8	43	11.6
Blood doping	13	8.0	6	6.3	4	8.3	4	6.2	27	7.3
Non-approved substances	12	7.4	6	6.3	1	2.1	7	10.8	26	7.0
Peptide hormones										
&Human growth	12	7.4	6	6.3	1	2.1	6	9.2	25	6.7
hormone Cannabinoids	8	4.9	10	10.4	3	6.3	4	6.2	25	6.7
Anabolic steroids	11	6.8	6	6.3	2	4.2	4	6.2	23	6.2
Beta 2 agonists	11	6.8	5	5.2	2	4.2	3	4.6	21	5.7
Diuretics and masking agents	10	6.2	5	5.2	1	2.1	3	4.6	19	5.1
Tetrahydrohestrinone	9	5.6	3	3.1	2	4.2	4	6.2	18	4.9
Erythropoietin (EPO)	11	6.8	5	5.2	1	2.1	1	1.5	18	4.9
Glucocorticoids	8	4.9	6	6.3	1	2.1	1	1.5	16	4.3
Total	162	100	96	100	48	100	65	100	371	100

Table 4.10: Prohibited performance enhancing substances used in the last 12 months

Regarding prohibited performance enhancing substances used in the last 12 months, 92 athletes (27.2%) admitted using prohibited performance-enhancing substances at least once. Among different sports, weightlifting had the highest proportion with 16 athletes (32.0%), followed by athletics with 36 (27.1%), rugby with 23 (25.3%), and boxing with 17 (18.7%). Further investigations demonstrated that participating athletes mostly used stimulants 60 (16.2%), beta-blocker 50 (13.5%), and narcotics 43 (11.6%). Table 4.10 shows that the three which are

stimulants, beta-blockers, and narcotics are also the most common in all the four sport disciplines. Overall, the least used banned substances in the last 12 months were Tetrahydrohestrinone 18 (4.9%), Erythropoietin 18 (4.9%), and Glucocorticoids 16 (4.3%). These findings suggests that a significant number of athletes participating in the dominant Olympic sports in Kenya are troubled by the prevalent use of prohibited substances, with stimulants, beta blockers, and narcotics being among the most frequently used. However, the researcher notes the high scores recorded on the Use of Beta-blockers in sports disciplines which scientifically, the substance cannot enhance performance in the examined dominant Olympic sports disciplines. Therefore, the high scores could be attributed to lack of knowledge on the benefit of that substance to the body or athletes could have just perceived to have used it for therapeutic purposes

Respondents were asked the Anti-Doping rules they have violated in the last 12 months. Their responses are shown in Table 4.11.

Table 4.11: Violation of Anti-Doping Rules in the Last 12 Months

	Nev	ver	No moi	last 12 nths	1-2	times	3-5 t	imes	6-1 tim) es	>1 tin) ies	Over viola	call tions
Anti-Doping Violation	n	%	Ν	%	Ν	%	n	%	n	%	n	%	n	%

Refusing to submit a	25	75.4	45	13.3	18	5.3	19	5.6	0	0.0	1	0.3	38	11.2
sample	5													
Attempting to use prohibited substance or method	29 0	85.8	20	5.9	14	4.1	7	2.1	2	0.6	5	1.5	28	8.3
Presence of a prohibited substance	27 9	82.5	33	9.8	11	3.3	6	1.8	5	1.5	4	1.2	26	7.8
Anti-Doping rule of complicity	25 8	76.3	56	16.6	13	3.8	4	1.2	3	0.9	4	1.2	24	7.1
Failure to file whereabouts?	27 8	82.2	38	11.2	13	3.8	5	1.5	2	0.6	2	0.6	22	6.5
Possession of a prohibited substance	27 3	80.8	47	13.9	9	2.7	5	1.5	2	0.6	2	0.6	18	5.4
Trafficking a prohibited substance	27 4	81.1	47	13.9	6	1.8	4	1.2	3	0.9	4	1.2	17	5.1
Administration or attempted to administer	26 4	78.1	57	16.9	9	2.7	5	1.5	3	0.9	0	0	17	5.1
Tampering with sample collection process?	28 6	84.6	37	10.9	7	2.1	6	1.8	2	0.6	0	0	15	4.5
Prohibited association	27 4	81.1	50	14.8	4	1.2	5	1.5	4	1.2	1	0.3	14	4.2

Note: The overall violations represent the total number of anti-doping rule infractions reported by participated athletes, ranging from (1-2 times and more than 10 times).

The results in Table 4.11 show that refusing to submit a sample was the highest anti-doping rule violations 38 (11.2%) followed by attempting to use prohibited substance or method 28 (8.3%), and presence of prohibited substances 26 (7.8%). The least reported anti-doping rule violations by athletes were prohibited association 14 (4.2%), tampering with sample collection process 15 (4.5%), and administration or attempted to administer prohibited substances 17 (5.1%). This suggests that the main Anti-Doping rule violation amongst athletes in dominant Olympic sports is strongly linked to refusal to submit a sample ignorantly or purposively.

4.4 Predisposing Factors for Doping Behaviour

Study objective two sought to establish the predisposing factors of doping behavior among athletes in dominant Olympic sports in Kenya. The corresponding null hypothesis (H_01) stated that Doping behavior among dominant Olympic sports in Kenya is not significantly influenced by predisposing factors of physiological, political, financial, cultural and individual. Specifically, the following sub hypothesis were used in the study:

H0_{1a} Doping behaviour among dominant Olympic sports in Kenya is not significantly influenced by physiological factors

H0_{1b}: Doping behaviour among dominant Olympic sports in Kenya is not significantly influenced by political factors.

H0_{1c:} Doping behaviour among dominant Olympic sports in Kenya is not significantly influenced by financial factors.

H0_{1d:} Doping behaviour among dominant Olympic sports in Kenya is not significantly influenced by cultural factors.

 $H0_{1e:}$ Doping behaviour among dominant Olympic sports in Kenya is not significantly influenced by individual factors.

Table 4.12 show descriptive statistics on predisposing factors based on percentage of maximum possible score. The mean was arrived at by determining the score on each statement (ranged between 1- very likely to 5-not sure) and summing the score of all the statements from respective component (e.g., physiological, financial factors) and determine the average.

 Table 4.12: A Summary of Perceived Doping Risk Factors for all Participants Based on

 the Percentage of Maximum Possible Scores (POMP)

 Factors	Mean	SD			<i>p</i> value	
			By sport Kruskal Wallis test	By gender	Source of significant difference	

				Mann Whitney U	
				test	
Political	38.3	13.22	.010	.290	Boxing-Athletics $p = .001$; Rugby–Athletics p
					=.038
Cultural /Social	32.7	9.63	.047	.210	Boxing – Rugby $p = .005$
Individual	32	9.23	.274	.585	
Financial	27.8	11.34	.193	.043	
Physiological	26.8	11.75	.032	.017	Boxing-Athletics $p = .020$

Note: statistical significance set at $p \le .05$

Table 4.12 suggests that political factors is the top predispose doping factors in Kenya's dominant Olympic sports (38.3 ± 13.22) followed by cultural or social factors (32.7 ± 9.63). Table 4.12 further indicates that financial and physiological factors posed the least predisposition to doping among Kenya athletes in dominant Olympic sports 27.8 ± 11.34 and 26.8 ± 11.75 respectively. The risk of doping because of political, cultural, and physiological reasons significantly varies from examined sport disciplines to the next (p < 0.05).

4.4.1 Regression Analysis

Still on the study objective two which was to establish the predisposing factors of doping behavior (PDB) among athletes in dominant Olympic sports in Kenya, a three-step process of standard statistical analysis was used in the analysis of this objective as suggested by Lazuras et al., (2015). The three-step process included univariate logistic regressions, assessments of multicollinearity and binary logistic regressions. All analyses were conducted using SPSS 24.

4.4.2 Step 1: Univariate logistic regressions

The first step of this analysis was to determine the effect of respective independent variables on doping behavior (Use of performance enhancing substances). The five independent variables included in these regressions were physiological, individual, cultural, financial and political factors. The goal of a univariate regression was to explain the effect observed in a dependent variable as an outcome of their exposure to an independent variable (Bland & Altman, 2000; Haase, 2011; Szumilas, 2010). Therefore, univariate regressions evaluated and described the effects of a single independent variable (e.g., political factor, financial) on the dependent variable (use of PES). Univariate regressions were an appropriate statistical approach in the initial phase of this three -step statistical analysis process which sought to identify factors which influence doping behaviors.

 Table 4.13: Univariate Regression Results of the Effect of Covariates on the Odds of

 Doping Behaviours

Factors	В	S.E.	Wald	Df	Sig.	Exp(B)
Physiological	0.714	0.172	17.244	1	0.000	2.042
Financial Factors	1.044	0.235	19.807	1	0.000	2.84
Political Factors	0.295	0.199	2.209	1	0.137	0.744
Cultural Factors	0.66	0.119	30.566	1	0.000	1.935
Individual Factors	0.492	0.144	11.749	1	0.001	1.636

The results in Table 4.13 showed that four out of the five factors have a significant relationship with doping behaviors amongst dominant Olympic sports. Nonetheless even for the one factor that was not significant (political factor) the p-value was below 0.250. For any factors to be included in univariate regression analysis, all the factors must have a p-value below 0.250 (Field, 2017). Hence all the factors were included in bi-variate regression analysis.

4.4.3 Step 2: Assessments of Multicollinearity

It was essential that multicollinearity between independent variables be identified and reported. Assessing multicollinearity was critical in step two of this analysis as non-collinearity is an assumption which must be met before regressions can be performed (Laerd Statistics, 2018c). Spearman's correlations were therefore conducted as a non-parametric measure of multicollinearity between independent variables which were revealed as influential to respective dependent variables in step one of this analysis (Laerd Statistics, 2018d; Rebekic et al., 2015). Spearman's correlations were the most suitable method to assess multicollinearity in this phase of analysis as ordinal data was used in these appraisals. A high correlation between independent variables indicates a lack of independence and a linear relationship between covariates. On the contrary, low to medium correlation demonstrates existence of independence amongst the predictor variables.

		Physiological	Political	Financial	Cultural	Individual
		Factors	Factors	Factors	Factors	Factors
Physiological	Correlation	1				
Factors	Coefficient					
	Sig. (2-tailed)					
	Ν	338				
Political	Correlation	332**	1			
Factors	Coefficient					
	Sig. (2-tailed)	0				
	Ν	338	338			
Financial	Correlation	.268**	-0.091	1		
Factors	Coefficient					
	Sig. (2-tailed)	0	0.095			
	Ν	338	338	338		
Cultural	Correlation	.487**	322**	.222**	1	
Factors	Coefficient					
	Sig. (2-tailed)	0	0	0		
	N	338	338	338	338	
Individual	Correlation	.575**	211**	.132*	.453**	1
Factors	Coefficient					
	Sig. (2-tailed)	0	0	0.015	0	
	N	338	338	338	338	338

Table 4.14: Correlation Analysis between Study Variables

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

This result indicated that none of the independent variables had a high correlation with other predictor variables, with all the variables having a low to medium correlation co-efficient. This demonstrates that multicollinearity was not identified, allowing the independent variables to be used together in the bi-variate regressions analysis.

4.4.4 Step 3: Binary Regressions

Binary regression was employed because the question: have you ever used performance enhancing substances either ignorantly or purposely was used as the dependent variable (Yes/No response). The regressions for the dependent variable were conducted many times, using a backward elimination method.

Table 4.15: Bi-variate Regression Results of The Effect of Covariates on The Odds of Doping Behavior

Models	Factors	В	S.E.	Wald	df	Sig.	Exp(B)	
--------	---------	---	------	------	----	------	--------	--

Step I Physiological 0.183 0.226 0.658 I 0.417	1.201								
Factors									
Financial Factors 0.621 0.261 5.646 1 0.017	1.861								
Political Factors 0.113 0.227 0.248 1 0.619	1.12								
Cultural Factors0.4370.1478.83510.003	1.547								
Individual Factors 0.104 0.174 0.354 1 0.552	1.109								
Constant-6.4451.42520.45610.000	0.002								
Step 2 Physiological 0.16 0.222 0.521 1 0.470	1.174								
Factors Financial Factors 0.625 0.261 5.711 1 0.017	1 867								
	1.807								
Cultural Factors 0.425 0.145 8.584 1 0.003	1.53								
Individual Factors 0.105 0.173 0.369 1 0.544	1.111								
Constant-5.9531.01134.64210.000	0.003								
Step 3 Physiological 0.214 0.204 1.101 1 0.294	1.239								
Factors									
Financial Factors 0.615 0.261 5.561 1 0.018	1.85								
Cultural Factors 0.452 0.138 10.674 1 0.001	1.572								
Constant-5.7980.97335.50410.000	0.003								
Step 4 Financial Factors 0.666 0.257 6.694 1 0.010	1.946								
Cultural Factors0.5220.12317.85410.000	1.685								
Constant-5.3970.88936.83110.000	0.005								
a Variable(s) entered on steps: physiological factors, financial factors, political factors, cultural									
factors, individual factors									

Results of these multivariate regressions as shown in Table 4.15 indicate that in all the four steps of regression analysis only financial and cultural factors significantly influence doping behavior of athletes in dominant Olympic sports in Kenya. Hence rejecting the overall hypothesis: Doping behaviour among dominant Olympic sports in Kenya is not significantly influenced by predisposing factors of physiological, political, financial, cultural factors and individual. Specifically, the study rejected the sub hypothesis: H0_{1a}: Doping behaviour among dominant Olympic sports in Kenya is not significantly influenced by financial factors and H0_{1b}. Doping behaviour among dominant Olympic sports in Kenya is not significantly influenced by cultural factors. However, the study accepted the sub hypothesis: H0_{1c}: Doping behaviour among dominant Olympic sports in Kenya is not significantly influenced by physiological factors, H0_{1d}: Doping behaviour among dominant Olympic sports in Kenya is not significantly influenced by physiological

influenced by political factors and H0_{1e}. Doping behaviour among dominant Olympic sports in Kenya is not significantly influenced by individual factors.

This finding implies that doping in dominant Olympic sports in Kenya can be predicted to be significantly dependent on financial and cultural factors.

4.5 Knowledge of Athletes on Prohibited Substances

Objective three of the study sought to examine the perceived knowledge of athletes on the World Anti-Doping Agency (WADA) prohibited substances in dominant Olympic sports in Kenya. The corresponding research question stated that what is the extent of the knowledge of athletes on the World Anti-Doping Agency? Table 4.16 presents frequency and percentage results of various WADA prohibited substances and PES as assessed through Likert scale of 1= banned at all times, 2= banned in competition only, 3 = Don't know the banned status and 4= Leave blank to indicate not banned.

Categorization	Substances	Banı at all time	ned I s	Banned in- competition only		Don't the ba status	know nned	Leav blan indic bann	Leave blank to indicate not banned		
		n	%	n	%	n	%	n	%		
Performance	Anabolic Steroids	162	47.9	27	8.0	127	37.6	22	6.5		
enhancing drugs	Growth Hormone	152	45.0	41	12.1	121	35.8	24	7.1		
	Blood Doping	186	55.0	25	7.4	110	32.5	17	5.0		
	Erythropoitien	164	48.5	32	9.5	122	36.1	20	5.9		
	Clenbuterol	166	49.1	31	9.2	123	36.4	18	5.3		
	Gene and Cell Doping	175	51.8	38	11.2	114	33.7	11	3.3		
	Chemical and Physical	182	53.8	40	11.8	112	33.1	4	1.2		
	Manipulation										
	Category Average	170	50.2	33	9.9	118	35.0	17	4.9		
Illicit and Non-	Alcohol	86	25.4	105	31.1	95	28.1	52	15.4		
Illicit	Caffeine	96	28.4	73	21.6	116	34.3	53	15.7		
Recreational	Amphetamines	151	44.7	47	13.9	128	37.9	12	3.6		
Substances	Cocaine	196	58.0	32	9.5	95	28.1	15	4.4		
	Ecstacy	166	49.1	48	14.2	112	33.1	12	3.6		
	Heroin	202	59.8	38	11.2	88	26.0	10	3.0		
	Marijuana/Cannabinoids	195	57.7	52	15.4	77	22.8	14	4.1		
	Other recreational drugs	144	42.6	61	18.0	120	35.5	13	3.8		
	Category Average	155	45.7	57	16.9	104	30.7	23	6.7		

 Table 4.16: Athletes Knowledge of WADA Prohibited List and Performance Enhancing

 Substances

Therapeutic	Beta Agonists/ Asthma	125	37.0	60	17.8	124	36.7	29	8.6
Substances on	puffers								
Prohibited List	Beta Blockers	150	44.4	51	15.1	126	37.3	11	3.3
	Clomiphene	141	41.7	49	14.5	134	39.6	14	4.1
	Diuretics	154	45.6	44	13.0	129	38.2	11	3.3
	Insulin	100	29.6	77	22.8	124	36.7	37	10.9
	Narcotics Analgesics	152	45.0	49	14.5	123	36.4	14	4.1
	Prednisone	137	40.5	47	13.9	145	42.9	9	2.7
	Category Average	137	40.5	54	15.9	129	38.3	18	5.3
Therapeutic	Pseudophedrine(Sudafed)	118	34.9	63	18.6	150	44.4	7	2.1
Substances not	Zolpidem(stilknox)	119	35.2	49	14.5	164	48.5	6	1.8
on Prohibited	Diazepam(valium)	118	34.9	61	18.0	150	44.4	9	2.7
List	Sildenafil (Viagra)	113	33.4	65	19.2	141	41.7	19	5.6
	Category Average	117	34.6	60	17.6	151	44.8	10	3.1
Supplements	Vitamins/Minerals	60	17.8	56	16.6	110	32.5	112	33.1
	Protein Powders	66	19.5	50	14.8	115	34.0	107	31.7
	Iron	54	16.0	44	13.0	118	34.9	122	36.1
	Creatine	70	20.7	44	13.0	134	39.6	90	26.6
	Colostrum	75	22.2	48	14.2	153	45.3	62	18.3
	Actovegin	75	22.2	51	15.1	166	49.1	46	13.6
	Category Average	67	19.7	49	14.5	133	39.2	90	26.6

Table 4.16 shows that 50.2% (170) of the participating athletes are aware of the status of WADA-prohibited performance-enhancing drugs, indicating a moderate level of knowledge in this area. However, their understanding of both illicit and non-illicit recreational substances is insufficient. For example, only 13.9% (47) knew that amphetamines are banned only during competition, and just 9.5% (32) correctly identified that cocaine is prohibited solely in competition. Regarding therapeutic substances on the prohibited list, 37.0% (125) of the athletes knew that beta agonists (asthma inhalers) are banned at all times, while 29.6% (100) were aware of insulin's prohibited status, indicating a low level of knowledge in this category. Additionally, 48.5% (164) of athletes did not know that Zolpidem (Stilnox) is a therapeutic substance not on the prohibited list, and 41.7% (141) were unaware of the banned status of Sildenafil (Viagra). Concerning supplements, 26.6% (90) of athletes knew about their banned status. For instance, 49.1% (166) did not know the correct banned status of Actovegin and also 37% did not also know the banned status of betablockers. Overall, Table 6 demonstrates inconsistent knowledge of the WADA prohibited substances list and PES among athletes in dominant Olympic sports in Kenya.

4.6 Doping Attitudes of Athletes in Dominant Olympic Sports in Kenya

Objective four of the study involved examining doping attitudes of athletes in dominants Olympic sports in Kenya. This was assessed through the question what are the attitudes of athletes in Olympic dominants towards doping in Kenya? Doping attitudes were assessed using 5-likert scale of 17 items. The descriptive results are shown in Table 4.17

Attitudes	Ν	Mean	Std. Deviation
Permissiveness Attitude Average Score	338	1.86	0.972
Permissiveness Average POMP Score	338	21.5237	24.3028
Circumstantial Attitudes Average Scores	323	2.66	0.716
Circumstantial Attitudes POMP Scores	323	21.8782	23.8507
Positive Needs Attitude Average Score	338	2.44	0.911
Positive Needs Attitude POMP Scores	338	36.0947	22.7648
Minimization of Issues Attitude Average Scores	338	2.46	0.968
Minimization of Issues Attitude POMP Scores	338	36.3905	24.2022
Doping Attitude Average Score	323	2.59	0.735
Doping Attitude Average POMP Score	323	19.8142	24.4942

 Table 4.17: Descriptive Statistics on Athletes' Attitude towards Doping in Dominant

 Olympic Sports in Kenya

The results in Table 4.17 reveals that athletes had low average POMP score in attitudes towards doping (21.523±24.308. The doping attitude sub-component with the highest score was 'minimization of issues Attitude POMP (36.390±24.202), while the lowest score was 'circumstantial attitudes POMP (21.878±23.851). The low overall score indicates that majority of the athletes in the study population have negative attitudes towards doping.

4.7 Doping Vulnerability amongst Athletes in Dominant Olympic Sports in Kenya.

Study objective five sought to analyse doping vulnerability amongst athletes in dominant Olympic sports in Kenya. Assessment of doping vulnerability was conducted by use of 5-likert scale items, with the average score converted to POMP scores for total doping vulnerability and the sub-component doping vulnerability categories. Descriptive results are presented in Table 4.18.

Table 4.18: Descriptive Statistics on Doping Vulnerability of Respondents

Vulnerability	Ν	Mean	Median	Std. Deviation
Doping Vulnerability Average Scores	337	2.712	3	1.06776
Doping Vulnerability POMP	337	42.804	50	26.69409
Personal Vulnerability Average Scores	338	2.650	3	1.10945
Personal Vulnerability POMP	338	41.272	50	27.7362
Situation Vulnerability Average Score	337	2.635	3	1.058
Situation Vulnerability POMP	337	40.875	50	26.45002

The results in Table 4.18 reveal that athletes had low average POMP score in vulnerability towards doping (42.80 ± 26.69 , median = 50.00[%]). The doping vulnerability sub-component scoring the highest was personal vulnerability POMP Scores (41.27 ± 27.73), while the lowest scoring was situation vulnerability POMP Scores (21.878 ± 23.851). The relatively high overall score indicates that majority of the athletes in the study population are vulnerable towards doping more so due to personal than to circumstantial reasons.

4.8 Comparison of Doping Prevalence and Predisposing factors across Selected Demographic Factors

Study objective six sought to determine whether doping prevalence from the study sample, predisposing factors, perceived knowledge, attitudes and vulnerability are influenced by selected demographic factors of gender, type of sport, age, title held, level of education annual income. The corresponding hypothesis (H_02) stated that doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athletes' gender, type of sport, age, title held, level of education, annual income. Specifically, the following sub hypothesis were tested;

 H_02a : Doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athlete's gender.

 H_0 2b: Doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athlete's type of sport.

H₀2c: Doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athlete's age.

H₀2d: Doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athlete's title held.

 H_0 2e: Doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athlete's level of education.

H₀2f: Doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athlete's annual income.

Table 4.19 presents a summarized results (p-values from Mann Whitney U test) on doping prevalence, predisposing factors, knowledge, attitudes and vulnerability based on responded athletes' gender.

Statement	Male (n = 237)	Females (n =		
	Mean	Std	Mean	Std	р
Doping practice in sport	2.87	1.711	3.12	1.705	0.191
PES Use in Sports	1.23	0.420	1.20	0.400	0.566
PES use in Past 12 Months	1.44	0.962	1.31	0.711	0.349
Anti-Doping Violation in 12 Months	1.68	0.949	1.52	0.676	0.046
Knowledge of WADA substances	2.15	1.003	2.17	1.003	0.312
Physiological Factors	25.87	11.659	29.07	11.711	0.214
Financial Factors	28.45	9.636	26.34	8.457	0.034
Political Factors	38.10	3.767	38.79	3.151	0.721

 Table 4.19: A Summary of doping prevalence, predisposing factors, knowledge, attitudes

 and vulnerability based on athletes' gender

Cultural Factors	32.22	9.528	33.67	9.833	0.210
Individual Factors	31.73	9.090	32.63	9.592	0.016
Doping Attitudes	36.43	11.554	38.71	13.110	0.421
Vulnerability	21.06	8.684	22.01	8.677	0.376

Table 4.19 showed no significance difference in; self reported doping practice in the sport, known PES use in the sport, prohibited PES use in Past 12 Months, Political risk factors and Cultural Doping risk factors, physiological risk factors, doping attitude and doping vulnerability amongst males and female athletes. However, anti-doping violation in 12 months showed a significant difference (p = 0.046) with male athletes indicating slightly higher doping violations (1.68 ± 0.949) than female athletes (1.52 ± 0.676). Furthermore, predisposing factors, individual factors indicated a significant difference (p = 0.016) with male athletes (32.63 ± 9.592). Doping predisposal due to financial factors also showed significant differences (p = 0.034) with the male athletes registering higher mean scores than female athletes (28.45 ± 9.636) and (26.34 ± 8.457) respectively. This means that both men and female athletes are at increased risk of breaking anti-doping rules due to different reasons, (individual or financial factors). Based on the results, the hypothesis doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athlete's gender was rejected.

Pairwise comparison with Dunn's post hoc tests showed that male athletes strongly agreed that financial factors and individual factors influence doping. A post-hoc test using Dunn's test with Bonferroni correction also revealed that male athletes strongly agreed that they have broken anti-doping rules at least once. The result of the Post hoc analysis showed that male athletes are more prone to breaking anti-doping rules and being influenced by financial and individual doping factors.

Table 4.20 shows summarized results (p-values from Kruskal Wallis test) on doping prevalence, predisposing factors, knowledge, attitudes and vulnerability based on responded athletes' type of sport.

Statement	Ath	letics	Ru	gby	Box	ing	Weig	htlifting	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std	р
Doping practice	2.89	1.697	3.29	1.577	2.94	1.819	2.39	1.701	0.030
in sport									
PES Use in Sports	1.17	0.378	1.14	0.347	1.32	0.470	1.34	0.480	0.004
PES use in Past	1.40	0.869	1.27	0.666	1.30	0.665	1.44	0.963	0.716
12 Months									
Anti-Doping	1.60	0.806	1.50	0.657	1.52	0.679	1.70	0.98	0.228
Violation in 12									
Months									
Knowledge of	2.18	0.990	2.23	1.026	2.05	0.968	2.15	1.015	0.103
WADA									
substances	••••	10 100	05.15	10 550		11.054		11 50 4	0.000
Physiological	29.38	12.403	25.17	10.570	25.33	11.374	25.24	11.734	0.032
Factors	26.22	10 5 4 2	28.20	7.044	20.16	0.000	20.20	7.070	0.102
Financial Factors	26.22	10.543	28.29	/.944	29.16	9.089	29.20	/.9/9	0.193
Political Factors	38.97	3.557	38.06	3.907	37.56	3.158	38.22	3.664	0.019
Cultural Factors	32.96	10.895	34.34	8.053	30.16	9.250	33.05	8.444	0.057
Individual	32.67	9.971	32.66	8.292	30.26	9.404	31.93	8.220	0.274
Factors									
Doping Attitudes	37.14	12.203	37.59	11.669	35.73	10.953	38.78	14.491	0.762
Vulnerability	19.71	7.576	21.77	8.665	22.44	9.188	23.41	10.2444	0.111

 Table 4.20: A Summary of doping prevalence, predisposing factors, knowledge, attitudes

 and vulnerability based on athletes' type of sport

The results in Table 4.20 show that there were significant differences on doping practice in sports (p = 0.030), PES use of sports (p = 0.004), physiological risk factors (p = 0.0032) and political risk factors (p = 0.019). This illustrates that the doping factors varies from one sport to the other. Hence the hypothesis, doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athlete's type of sport was rejected.

Pairwise comparison with Dunn's post hoc tests showed runners strongly agreed that physiological (29.38 \pm 12.403) and political factors (38.97 \pm 3.5577) influence doping. A post-

hoc test using Dunn's test with Bonferroni correction also revealed that most participants from rugby felt that doping is not a problem in sports.

A post-hoc z-test on the adjusted residuals with Bonferroni correction revealed that boxing athletes had used performance enhancing substances to low extent. There were no significant differences in PES use in Past 12 Months, Anti-Doping Violation in 12 Months, financial risk factors, cultural factors, individual risk factors, doping attitudes and doping vulnerability.

Table 4.21 is summarized results (p-values from Kruskal Wallis test) on doping prevalence, predisposing factors, knowledge, attitudes and vulnerability based on the age of athletes.

 Table 4.21: A Summary of doping prevalence, predisposing factors, knowledge, attitudes

 and vulnerability of athletes based on age

Statement	18-24 Yrs. (n=		25-30 Yrs.		31-3	31-35 Yrs.		36-40 Yrs.		>40 Yrs.	
	17	71)	(n=	117)	(n= 25)		(n= 14)		(n=7)		
	Mean	Std	Mean	Std	Mean	Std	Mean	Std			р
Doping	3.16	1.713	2.78	1.677	2.44	1.660	2.29	1.541	3.00	2.000	0.125
practice in											
sport											
PES Use in	1.28	0.792	1.26	0.439	1.20	0.408	1.43	0.514	1.43	0.535	0.085
Sports											
PES use in	1.31	0.763	1.40	0.824	1.35	0.757	1.24	0.548	1.63	0.844	0.600
Past 12											
Months											
Anti-Doping	1.51	0.700	1.65	0.858	1.56	0.684	1.581	0.886	1.62	0.723	0.020
Violation in											
12 Months											

Knowledge	2.1	1.008	2.18	0.993	2.49	0.919	2.06	1.005	2.29	1.026	0.087
of WADA											
substances											
Physiological	26.76	11.666	26.77	11.687	30.32	11.390	21.36	10.888	28.71	13.841	0.187
Factors											
Financial	27.59	9.117	28.31	9.868	25	8.597	31.21	8.929	25.71	8.845	0.184
Factors											
Political	38.34	3.694	38.31	3.752	38.16	2.544	38.29	4.159	38.29	2.289	0.077
Factors											
Cultural	33.20	9.727	31.56	10.303	35.32	6.805	28.86	8.104	32.71	5.559	0.019
Factors											
Individual	33.01	9.301	30.58	9.561	34.64	6.337	26.07	8.606	32.14	7.290	0.346
Factors											
Doping	37.30	12.475	37	11.659	36.12	11.911	37.79	12.084	38.86	13.310	0.949
Attitudes											
Vulnerability	20.91	8.238	21.43	8.893	21.24	7.474	27.57	12.507	19.71	8.036	0.281

Results in Table 4.21 show that predisposing factors based on age category of participants elicited significant differences in the distribution of frequency of Anti-Doping Violation in 12 Months (p = 0.020) and in cultural factors (p = 0.019). From the results the hypothesis, doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athlete's age was rejected.

The results of post-hoc test revealed that athletes in the 36-40 age category strongly agreed that cultural factors influence doping (28.86 ± 8.104) and most athletes have not violated antidoping rules in the past 12 months (mean < 2.0). Therefore, it is apparent that older athletes are more likely to be influenced by cultural factors to dope and at increased risk of violating the anti-doping rules. There were no differences on age category of participants and doping practice in sports, prohibited PES use in sports, prohibited PES use in past 12 Months, physiological factors, financial factors, political factors, individual risk factors, doping attitudes and doping vulnerability.

Table 4.22 shows summarized results (p-values from Kruskal Wallis test) on doping prevalence, predisposing factors, knowledge, attitudes and vulnerability based on the title held by athletes.

Table 4.22: A Summary of doping prevalence, predisposing factors, knowledge, attitudes and vulnerability of athletes based the title held by athletes

Statement	No tit	tle (n=	Intern	ational	Oly	mpic	Nat	ional	St	ate	
	1(03)	(n=	= 58)	(n=	= 26)	(n=	= 91)	(n=	=60)	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std			р
Doping	3.17	1.757	2.72	1.496	2.00	1.549	3.01	1.722	3.07	1.765	0.048
practice in											
sport											
PES Use in	1.12	0.322	1.29	0.459	1.35	0.485	1.27	0.449	1.18	0.390	0.000
Sports											
PES use in	1.14	0.507	1.79	1.083	1.61	0.915	1.23	0.650	1.35	0.756	0.000
Past 12											
Months											
Anti-Doping	1.41	0.489	1.92	1.106	1.65	0.799	1.52	0.703	1.54	0.639	0.000
Violation in											
12 Months											
Knowledge	2.09	0.984	2.43	0.976	1.97	0.976	2.03	0.988	2.30	0.982	0.096
of WADA											
substances			•••••	1.0.000							
Physiological	26.97	11.776	29.64	12.290	26.27	12.711	22.43	10.413	30.77	10.741	0.000
Factors					00.10	10 (50	20.05			0.077	0.001
Financial	26.97	9.232	26.22	9.234	29.12	10.652	30.85	8.798	25.67	8.877	0.001
Factors	20.00	2 9 5 2	20.05	2.057	27.50	2.076	27.25	4.520	20.67	2.550	0.000
Political	38.80	2.855	38.95	3.057	37.50	3.076	37.25	4.530	38.67	3.339	0.000
Factors	25 54	Q 50Q	22 74	0 565	27.25	12 592	20.21	0.628	22.62	9 265	0.010
Eastors	55.54	8.308	52.74	9.303	21.33	12.362	50.21	9.030	33.05	0.303	0.019
Individual	33 37	8 576	32.66	8 8/1	27 73	11 710	30.26	0 542	33 50	8 3 1 1	0.014
Factors	55.57	8.570	52.00	0.041	21.15	11./19	50.20	9.542	55.50	0.511	0.014
Doning	35 76	11 458	41.05	12 482	37 54	11 332	34 67	11 502	39.17	12 874	0 173
Attitudes	55.10	11.120	11.00	12.102	57.51	11.552	5 1.07	11.202	57.17	12.074	5.175
Vulnerability	20.95	9.081	22.52	8.249	20.27	7.476	20.56	9.362	22.55	7.751	0.383
Vulnerability	20.95	9.081	22.52	8.249	20.27	7.476	20.56	9.362	22.55	7.751	0.383

The results in Table 4.22 shows that based on the titles held by athletes, significant differences were returned on doping practice in sports (p = 0.048), prohibited PES use in sports (p < 0.001), PES use in past 12 months (p < 0.001), anti-doping violation in 12 months (p < 0.001), predisposing risk factors, physiological factors (p < 0.001), financial risk factors (p = 0.001), political factors (p < 0.001), cultural risk factors (p = 0.019), and individual risk factors (p = 0.014). From the results, hypothesis that doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athlete's titles was rejected.

Pairwise comparison with Dunn's post hoc tests showed athletes from with international title have violated Anti-Doping rules at least once (1.92 ± 1.106) , athletes with national title indicated that physiological (22.43 ± 10.413) and individual factors (30.26 ± 9.42) influence

doping, athletes with Olympic title revealed that financial factors (29.12 \pm 10.652) influences doping, and athletes with international title showed more affirmation to use some form of prohibited substances at some point in sports compared to other athletes with different titles (1.29 \pm 0.459).

A post-hoc z-test on the adjusted residuals with Bonferroni correction revealed that significant portion of athletes that have used prohibited PES have international titles. However, there were no significant differences for doping vulnerability, doping attitudes and titles held. Thus, it appears that athletes with international and Olympic titles are more likely to be predisposed to doping.

Table 4.23 represents summarized results (p-values from Kruskal Wallis test) on doping prevalence, predisposing factors, knowledge, attitudes and vulnerability based on responded athletes' level of education from sport.

Statement	No sch	ool (n=	Prii	mary	Seco	ndary	Co	llege	Univ	ersity	
	4	5)) (n= 53)		(n= 136)		(n=73)		(n= 71)		
	Mean	Std	Mean	Std	Mean	Std	Mean	Std	Mean	Std	р
Doping practice in sport	1.40	0.548	2.17	1.464	2.99	1.749	3.10	1.693	3.38	1.668	0.001
PES Use in Sports	1.40	0.548	1.45	0.503	1.22	0.416	1.16	0.373	1.08	0.280	0.001
PES use in Past 12	1.11	0.231	1.75	1.034	1.30	0.725	1.36	0.840	1.14	0.505	0.000
Months Anti-Doping Violation in	1.44	0.210	1.74	0.962	1.56	0.754	1.60	0.796	1.43	0.524	0.480
12 Months Knowledge of WADA	1.29	0.387	2.20	0.941	2.24	0.990	2.18	1.030	2.01	0.986	0.128
Physiological Factors	27	16.508	25.13	10.219	27.94	12.112	28.26	12.298	24.46	10.978	0.201

 Table 4.23: A Summary of doping prevalence, predisposing factors, knowledge, attitudes

 and vulnerability of athletes based on athletes' level of education
Financial	30.2	13.255	30.11	8.414	26.85	10.440	26.52	8.505	29.14	7.922	0.010
Factors											
Political	36	2.000	38.15	3.549	38.54	3.584	38.12	3.153	38.32	4.171	0.163
Factors											
Cultural	31.2	14.923	27.77	9.409	33.81	10.137	32.90	9.003	33.94	7.982	0.006
Factors											
Individual	28	9.695	28.08	8.689	32.88	9.945	32.58	8.843	32.93	7.918	0.353
Factors											
Doping	29.6	1.517	37.42	10.842	37.99	11.552	37.58	13.882	35.28	12.188	0.049
Attitudes											
Vulnerability	18.6	3.975	20.58	6.506	22.46	8.888	20.52	9.518	20.82	8.969	0.543

Results in Table 4.23 in terms of level of education of the athletes and predisposing factors, significant differences were returned on doping practice in sports (p = 0.001), prohibited PES use in sports (p = 0.001), prohibited PES use in past 12 months (p < 0.001), financial risk factors (p = 0.010), cultural risk factors (p = 0.006), and doping attitude (p = 0.049). From the results the hypothesis that doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athlete's level of education was rejected. Pairwise comparison with Dunn's post hoc tests showed athletes with secondary education strongly agree that financial factor influences doping (26.85 ± 10.440), athletes with primary education reported that cultural factors influence doping (27.77 ± 9.409), athletes with no school education reported doping is a major problem in sports (1.40 ± 0.548).

Table 4.24 shows summarized results (p-values from Kruskal Wallis test) on doping prevalence, predisposing factors, knowledge, attitudes and vulnerability based on responded athletes' annual income of athletes.

 Table 4.24: A Summary of doping prevalence, predisposing factors, knowledge, attitudes

 and vulnerability of athletes based annual income of athletes

Statement	<100 000 (n=26)		100 - 500 000 (n=256)		500 – 1 000 000 (n=32)		1 – 5 000 000 (n=14)		> 5 000 000 (n=10)		
	Mean	Std	Mean	Std	Mean	Std	Mean	Std	Mean	Std	р
Doping practice in sport	3.19	1.789	2.98	1.731	2.69	1.595	2.71	1.637	2.60	1.578	0.927
PES Use in Sports	1.12	0.326	1.20	0.400	1.31	0.471	1.43	0.514	1.40	0.516	0.053

PES use in	1.18	0.540	1.27	0.682	1.66	1.002	1.93	1.298	1.86	1.211	0.000
Past 12											
Months											
Anti-Doping	1.46	0.624	1.51	0.678	1.77	0.952	2.08	1.144	2.01	1.277	0.003
Violation in											
12 Months											
Knowledge	1.82	0.882	2.16	0.990	2.36	1.024	2.38	0.962	1.98	1.092	0.067
of WADA											
substances											
Physiological	22.23	10.033	26.65	11.677	30.84	11.992	32.50	13.375	22.5	9.046	0.297
Factors											
Financial	30.73	8.210	27.91	9.179	24.47	10.497	24.86	10.257	32.8	7.285	0.479
Factors											
Political	37.77	3.216	38.25	3.632	38.78	3.118	38.64	4.893	39.2	3.584	0.000
Factors											
Cultural	30.42	8.851	32.97	9.453	33.91	10.393	32.64	11.160	26.4	10.167	0.747
Factors											
Individual	29.73	9.689	32.21	9.171	32.84	9.436	31.79	9.807	30.2	9.151	0.854
Factors											
Doping	29.81	8.462	37.11	11.951	41.03	12.217	40.36	14.679	39.1	12.261	0.020
Attitudes											
Vulnerability	19	9.859	21.59	8.846	21.78	7.615	20.79	8.002	20.6	4.719	0.380

Results in Table 4.24 show that the athlete's annual earning indicated significant differences on prohibited PES use in past 12 months (p < 0.001), anti-doping rule violation (p = 0.003), political factors (p < 0.001), and doping attitudes (p = 0.020). From the results the hypothesis that doping prevalence, predisposing factors, knowledge, attitude, and vulnerability does not significantly differ based on the athlete's annual income was rejected.

Pairwise comparison with Dunn's post hoc tests showed athletes with income between 1,000,000 and 5,000,000 have violated anti-doping rule at least once (2.08 ± 1.144) , athletes with income levels of between 500,000 to 1,000,000 have permissible attitude towards doping (41.03 ± 12.217) , athletes with less than 100,000 annual incomes indicated that political factors is more likely to influence doping (37.7 ± 3.216) . There were no significant differences on physiological factors, financial factors, cultural risk factors, individual risk factors, doping practice in sports, prohibited PES use in sports and doping vulnerability.

CHAPTER FIVE: DISCUSSION

5.1 Introduction

This section discusses the research findings emanating from chapter four by comparing and contrasting the findings with extant literature. The chapter also provides implications of the findings in line with the study objectives. The findings are discussed in order of prevalence of PES use among athletes, predisposing factors of doping behavior, knowledge of athletes on Anti-Doping behavior, doping attitudes, doping vulnerability, and comparison of the aforementioned areas with selected socio-demographic factors of gender, sports category, level of education, age of athletes, athlete's title and annual income of athletes.

5.2 Prevalence of Performance Enhancing Substance use amongst Athletes in Dominant Olympic Sports

The findings of the study established a self-reported doping of 21.9% in a sample of 338 competitive athletes from dominant Olympic sports in Kenya. In addition, 36.1% of athletes in dominant Olympic sports knows of a colleague who use performance-enhancing substances. Elite athletes have been found to use PES in mixed and varying levels based on the methods used for measuring doping prevalence. As a result, caution need to be taken when interpreting these findings. Nonetheless, the findings of this study resonate with other studies which suggested that doping prevalence is approximately between 10% to 40% (Bird et al., 2016; Campian et al., 2018) and 0% to 73% among competitive athletes (Gleaves et al., 2021).

The majority of the self-reported studies on doping prevalence were in Europe which corresponds with the findings of this study (Elbe & Pitsch, 2018; Hon et al., 2015; Mottram & Chester, 2018). For instance, amongst Danish elite athletes, a prevalence of between 26% - 30.6% was reported (Elbe & Pitsch, 2018) while in Germany the prevalence of prohibited PED use of between 10% - 48% was reported (Hon et al., 2015; Mottram & Chester, 2018). In Africa, the study findings have also been supported by similar findings in Nigeria, where a

prevalence of 26% was realized amongst elite athletes. (Adegboyega, 2012; Olanipekun & Adegboyega, 2014). However, a study conducted amongst Ugandan athletes revealed a slightly lower prevalence (3.3%-13.1%) (Muwonge, 2015). One possible explanation for the disparity with the study findings could be attributed disparity of study measures for doping prevalence, for example, level of competition examined (national, international), athletes involved (amateur, professional, junior) as well as sport discipline investigated (athletics, football, tennis, mixed). For example, the study from Uganda assessed amateur athletes, unlike the current study that focused on elite athletes from dominant Olympic sports (athletics, rugby, boxing, weightlifting). Another possible reason for the difference in study findings is the methodological heterogeneity inherent in the cross-sectional studies of self-reported doping. In this regard, De Hon et al., (2015) suggested that prevalence rates in most self-reporting studies on doping range from 1 to 70% of all athletes having used banned substances at some point in their career, dependent on specific sport and competitive level.

The study established a significant variation in the self-reported doping of prohibited PESs use with athletes from weightlifting discipline admitting to use prohibited PESs more than other three disciplines (34.1%) and (32%) admitted to have at least used the substance once. Despite the sparse empirical evidence on weightlifters on the subject, Kolliari et al. (2021) analyzed the publicly available data from the International Weightlifting Federation (2008 – 2019) on prohibited PESs use among weightlifters and found that 82% used prohibited PES particularly Anabolic Androgenic Steroid (AAS) metabolites and markers indicating endogenous AAS. There are several possible reasons for weightlifters in Kenya to admit use of prohibited PES, among them ignorance, cultural and peer pressure, and lack of oversight. This is because over the years rigorous anti-doping measures in Kenya had focused on athletics but recently anti-doping efforts have spread to other sports including weightlifting.

The relatively wide spread of the self-reported doping among elite athletes in dominant Olympic sports is supported by the finding that approximately 49% of the respondents perceive doping to be a problem in dominant Olympic sports. These findings are aligned with the results revealed in the study (Chebet, 2014) where it was reported that around 47% of athletes consider doping to be a problem. Similarly, Ogama and Sakwa (2019) found that around 50% of elite athletes in middle and long-distance athletics consider doping to be a problem in sports.

The findings of this study showed that the substances highly used were stimulants followed by narcotics, Atetrahydrohestrinone, EPO, blood doping, and glucocorticoids. On the contrary, diuretics & masking agents, non-approved substances, beta 2 agonists, peptide hormones, human growth hormone, and cannabinoids were found to be among the prohibited substances with low use by the elite athletes. The study findings contradict the existing studies on the usage of WADA-prohibited performance enhancing substances showing varied findings (Al Ghobain, 2016; Faiss et al., 2020). For instance, Al Ghobain, et al. (2016) demonstrated that the most commonly used drugs were found to be stimulants, narcotics, and anabolic steroids. Similarly, Aguilar-Navarro et al, (2020) found out that anabolic agents and stimulants were the most common banned substances detected when accounting for all individual and team sports, with the remaining groups of substances being found much less frequently. An interesting outcome of the current study was peptide hormones, human growth hormones, cannabinoids, and beta blockers were used by a small number of elite athletes. A divergent finding is reported in the study by Aguilar-Navarro et al, (2020) that indicated peptide hormones, human growth hormone, cannabinoids, and beta blockers as commonly used by athletes based on analysis of WADA report between 2012 and 2017. Thus, differences in study findings could be attributed to the methodologies used in the studies.

5.3 Predisposing Factors of Doping Behaviour among Athletes in Dominant Olympic Sports

The findings of this study reveal that financial and cultural factors significantly influence the doping behavior of athletes in dominant Olympic sports in Kenya. This finding is in line with

Nica-Badea (2016) who opines that one of the basic reasons that influence the intention to use banned substances to enhance the performance of athletes is the quest for financial and material gains. Indeed, 60.6% of respondents in the study said the chance to have financial and material gains was the reason why they indulged in doping in sports. Similarly, Ogama and Sakwa (2019) confirm that prize money and financial pressure are the main incentives for middle and long-distance athletes to dope in Kenya.

Financial motivation for doping is attributed to the financial pressures that are inherent in athletics such as the desire to win race prizes and to get financial rewards from sponsors (Kegelaers et al., 2018). Athletes use available or impeding financial incentives to make a costbenefit analysis. Doping costs may only have a minimal effect on the prevalence of doping based on the amounts that race organizers award athletes. The higher the prize money the more likely an athlete will be motivated even with the knowledge of prevailing costs.

Ogama and Sakwa (2019) found that economic factors of prize money, sponsorship deals, individual financial status, and family financial standing, boost economic and economic depression contributing to doping amongst middle and long-distance runners in Kenya. Similarly, Gitonga (2018) showed that financial incentives are a major contributing factor to doping prevalence in Kenya.

The study findings demonstrate that cultural or social factors are a strong predictor of doping in Kenya. This aligns with the findings of a study done in Italy that showed that social/cultural factors at both micro and macro/meso-level factors determine doping intentions amongst athletes (Salinero, et al., 2020). Although the study investigated social-cultural reasons for doping at all three levels, the current study was only limited to micro-level or individual reasons. Social reasons at the micro level are largely attributed to physicians, coaches, parents as well as other athletes who may influence athletes to engage in doping, provide essential information on doping, and aid the sportspersons in obtaining the prohibited PES, or even assist in administering the substances. Allen et al., (2015) in emphasizing the role of athlete support personnel in doping argue that support personnel in sports provides a wide socialization context that involves a confluence of definitions, associations, shaping behaviors, reinforcement, and imitation through interactions. These study findings are in agreement with the findings by (Sekulic et al., 2017; Ulrich et al., 2018) that showed that the coach, team managers, teammates, friends, and family members are instrumental in influencing athletes into doping as they are sources of doping knowledge.

Another reason cited in the literature for the significance of cultural factors on doping relates to sporting culture. According to Lazuras et al. (2010), being an athlete in a given sporting discipline also means adopting the norms and beliefs that are dominant in that sporting culture. The author further argues that if the sporting culture involves the normalization of doping, then athletes in such sports will always be under pressure to use performance-enhancing substances.

The findings of the study indicate that political, cultural, financial, individual, and physiological factors all have a positive effect on doping behavior. This suggests that within the Kenyan context, all these factors may worsen doping behavior with varied significant levels. However, only financial and cultural factors can be confidently associated with increases in doping in the country. The non-significance of political, individual, and physiological factors in the study contradicts the reported findings elsewhere (Kegelaers et al., 2018) which reported that significant predictors of doping are psychological factors, psychosocial and financial factors of doping. An explanation for the difference could be attributed to the study design.

5.4 Athletes Perceived Knowledge on the World Anti-Doping Agency (WADA) Prohibited Substances

The findings of this study indicated that athletes' knowledge of WADA Prohibited List and PES was average and irregular (Table 4.16). This implies that most of the athletes in dominant

Olympic sports in Kenya have limited correct knowledge of WADA-prohibited substances. Similar results were reported in the study conducted amongst elite athletes in Australia where athletes had limited knowledge of the banned status of the 30 substances/method prohibited by WADA (Orr et al., 2018). The limited correct knowledge by athletes on WADA banned substances could be attributed to low levels of awareness about banned substances due to its complex language . Boit et al., (2014) concluded that the great majority of Kenyan athletes are ignorant about substances that are classified as prohibited in sports. This is even though elite athletes are expected to be knowledgeable on various banned substances in the sports they are participating in. In this regard, WADA has engaged different ADOs to create more awareness amongst amateur and elite athletes on banned substances. Despite the efforts by WADA on creating awareness, the knowledge level of banned substances has been found to be varied (Zeigler-Hill & Shackelford, 2020) which further explains the limited knowledge of banned substances.

The findings of the study contradict other previous studies on knowledge of WADA banned substances in Africa (Akindutire et al., 2012; Muwonge et al., 2015). For instance, Muwonge et al., (2015) noted that the majority of Ugandan athletes were knowledgeable about most WADA banned substances. In Nigeria, athletes were reported to have good knowledge of most of the banned substances, with only limited knowledge of some doping substances (Akindutire et al., 2012). One possible explanation of this could be the different pathways for athletes' entry into elite sports or their transition that plays a critical role in determining their exposure to knowledge on WADA-prohibited substances (Sanders & Winter, 2016).

The study findings also demonstrated that responding athletes perceived their knowledge of banned performance-enhancing substances as poor. Similar findings were reported in Saudi Arabia where the knowledge of the status of substances and methods prohibited at all times ranged from 6 to 30% (Al Ghobain, 2017). Despite the more emphasis that is placed by Anti-Doping organizations on prohibited substances, less awareness of this substance is reported.

This could be attributed to education strategies used to educate or make athletes aware of WADA prohibited substances and the sources of education for awareness on WADA prohibited substances. Boit et al., (2014) in supporting this, reported that athletes receive knowledge on WADA prohibited substances from various sources, with 30% of athletes reporting receiving information from ADAK while the rest are from different sources. Indeed, some of the sources of knowledge on doping among athletes may not be current or credible as exemplified in a study conducted in Turkey (Ozkan et al., 2020). The study reported that the common sources of information among athletes are physicians, coaches, pharmacists, teammates, WADA, and Anti-doping authorities in Turkey. Accordingly, the findings showed that only physicians were reported as highly credible sources while the rest scored low to moderate credibility.

The study findings show that athletes perceived themselves as better informed regarding status of the supplement substances on the WADA prohibited and substance list. The finding underscores how the sale and consumption of supplements have increased both in the general population and the sports population (Jovanov et al., 2019). This is possibly attributed to the reason that most athletes believe or consider dietary supplements not contaminated with prohibited substances. These findings are consistent with findings among Greek and Spanish athletes that showed that more than 50% of athletes had correct knowledge of supplements on the WADA prohibited list (Baltazar et al., 2019; Konstantinos et al., 2018). In Kenya, around 50% of athletes have good knowledge of supplements as WADA banned substances (Boit et al., 2014; Chebet, 2014).

The high perceived knowledge of supplements' status having the possibility of containing a banned substances could be linked to the awareness done by ADAK in cautioning athletes against the use of supplements. In Kenya, supplement use is not regulated and banned, and this may encourage more athletes to use it. This situation may increase the risk of athletes breaking Anti-Doping rules as some of the supplements are laced with prohibited substances (GoK,

2020). This is supported by the Athletics Integration Unit (2020) reports that revealed that failed doping tests from 2 Kenyan athletes between 2017 and 2019 were from a contaminated supplement.

5.5 Doping Attitude among Athletes in Dominant Olympic Sports

The findings of the study showed that athletes had negative attitudes toward doping. The low attitude towards doping confirms that a significant portion of the athletes in the study population is less permissive towards doping. These affirms the findings revealed in local studies on doping attitudes among athletes at different levels of competition (Chebet, 2014; Kamenju et al., 2016; Ogama, 2019; Rintaugu & Mwangi, 2021). For example, Chebet, (2014) noted that athletes have a negative attitude toward doping (Kamenju et al., 2016; Rintaugu & Mwangi, 2021) reported that athletes in teacher trainees and university students pursuing sport science degrees had a negative attitude toward doping. Similarly, doping attitudes among middle long-distance runners in Kenya are largely negative (Ogama, 2019). It is thus evident that the majority of elite athletes participating in dominant Olympic sports in Kenya have negative attitudes toward doping.

However, these findings on attitudes toward doping contradict other results reported in developed countries. For example, Zeigler-Hill and Shackelford (2020) showed that elite athletes have positive attitudes toward doping in Europe. The difference in findings can be linked to the geographical and cultural context of the studies. Athletes in Europe have a slightly critical viewpoint towards doping compared to athletes in Africa (Hurst et al., 2022). In sports, moral identity is considered an important factor that determines the doping attitudes of athletes (Stanger & Backhouse, 2020).

On the sub-components of doping attitudes, the study revealed that elite athletes in dominant Olympic sports in Kenya have the highest scores on attitudes linked to minimization of issues while the lowest scores were on attitudes linked to circumstantial factors. These findings demonstrate that high permissibility towards doping amongst elite athletes is largely tied to the minimization of the doping problem. Higher doping permissibility due to minimization of issues has been attributed to moral disengagement amongst athletes (Hodge, et al., 2013). This is evidenced in the findings reported by Blank, et al. (2016) who demonstrated that athletes with high levels of moral disengagement had relatively positive doping attitudes due to the minimization of issues. Consistent results have also been found in previous studies (Chen, et al., 2017; Sukys et al., 2021). These studies found that a positive doping attitude among athletes is linked to the minimization of issues.

The study findings are indifferent to the results reported by López-Hincapié et al. (2020) in Spain that a higher level of doping attitudes was regarding circumstantial factors. This could be explained by the study's focus on high-performance athletes that are increasingly under pressure to win or succeed at all costs. This is because athletes with extremely high perfectionism levels are also more inclined to have positive attitudes toward doping.

5.6 Doping Vulnerability amongst Athletes in Dominant Olympic sports

The findings highlighted that the athletes from the dominant Olympic sports in Kenya have low vulnerability towards doping. These findings indicate that athletes from dominant Olympic sports may be less vulnerable to a doping decision. This is contrary to the findings in a report published by WADA (2022) that showed that athletes have higher vulnerabilities to doping. The difference in findings between the WADA and the current study is more likely attributed to the factors explaining vulnerability. For example, the WADA (2022) report identified access and availability to nutritional supplements as the leading factor for doping vulnerability. However, WADA acknowledged that nutritional supplements are easily and readily available in developed countries as opposed to developing countries.

On the doping vulnerability sub-components, the findings revealed that personal vulnerability was more likely to be experienced amongst the athletes in dominant Olympic sports in Kenya as opposed to situational vulnerability. These findings suggest that vulnerabilities amongst athletes in dominant Olympic sports in Kenya are more likely linked to personal characteristics, personality traits, or attitudes than career-related circumstances and temporary situations in the life of the athlete. Hence it can be deduced that intrinsic motivation holds more sways than extrinsic motivation in making athletes in doping Olympic sports vulnerable. The results align with the findings of a study conducted in the UK by Nicholls et al. (2017) where personality traits represent a potential answer to explain the fact that several elite and amateur athletes' resort to doping substances in comparison to career-related factors.

The findings of the study echo previous work illustrating that personality traits as a factor of perfectionism are important in athletes' vulnerability towards doping. In this regard, the findings are congruent with recent meta-analytic evidence in highlighting that this is particularly the case for perfectionistic concerns (Madigan et al., 2020). These findings are also consistent with the broader literature showing that other personality traits are important factors for doping vulnerability (Hardwick et al., 2021).

The findings reported that situation-related vulnerability amongst athletes is low in Olympic dominant sports. This contradicts other studies that have reported that athletes are more likely to develop a willingness to dope during periods of instability. This is what Overbye and colleagues (2013) referred to as setback situations and others have referred to as tipping points, or periods of personal distress (Hauw & Bilard, 2012; Kirby et al., 2011; Mazanov, et al., 2011). Injuries were commonly perceived by these National level athletes as pressure that could lead to doping to recover quickly, corroborating previous research (Bloodworth & McNamee, 2010; Mazanov et al., 2011). Occupational necessity has also been reported in other studies as a main reason for doping vulnerability among athletes (Henning & Dimeo, 2018; Shelley et al., 2021). Accordingly, these studies have shown that concerns about supporting their family, paying the mortgage or retiring from the sport with no qualifications to fall back on, pressure to secure a

source of income for professional rugby players and pressure of needing to hit performance standards have the potential to trigger doping in athletes.

5.7 Comparison of Doping Prevalence and Predisposing factors across Selected Demographic Factors

This section discusses the findings emerging from the comparison of doping prevalence, doping attitudes, doping vulnerability, predisposing factors against selected demographic factors of age, sports category, education level, title of athletes and annual income.

5.7.1 Gender

The findings of the study indicated that male athletes are more likely to be motivated to doping due to financial factors. This result suggests that financial and individual reasons are strong incentives amongst men than women in their doping behavior. This could be explained by Njororai's (2016) assertion that gender differences in doping behavior are tied to the physical, physiological, and psychological characteristics of athletes as well as the social-cultural context in which they live as athletes. The socio-cultural context of the study places more burden on athletes to win monetary rewards as they are considered the household breadwinners. Thus, in the African context, Kenya included, men rather than women are more inclined to be under the pressure to dope for the reason of winning monetary rewards.

This could be attributed to the patriarchal society of Kenyan Athletes. In the traditional sub-Saharan context, men are expected to be the breadwinners of their families and to support their families while women are largely dependent on men for financial support and care (Burnett, 2018). This places an extra burden on male athletes to dope for financial reasons in comparison to female athletes.

This is not the first study to report a higher doping likelihood in male athletes due to financial motivation. Teetzel (2008) reported that male athletes are more likely to be motivated to dope for financial reasons than female athletes. In a recent study conducted in Kenya, Ogama (2019)

reported that male athletes in the middle and long-distance running are more prone to doping motivated by financial reasons. As support for these studies, it must be stated that the association between male athletes and financial motivations for doping is not only a characteristic of athletes in dominant Olympic sports but also other athletes in other sports disciplines. Regardless of the sports disciplines, it is clear that monetary reward as a motivation for doping behaviors is more likely to be reported amongst male athletes than females. This is supported by the ADAK report 2023 doping statistics for males and females at 70-60%. These demonstrated that men are more motivated to dope because of financial reasons than females (Boit et al., 2014).

The findings showed that individual factors such as the need to enhance self-esteem, confidence, and fame in sports influence doping more amongst male athletes than female athletes. This could be linked to what Bilard et al. (2011) attribute to benefit appraisal amongst male athletes. In explaining the benefit appraisal, the authors assert that male athletes for personal reasons are more likely to dope if they believe it can help them win, enhance their self-esteem and improve their confidence. Another reason was highlighted in a study on motivation for doping behavior among athletes indicating that female athletes' concern about the negative consequences of doping to their reputation is a more limiting factor to doping due to personal factors in comparison to male athletes (Zaletel et al., 2015).

Previous studies have reported that individual factors are one of the strong predictors of doping behavior (Backhouse et al., 2015; Ntoumanis et al., 2013; Pedersen, 2010). In these studies, male athletes were found to be more likely to dope because of the need to improve their self-esteem and confidence. This logically reflects a higher likelihood of doping behavior due to individual factors among male athletes.

The findings revealed that male athletes were more susceptible to the breaking of anti-doping rules than female athletes. This implies that there is a positive tendency for doping amongst

male athletes that leads them to violate anti-doping rules. According to Sekulic et al. (2016), the gender differences in anti-doping violations can be explained by the less concern about the negative consequences of doping behaviors and punishment for breaking anti-doping rules among men. For example, Moston (2015) found that few female bodybuilders had broken the anti-doping rules in comparison to male body builders. Similarly, Madigan et al. (2019) found that male junior athletes were more likely to be found to have committed anti-doping violations in comparison to female junior athletes who may have low doping intentions due to fear of shame if caught.

5.7.2 Comparison Based on Sport Category

This study indicated that athletes from middle and long-distance running felt that physiological and political factors strongly influence doping. Athletes from field and track events are considered to have a strong culture of doping in comparison with other sports disciplines in Kenya (Ogama, 2019) and this is evident from the number of athletes in track and field who have failed doping controls in Kenya as evidenced in WADA (2016) report on doping in Kenya. The report showed that a total of 5 athletes from field and track events were reported to have doped as opposed to 1 athlete in other events. A strong culture of doping is associated with high levels of competition as is the case in field and track events in comparison with other sports disciplines. Overall, it can be reasonably concluded that runners are at greater risk of doping due to their history of doping and the higher level of competition in athletics. These study findings are in support of Chebet (2014) that revealed that physiological reasons such as faster recovery from injuries are significant risk factors for doping in middle and long-distance runners.

The findings of the study revealed that athletes from Rugby do not consider doping to be a problem in sports. This could be explained by the perception that the use of PES is less common among those involved in team sports. Similar findings were reported in the study by Whitaker et al. (2017) that revealed that the perception of doping in rugby players is relatively low

compared to other sports. Nonetheless, the findings contradict the Word Rugby Union report (2016) that was commissioned to conduct an independent investigation on matters arising from the Kenya Government anti-doping Taskforce Final Report of 2014. The report revealed the presence of systematic doping through the use of supplements laced with steroids within the National team and clubs. The difference in findings could be linked to the study methodology. The use of self-reported questionnaires may result in participants underrepresenting the doping problem (Petróczi et al., 2008).

The findings of the study revealed that a significantly lower portion of boxers has used performance-enhancing substances as compared to athletes from other sports disciplines. Matthews and Jordan (2020) opine that the traditional ways of training and competing in boxing make the sport resistant to performance-enhancing drug use. The authors also argue that boxing is associated with the masculine values of putting in 'honest' hard work without cutting corners, a situation that allows coaches and athletes to refrain from a 'winning at all costs' mentality. These findings concur with Woolf and Perkari (2021) that reported that the use of performance-enhancing substance appear to be low in Boxing sports in comparison with other types of sports.

5.7.3 Comparisons Based on Level of Education

The findings showed that athletes with secondary education were more at risk of financial factors of doping while athletes with primary level of education felt that cultural factors strongly influenced doping. This suggests that the education level of athletes relates to risk factors in doping independently and differently. This could be attributed to the reason that the level of education is a determinant of the moral value and level of the reference group in each sport. Accordingly, moral values and reference groups have implications on the athlete's perception of risk factors and attitude toward doping.

Another possible explanation for the association between low-level education and social factors could be found in the study by Rodek et al., (2013) which reported that a low level of education is likely to encourage athletes to use prohibited substances due to lack of information on what constitute prohibited substances and risks associated to doping. Hence athletes with a primary level of education can be seen as more predisposed to believing that doping is socially desirable and may be acceptable. This aligns with the assertion by Akindutire and Olanipekun (2015) that athletes with lower education status are likely to be under pressure to social and societal pressures, and the desire for social recognition in Nigeria.

The results of the study also showed that level of education is a determinant of supplement use amongst athletes, with athletes of higher education status, more likely to use supplements than their counterparts of lower education status. These findings partly conform to the findings of Muwonge et al. 2015 where nutritional supplement use was significantly higher in athletes with a tertiary education in Uganda.

5.7.4 Comparisons Based on Age of Athletes

In terms of age comparison, the findings indicated that athletes from the older age categories were more inclined to violate Anti-Doping rules than athletes from the younger categories. One explanation regarding this trend is that older athletes feel greater pressure to be successful in sport (e.g. win in competitions or secure professional contracts) or to increase their muscle mass as compared to younger athletes who believe in training hard for positive results/performance (Ntoumanis et al., 2014) who believes in training hard for positive performance.

This finding resonates with the literature where older athletes were found to be more likely to break Anti-Doping rules due to pressure to remain competitive as they get older (Backhouse et al., 2013; Overbye et al., 2013)

The study findings revealed that older athletes are more likely to be influenced by cultural factors to dope. This implies that as athletes get older the social factors will increasingly become a significant determinant of their doping behavior. Older athletes may be predisposed to dope due to many reasons. First, becoming a senior is often associated with increased pressure to win, generated both by the athlete and the athlete's support personnel (ASP). This can also be aggravated by an expectation of the athlete to win at all costs. At the same time, as athletes get older, they are more likely to experience a decline in performance. The combination of these factors and the athlete support personnel culture can be an additional risk factor when the ASP holds a positive doping attitude and direct influencers are present. It can be concluded that older athletes can be pushed to dope due to cultural factors because of the personal environment, especially when ASP have positive attitudes towards doping behavior. Social factors as a contributing factor to older athletes doping behavior have also been reported in other studies (Kegelaers et al., 2018; Ring et al., 2019).

5.7.5 Comparisons Based on Title of Athletes

The study findings showed that athletes with international titles are more susceptible to the violation of Anti-Doping rules and the use of PES. This suggests that athletes' concern for success at international sporting events is likely to push them to use PES and violate anti-doping rules in their careers. This can be explained that success in major international sporting events can serve as a stimulus for broader participation and recognition of the athletes in their sporting career. Success in these events not only provides an economic incentive for athletes such as winning rewards but can also catch the attention of sponsors who may provide long terms economic support to athletes locally and internationally. Elite athletic performance necessitates intense commitment from those who dedicate themselves to the pursuit of victory. The pressure to succeed can create an environment where athletes seek to gain a competitive edge through the use of performance-enhancing substances. Watson et al. (2022) also found

that the pressure to participate and compete in international sports events is likely to put more pressure on athletes to use performance-enhancing substances.

Athletes with Olympic titles were found to believe that financial factors are more likely to influence doping than other factors. These highlight that elite athletes training for the Olympics may opt to dope as a result of financial motives. To most athletes, the Olympic Games are considered to be the most important event in an athlete's career life, and winning a medal at the Olympics is the highest achievement of any athlete and may completely change the economic fortunes of such an athlete (Hayward et al., 2022). The media's misplaced fixation on the Olympics as well as the desire for country honors may put more pressure on athletes to have doping intentions. These findings echoed those by Gleaves et al. (2021) which demonstrated that the desire to win an Olympic medal puts more pressure on athletes to dope.

Furthermore, the study findings reported that athletes with Olympic titles strongly believed that doping is a major problem in sports. An explanation for this could be the number of anti-doping violations reported on media before the Olympic Games or at the beginning of the sporting event. For instance, the WADA report showed that a total of 130 Anti-Doping rule violations were reported from samples collected during Beijing 2008 and London 2012 Olympic Games. Similarly, 18 Anti-Doping rule violations were reported at the Tokyo 2020 Olympic Games, including 2 Kenyans (WADA, 2022). The WADA report concurs with the findings revealed in the study by Hayward et al. (2022) where athletes with Olympic titles were found to consider doping to be a problem.

The findings also showed that athletes with National titles strongly felt that doping behavior was more likely due to physiological and individual reasons. This implies that triggers for doping intentions may occur due to a particular social and physical situation of the athletes. Odhiambo (2015) explains that athletes who compete in local or National competitions are motivated by the desire to use national competitions as a platform to scale to international competitions, use it to prepare for international competitions, and build their confidence and self-esteem. The findings also revealed that athletes with no titles have used some form of WADA prohibited substances. Athletes with no titles may be more inclined to believe that fair play is no longer present in the world of sports. This situation contributes to significant psychological pressure having "a constraining influence on the mind" of the competing athletes to try doping. The findings support the hypothesis that failure to win medals in sports may act as a push factor to consider using performance-enhancing substances. Similarly, Kegelaers et al. (2018) reported that athletes with limited success in sports were more likely to dope than those with significant success in sporting events.

5.7.6 Comparisons Based on Annual Income of Athletes

Study findings showed that athletes earning higher incomes are more prone to violating antidoping rules suggesting that the pressure to dope is stronger amongst high-income earning athletes. Overbye et al. (2013) attribute this to the need for high-earning athletes to maintain their socio-economic status. The fear of losing their financial status may motivate them to use performance-enhancing substances to shore up their chances of winning competitions and the reward that comes with winning. The financial pressures of elite sports and the idea that through enhancing their performance, athletes could improve their financial status to be considered as important incentives for doping among high earning athletes (Onywera, et al., 2006).

The findings show that athletes with an annual income of between 500,000 to 1,000,000 have a permissible attitude toward doping. This demonstrates that athletes earning lower incomes have a more positive attitude toward doping intentions. This was also supported by the findings that indicated that athletes earning less than 100,000 have used some form of WADA prohibited substances at least once (Table 4.22). The permissible attitude from low earning athletes could be attributed to the reason that athletes view sports as a means of economic empowerment. This is supported by the study by Onywera et al. (2006) which found that onethird of Kenyan international runners became athletes for economic empowerment. It is estimated that 33% of the total Kenyan population is unemployed (KNBS, 2019) while 37% live below the poverty line (World Bank, 2017) hence economic reasons would act as an important motivator for athletes to participate in sports. Economic empowerment as the reason for participation in sports was also expressed by Ogama (2019) who found that athletes run to win prize money for economic empowerment, get sponsorship deals for their economic wellbeing, and improve their financial status. Another reason for economic empowerment as motivation for sports is because successful athletes have been reported to have invested in the purchase of assets, engaging in farming, and running various businesses and this serves as a motivation for young athletes to win through doping.

Lastly, the study findings revealed that athletes from low economic status were not in agreement on the importance of political factors as an influence on doping. This suggests that athletes from low economic status consider micro-related factors to be more important in determining doping intentions than Macro related factors. This aligns with the conclusion by Kegelaers et al. (2018) and Henning et al. (2021) that micro factors are more significant risk factors for the doping intentions of athletes than macro risk factors.

CHAPTER SIX: SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Demographic Information

A total of 338 athletes participated in the study translating to a response rate of 92.61%. This consisted of 101 female (29.88%) and 237 (70.12%) male athletes. Most of the participants had a tertiary level of education (42.6%) followed by those with a secondary level of education (40.2%) and lastly basic education (15.7%). The majority of respondents (93.7%) were in the age category of 18 and 35 years with the rest older than 35 years. The majority of the athletes had annual incomes ranging between Ksh 100,000 to Ksh 1,000,000 (92.9%) with the rest belonging to the high-income category above Ksh 5,000,000 (3%).

6.1.1 Prevalence of Performance Enhancing Substance Use

The first objective of the study was to investigate the extent of the use of performanceenhancing substances among athletes in dominant Olympic sports in Kenya. The findings indicated that almost half 48.8% of responded athletes considered doping to be a problem in their sport. However, 33% reported doping is not a problem in their sport. Additionally, 18.3% of athletes were not sure whether doping was a problem. Further, 21.9% of athletes selfreported having used prohibited performance-enhancing substances either ignorantly of purposely while 36.1% of the athletes were aware of a colleague or friend who uses prohibited PES.

6.1.2 Predisposing Factors of Doping Behaviour among Athletes in Dominant Olympic Sports in Kenya

The second objective of the study was to establish the predisposing factors of doping behavior among athletes in dominant Olympic sports in Kenya. Findings indicated that financial and cultural factors were significantly associated with the doping behavior of athletes in dominant Olympic sports in Kenya. The findings also revealed that political, individual, and physiological factors had a positive effect on doping behavior.

6.1.3 Knowledge of Athletes on the World Anti-Doping Agency (WADA) Prohibited Substances in Olympic Dominant Sports in Kenya

The third objective of the study was to examine the knowledge of athletes on the World Anti-Doping Agency (WADA) list of prohibited substances in dominant Olympic sports in Kenya. The findings of the study showed that athletes from dominant Olympic sports in Kenya had perceived average knowledge of performance-enhancing substances and manipulation (9.301 ± 3.607) .

The study also reported that the lowest knowledge on the WADA list of prohibited substances was reported for knowledge on performance-enhancing substances (5.1657 ± 2.812) while the highest knowledge on WADA prohibited substances was reported on supplement use (12.564 ± 3.836).

6.1.4 Doping Attitude of Athletes in Dominant Olympic Sports in Kenya.

The fourth objective of the study was to examine the doping attitudes of athletes in dominant Olympic sports in Kenya. The findings indicated that those athletes from dominant Olympic sports in Kenya had largely negative attitudes towards doping (21.523±24.308). Further results showed that positive attitude on doping attitude in terms of categorization was recorded on 'Minimization of Issues Attitude'' (36.390±24.202) while the negative attitude regarding attitude categorization was recorded on circumstantial attitudes (21.878±23.851).

6.1.5 Doping Vulnerability amongst Athletes in Dominant Olympic Sports in Kenya

The fifth objective of the study was to analyse doping vulnerability amongst athletes in dominant Olympic sports in Kenya. The findings indicated that in general athletes from dominant Olympic sports in Kenya perceived themselves to have a low vulnerability towards doping (42.80 ± 26.69). Further, the results demonstrated that athletes had high personal vulnerability (41.27 ± 27.73) and low situation vulnerability (21.878 ± 23.851).

6.1.6 Doping Prevalence, Predisposing Factors, Knowledge, Attitude and Vulnerability Mediation with Selected Demographic Factors

The sixth objective of the study was to determine whether doping prevalence, predisposing factors, knowledge, attitude, and vulnerability are mediated by selected demographic factors of age, gender, income, type of sport, and experience in sports. Findings showed that antidoping rule violation, individual factors, and financial predisposing factors reported significant differences based on the gender of the respondents in favour of male athletes.

The findings revealed that doping practice in sports, use of prohibited PES in sports, physiological risk factors, and political risk factors are significantly associated with sports category (boxing sports).

The findings also demonstrated significant differences in the age distribution (30 years and above) with anti-doping rule violations and cultural risk factors for doping. The results also showed athletes with international titles are more likely to practice doping, violate anti-doping rules, and be predisposed to physiological factors and financial risk factors. Additionally, the findings indicated that basic to the elementary level of education is associated with doping practice in sports, use of PES in sports, anti-doping rule violation in 12 months, financial risk factors, cultural risk factors, doping attitude, and individual risk factors. Lastly, the findings revealed that athletes with low to moderate annual income have been influenced to dope, violate anti-doping rules once, are influenced to dope more by political factors, and have positive doping attitudes.

6.2 Conclusions

From the findings of the study the following conclusions are drawn:

1. That the self-reported doping rate in dominant Olympic sports in Kenya is the varied across the four sport disciplines.

- 2. That athletes from the dominant Olympic sports in Kenya consider doping to be a problem in their sport.
- 3. That doping behaviour amongst dominant Olympic sports is largely precipitated by financial and cultural factors.
- 4. On perceived knowledge of WADA'S prohibited substances, athletes from dominant Olympic sports in Kenya demonstrated limited knowledge of a wide range of substances in relation to the list of prohibited substances.
- On doping attitude, it can be concluded that athletes from dominant Olympic sports in Kenya have negative attitudes towards doping.
- Demographic factors of gender, sports categorization, education level, age, title held, and annual income of athletes are critical to susceptibility to doping among athletes on dominant Olympic sports in Kenya.

6.3 Recommendations for Policy and Practice

6.3.1 Predisposing Factors of Doping Behaviour

On practice, it is recommended that Anti-Doping organizations (ADOS) pay attention to the effective use of cognitive, behavioral strategies and educational programs in reducing doping among athletes. Anti-Doping organizations and other athlete bodies in Kenya should create anti-doping education programs that focus on financial and cultural reasons to dope as the foundation of the programs. Educational programs by ADOS on doping prevention should focus more on strengthening the athletes' opportunities to enable them to reflect on personal values and sporting priorities.

On Policy, it is recommended that the Kenya National Anti-Doping Policy of 2016 amended in 2020 be revised to set out the policy objectives and requirements of the Government, sports administrators, ADAK, Sports Federations, Sports Councils, and the National Governing Bodies of sport in Kenya. This will help identify the roles and responsibilities of each body in delivering and/or supporting Anti-Doping efforts in a holistic manner.

6.3.2 Knowledge on the World Anti-Doping Agency (WADA) Prohibited Substances

It is highly recommended that the Government, through the relevant sports bodies, more so ADAK reevaluate their Anti-Doping education programs across various sporting bodies and analyze the delivery of Anti-Doping information and appraisal of knowledge retention to make the education programs more beneficial. The addition of substances to the WADA prohibited list and its change in status suggest that ADAK and other sports bodies should adopt effective communication.

On policy, it is recommended that ADAK through the Ministry of Sport should develop policies that will strengthen the Anti-Doping role of National Governing bodies of sports and nonsports in Kenya to create awareness about the WADA list of prohibited substances.

6.3.3 Doping Attitudes of Athletes

On practice, it is suggested that sports bodies and ADAK should continue reinforcing the norms that cement negative attitudes on doping amongst athletes in Kenya, with an increased focus on adolescent athletes. The Anti-Doping Agency of Kenya should engage in social media education programs that make use of positive norms that continue to promote negative doping attitudes in athlete sporting contexts.

On policy, it is recommended that ADAK and the Ministry responsible for Sports should enact laws that criminalize doping in Kenya. This will further help cement the negative doping attitudes in the country.

6.3.4 Doping Vulnerability Analysis amongst Athletes

On practice, it is recommended that ADAK and other sports bodies should schedule preventative strategies that focus on personal decisions making as athletes move towards higher levels of competition and become aware of which substances are likely to enhance their performance levels. The Anti-Doping Agency of Kenya should develop more precise drug education such as the development of both comprehensive and in-depth, well-structured Anti-Doping education programs and greater emphasis on personal factors of doping.

On policy, it is recommended that ADAK, in partnership with stakeholders in the education sector and sports professional develop national curriculum and policy on sporting values. The policy and curriculum should be targeted at educational institutions.

6.3.5 Mediation factors of Doping Behaviour

On practice, the central position of socio-demographic factors in the relationship between doping prevalence, attitude, vulnerability, risk factors, and knowledge of WADA substances opens up the potential need for educational programs that are gender, sports, age, education level, and income level specific as opposed to one size fits all programs. More precisely, ADAK should prioritize its focus and resources on supporting programs that address these specific socio-economic variables.

On policy, it is recommended that ADAK in conjunction with the National Government develop an integrated sport policy that focuses on the overall wellbeing of athletes at adolescent, youth level, and adult level.

6.4 Recommendations for further Research

The target population in this study was athletes from dominant Olympic sports in Kenya. It is suggested that more studies be conducted among athletes in other Olympic and non-Olympic sports which were not addressed in this study.

The study revealed some prevalence levels of doping and moderate knowledge of WADA's list of prohibited substances. It is recommended that more research in the form of evaluation-based studies be conducted to evaluate the effectiveness of Anti-Doping programs. Its also recommended the a standardized evaluation criteria to establish prevalence of doping be developed cognizance of the dynamic demographic populations across the world. The study revealed that doping behavior is mediated by age, gender, sports category, education level, and income level. However, the non-significance of doping risk factors shows the need for other intervening studies. It is suggested that future research should focus on moderating factors of athletes' behavioral strategies toward Anti-Doping.

It is also suggested that future research on the prevalence on doping could adopt a scientific model to gauge the actual prevalence based on an experimental methodology.

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APPENDICES

APPENDIX A: Introduction Letter of Data Collection Instruments

Date

To the Sports Teams Managers/Coaches, Kenya Weightlifting Federation, Boxing Association of Kenya, Kenya rugby union and Athletics Kenya

REF: REQUEST FOR DATA COLLECTION

Above refer.

My name is Martin Sisa Yauma. I am a student undertaking PhD studies at Kenyatta University. I am currently conducting research on the topic entitled "**Doping Knowledge, Prevalence,** And Predisposing Factors Among Athletes In Dominant Olympic Sports In Kenya". My general goal as a researcher is to find out what you know and think and perceive about doping in sports. I wish to collect data in line with you as my target participants. With me is an interview guide and questionnaire designed for you. Kindly assist me so that I can collect the data. I am assuring you that the information you will give will be treated with utmost confidence and will only be used for the purpose of this study.

Maumber .

Yours Sincerely,

Martin Sisa Yauma,

Kenyatta University

APPENDIX B: Athletes' Questionnaire

General Information for Participants

My name is Martin Sisa Yauma representing Kenyatta University. I am conducting this research in an effort to provide information that can be used in improving Anti-Doping programs in Kenya. I need to find out what you know and think about performance enhancing substances issues. So please participate in filing this questionnaire. Please be assured that your responses will remain confidential and that nothing that appears in the final report will be attributable to any individual athlete and athlete support personnel.

SECTION A; Sporting Background and Demographic characteristics.

1. What is the main sport you are or have been involved in?

Sporting background

2.	How many years have you competed in your main sport?
	Less than 1 year (or season1
	1 or 2 years (0r seasons
	More than 2 but less than 5 years (or seasons)
	5 or more years (or seasons4
3.	What is the highest level you have competed at?
	Olympics games1
	World championships events/international events
	National competition
	State competitions
	Regional competitions
	City/district competitions
4.	Do you hold or have any titles?
	Yes-National title1

Yes -Olympic title	2
Yes -International title	3
Yes-State title	4
No	5

Socio-demographic information.

1.	What is your age?
2.	Are you:
	Male1
	Female2
3.	What is your highest level of Education?
	No school at all1
	Primary2
	Secondary
	College4
	University

To what extent do you currently derive income from your participation in Sport?
Include here both direct payments and winnings as well as sponsorship, endorsement and scholarships.

	No income at all from sport1
	Occasional income from sport2
	Regular income from sport
	About half my income from sport4
	More than half from sport, but not all my income5
	All or almost all of my income from sport6
5.	What is your annual income from all sources?
	Less than 100,0001

100,000 to 500,000	2
500,000 to 1,000,000	3
1,000,000 to 5,000,000	1
Above 5,000,0005	5

SECTION B: Prevalence of Doping Substances and Practices

This section seeks to find your opinion on prevalence of doping substances and their use in your sport. Kindly respond to the items by ticking or filling in where necessary.

1. To what extent do you consider there is a doping practice in your sport? Please answer using a scale of 1 to 5 where 1 means there is a major problem and 5 means

there is no problem at all. (Please Tick one)

Doping is a major problem in my sport

Doping is a problem to a good extent

Doping problem is neither high nor low

Doping is a problem to a low extent

Doping is not a problem in my sport

- 2. If there is doping practice in your sport, would you say that the problem of doping is mostly associated with; (Please Tick one only)
 - Performance Enhancing Substances

□ Social drugs

Both Performance Enhancing Substances and social drugs.

Don't know

 Do you or athletes in your sport use herbal or nutritional supplements (Please Tick one)

🗌 Yes

🗌 No

Don't know what herbal or nutritional supplements are.

4. In the last 12 months, how often have you used any of the following for whatever reason?

	Have	Did not	1 to 2	3 to 5	6 to	More
	never	use in the	times	times	10	that 10
	used	last 12			times	times
		months				
Anabolic Steroids	1	2	3	4	5	6
Non-approved	1	2	3	4	5	6
substances						
Beta blockers	1	2	3	4	5	6
Tetrahydrohestrinone	1	2	3	4	5	6
EPO.Erythropoietin	1	2	3	4	5	6
Peptide hormones	1	2	3	4	5	6
Human growth						
hormone						
Diuretics&Masking	1	2	3	4	5	6
agents						
Blood doping	1	2	3	4	5	6
Beta 2 agonists	1	2	3	4	5	6
Stimulants	1	2	3	4	5	6
Narcotics	1	2	3	4	5	6
Cannabinoids	1	2	3	4	5	6
Glococorticoids	1	2	3	4	5	6
Beta Blockers	1	2	3	4	5	6

- 5. Have you ever used Performance Enhancing Substances either ignorantly or purposely?
 - Yes 🗌 No 🗌
- 6. Have you ever heard of colleague athlete/s in your sport who use Performance Enhancing Substances?
 - Yes 🗌 No 🗌
- 7. In your sporting career, how often have you violated any of the following Anti-

Doping rule violations?

	Have	Have	1 to 2	3 to 5	6 to 10	More than
	never	not	times	times	times	10 times
	violated	violated				
		in the				
		last 12				
		months				
Presence of a	1	2	3	4	5	6
prohibited substance						
Use or attempted use	1	2	3	4	5	6
of a prohibited						
substance or method						
Refusing to submit a	1	2	3	4	5	6
sample						
Failure to file	1	2	3	4	5	6
whereabouts						
Tampering with	1	2	3	4	5	6
sample collection						
process						

Possession of a	1	2	3	4	5	6
prohibited substance						
Trafficking a	1	2	3	4	5	6
prohibited substance						
Administration of	1	2	3	4	5	6
attempted to						
administer						
Complicity	1	2	3	4	5	6

SECTION C: KENYAN ATHLETES' KNOWLEDGE OF THE WADA PROHIBITED

SUBSTANCES LIST AND PERFORMANCE ENHANCING SUBSTANCES

The following substance indicate a list of substance prohibited by WADA. Please show/ indicate your response 1= banned at all times, 2= banned in competition only, 3 = don't knowthe banned status and 4= Leave blank to indicate not banned

Categorization	Substances	Banned	Banned in-	Don't	Leave
		at all	competition	know the	blank to
		times	only	banned	indicate
				status	not
					banned
Performance	Anabolic Steroids				
enhancing	Growth Hormone				
drugs	Blood Doping				
	Erythropoitien				
	Clenbuterol				
	Gene and Cell Doping				

	Chemical and Physical		
	Manipulation		
Illicit and Non-	Alcohol		
Illicit	Caffeine		
Recreational	Amphetamines		
Substances	Cocaine		
	Ecstacy		
	Heroin		
	Marijuana/Cannabinoids		
	Other recreational drugs		
Therapeutic	Beta Agonists/ Asthma		
Substances on	puffers		
Prohibited List	Beta Blockers		
	Clomiphene		
	Diuretics		
	Insulin		
	Narcotics Analgesics		
	Prednisone		
Therapeutic	Pseudophedrine(Sudafed)		
Substances not	Zolpidem(stilknox)		
on Prohibited	Diazepam(valium)		
List	Sildenafil(Viagra)		
Supplements	Vitamins/Minerals		
	Protein Powders		
	Iron		

	Creatine		
	Colostrum		
	Actovegin		

SECTION D: PREDISPOSING ASSESSMENT

Indicate the extent to which athletes in your sport are likely to use Performance Enhancing Substances due to the following factors: Use the key of Very likely (VL), Likely (L), Not likely (NL), Very Unlikely (VU), Not Sure (NS).

A.	PHYSIOLOGICAL FACTORS	VL	L	NL	VU	NS
	Techniques and Tactics in my sport					
	1. Endurance (Demands required in the sport					
	2. Power required in the sport					
	3. Speed required in the sport					
	4. Our sport requires a lot of strength					
	5. Quick recovery from injury					
	6. Faster outcomes of training					
	7. Physiological demands in my sport predisposes athletes					
	to					
	Doping					
	8. High pressure demands of competition					
	9 Muscular strength required in sport					
В.	FINANCIAL FACTORS					
	1. My report had attractive rewards					
	2. My Sport has good Incentives					
	3. My Sports has lucrative contracts					

	4. There is exceptional payments offered in the sport			
	5. There is Possible sponsorship in my sport			
	6. Maintaining high performance during injury			
	7. My age pushes me to dope			
	8. My Sports has Huge salaries			
	9. Winning attracts good athletic scholarships			
	ENVIRONMENTAL FACTORS (POLITICAL,			
	SOCIAL/CULTURAL			
C.	POLITICAL FACTORS			
	1. My sport is characterized by history of doping			
	2. There are no policies to regulate doping in my			
	Federation			
	3. Our Federation has weak governance structures to deter			
	Doping			
	4. Sport administrators in our Federation do not care			
	about Doping			
	5. The attitudes of persons in my sport are pro-doping			
	6. Doping is tolerated in our Federation			
	7. The political climate on corruption in Kenya does not			
	curtail doping			
	8. Drug laws in the country are weak			
	9. Enforcers of drug laws are compromised easily			
	10. If we don't allow athletes to dope and win, they will			
	migrate to US or oil-rich countries			
	11. PED are readily available in Kenyan markets			

	12. PED are affordable to ordinary athletes			
	13. There is no need to prevent doping as everybody else			
	is doping			
	14. The popularity of my in the country.			
C.	CULTURAL /SOCIAL FACTORS			
	1. In my sport somebody cannot win without doping			
	2. In my sport doping is acceptable while in out of			
	competition			
	3. Athlete support personnel in my sport are not bothered			
	by Doping			
	4. Coaches and physicians in my sport abet doping			
	5. In my sport, those with declining abilities due to age			
	can Dope			
	6. Doping is as good as high attitude training			
	7. Athletes in my sport have knowledge on how to dope			
	8. There is no option of losing in my sport (winning at all			
	cost)			
	9. Our coaches are associated with winners only			
	10. The people close to me expect me to be a winner at all			
	Times.			
E.	INDIVIDUAL FACTORS			
	1. Doping is allowed for weight management in my sport			
	2. I want to be to be famous in my sport			
	3. If other athletes are cheating, I think I can do it			
	4. Athletes can dope if they come from families of dopers			

5. There is no clean sport as everyone else is doping			
6. I could cheat if I thought it could help me win			
7. I could dope to enhance my self-esteem			
8. I can use PES to improve my confidence			
9. Dietary supplements are important in my sport			
10. Doping is allowed to improve my personal appearance			

SECTION E: ASSESSMENT OF ATTITUDE TOWARDS DOPING

Below are statements showing what many people think and feel about sport and performance enhancing drugs. How strongly do you agree or disagree with the following statements? Please read each item below carefully and circle the appropriate number after each statement, which shows the level of your agreement using the scale below:

Strongly	Disagree	Neutral	Agree	Strongly Agree
Disagree				
1	2	3	4	5

My opinion regarding sport in general is that

Statements	1	2	3	4	5
Doping is necessary to be competitive.					
Doping is not cheating since everyone does it					
Athletes often lose time due to injuries and drugs can be used to					
help to make up the lost time.					
Only the quality of performance should matter, not the way					
athletes achieve it.					

Athletes in my sport are pressured to take performance		
enhancing drugs.		
Athletes who take recreational drugs use them because they help		
them in sport situations.		
Athletes should not feel guilty about breaking the rules and		
taking performance-enhancing drugs.		
The predisposing related to doping are exaggerated.		
Athletes have no alternative career choices, but sport.		
Recreational drugs assist in motivating athletes to train and		
compete at the highest level.		
Doping is an unavoidable part of competitive sport.		
Recreational drugs help to overcome boredom outside of		
competition		
There is no difference between drugs and the technical		
equipment that can be used to enhance performance (e.g.		
hypoxic altitude simulating environments)		
The media should talk less about doping.		
The media blows the doping issue out of proportion.		
Health problems related to rigorous training and injuries are just		
as bad doping side effects		
Legalizing performance enhancements would be beneficial for		
sports.		

SECTION F: DOPING VULNERABILITY

The following statements are circumstances under which athletes would consider the use of banned substances. State your level of agreement to any of the following statements. 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree

Statements	1	2	3	4	5
The desire to maintain to performance standards can push me					
to consider the use of banned substances					
Situation of personal/family economic difficulties can make					
me consider doping					
Desire to prolong career can push me to consider using					
banned substances					
Desire to be selected to represent the country can push me to					
think highly about doping					
The desire of an athlete to be selected in a team can make an					
athlete to consider doping					
Suffering an injury is a good situation that may tip athletes					
over the edge to doping.					
Athletes' network can create unnecessary pressure for					
him/her to dope					
The culture of doping in the society can motivate me to					
strongly consider using banned substances					
The pressure to win in major competitions such as Olympic					
can push an athlete to consider doping					

APPENDIX C: Informed Consent Form

Informed Consent (Sample)

My name is Martin Sisa Yauma /I am a Ph.D student from Kenyatta University). I am conducting a study titled " **Doping Knowledge, Prevalence, And Predisposing Factors Among Athletes In Dominant Olympic Sports In Kenya**"The purpose of this study is to assess the prevalence and predisposing factors of doping on Kenya Olympic sports. The study is aimed at improving Anti-Doping programs Kenya.

I need to find out what you know and think about performance enhancing substances issues. So please participate in filing this questionnaire. Please be assured that your responses will remain confidential and that nothing that appears in the final report will be attributable to any individual athlete and athlete support personnel

Voluntarism

You have the right to refuse participation in this study. You will get the same services and care whether you agree to join the study or not and your decision will not change the care you will receive. Please remember the participation in this study is voluntarily. You may ask questions related to the study at any time.

You may refuse to respond to any questions and you may stop an interview at any time. You may also stop being in the study at any time without any consequences to the services you receive here or any other organization now or in the future.

Discomforts and Risks

Some of the questions you will be asked are on intimate subject and may be embarrassing or make you uncomfortable. If this happens, you may refuse to answer these questions if you so choose. You may also stop the interview at any time. The interview may add approximately half an hour to the time you wait before you receive your routine services.

Benefits

This study will contribute to knowledge on doping testing and education in order to minimize or possibly eradicate doping in Kenya. It will also assist the Anti-Doping Organizations on where to direct resources in intelligence testing and Anti-Doping education. In addition the findings from this study will help to increase the effectiveness of testing programs through targeting right athletes and this may increase the chances of detecting doping thus deterring amongst athletes in different sports in Kenya.

The study findings will also contribute to knowledge which can be used to amend/improve the WADA protocols, especially for developing countries where there is paucity of relevant data in this regard currently. All this is aimed to guarantee the fundamental rights for you as an athlete to participate in a doping free sport hence staying clean and winning right.

Reward

There are no rewards or any payment to you if you participate.

Confidentiality

The interview and questionnaire filling will be treated with confidence. Your name will not be recorded on the questionnaire. The questionnaires will be kept in a locked cabinet for safe keeping. Everything will be kept private and only shared with the study team.

Contact Information

If you have questions about the study call the Investigator Mr. Martin Yauma 0723942101 or Supervisor Prof Elijah Gitonga 0727649790 or Dr. Francis Mundia 0722761379.

However, if you have questions about your rights as a study participant: You may contact Kenyatta University Ethical Review Committee Secretariat on chairman.kuerc@ku.ac.ke,

Participant's statement

The above information regarding my participation in the study is clear to me. The study has been explained to me and I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time. I understand that I will still get the same care and treatment whether I decide to leave the study or not and my decision will not change the care that I will receive from the clinic today or that I will get from any other clinic at any other time. Name of Participant:

Signature or Thumbprint	Date
Name of Representative/Witness (where necessary)	Relationship to Subject
Investigators statement	
I, the undersigned, have explained to the voluntee	er in a language s/he understands, the
procedures to be followed in the study and the risks an	nd benefits involved
Name of Interviewer	

Signature

Date

Time	Topics	Detailed Instructions
9.am -10 am	Intro to the project	Introduce the trainer and data collectors
		• Present the training schedule
		• Present the goal of the study
		• Present the data collection schedule: when,
		where, what
10 am-12 pm	Intro to the Research	Describe the measurement approach and the
	instruments	applied research instruments: questionnaire
		and interview guide • Describe the
		questionnaire and its different sections: •
		Actual questionnaire with questions on extent

APPENDIX D: Training Schedule for Research Assistants

		of performance enhancing substance use,
		predisposing factors of doping behavior,
		knowledge of athletes on the World Anti-
		Doping Agency (WADA) prohibited
		substances, doping attitudes of athletes and
		doping vulnerability
12am-1 pm	Intro to question types	Explain the different types of questions,
		demonstrate how to ask them and make sure
		that every data collector understands how to
		ask the questions and how to fill
		in the answers.
2pm-3pm	Role play	Each of the future data collectors conducts at
		least two mock interviews.
3pm-4pm	Pretest	Every data collector conducts interviews with
opin ipin		
		at least one athlete at the pilot stage

APPENDIX F: Research Authorization by Graduate School

KENYATT GRADU	TA UNIVERSITY ATE SCHOOL
E-mail: <u>kubps@yahoo.com</u> <u>dean-graduate@ku.ac.ke</u> Website: <u>www.ku.ac.ke</u>	P.O. Box 43844, 00100 NAIROBI, KENYA Tel. 8710901 Ext. 57530
Our Ref: H87/39360/16	Date: 4th May, 2021
The Director General, National Commission for Science, Tech P.O. Box 30623-00100, <u>NAIROBI</u>	nnology & Innovation,
Dear Sir/Madam,	
RE: RESEARCH AUTHORIZATION FOR MART	TIN S. YAUMA - REG. NO. H87/39360/16
I write to introduce Yauma who is a I Student is registered for a Ph.D. degre Education, Exercise & Sports Science Human Sciences.	Postgraduate Student of this University. The re programme in the Department of Physica in the School of Public Health & Applied
I write to introduce Yauma who is a I Student is registered for a Ph.D. degre Education, Exercise & Sports Science Human Sciences. Yauma intends to conduct research Predisposing Factors Associated wit Olympic Sports in Kenya".	Postgraduate Student of this University. The e programme in the Department of Physica in the School of Public Health & Applied for Ph.D. thesis entitled, "Prevalence and th Doping among Athletes in Dominan
I write to introduce Yauma who is a I Student is registered for a Ph.D. degre Education, Exercise & Sports Science Human Sciences. Yauma intends to conduct research Predisposing Factors Associated wit Olympic Sports in Kenya".	Postgraduate Student of this University. The e programme in the Department of Physical in the School of Public Health & Applied for Ph.D. thesis entitled, "Prevalence and th Doping among Athletes in Dominan
I write to introduce Yauma who is a I Student is registered for a Ph.D. degre Education, Exercise & Sports Science Human Sciences. Yauma intends to conduct research Predisposing Factors Associated wit Olympic Sports in Kenya". Any assistance given will be highly ap	Postgraduate Student of this University. The e programme in the Department of Physical in the School of Public Health & Applied for Ph.D. thesis entitled, "Prevalence and th Doping among Athletes in Dominan
I write to introduce Yauma who is a I Student is registered for a Ph.D. degre Education, Exercise & Sports Science Human Sciences. Yauma intends to conduct research Predisposing Factors Associated wit Olympic Sports in Kenya". Any assistance given will be highly ap Yours faithfully, PROF, ELISHIBA KIMANI DRAM CRADUATE SCHOOL	Postgraduate Student of this University. The e programme in the Department of Physica in the School of Public Health & Applied for Ph.D. thesis entitled, "Prevalence and th Doping among Athletes in Dominan oppreciated.
I write to introduce Yauma who is a I Student is registered for a Ph.D. degre Education, Exercise & Sports Science Human Sciences. Yauma intends to conduct research Predisposing Factors Associated wit Olympic Sports in Kenya". Any assistance given will be highly ap Yours faithfully, PROF, ELISHIBA KIMANI DEAN, GRADUATE SCHOOL	Postgraduate Student of this University. The e programme in the Department of Physica in the School of Public Health & Applied for Ph.D. thesis entitled, "Prevalence and th Doping among Athletes in Dominan opreciated.

APPENDIX G: Ethical Approval



KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575 Email: <u>chairman.kuerc@ku.ac.kc</u> Nairobi, 00100 P. O. Box 43844,

Website: <u>www.ku.ac.ke</u> Our Ref: KU/ERC/APPROVAL/VOL.1 Tel: 8710901/12

Date: 23rd June, 2021

Martin Sisa P.O Box 43844, 00100 Nairohi.

Dear Mr. Sisa

APPLICATION NUMBER: PKU-2267/11409 PREVALENCE AND PREDISPOSING FACTORS ASSOCIATED WITH DOPING AMONG ATHLETES IN DOMINANT OLYMPIC SPORTS IN KENYA

This is to inform you that *KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE* has approved version 4 of the study protocol together with the attached consent forms dated 11th June, 2021. Your application approval number is PKU-2267/11409. The approval period is 23rd June, 2021 TO 23rd June, 2022.

This approval is subject to compliance with the following requirements;

- Only approved documents including (informed consents, study instruments, MTA) will be used
- All changes including (amendments, deviations, and violations) are submitted for review and approval by KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE.
- iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE within 72 hours of notification
- Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be

reported to KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE within 72 hours

Clearance for export of biological specimens must be obtained from relevant institutions. Submission of a request for renewal of approval at least 60 days prior to expiry of the V. vi.

approval period. Attach a comprehensive progress report to support the renewal. Submission of an executive summary report within 90 days upon completion of the study to *KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW* vii.

COMMITTEE.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <u>https://oris.nacosti.go.ke</u> and also obtain other clearances needed.

To serve you better, researchers are kindly requested to access and complete a customer feedback form and sent it back online as you continue with research and upon completion of data

websitelink;(<u>https://docs.google.com/forms/d/1ytWefDwvyz5h1oz_VIn0xbxg3uGdIDzMX</u> FWNDsMrRPQ/edit?usp=sharing

Yours sincerely

TA UNIV 2 3 JUN 2021, Prof. Judith Kimiywe

DIRECTOR- KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE.

APPENDIX H: Approval by NACOSTI

