

**ANTI-DOPING KNOWLEDGE, ATTITUDES AND EXPERIENCES OF
GENERAL PRACTITIONERS AND PHARMACISTS IN SELECTED
COUNTIES IN KENYA**

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UNIVERSITY.**

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DECLARATION

This thesis is my original work and has not been presented for a degree award in any other University.

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DEDICATION

This work is dedicated to all the General Practitioners and Pharmacists who participated in this study. This work is further dedicated to my late grandfather who encouraged me to further my studies to the highest levels possible. May he rest in peace.

I also dedicate this work to my family especially my wife, Lucy, who had to step in for the family and bear with my absence during data collection and the long duration of this study. God bless you all.

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ABBREVIATIONS AND ACRONYMS

AAFs	Adverse Analytic Findings
AAS	Anabolic Androgenic Steroids
ADAK	Anti-Doping Agency of Kenya
ADeL	Anti-doping e-learning platform
ADRVs	Anti-Doping Rule Violations
AK	Athletics Kenya
ASP	Athlete Support Personnel
CPE	Cognitive Performance Enhancers
DNA	Deoxyribonucleic acid
FIFA	Fédération Internationale de Football Association
FIP	International Pharmaceutical Federation
FMHACA	Food, Medicine, and Health Care Administration and Control Authority of Ethiopia
IAAF	International Association of Athletics Federations
IOC	International Olympic Committee
KMPDC	Kenya Medical Practitioners and Dentists Council
KPPB	Kenya Pharmacists & Poisons Board
NACOSTI	National Commission for Science Technology and Innovation
NOCK	National Olympic Committee of Kenya
NADO	National Anti-Doping Organizations
PEAS	Performance Enhancement Attitude Scale
PEDs	Performance Enhancing Drugs

PCE	Cognitive Performance Enhancers
RADO	Regional Anti-Doping Organizations
TUE	Therapeutic Use Exemptions
UNESCO	United Nations Education, Scientific and Cultural Organizations
WADA	World Anti-Doping Agency

OPERATIONAL DEFINITION OF TERMS

Athlete Support Personnel (ASP): Refers to any coach, trainer, manager, agent, team staff, official, medical, paramedical personnel, parent or any other person working with, treating or assisting an athlete participate in or preparing for sports competitions.

Attitude: It denotes Kenyan General Practitioners and Pharmacists' feelings and opinions regarding doping practice, their role in the fight for clean sport and doping regulations in Kenya.

Doping: Occurrence of one or more of the anti-doping rule violations identified in WADA Article 2.1 through Article 2.11

Doping experiences: Refers to the frequency at which General Practitioners and Pharmacists are confronted with either requests for information about doping or requests for doping prescription by Kenyan athletes.

General Practitioner: A Medical Doctor who is qualified in general medical practice and is usually a first point of contact for athletes in case of acute illness in primary care.

Knowledge: Refers to awareness or familiarity with doping issues, methods, substances, rules and regulations by General Practitioners and Pharmacists in Kenya.

Nonmaleficence: Refers to General Practitioners and Pharmacists doing no harm to athletes by considering their actions, for example, by facilitating doping.

Performance Enhancing Drugs (PEDs): Refers to drugs that are used by athletes illegally to improve athletic performance as per the WADA codes.

Pharmacist: A healthcare professional and medication expert who prepares and dispenses prescription medications and provides essential information to athletes about drugs and their use.

Prohibited list: Means any substances and methods that have the potential to enhance performance or violate the spirit of sport as classified by WADA within a given year.

Therapeutic Use Exemption (TUE): An exemption granted by WADA that allows athletes to use a prohibited substance or method for therapeutic purposes only.

ABSTRACT

The Athletic support personnel (ASP) significantly influence athletes' attitudes, perceptions, and use of Performance Enhancing Drugs (PEDs). Among the ASP, General Practitioners and Pharmacists play a substantial role in providing medical and pharmaceutical support to athletes. Health practitioners are in a position to influence, advise, encourage or discourage the use of PEDs to precarious athletes yearning to improve their performance beyond the limit. Nonetheless, the decision of General Practitioners or Pharmacists to encourage or discourage the use of PEDs depends on their knowledge, experience, and attitude toward doping. Therefore, this study aimed to investigate General Practitioners' and Pharmacists' doping knowledge, attitudes, and experience from seven purposely selected counties in Kenya and to examine if there were significant differences in doping knowledge and attitude between General Practitioners and Pharmacists in Kenya. A cross-sectional analytical study design was used to examine General Practitioners' and Pharmacists' doping knowledge, attitudes, and experiences. A stratified random sampling technique was used to select General Practitioners and Pharmacists from the seven targeted counties. A self-administered questionnaire was used to collect the data for the study. Six hundred and fifteen practitioners (250 General Practitioners and 365 Pharmacists) participated in the study. Of these, 151 (60.4%) male and 99 (39.6%) female were General Practitioners, while 209 (57.3%) male and 156 (42.7) female were Pharmacists. Results demonstrated that General Practitioners and Pharmacists in Kenya are well aware of WADA and ADAK. General Practitioners and Pharmacists self-reported average to slightly above average doping knowledge (47.77 ± 14.03 and 46.63 ± 13.36), respectively, where the average doping knowledge was measured at 42.5. Mann-Whitney test results revealed no significant difference in doping knowledge between General Practitioners and Pharmacists ($p = .518$). General Practitioners and Pharmacists had a negative attitude towards doping (45.23 ± 13.64 and 47.28 ± 13.65), where a score of 59.5 and above implied being positive towards doping attitude. Mann-Whitney test showed a significant difference between General Practitioners and Pharmacists towards doping attitude ($p = .039$). Male respondents demonstrated more doping knowledge, 49.04 ± 13.57 , compared to the female respondents, 44.35 ± 13.29 . Mann-Whitney test revealed that gender significantly influenced respondents, doping knowledge ($p = .006$), and attitude towards doping ($p = .016$). Kruskal-Wallis test revealed that age contributed to significant difference in doping knowledge among Pharmacists ($p = .024$) but not with the General Practitioners $p = .024$. Kruskal-Wallis analysis also indicated that work experience contributed remarkable variation in doping knowledge among General Practitioners ($p < .001$) but not among Pharmacists. In addition, age and work experience demonstrated (Kruskal Wallis test) significant influence on the doping attitude of General Practitioners ($p = .003$) and ($p = .008$), but no significant difference was identified among the Pharmacists, $p = .301$ and $p = .063$ respectively. Pharmacists in Kenya were an essential source of doping and related information. As many as 155 (25.2%) General Practitioners and Pharmacists had been requested for doping information or substances during their professional work. It was concluded that General Practitioners and Pharmacists in Kenya have unreliable doping knowledge and negative attitudes towards doping. Age significantly influenced the doping knowledge of General Practitioners and Pharmacists. A considerable difference exists in the doping attitude between General Practitioners and Pharmacists. The study recommended more anti-doping education, campaigns, and training that start at the college level to address the low doping knowledge of younger practitioners. An emphasis is needed to involve more female practitioners in anti-doping campaigns to ensure doping knowledge across the board. A study involving all General Practitioners and Pharmacists in Kenya is recommended to provide a comprehensive view of the current doping status in the country.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The World Anti-Doping Agency (WADA) has committed to coordinating, monitoring, and intensifying anti-doping campaigns in all manners. Despite its efforts, prominent doping cases in sports have continued to hit the public, reflecting that doping is widespread and the cheater is ahead of the tester (Donovan et al., 2002; Petroczi et al., 2012). Doping cases have been on the rise because of the athletes fixation with improving their physical output and earn more profits. This has been through the use of either legal or illegal, harmful or health methods as opposed to training hard (Mazzeo et al., 2016; Santamaria et al., 2013).

Recent studies on doping Knowledge, Attitude, and Practices (KAP) of athletes and General Practitioners Pharmacists, and other Athletic Support Personnel (ASP) have found that the majority, if not all, respondents indicated that healthcare practitioners could play a key part in combating doping in sports (Backhouse & McKenna, 2011; El-Hammadi, & Hunien, 2013, Jaber et al., 2015; Starzak et al., 2016). It is worth noting that the primary role of General Practitioners and Pharmacists is to provide medical and pharmaceutical support to patients; where some are elite athletes. However, the practitioners can influence athletes' responsiveness in terms of adherence to treatment and medications (Backhouse & Mckenna, 2011). This influence capability plays a critical role in promoting clean sports. The attitude, knowledge, and experience of the General Practitioners and Pharmacists in doping significantly determine their response to doping assistance upon request by athletes. Some pharmacy students have been reported to indicate the selling of controlled drugs as a major source of income (Saito et al., 2013). These authors also noted that a third of the pharmacy students had no idea if an over-the-counter drug can possess doping

substances. Athletes may request advice regarding substances that can give an edge in performance.

In contrast, others can get prescriptions from innocent medical practitioners that contain stimulants, anabolic agents, hormones, or corticosteroids consequently making them culpable of the Anti-Doping Rule Violation (ADRV) (David, 2017). The WADA (2018) report on the status of doping in Kenya concluded that the local health practitioners, including quasi-medical personnel, play a critical role to athletes and their entourage regarding accessibility and use of prohibited substances or information. The report further asserts that Kenyan healthcare and quasi-medical service providers and healthcare professionals offering health services, such as clinical officers, are ignorant or willingly assume their responsibility in assisting access to doping substances to athletes and their entourage.

Medical practitioners need to understand that WADA has extended doping liabilities to athlete support personnel including; coaches, athletic trainers, team staff, technical officials, medical and paramedical personnel, parents, or any other individuals who work, treat, or assist in athletic participation for sports competitions (WADA, 2021 p. 23) under "*Prohibited Association, (Article 2.10) rule*". Therefore, General Practitioners and Pharmacists need to acknowledge the need for anti-doping education to avoid anti-doping rule violations (ADRV) under article 2.10 in WADA 2021 anti-doping regulations that show no leniency in sanctions. Mazanov et al. (2014) reported that sports physicians and coaches possessed poor knowledge regarding their responsibilities in facilitating clean and safe sports. Woods and Moyinan (2009) examined General Practitioners' knowledge and training regarding doping in sports in Ireland and found that only 14% of the total 771 respondents had a good knowledge of doping. Certainly, unless all stakeholders adopt the fight against doping, egocentric

athletes will continue accessing doping materials from empathetic organizations, professionals, or individuals. It is imperative for medical practitioners to be hands-on with WADA's updated list of banned substances to avoid non-intentional prescriptions of medications that contain banned substances.

Socio-demographic factors such as age, gender, education levels, and work experience may determine individual doping knowledge, attitude, and experience. Previous findings by Laure et al. (2003) showed that athletes consulted older physicians over 45 years more than younger ones regarding information on doping agents. Jaber et al. (2015) found that women physicians considered themselves more knowledgeable than their male counterparts and considered themselves more suitable to provide advice on drug abuse. In another study, a small difference in doping was established in relation to gender (15.2%) and age (86%) of the medical practitioners (Antić, 2017). EL-Hammadi and Huniem (2013) found that 38.6% of male Pharmacists in their study compared to 25.4% of females were more knowledgeable on doping. The influence of gender and work experience of medical practitioners on doping knowledge and attitude is not sufficiently investigated in Kenya, and therefore the need to assess in this study if there were any differences compared to other studies worldwide.

The General Practitioners' and Pharmacists' knowledge of the WADA list of banned substances and methods can significantly assist in the fight against doping through counseling, spreading anti-doping awareness, and providing relevant information regarding doping substances and associated hazards. This ensures the General Practitioners and Pharmacists are careful when handling athletes and can play a key role in helping them manage therapeutic use exemptions (TUEs). Perhaps the many doping cases like that of Kamila Valieva from Russia and Ophélie Claude-Boxberger,

France, were avoidable if healthcare providers had strong doping backgrounds (Time USA, 2022).

In 2019, Kipkemoi from Kenya received two years ban because of traces of prohibited substances which could have been avoided if the Doctor who treated him for Malaria had prior knowledge of WADA prohibited substances and methods (Sports Resolutions, 2019). Another case displaying Kenya's health practitioners' ignorance of WADA prohibited substances and methods was a doctor who prescribed Omanyala, a Kenyan sprinter, Tramadol and Diprofos which are prohibited substances for his back injury (ADAK, 2018). ADAK (2018) also reported a case where a doctor injected an athlete with Tramadol, which is a strong pain reliever whose application was prohibited by WADA before the competition. Although the athlete had asked the Doctor whether the drug was WADA prohibited, the Doctor unknowingly assured the athlete that it was safe. However, the athlete in question was later found positive for banned substances. These few instances clearly indicate that health practitioners in Kenya may lack knowledge of doping. Still, the full extent of their doping knowledge can only be established through systematic inquiries such as surveys.

According to Chebet (2014), athletes in Kenya indicated print media, chemists, and doctors as their main sources of doping information. Therefore, General Practitioners and Pharmacists must be willing, able, and ready to provide doping information to the athletes for a successful fight against Performance Enhancing Drugs (PEDs). Studies show that knowledge of Pharmacy and General Practitioner students about doping can help disseminate doping information and prescribe safe drugs to athletes (Shibata et al., 2017). According to Shibata et al. (2017), providing appropriate doping education to pharmacy students appears useful for anti-doping activities. Yee et al. (2020) also concluded that up-skilling is needed to allow Pharmacists to provide accurate

medication advice to athletes. Increasing health practitioners doping knowledge can be pivotal in the fight against doping because these health professionals are an important source of advice on medication athletes use (Chebet, 2014; Shibata et al., 2017; Yee et al., 2020). Therefore, it was necessary to find out the current status of the anti-doping KAE of General Practitioners and Pharmacists in Kenya.

Medical practitioners' experience with athletes requesting materials or sources of doping agents is alarming. Laure et al. (2003) reported that in 12 months, 37% of General Practitioners were requested by athletes to assist with the information regarding doping agents. The researchers further noted that 3% of General Practitioners received doping requests at least once a week and about 24.5% doping requests in a month. In another study assessing medical doctors' doping attitude and experience in the Balkan region (Bulgaria, Greece, Romania, Serbia, and Turkey), it was noted that within 12 months, 80% of the respondents were requested for doping-related information or agents (Nenad et al., 2007). While a majority of health practitioners recognize the need for clean sports and the health dangers associated with doping, 14% of the medical doctors believed they should assist athletes who want to dope so that they can do it safely (Nenad et al., 2007). This should concern WADA and other doping regulatory bodies because it will be difficult to achieve meaningful progress without changing the attitude of medical doctors, given their vital role in athletes' well-being. To demonstrate how Medical Doctors can facilitate athletes doping, Arnold (2012) posited that some healthcare practitioners strongly associate with athletes, their goals, and celebrity status. The author noted that such healthcare practitioners could knowingly assume their medical norms to help athlete clients to maintain their celebrity status. Although this may appear as an ethical

question (nonmaleficence), understanding the knowledge and attitude of such medical practitioners can substantiate their behavior which is vital in informing the study.

Although individual demographic such as gender, age, and work experience can play a significant role in influencing General Practitioners' or Pharmacists' knowledge and attitude towards PEDs, these variables are not exhaustively investigated and were vital in the current study. It is therefore important to interpret the results related to these independent variables and their influence on General Practitioners' and Pharmacists' PEDs knowledge and attitude with caution.

1.2 Statement of the Problem

Kenya is recognized globally for its middle, long-distance running, and marathon dominance. However, other sports, such as rugby and volleyball for women are also peaking on the global stage (Njororai, 2016). However, this athletic prowess has attracted world attention that suspiciously believes Kenyan athletes may be using PEDs to boost their performance (Reuters, 2018). This has made the Anti-doping Agency of Kenya (ADAK) conduct rigorous doping tests. Sadly, a good number of over 34 elite athletes tested positive for prohibited substances (ADAK, 2019). Kenya athletes have, on several occasions, failed the doping control and have subsequently been banned from participation in competitions because of using medications with elements that violate WADA's codes. Some healthcare practitioners assist athletes in accessing, administering, and masking doping substances affecting the credibility of sports and endangering athletes' health. Healthcare practitioners have confessed ignorance regarding prescribed medications being on WADA's prohibited list (Ogama et al., 2019). The assertions reveal wanting knowledge of doping among Kenya healthcare practitioners in providing medical services to competitive athletes.

Healthcare Practitioners can help reduce or prevent unintentional doping if they are competent in doping.

Athletics Kenya (AK) has attempted to incorporate medical doctors in the fight against doping. AK designated six medical professionals who can be consulted by the elite athletes in the country on matters regarding their medical issues (Athletics Kenya, 2017). However, without a well-laid strategy for serving them, the strategy remains an untapped idea. AK seems oblivious that some medical practitioners may collude with athletes to facilitate the use of PEDs. The Kenya Rugby Union (KRU) also demonstrates its commitment to the spirit of sports and desire to protect athletes' health by partnering with ADAK to educate rugby players and management on anti-doping (APO Group, 2020).

Additionally, the knowledge, attitude, and experience of General Practitioners and Pharmacists regarding doping are unknown. The information gap leaves Kenya's athletes exposed to the risks of consulting doping complacent health practitioners who may be inexperienced with doping agents. Poor involvement of health practitioners, such as General Practitioners and Pharmacists, in the fight against doping, seems to be global. Lauritzen et al. (2017) alluded that the people entrusted with safeguarding the athlete's health have disputed an understanding of PEDs' health effects, and their attitude towards doping is not well documented. When General Practitioners and Pharmacists lack adequate doping knowledge, athletes become exposed to the risks of unintentional doping, and their health becomes antagonized. Although the current doping measures seem to achieve momentum in the fight against PEDs use, doping education to General Practitioners and Pharmacists cannot be the only way but one of the ways to achieve full progress against this vice.

In Kenya, several studies on knowledge, attitude, and practice of doping in sports have focused on athletes as well as Athlete Support Personnel such as coaches, athletic trainers, and parents (Boit et al., 2014; Kamenju et al., 2016; Ogama et al. 2019; Rintaugu & Mwangi, 2020). However, none of these studies evaluated the General Practitioners' and Pharmacists' doping knowledge, attitude, and experience despite their potential source of doping information and ability to prescribe, administer or discourage and influence the use of PEDs; hence the need for this study.

1.3 Purpose of the Study

The study set to examine the knowledge, attitudes, and experience of doping amongst the General Practitioners and Pharmacists in Kenya and how these variables differ across demographics (age, gender, and work experience).

1.4 Objectives of the Study

The study was guided by the following objectives:

1. To evaluate the doping knowledge among General Practitioners and Pharmacists in Kenya.
2. To assess the doping attitude of General Practitioners and Pharmacists in Kenya.
3. To determine if there is any significant difference in doping knowledge between General Practitioners and Pharmacists in Kenya.
4. To determine if there is a difference in doping knowledge with regards to selected demographic factors (age, gender, and work experience) among General Practitioners and Pharmacists in Kenya.
5. To determine if there is any significant difference in doping attitude between General Practitioners and Pharmacists in Kenya.

6. To determine if there is a significance difference in doping attitude in relation to selected demographic factors (age, gender, and work experience) between General Practitioners and Pharmacists in Kenya.
7. To establish the experience of General Practitioners and Pharmacists in Kenya in line with requests for information or prescription on PEDs.

1.5 Research Questions

The study was guided by the following research questions;

1. What is the knowledge level of the General Practitioners and Pharmacists in Kenya?
2. What is the attitude of General Practitioners and Pharmacists towards doping in Kenya?
3. What are the experiences of General Practitioners and Pharmacists in Kenya with regard to athletes' doping behavior?

1.6 Research Hypotheses

The study was guided by the following null hypotheses:

- Ho₁ There is no significant difference in doping knowledge between General Practitioners and Pharmacists in Kenya.
- Ho₂ There is no significant difference in doping knowledge based on gender amongst the General Practitioners and Pharmacists in Kenya.
- Ho₃ There is no significant difference in doping knowledge based on age of the General Practitioners and Pharmacists in Kenya.
- Ho₄ There is no significant difference in doping knowledge among the General Practitioners and Pharmacists in Kenya based on work experience.
- Ho₅ There is no significant difference in attitude towards doping between General Practitioners and Pharmacists in Kenya.

Ho₆ There is no significant difference in attitude towards doping amongst General Practitioners and Pharmacists in Kenya based on gender.

Ho₇ There is no significant difference in attitude towards doping among General Practitioners and Pharmacists in Kenya based on age.

Ho₈ There is no significant difference in attitude towards doping among General Practitioners and Pharmacists in Kenya based on work experience.

1.7. Significance of the Study

The findings of this study prompt General Practitioners' and Pharmacists' curiosity to equip themselves with knowledge of WADA's prohibited list of substances and methods. Based on the findings, the practitioners can be equipped through awareness of Anti-Doping Rule Violation (ADRV) and can better prescribe advice or suggest the use of medications that are consistent with WADA codes or have no adverse health effects on athletes. Additionally, the study results inform WADA and ADAK about the current status of doping knowledge and the attitude of Kenya's General Practitioners and Pharmacists, which can guide them in developing appropriate anti-doping measures through the education departments. The study informs ADAK and WADA on the importance and input of Medical Practitioners' work experience, age, and gender in influencing their role in promoting clean sports, which is in alliance with their mission of encouraging drug-free sports. The findings could have implications for the regulatory bodies of Doctors and Pharmacists, such that health practitioners implicated in doping can have disciplinary actions taken against them.

The findings intrigue the Kenya government, medical training schools, and universities to relook into their curricula and perhaps inculcate the doping education necessary to support medical practitioners with doping knowledge. Additionally, the

knowledge generated from this study contributes to the literature gap in Kenya concerning General Practitioners' and Pharmacists' knowledge, attitude, and experience in doping. It can become a basis for further studies in the fight against doping.

1.8 Delimitations of the Study

The study respondents were General Practitioners and Pharmacists currently in practice and operating in Kenya and duly registered by Kenya Medical Practitioners and Dentists Council (KMPDC) and the Kenya Pharmacy and Poisons Board (KPPB). They also had to be stationed within the seven selected counties, Nairobi, Nandi, Uasin-Gishu, Elgeyo-Marakwet, Nakuru, Bomet, and Laikipia. These counties were crucial to the study because they represent areas where athletes' training camps are mainly concentrated.

The counties selected for the study may not have precisely represented areas where athletes go for their medical treatments. However, the counties selected correspond to potential regions with major training camps and where most elite athletes hail from, consequently suggesting the need for the selection. Questionnaires were used to collect data from General Practitioners and Pharmacists on doping knowledge, attitude, and experience.

1.9 Limitation of the Study

Due to the nature of their profession, General Practitioners and Pharmacists are reserved and reluctant to disclose or discuss patients' private information. Additionally, the illegal and ethical nature of doping may have restricted medical practitioners from divulging thorough information that may have been significant to the study. Nonetheless, the significance of the study was explained to the practitioners

together with the substantial success that can be achieved through their support and effort.

The limitation of the available literature investigating the General Practitioners' and Pharmacists' knowledge, attitude, and experience on doping in Kenya leads to the inadequate comparative literature on this concept. This may affect the robustness of the findings and generalization. However, the study design was carefully selected to fit the study topic, and a suitable methodology was identified for study objectives to ensure and maintain methodological rigour.

1.10 Assumptions of the Study

The study assumed that the General Practitioners and Pharmacists responded objectively and honestly to the self-administered questionnaire regarding their doping knowledge, experience, and attitude. The study further assumed that General Practitioners and Pharmacists in Kenya experience drug (PEDs) related and substance use requests from athletes and that they have some doping attitude due to their interaction with athletes coupled with some level of knowledge in doping which may vary according to the age, gender, and work experience. The study also assumed that there is limited doping education or training of General Practitioners and Pharmacists in Kenya, which could be associated with low knowledge of doping substances and methods, consequently leading to a negative attitude towards doping.

1.11 Conceptual Framework

The study was anchored on Donovan et al. (2014) Sports Drug Control Model (SDCM). The SDCM has six primary tenets postulated to predict an individual's attitude or intention to use PEDs. Threat appraisal (enforcements), benefit appraisal (performance), personal morality (cheating), perception of legitimacy, self-esteem (personality), and reference group have been identified to influence General

Practitioners' and Pharmacists' doping attitudes. Gucciardi et al. (2011) examined the six theoretical tenets of the SDCM using 643 elite Australian athletes and established that morality, performance, and perception of threat strongly influenced doping attitude. Although personality, reference group, and perceived legitimacy demonstrated significant association with doping attitude, the effect was small (Gucciardi et al., 2011). The SDCM is a commonly applied model because it explicitly illustrates the Psychology of doping. The SDCM may be modified and applied in other populations to demonstrate how various key variables identified in the model influence doping actions in the population. The model was adapted to address the dependent variables of knowledge, attitude, and experience of General Practitioners and Pharmacists on doping. According to SDCM, the health practitioners facilitating doping behaviors are influenced by their doping knowledge and substance use experience. General Practitioners' and Pharmacists' knowledge of doping methods, substances, and their experience with the vice, perceived righteousness, practitioners' self-esteem, and benefits derived from their actions influence their intentions to assist athletes in doping. The model was deemed relevant in understanding how multiple variables contribute and interact to influence Medical Practitioners' and Pharmacists' positions regarding doping.

The general model initially showed six major inputs to the General Practitioners' or Pharmacists' attitudes facilitating athletes in doping. The input, self-esteem, which relates to independent variables of personality factors, is suggested to influence the health practitioners' beliefs about the health consequences of doping and their strength and weakness in facilitating or stopping doping. The other five variables are dependent variables derived from several attitude and behavior change models: threat

appraisal, benefit appraisal, reference group influences, personal morality, and legitimacy.

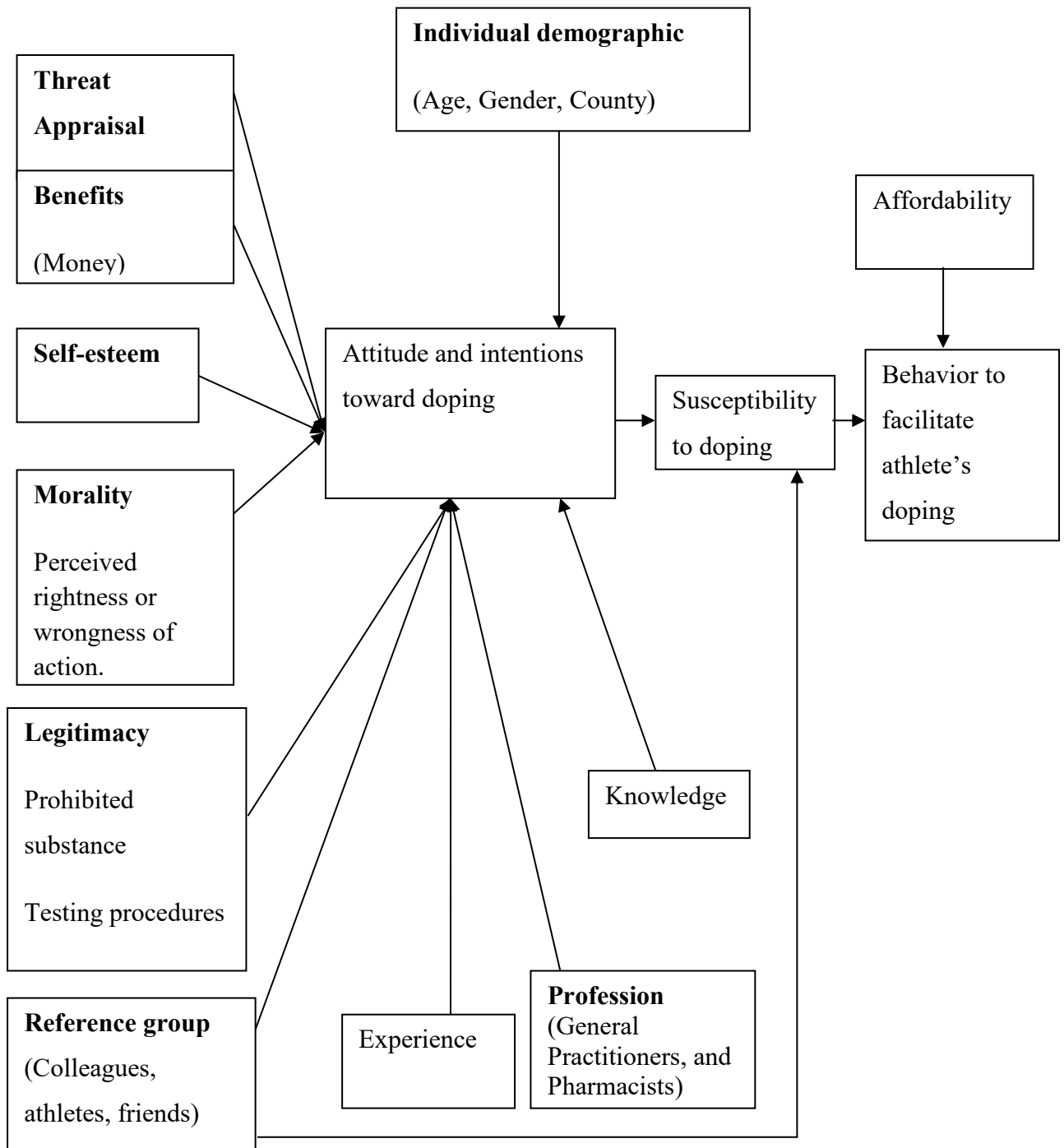
Jalleh et al. (2014) reviewed the 2002 SDCM model to incorporate five other dimensions that inform individuals' decisions for to dope. The other tenets of the model help to explain the factors associated with doping attitude and the susceptibility of practitioners to facilitating doping (Jalleh, et al., 2014). These include: individual demographics, legal supplements and technologies use, susceptibility/attitude intentions, trafficking, and efficacy. During an assessment of the influence of deterrents of the customized drug deterrence model using a survey involving Australian Rules football players (N=32) and football athletes as respondents (N=84), Strelan and Boeckmann (2006) reported that the more a person perceived the consequences of their action to be severe, the more this was related to lower chances of them doping or facilitating the behavior.

Donavan et al. (2014) posit that some factors either contribute to or hinder the conversion of intentions and attitudes to behaviors. If the General Practitioners and Pharmacists perceive threats of sanctions because of their professional code of conduct, this can deter them from assisting athletes in doping. Donavan et al, (2014) revealed that athletes' intention to dope was high when the test could not detect the drug easily; health practitioners are likely to assist athletes with doping where they feel they would not get caught. Backhouse et al. (2015) reported in their meta-analysis on doping that threat, benefit appraisals, and personal morality were related to attitude towards doping behavior. Similarly, General Practitioners or Pharmacists would be confident to administer or prescribe doping drugs that they feel would be difficult to detect during a test. However, if the fear of getting caught surpasses the confidence in administering the PEDs, they would hesitate to assist athletes in doping. Chebet (2014)

also affirmed that athletes are likely to use prohibited substances if they are willing to, especially when they believe that using them would positively change the outcome, questioning the ability of the testing programs where they believe they would not be caught if tested. Chebet's (2014) views could also be true for General Practitioners and Pharmacists, hence the need for this study.

The interrelation of all the above variables is shown in Figure 1.1. This gives an overall impression of how various psychological factors may combine to influence the Medical Practitioners' knowledge, attitude, and experiences concerning athletes' doping behavior.

Figure 1.1: Diagrammatic Representation of the PEDs Control Model
 Adapted from Jalleh et al. (2014).



CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter briefly introduces doping prevalence, anti-doping organizations, and information about WADA's prohibited list and methods. The chapter also contains reviewed literature on doping and anti-doping with respect to General Practitioners and Pharmacists. Appraised literature focused on General Practitioners' and Pharmacists' anti-doping knowledge, attitude, and experience from a global, regional, and local perspective.

2.2 Prevalence of Doping

Doping refers to athletes' use of prohibited substances, drugs, or treatment to enhance their performance. WADA defines doping as one or more of the anti-doping rule violations outlined in Article 2.1 (WADA, 2021). The use of performance enhancement methods, drugs, and even diet dates back to the century at the beginning of sports. Greek athletes between 5BC and 3BC took a special diet made of dried figs, meat, wet cheese, and mushrooms and drank wine to promote their sports performance (Chebet, 2014). Athletes from Latin America, such as Peru and Mexico, took cola to increase their sports endurance. In West Africa, warriors were given cola nitida, a special herb believed to improve performance (Chebet, 2014).

Today, because of advanced technology, new approaches such as gene and blood manipulation, and drugs such as anabolic steroids and peptide hormones are utilized to promote athletes' performance (Vlad et al., 2018). Doping promotes unfair competition and taints the credibility of sports performance. Additionally, the health consequences of doping, such as heart diseases, diabetes, and tumors, have become not only athletes' issues but a public health concern (Ahmadi et al., 2016).

Doping prevalence in elite sports varies significantly, ranging from 0 to 73%, but a systematic review involving 89 self-reported studies indicates that most doping prevalence fell under 5% (Gleaves et al., 2021). Pielke (2018) identified that limited scientific studies have addressed the prevalence of doping. WADA (2016) Working Group concluded that the limited focus on the true prevalence of doping was a general attempt to slow the successful effort of delivering doping-free sports. The evidence indicates doping prevalence rates for athletes at the International Association of Athletics Federations (IAAF) 2011 World Championships at 43.6% and 57.1% at the 12th Quadrennial Pan-Arab Games in the same year (Pielke, 2018). Given the limited documented health consequences of doping to support current doping prevalence and high prevalence rates for doping behaviors from the available data, it is imperative to prompt anti-doping education for athletes and all their athlete support personnel.

2.3 Anti-Doping Organizations

International and local agencies have been established to protect the integrity of sports and shield athletes' health from the use of harmful substances. In 1999, World Anti-doping Agency (WADA) was established as an international and independent body initiated by International Olympic Committee (IOC). The agency's primary role is to develop, harmonize, and coordinate anti-doping rules and policies across all the member countries and sports agencies. WADA also supports doping research and education to help develop ways to promote anti-doping through the involvement of athletes, athletes' support personnel, and researchers (WADA, 2022).

Globally, countries or governments have designated National Anti-Doping Organizations (NADOs) as the primary authority at the national level to ensure anti-doping programs are carried out (IOC, 2021). In Kenya, the National Anti-doping

Agency Kenya (ADAK) is responsible for controlling and monitoring doping in all sports in Kenya (ADAK, 2021). ADAK educates athletes and ASPs intending to promote clean sports. ADAK adopts and implements WADA anti-doping rules and policies to ensure harmonized doping control in local sports. WADA collaborates with international sports agencies such as International Olympic Committee (IOC), United Nations Education, Scientific and Cultural Organizations (UNESCO), and Fédération Internationale de Football Association (FIFA) to ensure effective doping control, which aims to protect athletes from harmful substances and promote clean sports (IOC, 2021).

2.4 WADA Prohibited Substances and Methods

WADA designates substances and methods prohibited in and out of competition and substances prohibited in particular sports. WADA publishes an updated prohibited list each year, which all its signatories adopt. The following is a detailed summary of 2022 Prohibited Methods and Substances.

2.4.1 Substances and Methods Prohibited at All Times

These prohibited substances and methods are categorized into several classifications. Non-approved substances (S0) refer to drugs or substances that have not been approved by government regulatory health authorities for therapeutic use. S0 includes drugs or substances still in pre-clinical or clinical development, discontinued drugs, or substances intended for veterinary use. The S0 substances are prohibited at all times.

The S1 include anabolic agents, S2-peptide hormones, growth factors, mimetics, S3-Beta-2 agonists, S4-hormone and metabolic modulators, and S5-diuretics and masking agents belong to a class of substances and methods prohibited at all times (WADA, 2022). WADA also include methods that are prohibited at all times. They

include the M1-manipulation of blood and blood components, M2-chemical and physical manipulation, and M3 gene and cell doping (WADA, 2022).

2.4.2 Substances and Methods Prohibited In Competition

This category includes substances or drugs allowed outside competition or with TUE. The class includes S6-stimulants that could be found in medications that treat attention deficit, cold and influenza (WADA, 2022). Also categorized in the class of substances and methods prohibited in the competition are the S7-narcotics found in pain-relieving medications, S8-cannabinoids with exceptions of cannabidiol, and the S9-glucocorticoids sometimes found in medications for allergy, asthma, or inflammatory diseases (WADA, 2022).

2.4.3 Substances Prohibited in Particular Sports

Beta-blockers (P1) constitute this class with prohibited substances in particular sports. They may sometimes be found in medications used to treat hypertension and heart failure and belong to the category of substances that are prohibited in particular sports and competitions only. Still, some sports may prohibit them from out-of-competition, such as acebutolol, oxprenolol, and esmolol (WADA, 2020).

Sports prohibiting beta-blockers out-of-competition include Automobile, Darts, Golf, Archery, Shooting, Skiing, and Billiards (WADA, 2020).

2.5 Prohibited Substances and Methods Commonly Abused

The use of performance-enhancing substances or methods may vary from one sports discipline to the other and from country to country because of accessibility, cost, and anti-doping knowledge. A study involving Italian athletes reported that 10% of athletes used amphetamines or anabolic steroids to enhance performance (Al Ghobain et al., 2016). Laure et al. (2003) reported stimulants, narcotics, and anabolic steroids

as the commonly abused prohibited substances by French athletes. The most commonly detected group of prohibited substances are stimulants and anabolic agents.

Navarro (2020) established that diuretics and masking agents were common in sports such as gymnastics, wrestling, judo, boxing, taekwondo, and shooting. Peptide hormones and growth factors were identified in high proportion in sports such as cycling, athletics, and rugby (Navarro, 2020). Stimulants were discovered abnormally high in sports disciplines such as cycling, rowing, tennis, ice hockey, and aquatics, mainly because of their capacity to enhance athletic endurance.

In Kenya, corticosteroids, anabolic agents, diuretics, and masking agents are the commonly abused prohibited substances, particularly by athletes in the athletic discipline (ADAK, 2014). This study, therefore, sought to find out if this could be confirmed by medical practitioners who interact with athletes during their career.

2.6 Therapeutic Use Exemption

Therapeutic Use Exemption (TUE) allows athletes to use medications or procedures that would otherwise invoke ADVR and lead to sanctions if they have an illness that requires them to use prohibited medications for treatment. Athletes must seek TUE from the local anti-doping regulatory body such as ADAK in Kenya to authorize them to use substances or methods while competing, training, or out of competition (WADA, 2016). ADAK recommends athletes to apply for TUE (for substances prohibited in-competition only) at least 30 days before the next competition (ADAK, 2022).

TUE application is reviewed by the TUE committee that includes physicians to establish the legitimacy of the application before approval. General Practitioners' and Pharmacists' understanding of TUE is important in preventing prescribing athletes

with prohibited substances. TUE should be the first thing healthcare providers treating athletes should ask athletes before initiating treatment.

2.7 Athletes' Support Personnel and Doping

Athletic Support Personnel (ASP) refer to the athletic entourage. Any individual involved in delivering supportive services, such as treating athletes participating in or preparing for sports competition (McArdle et al., 2016). ASP involves personnel such as coaches, agents, managers, physicians, parents, and other persons who may be assisting athletes while preparing for competitions.

ASPs play a vital role in influencing athletes to fulfill their mandate to adhere to clean sports (WADA, 2021). ASPs are considered a figure of trust and role models for athletes. Therefore, the behavior of ASPs is crucial to athletes; hence, they should be compatible with sports and uphold fair play.

The pivotal roles ASPs play in athletes make them liable to ADRVs if they are found in possession, administering, or attempting to administer prohibited substances (McArdle et al., 2016). General Practitioners and Pharmacists dealing with athletes, as ASPs, have the legal, ethical, and professional mandate to protect athletes from doping by declining to facilitate doping and educating athletes about the same. General Practitioners and Pharmacists could be sanctioned if found guilty of facilitating doping in any form. Nonetheless, ASPs need sufficient doping knowledge, experience, and a negative attitude towards doping to successfully and effectively promote clean sports.

The central role of General Practitioners and Pharmacists is to provide health care and pharmaceutical support for their patients. However, over the years, the role of these medical practitioners in taking care of athletes' health has changed phenomenally.

General Practitioners' and Pharmacists' long established role was to protect the health of athletes, and treat and prevent injuries (Hooper et al., 2019). Some practitioners have abandoned their traditional duty and instead recommend, prescribe or facilitate the use of performance-enhancing drugs (Hilderbrand, 2007).

While it's quick to say rogue General Practitioners and Pharmacists collude with athletes to use unconventional methods to achieve a sports performance objective, it is worth establishing under what circumstance the prescription of PEDs occurred. For example, medical practitioners use diverse ways to meet conventions for prescribing treatments that denote their professional variability and autonomy. It's, therefore, important to recognize the variability in medical practitioners' decision making which is sometimes based on a lack of 'gold standard' evidence (Backhouse & McKenna, 2011). Additionally, individual practitioners may be motivated to resist the unwanted influence due to the presence of guidelines that extend liabilities of pharmaceutical side effects that an athlete could or may experience. Salih and Abd (2021) established that even when Physicians and Pharmacists are aware of substances on the WADA prohibited list for athletes, some substances are not precisely indicated on the label of ingredients on products. Such an event exposes healthcare practitioners and athletes on the line for ADRV. Several strategies such as partnering between healthcare practitioners and Anti-Doping Organizations, introduction of anti-doping programs and training in college are being used to support General Practitioners and Pharmacists on the subject but the process is often slow and lacking in many countries including Kenya. Evaluating General Practitioners' and Pharmacists' doping knowledge, attitude, and experience provides relevant information to enable them adhere to their roles as WADA 2021 codes outline under Article 21.2 on "*Roles and Responsibilities of ASP*".

2.8 Knowledge on Doping among General Practitioners and Pharmacists

WADA expects healthcare practitioners such as General Practitioners and Pharmacists to have an unlimited knowledge of anti-doping rules and to support athletes in achieving their athletic goals in line with its code. In line with these expectations, WADA introduced an Anti-doping e-learning platform (ADeL) for healthcare practitioners to enhance their doping knowledge to enable them to facilitate the achievement of clean sports (WADA, 2020).

Several surveys have documented the doping knowledge of General Practitioners and Pharmacists globally. A study by Saito et al. (2013) on 572 Japanese pharmacy college students' on their knowledge and attitudes towards doping and supplement intake reported that they were aware of doping; however, only 16% had attended training offered by experts trained in doping. Additionally, a third of the respondents had no idea if an over-the-counter drug could possess doping substances. The authors acknowledged the importance of doping education for Pharmacists students as they demonstrated interest in learning about drug usage among athletes. Finnish Pharmacists recorded poor knowledge of anti-doping counseling and the pharmacology of doping (Lemettila et al., 2021). The study also established that Finnish Pharmacists could not easily categorize different doping agents' interactions with other drugs. Based on their role, Pharmacists are supposed to be well-grounded in knowledge and skills related to prescribing safe medications as they have a good understanding of pharmacodynamics and pharmacokinetics (Hooper et al., 2019). However, dynamics in sports are often assumed contributing to the Pharmacists' limited knowledge of doping.

Previous studies have reported insufficient doping knowledge among medical and healthcare practitioners. This has been attributed to inadequate or non-existent anti-doping training (Auersperger et al., 2012; Backhouse & Mckenna, 2011; Dikic et al., 2013; Erickson et al., 2015; Laure et al., 2003 and Starzark et al., 2016). Although ADAK is mandated to train and educate all stakeholders on doping and its consequences, including General Practitioners and Pharmacists, the presence, availability, and schedule of these outreach programs are relatively recent and probably unpopular in Kenya as the training programs are for athletes and coaches (ADAK 2019).

Regardless of athletes' frequent visits and requests for doping information, medical practitioners have been found to have limited knowledge of doping. Backhouse and Mckenna (2011) acknowledged that limited doping knowledge could influence the practitioners' actions when soliciting such advice. While evaluating athletes' support personnel on anti-doping knowledge and ethical stance in Australia, Mazanov et al. (2014) reported that sports physicians had a relatively high knowledge of doping knowledge and regulations. However, the authors elicited concerns about the respondents' ethical behavior around anti-doping, especially by support role. A number of health practitioners and Athlete Support Personnel may lack ethical soundness, and they are willing to make ethical exceptions around doping to assist athletes in using prohibited substances (Mazanov et al., 2014).

When examining General Practitioners' knowledge, performance and education requirements regarding doping in sports in Ireland, Woods and Moyinan, (2009) revealed that only 14% (112) out of 771 respondents indicated good to very good doping knowledge. They further reported that 12 % (94) of the respondents had

training in sport or doping, and 24 % (184) were linked with a particular sport as a team doctor or advisor. The General Practitioners further reported that the current measures used to curb doping were ineffective and offered to help support the fight against doping. Antic (2017) established that General Practitioners in Serbia had limited knowledge of the List of Prohibited Doping Substances and Methods and the Law on Prevention of Doping in Sport. Using a cross-section survey involving 276 General Practitioners, the researcher established that only 10.5% and 8% of the respondents had good knowledge of the List of Prohibited Doping Substances and Methods and the Law on Prevention of Doping in Sports, respectively. The scarcity of doping knowledge suggests that the practitioners could be limited to providing appropriate medical support to athletes. The findings reflect the need to educate General Practitioners and Pharmacists on doping and other related concepts. Woods and Moyinan's (2009) study provides substantial literature regarding Ireland's General Practitioners' knowledge, practice and training requirements. Though Woods and Moyinan's (2009) study has rich doping information, it's important to recognize that Ireland is a developed country. Ireland's medical training facilities are incomparable to Kenya, the current study location, which may have influenced the General Practitioners' response rate and doping knowledge, consequently suggesting different data collection approaches.

In a survey examining anti-doping knowledge and opinions of South African Pharmacists and General Practitioners, Starzak et al. (2016) concluded that the respondents possessed inadequate doping knowledge and they lacked anti-doping training. The researchers established doping training was not given reasonable attention, especially in undergraduate curricula for medicine and pharmacy students. The authors reported a lack of doping-related workshops to educate General

Practitioners or Pharmacists. However, the above study could not discern reasons for low doping knowledge among General Practitioners and Pharmacists, but they assumed it was due to a lack of practitioners' interest in doping and the unavailability of doping studies/topics or courses in South Africa. Shibata et al. (2017) investigated Pharmacists students' interests and understandings of drug usage, doping and supplement consumption in Japan. The study found that students were not given learning opportunities on doping and supplement consumption. Insufficient or absence of doping education for General Practitioners and Pharmacists directly impacts their ability to address doping in sports.

Dikic et al. (2013) blamed the positive doping cases and series of mistakes by the International Federation of Basketball medical doctors on insufficient knowledge of the nuances of doping regulations and the list of prohibited substances. Several team doctors have demonstrated poor judgment concerning PEDs and possible ignorance of their health side effects on athletes. The consequence is that athletes are punished for doping offences based on doctors' negligence (Dikic et al., 2013). In such scenarios, athletes' rights are jeopardized by a failure of duty of care by the healthcare practitioners who owe the patient-athletes as expected by law and WADA.

Erickson et al. (2015), in their review of the social psychology of doping in sports, reported that the majority of the studies across medical professionals and coaches indicated that health professionals had low knowledge and inadequate training in anti-doping agents. A cross-sectional survey with 273 Malaysian Pharmacists reported that the respondents had moderate doping knowledge (Chan et al., 2019). The study reported that over 80% of the respondents recognized anabolic androgenic steroids (AAS), amphetamine, paracetamol and cannabis as prohibited substances. The

relatively high doping knowledge was linked to most respondents attending courses related to sports and watching and participating in sports programs. General Practitioners and Pharmacists must be cautious when their patient is an active athlete because some substances are used for genuine medical reasons, such as corticosteroids which are used to treat asthma and allergies and are prohibited in competition (Thorsby & Gjelstad, 2021). Kenya General Practitioners and Pharmacists need reliable knowledge of doping and its mechanism. Prohibited methods such as DNA profiling and enhancing blood oxygen transfer have been associated with endurance ability and improved muscle performance, but they also expose athletes to tendon injuries and psychological aptitude (Pokrywka et al., 2013). Erickson et al. (2015) proposed further education and support to facilitate ASP anti-doping efforts in the future. The authors further requested effective preparation for ASP regarding their prescribed code responsibilities pointing out that they face doping-related issues in their work.

Elliott and Leishman (2012) connoted that there are often innovative medicines and techniques that interest dopers in using them, believing that they would be undetectable to the current methods. Undoubtedly the only way WADA and the sports fraternity would win the fight against doping is through a close collaboration between the biopharmaceutical industry and anti-doping agencies across all regions. Elliott and Leishman (2012) observed that the bio-pharmaceutical industry has a place in identifying the doping potential of new medicines at early stages, which can assist in designing detection assays. However, when the entrusted professionals lack reliable knowledge on the subject, it becomes challenging to eradicate doping. A 2020 Australian survey involving 135 registered Pharmacists reported that they were not confident in advising athletes to prevent them from unintentional doping (Yee et al.,

2020). The study recommended educating Australian Pharmacists to enable them to provide appropriate medications for athletes.

In most cases, the lack of educational opportunities for health practitioners, especially General Practitioners and Pharmacists, is the major contributor to their inadequate doping knowledge. General Practitioners and Pharmacists need to learn the aspects of sports medicine and pharmacy to help them provide evidence-based advice to athletes (Hooper et al., 2019). In their review, these authors reported that Pharmacists possess inadequate knowledge and awareness of doping and anti-doping regulations. In another study by Singh et al. (2014) assessing college pharmacy students on their knowledge of cognitive enhancement drugs, the researchers established only 2% of the students (n=877) could identify the six substances considered in that study as Cognitive Performance Enhancers (CPE). The evidence from Hoopers and Singh's studies reveals Pharmacists lack adequate doping knowledge to participate in the fight against doping. The low doping knowledge was also reported in a study evaluating sports pharmacies in Turkey and North Cyprus (Üresi et al., 2018). The survey reported that only 12% of the Pharmacists interested in athletic products and health were well informed about athletic products. Reviewed literature demonstrates that the lack of designated resources to help healthcare practitioners is responsible for their insufficient doping knowledge (Hooper et al., 2019; Singh et al., 2014; Üresi et al., 2018). These three studies (Hooper et al., 2019; Singh et al., 2014; Üresi et al., 2018) demonstrate a concerning limited doping knowledge of the Pharmacists who should play a central role in educating, discouraging as well as treating athletes' health side effects of PEDs. However, the Pharmacists demonstrated a desire to learn sports pharmacy and assist athletes on matters related to doping (Hooper et al., 2019; Singh et al., 2014).

While examining the knowledge of doctors belonging to the Senegalese Association of Sports Medicine about doping in sports, Dhar et al. (2005) indicated that only 11 of the 60 medical practitioners who participated in the study demonstrated an understanding of doping while 15% (n=9) of the respondents were unable to identify any form of the family of doping products. Dhar et al.'s (2005) survey conveyed the knowledge of Senegal doctors registered with the Sports Medicine Association, but the results would probably be daunting if the study involved all doctors in the country as athletes may be attended by physicians who are not in Sports Medicine Association.

A study involving 61 Ethiopian Pharmacists from the Dessie region reported that the average score on knowledge regarding the status of 13 doping agents was 4.5 from a possible score of 13 (Hailu et al., 2021). The study further indicated that 27.9% of Pharmacists used WADA as a source of doping information. These findings indicate low doping knowledge among Pharmacists despite being an important emissary of athletes' medical support. Hailu et al. (2021) also reported majority of the respondents, 55.7% (n=34), indicated that themselves are a potential doping source. However, the study reported that almost two-thirds (n=46) of the Pharmacists indicated Pethidine and Cannabis as banned substances. Narcotics are on WADA's list, but sufficient knowledge of prohibited substances in particular sports are important to allow Pharmacists to provide safe and evidence-based services to athletes.

Another study conducted an online survey among 80 female pharmacy students from Qatar. It was observed that the majority were able to correctly identify doping substances in relation to their use, such as anabolic steroids (65%), amphetamines (72%), Paracetamol (88%), and antihistamines (61%) (Awaisu et al.2015). Athletes widely abuse the identified substances, and given the established Qatar sports

pharmacy program, it increases respondents' possibilities of correctly identifying the substances. Awaisu et al. (2015) also reported that 60% (48) of the respondents were unaware of WADA, and 85% (68) were uninformed of the International Pharmaceutical Federation (FIP) statements. Lack of knowledge of doping regulatory bodies and FIP statements collaborate Pharmacists' limited knowledge on doping and drugs' performance-enhancing properties and their value in the fight against it. The survey also established that doping knowledge and the PEDs' performance-enhancing properties improved as students advanced in their studies, $p < 0.001$).

In Kenya, information on anti-doping knowledge by General Practitioners and Pharmacists remains unknown. Despite frequent doping cases reported against top-level Kenyan athletes, numerous studies have focused on athletes, coaches, sports managers and students in an attempt to unearth the motives behind doping (Boit et al., 2014; Chebet et al., 2014; Dimeo et al., 2013; Kamenju et al., 2016; Mwangi et al., 2019; Ogama et al., 2019). There might be none, however, which has focused on the Medical Practitioners despite their critical role in the fight against doping and, therefore, the need for this study.

2.8.1 Gender, Age, Work Experience and Doping Knowledge

Gender and profession distribution have been reported to mediate doping knowledge and experience of General Practitioners and Pharmacists. During their study on knowledge, attitude, and behavior involving 159 Iraq Physicians and Pharmacists on doping, Salih and Abd (2021) reported gender and professional category (physician and Pharmacists) influenced doping knowledge. Sixty (56.10%) male respondents recorded high level of doping knowledge compared to 15 (28.8%) female respondents ($p = 0.002$) (Salih & Abd, 2021). Another study with 61 Ethiopian Pharmacists

associated doping knowledge with being male and regularly watching sports (Hailu et al., 2021). These study findings make it important to investigate whether gender play any substantial role in doping knowledge among General Practitioners and Pharmacists in Kenya to suggest an ideal intervention that would contribute to a practical doping solution for male and female healthcare practitioners.

Available evidence supports that knowledge increases across development and it is generally retained adequately in old age although the recall performance can be reduced (Brod & Shing, 2022). Researchers also note that education have a protective effect on knowledge because of the accumulation effect that comes with experience (Young, 2020). Therefore, older General Practitioners and Pharmacists are expected to demonstrate a higher doping knowledge resulting from their vast work experience. During a survey with 276 General Practitioners in Serbia the older practitioners had high doping knowledge than their younger counterparts (Antic, 2017). Though the concept of age and doping knowledge is less investigated, this study's findings add to the literature that supports the need to utilize older healthcare practitioners as anti-doping mentors for the new entrants.

Work experience compliments knowledge through accumulated learning and skills obtained over time. As such a general perception is that more experienced General Practitioners and Pharmacists demonstrate a high doping knowledge. Awaisu et al. (2017), while investigating doping knowledge among pharmacist students in Qatar, established that fourth-year pharmacists evaluated higher doping knowledge than student pharmacists in the lower academic year of study. In another study, Finland pharmacists with less work experience were identified to possess less doping knowledge (Lemittila et al., 2021). Investing how work experience affects doping

knowledge among Kenya General Practitioners and Pharmacists helps to establish whether the Kenya practitioners doping knowledge is consistent with identified studies and adds to the absent literature on doping knowledge among the Kenyan healthcare practitioners.

2.9 Source of Doping Information

General Practitioners can learn about doping and substance use health concerns from various sources such as WADA, local doping regulating agencies, school curricula, athletes, seminars, or training. Relentless anti-doping campaigns and collaborations have made WADA the main source of doping information for healthcare practitioners (Shibata et al., 2017). Nakajima et al. (2020) reported that accredited sports Pharmacists consulted the WADA prohibited list and the global drug online reference to learn about doping. WADA and online sources make up a fundamental source of doping information and it should be the goal of doping regulators to ensure the information relayed is reliable and up to date.

Local doping regulators are crucial in providing healthcare practitioners with useful doping information. A study involving Ethiopian Pharmacists established that the majority of the Pharmacists (42.6%) referred to the local Food, Medicine, and Healthcare Administration and Control Authority of Ethiopia (FMHACA) for doping information, with 27.9% indicating they would refer to WADA for doping related information (Hailu et al., 2021). Opportunities for the General Practitioners and Pharmacists to learn more about doping would be presented through the cause of their interaction with athletes and collaboration with other healthcare professionals such as dieticians (Nakajima et al., 2020).

Anti-doping seminars, training, and college curriculum with anti-doping topics also provide a learning opportunity for General Practitioners and Pharmacists. In South Africa, the General Practitioners and Pharmacists are exposed to anti-doping content in colleges, although there is not much attention on the topic (Starzak et al., 2016). In Kenya, ADAK launched an e-learning platform that provides athletes and healthcare professionals access to doping-related topics (ADAK, 2021).

2.10 General Practitioners' and Pharmacists' Attitude towards Doping in Sport

General Practitioners' and Pharmacists' doping attitude refers to their predisposition toward using WADA-prohibited substances and methods (Muwonge et al., 2015). Previous studies have shown that healthcare practitioners with a positive doping attitude, that is, those who support doping or believe doping is part of the sport, have a higher likelihood of assisting athletes in doping (Jaber et al., 2015; Møller, 2009; Domagała et al., 2018). General Practitioners and Pharmacists need to have a strong negative attitude towards doping because of the health issues, heart diseases and hypertension associated with the use of prohibited substances, and it is against the spirit of sport and fair competition. The Performance Enhancement Attitude Scale (PEAS) is used as a measure of attitude toward doping. The PEAS contain 17 statements used to assess respondents doping attitude, measured on a seven-point Likert scale ranging from 1-strongly agree to 7-strongly disagree (Petróczi, 2007).

Several factors have been identified as the main contributors to healthcare practitioners' positive attitude toward doping. Insufficient doping knowledge and the health consequences, inadequate doping regulations and sanctions and personal morality are critical variables to a positive doping attitude (Backhouse et al., 2015; Jalleh et al., 2014). When the doping regulations and policies are not enforced,

General Practitioners and Pharmacists become confident in facilitating PEDs for athletes.

Although healthcare professionals may play a critical part in the fight against PEDs, controversy exists as one of the primary goals of sports science/medicine is to improve human performance above normal functioning (Vlad et al., 2018). Therefore, the status of medical professionals' involvement in prescribing or facilitating the use of prohibited substances is contentious (Backhouse & McKenna, 2011). In their review of medical practitioners' attitudes, Backhouse and McKenna (2011) noted that Sports Scientists' goal of improving human performance above the ordinary challenges sporting ethics. It becomes problematic when the same products used to improve performance bring potentially harmful side effects. The researchers described that practitioners who supported PEDs pointed to the latest condemnations of doping programs for failing to address the safety of athletes. The inclusion of health as a reason to ban some medical substances or treatments has attracted intense criticism because of the paternalism of the approach. Henning and Dimeo (2018) argue that the anti-doping process fails to consider practical health promotion or athlete protection. A study involving 257 Polish Physicians reported that respondents had a negative attitude toward doping (Domagała et al., 2018). These authors established that 96.5% of the respondents described doping as an unethical behavior. Healthcare practitioners who view doping as part of sports or perceive using PEDs as helpful to athletes are likely to facilitate unethical doping behaviors. These Poland Physicians, however, observed that they needed to participate in countering doping (Domagała et al., 2018). On the other hand, a study on Malaysian Pharmacists students demonstrated a negative attitude toward doping and supported implementing initiatives to prevent it (Chan et al., 2019). Involving healthcare practitioners in anti-doping training and

education and providing necessary resources is critical to changing practitioners' doping attitudes relevant to succeeding in the fight against doping.

WADA prohibits some substances only in competitions, but many unlisted substances are not permitted at all times. Additionally, WADA annually updates the list of banned substances. However, some healthcare practitioners have reported to be overwhelmed by these changes and hardly keep up with WADA updated list of prohibited substances and methods. Further, recreational substances with no athletic impacts, such as cannabis (WADA, 2017), also elicited controversy among sports scholars. Health practitioners' inability to distinguish different WADA prohibited substances and the inclusion of recreational drugs with no athletic effects on the WADA list has been linked with positive attitudes toward doping (Erickson, 2015)

Furthermore, the uneven liberalization of recreational marijuana in most countries compounds the issue (Henning & Dimeo, 2018). This has contributed to the discrepancy in the enforcement of ADRV, and doping lenient healthcare practitioners who often cite such inconsistencies to support their acts of aiding doping.

In their systematic review, Erickson et al. (2015) reported that several studies assessing ASPs' (coaches and health practitioners) attitudes toward PEDs indicated a negative doping attitude. The medical professionals questioned the ethical position of doping and its impending effects on the health of athletes. In an earlier study, Møller (2009) posited that the moral standing of medical doctors depends on the circumstances under which doping happens to determine the morality of the practice. For example, the medical practitioner working with athletes may not prescribe PEDs because of ethical concerns and lack of official permission. Therefore, it is unethical

for a medical practitioner not directly working with athletes in an official capacity to not provide medical assistance to the patient who is also an athlete.

Laure et al. (2003), in their study on General Practitioners and doping in sports in France, found that most General Practitioners favor the prescription of drug substitution for athletes who have used doping agents that can cause dependency. The concern is how taking a drug that can lead to addiction as a substitute could be reconciled with anti-doping regulations that ban drug use with similar effects. This could explain the legitimacy of the positive attitudes of the French General Practitioners (Laure et al. 2003). The authors proposed the need to educate health professionals, particularly doctors. According to their survey, doping is viewed as a health problem given the consequences of doping, such as heart diseases, diabetes, and hypertension. Nevertheless, General Practitioners considered themselves poorly prepared to assume an active role in prevention despite most of them having a reference list of doping substances prohibited by WADA and contact with athletes. In an earlier study, Laure (1997) pointed out that medical practitioners must consider doping a health issue. If the General Practitioners and Pharmacists view doping as a health issue, there is a chance that their attitude toward doping in sports will potentially change. Medical practitioners need efficient tools to arm themselves against doping and protect athletes from harmful substances.

Another study by Jaber et al. (2015) on 198 pharmacy students in Jordan indicated that 34% of the respondents indicated that prescribing controlled medications with no doctor's prescription was a significant source of money. Jaber et al. (2015) further reported that 13.1% of the respondents were uncertain if selling controlled drugs to potential abusers was unethical. Money and ethical uncertainty of the health

practitioners make them receptive to athletes doping, and they may display a positive attitude toward doping. Jaber et al. (2015) recommended training Pharmacists students on proper identification, prevention, and ideal management of controlled drugs as well as over-the-counter medication to reduce misuse and abuse. Nonetheless, the above survey provided critical information that assisted the current study in appropriately selecting the ideal data collection method.

Based on the reviewed studies, many General Practitioners and Pharmacists have stated that the current approach to curtail doping is ineffective. The punishment for athletes who fail doping tests is not sufficiently severe; hence the General Practitioners and Pharmacists may not feel dissuaded from assisting athletes to dope in sports (Auersperger et al., 2012). In their study involving 645 General Practitioners and 330 Pharmacists, these researchers found that only 5% of General Practitioners and Pharmacists supported the legalization of doping, 94% were against it, while 1% remained neutral. This could indicate that medical practitioners lack the necessary knowledge to deal with sports doping issues. Additionally, there was a disconnect that existed between their medical view of health issues and doping, and until this perspective is changed, physicians may continue consciously or unconsciously prescribing athletes with PEDs. Kenyan General Practitioners' and Pharmacists' attitude toward doping is unknown and may be resounding; hence the need to establish a better standing in the anti-doping fight in Kenya.

2.9.1 Gender, Age, Work Experience and Attitude towards Doping

Factors such as morality and reference group opinions are notable components that influence attitude towards doping (Grimau et al., 2021). Other aspects such as gender, age, and work experience are less investigated and where their influence toward

doping attitude is examined, they are lightly considered and still there is absence of general consensus about their impacts. For example, Antic (2017) did not establish a significant variation in attitude towards doping between male and female Serbians General Practitioners. Limited literature on gender and attitude towards doping among General Practitioners and Pharmacists necessitates investigation on this dimension to fill the literature gap.

In a study by Jaber et al. (2015) on influence of age on attitude towards doping involving Jordan pharmacists revealed age had no significant effect. In a different study by Antic (2017), age had no significant influence on Serbian General Practitioners' attitude towards doping. Given the cross-cultural variations between these countries with Kenya, assessing the impact of the age of Kenyan General Practitioners and Pharmacists on their attitude towards doping presents important evidence that is highly relatable because it is relevant to the local culture.

The limited evidence on work experience and attitude towards doping of healthcare practitioners reveal work experience as a crucial factor. Lemettilla et al. (2021) established that their work experience significantly influenced the attitude towards doping of Finnish Pharmacists. Work experience can influence General Practitioners' and Pharmacists' attitude toward doping through their job satisfaction which is a product of several factors such as good relationship with the employer and team, job flexibility, and recognition among other things (Kennedy & Belgamwar, 2014). These factors influence individual responses towards doping, and therefore work experience may be valuable hence the need to investigate its influence on the attitude towards doping among Kenyan General Practitioners and Pharmacists.

2.10 Doping Experience among General Practitioners and Pharmacists

Doping experience in relation to General Practitioners and Pharmacists implies the interaction between the health practitioners and the athletes over time as they seek any form of assistance, doping drug prescription or information intentionally or unintentionally regarding doping and or use of PEDs (Heuberger et al., 2022). Several surveys have reported that healthcare professionals frequently encounter doping requests from athletes who visit them for health checkups or advice. A study by Auersperger et al., (2012) involving 645 General Practitioners and 330 Pharmacists in Slovenia on personal experiences with doping, found that, 4% of the respondents knew at least one athlete who used prohibited substances. Twelve percent of the General Practitioners and 46.2% of Pharmacists affirmed receiving requests to prescribed banned substances in the past 12 months, 37% of General Practitioners also observed that they had requested them for doping-related information over the past 12 months. The information was mainly on stimulants, anabolic agents, hormones and corticosteroids. General Practitioners agreed that they play a core role in preventing doping. The ability of anabolic steroids to increase lean mass and muscle strength makes them common among athletes (Huang & Basaria, 2018). General Practitioners and Pharmacists must understand the health risks associated with using these substances, such as acne, cardiac arrhythmia, and sudden death, before prescribing them to athletes (Huang & Basaria, 2018).

Woods and Moyinan's (2009) study on the General Practitioners' education requirements regarding doping in sports in Ireland showed that one in four physicians (28%:217) had been approached by athletes requesting doping information. A survey on medical doctors and doping experience in the Balkan region (Dikic et al.2013) reported that during 12 months, 80% of the doctors had been requested for

information about doping agents by athletes, with 25% asking for prescriptions of PEDs. The researchers further observed that 14% of the doctors felt that they should assist athletes with doping by showing them how to use PEDs safely, while 25% reported treating athletes with doping health problems. It is evident that General Practitioners and Pharmacists receive doping requests from athletes, and without official records of the number of athletes the medical practitioners help, the figures could be overwhelming. Dikic et al.'s (2013) report highlighted the need to empirically engage medical practitioners on anti-doping matters through training, conferences and seminars. They further alluded that WADA has constantly maintained the desire to liaise with medical practitioners regarding PEDs, pain relievers, recreational drugs, doping substances, other products (extra protein, vitamins), and legal products (cigarettes and alcohol). The substances may contain harmful elements and may not be explicitly indicated on the WADA prohibited list.

A study involving Physicians and Pharmacists from Iraq revealed that 51 (53.7%) Pharmacists and 24 (37.5%) physicians knew of past cases of doping (Salih & Abd, 2021). Medical Practitioners are also required to assist athletes in preventing health risks (physical and physiological) that could result from doping agents and facilitate identifying doping substances or elements during clinical and/or biological examinations. However, it is problematic as it has been established that the Physicians who deal with the athletes do not regularly attend the necessary training on matters that can improve their doping knowledge (Dikic et al., 2013). This is so when Pharmacists have been reported to self-declare as a key source of doping agents (Hailu et al., 2021).

From the reviewed studies, it is worth noting that General Practitioners and Pharmacists receive doping assistance requests from athletes. It was, therefore, imperative to examine the Kenyan experience situation, which has hardly been documented, to provide the anti-doping agencies with a premise to further base training needs and, consequently, help equip the medical practitioners in the country to fight this menace.

2.11 Summary of Literature Review

From the reviewed literature, it is apparent that health professionals have insufficient information regarding doping knowledge, and majority are inept in providing athletes with doping-related services. Several authors have cited a lack of proper or inadequate knowledge of doping in their respective countries (Auersperger et al., 2012; Backhouse & Mckenna, 2011; Dikic et al., 2013; Erickson et al., 2015; Laure et al., 2003; Starzark et al., 2016). General Practitioners and Pharmacists have a low interest in doping issues, which was established to account for their limited doping knowledge (Starzark et al., 2016). This demonstrates inadequate cooperation between Medical Practitioners and sports organizations championing clean sports. General Practitioners have been identified as having negative attitudes toward doping and show their willingness to fight against doping (Chan et al., 2019; Domagała et al., 2018; Erickson et al., 2015). General Practitioners and Pharmacists experience frequent visits from athletes who seek advice on doping (Backhouse & Mckenna, 2011). Lack of robust anti-doping regulations, need for money, and doping attitude were notable reasons for General Practitioners and Pharmacists to engage in doping (Auersperger et al., 2012; David, 2017; Henning & Dimeo, 2018; Møller, 2009). Also notable from the reviewed literature is athletes' preference for doping consultation with older physicians (Laure et al., 2003). Pharmacy students, who are male, were identified to

be more knowledgeable about doping matters (EL-Hammadi & Huniem, 2013). However, female health practitioners considered themselves more knowledgeable and suitable for providing doping information than men (Antić, 2017). In light of these findings, there is a continuous need to equip General Practitioners and Pharmacists with training, reading material and seminars to improve their knowledge and better attend to athletes within the conformities of WADA statutes as recommended by various researchers.

Examined literature on the influence of age, gender, and work experience on General Practitioners' and Pharmacists' attitudes is hardly investigated. However, the available evidence indicates gender and age have no considerable effect on healthcare practitioners' attitudes towards doping (Antic, 2017), while work experience has a mediating effect on the pharmacists' attitude towards doping (Lemettilla et al., 2021). The absence of sufficient literature justifies the need to investigate these elements (age, gender, and work experience) among Kenya General Practitioners and Pharmacists and fill the literature gap.

Evidently, Medical Practitioners frequently interact with athletes for their health advice and treatments. Any inconsistencies in this cohort regarding doping will impact athletes' decisions to use PEDs. This study, therefore, sought to evaluate doping knowledge, attitudes and experiences of General Practitioners and Pharmacists in Kenya.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter contains information related to the study design, variable measured, study location, target population, and respondents' selection criteria used in this study. The chapter also details sampling technique and sample size determination criteria, data analysis methods applied, data collection procedure and ethical considerations employed during the study.

3.2 Research Design

A cross-sectional analytical study design was used to assess anti-doping knowledge, attitudes, and experiences of General Practitioners and Pharmacists in Kenya. A cross-sectional analytical study design is a quantitative non-experimental study design that collects data from a defined population at a particular time (Scmidt & Brown, 2021). The goal of the cross-sectional analytical study design was to concurrently describe General Practitioners' and Pharmacists' doping knowledge, attitude, and experience. The study design was selected due to its viability in collecting data without manipulating independent or dependent variables and its ability to describe characteristics that exist in a population.

3.3 Measurement of Variables

The study's independent variables were; the respondents' demographics of age measured at the ordinal level, gender at the nominal level, and work experience at the ordinal level. The dependent variables were doping knowledge and experience which were measured at the ordinal level of measurement, while doping attitude was measured at the interval level using PEAS.

3.4 Study Location

The study was conducted in 7 counties in Kenya. These included: Nairobi, Nandi, Uasin-Gishu, Elgeyo-Marakwet, Nakuru, Bomet, and Laikipia. The counties were selected due to their rich location of significant athletic clubs, potentially reflecting isolated pockets where athletes are likely to seek health support and possibly doping-related advice (Appendix A).

3.5 Target Population

As of December 2021, there were approximately 4,613 General Practitioners and 16,831 Pharmacists in Nairobi, Nandi, Uasin-Gishu, Elgeyo-Marakwet, Nakuru, Bomet, and Laikipia counties in Kenya (KMPDC, 2022; KPPB, 2022). The study targeted General Practitioners and Pharmacists who were active and registered with their respective bodies.

3.5.1 Inclusion Criteria

The General Practitioners and Pharmacists currently in practice and operating in Kenya duly registered by KMPDC and KPPB were eligible for the study. The respondents had to be stationed within the selected counties to be considered for the study.

3.5.2 Exclusion Criteria

The study excluded the unregistered medical practitioners working outside the selected counties. Those registered but not active (practicing) were also excluded during data collection.

3.6 Sampling Techniques and Sample Size

3.6.1 Sampling Technique

The study used purposive sampling to select the seven target counties included in the survey. A stratified sampling technique was used to distribute respondents (sample) on the seven counties according to their proportion for each county's target population. A simple random sampling was then used to pick respondents to participate in the study in each county.

3.6.2 Sampling Size

The sample size was determined using Israel (1992) sampling table (Appendix D). The formula was derived by Yamane (1973).

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size, N is the population size and e is the level of precision, where in this case is 0.05. The sample size for General Practitioners and Pharmacists was calculated as follows.

General Practitioners	Pharmacists
$n = \frac{4613}{1 + 4613(0.05)^2} = 368$	$n = \frac{16831}{1 + 16831(0.05)^2} = 391$

The calculated sample size for each cohort, 368 General Practitioners and 391 Pharmacists, was further increased by 30% to cater to unresponsive respondents, as Israel (1992) recommends. The targeted sample size for each cohort changed to 478 General Practitioners and 507 Pharmacists. The sample size of the General Practitioners and Pharmacists based on the selected counties are presented in Tables 3.1 and 3.2.

Table 3.1: Target General Practitioners According to Selected Counties

County	Registered General Practitioners	Percent %	Sample size (n)
Nairobi	3792	82.2	393
Uasin-Gishu	332	7.2	34
Nakuru	272	5.9	28
Bomet	92	2	10
Nandi	55	1.2	6
Elgeyo-Marakwet	37	0.8	4
Laikipia	32	0.7	3
TOTAL	4613	100%	478

Table 3.2: Target Pharmacists According to Selected Counties

County	Registered Pharmacists	Percent %	Sample size (n)
Nairobi	9458	56.2	285
Nakuru	3019	17.9	91
Uasin-Gishu	2067	12.3	62
Elgeyo-Marakwet	753	4.5	23
Bomet	645	3.8	19
Laikipia	651	3.9	20
Nandi	238	1.4	7
TOTAL	16,831	100%	507

Nairobi had the highest number of registered General Practitioners , 82.2% (4192), followed by Uasin Gishu at 7.2% (371), Nakuru at 5.9% (303), while Laikipia trailed at 0.7% (36). Nairobi county also led in the number of registered Pharmacists at 56.2% (9458), followed at a distance by Nakuru county with 17.9% (3019) and Uasin-Gishu with 12.3% (2067). Nandi and Laikipia counties had the lowest number of registered Pharmacists at 1.4% (238) and 3.9% (651), respectively.

3.7 Research Instrument

A self-report questionnaire was the main instrument used for data collection in this study (Appendix C). The researcher prepared and compiled the questionnaire from previously validated items obtained from various self-report questionnaires. The questionnaire was divided into four sections. Section A captured the respondents' demographic information, including age, gender, county of residence, level of formal education, occupation, and the number of years they had worked.

General Practitioners' and Pharmacists' knowledge of doping was assessed in Section B, which comprised six items derived from the WADA athletes' online resource (WADA, 2019). The tool was scored by responding to questions related to knowledge of anti-doping agencies (items 1 and 2) and ranking how informed they were on matters of doping (item 3). The respondents' Familiarity with doping codes and related issues was assessed using 17 statements that were measured using a five-point Likert scale. The scale ranged from 1- Not at all familiar, 2- Slightly familiar, 3- Somewhat familiar, 4- Moderately familiar, and 5- Extremely familiar. The possible cumulative maximum score on doping Familiarity for General Practitioners and Pharmacists was 85, indicating that the participant was extremely familiar with doping codes and related issues. A score of 42.5 and below demonstrated an average to poor knowledge of doping codes and related issues, whereas a score above 42.5 indicated good doping familiarity. Item 5 in this section sought to investigate the respondents' knowledge of the prohibited classes of substances or methods as well as classes of prohibited substances in certain sports using a seven-point Likert scale. The scale ranged from 1-100% correct, 2- 60% correct, 3- 30% correct, 4- Neither correct nor incorrect, 5- 30% incorrect, 6- 60% incorrect, and 7- 100% incorrect. Finally, item

6 of this section sought to determine the respondents' sources of knowledge about doping and performance enhancing drugs. They were expected to identify from a list of possible sources as identified from literature.

The third section, C, investigated the respondents' attitudes toward doping in sports in Kenya. It sought to find out what the health practitioners' thought about doping. The section (item 7) comprised of 17 statements adapted from Petróczi (2007). Respondents' doping attitude was assessed by a seven-point Likert scale with values assigned as follows; 1- Strongly Disagree 2- Somehow Disagree, 3- Disagree, 4- Neutral, 5- Agree, 6- Somehow Agree, and 7- Strongly Agree. The minimum score per statement was 1, and the maximum was 7. A high score on each item of the Likert scale ≥ 3.5 reflected positive attitude toward doping while a score of ≤ 3.5 demonstrated negative attitude towards doping. A maximum cumulative score would have been 119, implying a positive doping attitude. The doping attitude score of 59.5 and below denoted a negative to strong negative doping attitude (Petróczi & Aidman, 2009). In addition, the section also sought to find out the practitioners' thoughts on the source of PEDs to the athletes (item 8). A list of the probable sources was provided for them to choose from.

Finally, section D had seven items (9-15) that examined the doping experience of General Practitioners and Pharmacists on doping in sports. The items were adapted from Woods & Moynihan (2009). Questions in this section focused on finding out whether General Practitioners and Pharmacists had ever been approached by athletes seeking doping information or drugs, the frequency at which athletes confronted them for information, some of the drug information athletes often sought, the kind of drugs athletes requested for prescription, whether they had received any request for information or doping substances or treatment for the past one year and what they

thought compelled some General Practitioners and Pharmacists to assist athletes in doping. Respondents had been presented with options to choose from in the various items in this section.

3.8 Recruitment and Training of Research Assistants

Before the start of data collection, the researcher gathered a team of 5 members: one principal investigator and four research assistants. A group of 5 members was ideal for data collection because most hospitals and pharmacies in the selected counties are concentrated in major town centers, hence easy to access. Furthermore, each county was assigned four days' timeline for data collection, which was enough to access the major towns in each county. The training of research assistants was scheduled for two days (Appendix E). Members were trained on the background and setting of the study, data collection protocol, survey tools, their roles, and proper communication strategies. The principal investigator was responsible for planning travels, arranging respondents' meet ups, and scheduling the specific hospitals or pharmacies to visit each day. Research assistants were tasked with distributing and collecting questionnaires from the respondents.

To qualify to be a member of the data collection team in this study, one had to meet the following criteria: A graduate preferably with a degree in Recreation and Sports Management, Exercise and Sport Science or a related course with experience in data collection, have good communication skills, able to work independently and available throughout the data collection period.

3.9 Pre-testing of Research Instrument

Pretesting of the research tool was performed to identify issues such as ambiguous and repetitive questions, appropriateness of the statements to the study respondents,

and the ability of the questionnaires to address the study objectives effectively. The study instrument was tested using 15 General Practitioners from Baringo Level Five hospital and 15 Pharmacists from Kabarnet town. Baringo County was deemed appropriate as some of the renowned athletes come from here, and also, the county houses international and up-coming athletes. Kabarnet town also borders Uasin-Gishu and Elgeyo-Marakwet counties, the *Home of Champions* hence a high probability of competitive athletes seeking health care services from the county. The respondents were requested to complete the questionnaire. This assisted in establishing the appropriateness of the research questions and the ability to evaluate all the intended variables.

The pretest response helped determine the respondents' ability to correctly interpret and understand the questions. Moreover, additional features such as appropriateness of language, length, irrelevance, and ambiguity of the questions were identified and modified.

3.9.1 Validity and Reliability of the Instrument

Validity is the ability of the study instrument to precisely assess what it was intended to measure (Heale & Twycross, 2015). In the current study, external validity was upheld by ensuring the sample was as representative as possible using stratified random sampling for the results to generalize to Kenya's General Practitioners' and Pharmacists' perspectives on doping knowledge, attitude, and experience. The face and content validity were achieved by ensuring the questionnaire captured all the study variables and evaluated all the study objectives.

Reliability refers to the extent to which results are consistent over time while accurately representing the study population (Zohrabi, 2013). Moreover, it implies

that the findings could be replicated using the same methodology and the research instrument. The study used a test-retest approach with a time interval of two weeks to establish consistency. Fifteen Medical practitioners from Baringo Level five hospital and 15 Pharmacists from Kabarnet town were randomly selected to test the instrument's reliability. Respondents took approximately 25 minutes to answer all the questions and provided their views regarding the appropriateness of the study questions. The statements identified as vague, irrelevant, or repetitive were restructured to make them appropriate for the respondents. This was to ensure the accuracy of the research instrument. For internal consistency, the coefficient alpha technique was used. The test-retest reliability recorded a high correlation, 0.87 indicating sufficient temporal stability or reliability $p < .001$ of all the three sections of the research instrument. Evidence from previous studies that have used the PEAS reported the tool is reliable, with Cronbach alpha above .70 (Petróczi & Aidman, 2009; Petróczi, 2007). This study's internal consistency of PEAS was acceptable reliability coefficients ($\alpha = 0.79$). The reliability of sections B (doping knowledge) and D (doping experience) was reviewed by experienced supervisors in doping research to ensure the sections addressed the intended objectives.

3.11 Data Analysis and Presentation

Data from the questionnaires were recorded, coded, and stored in excel file format. Verification for double entry and quality control was performed before the data was processed in Statistical Package for Social Sciences (SPSS) version 25.

Descriptive statistics of percentages, frequencies, means, and standard deviations (SD) were used to summarize the demographic characteristics. Descriptive statistics methods were utilized for initial data analysis to calculate frequency, mean, standard deviation, and percentages on General Practitioners' and Pharmacists' familiarity with

doping substances and methods, doping attitude, source of performance enhancing substances, and doping experience.

Where parametric tests assumptions were not met for inferential statistics, non-parametric tests were used. The Mann-Whitney U test, a non-parametric test, was used to establish if there was a difference in the mean between General Practitioners' and Pharmacists' doping knowledge (Ho₁) and attitude (Ho₅). Mann-Whitney U test was also applied to examine the difference in the means on doping knowledge (Ho₂) and attitude (Ho₆) based on the gender of the respondents. Kruskal-Wallis test was used to establish the influence of age (Ho₃) and work experience (Ho₄) on General Practitioners' and Pharmacists' doping knowledge. Kruskal-Wallis was also used to establish if there was significant mean difference in doping attitude based on age (Ho₇) and work experience (Ho₈) among General Practitioners and Pharmacists. The Bonferroni correction method was applied to examine pairwise differences among the age group and work experience category to establish where a significant difference in doping knowledge existed.

All statistical levels of significance were evaluated at $p < .05$.

3.10 Data Collection Procedure

The researcher randomly selected General Practitioners and Pharmacists from a list of contact issued by KMPDC and KPPB. After acquiring required research permits from the relevant authorities, the researcher and the research assistants made travel arrangements to each county and randomly visited chemists and hospitals and clinics.

To ease data collection, the respondents were classified according to counties and then to their working station, where each county was assigned a timeline of 4 days. In

a case where several General Practitioners work in the same station, data was collected at once for those respondents.

The researcher or the research assistant explained the scope and importance of the study and further assured confidentiality of the information given and the individual participating in the study. Once the individual agreed to be a respondent in the study, they signed the consent form before a questionnaire was issued. The questionnaire was administered using open-data kit technology to ensure the adherence of the study to the covid-19 protocols. Data collection took place in the month of October 2021 spending a total of 21 days .

3.12 Logistical and Ethical Considerations

A permit to conduct the study was sought from Kenyatta University Graduate School (Appendix F). Additionally, Kenyatta University Ethical Review Committee (KUERC) approved the study protocol (PKU/2307/11448) (Appendix G) while additional permit to conduct the study in the country was obtained from the National Council of Science Technology and Innovation (NACOSTI) (NACOSTI/P/21/12371) (Appendix H), respectively). The researcher further requested authorization from the identified General Practitioners and Pharmacists to participate in the study as respondents (Appendix B). Once the respondents accepted to become part of the study's respondents, they were given a consent form to sign. The importance and scope of the study were explained before signing the consent form (Appendix B). The respondents were assured that the details they provided would remain confidential and were for the current study only. The respondents were also educated on their right to withdraw from the study at any moment without prejudice or penalties.

To ensure confidentiality of the data, the questionnaires were coded for both the General Practitioners and Pharmacists, and they were also not shared with any other contact besides the researcher. Research respondents were also given anonymous codes. The data was only used for the purposes of the research and only accessed by the researcher. To enhance the respondents' or the medical community's benefit from the study, the results would be shared with them through seminars to disseminate the outcome and way forward on how to enhance their knowledge and attitude through available resources from KMPDB, KPPB, WADA, and ADAK.

CHAPTER FOUR: RESEARCH FINDINGS

4.1 Introduction

This chapter presents results on the demographic characteristics of the study respondents (General Practitioners and Pharmacists), that is, the total number of respondents, gender and age composition, work experience of the health practice as well as their county of residence.

The chapter further outlines and expounds on the results of General Practitioners' and Pharmacists' doping knowledge. It also has the results describing if gender, age, and work experience of General Practitioners and Pharmacists contribute to differences in doping knowledge.

Also presented in this chapter are the results of General Practitioners' and Pharmacists' doping attitude and how demographic factors of gender, age, and work experience contribute to difference in doping attitude of the respondents. Results on experience in doping by General Practitioners and Pharmacists are also presented in this chapter.

4.2 Demographic Characteristics of the Research Participants

Out of 985 contacted General Practitioners and Pharmacists (478 General Practitioners and 507 Pharmacists), 615 respondents (250 General Practitioners and 365 Pharmacists) agreed to participate in the study. The study response rate was 62% which was established sufficient considering a survey response rate of 50% and above is deemed good in many circumstances. Story and Tait (2019) indicated that a good survey report presents findings with valid and reliable answers to the study questions with a reasonable response rate of at least 40% and augmented with sufficient

precision, the margin of error conventionally 5%, which would be $278 \pm 5\%$ as per sample size table (Adam, 2020) (Appendix D).

Table 4.1: Participants' Demographic Characteristics (n= 615)

	General Practitioners		Pharmacists	
	F	%	F	%
Participants' by Gender				
Males	151	60.4	209	57.3
Females	99	39.6	156	42.7
Total	250	100	365	100
Participants' Distribution by Age				
21-30	95	38	183	50.1
31-40	95	38	140	38.4
41-50	39	15.6	37	10.1
>50	21	8.4	5	1.4
Total	250	100	365	100
Participants' Work Experience				
≤5 years	96	38.4	144	39.5
6-10 years	70	28	138	37.8
11-15 years	40	16	55	15.1
16-20 years	20	8	18	4.9
≥21 years	24	9.6	10	2.7
Total	250	100	365	100
Participants' Level of Formal Education				
Postgraduate	27	10.8	15	4.1
Graduate	128	51.2	121	33.2
College	95	38	229	62.7
Total	250	100	365	100
Participants' County of Residence				
Nairobi	174	69.6	158	43.3
Nakuru	32	12.8	76	20.8
Uasin-Gishu	25	10	59	16.2
Bomet	7	2.8	19	5.2
Elgeyo-Marakwet	4	1.6	23	6.3
Laikipia	4	1.6	21	5.7
Nandi	4	1.6	9	2.5
Total	250	100	365	100

As indicated in Table 4.1, out of the 250 General Practitioners who participated in the study, 151 (60.4%) were male, while 99 (39.6%) were female. Likewise, of the 365 Pharmacists, there were more male (209; 57.3%) than female (156; 42.7) respondents.

Concerning age distribution, results showed that most General Practitioners were in the age category of 21-30 years and 31 - 40 years, 95 (38%) each followed by 39 (15.6%) in the age group 41-50 years while only 21 (8.4%) were older than 50 years. On the other hand, half of the pharmacists, 183 (50.1%), were in the age group 21-30 years, followed by 140 (38.4%) in the age category 31-40 years. There were 37 (10.1%) pharmacists in the age category 41-50 years, while those older than 50 years were only 5 (1.4%) in the study. These results indicate majority of the respondents (General Practitioners and Pharmacists) in the study were between 21 and 30 years.

Regarding the working experience of the respondents in this study, most of them 240 (39%), had been working as health practitioners for a period of below five years. Of these, 96 (38.4%) were General Practitioners , while 114 (39.5%) were Pharmacists. They were followed by respondents with 6-10 years of working experience, 70 (28%) General Practitioners and 138(37.8%) Pharmacists. Respondents with working experience of 16-20 years were the minority in this study, 20 (8%) for General Practitioners , while pharmacists with more than 21 years of working experience were least represented in this study, 10 (2.7%) (Table 4.1). These results imply that most practising General Practitioners and Pharmacists have less than five years of work experience.

Respondents' level of formal education was assessed, and results show that the majority of General Practitioners , 128 (51.2%), were graduates, followed by 95 (38%) who had a college level of education. In comparison, 27 (10.8%) of the General

Practitioners had attained Postgraduate studies. Pharmacists, 229 (62.7%) had a college diploma, followed by graduates 121 (33.2%), while 15 (4.1%) had a postgraduate level of education.

Results from Table 4.1 also show that more than half of the General Practitioners (174; 69.6%) were from Nairobi City County, followed by 32 (12.8%) from Nakuru County and 25 (10%) from Uasin Gishu. Only a few respondents were from other targeted counties. Table 4.1 also shows that almost half of the Pharmacists who participated in the study, 158 (43.3%), were from Nairobi County, 76 (20.8%) from Nakuru County, and 59 (16.2%) from Uasin Gishu County and the rest were distributed from other counties. These results indicate that most health practitioners (General Practitioners and Pharmacists) practice in Nairobi County.

4.3 General Practitioners' and Pharmacists' Knowledge on Doping

To address the research objective of establishing the doping knowledge of the General Practitioners and Pharmacists in Kenya, the study sought information from the respondents on the following; knowledge of anti-doping agencies, how informed and familiar they were on matters of doping in sports, and their knowledge on prohibited classes of substances or methods. The study also sought to assess the sources of knowledge on doping and performance-enhancing drugs of the medical practitioners who participated in the study.

4.3.1 Knowledge of Anti-Doping Agencies

To find out if the respondents knew about the main bodies that regulate doping, they were asked to respond to whether they had heard of WADA and ADAK. The findings are presented in Table 4.2.

Table 4.2: Participants' Knowledge of Doping Regulatory Bodies

		Health Practitioners					
Regulatory Body		General Practitioners		Pharmacists		Overall	
		F	%	F	%	F	%
WADA	Yes	177	70.8	238	65.2	415	67.5
	No	73	29.2	127	34.8	200	32.5
	Total	250	100	365	100	615	100
ADAK	Yes	173	69.2	227	62.2	400	65
	No	77	30.8	138	37.8	215	35
	Total	250	100	365	100	615	100

The results (Table 4.2) reveal that over half, 415 (67.5%) of the respondents have heard about WADA. Similarly, 400 (65%) health practitioners were aware of ADAK, the local doping regulatory body.

Table 4.2 also shows that the majority of the General Practitioners, 177 (70.8%), had heard about WADA, while 73 (29.2%) reported that they had never heard about it. On the other hand, 238 (65.2%) of the Pharmacists indicated they knew WADA, but a considerable number, 127 (34.8%), had never heard about WADA. The results implied that though a good number of the respondents were aware of WADA, a considerable number of General Practitioners and Pharmacists still lack knowledge of the doping regulatory agency.

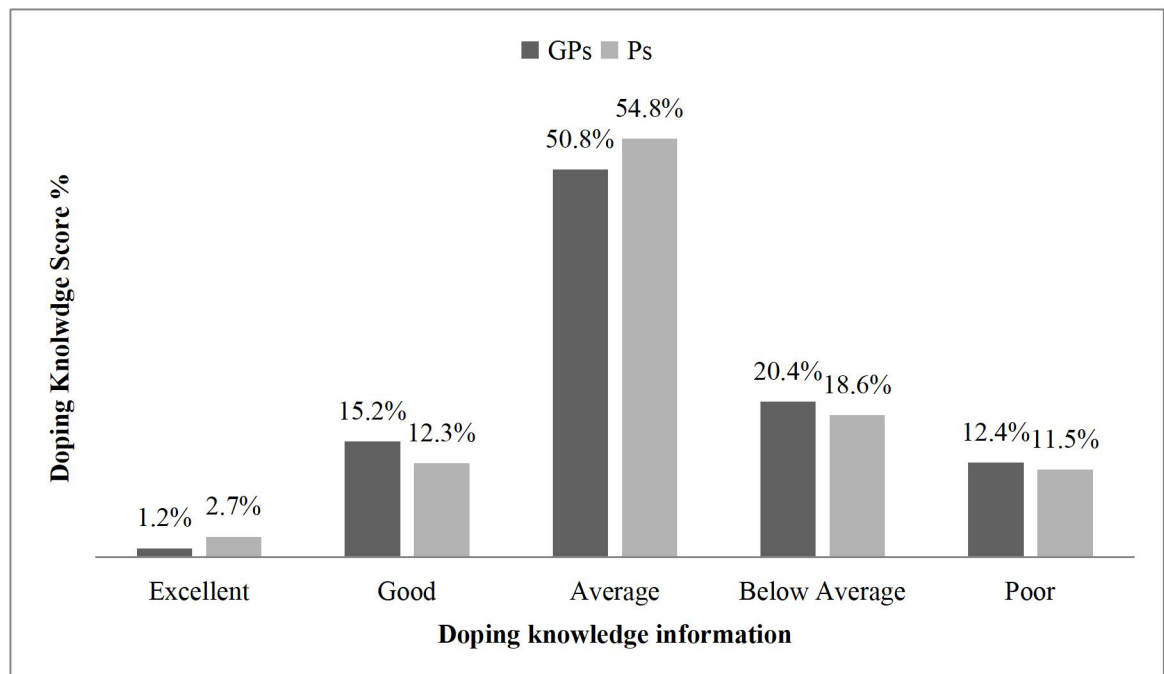
The study further investigated whether General Practitioners and Pharmacists in Kenya knew about the local doping regulatory body, ADAK. As shown in Table 4.2,

the results revealed that over half of the General Practitioners, 173 (69.2%), were aware of ADAK while 77 (30.8%) of them had never heard about it. On the other hand, a majority, 227 (62.2%) of the Pharmacists, knew ADAK, but a sizeable number, 138 (37.8%), reported to have never heard of ADAK. Similar to the knowledge of the international regulatory body, WADA, the results demonstrates that General Practitioners and Pharmacists in Kenya have good knowledge of ADAK. However, more than a third of the respondents were unaware of ADAK's existence.

4.3.2 Doping Knowledge Information Capacity

The study also evaluated how well the General Practitioners and Pharmacists were informed in relation to doping in sports. The respondents were asked to rate themselves on a five-point scale, and the results are presented in Figure 4.1.

Figure 4.1: Participants' Knowledge Information in Relation to Doping in Sports



The above results show that about half of the General Practitioners, 127 (50.8%), were averagely informed on doping issues. Only 41 (16.4%) of the General

Practitioners indicated good and excellently informed about doping. A considerable number, 82 (32.8%), rated their informed capacity on doping between below average and poor, as shown in Figure 4.1. Figure 4.1 also indicated that more than half, 200 (54.8%) of the Pharmacists rated themselves average, 55 (15%) reported they were between good and excellently informed about doping, but a fair number of 110 (30.1%) said they had a below average to poor information about doping. The above results indicate General Practitioners and Pharmacists in Kenya have average doping information.

4.3.3 Level of Familiarity in Relation to Doping in Sports

To determine the respondents' familiarity with doping matters, the study sought their responses on issues pertinent to doping information, which is essential in establishing their current level of doping knowledge. The respondents responded to 17 statements on a Five-point Likert scale ranging from 1, which indicated Not at all familiar, denoting little knowledge of doping, and 5, Extremely familiar, that signified high knowledge of doping. Results are presented in Table 4.3.

Table 4.3: Kenyan General Practitioners' and Pharmacists' Level of Familiarity on Knowledge in Doping in Sport

Statement		General Practitioners (n=250)		Pharmacists (n=365)		
		Frequency	%	Frequency	%	<i>p</i>
The world anti-doping code	Not at all familiar	111	44.4	172	47.1	.099
	Slightly familiar	74	29.6	136	37.3	
	Somewhat familiar	30	12	24	6.6	
	Moderately familiar	29	11.6	18	4.9	
	Extremely	6	2.4	15	4.1	

	familiar					
Performance Enhancing Drugs	Not at all familiar	55	22	42	11.5	.036
	Slightly familiar	96	38.4	102	27.9	
	Somewhat familiar	35	14	51	14	
	Moderately familiar	46	18.4	105	28.8	
	Extremely familiar	18	7.2	65	17.8	
Anti-doping rule violations.	Not at all familiar	55	22	92	25.2	.406
	Slightly familiar	96	38.4	133	36.4	
	Somewhat familiar	35	14	56	15.3	
	Moderately familiar	46	18.4	63	17.3	
	Extremely familiar	18	7.2	21	5.8	
The side effects of anabolic agents are liver damage, infarct, acne and libido disorders	Not at all familiar	34	13.6	45	12.3	.281
	Slightly familiar	82	32.8	105	28.8	
	Somewhat familiar	39	15.6	71	19.5	
	Moderately familiar	64	25.6	87	23.8	
	Extremely familiar	31	12.4	57	15.6	
Testosterone in sport is regarded as doping.	Not at all familiar	44	17.6	55	15.1	.368
	Slightly familiar	60	24	99	27.1	
	Somewhat familiar	36	14.4	42	11.5	
	Moderately familiar	70	28	91	24.9	
	Extremely familiar	40	16	78	21.4	
Erythropoietin in sport is regarded as doping.	Not at all familiar	50	20	74	20.3	.375

	Slightly familiar	61	24.4	84	23	
	Somewhat familiar	40	16	53	14.5	
	Moderately familiar	57	22.8	67	18.4	
	Extremely familiar	42	16.8	87	23.8	
Hypertension and heart attack is the most common side effects of erythropoietin	Not at all familiar	44	17.6	68	18.6	.534
	Slightly familiar	56	22.4	86	23.6	
	Somewhat familiar	42	16.8	65	17.8	
	Moderately familiar	70	28	92	25.2	
	Extremely familiar	38	15.2	54	14.8	
B2-agonists can be used for medical purposes.	Not at all familiar	38	15.2	52	14.2	.560
	Slightly familiar	61	24.4	97	26.6	
	Somewhat familiar	36	14.4	45	12.3	
	Moderately familiar	68	27.2	83	22.7	
	Extremely familiar	47	18.8	88	24.1	
Diuretics are listed as prohibited substance.	Not at all familiar	75	30	109	29.9	.805
	Slightly familiar	63	25.2	94	25.8	
	Somewhat familiar	35	14	67	18.4	
	Moderately familiar	55	22	55	15.1	
	Extremely familiar	22	8.8	40	11	
Blood transfusion is a prohibited method.	Not at all familiar	68	27.2	114	31.2	.177
	Slightly familiar	64	25.6	104	28.5	
	Somewhat familiar	43	17.2	49	13.4	

	familiar					
	Moderately familiar	47	18.8	57	15.6	
	Extremely familiar	28	11.2	41	11.2	
Genetic manipulation is a prohibited method.	Not at all familiar	45	18	74	20.3	.644
	Slightly familiar	68	27.2	96	26.3	
	Somewhat familiar	36	14.4	45	12.3	
	Moderately familiar	55	22	90	24.7	
	Extremely familiar	46	18.4	60	16.4	
Caffeine is not a doping agent.	Not at all familiar	50	20	103	28.2	.029
	Slightly familiar	62	24.8	82	22.5	
	Somewhat familiar	39	15.6	67	18.4	
	Moderately familiar	70	28	73	20	
	Extremely familiar	29	11.6	40	11	
Tein is not a doping agent.	Not at all familiar	107	42.8	195	53.4	.005
	Slightly familiar	53	21.2	75	20.5	
	Somewhat familiar	41	16.4	40	11	
	Moderately familiar	31	12.4	37	10.1	
	Extremely familiar	18	7.2	18	4.9	
Dietary supplements may result in a positive doping test.	Not at all familiar	62	24.8	88	24.1	.788
	Slightly familiar	65	26	101	27.7	
	Somewhat familiar	43	17.2	52	14.2	
	Moderately familiar	49	19.6	72	19.7	

	Extremely familiar	31	12.4	52	14.2	
Marijuana is not permitted in competitions only.	Not at all familiar	30	12	77	21.1	.002
	Slightly familiar	45	18	84	23	
	Somewhat familiar	36	14.4	44	12.1	
	Moderately familiar	84	33.6	89	24.4	
	Extremely familiar	55	22	71	19.5	
Cocaine is not permitted even in certain amounts	Not at all familiar	24	9.6	49	13.4	.106
	Slightly familiar	42	16.8	72	19.7	
	Somewhat familiar	35	14	54	14.8	
	Moderately familiar	77	30.8	91	24.9	
	Extremely familiar	72	28.8	99	27.1	
Beta-blockers are not prohibited in all types of sport.	Not at all familiar	62	24.8	106	29	.141
	Slightly familiar	64	25.6	98	26.8	
	Somewhat familiar	40	16	55	15.1	
	Moderately familiar	56	22.4	72	19.7	
	Extremely familiar	28	11.2	34	9.3	

Note: *Level of significant test at $p < .05$ * Mann-Whitney test is used to establish pairwise mean difference between General Practitioners and Pharmacists

Results in Table 4.3 reveals that majority of the respondents 111 (44.4%) of General Practitioners and 172 (47.1%) of Pharmacists, $p = .099$), were not at all familiar with the anti-doping code. The results further indicated a significant difference in respondents' familiarity with performance-enhancing drugs whereby more General Practitioners 55 (22%) than Pharmacists 42 (11.5%), $p = .036$ were not at all familiar

with PEDs. However, a significant number of 96 (38.4%) of General Practitioners and 133 (36.4%) Pharmacists, $p = .406$ were slightly familiar with anti-doping rule violations.

Results also show most respondents, 82 (32.8%) General Practitioners and 105 (28.8%) Pharmacists, $p = .406$ were slightly familiar with the side effects of anabolic agents. Similarly, only a few, 40 (16%) General Practitioners and 78 (21.4%) Pharmacists, $p = .368$ stated they were extremely familiar with testosterone being regarded as doping in sport. Results (Table 4.3) also reveal a small number, 42 (16.8%) General Practitioners compared to 87 (23.8%) Pharmacists, $p = .375$ who were extremely familiar with the statement that erythropoietin is regarded as doping in sport.

Results (Table 4.3) demonstrate some General Practitioners, 44 (17.6%) and 68 (18.6%) Pharmacists, $p = .534$ were not at all familiar with hypertension and heart attack are common side effects of erythropoietin. It was also established only a few, 47 (18.8%) General Practitioners and 88 (24.1%) Pharmacists, $p = .560$ were extremely familiar that B2-agonists can be used for medical purposes. Results also indicated a small number, 22 (8.8%) General Practitioners and 40 (11%) Pharmacists, $p = .805$ were extremely familiar that diuretics are in the list of prohibited methods. Results further established over a third of healthcare practitioners, 68 (27.2%) of General Practitioners and 114 (31.2%) Pharmacists, $p = .177$ reported that they were not at all familiar that blood transfusion is a prohibited method. Results in Table 4.3 also demonstrate over a third, 68 (27.2%) General Practitioners and 96 (26.3%) Pharmacists, $p = .644$ were slightly familiar that genetic manipulation is a prohibited method.

Results (Table 4.3) depict that more General Practitioners, 70 (28%) than Pharmacists, 73 (20%), $p = .029$ were moderately familiar with the fact that caffeine is not a doping agent. Results also reveal a significant difference in familiarity between General Practitioners and Pharmacists in relation to the statement that tein is not a doping agent with majority, 107 (42.8%) General Practitioners and 195 (53.4%) Pharmacists, $p = .005$ stating that they were not familiar. Results further indicate that only a few, 31 (12.4%) of General Practitioners and 52 (14.2%) Pharmacists, $p = .788$ were extremely familiar that dietary supplements may lead in positive doping test.

Results further revealed only a small number, 55 (22%) General Practitioners and 71 (19.5%) Pharmacists, $p = .002$ were extremely familiar that marijuana is not permitted in competitions only. However, most respondents, 77 (30.8%) General Practitioners compared to 91 (24.9%) Pharmacists, $p = .106$ were moderately familiar that cocaine is not permitted even in certain amounts. Results further established most General Practitioners, 64 (25.6%), were slightly familiar that beta-blockers are not prohibited in all types of sport compared to majority of Pharmacists, 106 (29%), $p = .141$ who indicated not all familiar on the same statement.

Results above (Table 4.3) imply that Kenyan General Practitioners' and Pharmacists' pattern in doping familiarity is consistent with only few particular instances, for example, familiarity with performance enhancing drugs where Pharmacists showed high familiarity than General Practitioners. The results further imply that General Practitioners and Pharmacists are moderately familiar with doping. It would therefore be practical to use a common approach to enhance their doping familiarity.

4.3.3.1 Difference in Level of Familiarity in Relation to Doping Knowledge between General Practitioners and Pharmacists

A summary of respondents mean percentage of maximum possible (POMP) on the level of familiarity with doping was calculated from the 17 doping knowledge statements for both General Practitioners and Pharmacists. Results which are presented in Table 4.4 indicate that General Practitioners and Pharmacists had slightly above average familiarity in doping, 47.77 ± 14.03 and 46.63 ± 13.36 , respectively. Mann-Whitney U test for two independent samples was used to establish if there was a significant difference in doping familiarity between General Practitioners and Pharmacists. Mann-Whitney U test was used in place of t-test because of the violation of the assumption of normal distribution of the data, normality test (Shapiro Wilk) General Practitioners, $W(250) = .985$, $p = .011$ and Pharmacists $W(365) = .991$, $p = .029$. The results (Table 4.4) show no significant difference $U(N_{\text{General Practitioners}} = 250, N_{\text{Pharmacists}} = 365) = 4425.50$, $z = -.647$, $p = .518$ in doping knowledge between General Practitioners and Pharmacists. General Practitioners and Pharmacists demonstrated a slight difference in level of doping knowledge, but the variation was insignificant. Therefore, the study hypothesis that there is no significant difference in doping knowledge between General Practitioners and Pharmacists in Kenya was not rejected/ upheld.

Table 4.4: Doping Knowledge between Kenyan General Practitioners and Pharmacists

Participants	Mean	Std	<i>p</i> -value
General Practitioners (n=250)	47.77	14.03	
Pharmacists (n= 365)	46.63	13.36	0.518

Note: The higher the mean scores, the higher the doping knowledge. Average 42.5.

4.3.4 General Practitioners' and Pharmacists' Knowledge of WADA's Prohibited Substances and Methods

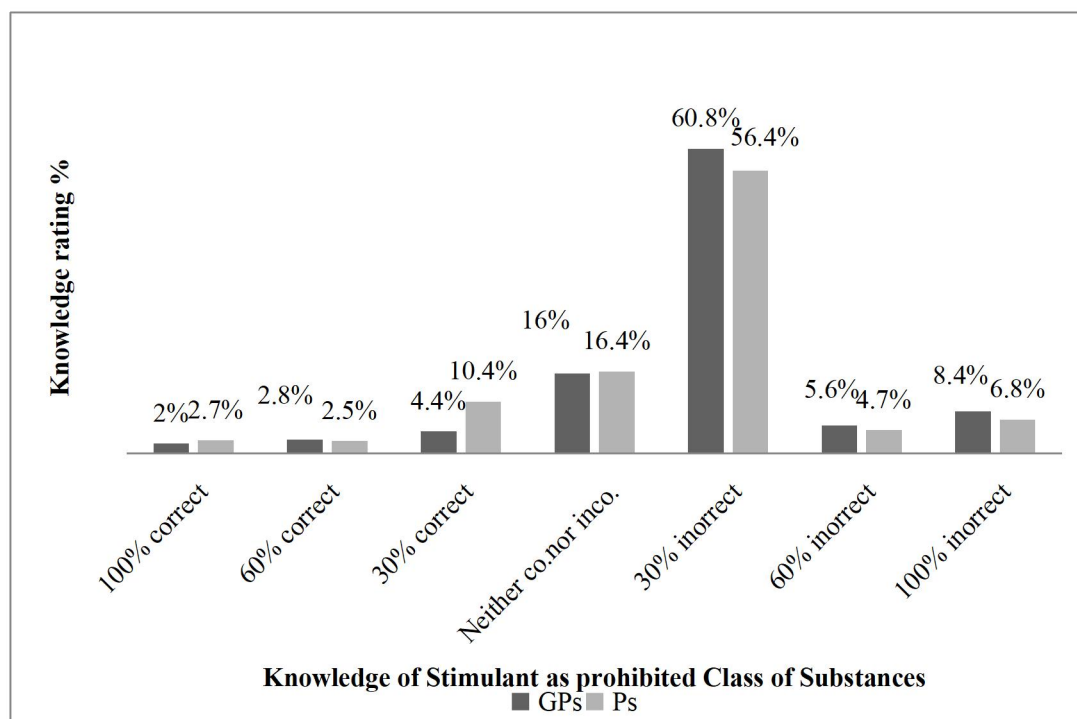
The study addressed objective one by further establishing if the respondents knew the prohibited classes of substances, methods, and class of prohibited substances in particular sports as guided by WADA. The respondents were required to indicate their responses on a seven-point Likert scale ranging from 100% - correct, which denoted high knowledge of doping, and 100% - incorrect, which signified low knowledge of doping. The results are presented in Figure 4.2 through Figure 4.16.

4.3.4.1: Knowledge of Prohibited Classes of Substances

The prohibited classes of substances that were investigated included; stimulants, narcotics, anabolic agents, diuretics, peptide hormones, mimetics, analogues, agents with estrogenic activity, and masking agents.

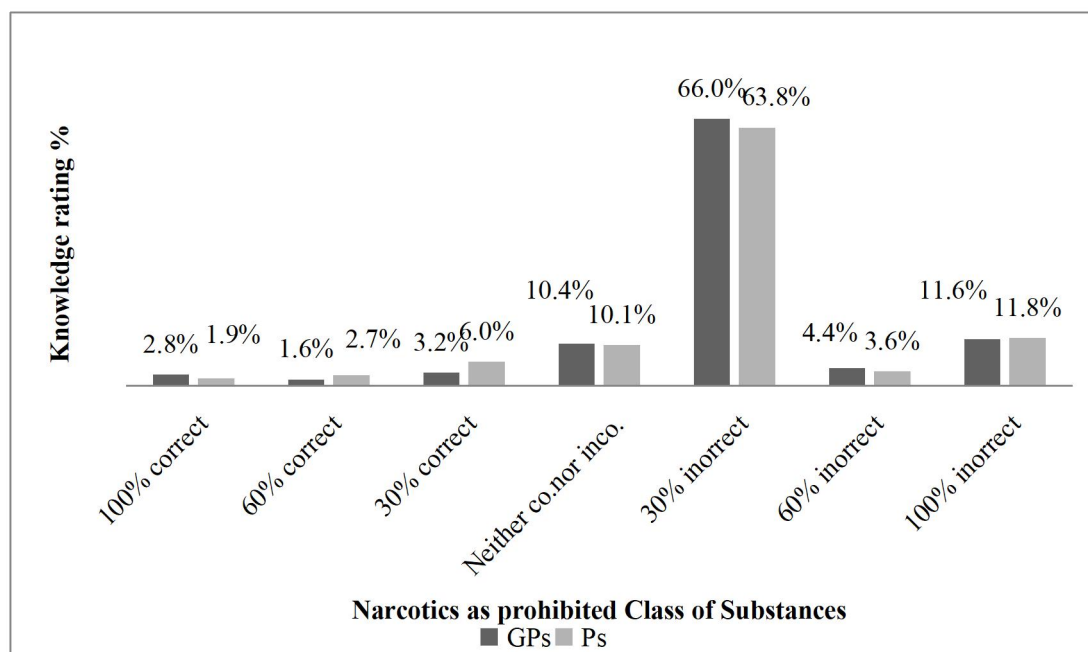
Concerning stimulants, the results revealed that above half of the General Practitioners, 152 (60.8%), were 30% incorrect, while 40 (16%) indicated they were neither correct nor incorrect, with 5 (2%) reporting they were 100% correct about stimulants. On the other hand, over half, 206 (56.4%) of the Pharmacists, stated that they were 30% incorrect about stimulants, with 60 (16.4%) indicating that they were neither correct nor incorrect, whereas 10 (2.7%), reported they were 100% correct about prohibited classes of substances. The results are presented in Figure 4.2.

Figure 4.2: Participants' Knowledge of Stimulant as Prohibited Class of Substances



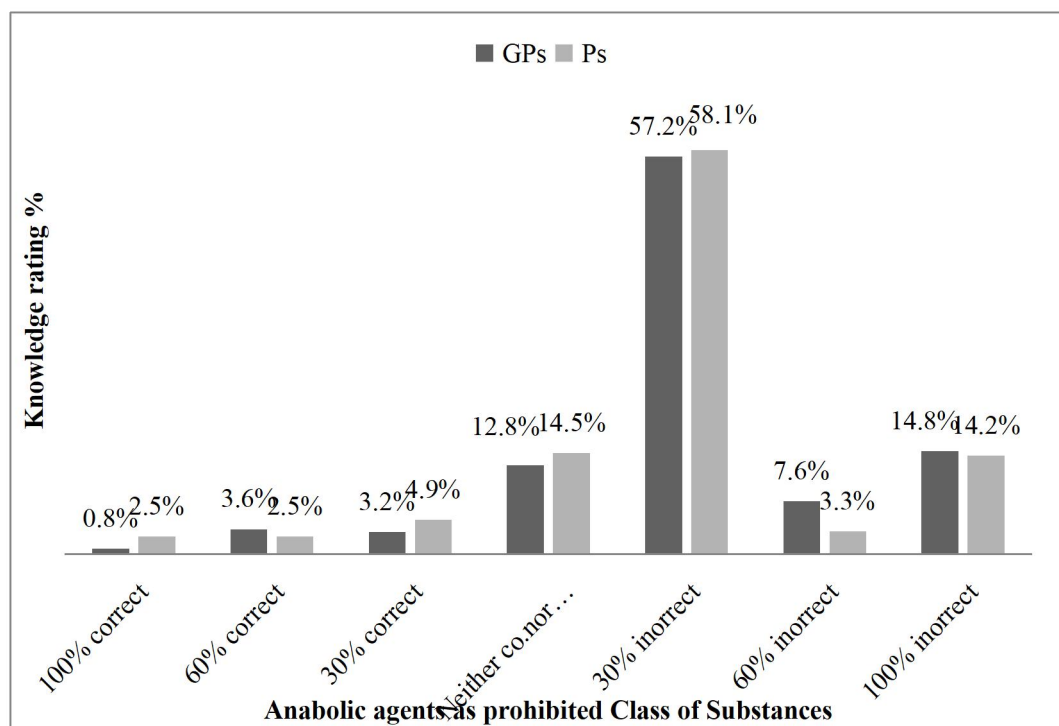
Regarding narcotics, results shown in Figure 4.3 indicate that 165 (66%) of the General Practitioners indicated 30% incorrect, 26 (10.4%) observed that they were neither correct nor incorrect, whereas 7 (2.8%) of them stated that they were 100% correct about narcotics being in the list of WADA's prohibited classes of substances. Still, on narcotics, more than half of the Pharmacists, 233 (63.8%), stated they were 30% incorrect, 37 (10.1%) indicated they were neither correct nor incorrect, while 7 (1.9%) said they were 100% correct about narcotics being on the list of prohibited classes of substances. These results are further illustrated in Figure 4.3 below.

Figure 4.3: Participants' Knowledge of Narcotics as a Prohibited Class of Substances



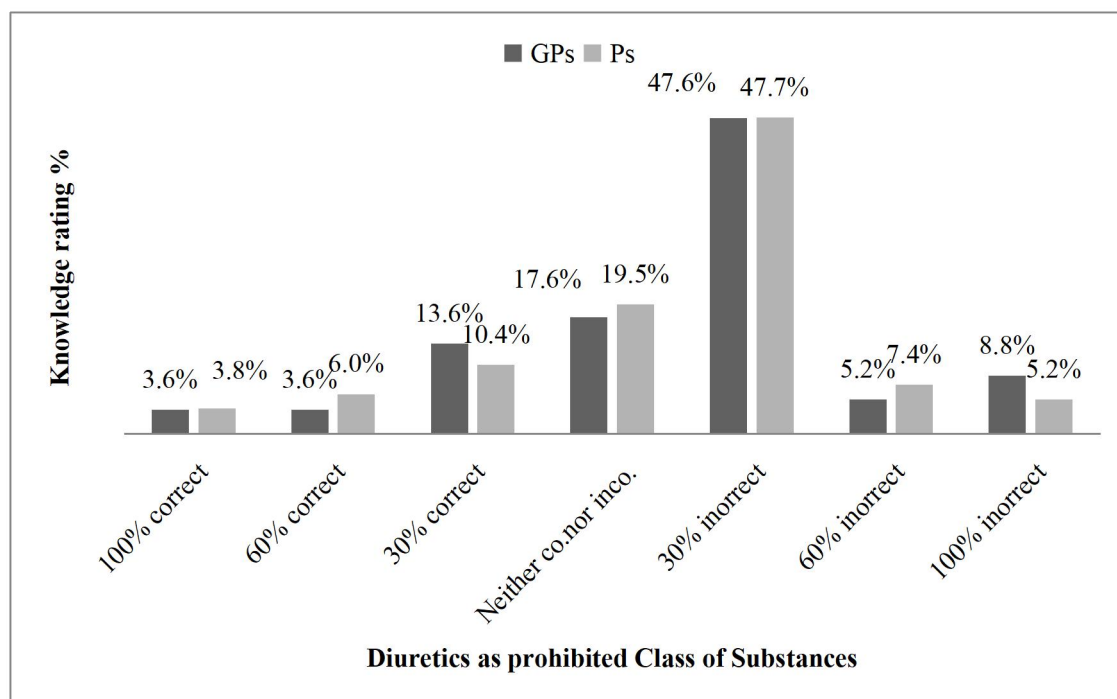
With regard to anabolic agents, the results in Figure 4.4 demonstrated that 143 (57.2%) General Practitioners were 30% incorrect about anabolic agents being on WADA's prohibited classes of substances, 32 (12.8%) indicated they were neither correct nor incorrect, whereas 2 (0.8%) reporting to be 100% correct. The results in Figure 4.4 showed that 212 (58.1%) Pharmacists were 30% incorrect about anabolic agents being on WADA prohibited classes of substances, where 53 (14.5%) reported they were neither correct nor incorrect, and 9 (2.5%) indicated they were 100% correct that anabolic agents are on WADA's prohibited classes of substances as shown in Figure 4.4.

Figure 4.4: Participants' Knowledge of Anabolic Agents as a Prohibited Class of Substances



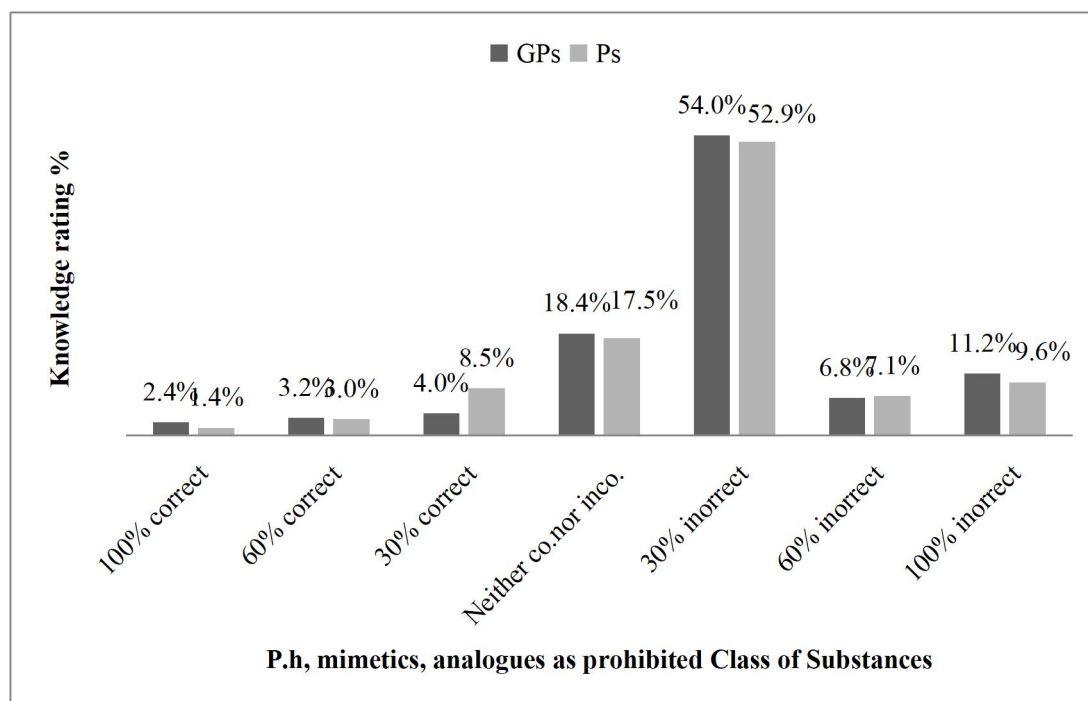
Regarding diuretics, results in Figure 4.5 revealed that almost half of the General Practitioners, 119 (47.6%), reported being 30% incorrect about diuretics, 44(17.6%) indicated they were neither correct nor incorrect, and 9 (3.6%) said they were 100% correct that diuretics were on WADA's prohibited classes of substances. Results from the Pharmacists indicated that, 174 (47.7%) were 30% incorrect about diuretics being on WADA's prohibited classes of substances. Seventy-one (19.5%) of the Pharmacists reported that they were neither correct nor incorrect about diuretics being on prohibited classes of substances, whereas 14 (3.8%) stated they were 100% correct that diuretics are on the WADA's prohibited classes of substances as shown in Figure 4.5.

Figure 4.5: Participants' Knowledge of Diuretics as a Prohibited Class of Substances



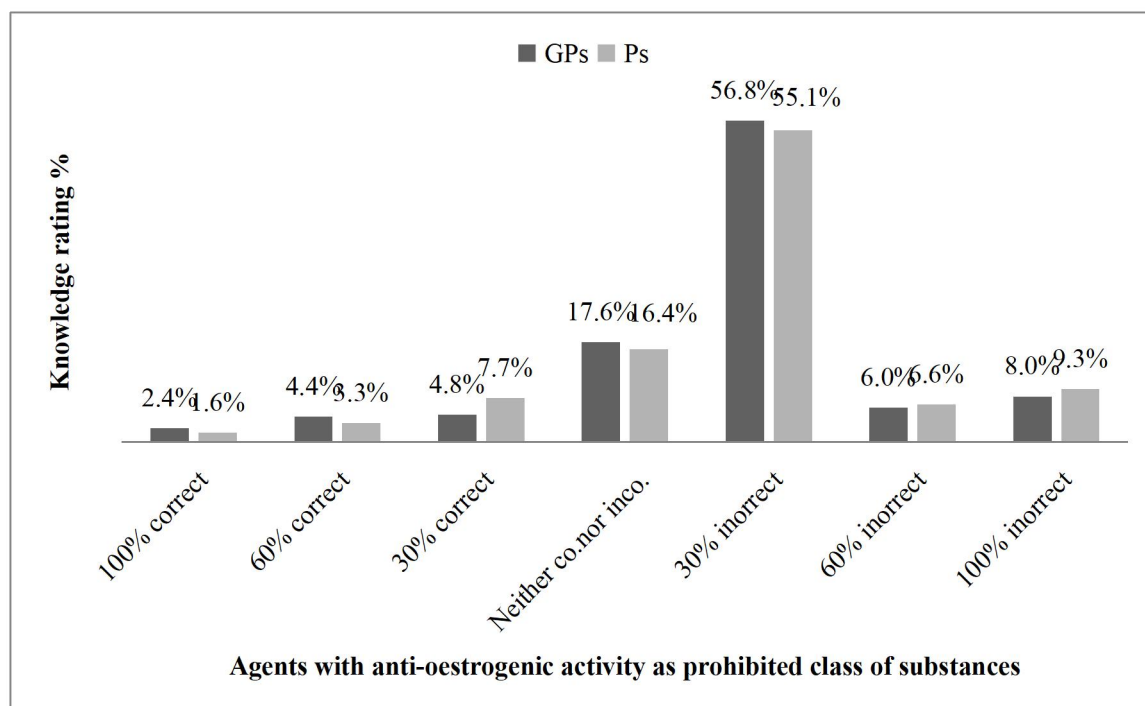
When responding to peptide hormones, mimetics, and analogues as a prohibited class of substances. Results in Figure 4.6 disclosed that over half of General Practitioners, 135 (54%), were 30% incorrect about peptide hormones, mimetics, and analogues being on prohibited classes of substances, 46 (18.4%) were neither correct nor incorrect. In comparison, 6 (2.4%) said they were 100% correct that these substances were one of WADA's prohibited classes of substances. On the other hand, 193 (52.9%) Pharmacists indicated that they were 30% incorrect that peptide hormones, mimetics, and analogues are listed on the WADA's prohibited classes of substances, and 64 (17.5%) said they were neither correct nor incorrect where 5 (1.4%) indicated that they were 100% correct as shown on Figure 4.6.

Figure 4.6: Participants' Knowledge about Peptide hormones, Mimetics, and Analogues as a Prohibited Class of Substances



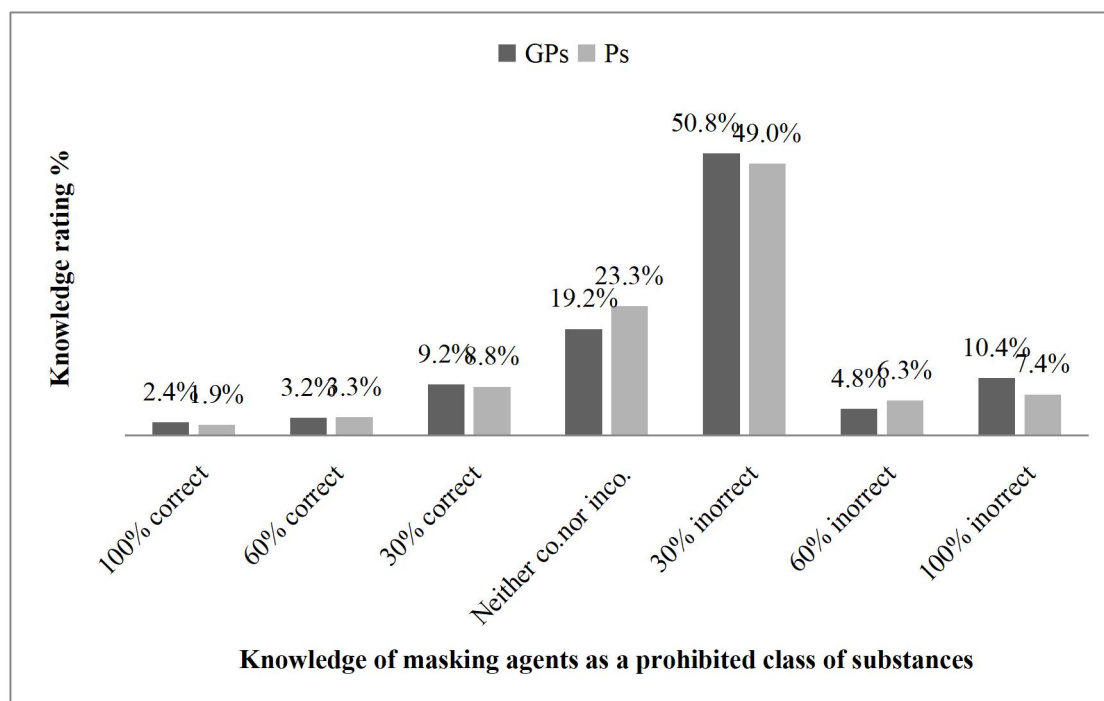
The study further asked participants whether they were aware if agents with anti-oestrogenic activity belonged to prohibited classes of substances. Results presented in Figure 4.7 showed that 142 (56.8%) General Practitioners were 30% incorrect, 44 (17.6%) indicated they were neither correct nor incorrect, whereas only 6 (2.4%) of the General Practitioners reported being 100%. When asked the same question, over half, 201 (55.1%) of the Pharmacists said that they were 30% incorrect, 60 (16.4%) stated that they were neither correct nor incorrect, and 6 (1.6%) indicated that they were 100% correct that agents with anti-oestrogenic activity are on the prohibited classes of substances.

Figure 4.7: Participants' Knowledge of Agents with Anti-estrogenic activity as a Prohibited Class of Substances



Finally, knowledge of whether masking agents are in the prohibited classes of substances was sought from the respondents. Results shown in Figure 4.8 revealed that about half of General Practitioners, 127 (50.8%), were 30% incorrect about masking agents being in the prohibited class of substances. A considerable number, 48 (19.2%) of the General Practitioners, stated they were neither correct nor incorrect, and 6 (2.4%) reported being 100% correct that masking agents are on WADA's list of prohibited classes of substances. 179 (49%) Pharmacists indicated that they were 30% incorrect that masking agents are on prohibited classes of substances. Eighty-five (23.3%) of the Pharmacists stated that they were neither correct nor incorrect, with a few, 7 (1.9), indicating that they were 100% correct, as illustrated in Figure 4.8.

Figure 4.8: Participants' Knowledge on Masking Agents as a Prohibited Class of Substances



Half of the General Practitioners and most Pharmacists here seem not to be sure whether masking agents are a prohibited class of substances.

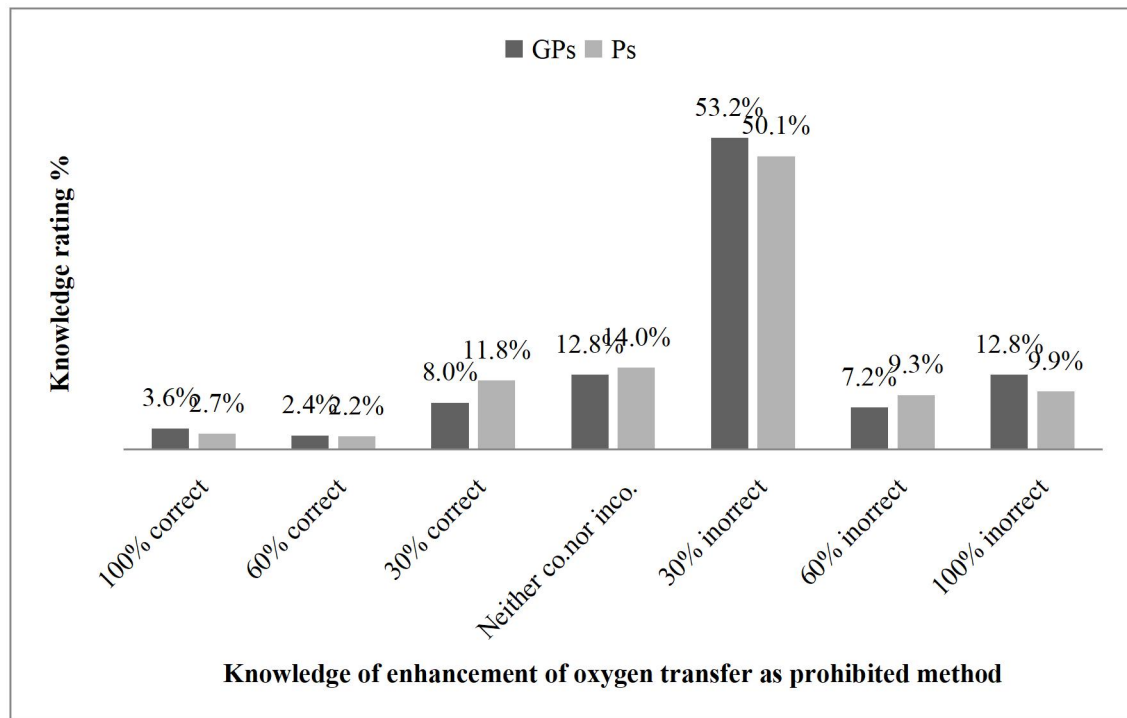
4.3.4.2: Knowledge of Prohibited Methods

The study sought to determine if the General Practitioners and Pharmacists were aware of prohibited methods by WADA. These included; enhancement of oxygen transfer, pharmacological, chemical, and physical manipulation, and gene doping. The results are presented in Figure 4.9 through Figure 4.11.

As illustrated in Figure 4.9, the respondents' knowledge of enhancement of oxygen transfer as a prohibited method revealed that over half, 133 (53.2%) of General Practitioners were 30% incorrect, and 32 (12.8%) were neither correct nor incorrect. A small proportion, 9 (3.6%), of the General Practitioners, indicated that they were 100% correct that enhancement of oxygen transfer is among the prohibited methods. When asked the same question, about half, 183 (50.1%) of the Pharmacists, stated that

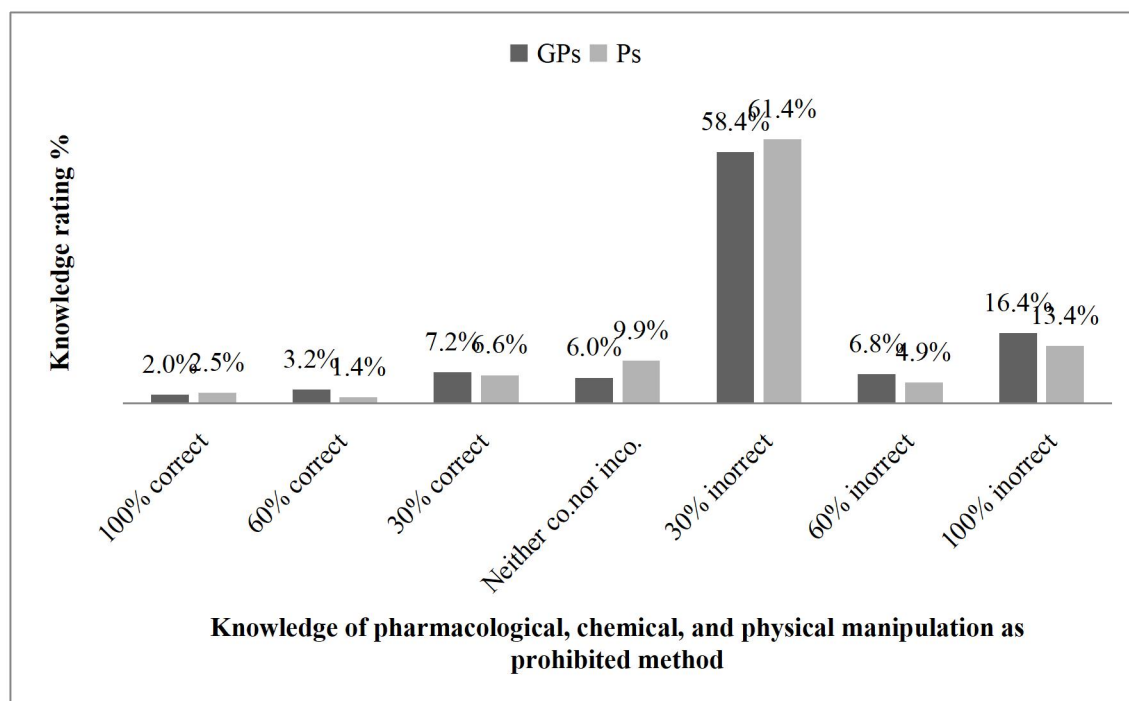
they were 30% incorrect that enhancement of oxygen transfer is a prohibited method. Results further showed that 51 (14%) of the Pharmacists reported that they were neither correct nor incorrect, with 10 (2.7%) stating that they were 100% correct that enhancement of oxygen transfer is a prohibited method.

Figure 4.9: Participants' Knowledge of Enhancement of Oxygen Transfer as a Prohibited Method



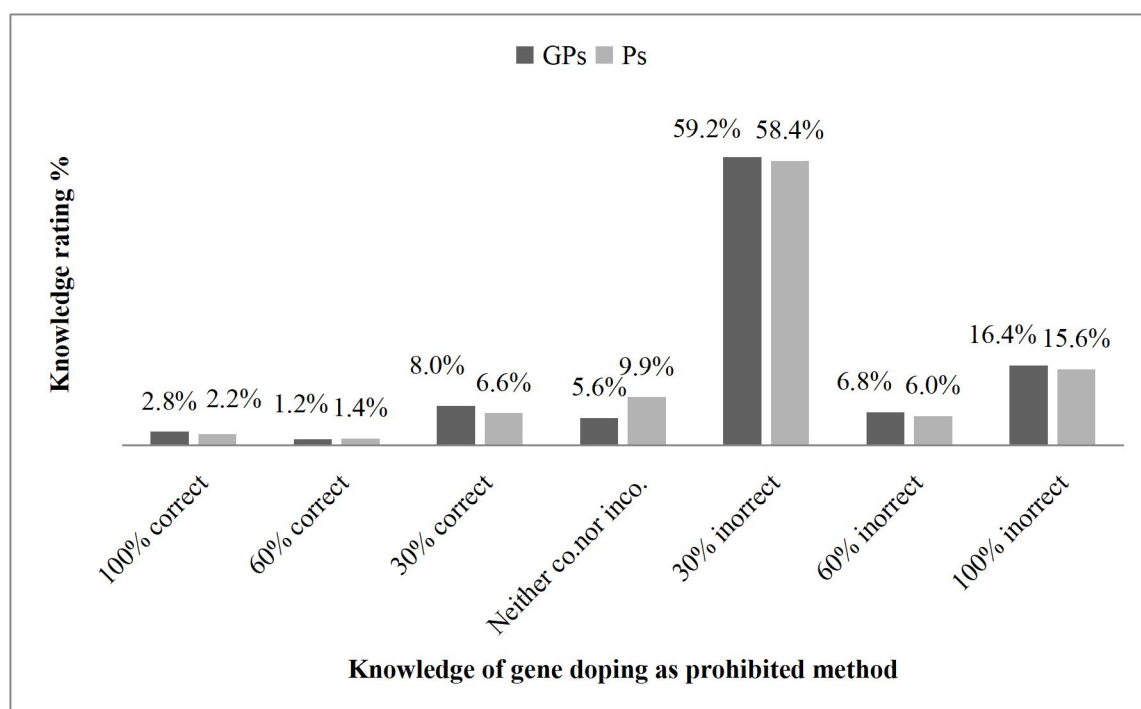
On the question of pharmacological, chemical, and physical manipulation, the results, as shown in Figure 4.10, revealed that 146 (58.4%) General Practitioners were 30% incorrect that it is a prohibited method, 15 (6%) said they were neither correct nor incorrect with a few 5 (2%) indicated that they are 100% correct. While responding to the same question, 224 (61.4%) Pharmacists were 30% incorrect on pharmacological, chemical, and physical manipulation being a prohibited method, 36 (9.9%) indicated that they were neither correct nor incorrect, whereas 9 (2.5%) of the Pharmacists stated that they were 100% correct.

Figure 4.10: Participants' Knowledge of Pharmacological, Chemical, and Physical Manipulation as Prohibited Methods



Lastly, the study wanted to establish whether Health Practitioners knew if gene doping is prohibited. The findings presented in Figure 4.11 demonstrated that 148 (59.2%) of the General Practitioners reported that they were 30% incorrect, 14 (5.6%) said they were neither correct nor incorrect, whereas 7 (2.8%) stated they were 100% correct. Pharmacists responded to the same questions, and the results show that over half, 213 (58.4%), were 30% incorrect, 36 (9.9%) were neither correct nor incorrect, with a small number, 8 (2.2%), stating they were 100% correct that gene doping is a prohibited method.

Figure 4.11: Participants' Knowledge of Gene Doping as a Prohibited Method



In a nutshell, the above results show that both General Practitioners' and Pharmacists' knowledge on gene doping is slightly above average (59.2% and 58.4%, respectively), which indicated they were 30% correct about this prohibited method. Additionally, only 2.8% of the General Practitioners and 2.2% of the Pharmacists were 100% correct that gene doping was prohibited.

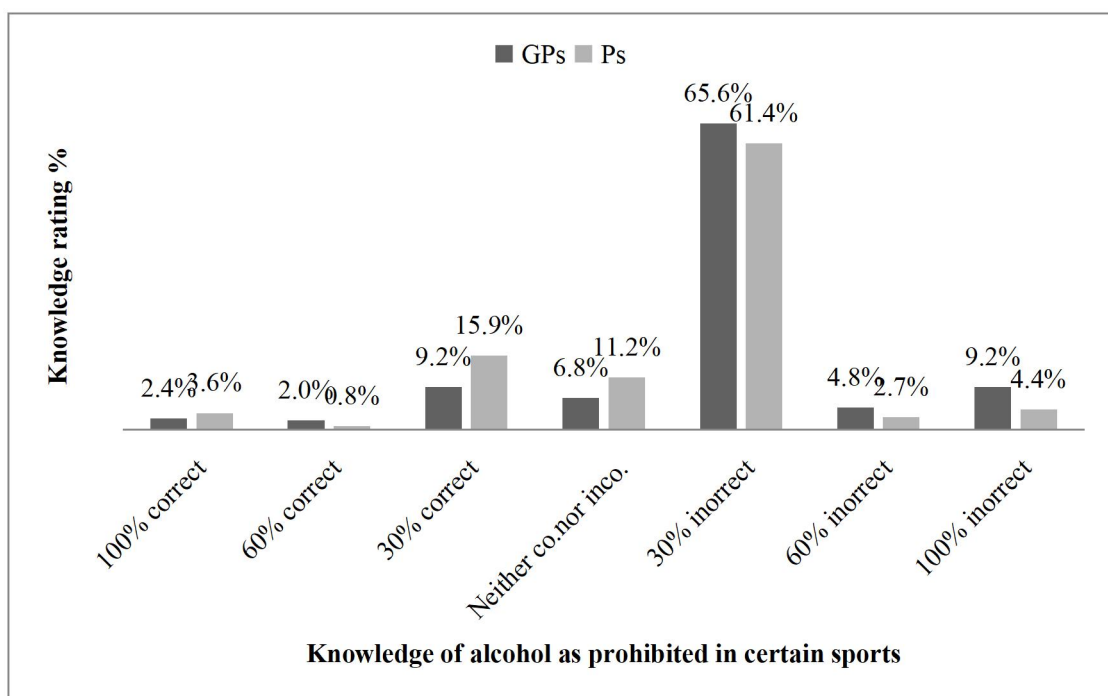
4.3.4.3: Knowledge of Classes of Prohibited Substances in Certain Sports

Further on investigating the knowledge of doping, the study evaluated the Practitioners' awareness of classes of prohibited substances in certain sports as guided by WADA. The classes studied were; alcohol, cannabinoids, local anaesthetics, glucocorticosteroids, and beta-blockers. The results are presented in Figure 4.12 through Figure 4.16.

The General Practitioners were asked if alcohol is among the prohibited substances in certain sports, and results, as presented in Figure 4.12, showed that over half, 164

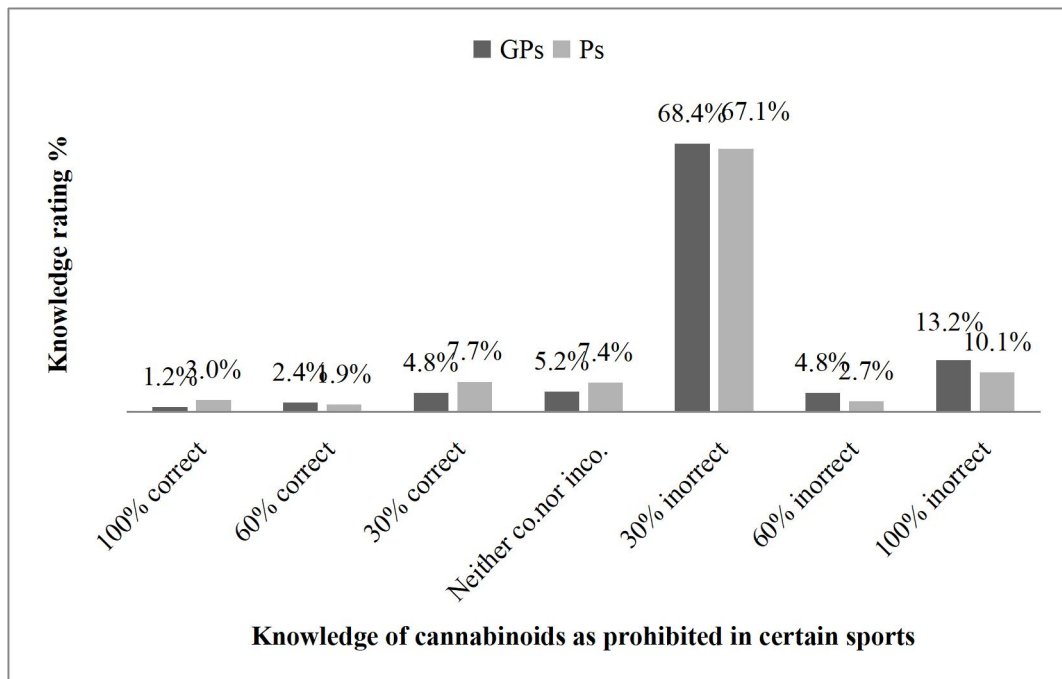
(65.6%), were 30% incorrect, 17 (6.8%) were neither correct nor incorrect whereas just 6 (2.4%) indicating that they were 100% correct. When Pharmacists were asked the same question, the results showed that 224 (61.4%) were 30% incorrect about alcohol being prohibited in particular sports. Forty-one (11.2%) Pharmacists stated that they were neither correct nor incorrect, and 13 (3.6%) indicated they were 100% correct that alcohol is prohibited in certain sports.

Figure 4.12: Participants' Knowledge of Alcohol as Prohibited in Certain Sports



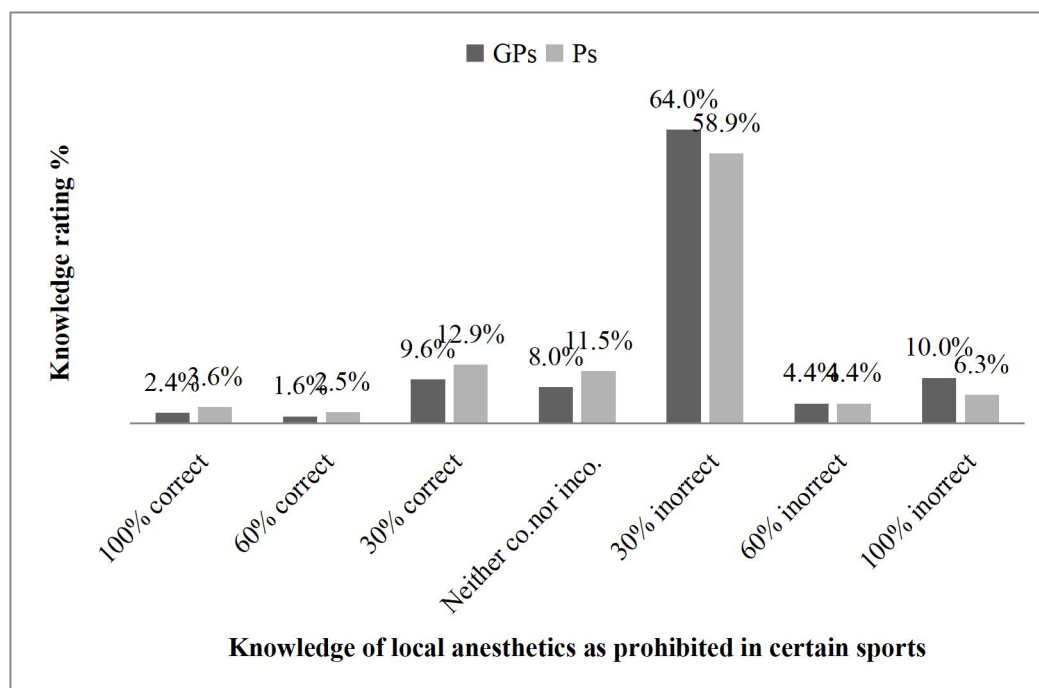
With regards to cannabinoids as prohibited in certain sports, 171 (68.4%) of General Practitioners were 30% incorrect, 13 (5.2%) reported they were neither correct nor incorrect, while 3 (1.2%) stated they were 100% correct cannabinoids are prohibited in particular sports as shown in Figure 4.13. When Pharmacists were asked the same question, the results showed that 245 (67.1%) of them were 30% incorrect, 27 (7.4%) indicated they were neither correct nor incorrect, and 11 (3%) reported they were 100% correct that cannabinoids are prohibited in certain sports.

Figure 4.13: Participants' Knowledge of Cannabinoids as Prohibited in Certain Sports



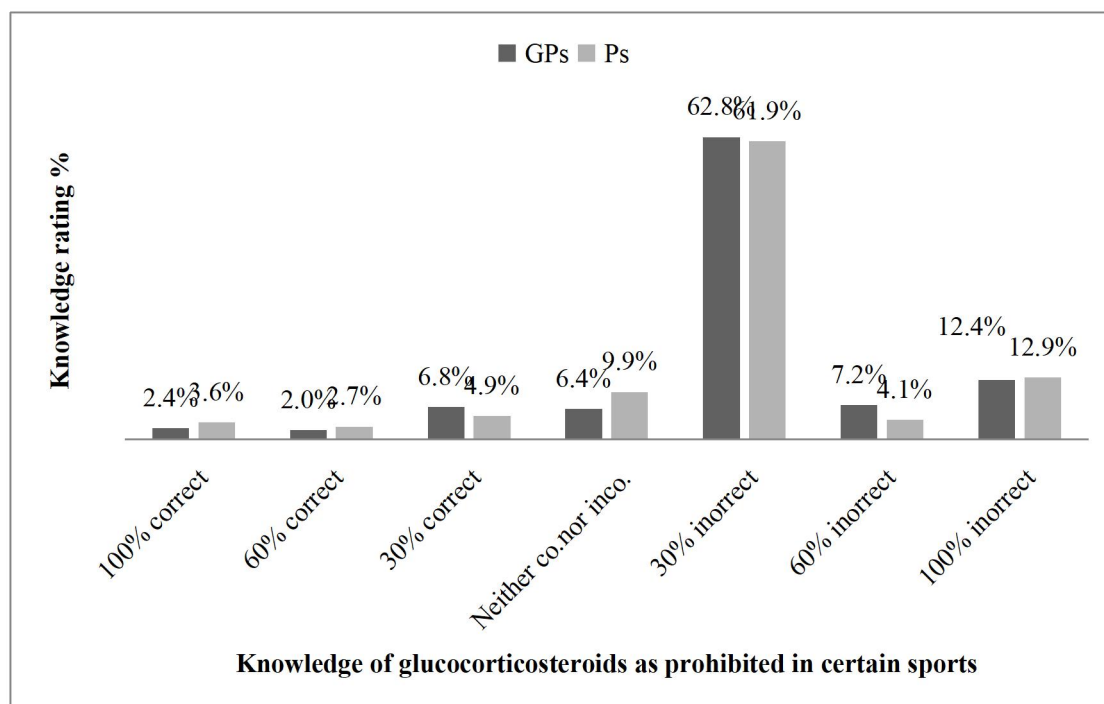
When establishing respondents' knowledge of local anaesthetics as prohibited in certain sports, the results presented in Figure 4.14 showed that more than half, 160 (64%), of General Practitioners were 30% incorrect, 20 (8%) were neither correct nor incorrect, and a few, 6 (2.4%), reported to be 100% correct. On the same question, 215 (58.9%) Pharmacists said that they were 30% incorrect, 42 (11.5%) were neither correct nor incorrect, whereas 13 (3.6%) indicated that they were 100% correct that local anaesthetics are prohibited in certain sports.

Figure 4.14: Participants' Knowledge of Local Anesthetics as Prohibited in Certain Sports



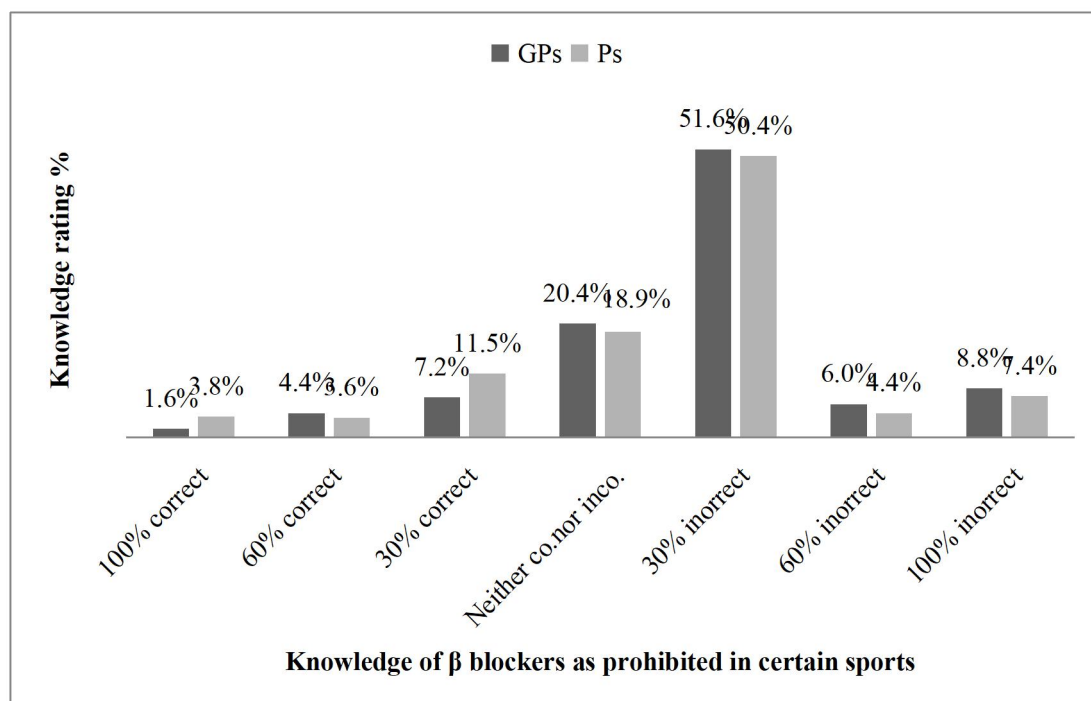
The study further asked General Practitioners if glucocorticosteroids are prohibited in certain sports, and the results are presented in Figure 4.15. The results demonstrated that 157 (62.8%) of them were 30% incorrect, 16 (6.4%) neither correct nor incorrect, while a few, 6 (2.4%) reported that they were 100% correct that glucocorticosteroids are prohibited in certain sports. The results also revealed that over half, 226 (61.9%), of the Pharmacists were 30% incorrect about glucocorticosteroids being banned in certain sports. Thirty-six (9.9%) Pharmacists stated that they were neither correct nor incorrect, while 13 (3.6%) stated that they were 100% correct that glucocorticosteroids are prohibited in certain sports.

Figure 4.15: Participants' Knowledge of Glucocorticosteroids as Prohibited in Certain Sports



In relation to beta-blockers as prohibited in certain sports, results shown in Figure 4.16 revealed that more than a half, 129 (51.6%) General Practitioners were 30% incorrect, 51 (20.4%) neither correct nor incorrect, and only 4 (1.6%) were 100% correct. When responding to the same question, 184 (50.4%) Pharmacists stated that they were 30% incorrect about beta-blockers being in the class of prohibited substances in certain sports, 69 (18.9%) reported they were neither correct nor incorrect, while 14 (3.8%) stated they were 100% correct.

Figure 4.16: Participants' Knowledge of β blockers as Prohibited in Certain Sports



The above results in Figure 4.16 show that only 8.8% and 7.4% of General Practitioners and Pharmacists were 100% correct that β blockers are prohibited in certain sports, while a majority of them, 51.6% and 50.4%, were 30% correct. This implies that their knowledge on this is below average.

4.3.5 Source(s) of Doping Knowledge

The study also aimed at establishing where respondents (General Practitioners and Pharmacists) get credible doping information. Various options were provided for respondents to identify. These were; WADA, ADAK, television/radio, internet, newspaper/magazines, in school/studies, seminars, and through friends. The results are presented in Table 4.5 below.

Table 4.5: Participants' Source of Doping Information

Source of doping information		General Practitioners	Pharmacists
	Count	153	202
Internet	%	61.4	58.9
	Count	128	215
TV/Radio	%	51.4	58.9
	Count	105	107
WADA	%	42.2	29.3
	Count	101	98
ADAK	%	40.6	26.8
	Count	85	108
Newspaper/Magazine	%	34.1	29.6
	Count	64	111
Studies	%	25.7	30.4
	Count	40	35
Friends	%	16.1	9.6
	Count	21	27
Seminars	%	8.4	7.4

Note: Count represents the number of times the option was selected *Participant could select more than one option.

The above results demonstrated that the main source of doping information reported as reliable by General Practitioners was the internet, as indicated by 153 (61.4%), followed by Television and Radio, 128 (51.4%), WADA, 105 (42.2%), and ADAK, 101 (40.6%). It was also noted that only 21 (8.4%) of the respondents indicated their source of knowledge was from attendance of seminars. On the other hand, Table 4.5 shows majority of pharmacists, 215 (58.9%), report TV/Radio as their reliable source

of doping information, followed by Internet, 202 (55.3%), Studies, 111 (30.4%), and Newspaper/Magazine, 108 (29.6%). Results (Table 4.5) show seminars were the least source of doping information for the pharmacists, 27 (7.4%). These results imply that Kenya General Practitioners' and Pharmacists' doping awareness is mainly from the internet and media.

4.3.6 Health Practitioners' Doping Knowledge based on Selected Demographics (Gender, Age and Work Experience)

The study assessed health Practitioners (General Practitioners and Pharmacists) doping knowledge based on gender, age, and work experience to have a detailed view of how these demographics relate to their doping knowledge. To do this, the doping knowledge was examined based on the collective score from the 17 doping familiarity statements. The 17 familiarity statements were selected to measure respondents doping knowledge because of ease of scoring and summing up doping knowledge score. Furthermore, the statements were used in previous studies to measure doping knowledge.

4.3.6.1 Healthcare Practitioners' Doping Knowledge Based on Gender

The study aimed to establish whether the gender of respondents (General Practitioners and Pharmacists) influenced their knowledge of doping. A score of 42.5 and below from the collective score of the 17 statements assessing doping knowledge demonstrated average to poor knowledge of the doping, while cumulative scores of 42.5 and above indicate good doping knowledge.

Table 4.6: Healthcare Practitioners' Familiarity with Doping based on Gender

Gender		General Practitioners	Pharmacists
Male	Mean	49.8	48.8
	Std	13.78	13.41
Female	Mean	44.7	44.2
	Std	13.9	12.92
	<i>p</i>	0.006	0.006

Note: The higher the mean scores the higher the doping knowledge. Average 42.5.

The above results show that male respondents were more knowledgeable in doping (General Practitioners 49.4 ± 13.78 and Pharmacists 48.8 ± 13.41) than their female counterparts (General Practitioners 44.7 ± 13.9 and Pharmacists 44.2 ± 12.92). The non-parametric Mann-Whitney U test for two independent samples was conducted to establish if there was a significant difference in means of doping knowledge between male and female respondents. The results yielded a significant difference in doping knowledge between male and female respondents, General Practitioners $U (N_{\text{males}} = 151, N_{\text{females}} = 99) = 5947.000, z = -2.733, p = .006$ and Pharmacists $U (N_{\text{males}} = 209, N_{\text{females}} = 156) = 13565.000, z = -2.745, p = .006$ respectively. The null hypothesis stating there is no significant difference in doping knowledge based on gender amongst the General Practitioners and Pharmacists was rejected.

4.3.6.2 Healthcare Practitioners' Doping Knowledge based on Age

The study examined the influence of age on respondents' (General Practitioners and Pharmacists) knowledge about doping, and results are presented in Table 4.7.

Table 4.7: Age and Doping Knowledge of General Practitioners and Pharmacists in Kenya

Age Years		21-30	31-40	41-50	>50
General Practitioners	Mean	46.7	48.2	50.7	47.3
	Std	13.83	14.26	14.50	13.58
Pharmacists	Mean	44.9	47.8	49.5	56.6
	Std	13.30	13.10	13.76	11.68

Note: The higher the mean scores, the higher the doping knowledge. Average 42.5.

The results (Table 4.7) indicate that General Practitioner in the age category of 41-50 years had the highest doping knowledge, 50.7 ± 14.50 whereas those in the age category of 21-30 years had the least doping knowledge among the four age groups. However, Kruskal Wallis test did not establish a significant mean difference across the four age categories of the General Practitioners, $H(3) = 1.758, p = .624$. Therefore, the null hypothesis that there is no significant difference in doping knowledge based on the age of the General Practitioners in Kenya was not rejected.

With regard to Pharmacists, Table 4.7 above shows Pharmacists older than 50 years were more knowledgeable about doping, 56.6 ± 11.68 , compared to other age categories. Younger Pharmacists in the age category of 21 to 30 years had the least knowledge of doping, 44.9 ± 13.30 . A significant mean difference in doping knowledge was established across the four age categories, Kruskal Wallis $H(3) = 9.429, p = .024$. The null hypothesis that there is no significant difference in doping knowledge based on the age of the Pharmacists in Kenya was rejected. A Post hoc test using Bonferroni correction established significant differences occurred between Pharmacists in the following age categories: 21-30 years and 31-40 years, $p = .049$; 21-30 years and 41-50 years, $p = .035$.

The above results imply Health Practitioners' doping knowledge improves with age, and this change is equal across any age category among General Practitioners but among Pharmacists, significant variation in doping knowledge exist across age categories.

4.3.6.3 Healthcare Practitioners' Doping Knowledge in Relation to Work Experience

The study intended to establish the influence of work experience on participants' doping knowledge, and the results are presented in Table 4.8.

Table 4.8: Work Experience and Doping Knowledge of General Practitioners and Pharmacists in Kenya

Work Experience in Years		≤5	6-10	11-15	16-20	≥21
General Practitioners	Mean	42.5	47.7	49.3	56.2	59.4
	Std	12.84	14.67	11.60	13.06	10.75
Pharmacists	Mean	45.4	47.2	46.2	49.7	54.0
	Std	14.20	12.28	14.45	9.12	14.21

Note: The higher the mean scores the higher the doping knowledge. Average 42.5.

Table 4.8 shows that General Practitioners with more than 21 years of work experience had more knowledge of the doping, 59.4 ± 10.75 , compared to respondents in other work experience categories. General Practitioners with less than five years of work experience show average doping knowledge and are last among the five work experience categories, 42.5 ± 12.84 . Kruskal Wallis test revealed a significant mean difference in doping knowledge across the five work experience categories, $H(4) = 37.241$, $p < .01$. The hypothesis that there is no significant difference in doping knowledge amongst the General Practitioners in Kenya based on work experience was rejected. Bonferroni correction identified significant mean variation in doping

knowledge of General Practitioners occurring between the following work experience categories: ≤ 5 years and 6-10 years, $p = .03$; ≤ 5 years and 11-15 years, $p = .01$; ≤ 5 years and 16-20 years, $p < .01$; ≤ 5 years and above 21 years, $p < .01$; 6-10 years and 16-20 years, $p = .02$; 6-10 years and above 21 years, $p < .01$; 11- 15 years and above 21 years, $p = .01$.

On the other hand, results (Table 4.8) reveal Pharmacists with more than 21 years of work experience had the highest doping knowledge (54.0 ± 14.21) among the five work experience categories, whereas those with less work experience indicate low doping knowledge, ≤ 5 years; 45.4 ± 14.20 . However, no significant mean difference in doping knowledge was identified across the five work experience categories, Kruskal Wallis $H(4) = 6.230$, $p = .18$. The hypothesis that there is no significant difference in doping knowledge amongst the Pharmacists in Kenya based on work experience was therefore not rejected/ was upheld.

These results show that overall doping knowledge improves as the Healthcare Practitioners' work experience increases, and this improvement in doping knowledge remains the same across work experience categories among Pharmacists, but this varies among General Practitioners across different work experience categories.

4.4 General Practitioners' and Pharmacists' Doping Attitude in Kenya

The PEAS was used to examine General Practitioners' and Pharmacists' doping attitude. Participants were asked about doping on a Seven-point Likert scale to rate their level of agreement with the statements concerning doping. The scale ranged from 1-Strongly disagree to 7-Strongly agree. High score on the Likert scale ≥ 3.5 indicated a positive attitude toward doping while a score of ≤ 3.5 showed a negative attitude towards doping. The results are shown in Table 4.9.

Table 4.9: Participants' Response to Attitude towards Doping Statements

Statement	General Practitioners (n=250)		Pharmacists (n=365)		<i>p</i>
	Mean	SD	Mean	SD	
Doping is an unavoidable part of competitive sport.	2.61	1.469	2.52	1.491	0.399
Recreational drugs help to overcome boredom outside of competition.	2.89	1.325	3.01	1.396	0.234
Legalizing performance enhancements would be beneficial for sports.	2.48	1.333	2.59	1.252	0.152
Recreational drugs assist in motivating athletes to train and compete at the highest level.	2.62	1.188	2.82	1.262	0.034
Athletes have no alternative career choice.	2.42	1.073	2.57	1.174	0.085
There is no difference between drugs and the technical equipment that can be used to enhance performance.	2.88	1.255	2.85	1.197	0.726
The risks related to doping are exaggerated	2.84	1.322	2.89	1.232	0.260
The media blows the doping issue out of proportion.	2.88	1.363	3.15	1.317	0.004
The media should talk less about doping.	2.39	1.093	2.68	1.216	0.001
Athletes should not feel guilty about breaking the rules and taking performance enhancing drugs.	2.42	1.117	2.57	1.150	0.074
Athletes who take recreational drugs use them because they help them in sport situations	2.92	1.286	3.09	1.314	0.090
Athletes are pressured to take performance enhancing drugs.	2.76	1.151	2.90	1.229	0.186
Only the quality of performance should matter, not the way athletes achieve it.	2.65	1.233	2.89	1.268	0.014
Health problems related to rigorous training and injuries are just as bad as doping side effects.	2.90	1.228	3.01	1.246	0.296
Athletes often lose time due to injuries and drugs can be used to help to make up the lost time.	2.78	1.191	2.87	1.149	0.154
Doping is not cheating since everyone does it.	2.42	1.166	2.42	1.113	0.676
Doping is necessary to be competitive.	2.38	1.103	2.46	1.113	0.277

Note: *Level of significant test at $p < .05$ * Mann-Whitney test is used to establish pairwise mean difference between General Practitioners and Pharmacists

Results show respondents (General Practitioners and Pharmacists) had a negative attitude toward doping (score of ≤ 3.5 in all statements), but some difference exists between General Practitioners and Pharmacist in a few areas. For example, a

significant difference ($p = 0.034$) was established between General Practitioners and Pharmacists, where Pharmacists showed a more supportive attitude (2.82 ± 1.262) towards the statement that recreational drugs assist in motivating athletes to train and compete at their highest level compared to General Practitioners (2.62 ± 1.188). Pharmacists also demonstrate a weak negative attitude (3.15 ± 1.317) towards the statement that the media blows the doping issue out of proportion compared to General Practitioners (2.88 ± 1.363), and the difference was significant ($p = 0.004$). Pharmacists show a relatively weak negative attitude (2.68 ± 1.216) compared to General Practitioners (2.39 ± 1.093) on the statement that media should talk less about doping, and the difference was significant ($p = 0.001$). Pharmacists also indicate a weak negative attitude (2.89 ± 1.268) compared to General Practitioners (2.65 ± 1.233) on the view that only the quality of performance should matter, not the way athletes achieve it the difference between the two Healthcare Practitioners is significant ($p = 0.014$).

Results in Table 4.9 imply that, General Practitioners and Pharmacists in Kenya have almost similar views regarding doping, but there are a few instances where this pattern significantly differs. For example, more Pharmacists than General Practitioners feel that the media exaggerate the issue of doping, $p = .004$, and it should talk less about it, $p = .001$. Generally, the attitude towards doping is likely to be similar between General Practitioners and Pharmacists in Kenya and can be effectively addressed in the same manner between the two cohorts.

To establish the doping attitude of respondents, the aggregate of the sum of PEAS score was calculated. The maximum score from the 17 statements was 119, implying a strong positive attitude towards doping. A score of 59.5 and below signified a negative to strong negative doping attitude. Participants' responses to each statement

were computed, and the mean doping attitude for each group (General Practitioners and Pharmacists) was examined and compared, as presented in Table 4.10.

Upon examination of the means of the doping attitude of the General Practitioners and Pharmacists in Kenya, it was established that the two groups had a negative attitude towards doping. However, the results indicated that Pharmacists were more lenient towards doping, mean of 47.28 ± 13.65 , compared to General Practitioners' mean of 45.23 ± 13.64 . To establish if there was a statistically significant difference in doping attitude between General Practitioners and Pharmacists, the Mann-Whitney U test was conducted. Results indicated a significant difference in doping attitude between General Practitioners and Pharmacists in Kenya, $U (N_{\text{General Practitioners}} = 250, N_{\text{Pharmacists}} = 365) = 41160.00, z = -2.068, p = .039$. The null hypothesis stating that there is no significant difference in doping attitude between General Practitioners and Pharmacists in Kenya was therefore rejected.

Table 4.10: A Summary of General Practitioners' and Pharmacists' Attitude towards Doping

Participants	Mean	Std	<i>p</i> -value
General Practitioners (n=250)	45.23	13.64	
Pharmacists (n= 365)	47.28	13.65	0.039

Note: A mean below or near the PEAS average 59.5 denotes a weak negative attitude towards doping

4.4.1 Health Practitioners' Doping Attitude based on Selected Demographics (Gender, Age and Work Experience)

The study investigated General Practitioners' and Pharmacists' doping attitude in relation to gender, age, and work experience to perceive their impacts on Kenyan health Practitioners regarding doping. PEAS scores were used to examine the impact

of each selected demographic. The attitude scale is among the standard doping attitude measurement tools used in doping research studies.

4.4.1.1 General Practitioners’ and Pharmacists’ Doping Attitude based on Gender

The study aimed to establish whether there was a difference in doping attitude based on the gender of the General Practitioners and Pharmacists. The results from PEAS are presented in Table 4.11.

Table 4. 11: Doping Attitude based on Gender of the Healthcare Practitioners

Gender		General Practitioners	Pharmacists
Male	Mean	43.6	46.3
	Std	13.49	13.41
Female	Mean	47.8	48.6
	Std	13.52	13.35
	<i>P</i>	.041	.169

Note: A Mean below or near the PEAS average 59.5 denotes a weak negative attitude towards doping

Table 4.11 demonstrates that male and female General Practitioners had a negative attitude towards doping (attitude score below 59.5) 43.6 ± 13.49 males and 47.8 ± 13.52 respectively. However, female General Practitioners slightly support (weak negative attitude) towards doping 47.8 ± 13.52 , compared to their male counterparts, 43.6 ± 13.49 . Results from the independent sample Mann-Whitney U test indicated that there was a significant mean difference between male and female General Practitioners’ attitude towards doping $U (N_{\text{females}} = 99, N_{\text{males}} = 151,) = 6334.00, z = -2.047, p = .041$. The null hypothesis stating that there is no significant difference in doping attitude based on the gender of General Practitioners in Kenya was therefore rejected.

Likewise, Table 4.11 shows that Pharmacists had a negative attitude towards doping. Nonetheless, female Pharmacists reveal leaning towards supporting doping at 48.6 ± 13.35 compared to male Pharmacists at 46.3 ± 13.41 . However, no significant mean difference was identified between female and male Pharmacists attitude towards doping, Mann Whitney U test, $U (N_{\text{females}} = 156, N_{\text{males}} = 209) = 14934.00, z = -1.374, p = .169$. Therefore, the null hypothesis stating that there is no significant difference in doping attitude based on the gender of Pharmacists in Kenya was upheld/ not rejected.

4.4.1.2 Healthcare Practitioners' Attitude toward Doping relative to Age

The study examined whether the age of the General Practitioners and Pharmacists in Kenya influenced their attitude towards doping. Results are displayed in Table 4.12.

Table 4.12: Healthcare Practitioners' Attitude towards Doping based on Age

Age in Years		21-30	31-40	41-50	>50
General Practitioners	Mean	47.2	45.8	39.2	36.9
	Std	14.23	12.41	13.14	11.52
Pharmacists	Mean	48.0	47.4	44.9	37.8
	Std	13.21	14.03	14.08	14.06

Note: A Mean below or near the PEAS average 59.5 denotes a weak negative attitude towards doping

Table 4.12 indicates that healthcare Practitioners in lower age categories had a weaker negative attitude towards doping (General Practitioners 21-30 years, 47.2 ± 14.23 and Pharmacists 21-30 years, 48.0 ± 13.21) compared to Health Practitioners in the older age categories, for example, those older than 50 years (General Practitioners 36.9 ± 11.52 and Pharmacists 37.8 ± 14.06). Based on means between the four age categories, the Kruskal-Wallis test established significant mean variations in attitude towards doping among the General Practitioners, $H(3) = 13.669, p = .003$. As a result, the null

hypothesis there is no significant difference in attitude towards doping amongst General Practitioners in Kenya based on age was rejected. Bonferroni correction test identified that significant mean difference was occurring between the following General Practitioners' age categories: above 50 years and those in 31-40 years, $p = .021$; above 50 years and 21-30 years, $p = .007$; 41-50 years and 31-40 years, $p = .024$ as well as 41-50 years and 21-30 years, $p = .005$.

However, in relation to Pharmacists, no significant mean difference in attitude towards doping was established across the four age categories, $H(3) = 3.660$, $p = .301$. Therefore, the null hypothesis stating that there is no significant difference in attitude, towards doping among Pharmacists in Kenya based on age was not rejected.

These results show that the overall attitude towards doping among the Health Practitioners leans more toward negative as their age advances. Whereas this change in attitude towards doping may not considerably vary between one age group to the other among pharmacists, the difference is remarkable among the General Practitioners.

4.4.1.3 Healthcare Practitioners' Doping Attitude based on Work Experience

The study also sought to examine the influence of the General Practitioners' and Pharmacists' work experience on their doping attitude. The results are presented in Table 4.13.

Table 4.13: Health Practitioners' Doping Attitude based on Work Experience

Work Experience in Years		≤5	6-10	11-15	16-20	≥21
General	Mean	48.5	43.8	45.5	40.3	40.3
Practitioners	Std	12.14	13.8	16.60	13.48	10.96
Pharmacists	Mean	47.2	48.9	46.9	43.2	35.6
	Std	13.68	13.44	12.16	14.58	17.16

Note: A Mean below or near the PEAS average 59.5 denotes a weak negative attitude towards doping.

Table 4.13 indicates that health Practitioners above 21 years had a strong negative attitude towards doping (General Practitioners 40.3 ± 10.96 , Pharmacists 35.6 ± 17.16), followed by respondents with 16-20 years of work experience (General Practitioners 40.3 ± 13.38 , Pharmacists 43.2 ± 14.58). However, General Practitioners with less than 5 years of work experience demonstrated a weak negative attitude towards doping, 48.5 ± 12.14 among the five work experience categories. Kruskal Wallis test identified that work experience contributed to a significant mean difference in attitude towards doping within the five work experience categories of the General Practitioners, $H(4) = 13.865, p = .008$. As a result, the null hypothesis stating that there is no significant difference in attitude towards doping amongst General Practitioners in Kenya based on work experience was rejected. Bonferroni correction established significant mean difference in doping attitude was occurring between the following work experience categories: < 5 years and 6-10 years $p = .028$; < 5 years and 11-15 years $p = .007$; <5 years and 16-20 years $p < .001$; <5 years and >21 years $p < .001$; 6-10 years and >21 years $p < .001$; 11-15 years and >21 years $p = .008$.

Among the Pharmacists, those with 6-10 years of work experience show the weakest negative doping attitude, 48.9 ± 13.44 amongst the five work experience categories. However, no significant mean difference in attitude towards doping was established between the work experience categories, Kruskal Wallis, $H(4) = 8.924, p = .063$.

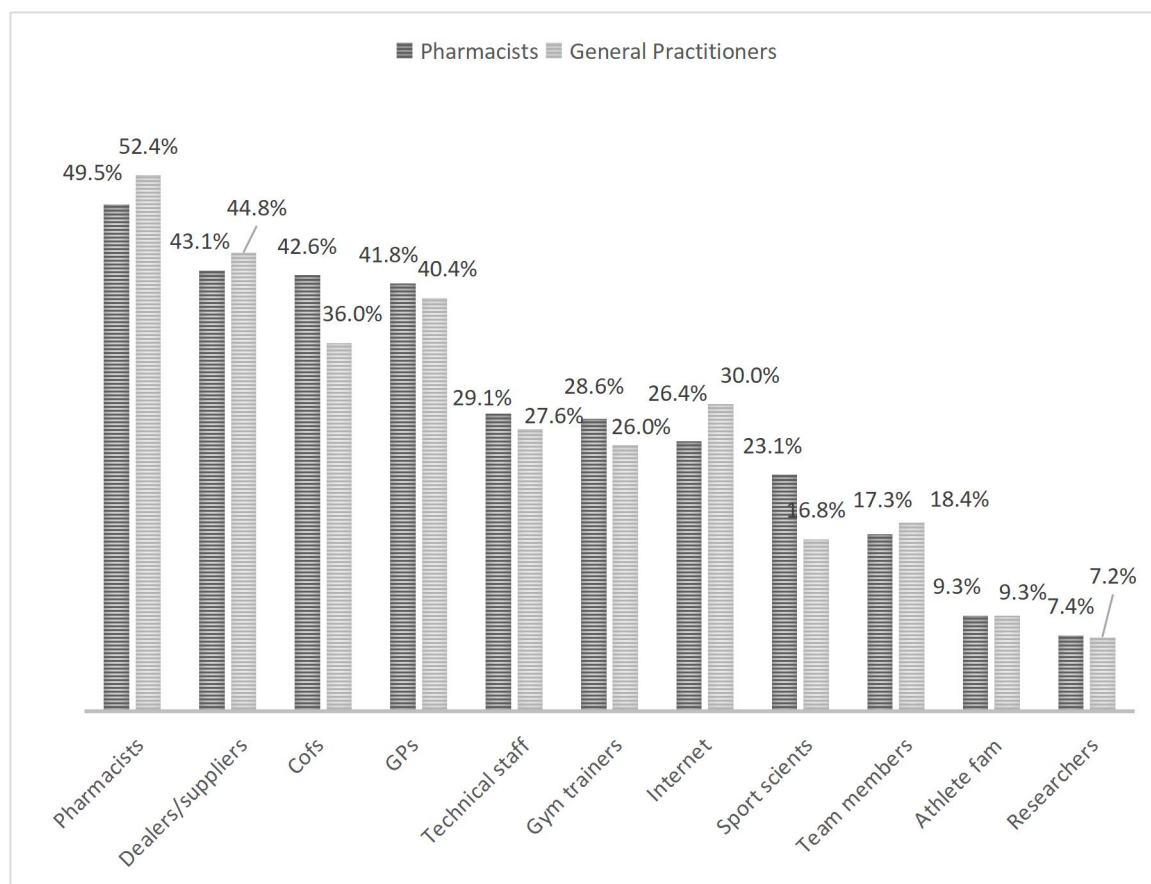
Therefore, the null hypothesis stating there is no significant difference in attitude towards doping amongst Pharmacists in Kenya based on work experience was not rejected.

These results demonstrated that, the more work experience General Practitioners and Pharmacists in Kenya have, the lower their likelihood of supporting athletes (negative doping attitude) to practice doping.

4.5 Athletes' Source of Performance Enhancing Drugs

The study sought to establish the source of Performance Enhancing Drugs (PEDs) of athletes in Kenya from the perspective of General Practitioners and Pharmacists. Various possible options were provided for the respondents to choose from. These were: the athlete's family, team members, General Practitioners , Pharmacists, clinical officers, dealers/suppliers, the internet, sports scientists, gym trainers, athletes' technical staff, and researchers. These findings are illustrated in Figure 4.17.

Figure 4.17: Athletes' Sources of Performance Enhancing Drugs according to General Practitioners and Pharmacists



As illustrated in Figure 4.17, according to the Healthcare Practitioners in the study, Pharmacists were the main sources of PEDs (General Practitioners, 131 (52.4%); Pharmacists, 180 (49.5%), followed by dealer suppliers (General Practitioners, 112 (44.8%); Pharmacists 157 (43.1%), General Practitioners (General Practitioners 101 (40.4%); Pharmacists 152 (41.8%), and clinical officers (General Practitioners 90 (36.0%); Pharmacists 155 (42.6%). Other sources of PEDS were Athletes' technical staff (General Practitioners 69 (26.0%); Pharmacists 104 (28.6%), the internet (General Practitioners 75 (30.0%); Pharmacists 96 (26.4%), gym trainers (General Practitioners 65 (26.0%); Pharmacists 104 (28.6%), and sports scientists (General Practitioners 42 (16.8%); Pharmacists 84 (23.1%). However, athletes' families (General Practitioners 14 (5.6%); Pharmacists 34 (9.3%) and researchers (General

Practitioners 18 (7.2%); Pharmacists, 27 (7.4%), were the least reported sources of PEDs.

These results imply that Healthcare Practitioners (General Practitioners and Pharmacists) in Kenya are critical in providing access to performance-enhancing drugs in Kenya.

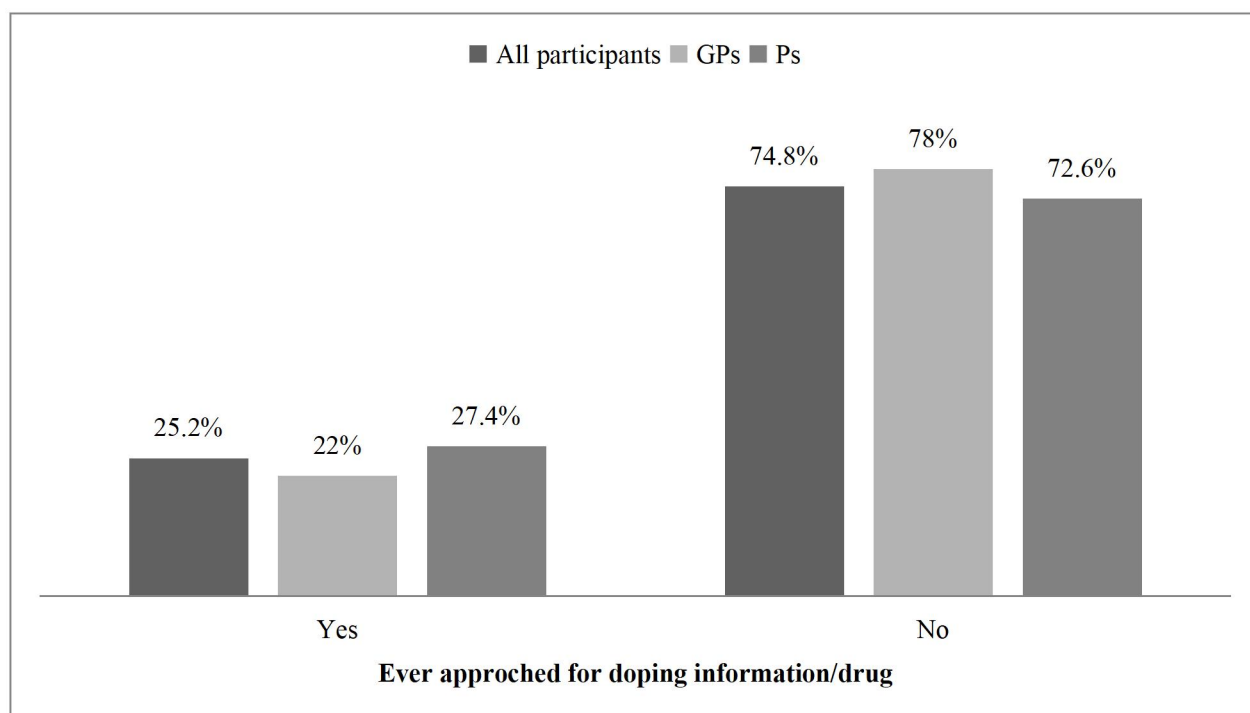
4.6 Doping Experience among General Practitioners and Pharmacists in Kenya

To answer research question 3 on the experiences of General Practitioners and Pharmacists in Kenya regarding athletes' doping behavior, the study determined selected questions related to the Health Practitioners' experience with athletes' doping. Participants responded to questions on the following: whether General Practitioners and Pharmacists had ever been approached by athletes seeking doping information or drugs, the frequency at which athletes confronted them for information, some of the drug information athletes often sought, requests for the prescription of doping agents, frequency of requests for prescriptions of PEDs and what they thought compelled the medical Practitioners to assist athletes in doping. The findings are presented below.

4.6.1 Participants Encounter with Athletes Seeking PEDs or Doping Information

All respondents were asked whether they had ever been approached by athletes seeking doping information or drugs. The results are presented in Figure 4.18.

Figure 4.18: Participants' Encounter with Athletes Seeking PEDS or Doping Information



The result shows that 460 (74.8%) said no, whereas 155 (25.2%) were affirmative. The majority, 195 (78%) General Practitioners, stated they had never been approached for doping, whereas 55 (22%) reported having been approached for doping information or drugs. Over half, 265 (72.6%) of the Pharmacists indicated that they had never been approached for doping for the past year, but 100 (27.4%) stated that they had been approached for doping information or drugs.

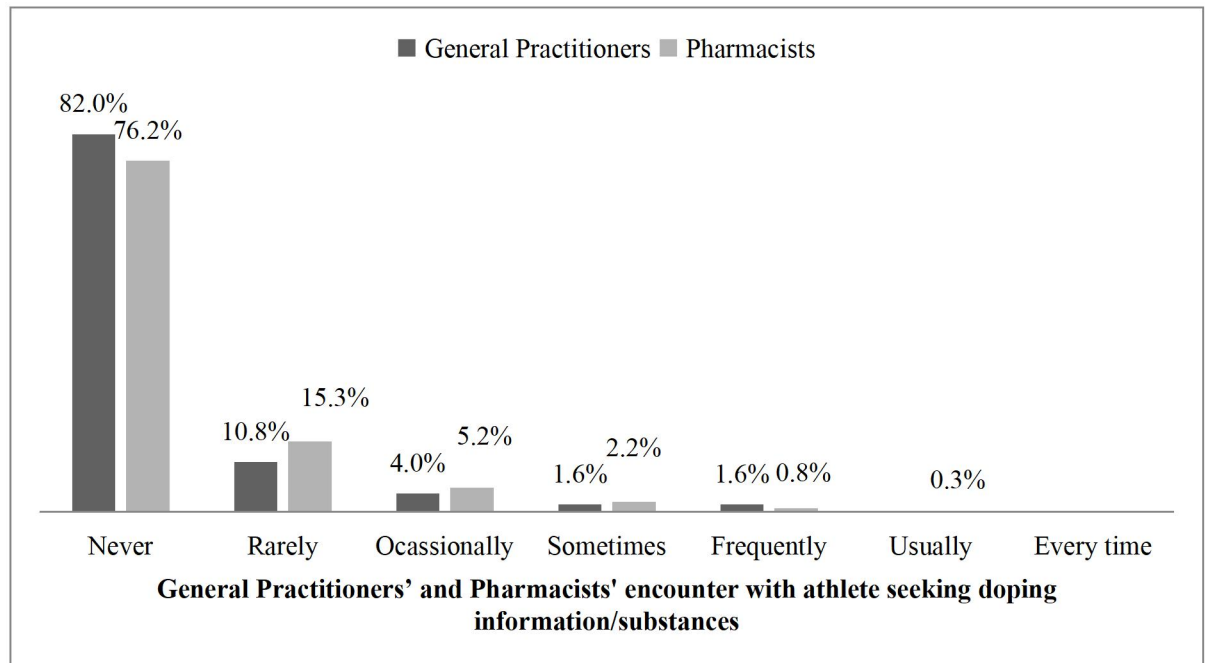
These results imply that most General Practitioners and Pharmacists in Kenya do not receive doping requests from athletes, but about a third of the Healthcare Practitioners may encounter doping requests from athletes probably once in the course of their duty.

4.6.2 Athletes' Frequency of Enquiry on Information about Banned Substances

With reference to the respondents who had been approached by athletes seeking information on doping, the study further sought to find out how frequently this

happened. The respondents were required to choose from the given options. The results are presented in Figure 4.19.

Figure 4.19: How often Athletes Seek Information of Banned Substances



Results in Figure 4.19 above illustrate that 205 (82%) of the General Practitioners stated that they had never encountered athletes seeking doping information or drugs, 27 (10.8%) indicated rarely, less than 10% of the chances, 10 (4%) reported occasionally, 30% of the chances, 4 (1.6%) sometimes, 50% chances and 4 (1.6%) reported frequently, 70% of the chances. Results from the Pharmacists revealed that 278 (76.2%) of them had never been approached for doping information or substances by athletes, 56 (15.3%) indicated rarely, 10% of the chances, 19 (5.2%) observed occasionally, 30% of the chances, 8 (2.2%) indicated sometimes, 50% of the chances, 3 (0.8%) frequently, 70% of the chances and only 1 (0.3%) observed usually, 90% of the chances as shown in Figure 4.19.

The above results imply that even though more than two-thirds of the Healthcare Practitioners (General Practitioners and Pharmacists) never received doping requests

from athletes, the remaining one-third is clear evidence that doping is happening and probably even more rampant in Kenya and Healthcare Practitioners still encounter doping requests and could play a critical role in assisting against doping in the country.

4.6.3 Information on Drugs Athletes Seek according to General Practitioners and Pharmacists

The study assessed some information about PEDs athletes seek from General Practitioners and Pharmacists in Kenya. The respondents were required to choose from given options: drugs to aid in the recovery process, the side effects/health risks of PEDs, shortening of recovery time after a sports injury, additional laboratory examination, and lastly, information on dosage regimes. The results are presented in Figure 4.20 below.

Figure 4.20: Drugs Information Athletes Seek according to Healthcare Practitioners

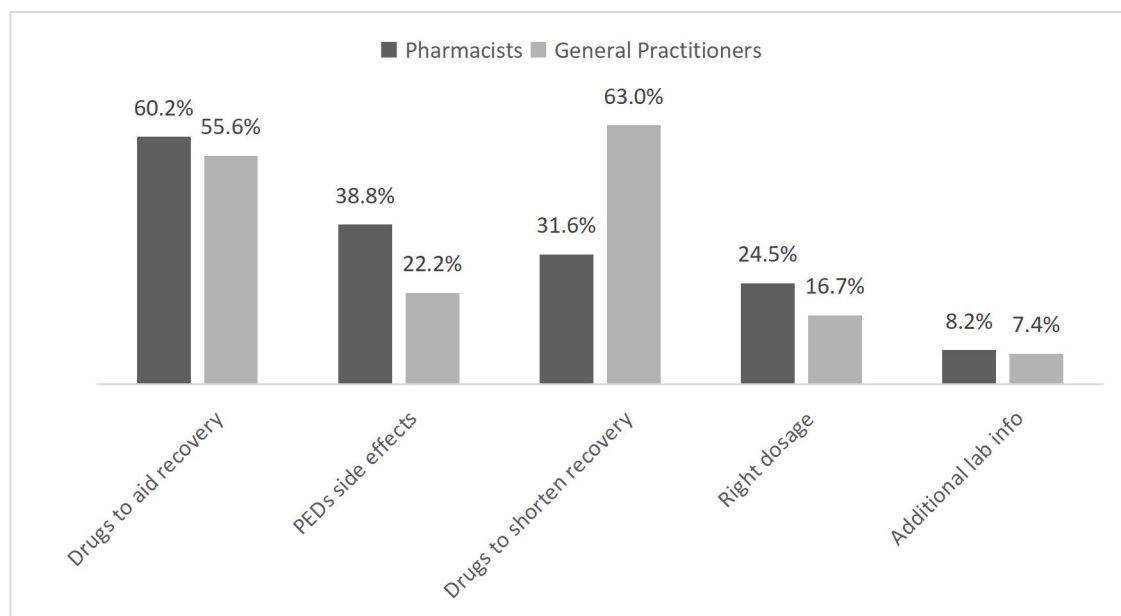


Figure 4.20 above reveals that most drug information requests General Practitioners receive from athletes are about those used to shorten recovery, 34 (63%), drugs to aid recovery, 30 (55.6%), and PEDs side effects, 12 (22.2%). On the other hand,

Pharmacists receive most drug information requests about drugs to aid recovery, 59 (60.2%), PEDs side effects, 38 (38.8%), and drugs to shorten recovery, 31 (31.6%). Results also showed that, the least drug information sought from the Healthcare Practitioners were about the right drug dosage (General Practitioners, 9 (16.7%), Pharmacists, 24 (24.5%) and additional lab information (General Practitioners, 4 (7.4%) and Pharmacists, 8 (8.2%).

These results reveal that Kenyan athletes seek information about substances from General Practitioners and Pharmacists to hasten recovery, which may give them an undue competitive advantage.

4.6.4 General Practitioners' and Pharmacists' Account on Doping Requests for the past 12 Months

The study also sought to establish whether the respondents (General Practitioners and Pharmacists) had directly received requests for prescription of doping agents in the past twelve months. The respondents were required to respond with either a yes or no answer. The results are shown in Table 4.14.

Table 4. 14: General Practitioners' and Pharmacists' Report on Requests of Prescription of Doping Agents within the last 12 Months (n=72)

Category	General Practitioners (n =26)		Pharmacists (n=46)	
	Yes	No	Yes	No
Response	Yes	No	Yes	No
Count	26	222	46	316
%	10.5	89.5	12.7	87.3

Note: Count represents the number of times the option was selected *Participant could select more than one option

The above results revealed that during the last 12 months, 26 (10.5%) of the General Practitioners had received doping requests, whereas the majority, 222 (89.5%), stated they had not encountered doping requests for the past 12 months. 46 (12.7%) of the

pharmacists said that they had received a request for doping prescriptions or substances during the last 12 months, but the majority, 316 (87.3%), reported not to have received doping requests in the past 12 months. This implies that although most General Practitioners and Pharmacists in Kenya do not receive doping requests, some still experience doping requests from athletes, hence the need to address the concern in Kenya by involving the Practitioners.

4.6.5 Participants' Account of the Frequency of Requests on Prescription of PEDs by Athletes

The study further sought to determine the frequency of athletes' requests for the prescription of banned substances for whatever reasons. The respondents were requested to respond on how frequently prescription was sought, for example, daily, weekly, monthly, once in three months, once in six months, once in a year, or never. Only those respondents who had indicated 'Yes' in the previous item (Section D; 13) were supposed to respond. The results are presented in Table 4.15.

Table 4. 15: Participants' Account of Frequency of Requests on Prescription of PED by Athletes (n=70)

Requests	General Practitioners (25)		Pharmacists (n=45)	
	Count	%	Count	%
Daily	0	0	2	4.4
Weekly	1	2.2	1	2.2
Monthly	7	28	8	17.8
Once in 3 months	8	32	13	28.9
Once in 6 months	5	20	12	26.7
Once in a year	4	16	9	20
Never	0	0	0	0

Note: Count represents the number of times the option was selected *Participant could receive doping request on or from different occasion/athletes.

The above results indicated that out of the 25 (10%) General Practitioners who responded to the question, 8 (32%) reported that they receive doping requests once in 3 months, 7 (28%) monthly, 5 (20%) once in 6 months, 4 (16%) once in a year and 1 (2.2%) weekly as shown in Table 4.15.

While responding to the same question, of the 45 (12.3%) Pharmacists who responded to the question, 13 (28.9%) stated that the frequency of doping requests is once in 3 months, 12 (26.7%) once in 6 months, 9 (20%) indicating once in a year, 8 (17.8%) monthly, 2 (4.4%) daily and 1 (2.2%) weekly. These results show that most of athletes seek prescriptions for PEDs monthly or every three months.

4.6.6 Report on Prescriptions for Performance Enhancing Drugs that Athletes Seek

The study sought to establish the PEDs that athletes commonly seek for a prescription from the perspective of General Practitioners and Pharmacists. Respondents were presented with a list of drugs to select from, including stimulants, anabolic steroids, peptide hormones, corticosteroids, masking agents, and diuretics. The results are shown in Figure 4.21.

Figure 4.21: Prescription Drugs Sought by Athletes

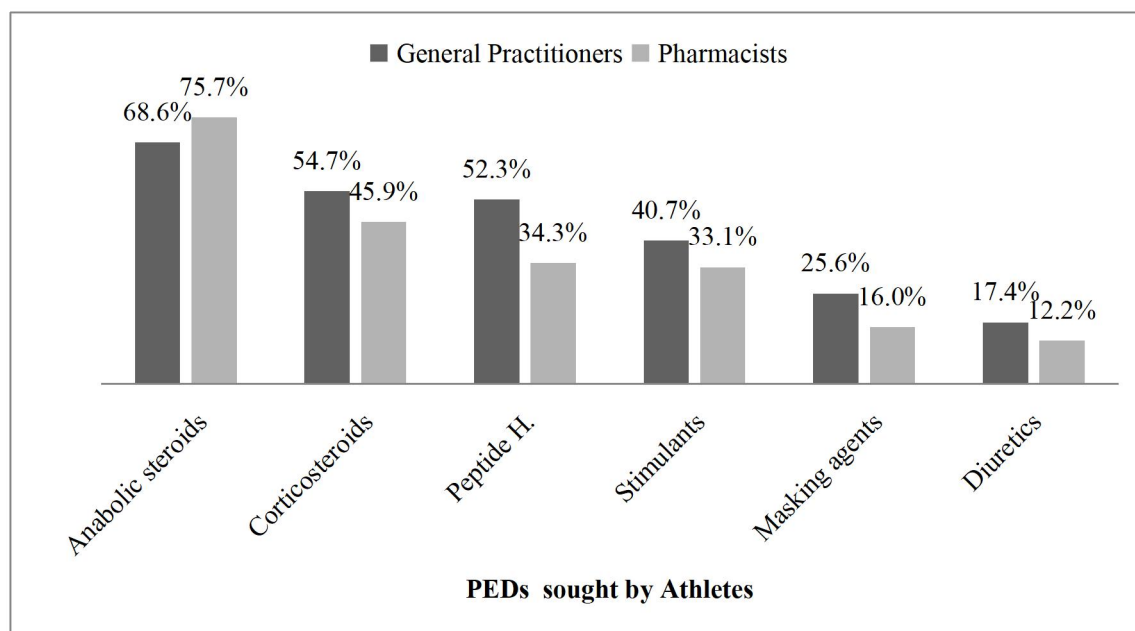


Figure 4.21 illustrates that most reported prescription drugs athletes sought were anabolic steroids, 59 (68.6%) from General Practitioners, and 137 (75.7%) from Pharmacists, followed by corticosteroids as indicated by 47 (54.7%) of the General Practitioners and 83 (45.9%) of Pharmacists. Respondents also indicated peptide hormones as the third most sought prescription drugs as observed by 45 (52.3%) of the General Practitioners and 62 (34.3%) of the Pharmacists.

Stimulants were also sought, as indicated by 35 (40.7%) of the General Practitioners and 60 (33.1%) of the Pharmacists. Masking agents were among the least sought-out drugs, as indicated by 22 (25.6%) General Practitioners and 29 (16%) Pharmacists, Diuretics as shown by 15 (17.4%) of the the General Practitioners and 22 (12.2%) of the Pharmacists. These findings imply that steroids are the main sought-after PEDs by athletes from General Practitioners and Pharmacists in Kenya.

4.6.7 Views on what Compels General Practitioners and Pharmacists in Kenya to Assist Athletes in Doping

Further to investigating the doping experiences of the respondents, the study sought to establish what would compel Kenya’s General Practitioners and Pharmacists to assist athletes in doping.

Respondents were required to identify the reasons from five options. These included; money, lack of strict regulations/sanctions, easy accessibility of doping agents, self-satisfaction, and ignorance. These findings are presented in Figure 4.22.

Figure 4.22: Participants’ Views on what Compels General Practitioners and Pharmacists in Kenya to Assist Athletes in Doping

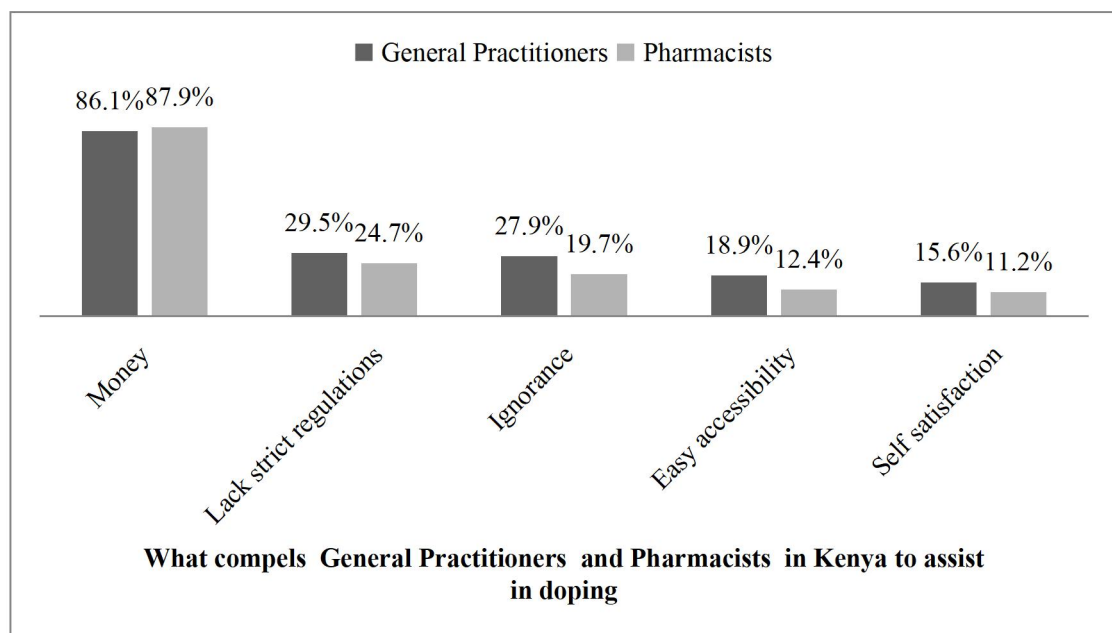


Figure 4.22 above shows that money (86.1%) was the leading motivation for doping among General Practitioners (210). Similar results (87.9%) were recorded among the Pharmacists (313). This was followed by the lack of strict doping regulations or sanctions, as indicated by 29.5% of General Practitioners (72) and 24.7% of Pharmacists (44). 15.6% of the General Practitioners (38) and 11.2% of the Pharmacists (40) established that self-satisfaction was the minor reason medical

Practitioners might help athletes in doping. This implies money, and the absence of elaborate doping regulations for General Practitioners and Pharmacists in Kenya creates a safe environment that encourages some to assist athletes in doping.

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.1 Respondents' Demographic Characteristics

The study involved 250 General Practitioners and 365 Pharmacists, where a majority in each cohort were males, 151 (60.4%) General Practitioners, and 209 (57.3%) were Pharmacists (Table 4.1). The findings are consistent with previous studies where male Healthcare Practitioners were more represented than female (Antic, 2017; Dikic et al., 2014; Hailu et al., 2021; Salih & Abd, 2021). These findings infer that male healthcare Practitioners (General Practitioners and Pharmacists) dominate the practice in most countries, including Kenya. However, a study involving Finland Pharmacists had 93.9% female respondents (Lemettila et al, 2021). The difference in this study was attributed to the study design, online survey using convenience sampling that is susceptible to low response rate and researcher's bias.

In relation to age distribution, most respondents (General Practitioners and Pharmacists) were represented in the age groups 21-30 years and 31-40 years (Table 4.1). The evidence is also true in reviewed literature where most General Practitioners and Pharmacists were aged 30-40 years (Antic, 2017; Dikic et al., 2014; Hailu et al., 2021; Lemettila et al, 2021). The findings suggest that most Healthcare Practitioners are relatively young and probably progress to more specialized health practices as they age. Nonetheless, the views of these young Healthcare Practitioners on doping are central to informing and shaping anti-doping strategies from the healthcare perspective.

Over a third of General Practitioners, 96 (38.4%), and Pharmacists, 114 (39.5%), had less than five years of working experience. Although little literature exists on General Practitioners' and Pharmacists' work experience and doping, considering most of the

Healthcare Practitioners in this study were young, between 21-30 years (Table 4.1) and substantial time (five or six years) they spent in studies, it then informs the high number of respondents with less than 5 years and those with 6-10 years working experience.

The educational level of respondents revealed that more than half of the General Practitioners, 128 (51.2%), had a Bachelor's degree compared to a college diploma for Pharmacists, 229 (62.7%), while Practitioners with postgraduate education were the minority. In Kenya and in many states it's highly recommended for General Practitioners to complete a Bachelor's degree, but a diploma in pharmacy attracts many potential Pharmacists who could not meet the high entry requirements for a Bachelor's degree in Pharmacy.

5.2 General Practitioners, Pharmacists and Doping

General Practitioners and Pharmacists constitute an integral part of athletes' support personnel and are critical in supporting athletes' health needs (Weier, 2021). In healthcare, General Practitioners and Pharmacists are mandated to provide safe, quality, and reliable healthcare services to the best of their knowledge for positive health outcomes. The same zeal is expected in sports to keep athletes at the top of their health, advise them on the best health interventions available, and, most importantly, protect or keep them off doping. However, for General Practitioners and Pharmacists to provide safe and effective services to athletes congruent to doping regulations, their doping knowledge, attitude, and experience must be reliably sufficient to provide services for this cohort safely. In line with these requirements, this survey examined doping knowledge, attitude, and experience of General Practitioners and Pharmacists in Kenya.

5.3 General Practitioners' and Pharmacists' Knowledge on Doping

5.3.1 Knowledge of Anti-Doping Agencies

The study's findings established that General Practitioners and Pharmacists in Kenya are well versed with WADA and ADAK as the bodies responsible for regulating and designing doping frameworks and protecting athletes from harmful substance use to facilitate clean sports. The admirable knowledge of doping regulatory agencies by General Practitioners and Pharmacists was related to the frequent involvement of Kenyan athletes in doping and recurrent cases of primary healthcare providers suspiciously treating and assisting athletes with prohibited substances (Reuters, 2018). ADAK, Athletics Kenya, KMPDC, and KPPB collaborating to curtail doping in Kenya with General Practitioners and Pharmacists are also presumed to be the key leading to the Practitioners in this study being aware of WADA and ADAK. The agencies conduct anti-doping sensation seminars and provide resources such as anti-doping e-learning for General Practitioners and Pharmacists to remain updated on anti-doping matters.

5.3.2 Doping Knowledge Information Capacity of General Practitioners and Pharmacists

The findings from this study revealed that General Practitioners and Pharmacists are moderately informed about doping. These findings were consistent with other studies where primary healthcare providers such as General Practitioners and community Pharmacists self-reported having limited knowledge of doping (Dikic et al., 2013; Hailu et al., 2021; Üresin et al., 2018; Yee et al., 2020). The average doping knowledge levels of General Practitioners and Pharmacists were attributed to inadequate emphasis by responsible stakeholders (ADAK, KMPDC, KPPB, and Ministry of Health) on doping among the Kenya General Practitioners and

Pharmacists, overreliance on limited doping seminars and regular training and education from ADAK. Additional information from the findings of the study revealed that WADA and ADAK were the key source of doping information for General Practitioners and Pharmacists. The pivotal roles WADA and ADAK directly or indirectly play towards supporting doping knowledge among healthcare providers are evident in several surveys (Dickie et al., 2014; Lemetil et al., 2021).

5.3.3 General Practitioners' and Pharmacists' Level of Familiarity with Doping

The study revealed that most General Practitioners and Pharmacists self-rated as slightly familiar to moderately familiar with doping in almost all questions assessing their doping knowledge (Table 4.10). For example, the findings indicated only a small number of 99 out of 250 General Practitioners, and 154 out of 365 Pharmacists (Table 4.3) were moderately and extremely familiar that erythropoietin (EPO) in sports is regarded as doping. The low familiarity with doping aspects such as erythropoietin among Kenya General Practitioners and Pharmacists is a concern given that EPO is the third most prevalent prohibited substance after nandrolone and corticosteroids detected in Kenyan athletes (WADA, 2016). Hailu et al. (2021) also established that Pharmacists from Northeast Ethiopia know little about drugs banned in sports. Haile et al. (2021) found more than half, 36 out of 61 Pharmacists, did not know EPO was prohibited in sports. Starzark et al. (2016) also established over half, 144 out of 201 General Practitioners and 71 out of 98 General Practitioners (Table 4.3), had poor to fair knowledge about the effects of doping agents on athletic performance. As indicated in these findings, the low familiarity with doping suggests that General Practitioners and Pharmacists lack enough involvement in anti-doping activities, especially in Kenya, which accounts for their low self-rating in doping familiarity.

The significant differences in responses between General Practitioners and Pharmacists in several doping familiarity statements signify the slight disparity in doping knowledge between the two cohorts. For example, more General Practitioners than Pharmacists, $p = .029$, were moderate to extremely familiar that caffeine is not a doping agent (Table 4.3). Starzark et al. (2016) reported similar findings where a significant difference in responses between General Practitioners and Pharmacists was established in several statements assessing their doping knowledge. The difference is likely due to variation in the nature of duty between the General Practitioners and Pharmacists allowing General Practitioners to interact more with athletes seeking doping-related advice or substances.

5.3.3.1 Difference in Level on Doping Familiarity between General Practitioners and Pharmacists

Although General Practitioners reported a slightly higher doping knowledge than Pharmacists (Table 4.4), the two had a little above average doping familiarity with the doping aspects (substances and measures) and no significant difference between the two cohorts. While little literature exists comparing General Practitioners and Pharmacists doping knowledge, similar findings on insufficient doping knowledge were reported among General Practitioners and Pharmacists in Serbia, Turkey, the Balkan region, Finland, South Africa, and Ethiopia (Antic, 2017; Dikic et al., 2013; Ercan et al., 2021; Hailu et al., 2021; Lemittila et al., 2021; Starzark & Derman, 2016). General Practitioners and Pharmacists are lacking in doping knowledge, questioning their reliability in attending to professional and sub-professional athletes' medical needs.

Several factors have been suggested as the key contributor to Healthcare Practitioners' insufficient knowledge of doping. For example, health professionals' disinterest in

doping and the absence of doping studies, training, or seminars in college have been reported in other studies (Starzark et al., 2021). Recognizing the critical roles General Practitioners and Pharmacists play in athletes' health and well-being, they must possess strong doping knowledge in all aspects, methods, and consequences. Studies that have examined doping and anti-doping knowledge among Healthcare Practitioners suggest doping education needs to effectively prepare them to deliver safe healthcare services to athletes (Erickson et al., 2021; Yee et al., 2020). The findings of this study are contrary to those reported among Pharmacists in Qatar, Japan and Australian physicians, where they possessed adequate knowledge of doping (Awaisu et al., 2015; Mazanov et al., 2014; Saito et al., 2013). Qatar's and Japan's remarkable sports pharmacy curricula in college and university programs can account for the difference in findings. Australia also has a relatively long-established (2006) Australian Sports Anti-Doping Authority compared to Kenya, where there is no sports pharmacy and recently enacted ADAK (2016) to educate train, and prevent doping (Uresin et al., 2018).

5.3.4 General Practitioners' and Pharmacists' Knowledge of WADA's Prohibited Substances and Methods

Healthcare providers addressing athletes' health must have sufficient knowledge of prohibited drugs or methods in competition, in some specific sports, or all the time. The study established that over half of the General Practitioners and Pharmacists in Kenya possess partial knowledge on prohibited classes of substances, prohibited methods, and classes of prohibited substances in certain sports (Figure 4.2 to Figure 4.16).

5.3.4.1 Knowledge of Prohibited Classes of Substances

The findings demonstrated almost a similar trend in knowledge of Prohibited Classes of Substances between General Practitioners and Pharmacists. Specifically, General Practitioners and Pharmacists were more able to correctly identify diuretics, masking agents, and anabolic agents as banned classes of substances. The identified prohibited substances are commonly reported as doping substances by Kenya's athletes, perhaps making them popular among General Practitioners and Pharmacists (Chebet, 2014). Similar findings were reported in studies conducted in Qatar, Malaysia, and Ethiopia, where Pharmacists correctly identified diuretics, AAS, and masking agents as prohibited substances in sport (Awaisu et al., 2015; Chan et al., 2019; Hailu et al., 2021). The incapacity of General Practitioners' and Pharmacists' knowledge of the prohibited class of substances makes them unreliable in offering medical services to athletes and culpable of anti-doping rule violations as an accomplice to athlete's unintentional doping. General Practitioners and Pharmacists are trusted sources of health information to the public, athletes, and teams that consult them for medical advice (Yee et al., 2020). The questionable knowledge among General Practitioners and Pharmacists of prohibited classes of substances reflects the need for proactive anti-doping education or training to improve their ability to serve the health needs of professional athletes in the country.

5.3.4.2 Knowledge of Prohibited Methods

Based on the findings, more General Practitioners and Pharmacists in Kenya correctly identified (60% and 100% correct) WADA prohibited methods of substances compared to the prohibited class of substances or the sport-specific prohibited substances (Figure 4.9 through 4.11). Although over half of General Practitioners and Pharmacists self-reported low knowledge of prohibited methods, the findings

established that many could identify enhancement of oxygen transfer, 30.7% and gene doping, 22.2% as prohibited methods (Figure 4.9 and 4.11). Gene doping and oxygen transfer methods are common doping violations among Kenyan long- and middle-distance runners (Chebet 2014). To athletes and their accomplices, gene doping and oxygen transfer methods are thought to improve their endurance capability as well as muscle performance (Pokrywka et al., 2013). The frequent cases of Kenyan athletes being banned from competitions because of gene doping and oxygen transfer violations may be attributed to the relatively high number of Kenyan General Practitioners and Pharmacists awareness of the two doping methods (AK, 2017; Reuters, 2018).

5.3.4.3 Knowledge of Classes of Prohibited Substances in Certain Sports

The findings of this study showed General Practitioners and Pharmacists in Kenya are unsure of substances prohibited in specific sports, especially alcohol and cannabinoids (Figure 4.12 and 4.13). The finding was similar to a study conducted with Finnish Pharmacists who reported having insufficient knowledge of doping for recreation drugs (Lemettila et al., 2021). Recreational drugs may be used in an attempt to enhance an athlete's performance which facilitates unfair competition and violates WADA rules (Reardon & Creado, 2014). This makes it essential for General Practitioners and Pharmacists to be aware of the class of substances that are prohibited in competition only or particular sports. Substances such as beta-blockers used to relieve chest pain or arrhythmia are prohibited in sports such as racing, golf, darts, fishing, and archery because it reduces anxiety, consequently increasing stability (WADA, 2021). Qatar Pharmacists, however, were reported to be more knowledgeable in classifying doping substances which contradict the current study findings (Awaisu et al., 2015). Variations in findings are ascribed to Qatar having a

well-established sports pharmacy accounting for the difference in doping knowledge between Qatar and Kenya. Nonetheless, Kenyan General Practitioners and Pharmacists need to be put to task to increase their knowledge on the class of prohibited substances in particular sports, given the country's active involvement in the global sports arena and reputation.

5.3.5 Source (s) of Doping Knowledge

Internet, radio, and television were the leading sources of General Practitioners' and Pharmacists' doping information in Kenya. WADA and ADAK followed as the major source of doping information among General Practitioners and Pharmacists (Table 4.5). Similar findings were reported from a study involving medical doctors in the Balkan region, where the internet was identified as a leading source of doping information (Dikic et al., 2013). Even with over 60% of General Practitioners and Pharmacists in Kenya admitting to knowing WADA and ADAK, the findings demonstrated that the internet was a superior tool for getting information on doping. Social networks such as Facebook and Twitter, TVs, and radios are often preferred sources of information not because of their ability to present credible doping information but for their convenience (Shalaby et al., 2018).

The findings also established that doping agencies are also becoming a popular source of doping information for General Practitioners and Pharmacists in Kenya (Table 4.5). The increased focus by WADA and ADAK on doping, specifically on the roles of healthcare providers on the vice, explains these agencies' popularity among General Practitioners and Pharmacists in Kenya. Hailu et al. (2021) reported that only 27.9% of the pharmacists cited WADA as a source of doping information. The findings of this study suggest General Practitioners and Pharmacists in Kenya view the internet, radio, and television as efficient tools for learning.

It is imperative for WADA, ADAK and other doping regulatory agencies to exploit these sources to ensure General Practitioners and Pharmacists get credible and verified doping information. Introducing ADAK's e-learning program allows healthcare professionals to self-educate on doping and related matters, which is good progress in the fight against substance use in sports. It is imperative for doping regulatory bodies to diversify doping education, such as through social media adverts targeting Healthcare Practitioners to dominate the internet so as ensure accurate and reliable information is accessible with ease. It is important for all doping sources to be controlled, verified, and accurate (Chebet, 2014).

5.3.6 Healthcare Practitioners' Doping Knowledge based on Gender

It was determined from the findings that male Healthcare Practitioners (General Practitioners and Pharmacists) were more knowledgeable in doping compared to female General Practitioners and Pharmacists, and the difference was statistically significant ($p = .006$) (Table 4.6). Salih and Abd (2021) reported similar findings where it was revealed gender influenced Iraq physicians and Pharmacists' doping knowledge, with male respondents indicating a high level of doping knowledge compared to female respondents.

Although this study did not further investigate potential variables that could inform the difference in doping knowledge between male and female General Practitioners and Pharmacists, such as participating in sports, possible lack of interest in sports, and probably doping was attributed to the difference in doping knowledge between male and female General Practitioners and Pharmacists in Kenya. Several studies agree with current findings where the difference in doping knowledge between male and female medical Practitioners and Pharmacists was established (Antic, 2017; Hailu et al., 2021; Jaber et al., 2015; Salih & Abd, 2021). Addressing the gender doping

knowledge gap closes a potential loophole athlete, and their accomplices may exploit to enhance the vice.

5.3.7 Healthcare Practitioners' Doping Knowledge based on Age

The findings demonstrated that respondents who were older than 50 years were well informed on doping and related issues than younger respondents (General Practitioners and Pharmacists). While age had a significant effect on pharmacists doping knowledge, $p = .024$ than amongst General Practitioners, the variations in doping knowledge was equal across age groups $p = .624$.

The difference in doping knowledge based on the age of the Pharmacists was related to the work experience that may determine respondents' exposure to doping education, training, and encounters with athletes seeking information or drugs. As for the General Practitioners, though the difference in doping knowledge was insignificant, it was apparent that it increased with age (Table 4.7). Similar findings were reported in a study involving Serbian General Practitioners (Antic, 2017). The study reported that older General Practitioners reflected a higher knowledge level of doping. The findings echo the need to initiate anti-doping education at an early age, mainly during the studying stage for Healthcare Practitioners. Early doping education prepares Healthcare Practitioners to address doping and contribute to their fight against substance abuse in sports (Dikic et al., 2013), which is an imperative measure to make General Practitioners and Pharmacists proactive in doping.

5.3.8 Healthcare Practitioners' Doping Knowledge in Relation to Work Experience

General Practitioners and Pharmacists with more than 21 years of work experience demonstrated more knowledge of doping and related issues than those with less work

experience (Table 4.8). Qatar Pharmacists reported similar findings where fourth-year Pharmacists were more knowledgeable in doping than other groups of pharmacy students (Awaisu et al., 2017). With General Practitioners having a significant difference in doping knowledge with an increase in work experience, ($p < .01$) this reveals how crucial work experience positively improves knowledge in doping which is a product of the longevity of doping information exposure.

Although only a few studies (Awaisu et al., 2017; Dikic et al., 2013) examined the impact of General Practitioners' and Pharmacists' experience on doping knowledge, the evidence demonstrates that work experience influences how healthcare Practitioners recognize doping and related issues. The evidence shows that experienced General Practitioners and Pharmacists can be pivotal in mentoring less experienced Healthcare Practitioners in matters related to doping, a strategy that could offload the burden of over-relying on anti-doping regulators for anti-doping education and training.

5.4 General Practitioners' and Pharmacists' Doping Attitude

General Practitioners and Pharmacists were required to rate how they agreed or disagreed with statements intended to assess their doping attitude. The findings revealed a consistent trend between General Practitioners' and Pharmacists' responses to statements assessing their doping attitude with view instances indicating significant variation ($p < .05$) between the two professionals, (Table 4.9). Specifically, General Practitioners' and Pharmacists' perceptions considerably varied ($p < .034$) on the view that recreational drugs assist in motivating athletes to train and compete at the highest. A significant difference ($p < .014$) was also established between General Practitioners and Pharmacists on the statement that only the performance quality should matter but not how athletes achieve it (Table 4.9). Such variations in General Practitioners' and

Pharmacists' perceptions in such few instances depict dynamic opinions among Kenya General Practitioners and Pharmacists on doping. The scarcity of literature on doping attitudes between General Practitioners and Pharmacists makes it challenging to provide comparable findings. However, the present study's findings suggest the need to address Kenya's General Practitioners' and Pharmacists' doping attitude. The findings, however, pointed out that General Practitioners and Pharmacists believed that doping is unavoidable and part of competitive sport (Table 4.9). Practitioners also disagreed with legalizing performance enhancements. These findings suggest that Kenyan General Practitioners and Pharmacists are against and do not support doping. These findings, however, contradicted Laure et al. (2003) findings that established that 87.5% of the General Practitioners stated doping is a public health problem while 80% reported doping is a form of drug addiction, revealing their doping support. The difference in findings between the two studies was linked to the huge gap in time where today's medical Practitioners have insights regarding the harmful health impacts of doping and the long stride doping regulatory bodies have made in sanctioning doping offenders, including medics since 2003, up-to-date.

The current study's findings further demonstrated that General Practitioners and Pharmacists in Kenya have a negative attitude towards doping (Table 4.10). However, Pharmacists were more lenient towards doping (weak negative doping attitude) than General Practitioners, and a considerable difference in doping attitude exists between the two healthcare Practitioners in Kenya ($p = .039$). The bulk of a Pharmacists' job involves dispensing medications to patients, including athletes, unlike General Practitioners but consistent with the law, such as requiring physician prescription before issuing some drugs to athletes. However, when they lack enough knowledge about doping and its consequences on athletes' health, such as the use of beta-blockers,

then the General Practitioners and Pharmacists will continue to prescribe and disperse these substances, which may affect their overall doping attitude towards facilitating the vice. Backhouse et al. (2015) indicated that athletes' support personnel, including medics, displayed a negative doping attitude. Similar findings were reported among Malaysian student Pharmacists (Chan et al., 2019) and Polish physicians (Domagala et al., 2018). The study attributes the ethical and role responsibilities (to protect patients from harm and anti-doping campaigns) of General Practitioners and Pharmacists in Kenya to the identified negative doping attitude. Backhouse and McKenna (2011) posited that recent doping criticisms increased Healthcare Practitioners' support for doping restrictions which supports their negative doping attitude. Perhaps this explains the findings of an earlier study by Laure et al., (2003), where General Practitioners in France supported the prescription of medications that could cause dependency to athletes, which was against WADA doping regulations. Such findings mirror the triumph of doping education by anti-doping agencies in changing Healthcare Practitioners' perceptions of doping (APO Group, 2020). While they were limited studies comparatively investigated doping attitude between General Practitioners and Pharmacists, the Kenyan Pharmacists' slight leniency towards doping compared to General Practitioners was attributed to the fact that Pharmacists are regularly reported as among the main source of PEDs compared to General Practitioners (Hailu et al., 2021). Findings revealed that General Practitioners and Pharmacists perceived doping as an unavoidable part of sports (Table 4.9). Such opinions from General Practitioners and Pharmacists increase their orientation towards facilitating athletes using prohibited substances. Banishing General Practitioners and Pharmacists linked with doping practice may temporarily prevent them from assisting athletes in doping. However, researchers recommend education

and training of Healthcare Practitioners on the adverse effects of doping on athletes' health as an efficient strategy against the vice (Auersperger et al., 2012; David, 2017).

5.4.1 General Practitioners' and Pharmacists' Doping Attitude based on Gender

The findings of this study showed that gender had a weak influence on the General Practitioners' doping attitude ($p = .041$) but not for the Pharmacists ($p = .169$). Nonetheless, female respondents (General Practitioners and Pharmacists) demonstrated some leniency towards doping compared to male respondents (Table 4.11). These findings are contrary to studies that did not establish the difference in doping attitudes based on the gender of the Healthcare Practitioners (Antić, 2017; Jaber et al., 2015). Cross-cultural variations that influence individual interests and participation in sports between Kenya, Jordan, and Serbia as well as respondents (pharmacy students and practising General Practitioners and Pharmacists), may play a vital role in the disparities of the findings between these studies. Nevertheless, the doping attitude status of Healthcare Practitioners is fundamental in supporting sports ethics and protecting the health of athletes. Therefore, engaging General Practitioners and Pharmacists in anti-doping education, training, and prevention are integral to offsetting their compassion towards doping (Henning & Dimeo, 2018). Both male and female General Practitioners and Pharmacists need to be trained to perceive the use of PEDs as a health concern for them to consider protecting athletes from self-harm.

5.4.2 General Practitioners' and Pharmacists' Doping Attitude based on Age

The findings from this study indicated that the doping attitude of General Practitioners considerably vary across age $p = .003$ but there was no significant difference among Pharmacists $p = .301$. A study involving Serbian General Practitioners contradicts the present findings as it established that age did not influence respondents doping attitudes (Antić, 2017). Cross-cultural variations of the respondents, for

example, participation perception of sports in Jordan, where the majority are Muslims, unlike Kenya, where Christians are the majority, were linked to the disparities in the findings of these studies. However, similar findings were reported on Jordan Pharmacists where no significant difference in doping attitude was established in relation to Pharmacists' age (Jaber et al., 2015).

Overall, respondents (General Practitioners and Pharmacists) in lower age categories 21-30 years demonstrated a more positive attitude (a weak negative attitude) towards doping issues than older respondents, such as those older than 50 years (Table 4.12). The findings demonstrate how age remarkably impacts General Practitioners and Pharmacists doping attitude. Psychology studies suggest that young people are more open to new ideas and therefore likely to support new approaches, in this case, prohibited methods to foster athletes' performance unlike older individuals (General Practitioners and Pharmacists). As people grow old, they become less receptive to new ideas and they are likely to evaluate them based on merits, ethics, and evidence. Therefore, older General Practitioners and Pharmacists are resistive to doping consequently a stronger negative doping attitude.

5.4.3 General Practitioners' and Pharmacists' Doping Attitude based on Work Experience

In this study, the work experience of General Practitioners was determined to influence their doping attitude ($p = .008$), unlike for the Pharmacists $p = .063$. Respondents (General Practitioners and Pharmacists) with few years of working experience showed reluctance toward doping measures, compared to Healthcare Practitioners with over 21 years of work experience who demonstrated a strong negative attitude towards doping (Table 4.13). Similar findings were made with Finnish Pharmacists, where work experience was essential in determining doping

attitude (Lemettila et al., 2021). Work experience exposes General Practitioners and Pharmacists to athletes seeking PES or doping information, which could influence their doping attitude to prevent or facilitate doping practices. For example, the findings of this study showed that one quarter 155 (25.2%) of the respondents have been approached for PES or doping information by athletes for the past year (Figure 4.18). Donovan et al. (2014) suggested that if the threats because of sanctions and jail are perceived as weak, then the individuals, in this case, healthcare Practitioners' may facilitate doping because of their positive doping attitude mediated by ineffective sanctions. Therefore, doping education that focuses on the health impacts of PEDs education instead of threats to sanction and banish General Practitioners and Pharmacists enhances their support in the fight against doping (Backhouse & McKenna, 2011).

Anti-doping education, active involvement in the fight against PEDs use among athletes, and collaboration between Health Practitioners and local and international doping regulatory bodies such as ADAK and WADA, are among the fundamental measures to increase Healthcare Practitioners' support and positive perception in the fight against doping. The findings of this study established anti-doping regulatory agencies, WADA and ADAK, well recognized among the General Practitioners and Pharmacists in Kenya. This indicates their active involvement in the fight against doping in partnership with the Healthcare Practitioners necessary to promote negative doping attitude.

5.4.4 Athletes' Source of Performance Enhancing Drugs according to General Practitioners and Pharmacists

Most respondents (General Practitioners and Pharmacists) reported Pharmacists as a leading source of PEDs, closely followed by dealers or suppliers and General

Practitioners (Figure 4.17). These findings were consistent with a study from Ethiopia where Pharmacists were reported as a key source of doping substances (Hailu et al., 2021). The primary role of Pharmacists is to ensure the supply of medicine and advice patients, including athletes, about medication; therefore, it is unsurprising they are the leading potential source of PEDs (Henning & Dimeo, 2018). What is important is Pharmacists' understanding of their role in educating patients, including athletes, about safe drugs. Pharmacists have acknowledged their role in doping, but the limited knowledge of the concept exposes them to unintentionally facilitating athletes in doping (Yee et al., 2020).

The majority of the General Practitioners and Pharmacists in Kenya have limited knowledge of doping and related aspects based on the current study, making them a potential target by athletes seeking doping substances or information. Starzark and Derman (2016) hypothesized that the poor interest of General Practitioners and Pharmacists in the fight against doping and the absence of doping studies in colleges are the causative factors for their scarce knowledge of doping a weakness some athletes can exploit to gain access to PEDs or doping information. Educating General Practitioners and Pharmacists in Kenya is the ultimate way to protect them from prescribing WADA's prohibited substances and as such, removing them as athletes' preferred PED source of PEDs.

5.5 General Practitioners' and Pharmacists' Experience with Doping

5.5.1 General Practitioners' and Pharmacists' Encounter and Frequency with Athletes Seeking Doping Information

The findings demonstrated that as many as 25.2% Healthcare Practitioners have been requested for doping information or drugs in the last year (Figure 4.18). The findings

also revealed that about 22.2% of the General Practitioners and 27.4% of the Pharmacists had been approached for doping information or drugs (Figure 4.19). Similar findings were reported with medical doctors in the Balkan region, where 25% were contacted for doping information by athletes within 12 months, and 14% of the medical doctors considered assisting them to help them dope safely (Dikic et al., 2013). The current study had almost similar observations where 10.5% of the General Practitioners and 12.7% of the Pharmacists reported to have received requests for doping assistance for the last 12 months (Table 4.14). When General Practitioners and Pharmacists encounter such doping requests, it demonstrates the dire need for anti-doping organizations to collaborate with healthcare providers to uphold clean sports.

In a developing country such as Kenya, with world-class athletes, General Practitioners and Pharmacists are likely to be the ideal source for doping consultation. The current study revealed that as many as 10% General Practitioners and 28.9% Pharmacists receive requests for doping assistance almost every three months, with 4.4% Pharmacists stating they receive doping requests daily (Table 4.15). These findings demonstrate how important it is to involve General Practitioners and Pharmacists in anti-doping education and regulations. Equipping General Practitioners and Pharmacists with proper anti-doping education makes them a pivotal pillar in subduing the recurrent doping vices in the country.

5.5.2 Drug Information and Prescription Athletes Seek from General Practitioners and Pharmacists

The findings showed that most of the drug information athletes seek from General Practitioners in Kenya is for aiding the recovery process and from Pharmacists are those that enhance recovery after an injury (Figure 4.20). Injury is among the number one concerns in an athlete's career; therefore, finding ways to shorten recovery after

an injury could be the top priority. One of the prominent PEDs commonly used by athletes is the Human Growth Hormone (HGH). HGH has been used successfully in the treatment of burns in patients and athletes believe it could help them recover fast from injuries (Kim et al., 2016). The HGH is in the WADA prohibited list of substances and methods and its use is banned at all times for all levels of athletes (WADA, 2021).

The findings also indicated that 68.6% of the General Practitioners and 75.7% of the Pharmacists sought prescriptions for anabolic steroids (Figure 4.21). Anabolic steroids are allowed for genuine medical use, but their potential to stimulate muscle growth necessitates athletes to seek TUEs before using them. (Huang & Basaria, 2018). Corticosteroids were the second sought prescriptions by athletes from General Practitioners (54.7%) and Pharmacists (45.9%) in Kenya. The findings are consistent with the WADA 2018 report that established some of the most commonly used PEDs in Kenya are Nandrolone, corticosteroids, and EPO (WADA, 2018). Like anabolic steroids, corticosteroids are used for medical purposes such as asthma and allergy, but athletes need to apply for TUEs to determine if the use is necessary (Thorsby & Gjelstad, 2021). However, athletes can abuse corticosteroids to reduce pain and inflammation that may occur during extreme exertion.

5.5.3 General Practitioners' and Pharmacists' Views on what Compels them to Assist Athletes in Doping

Findings show that money was the top reason for General Practitioners and Pharmacists to assist athletes with doping, followed by a lack of strict doping regulations and sanctions and ignorance on doping and its aspects (Figure 4.22). Chebet (2014) reported similar findings where ignorance of doping regulations and money were the key reasons for many people involved in doping in Kenya. The

current economic recession exacerbated by the SARS-Covid-19 Pandemic may have influenced many people, including some unethical Healthcare Practitioners, to seek an alternative source of income. Furthermore, perceived weak doping regulations and the absence of tough sanctions appeal to unethical General Practitioners' and Pharmacists' behaviors to support doping (Donovan et al., 2014; Mazanov et al., 2014). As depicted by their insufficient knowledge of the concept, ignorance of the General Practitioners and Pharmacists in Kenya on doping and related issues exposes them to ADRVs and may lead athletes to unintentional doping. An example is the case of the doctor who prescribed a Kenyan sprinter, Omanyala, Tramadol and Diprofos that are prohibited drugs (ADAK, 2018). Indeed, it is not always about the question of General Practitioners' and Pharmacists' ethics, strict regulations, and sanctions, but sensitization of doping health risks to athletes, anti-doping rule violations, and their core mandate as healthcare providers that can bring long-term, positive, and effective change in the fight against doping.

CHAPTER SIX: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

6.1 Summary

The study investigated knowledge on doping by seeking relevant related information from General Practitioners and Pharmacists from seven purposefully selected counties in Kenya. The study also sought to establish these Health Practitioners' attitude towards doping. In addition, the study assessed the experiences of General Practitioners and Pharmacists in Kenya with regard to athletes' doping behaviour.

Of those who were sampled for the study, 615 respondents responded to the questionnaire successfully (250 General Practitioners and 365 Pharmacists), leading to a 62% study response rate. Among the General Practitioners, there were more male respondents (60.4%) than there were females (39.6%). This was also the case observed among the Pharmacists, with 57.3% of them being male and 42.7% being female. The majority, 45.2% of the respondents (General Practitioners and Pharmacist), were aged between 21 and 30 years. However, over half of the respondents, 50.6%, were between the ages of 31 and 50 years. Most of the General Practitioners, 38.4% had work experience of not more than five years. Similarly, the Pharmacists with less than 5 years of work experience were the majority, 39.5%. Over half, 51.2%, of General Practitioners were graduates, whereas the majority of the Pharmacists, 62.7%, had a college education (diploma). A majority, 69.6%, of General Practitioners and 43.3% of Pharmacists recruited for this study, were from Nairobi County.

6.1.1 General Practitioners' and Pharmacists' Doping Knowledge

General Practitioners and Pharmacists in Kenya have an excellent knowledge of doping regulatory agencies, WADA and ADAK. The commendable awareness was

linked to the current emphasis on collaboration between Healthcare Practitioners' bodies such as KMPDC and KPPB, in anti-doping education. However, General Practitioners and Pharmacists self-reported low doping knowledge, associated with a lack of robust training in Kenya.

More than half of the General Practitioners and Pharmacists demonstrated partial knowledge of prohibited classes of substances, prohibited methods, and classes of prohibited substances in certain sports. However, they were more able to identify diuretics, masking agents, and anabolic agents from the prohibited class of substances and gene doping and oxygen transfer methods in the prohibited methods category. The PEDs are the common doping methods popular among Kenyan athletes. Respondents demonstrated more knowledge of prohibited methods of substances. Respondents, however, showed insufficient knowledge when it comes to correctly identifying prohibited classes of substances and substances that are only prohibited in certain sports. General Practitioners and Pharmacists in Kenya have slightly above average knowledge of doping issues, and there is no considerable difference in doping knowledge between General Practitioners and Pharmacists. However, male respondents (General Practitioners and Pharmacists) were more knowledgeable about doping than their female counterparts, and the difference in doping knowledge was significant.

The age of the Pharmacists had a significant influence on doping knowledge but there was no significant variation in doping knowledge for General Practitioners. General Practitioners and Pharmacist who were older than 50 years had more doping knowledge compared to their younger counterparts. It was also established that work experience significantly influenced General Practitioners' doping knowledge but there was no significant difference the amongst the Pharmacists. Nevertheless, General

Practitioners and Pharmacists with more than 21 years of work experience had more doping knowledge than those with less work experience. General Practitioners and Pharmacist in Kenya receive their doping information mostly from the internet, TV, and Radio, which was attributed to convenience rather than the credibility of the information. WADA and ADAK were also reported among the leading sources of information on doping.

6.1.2 General Practitioners' and Pharmacists' Attitude towards Doping in Kenya

General Practitioners and Pharmacists in Kenya had a negative attitude towards doping. However, the Pharmacists revealed some leniency towards doping (a weak negative attitude) and a considerable difference exists between General Practitioners' and Pharmacists' doping attitude.

Females General Practitioners and Pharmacists in Kenya, showed a weak negative doping attitude (somehow inclined towards supporting doping) compared to their male counterparts (General Practitioners and Pharmacists). There was a significant difference in doping attitude between male and female General Practitioners but the variation was not significant between male and female Pharmacists. The study also demonstrated that age significantly influenced General Practitioners' attitudes towards doping unlike the Pharmacists. However, both General Practitioners and Pharmacists demonstrated dislike for doping or negative doping attitude as their age advances, for example, older than 50 years Healthcare Practitioners had strong negative attitude towards doping compared to their younger counterparts. Work experience contributed to significant difference in doping attitude of the General Practitioners but not for the Pharmacists. However, General Practitioners and Pharmacists with over 21 years of

work experience demonstrated a strong negative doping attitude than those with less work experience.

6.1.3 General Practitioners' and Pharmacists' Experience with Athletes' Doping Behaviors

As many as 25.2% of the study respondents (General Practitioners and Pharmacists) had been requested for doping information or substances by athletes. Kenyan athletes mostly seek doping information related to substances that aid recovery after injury and those that shorten the recovery period. The study further found that money was the key reason for some General Practitioners and Pharmacists involvement in doping, but lack of strict doping regulations and ignorance were also notable reasons for their interest in doping.

6.2 Conclusion of the Study

Based on the findings of the study, the following conclusions are drawn.

1. The study concluded that General Practitioners and Pharmacists in Kenya are well informed of doping regulatory agencies, WADA and ADAK.
2. General Practitioners and Pharmacists in Kenya lack sufficient understanding of prohibited classes of substances, prohibited methods and classes of prohibited substances in certain sports.
3. General Practitioners and Pharmacists in Kenya have slightly above average understanding of doping issues and that there is no significant difference between the two Healthcare Practitioners.
4. Male General Practitioners and Pharmacists were better informed on doping issues than their female counterparts.

5. Age contributed to significant difference in doping knowledge among Pharmacists but not among the General Practitioners. Additionally, older General Practitioners and Pharmacists had better doping knowledge than the younger ones.
6. Work experience contributed to significant difference in General Practitioners' doping knowledge in contrasting with the Pharmacists'. However, the Healthcare Practitioners (General Practitioners and Pharmacists) with more work experience displayed more knowledgeable of doping than those with less work experience.
7. General Practitioners and Pharmacists in Kenya have a negative attitude towards doping, but considerable differences exist between General Practitioners and Pharmacists. Pharmacists showed some leniency towards doping in contrast to General Practitioners, who reported a stronger negative attitude towards doping.
8. The gender of the General Practitioners in this study contributed significantly to the difference in doping attitude, in that, female General Practitioners were a bit relaxed towards doping, unlike their male counterparts who demonstrated a stronger negative attitude towards doping. It was also concluded that General Practitioners and Pharmacists with more work experience showed a strong negative attitude towards doping.
9. Pharmacists in Kenya are the main source of doping and the most sought out doping substances from General Practitioners and Pharmacists are drugs that aid recovery after injury and those that shorten the recovery period. Money,

lack of strong anti-doping measures, and ignorance are vital factors for Kenyan General Practitioners and Pharmacists involvement in doping.

6.3 Recommendations

6.3.1 Recommendations for Practice

1. General Practitioners and Pharmacists in Kenya should familiarize themselves with the WADA code. Healthcare Practitioners need to be concerned when treating or dispensing drugs to elite athletes.
2. Anti-doping campaigns should ensure a balance or emphasis between male and female Practitioners to encourage equal support from both genders. Additionally, targeting health Practitioners in colleges during anti-doping campaigns, seminar, and training would help promote doping knowledge and instill negative doping attitude at an early age that will be transferred later during practice.
3. County governments in conjunction with the National Government should put in place monitoring measures through parliament enactment of laws to guard and guide in the administration and dispensing of the drugs within the WADA banned substances.
4. Kenya government particularly Ministry of Education and the Ministry of Sports, Culture and Heritage should collaborate and include teaching about doping given the introduction of Competency-Based Curriculum (CBC) in pre-school to senior school to foster early anti-doping knowledge.

6.3.2 Recommendations for Policy

1. The study recommends that KMPDC and KPPB collaborate with ADAK to develop proactive anti-doping education. Anti-doping education and training

can help General Practitioners and Pharmacists avoid prescribing prohibited substances to athletes and alter their attitude towards doping.

2. The study recommends that the Kenya government, the Ministry of Health and Higher Education through the respective Principal Secretaries (PS) and other Institutes of Higher learning consider introducing anti-doping curriculum, in their medical and pharmacy courses to breach this inadequacy.
3. ADAK, WADA, KMPDC, and KPPB should design an appropriate strategy to exploit the power of the internet in disseminating reliable doping information/education, for example, using paid social media adverts targeting General Practitioners and Pharmacists.
4. KMPDC and KPPB should devise specific policies and structures, including reviews and monitoring procedures for General Practitioners and Pharmacists involved in helping athletes in doping and take appropriate actions against those found guilty.

6.3.3 Recommendations for Further Research

1. The current study was conducted using General Practitioners and Pharmacists pulled from seven counties where elite athletes feature from in Kenya. A survey involving General Practitioners and Pharmacists from all over the country may provide a closer reflection of the current doping knowledge, attitude, and experience of Kenya General Practitioners and Pharmacists.
2. The study only focused on the General Practitioners and Pharmacists doping knowledge, experience and attitude. There is need to investigate these variables further among Clinical officers, Nurses or Physiotherapists who may

be involved in handling athletes at any level. These groups are also part of ASPs; their knowledge, attitude and experience must be assessed and documented.

3. The current study focused on already working General Practitioners and Pharmacists in Kenya. There is a need to hear medical students' views and experiences on internships, too, as this might be the weakest link in the fight against doping in Kenya.
4. The current study used a closed-ended questionnaire to investigate the knowledge, attitude, and experience of General Practitioners and Pharmacists in Kenya. This might have locked out capturing of in-depth perspectives of respondents such as for example, why the young and less experienced Practitioners were a bit lenient towards doping. This study thus recommends other robust data collection approaches such as focused group discussions, interviews with an open-ended questionnaire, or longitudinal studies to allow the collection of comprehensive information about doping among Kenyan General Practitioners and Pharmacists.

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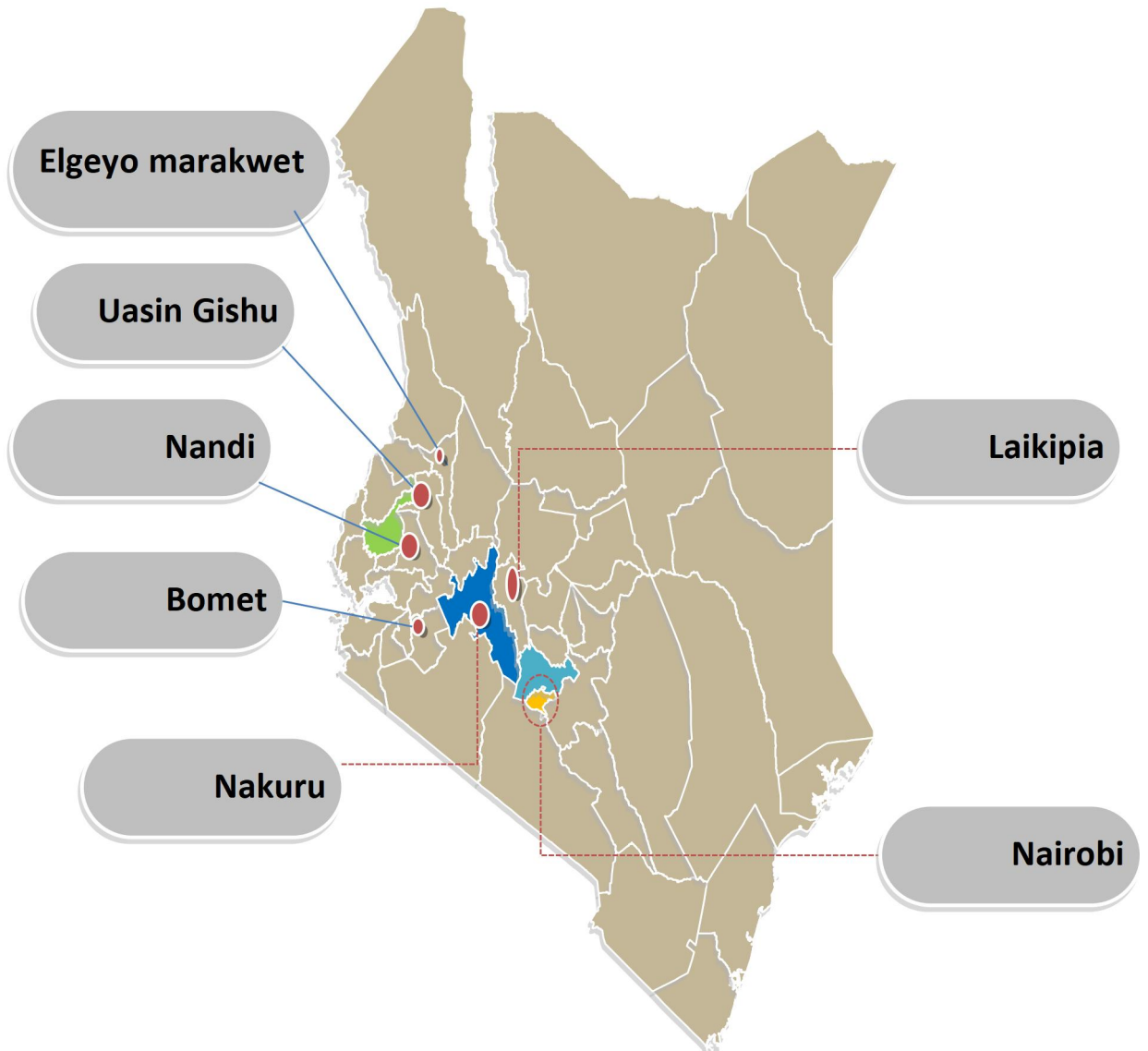
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APPENDICES

APPENDIX A: MAP OF THE STUDY LOCATION/AREA



APPENDIX B: PARTICIPANTS' INFORMED CONSENT FORM

KENYATTA UNIVERSITY

OFFICE OF THE CHAIRMAN ETHICS REVIEW COMMITTEE

Introduction

My name is Jonathan Kimtai Rotich, a PhD student of Kenyatta University in the department of Recreation and Sports Management. Am currently conducting a behavioral research survey on anti-doping knowledge, attitudes and experiences of General Practitioners and Pharmacists in Kenyan on sports issues and therefore invite you to participate in this study.

Procedures to be followed

Participation in this study will require that I ask you some questions and a Questionnaire will be issued which will take you about 25 minutes to answer. Most questions have choices where you simply pick the one that is true for you and tick or circle corresponding number to it. Some questions will require that you write your answer and a space for such question is provided

I will record the information you provide in a questionnaire.

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

My participation in this study will contribute towards further understanding of the knowledge, attitudes and preferences of exercise therapy in the treatment of Alcohol Use Disorders. My participation can help tailor make programs for this group of people.

Reward

There will be no rewards or any payment to you if you participate.

Confidentiality

I understand that information provided to this study may be used for research purposes including publications in research journals. There is no time my personal identity will be revealed as all information will be coded.

Contact Information

Should I feel to withdraw or would like more information about this project I will feel free to contact or write to principal investigator **Jonathan Rotich** on email jkswach@gmail.com/rotich.jonathan@ku.ac.ke phone number **0721113971**.

Supervisors; **Prof. Elijah Gitonga** 0727649740 Email [rintaugu.elijah@ku.ac.ke/elijahgitonga2001@yahoo.com](mailto:rintaugu.elijah@ku.ac.ke). or **Dr. Edna Thangu** 0722853107, Email: THANGU.EDNA@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 medical 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)
Subject

Relationship to
Subject

Investigators statement

I, the undersigned, have explained to the volunteer in a language s/he understands, the procedures to be followed in the study and the risks and benefits involved

Jonathan Kintai Rotich

Name of Interviewer



Signature

Date

**APPENDIX C: GENERAL PRACTITIONERS' AND PHARMACISTS'
QUESTIONNAIRE**

Thank you for completing this survey. This research is aimed at providing information that may be used in fight against doping and help improve doping education in Kenya. It is to find out doping knowledge, attitudes and experiences of General Practitioners and Pharmacists of Kenya. Participation in this study is voluntary and no question is compulsory.

Instructions

Most questions have choices where you simply pick the one that is true for you and tick or circle corresponding number to it. Some questions will require that you write your answer and a space for such question is provided. Do not write your name on this survey.

There is no right or wrong question but we kindly ask you to fill every question in this self-assessment questionnaire as truthful as possible.

SECTION A: BACKGROUND INFORMATION

Please fill in where applicable

1. Age

21-30

31-40

41-50

>50

2. Gender

Male

Female

3. County _____

4. Level of formal education

Postgraduate

Graduate

College (Diploma)

5. What is your current occupation?

General Practitioner Pharmacists

6. How many years have you been working in your current occupation? (Work Experience)

≤ 5 Years

6- 10 Years

11-15 Years

16 – 20 Years

≥ 21 Years

SECTION B: KNOWLEDGE OF DOPING IN SPORT

This section intends to assess your knowledge regarding doping agents, methods or their metabolites that can be used by athletes to enhance their performance. Please answer to the best of your knowledge.

1. Have you ever heard of World Anti-Doping Agency? (WADA)

Yes No

2. Have you ever heard of Anti-doping Agency of Kenya? (ADAK)

Yes No

3. How informed do you feel you are in relation to doping in sports?

Poor

Below average

Average

Good

Excellent

4. Please respond on your level of familiarity in relation to the following statements

1 Not at all Familiar 2 Slightly Familiar 3 Somewhat Familiar 4 Moderately Familiar 5 Extremely Familiar (Tick/circle the number based on your familiarity)

Item	Not at all Familiar	Slightly Familiar	Somewhat Familiar	Moderately Familiar	Extremely Familiar
The world anti-doping code					
Performance Enhancing Drugs					
Anti-doping rule violations					
The side effects of anabolic agents are liver damage, infarct, acne and libido disorders					
Testosterone in sport is regarded as doping					
Erythropoietin in sport is regarded as doping					
Hypertension and heart attack is the most common side effects of erythropoietin					
B2-agonists can be used for medical purposes					
Diuretics are listed as prohibited substance					
Blood transfusion is a prohibited method					
Genetic manipulation is a prohibited method					
Caffeine is not a doping agent					
Tein is not a doping agent					

Dietary supplements may result in a positive doping test					
Marijuana is not permitted in competitions only					
Cocaine is not permitted even in certain amounts					
Beta-blockers are not prohibited in all types of sport					

5. Tick whether the following are the prohibited classes of substances or methods

1. (100 % Correct) 2. (60% correct) 3. (30% correct) 4. (Neither correct nor incorrect) 5. (30% incorrect) 6. (60% incorrect) 7. (100% incorrect)

Classes of performance enhancing drugs.	(100 % Correct)	(60% correct)	(30% correct)	(Neither correct nor incorrect)	(30% incorrect)	(60% incorrect)	(100% incorrect)
1. Prohibited classes of substances							
a) Stimulants							
b) Narcotics							
c) Anabolic agents							
d) Diuretics							
e) Peptide hormones, Mimetics, and Analogues							
f) Agents with anti-oestrogenic activity							
g) Masking agents							

2. Prohibited methods							
a) Enhancement of oxygen transfer							
b) Pharmacological, chemical							
c) Physical manipulation							
d) Gene doping							
3. Classes of prohibited substances in certain sports							
a) Alcohol							
b) Cannabinoids							
c) Local anesthetics							
d) Glucocorticosteroids							
e) β blockers							

6. From which of the following sources did you learn about doping and performance enhancing drugs or drug free sport? You can tick more than one

Sources of doping and performance enhancing drugs or drug free sport	Tick as appropriate
World Anti-doping Agent (WADA)	
Anti-doping agent of Kenya (ADAK)	
Television/radio	
Internet	
Newspaper/magazines	

In your studies (school)	
Seminars	
Friends	

SECTION C: ASSESSMENT OF ATTITUDE TOWARDS DOPING (PEAS-Petroczi & Aidman, 2012)

This section intends to assess your attitude towards doping in sport.

7. The statements below represent what health Practitioners may think about doping. Please circle in the number that best reflects your agreement. There is no right or wrong answer.

The numbers stand for:

- 1** Strongly Disagree, **2** Somehow Disagree, **3** Disagree, **4** Neutral, **5** Agree, **6** Somehow Agree and **7** Strongly Agree.

S/No	Items	Strongly Disagree	Somehow Disagree	Disagree	Neutral	Agree	Somehow Agree	Strongly Agree
a)	Doping is an unavoidable part of competitive sport.							
b)	Recreational drugs help to overcome boredom outside of competition.							
c)	Legalizing performance enhancements would be beneficial for sports.							
d)	Recreational drugs assist in motivating athletes to train and compete at the highest level.							
e)	Athletes have no alternative career choice							

f)	There is no difference between drugs and the technical equipment that can be used to enhance performance (e.g. hypoxic altitude simulating environments).							
g)	The risks related to doping are exaggerated.							
h)	The media blows the doping issue out of proportion.							
i)	The media should talk less about doping.							
j)	Athletes should not feel guilty about breaking the rules and taking performance-enhancing drugs.							
k)	Athletes who take recreational drugs use them because they help them in sport situations.							
l)	Athletes in my sport are pressured to take performance-enhancing drugs.							
m)	Only the quality of performance should matter, not the way athletes achieve it.							
n)	Health problems related to rigorous training and injuries are just as bad doping side effects.							
o)	Athletes often lose time due to injuries and drugs can be used to help to make up the lost time.							
p)	Doping is not cheating since everyone does it.							
q)	Doping is necessary to be competitive.							

8. Where do you feel is the source of performance enhancing drugs (PEDs)? You can tick more than one response

Source of Performance Enhancing Drugs	Tick as appropriate
Athlete's family	
Team members	
General Practitioners	
Pharmacists	
Clinical officers	
Dealers/suppliers	
Internet	
Sport scientists	
Gym trainers	
Athletes Technical staff	
Researchers	

SECTION D:

The following statements intend to establish your (respondent) experience in relation to doping in sport. Please tick where applicable as honestly as possible.

9. Have you ever been approached by athletes seeking for doping information/drugs?

Yes

No

10. How frequent do athletes ask you for information about banned substances?

Frequency of enquiry on information about banned substances	Tick as appropriate
Never	
Rarely, less than 10% of the chances	
Occasionally, in about 30% of the chances	
Sometimes, in about 50% of the chances	
Frequently, about 70% of the chances	
Usually, in about 90% of the chances	
Every time	

11. The following are some of the drug information athletes often seek about. Identify the ones that are familiar to you. You can tick more than 1

Drug information sought by athletes	Tick as appropriate
Drugs to aid recovery process	
Side effects/ health risks of PEDs	
Shortening recovery time after sports injury	
Additional laboratory examination	
About dosage regimes	

12. During the past 12 months, have you directly received requests for prescription of doping agents?

Yes

No

13. How frequent do athletes ask you for drugs prescription of banned substances for whatever reasons?

Frequency of requests on drugs prescription of banned substances by athletes	Tick as appropriate
Daily	
Weekly	
Monthly	
Once in 3 months	
Once in 6 months	
Once in a year	
Never	

14. Which of the following drugs do athletes seek prescription for? You can tick more than 1 responses.

Drugs (PEDs) athletes seek prescription for	Tick as appropriate
Stimulants	
Anabolic steroids	
Peptide Hormones	
Corticosteroids	
Masking agents	
Diuretics	

15. What do you think compels General Practitioners/Pharmacists to help athletes in doping? You can tick more than one response.

Reasons why General Practitioners/ Pharmacists may help athletes in doping	Tick as appropriate
Money	
Lack of strict regulations/sanctions	
Easy accessibility of doping agents	
Self-satisfaction	
Ignorance	

THANK YOU FOR TAKING YOUR TIME TO RESPOND TO THIS QUESTIONNAIRE.

APPENDIX D: SAMPLING SIZE TABLE

Sample size calculation (95% confidence level)

Population size	Margin of error			
	0.05	0.035	0.025	0.01
50	44	47	48	50
100	80	89	96	99
150	108	126	137	148
200	132	160	177	196
250	152	190	215	244
300	169	217	251	291
400	196	265	318	384
500	217	306	377	475
600	234	340	432	565
700	248	370	481	653
800	260	396	526	739
900	269	419	568	823
1,000	278	440	606	906
1,200	291	474	674	1067
1,500	306	515	759	1297
2,000	322	563	869	1655
2,500	333	597	952	1984
3,500	346	641	1068	2565
5,000	357	678	1176	3288
7,500	365	710	1275	4211
10,000	370	727	1332	4899
25,000	378	760	1448	6939
50,000	381	772	1491	8056
75,000	382	776	1506	8514
100,000	383	778	1513	8762
250,000	384	782	1527	9248
500,000	384	783	1532	9423

*Adopted from: <http://www.research.advisors.com/tools/sampleSize.htm>.

APPENDIX E: RESEARCH ASSISTANTS' TRAINING SCHEDULE

Day 1: Assess potential research assistants' interest to participate in the study using the study inclusion criteria. Activity starts at 9 am and ends at 1 pm.

Day 2: Schedule

PART 1	Time		PART 2	Time		PART 3	Time
Field Preparation	Starts 9 am		Data collection Protocol		Break	The Survey	
1. Principal investigator and research assistant introduction	10 mins		1. Instructions to filling the questionnaire	15 min	15 Minutes Break	1. Informed consent	10 min
2. Brief introduction to the survey	5 mins		2. Nature/format of the questionnaire	10 min		2. Quality monitoring/collecting filled questionnaire	10 min
3. Objectives of the study	5 mins		3. checking of completed questionnaire	5 min		3. Any other concern	30 min
4. Distribution of questionnaire	5 mins		4. Marking responses	5 min			
5. Team structure	15 mins		5. Any other issue/concern	30 min			
6. Explanation of selected areas of the survey	20 mins						
7. Completing the survey	5 mins						
Total Time allocated	65 min			65 min			

**APPENDIX F: APPROVAL OF THE RESEARCH PROPOSAL BY KENYATTA
UNIVERSITY GRADUATE SCHOOL**



**KENYATTA UNIVERSITY
GRADUATE SCHOOL**

E-mail: dean-graduate@ku.ac.ke

Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Our Ref: H87/28033/2018

DATE: 9th July, 2021

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

**RE: RESEARCH AUTHORIZATION FOR MR. ROTICH JONATHAN KIMTAI –
REG. NO. H87/28033/18**

I write to introduce Mr. Rotich Jonathan Kintai who is a Postgraduate Student of this University. He is registered for Ph.D. degree programme in the **Department of Recreation & Sports Management**.

Mr. Kintai intends to conduct research for a Ph.D. thesis Proposal entitled, **“Knowledge, Attitudes and Experiences on Anti-Doping of General Practitioners and Pharmacists in Selected Counties in Kenya.”**

Any assistance given will be highly appreciated.

Yours faithfully,



PROF. ELSHIBA KIMANI
DEAN, GRADUATE SCHOOL

**APPENDIX G: APPROVAL OF THE RESEARCH BY KENYATTA
UNIVERSITY ETHICS REVIEW COMMITTEE**



KENYATTA UNIVERSITY

KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE

Mr. Jonathan Rotich
Kenyatta University
Dept. of Recreation & Sports Mgt.

P.O BOX 43844-0100
Nairobi
Tel.: 8710901/12
Email: chairman.kuerc@ku.ac.ke
26th July, 2021

Ref: **KU/KUERC/CONDITIONALAPPROVAL/VOL.1**

Dear Mr. Rotich,

APPLICATION NUMBER PKU/2307/11446 – KNOWLEDGE, ATTITUDES AND EXPERIENCES ON ANTI DOPING OF GENERAL PRACTITIONERS AND PHARMACISTS IN SELECTED COUNTIES IN KENYA

1. IDENTIFICATION OF PROTOCOL

The application came before the **KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE** with the research topic *Knowledge, Attitudes And Experiences On Anti-Doping Of General Practitioners And Pharmacists In Selected Counties In Kenya*

2. APPLICANT

Jonathan Rotich

3. SITE

Nairobi

4. DECISION

The committee considered the research protocol in accordance with the Kenyatta University Research Policy (Section 8.1.1) and the Kenyatta University Ethics Review Committee Policy

and Guidelines and **APPROVED** that the research proceed **ON CONDITION** that you incorporate its advice as below

5. ADVICE/CONDITIONS

- i. The scientific design should be cross-sectional analytical
- ii. Calculation of the sample size to be worked out at the appropriate section
- iii. There is need for clarity in the actual recruitment process
- iv. Care and protection of the research participants should be stated
- v. Community consideration should be stated
- vi. Should spell out how confidentiality of research participants will be assured

The above specific conditions must be fulfilled in writing before an approval is given.

The manner of fulfilling this conditions should be outlined and submitted to Kenyatta University Ethics Review Committee.

When replying please quote the application number above.

If you accept the decision reached and advice and conditions given please sign in the space below and return to KU ERC a copy of the letter.

11

29 JUL 2021

Prof. Judith Kimiywe
Director, Centre for Research Ethics and Safety

 30/7/2021



**KENYATTA UNIVERSITY
DIRECTORATE OF ETHICS REVIEW COMMITTEE**

Fax: 8711242/8711575
Email: chairman.kuerc@ku.ac.ke
Nairobi, 00100

P. O. Box 43844,

Tel: 8710901/12

Website: www.ku.ac.ke
Our Ref: **KU/ERC/APPROVAL/VOL.1**

Date: 3rd August, 2021

Mr. Rotich Jonathan Kimtai
P.O BOX 43844-00100
Nairobi.

Dear Mr. Rotich

APPLICATION NUMBER: PKU/2307/I1446-Knowledge, Attitudes and Experiences on Ant-Doping of General Practitioners and Pharmacists in Selected Counties, Kenya

This is to inform you that **KENYATTA UNIVERSITY DIRECTORATE OF ETHICS REVIEW COMMITTEE** has approved version 2 of the study protocol together with the attached consent forms dated 03.08.2021. Your application approval number is **PKU/2307/I1446**. The approval period is **03/08/2021 to 03/08/2022**.

This approval is subject to compliance with the following requirements;

- i. Only approved documents including (informed consents, study instruments, MTA) will be used
- ii. 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
- iv. 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
- v. Clearance for export of biological specimens must be obtained from relevant institutions.

APPENDIX H: RESEARCH PERMIT – NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

104560

RESEARCH LICENSE

104560

Applicant Identification Number

104560

Director General

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

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