



**UNIVERSITY OF
STIRLING**

SCHOOL OF SPORT



**DOPING EDUCATION STATUS IN KENYA:
EVALUATION OF KNOWLEDGE, ATTITUDES AND PRACTICE
OF DOPING AMONG ELITE KENYAN ATHLETES**

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

Michael Boit¹, Paul Dimeo², Vincent Onywera¹, Gitahi Theuri¹, Festus Kiplamai¹, Selina Sigei¹,
Danielle Stewart², Lorcan Cronin²

¹**Kenyatta University, Nairobi, Kenya**

²**University of Stirling, Stirling, United Kingdom**

TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	2
EXECUTIVE SUMMARY.....	3
LITERATURE REVIEW.....	3
Background.....	3
Diet and lifestyle factors.....	4
Historical and physiological explanations.....	4
Environmental influences.....	4
Athlete motivation.....	4
Global Flow.....	4
'Migration' of African athletes.....	4
Drug Use: Sport and Non-Sport.....	5
Recreational drug use in Kenya.....	5
Knowledge and use of plants.....	5
Kenyan khat/ miraa.....	5
Drugs in African Sport.....	6
Participants.....	8
Procedures.....	9
Measures.....	9
.....	9
RESULTS.....	10
Knowledge of drug testing procedures.....	10
Knowledge of procedures following a positive test.....	10
Common sources of doping information.....	11

Sports Associations	11
Preferred websites for drug-free sport information	11
Other resources and services	11
Evaluation of knowledge about doping	12
Prohibited substances and methods.....	12
Testing procedures	12
Athlete rights and Responsibilities.....	13
Knowledge of supplements.....	13
Attitudes of Kenyan athlete’s towards doping	13
Evaluation of doping among Kenyan athlete’s	13
Athletes’ perceptions of the extent of doping	13
Association between doping and social drugs	13
Purposeful use of performance enhancing drugs.....	14
Knowledge of fellow athletes using P.E.D’s	14
Use of nutritional supplements bought over-the-counter	14
Use of supplements by Kenyan athletes	14
Extent of use of herbal and nutritional supplements	14
Types of supplements used.....	14
Reasons for use of supplements	14
Athletes suggestions about managing doping in their sport.....	15
Specific drug-free issues or testing needed by athletes.....	15
Means by which you would prefer to be alerted to news on drug-free sport	15
DISCUSSION	16
Knowledge of doping among Kenyan athletes.....	16
Attitudes of Kenyan athletes towards doping.....	16

Doping practices among Kenyan athletes	16
Use of herbal and nutritional supplements	16
Factors that influence the doping practices of Kenyan athletes	17
Sources of doping information used by Kenyan athletes.....	17
SUMMARY	17
Demographic information.....	17
Assessment of doping knowledge.....	17
Attitudes of Kenyan athletes towards doping	17
Doping practices among Kenyan athletes	17
Factors that influence doping practices amongst Kenyan athletes.....	17
Sources of doping information used by Kenyan athletes	17
Effect of age, gender and experience on athlete’s attitudes and doping practices	18
CONCLUSION.....	18
RECOMMENDATIONS	19
REFERENCES	19
APPENDIX.....	23

ACKNOWLEDGEMENTS

Collecting information from coaches and elite athletes is challenging, especially when the subject matter might be considered sensitive. The support of various organisations was vital to the success of this project. We would like to thank the following for their support in assisting with contacting and recruiting respondents:

1. Athletics Kenya
2. High Performance Training Camp - Eldoret
3. ROSA camp - Eldoret
4. Kapsabet Training camp
5. Mashambani Training Camp - Ngong
6. Kasarani athletics officials

We are grateful to all the athletes and coaches who took the time to complete the survey. Their honest responses and discussions underpin the strength of the findings. Finally, we would like to thank the Education Committee members at WADA and in particular the Education Manager Léa Cléret who offered committed support to the project from its inception to completion.

EXECUTIVE SUMMARY

The key objective of this report is to look at the current status of doping education in Kenya and any possible use of ergogenic aids by Kenyan athletes. Kenya has been a power house in middle and long distance running since the 1968 Mexico Olympics. In spite of the Olympic boycotts of 1976 and 1980, Kenya's performance has been spectacular. For instance, the 2008 Beijing Olympics haul of 14 Olympic medals, six of which were Gold, ranked Kenya among the top 13 nations in the world. Although the 2012 London Olympics was less impressive, Kenya's performance was, by any standard, an incredible achievement. Kenya's phenomenal success has led to much research into why the Kenyan's are so successful at distance running. Previous studies by Danish scientists, headed by Professor Bengt Saltin, have focused on Kenyan runners' slender physical parameters in relation to running economy. Recent work by researchers from Kenyatta University, Kenya and the University of British Columbia, Canada, looked at pulmonary function parameters and a possible link with running economy. However, none of these studies have focused on the possible use of ergogenic aids by Kenyan athletes. This report provides information from a study conducted by researchers from the University of Stirling, United Kingdom and Kenyatta University, Kenya. This report establishes baseline data on knowledge, attitudes and the practice of doping amongst Kenyan athletes. The International Olympic Committee (IOC) mandate requires that doping education be made an integral part of every country's sports development program. In light of a recent doping violation by an elite Kenyan athlete and media allegations, research on doping education in Kenya is indeed timely.

The purpose of this study was to evaluate the level of knowledge, attitude towards, possible existence and use of performance enhancing drugs among Kenyan athletes. The study also investigated the reasons for their use as well as the most common sources of doping information in Kenya. The overall goal of the study was to provide information that can be used as a basis for developing doping education programs in an effort to minimize and possibly eradicate instances of doping in Kenya. The target population was elite Kenyan athletes in middle and long distance events. Data was collected from elite Kenyan middle and long distance runners. These covered four main events: middle distance track events, long distance track events, cross country and marathon. The sample comprised of 327 elite athletes, with approximately equal numbers from each event category. Stratified and systematic random sampling was used to

identify participants. Recruitment of the participants was on a voluntary basis. The participants were stratified randomly, first on the basis of gender (male and female) and then on the basis of age (junior and senior athletes). An excellent return rate (approximately 80%) was evident. Data generated from questionnaires was analysed using the SPSS statistical package. Statistical tests were used for comparisons between the stratified samples. The findings are presented in the form of a report; with illustration of the results using charts, graphs and tables. Discussions are carried out with reference to the existing literature. Conclusions and recommendations are made in light of the research findings of this study.

The primary objectives were as follows:

1. To assess the doping knowledge of Kenyan athletes.
2. To examine the doping attitudes of Kenyan athletes.
3. To assess the possible practice of doping amongst Kenyan athletes.
4. To determine the factors that may influence doping amongst Kenyan athletes.
5. To determine the common sources of anti-doping education for Kenyan athletes

This study found Kenyan athletes' knowledge of banned substances to be as follows: 42% reported a low level of knowledge, 26% reported a medium level of knowledge and 30% reported a high level of knowledge. On the issue of Kenyan athletes' knowledge of doping test procedures: 46% reported a low level of knowledge, 36% reported a medium level of knowledge, while only 17% reported a high level of knowledge. With regard to athletes' rights and responsibilities: 32% reported a low level of knowledge, 36% reported a medium level of knowledge, 26% reported a high level of knowledge and only 5% reported having a very high level of knowledge.

With regard to attitudes towards doping, 92% of athletes disagreed with the statement: "doping is necessary for success in sports". Only 8% either slightly agreed or agreed with the statement.

On the issue of doping practices, 4.4% admitted to having used performance enhancing drugs while 95.6% denied ever using performance enhancing drugs. However, 38% of athletes

admitted knowing someone who uses performance enhancing drugs. Furthermore, 15% reported knowing sources or outlets of performance enhancement drugs.

In relation to the question of why athletes practice doping: 38% of respondents attributed it to the desire to excel, 22% cited a lack of awareness of banned substances, 32% reported not knowing the factors influencing doping and 4% felt it was due to external pressures.

With regard to the main sources of doping information: 30% of respondents indicated Athletics Kenya (AK), 19% cited the IAAF, 9% listed WADA and 7% mentioned the National Authority for Campaign against Alcohol and Drug abuse (NACADA).

The Executive Summary covered the background information, methods, objectives and the findings of this report. As articulated in the discussion, the findings of the present study are similar to findings from previous studies on doping education. Since this was the first study of knowledge, attitudes and doping practices in Kenya, it would not be an overstatement to say the study was both historical and informative. Furthermore, the study provides information that can help inform doping policy and guidelines in Kenya. Lastly, this study should also help set the tone for future studies on doping education in Kenya and elsewhere.

LITERATURE REVIEW

Background

Kenya, alongside other East African nations, has had major success in international athletics especially in middle and long distance running. There is a developing body of research offering varied and complex explanations for this athletic success. Nine articles that considered and tested various explanations were identified and included in this review [1-9]. One other dated historical article [10] that broadly discusses the Kalenjin running tribe and examined the various notions that have been advanced for their success was not included within the review due to the time period covered. The Kalenjin tribe has produced a disproportionately large number of elite Kenyan runners. Two further articles that examined related areas were also included in the review. One was associated with the hydration of elite Kenyan athletes [11] and the other compared the motivational factors of elite Kenyan and Danish middle and long distance runners [12]. In addition, two books [13, 14] were considered relevant for inclusion in the review.

This section will firstly consider the literature that has examined diet and lifestyle factors of elite Kenyan runners as related to East African running dominance [5, 9, 11]. Secondly, attention will be drawn to historical explanations concerning colonialism [15], before discussing physiological explanations relating to genetic heritage and body composition [6, 7, 8, 14]. Thirdly, the results of a study of the environmental background of elite Kenyan runners (1) will be considered, before reviewing the less frequently explored explanation of a psychological advantage [4, 14]. Finally, research concerned with the various motivations of elite Kenyan runners [1, 9, 12] will be looked at, with a view to building an understanding of what drives elite Kenyan runners to reach outstanding levels of performance.

Diet and lifestyle factors

Two articles investigated different aspects of the diet and lifestyle of elite Kenyan runners [5, 11]. One assessed the hydration status of elite Kenyan endurance runners during an important training period. This study demonstrated that elite Kenyan runners stay well hydrated day-to-day with an ad libitum fluid intake; a pattern and volume of fluid consumption that is in line with previous observations of elite Kenyan endurance runners [11]. The other study aimed to measure

energy balance in nine elite Kenyan runners during intense training [5]. Energy intake and expenditure were determined over seven days using weighed dietary intake and doubly labelled water. This study indicated that athletes were ‘on average’ in negative energy balance, although there was no loss in body mass. Dietary findings showed that athletes’ diets were high in carbohydrates (67%) with adequate protein (15%) and fat (17%) intake. The authors note that these results are consistent with previous observations that Kenyan runners are in negative energy balance during periods of heavy training [5]. They conclude that a negative energy balance would result in a reduction in body mass; which, when combined with a high carbohydrate diet, would have the potential to enhance running performance by reducing the energy cost of running. However, this study does not provide support for these concluding remarks, since there were no findings of such a reduction in body mass.

A recent article by Onywera [9] gives insight into the past, present and potential future success of East African runners; it deals with the foundations of running excellence, talent identification, diet and injury management used by these runners. Discussing the diet and lifestyle of East African runners, this article notes that nutritional supplements are still largely unknown among most of this population of athletes. This is in line with other research carried out with Kenyan rugby players [16]. Some details are provided into the types of traditional foods consumed by these athletes, with the author focusing on the use of healthy (no ‘junk’) food and drinks to provide energy. Onywera [9] states that athletes have benefited in some ways from the basic equipment and amenities available and the circumstances in which they live and train. He states that they have learned to become self-aware and in-tune with their bodies; monitoring and evaluating their condition without the use of scientific technology. This article does not provide any new evidence into the possible reasons for Kenyan athletes’ phenomenal success, but does provide further insight into the lifestyle of these athletes.

Historical and physiological explanations

A number of studies seek to explain the reasons for Kenyan athletic success. Bale and Sang [13] discuss the dissemination of Western forms of sport as a form of social control in colonial contexts, and explain that these sports have become a source of national identity and prestige. Entine [14] argued that East African runners might have a specific racial or genetic heritage that

predisposes them to success in running. However, geneticists who have investigated this claim have found mixed results. Scott and Pitsiladis [7] noted that by 2007, the only available genetic studies of elite African athletes do not find these athletes to possess a unique genetic makeup; rather they serve to highlight the degree of genetic diversity in East African populations and amongst elite east African athletes. One study found that the ACE gene variation was not an explanatory factor for the superior endurance performance of Kenyan runners [8], while another reported that the oxygen transport of the blood cannot explain this success either [6]. A recent study suggested that Mitochondrial Haplogroup distribution might influence success (2). This study concluded that elite Kenyan athletes differed in their mtDNA haplogroup distribution relative to the Kenyan population. Findings demonstrated that international standard Kenyan athletes display an excess of L0 haplogroups and a lower frequency of L3* haplogroups relative to controls, while national athletes displayed an excess of M haplogroups [2; see also 18].

Environmental influences

A more rigorous social scientific research project, conducted by Onywera et al. [1], surveyed 404 elite level athletes and identified the geographical location of the majority of athletes (Rift Valley), the major ethnic group (Kalenjin), the main sub-tribe (Nandi) and the main language spoken (Nilotic origin). Therefore, successful Kenyan athletes are from a distinctive environmental background in terms of geographical distribution and ethnicity. A key factor was that many of the successful athletes had to run a significant distance to school, which highlights the importance of environmental and social factors in the success of Kenyan runners.

Psychological advantage

Hamilton [4] explored empirical evidence for various influences that have been proposed as contributing factors to East African running dominance, including environmental, physiological, social and psychological variables. This article concluded that there was no clear explanation for the East African success. It was argued, however, that certain psychological factors may maintain this dominance by attributing differences between African and white running performances to stable external factors, and by doing so weakening white runners and empowering East African runners. In this regard, Gill [19] describes the attribution of failure to stable external factors – for example, altitude training – as reducing the shame associated with defeat, but as having the

worst prediction for future performance.

Another article (4) discusses the potential negative consequences of athletes having sustained beliefs about the existence of physiological advantages of their opponents. Baker and Horton [cited in 4] describe the psychological atmosphere created by such beliefs as stereotype threat. The short-term consequences of stereotype threat include state anxiety, more damaging long term effects like feelings of dissatisfaction and ultimately dropout from sport. This possible psychological advantage is less discussed as a contributing factor, but it is worth noting as it is more likely to have an effect on both the East African runners themselves and their opponents. Similar ideas are discussed by Entine [14], who proposes that Kenyan athletes might have internalized a self-conception that identifies themselves as middle and long distance runners. This self-conception serves to perpetuate a culture of running which leads to international success.

Athlete motivation

In addition to the research concerning the explanatory factors for the success of Kenyan runners, the literature search also identified a cross-cultural comparison of motivational factors in Kenyan and Danish middle and long distance runners [12]. Results showed that both groups of runners show higher hope for success than fear of failure, and higher task than ego orientation, with Kenyan runners scoring significantly higher on these aspects of motivation. Furthermore, Kenyan runners demonstrate more extrinsic reasons for running than the Danish runners [12]. This is supported by Onywera et al. [1] who noted that the majority of national (39%) and international (32%) Kenyan distance runners were motivated by economic reasons; although 18% of international athletes, particularly those who ran in the 1970s-80s, ran for Olympic glory and modest financial reward. The motivation and inspiration of young runners from East Africa has been discussed by other researchers [20]. These have been said to include but are not limited to:

- exposure to running at a young age,
- the presence and freedom to meet and spend time with role models,

- opportunities to train in local areas alongside international athletes including World and Olympic Champions,
- athletics being regarded as a route to fame and fortune.

As noted by Scott et al. [2], although the supremacy of East African runners has been much discussed, these results further suggest that this phenomenon is likely to be complex in nature and extremely unlikely to be due to a genetic feature specific to these populations. However, none of these studies explored the potential use of doping substances or natural plants as ergogenic aids to boost performance. This reflects a wider weakness in academic research on the factors that can influence success in international sport, such as legal and illegal substances that might enhance performance [21].

Global Flow

Five peer-reviewed articles and one book chapter were identified that examined the movement of African athletes across borders [22-27]. All articles were concerned with the migration of African athletes from Africa to various countries across the world. The research was predominantly about the sports of football [27-29] and athletics [26, 30, 31]. This section will not review the literature concerning football as the focus of this study is athletics. There will be a brief discussion of Jarvie's [30] sociological chapter, followed by a summary of the two remaining texts on athletics.

'Migration' of African athletes

The first text to discuss is a chapter [30] in an edited collection which provides some sociological insight. The emphasis of the discussion lies with the fact that poverty within Kenya has led to many successful athletes seeking opportunities in other countries. During the past ten years, such opportunities have emerged in the oil rich countries of Qatar and Bahrain, as well as more traditional places like the USA.

In the next paper which will be discussed, Lukalo [31] explores the issue of athlete 'defection', questioning whether athletes, athletics, sports policy and governing bodies are witnessing an evolution in autonomy especially when citizenship changes necessitate identity changes. This

paper explores these issues, while situating the practice of athlete ‘defection’ within the global flow of movement and questions of identity [31].

The migration of athletes, often referred to as the new scramble for Africa [27, 30] started as early as the 1960s with athletes being enticed to American universities. More recently, oil rich countries are importing athletic talent from Africa [30]. One paper [26] recognises that little is known about the experiences of Kenyan student-athletes in the United States and focuses on these athletes who travel away from their homelands for further education. Data collection procedures included telephone interviews and a survey that was emailed to Kenyan student-athletes in the United States. Of the 30 that received the email, 28 responded (22 on email and 6 provided responses via telephone). Findings revealed that:

- student-athletes generally received university degrees in four (60%) or five (40%) years, had full (75%) or partial (25%) scholarships, were satisfied with their academic experience and encouraged their athletic peers in Kenya to pursue their education in the United States.
- many student-athletes also expressed concerns regarding their athletic experiences, the strained relationships with coaches and teammates, and the pressure to continually produce performances in order to maintain their scholarships.

This study illustrates that Kenyan athletes’ sporting and educational experiences in foreign countries are not without a certain degree of pressure and expectation. What is not known is the extent to which these experiences shape their knowledge, attitudes and behaviours towards drug use both in and out of sport.

Drug Use: Sport and Non-Sport

Twenty-two articles were identified that examined drug use in Kenya. Of these, three were concerned with recreational drug use and abuse [32-34] and one study considered Kenyan adolescent knowledge, values and coping strategies (including the use of drugs) and the implications for their health [35]. Thirteen studies addressed participant’s knowledge of drugs, uses of plants and herbal remedies, including five that examined the categorization, use and effects of the natural and popular plant known as ‘khat’ or ‘miraa’ [36-48]. Very little research

investigating drug use in African sport was found. Four sport specific studies involving football [49], rugby [50], the world anti-doping code [51], and performance-enhancing drug-use among sportspeople in Cameroon [52] were identified. In addition, one book chapter considers an action plan for Africa with regard to current problems in sport, ethics and doping [53].

This section will start by providing an overview of one study that considers Kenyan adolescents attitudes towards drugs [35]. This study provides some background information on the prominence of drug use among a sample of Kenyan adolescents. This will be followed by a discussion of the remaining two studies that also explore drug use among Kenyan adolescents. One study investigating the perception of heroin usage was excluded due to a lack of relevance to this study. The second subsection will provide a brief summary of the findings of eight studies that consider participant's knowledge and various uses of plants and herbal remedies [36-43], followed by a review of five papers that examined the categorization, use and effects of the natural and popular plant known as khat or miraa [44-48]. The final subsection will review the five sport specific texts outlined above [49, 50-53].

Recreational drug use in Kenya

The purpose of the study by Balmer and colleagues [35] was to explore the experiences and knowledge of adolescents living in an urban area in Kenya. Additionally, the study sought to understand how the decisions they make affect their physical and psychological health. Data gathered from a sample of 216 adolescents, who lived in lower socioeconomic areas, revealed that 'drugs' was the second most discussed topic (after 'emerging sexuality') [35]. In addition, the use of drugs was a coping strategy adopted by adolescents when they were unable to achieve important values that were identified during the research. The authors conclude that social changes in developing countries have intensified the dilemmas experienced by adolescents and that a comprehensive review of this group is necessary in order to improve their health.

A cross-sectional study designed to determine the factors associated with drug abuse among secondary school students was carried out in nine schools in Kisumu town, western Kenya [34]. The sample included 458 students who were interviewed using a closed-ended questionnaire. The purpose of the research was to determine the effect of age, gender and peer influence on drug abuse and to establish reasons why students abuse drugs. The term 'drug abuse' is used by

the authors who provide a definition within their introduction. It is defined as self-administration of drugs for non-medical reasons, in quantities and frequencies that may cause an inability to function effectively, or may result in social, physical and/or emotional harm.

The results of this study showed that 57% of the respondents had consumed alcohol at least once in their lives, 35% had used tobacco, 18% had used cannabis, 23% had used khat and 5% had abused inhalants and/or cocaine. The reasons given for the abuse of drugs were: experimentation (38%), enjoyment of the feeling they experience (47%), influence from friends (9%), influence from relatives (2%) and for treating stomach ailments (3%). The study recommends that these reasons should be considered when planning health education for secondary schools, and that appropriate intervention, support and referral systems should be established in schools (and extended to places of residence) to prevent drug use. On a methodological note, Otieno and Ofulla [34] propose that young people may feel comfortable to answer a question about the opportunity to use drugs rather than a question about actual drug use, because the opportunity is less likely to be illegal or particularly sensitive. However, the accuracy of this approach may be open to question. In summary, this study and other research of drug use in Kenya found the risk factors associated with drug use to be as follows: low socio-economic areas [34], those aged 16-18 [34], boys [32, 34] and being out of school [32].

Knowledge and use of plants

In each of the eight studies that consider Kenyan participant's knowledge and use of plants and herbal remedies; there was consensus on the tremendous importance of traditional plant use in many societies, including most rural African communities. These ethnobotanical studies are instrumental in disease prevention by improving the chances of discovering plants with antimicrobial activity for new drug development [36, 42]. Several studies [38, 39, 41, 42] reported concerns regarding the continuation of traditional knowledge in certain areas – usually passed orally from generation to generation - where communities are adopting a more Western lifestyle and are becoming more reliant on modern medical care. This said, the findings of the research demonstrated that there is a depth of ethnobotanical knowledge in many regions [36, 41, 42, 54] and one study found that the local population of the Samburu district, Kenya have adopted sound management/conservation practices.

The safety and efficacy of herbal medicine was another theme evident within the literature [40, 55]. Orwa [55] noted that safety and efficacy data are only available for a small number of plants, their extracts, active ingredients and preparations containing them. Since this paper was published in 2002, there has been a developing body of literature concerned with the use and effectiveness of herbal medicine (discussed further in this section). However, research regarding the safety of employing herbal remedies was quite sparse within the literature. One study with a focus on herbs and cancer prevention weighed up several benefits and risks of the use of herbs, concluding that since the use of non-steroidal anti-inflammatory drugs (NSAID) is associated with a reduced risk for several cancers, it is plausible that natural NSAID could be found and used as cancer preventatives [40]. There is limited data available regarding exact usage levels from the studies that were identified. However, there is some data relating to the various uses of plants and respondents reasons for opting for this type of treatment, the details of which are discussed below.

The objective of one study [36] was to document indigenous medicinal plant utilization, management and their extinction threat in the Samburu district, Kenya. Data on plant use from the participants yielded 990 citations on 56 medicinal plant species, which are used to treat 54 different animal and human diseases including: malaria, digestive disorders, respiratory syndromes, and ectoparasites. Another study explored the traditional remedies used in managing various ear, nose and throat (ENT) problems in seven districts of the Central Province of Kenya [42]. The results showed that 67 species belonging to 36 plant families were utilized in this region. The authors report that the most common ENT conditions managed using traditional therapies include: cough, common cold, tonsillitis, otitis-media, chest pains and asthma [42].

The plant use of the Maasai tribe in the Sekenani Valley, North of the Maasai Mara National Reserve, is also examined in one paper [38]. Of the 155 plant species that were collected, 39 had a medicinal use, and 30 species served as food for livestock. In most cases the treatment of illness involves herbal purgatives to cleanse the patient. There are also frequent indications of plant use for common problems like wounds, parasites, body aches and burns. Another study [41] investigated the use of traditional health remedies among the Maasai of Kuku Group Ranch of Southern Kaijado District, Kenya. Use of ethno-medicine was prevalent, with 73% of the respondents indicating that this was their preferred type of treatment. Traditional medicine was

the primary health care system for the community even though 98% of the respondents mentioned that they frequently sought modern health care provided by the local dispensaries and clinics.

Finally, an investigation into the role of herbal medicines in managing diarrhea in an urban area was carried out. This study documented important plants utilized and their conservation status [39]. Results indicated that herbal preparations were the mode of treatment sought by 97% of participants. The reasons for choosing this type of treatment included perceptions of effectiveness over biomedicines (23%) and a lower cost (13%). Other research has reported reasons for the popularity of the use of herbals to include the belief that herbs can provide some benefit over allopathic medicine and allow users to feel that they have some control in their choice of medications [40]. The huge range of conditions treated by plant remedies and the preference for this type of treatment, reinforce the central role herbal medicine plays within many societies in Kenya today.

Kenyan khat/ miraa

This section provides a brief overview of five articles that examined the categorization, use and effects of the natural and popular plant known as ‘khat’ or ‘miraa’. Two papers discussed the functions and categorization of this substance within Kenyan culture [44, 48], two scientific papers considered the health effects related to khat use [46, 47], and a final study attempted to describe the socioeconomic effects of khat chewing in one district of Kenya [45].

There is much debate over the classification and categorization of the substance khat, both within the country in which it is grown and worldwide. Discussion of khat center around the cultural importance of the substance, its long-standing place within the traditions of many groups and the economic significance of its growth and trade [44, 48]. The substance is viewed favorably by various segments of Kenyan society (including the Somalis, Tigania and Igembe) who perceive it as a central focus for social gatherings, a symbol of identity, a valuable contributor to resolving conflicts between disputants, and in bringing families together in marriage alliances [44, 48]. Though at one time restricted to elders, Carrier [44] discusses how miraa is now also incorporated into ‘youth culture’ where it is seen as poa (‘cool’). This paper argues that rather than leading to a dismissal of its traditional importance, for many Tigania and Igembe youth, this

validation of miraa as poa ('cool') reinforces the respect they have for this its traditional and local significance. For Kenyan youth, the fact that miraa is a successful product, is linked to their heritage, and is regarded as poa ('cool') by many of their peers, helps them create an identity as young, modern and coming from the Meru community of Kenya [44].

In contrast, miraa meets disapproval from many groups, among them many Somalian women, groups of the Kenyan middle classes, various religious groups, and some cafes and night clubs. Negative perceptions of miraa in Kenya are common, with the substance seen as a 'drug', the consumption of which is aesthetically unpleasant, unhealthy, a burden on household finances, disruptive to family life, a cause of violence and contrary to religious teaching. One paper [48] reports on the role of the media in creating negative perceptions of the substance. These discourses often include warnings to readers of the damaging consequences of chewing the substance. Perceptions are shaped by discourses at both the local and global level, and it is argued that of great importance is the 'war on drugs' rhetoric, which allows the fusion of miraa with other substances, also termed 'drugs' [48]. Much of the debate surrounding the substance centers on how miraa should be categorized and whether it can be labeled a 'drug'. The 'war on drugs' rhetoric is countered by discourse in which its use is termed 'cool', 'traditional' and an 'economic miracle'.

The legality of miraa varies from country to country, being legal in Kenya, Ethiopia and the United Kingdom, but illegal in Tanzania, New Zealand, the United States and Canada [44, 46, 48]. Miraa's stimulant properties are reported to be particularly appreciated in a work context by those in roles such as night watchman, drivers and students studying for exams [44, 47, 48]. Though there were no consumption statistics available for use of miraa/ khat within Kenya, some reports suggest that 80-90% of the male adult and 10-60% of the female adult populations in East Africa consume khat daily [47].

Recognizing that khat plant leaves contain the active psycho-stimulant substance cathinone, that is similar in structure and pharmacological activity to amphetamine, one paper [46] reports on the health effects associated with a khat chewing habit. Findings conclude that intoxication with khat is self-limiting and that chronic consumption can cause certain health disturbances including: arrhythmia, increased blood pressure, gastritis, constipation, loss of appetite and

effects on fetal growth during pregnancy for women users.

Another study reviewed the literature on the association between khat and mental illness [47]. This study reported that although excessive khat use ‘appears’ to exacerbate psychological problems caused by pre-existing stressors, there is no clear evidence indicating a relationship between khat use and the development of mental illness. This paper suggests that the representation of the harmfulness of khat can perhaps be understood as a case of ‘moral panic’; in which the behavior of a group, often a minority or subculture, is exaggerated or falsely projected as dangerous [47]. It could be suggested that any case of ‘moral panic’ would only be reinforced through the previously discussed negative newspaper coverage of khat.

Another paper carried out a cross-sectional study aimed at describing the socioeconomic effects of khat chewing in Ijara district in the northeast of Kenya [45]. The findings can be summarized as follows:

- Consumption statistics revealed that of the fifty respondents who were interviewed, 88% were khat chewers and the majority (80%) had family members who engaged in the khat habit. The study reported that there was an overall lack of knowledge on the negative effects of this substance.
- As a result of mood changes and withdrawal symptoms when not chewing khat, many respondents spent more than half of their domestic budget on khat, but few (28%) regarded this as a waste of resources. The loss of household income that could have been used for food, home improvements, education or other family needs is recognized by others [46] as a negative effect of khat.
- In total, 54% of khat chewers usually engaged in the habit during the day - implying a reduction in time for productive work. However, only 40% of the participants disclosed that the drug affected work performance negatively.
- Lastly, the khat habit was associated with strain on family relationships, anti-social behavior and health effects such as insomnia.

'Natural' substance use and sport

International sport has been plagued by the use of chemically produced substances such as amphetamines, steroids, human growth hormones, erythropoietin and other advanced chemical innovations. Since the 1960s [56-58] these substances have been used to improve performances. It is these substances that have been targeted by anti-doping regulations and scientific testing. However, 'natural' substances such as coca leaves, kola nuts, opium and theobromine were used in Western countries to enhance sports performance in the early 20th century [56]. There is some evidence to suggest that naturally occurring plants in Kenya, such as miraa, ephedra and khat contain substances banned by WADA's regulations. Discussing ephedrine, methylephedrine and cathine, Mottram [59] states that this group of drugs is structurally related to amphetamine, and adds that ephedrine occurs naturally in the plant genus ephedra. He adds that cathine is derived from the plant Khat. This plant has a number of active constituents, the most potent of which is cathinone, which has amphetamine-like actions [59]. Importantly, although cathinone is not specifically mentioned as an example of a stimulant on the WADA prohibited list, it would constitute an adverse finding under the condition "other substances with a similar structure or similar biological effect(s)".

Carrier [48] notes that antidrug agencies, similar to those found in the United States, have formed in a number of countries and in Kenya miraa is a definite target substance of the National Agency for the Campaign Against Drug Abuse (NACADA). This agency has made appeals for a ban on miraa, including after a recent incident following a Kenyan boxer being sent home from the Olympics after testing positive for cathine, allegedly from chewing miraa (although the boxer denies this). In media reports at the time, a NACADA spokesman "stressed that the legal status of miraa in the country was tantamount to the government courting death and destruction for its citizens...and appealed to the government to ban the drug, adding that it is one of the most abused drugs in the country" [48]. This creates two potential issues for anti-doping authorities. The first is that Kenyan athletes may be deriving a benefit from these plants; the second is that they risk inadvertently testing positive when tested. Indeed, it is possible they might not even consider such substances to constitute a form of doping.

Drugs in African Sport

Kenyan athletes are not widely suspected of doping as there have only been eight high profile cases in the past 20 years. The substances used included EPO and nandrolone, which are common on the list of substances deliberately used to enhance performance. Two athletes were found guilty of using drugs that might have been for medical purposes: clomiphene and salbutamol. One athlete refused an out-of-competition test, while another failed due to a high level of cathine which allegedly came from chewing the natural and popular plant known as khat or miraa. These outcomes suggest that Kenyan athletes are not always aware of the rules and regulations and many athletes who consume herbal or natural substances may be risking a positive test. However, the low numbers suggest that either doping is not a widespread problem or that the testing facilities/ level of testing in Kenya is not on a par with other Western countries. At the same time, academic research on doping sub-cultures, and on international anti-doping policy, has tended to ignore the situation in African and other developing countries. As a result, there is an absence of research on doping behaviours and the interaction between those behaviours and the promotion of anti-doping within Kenyan sport. Four sport-specific studies of doping from Africa were identified. These studies focused on football [49], rugby [50], the world anti-doping code [51], and performance-enhancing drug-use among sportspeople in Cameroon [52]. In addition, one book chapter considers an action plan for Africa with regard to current problems in sport, ethics and doping [53].

As mentioned previously, little research has examined the extent of drug use in sport within Africa and other 'developing' countries. The purpose of one study was to determine the degree of knowledge, consumption levels and identify the factors that influence the utilization of dietary supplements by male rugby players in Kenya [50]. The target population was 210 players from seven teams that participated in the Kenya Cup, the highest level of rugby in Kenya. Simple random sampling was used to select 140 (67%) participants out of the target group. Results and conclusions revealed the following:

- In general, the rugby players had a moderate knowledge about dietary supplements. Percentages were used to describe the players' knowledge levels. Knowledge levels were rated at 44% for creatine monohydrate, 11% for antioxidants, 44% for

multivitamins, 14% for glutamine, 37% for whey protein and 9% for Zinc Magnesium Aspartate (ZMA).

- Reported consumption levels were low with 15% reporting use and 54% reporting that they didn't use supplements.
- Hypothesis testing confirmed that there were significant differences between the variables (age, academic qualification, occupation, experience and club affiliation) and the usage levels and reasons for taking supplements.
- The methods employed in the study did not allow for a clear understanding of why players chose to take supplements or not. Results did reveal that 42% of respondents believed that they often excelled due to supplement intake, while a higher proportion (45%) expressed that their performance was not due to supplement intake. The authors suggest that this means that there are other factors besides supplements that enable these players to perform. The majority (53%) of participants believed it was necessary to use supplements quite often, while over a quarter (27%) felt supplements were not necessary. In addition, most of the players reported that they could not afford to purchase supplements.
- The paper concluded that the Kenyan Rugby Union should endeavour to educate rugby coaches through organised clinics, courses, and seminars focusing on dietary supplementation and its role in enhancing the nutritional status of players.

The limited knowledge about the use of dietary supplements apparent from this study and the requirement for athlete education, poses the question: what are Kenyan athlete's knowledge levels of other substances (both legal and illegal) commonly used within the sport?

Two studies were identified that considered the use of drugs in sport in the African country of Cameroon. The first study aimed to investigate the use and awareness of lawful and unlawful substances by amateur footballers in the country's capital, Yaoundé [49]. A total of 1,116 amateur footballers participated in the study. These were divided into three groups: elite players

($n = 314$), local players ($n = 723$) and female players ($n = 79$). A thirty-item questionnaire was administered with the key themes of: use and awareness of social/recreational drugs, doping substances and nutritional supplements. The results of this study are summarised below:

- In total, 60% of participants stated they had not heard of cocaine, 68% were not aware of anabolic steroids and 74% had not heard of amphetamines.
- Overall, 7% of all respondents indicated that they had used cocaine prior to a match, with the greatest use among local players (8%), followed by professional footballers (5%) and females players (3%).
- A small percentage (6%) of amateur and professional players reported using liboga (a plant root with stimulating effects) before matches.

With regard to doping awareness, results from the study demonstrated that the knowledge of the drugs listed in the study varied between the three groups. In addition, there was evidence of the use of unlawful and lawful drugs both for social and doping purposes in the three groups. Findings regarding the type of drugs used (stimulants, narcotics, iron supplements, etc.) and the lack of doping knowledge highlight the importance of implementing preventative measures and studying drug use amongst footballers [49].

The second paper [52] recognises that the use of drugs is commonly associated with sporting events in Cameroon, particularly among amateur sportsmen and women. The authors highlight that sportsmen and women are not being educated sufficiently about the negative health effects and the potential sanctions associated with drug use in sport. This study also sought to obtain evidence on the current situation in order to inform future prevention programs. In doing this, the study aimed to understand young athletes' doping behaviour, how they acquire drugs, sources of knowledge about drugs, awareness and use of lawful/unlawful substances by young athletes and perceptions regarding Cameroon's anti-doping measures. The study was cross-sectional in design and adopted a multi-method data collection strategy that combined quantitative (questionnaire completed by 1600 young athletes) and qualitative (content analysis of interviews of key informants) techniques. The key findings are summarised below.

Knowledge of unlawful (93%), lawful (55%) and food supplements (84%) associated with sports was common. These knowledge levels are higher than both studies discussed previously [49, 50]. Respondents cited a wide range of performance enhancing substances; most notably Banga (74%) and Cocaine (54%) which are both unlawful [52]. Only 11% of athletes had seen the country's anti-doping regulation. This study also found that without organised education, athletes find out about drugs through friends, the media, and about the negative effects from trainers.

In total, 19% of athletes believed that doping is essential for success in sports and 6% believed that athletes dope out of necessity. Over half of the subjects (54%) disclosed that doping is common within their respective federation [52]. Athletics was among the most affected sports, alongside football, boxing and cycling. Participants revealed knowledge of colleagues and opponents who used drugs. Marijuana and cocaine were the most common substances used.

Athletes acquired drugs from friends, dealers, the market and the pharmacy. Though managers, coaches, sports medics and relatives were reported to be the main drivers behind the supply of doping substances to athletes. Regarding access, around 50% of athletes had acquired unlawful natural substances and 30% unlawful chemical substances [52]. Given the previous discussion of the widespread use and trade of natural substances (such as khat), this finding is not surprising.

Most athletes were aware of the non-implementation of anti-doping measures within their federations. Only 17% of the participants had undergone a drug test during their sports careers. Of those who claimed anti-doping measures were being put into action, 60% mentioned education, 19% surveillance and 11% repressive measures. The study reported that official doping controls were not conducted during local and national competitions and doping surveillance was neither routinely nor intermittently conducted.

Both internal and external pressures to engage in doping behaviour were experienced by athletes. Many doping offenses were said to occur due to ignorance of what constitutes lawful and unlawful substances. This lack of knowledge of what constitutes doping appeared to make athletes vulnerable to manipulation by influential others. Key informants suggested that the

growing popularity and increasing commercialisation of sports was causing young athletes to dope in order to succeed [52].

Kenyan anti- doping policy

A study conducted by Wekesa (62) on the regulation of doping in Kenya revealed there was no regulatory framework or anti-doping policies in the country. In this study, several books, journal and newspaper articles, statutes and Kenyan law books were analysed. Interviews were also accepted out with sporting bodies and government agencies. From the findings of literature reviewed in the study, there was no record of anti-doping laws or policies. Furthermore, sporting bodies had inherent structural weaknesses. For instance, the sports federations lacked procedures and policies for implementing doping education. In fact, implementation of anti-doping education was non-existent.

With the absence of a legal framework and policies to operate on, Athletics Kenya, The National Olympic Committee of Kenya (NOCK) and other government agencies are making efforts to address doping issues. The Kenyan government plans to partner with Norwegian and Chinese anti-doping agencies to help train local experts on anti-doping programs (www.sportsnewsarena.com) The two agencies are expected to help Kenya build anti-doping policies.

An examination of Kenya law reveals Kenya does not directly incriminate the use of PEDs as discussed by Wekesa (62) reveals that sections of the sports bill and sports policy provides for framework for actions against doping. Although the Sports Policy framework does not directly outline procedures of regulating doping, sections of it touch on drugs in sports. (National Sports Policy, 2002). The sections concerns protection of health of individuals by guarding against harmful substances. This section can be improved to provide guidelines on use of drugs in sport.

The ratification of the 2005 UNESCO Convention on 17th of August 2009 meant that under the new constitution, the convention stipulations become part of Kenya law. It provides legal framework for regulating doping in Kenya. This implies the Kenyan government must oversee the implementation of these regulations among sports organs in the country.

The National Olympic Committee of Kenya (NOCK) plays a role in doping control. The committee is affiliated to the IOC and by law, expected to abide by its rules and regulations. IOC, therefore, provides the guidelines with regard to implementation of doping regulations. The Kenya Anti Doping Agency operates under the umbrella of NOCK. This restricts its mandate and operation to members of NOCK.

Meanwhile, several measures are being taken to address existing allegations and issues of doping. The Kenya government has formed a task force composed of anti-narcotics police, doctors and lawyers to investigate allegations of doping and make recommendations on appropriate actions to be taken.

Kenya is also working with Regional Anti-Doping Organization (RADO) Zone Five, of which Kenya is a member, to address doping issues. RADO Zone Five recently supported the training of more doping control officers in the country. In this way, Kenya relies on efforts of RADO and the IAAF to enforce the international anti-doping regulations. The two organisations occasionally conduct in and out of competition testing during major events in the Athletics Kenya calendar. This helps deter athletes from engaging in doping practices.

Kenya's problems in the fight against doping goes beyond the lack of a legal framework and policies. The country does not have an established doping education framework to impart knowledge of doping procedures, the ethical and moral values involved and the effects of doping on an individual's health. Under such circumstance, the Kenyan athlete becomes vulnerable to misleading information on doping and relies on hearsay from sports agents, coaches and colleagues.

METHODS

Participants

In total, 327 elite Kenyan athletes took part in this study. With regard to gender, there were 190 (58%) male participants and 137 (41%) female participants. The age of respondents was as follows: 38.2% were of the junior category while majority (61.7%) were of senior category.

Age	Frequency	Percent
≤ 18	125	38.2%
≥ 36	202	61.7%
TOTAL	327	100%

Table 1: Distribution by age.

This study also established that majority (62.6%) of the interviewed elite athletes first joined world class performance athletics in Kenya between 2006 and 2010, while 17.7% joined between 2011 and 2013, and in 1985-1999 only 2.1% of those interviewed had first joined world class performance athletics (Table 2).

Athlete Experience	Frequency	Percent
1985-1999	7	2.1%
2000-2005	57	17.4%
2006-2010	205	62.6%
2011-2013	58	17.7%
TOTAL	327	100%

Table 2: Year the athlete joined world class performance athletics.

Table 3 displays the athletic discipline of the participants surveyed. Majority of the athletes competed in long distance track events >800M (58.1%). The next highest group competed in cross country/ marathon (39.1%) and a total of 9 % competed in both track and field. Only 1% competed in walking race.

Event	Frequency	%
Cross country/marathon	128	39.1%
Track events long races >800M	190	58.1%
Track & Field events(throws)	1	0.3%
Track & Field events(jumps)	7	2.1%
Race walking	1	0.3%
Total	327	100%

Table 3: The athletic discipline of athletes surveyed

Procedures

The participants in the current study were contacted through the training camps they lived and trained in. In practical terms, this meant contacting the camp manager who gave their approval for the survey to take place. As an inclusion criteria, the athletes completing the survey must have been currently active in athletics at elite level, competing either at national or international level. The survey was distributed to athletes from four major training camps: 1. High Performance Training camp in Eldoret, 2. Rosa training camp in Eldoret, 3. Kapsabet training camp, and 4. Mashambani training camp in Ngong. Additionally, officials from Athletics Kenya and from the Kasarani area helped distribute the survey to eligible athletes. Out of the 400 surveys distributed, 327 were successfully completed and returned. This 83% response rate is very good when compared to other similar studies.

Measures

The WADA survey participants completed was previously used in a study involving UK Sport athletes in 2005. The survey examines the knowledge, attitudes and behaviors of athletes to ergogenic aids and doping/ anti-doping issues. For the current study, the survey was adapted to

the Kenyan context. In practical terms, this meant translating the survey into Kiswahili (the national language of Kenya). This was achieved by getting a fluent English and Kiswahili speaker to translate the survey from English to Kiswahili. Additionally, some questions had to be adjusted for the Kenyan context. For example, 'When did you join the World Class Performance Program' had to be adjusted to 'When did you start training at an elite level'. This was because no official World Class Performance Program exists within Kenyan athletics.

The survey included a combination of factual knowledge questions with closed answers of 'Yes' or 'No', questions with a number of options to choose from, and attitude questions with space for open-ended written answers. Participant anonymity was ensured by not requiring athletes to give their name when answering the survey. It was hoped that this measure would ensure honesty of responses.

RESULTS

Knowledge of drug testing procedures

The survey began with questions about the athletes' knowledge of doping procedures and procedures that follow a positive test. Of the responses, 41.9% of athletes indicated being 'very well informed' about drug testing procedures, 7.2 % indicated they were 'well informed', 10 % said they were 'not informed', 2.4 % indicated they were 'poorly informed', and finally, 38.5% said they were 'very poorly informed' (see Figure 1).

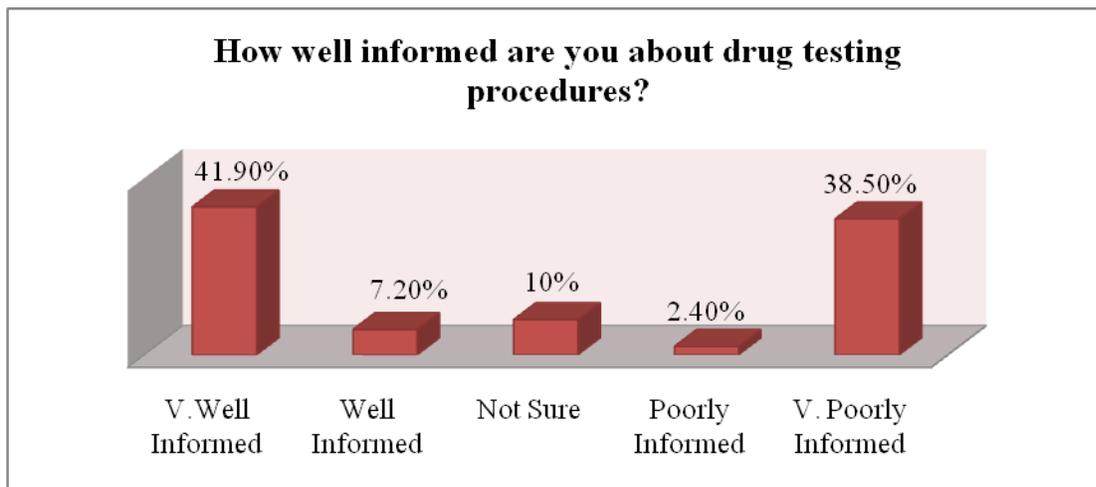


Figure 1: Drug testing procedures

Knowledge of procedures following a positive test

On the issue of whether they knew the procedures that follow a positive test, 35.5 % reported that they were 'very well informed', 9.2 % indicated they were 'well informed', 7% were 'not sure', 8.3% said they were 'poorly informed' and 40% indicated they were 'very poorly informed' (see Figure 2). The findings indicate a lack of adequate knowledge on doping procedures by more than half of the participants.

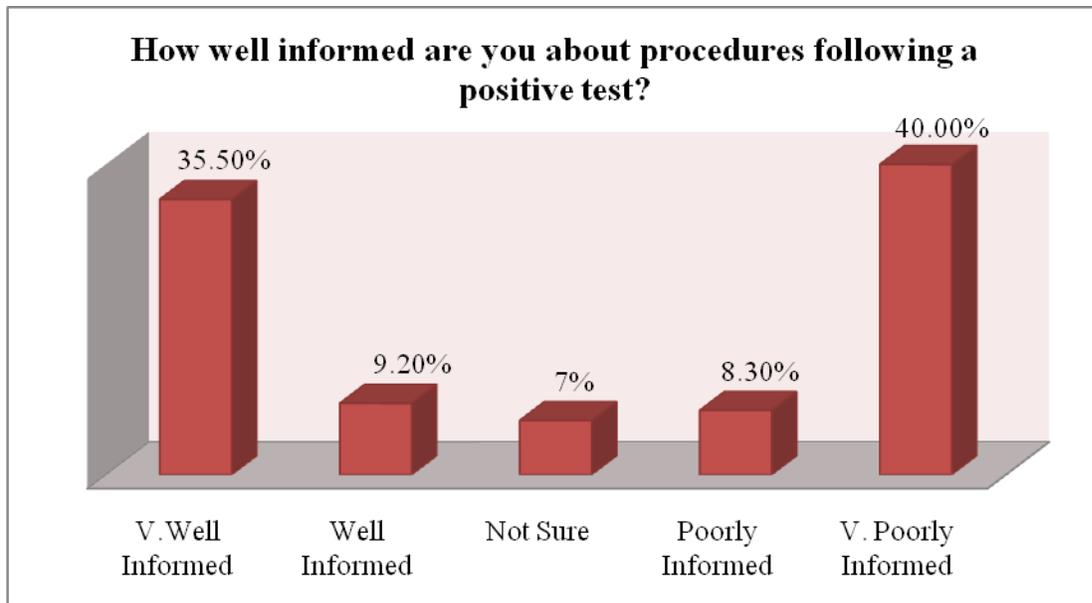


Figure 2: Knowledge of procedures following a positive test

Athletes' exposure to in and out of competition testing

With regard to drug testing experience, a question was posed to establish the number of athletes who have undergone drug testing. Of the responses, 59% reported that they have never been tested, while 41% indicated having been tested at one time or another (see Figure 3). Of the 158 athletes who have undergone testing, 65 athletes (21%) reported having been tested 1-3 times and 58 (18%) reported being tested 4-10 times.

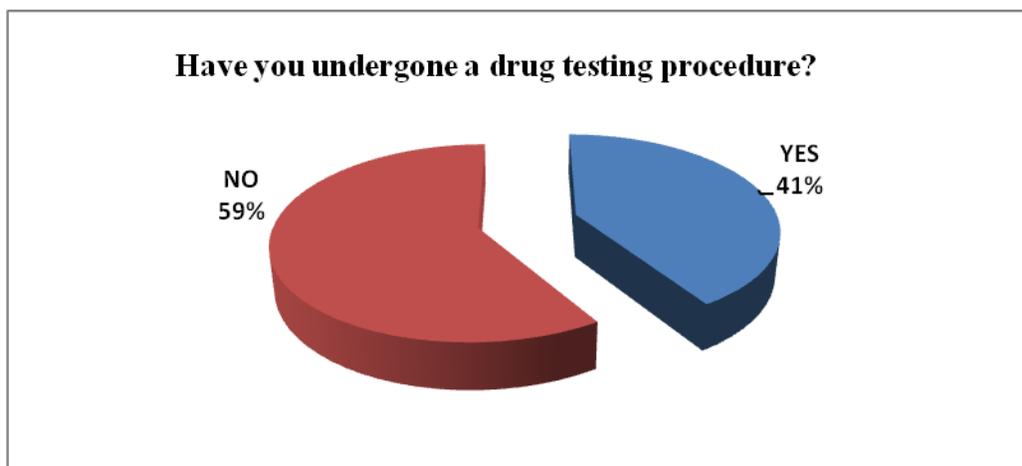


Figure 4: Exposure to drug testing

Satisfaction with explanation of testing procedures

Asked if they were satisfied with the explanation they received about testing procedures, 40.8 % indicated being ‘very satisfied’, 41.5% as being ‘satisfied’, 7.7 % as being ‘neither satisfied nor dissatisfied’, 5.6% were ‘dissatisfied’, while 4.3 % either ‘do not remember or did not receive an explanation’ (see Figure 4).

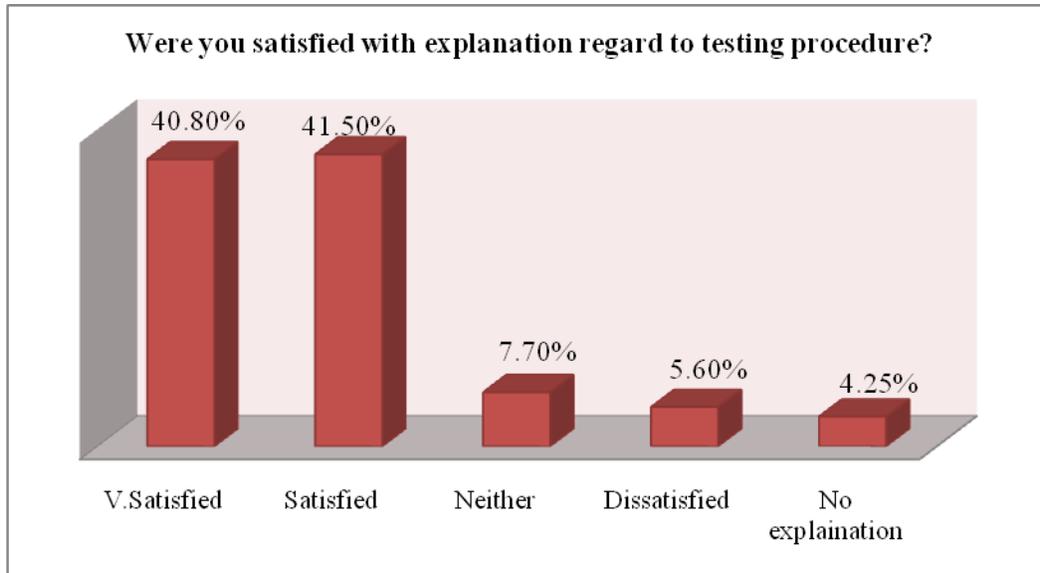


Figure 4: Satisfaction with testing process explanation

On the issue of whether they were satisfied that the test was carried out fairly and accurately, 36.7% reported they were ‘very satisfied’, 51% indicated they were ‘satisfied’, 5.8 % said they were ‘neither satisfied nor dissatisfied’ and a further 7.5 % were either ‘dissatisfied’ or very dissatisfied (see Figure 5).

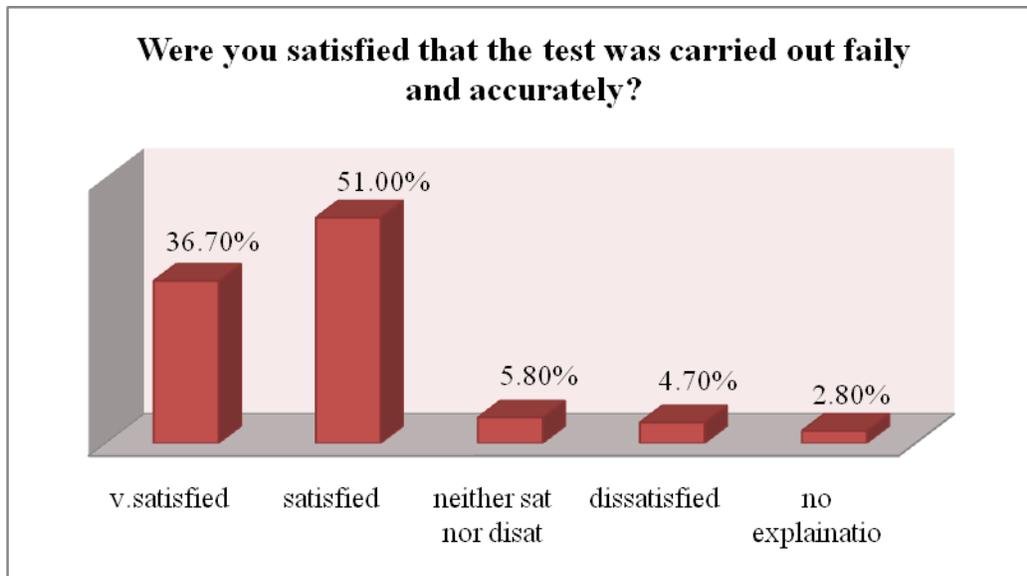


Figure 5: Satisfaction with fairness of the testing process

Common sources of doping information

The second set of questions assessed the common sources of doping information used by Kenyan athletes. Among the areas that were assessed were websites, sports associations, emails, information lines, advice cards, athletes’ coaches, doctors and managers.

Sports Associations

According to the respondents, the most common source of doping information is Athletics Kenya (30.6%) followed by the IAAF at 19.4% (see Table 5). The study also established that a substantial number (20.4%) of athletes have never received information on drug-free sport ,while 9.2% indicated that they have received information on drug-free sport but they are not certain about the source.

Source of Information	Frequency	Percent
AK	96	30.6
NACADA	22	7
IAAF	61	19.4
World Anti-Doping Agency	29	9.2
Other	13	4.1
Do not know the source(s)	29	9.2
Never received information on doping	64	20.4
	314	100
Missing	13	3.9

Table 4: Common sources of doping information among sports associations

Preferred websites for drug-free sport information

When athletes were asked to name their preferred website for drug-free sport issues, two distinct categories of athletes emerged; those who visit the Athletics Kenya website (40.3%) and those who indicated they had no time to spend on browsing the internet (33.6%) (see Table 5). The third category was those who visit WADA website (11.5%). Ten percent of the athletes visit other websites.

	Frequency	Percent
AK	133	40.3
International Federation Website	17	5.2
World Anti-Doping Agency Website	38	11.5
Other Websites	11	3.3
Not spent time on drug free sport information	111	33.6
Total	310	93.9
Missing	17	6.1

Table 5: Preferred website for drug-free sport information

Other resources and services

This study was also interested in exploring all possible sources of anti-doping information, thus prompting inquiry into other sources of anti-doping information for Kenyan athletes. When respondents were asked to name other sources, 26.9% of respondents mentioned the media, 17.3% listed coaches, 15.4% said Athletics Kenya officials /offices, and 14.4% mentioned chemists, 11.5% mentioned books and 10.6% mentioned internet. A minority (3.8%) mentioned private doctors who do not officially operate clinics but claimed to have knowledge of medicine and are able to assist athletes, which in the figure below have been referred as quack doctors (see Figure 6).

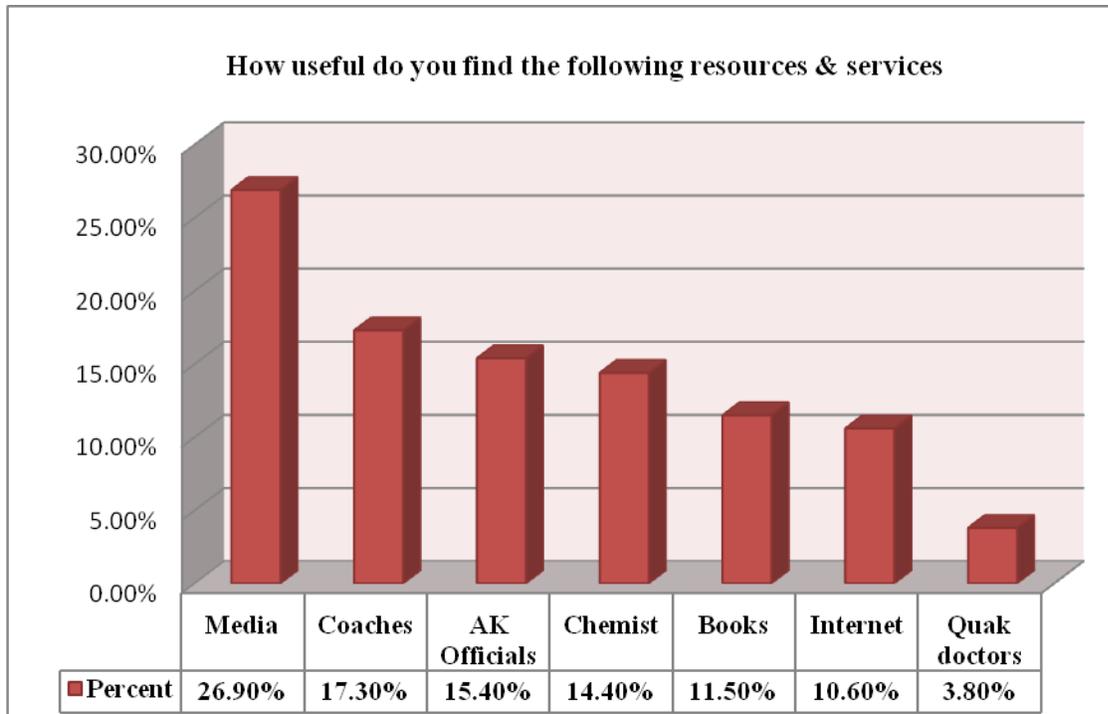


Figure 6: Other resources for anti-doping information

Attendance and perception of workshops on drug-free sport

The athletes were asked whether they have attended a workshop on drug free sport and how useful they found it. Of the respondents, 26.6% reported having attended a workshop and 72% indicated that they have not attended a workshop (see Figure 7).

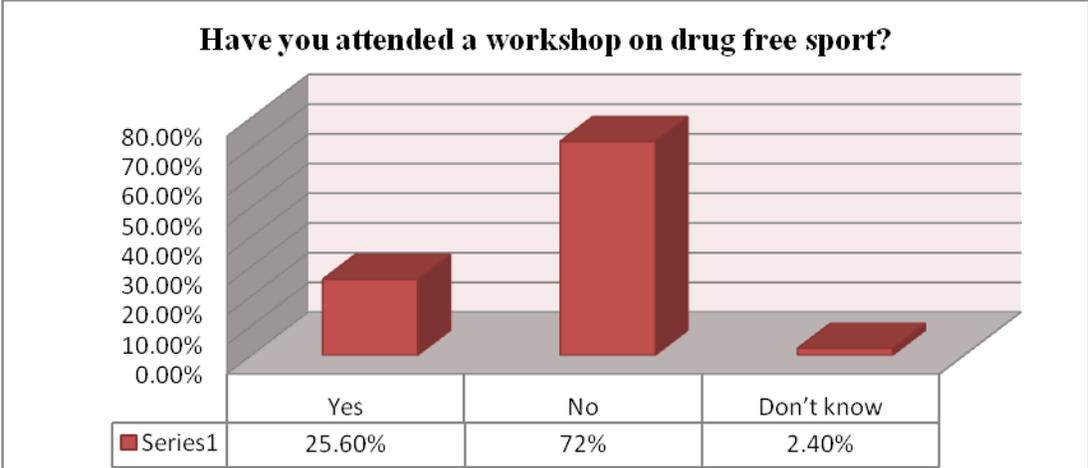


Figure 7: Drug-free sport workshop attendance

Of those who have attended, 65.2% reported the workshop as being ‘very useful’, 15.7% said the workshop was ‘useful’, 6.7% were ‘not sure’, 5.2% said the workshops were ‘not useful’ and 7.2% said they were ‘not at all useful’ (see Figure 8).



Figure 8: Perception of workshop

Athletes' officials as sources of information on doping

Athletes were asked whether they get information on doping from their personal officials. (see Figure 9). In total, 87.1% indicated having received information from coaches, 6% indicated 'no' they had not received information from coaches, while 3% indicated they were 'not sure'. Asked about their GP, 43.3% of athletes indicated having received information from their GP, 36% said 'no' they had not received information from their GP, while 4% indicated they were 'not sure'. Of the respondents, 58.4 % of the athletes confirmed having received information from a team doctor, 22% indicated 'no' they have not received information from their team doctor, while 10% were 'not sure'. Asked whether they have received information on doping from their governing body, 43.6 % indicated 'yes', 33% said 'no', and 10% said they were 'not sure'. With regard to researchers as sources of information on doping, 45.5 % indicated 'yes' they had received information from a researcher, 31% said 'no' they had not received information from a researcher, and 5% were 'not sure'.

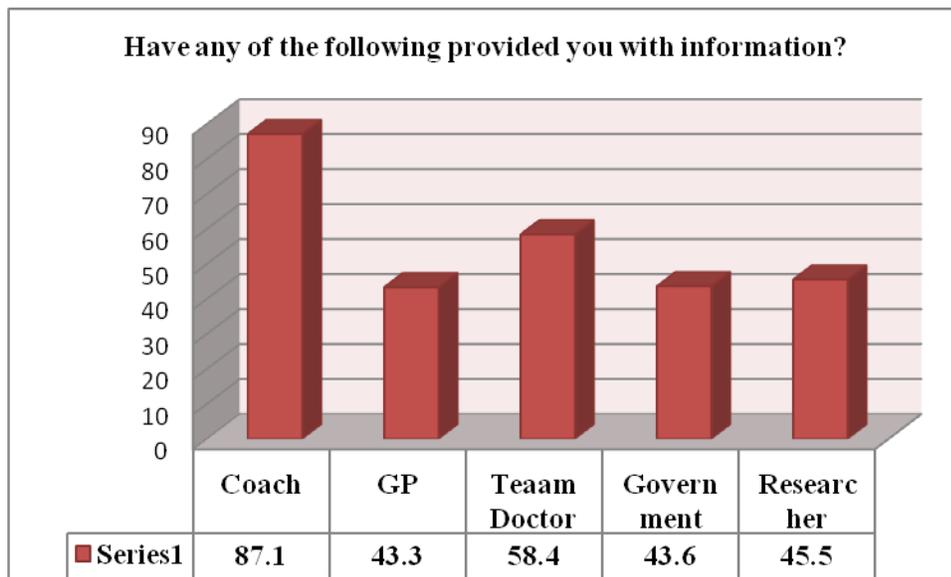


Figure 9: Sources of information on doping

Evaluation of knowledge about doping

A total of twenty questions were asked to test athletes' actual knowledge of doping on four major areas: prohibited substances, testing procedures, athletes' rights and procedures, and use of supplements. A five-point Likert scale (where 0 indicated 'very low', 1 indicated 'low', 2

indicated ‘medium’, 3 indicated ‘high’ and 4 indicated ‘very high’) were used to evaluate the athletes’ knowledge of specific doping issues.

Prohibited substances and methods

Results were as follows (see figure 10): 31% of athletes had a ‘high’ to ‘very high’ knowledge of prohibited substances, 42% of athletes had a ‘low’ to ‘very low’ knowledge of prohibited substances, and 27% of athletes had a ‘medium’ level of knowledge of prohibited substances. These findings indicate that a great majority of Kenyan athletes are ignorant about substances that are classified as prohibited in sports.

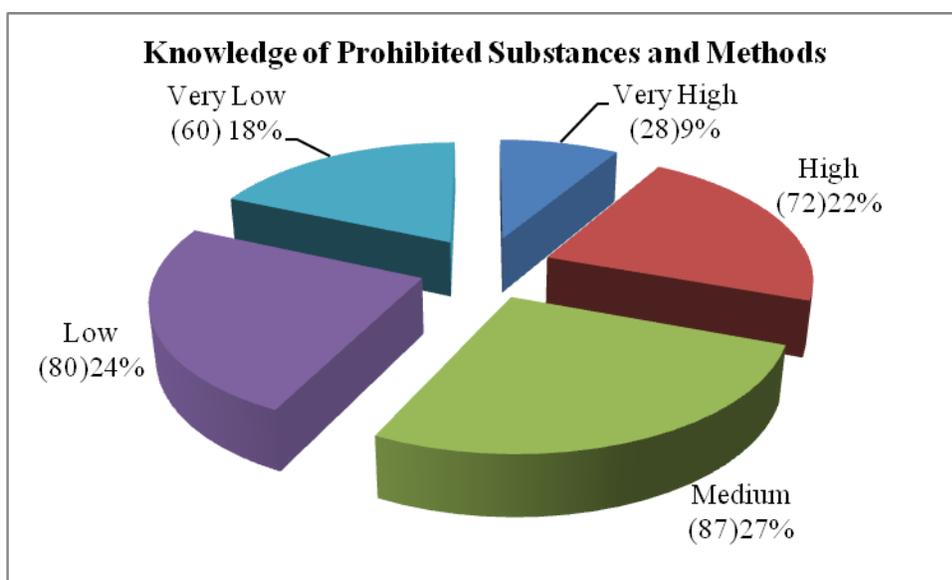


Figure 10: Knowledge of prohibited substances and methods

Testing procedures

Results reveal that a great number (46%) of athletes have a ‘low’ to ‘very low’ knowledge of testing procedures (see Figure 11). Additionally, only 18% of athletes had a ‘high’ to ‘very high’ knowledge of testing procedures. This finding indicates that many Kenyan athletes are ignorant of the testing procedures.

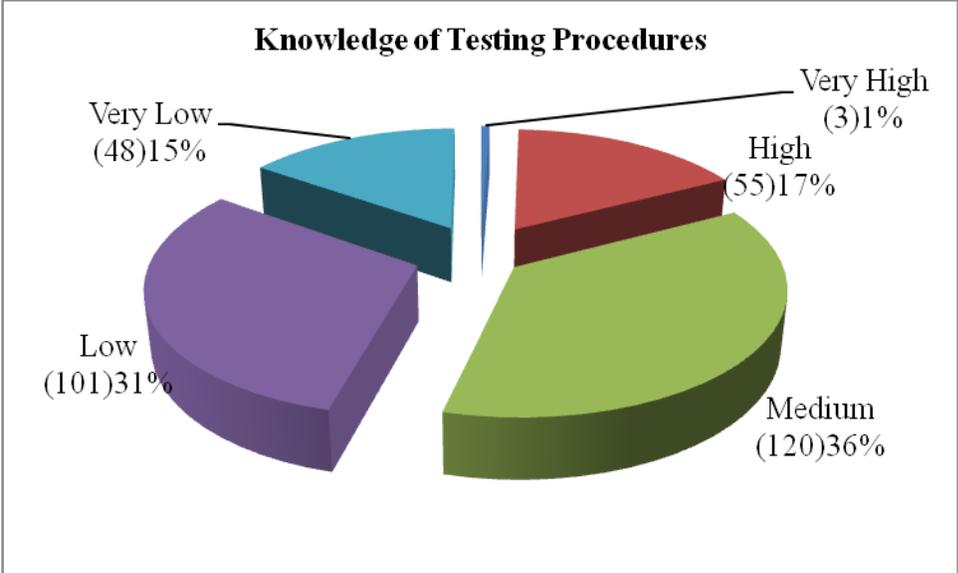


Figure 11: Knowledge of testing procedures

Athlete rights and Responsibilities

With regard to athlete rights and responsibilities, the results suggest that athletes are generally aware of this issue. Figure 12 indicates that 12% have ‘very low’ knowledge, 21% have ‘low’ knowledge, 36% have ‘medium’ level knowledge, 26% have ‘high’ knowledge and 5% have ‘very high’ knowledge. These results point to a population that is fairly well informed.

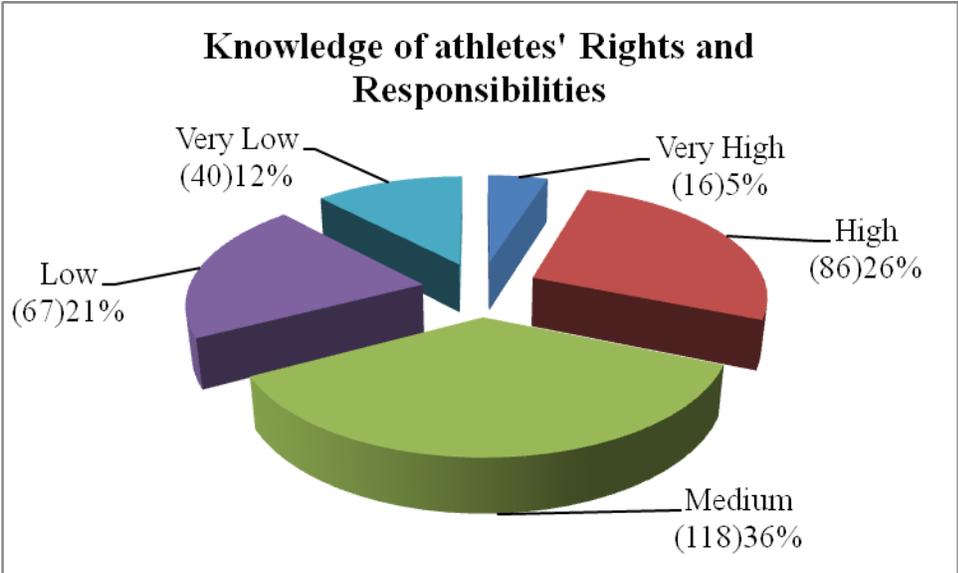


Figure 12: Knowledge of athletes’ rights and responsibilities

Knowledge of supplements

Figure 13 indicates that athletes' knowledge of supplements is fairly good as 46% of respondents indicated they had 'high' to 'very high' knowledge of supplements. In comparison, 31% indicated they had 'low' to 'very low' knowledge of supplements. A further 23% had medium knowledge.

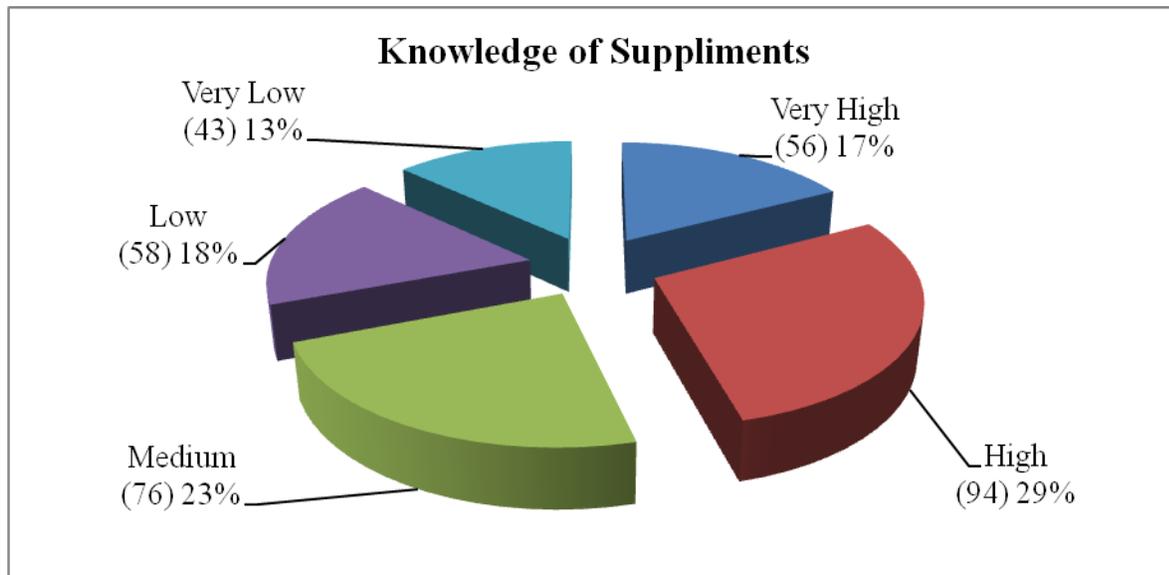


Figure 13: Knowledge of supplements

Attitudes of Kenyan athletes towards doping

A thirteen-item attitude scale was used to assess athletes' attitudes toward doping. The respondents were asked about doping, on a six-point Likert scale, to indicate the extent to which they 'agree' or 'disagree' with statements concerning doping. Responses to all the statements were collapsed and a composite index (mean score) computed for all the functions as indicated in Table 6.

Majority (91.6%) of respondents were in the 'slightly disagree', 'disagree' and 'strongly disagree' categories; whilst only 8.4% either 'slightly agree' or 'agree' with doping. When asked whether doping is necessary to be competitive: 78% indicated they 'strongly disagree', 12% 'disagree' with the statement, 2% 'slightly disagree', while a total of 8% either 'agreed' or slightly agreed with the statement. Athletes were also asked whether it is only the quality of performance that should matter, not the way athletes achieve it. Similarly, majority of athletes

(71%) chose to ‘strongly disagree’, 18% indicated they ‘disagree’ and 4% said they ‘slightly disagree’. In contrast, only 7% indicated that they either ‘slightly agree’ or ‘agree’ or with the statement. In both questions none of the respondents strongly agreed with the statement. The above findings indicate that Kenyan athletes have a negative attitude towards doping.

Response	Frequency	Percent
Strongly Disagree	86	29.4
Disagree	124	42.4
Slightly Disagree	58	19.9
Slightly Agree	21	7.2
Agree	3	1
Strongly Agree	0	0
Total	292	100
Missing	35	

Table 6: Overall attitudes of Kenyan athletes towards doping

Evaluation of doping practice among Kenyan athletes

A number of questions were raised to establish the possible occurrence and/or infringement of the eight anti-doping violations stipulated by WADA. Areas assessed included purposeful or accidental use of PEDs, knowledge of colleagues using PEDs, presence of PEDs outlet/suppliers in the country, and possible consumption of nutritional/herbal supplements containing prohibited substances.

Athletes’ perceptions of the extent of doping

This section was introduced with a general question to establish the athletes’ perception of doping as a problem in their sport. Results revealed that a high percentage of athletes (47%) felt that doping is a problem in their sport. Up to 11.4% were not sure whether doping was a problem in their sport or not. On the contrary, 7.1% felt it was not a major problem while 34% felt it was not a problem at all.

To what extent do you consider doping to be a problem in your sport	Frequency	Percent
To a major extent	120	40.4
To a good extent	21	7.1
Neither high or low	34	11.4
To low extent	21	7.1
Not a problem at all	101	34
Total	297	100
Missing	30	

Table 7: To what extent is doping a problem in your sport

Association between doping and social drugs

Those respondents who suggested that doping is a problem ‘to a major extent’ and ‘to a good extent’ were asked what they felt were the reasons for doping. The majority of athletes (41.3 %) were of the opinion that doping is used for ‘performance enhancement’, 25% believe that doping is used for ‘both performance enhancement and as a social drug’, 7.8% believe that doping was used as a ‘social drug’; while 25.7% said they ‘don’t know’ (see Figure 14).

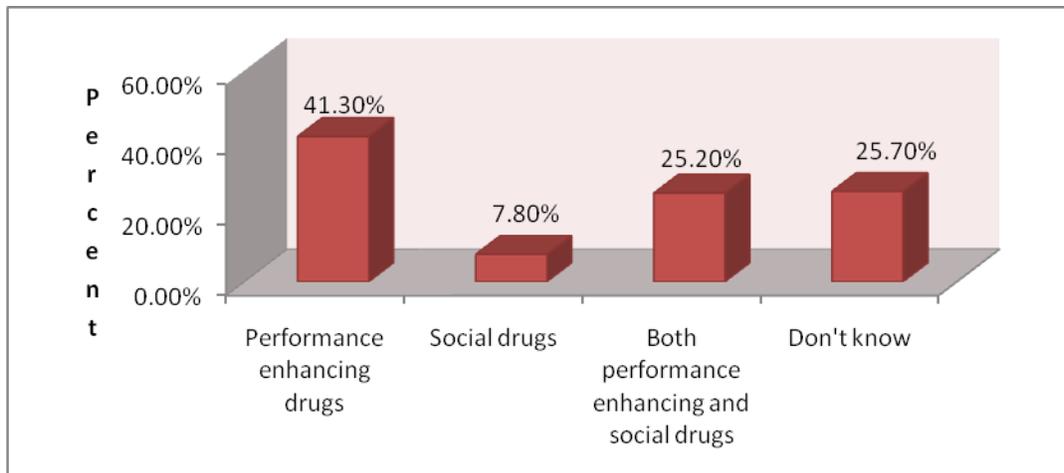


Figure 14: Reasons for drug use

Purposeful use of performance enhancing drugs

When athletes were asked whether they have ever used performance enhancing drugs either ignorantly or purposely, 4% said ‘yes’ while 96% said ‘no’ (see Figure 15). This finding suggests a low level of usage of performance enhancing drugs amongst Kenyan athletes. However, the fact that a section of the respondents had used P.E.D.s may be a wake-up call for Kenyan athletics.

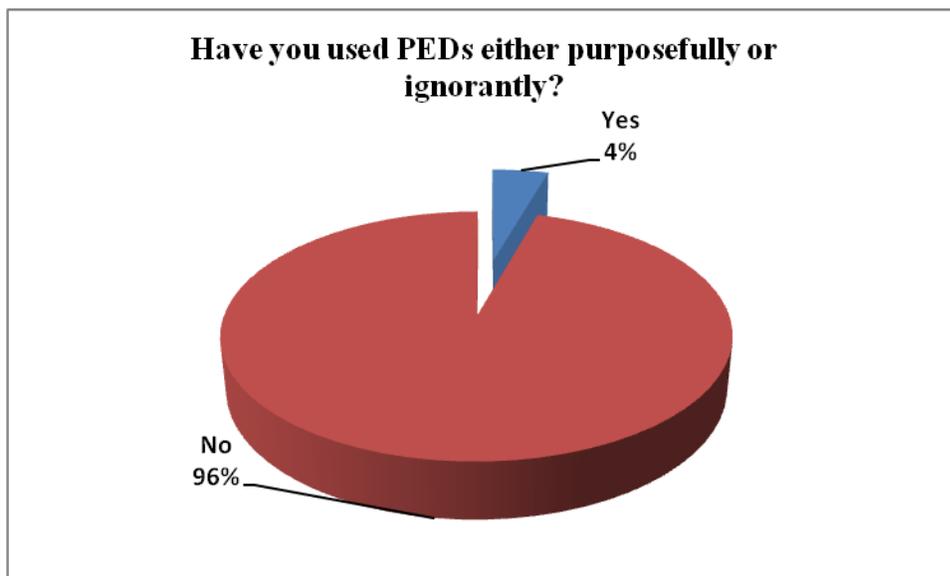


Figure 15: Have purposefully used performance enhancing drugs

Knowledge of fellow athletes using P.E.D.s

The athletes were also asked if they knew a colleague/fellow athlete that used performance enhancing drugs. Results showed that 38% of respondents indicated that they knew a fellow athlete who used P.E.Ds, while 62% did not know of a fellow athlete who had used P.E.Ds (see Figure 16). These findings contradict the earlier results that only 4.4% have used P.E.D.s, since the same athletes admitted that they have heard of a fellow athlete who used performance enhancing drugs. Furthermore, 15% of athletes indicated that they have heard where the drugs can be accessed.

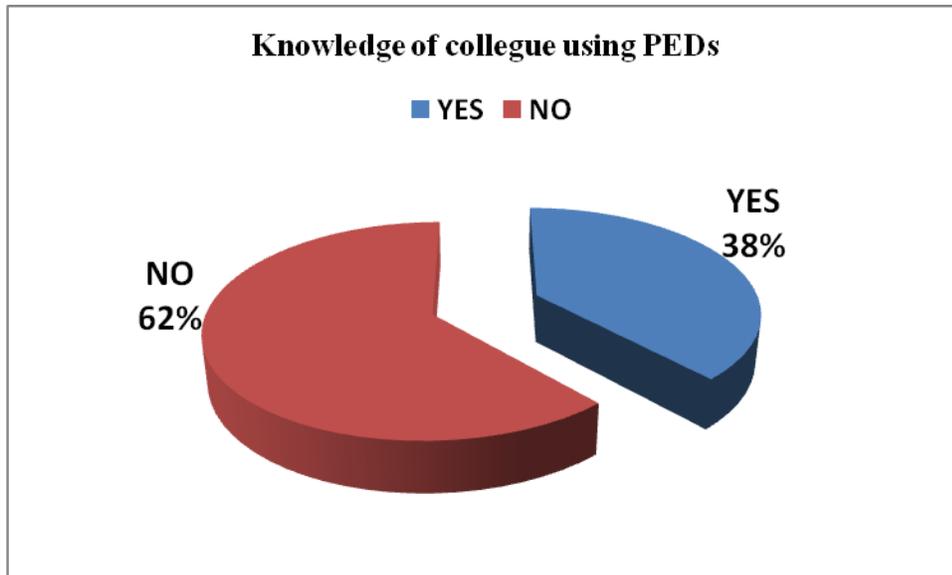


Figure 16: Knowledge of an athlete who uses P.E.D.s

Use of nutritional supplements bought over-the-counter

Two questions were asked in order to establish the possible use of P.E.D.s ignorantly through the use of nutritional supplements bought over the counter. Firstly, athletes were asked whether nutritional supplements bought over-the-counter were safe to use. Secondly, athletes were asked if the label would indicate prohibited substances. In response to the first question, 27% of athletes agreed that it was ‘true’ that supplements bought over the counter were safe, 56% indicated this was ‘false’, while 17% ‘did not know’ the answer (see Figure 17). This indicates that 27% or more of these athletes could easily have used or be currently using nutritional

supplements with a prohibited substance, solely on the basis that they thought supplements bought over-the-counter are safe. Additionally, those who ‘did not know’ if the statement was true or false (17%) could be vulnerable to making a choice (unknowingly) that could ruin their athletic career in the event of using a nutritional supplement bought over-the-counter. This perhaps underscores the need for educating these athletes about the use of supplements.

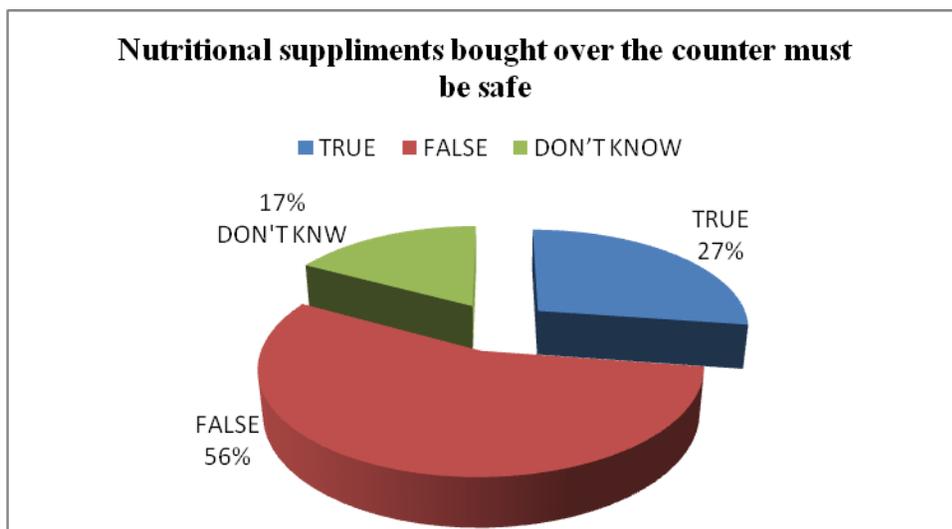


Figure 17: Safety of over-the-counter nutritional supplements

Use of supplements by Kenyan athletes

The purpose of this section was to establish the extent to which Kenyan athletes use supplements, the reasons behind their usage and how much they knew about the risk associated with supplements in relation to WADA violations.

Extent of use of herbal and nutritional supplements

When athletes were asked whether they use or they had used herbal or nutritional supplements 21.4 % indicated ‘yes’, 73.9 % said ‘no’, while 4.7 % indicated ‘don’t know’ (see Figure 18). These results suggest that the majority of Kenyan athletes are not using herbal or nutritional supplements.

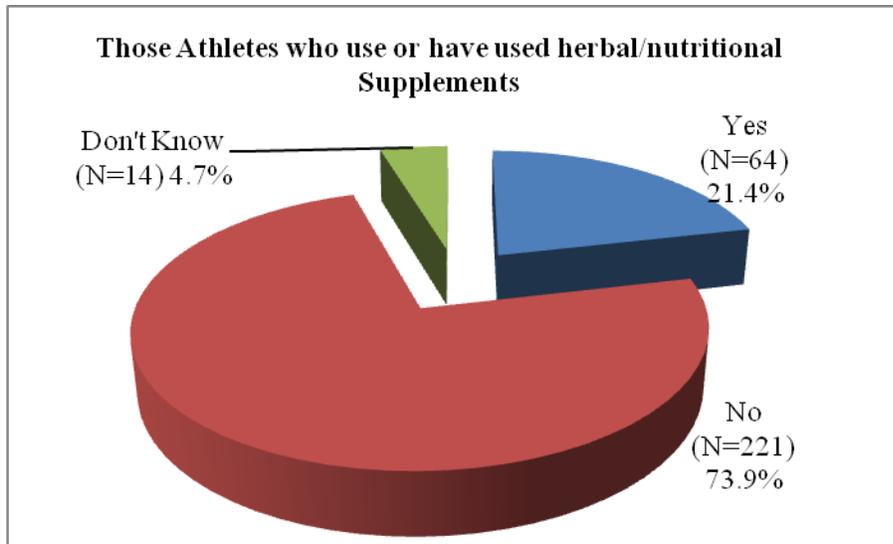


Figure 18: Those athletes who use or have used herbal/nutritional supplements

Types of supplements used

Those who indicated that they had used herbal or nutritional supplements were asked to indicate whether they had used any of the supplements in Figure 19. The results indicate that apart from multivitamins (16.7%) and vitamin C (8.5%), the respondents only used other supplements to a small extent.

Supplement		Frequency	Percent
Creatine	Yes	4	1.2
	No	324	98.5
Iron	Yes	11	3.3
	No	318	96.7
Ginseng	Yes	2	0.6
	No	327	99.4
Multivitamins	Yes	28	8.5
	No	301	91.5
Vitamin C	Yes	55	16.7
	No	274	83.3
Caffeine	Yes	6	1.8
	No	323	98.2
Magnesium	Yes	7	2.1
	No	322	97.9
Whey Protein	Yes	3	0.9
	No	326	99.1
Echinacea	Yes	1	0.3
	No	328	99.7
Khat	Yes	0	0
	No	329	100
Others	Yes	2	0.6
	No	327	99.4

Table 8: Types of supplements used by Kenyan athletes

Reasons for use of supplements

Though the study indicates that Kenyan athletes have diverse reasons for using supplements, the most important reason appears to be ‘to enhance my endurance’ (15.5%) (see Table 9).

Reasons given for supplement use:	Percentage responses
No time to prepare nutritious meals	1.2%
To maintain my strength	0.9%
To enhance my endurance	15.5%
To allow me to train longer	3.0%
To overcome an injury	1.5%
I was advised by my doctor/ nutritionist	2.4%
It's provided to us by the governing body	0.3%
Other reasons	0.3%

Table 9: Reasons for using supplements

Factors that Influence Doping practice

An assessment of potential factors that may influence Kenyan athletes to dope established that desire for money prize was the strongest factor, with up to 54% of the athletes in the study mentioning it. This was followed by lack of knowledge, at 18%, and external pressure (14.4%). Ignorance of side effects and easy access to drugs were least, with 8% and 6% respectively.

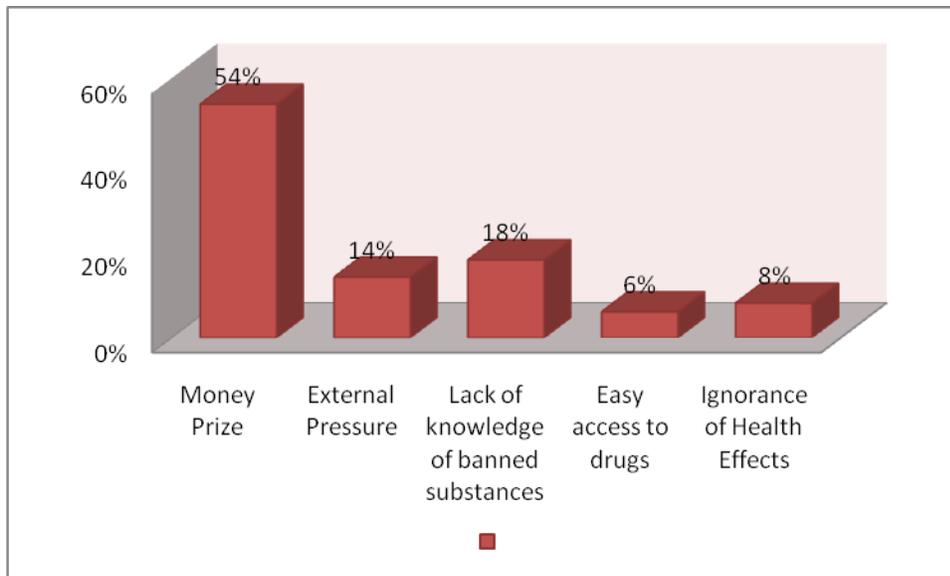


Figure 19: Factors that influence doping

Athletes suggestions about managing doping in their sport

The final part of the questionnaire sought to establish the athletes’ opinions on how to manage doping in their sport. This included the areas that they would like to receive further information about.

Specific drug-free issues or testing needed by athletes

One question asked respondents which drug-free issues they would like more information about. In summary, 29.3 % of athletes indicated the ‘WADA code’, 24.3 % said ‘prohibited substances and methods’, 21.3 % indicated ‘anti-doping rules’ and 14.7 % said testing procedures (see Figure 19). These responses indicate that respondents were eager to learn more about drug-free issues.

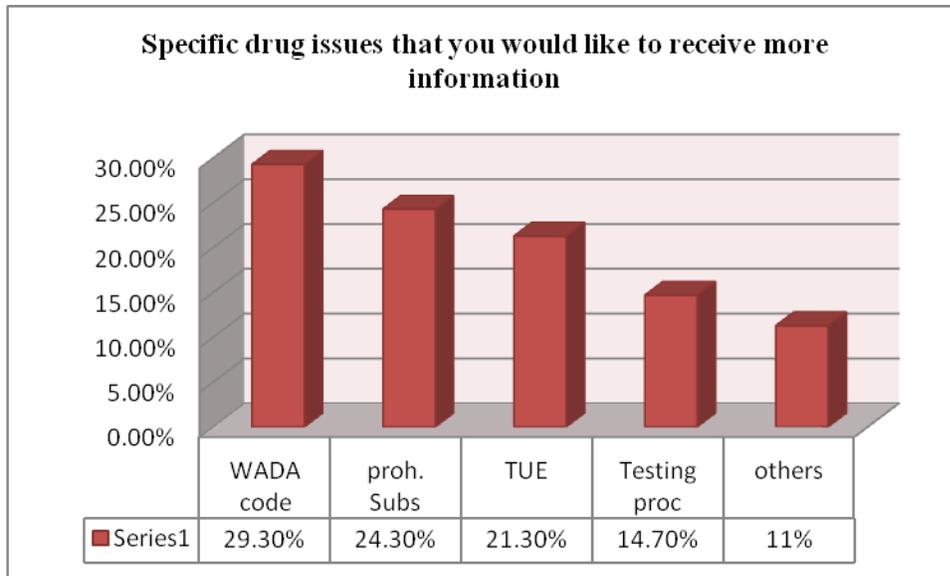


Figure 20: Drug-free issues athletes would like more information on

Means by which you would prefer to be alerted to news on drug-free sport

Another question asked athletes how they would prefer to be alerted to news on drug-free sport. In summary, 41.9% of athletes indicated their ‘coach’, 23% said via ‘email’, 16.5% indicated ‘SMS’, 8.6% said by ‘telephone’, 5% indicated via ‘post’, and finally 4.3% listed their ‘agent’ (see Figure 20). The three main communication means (coach, email and SMS) should be explored to see if they could be used to successfully inform athletes about drug-free sport.

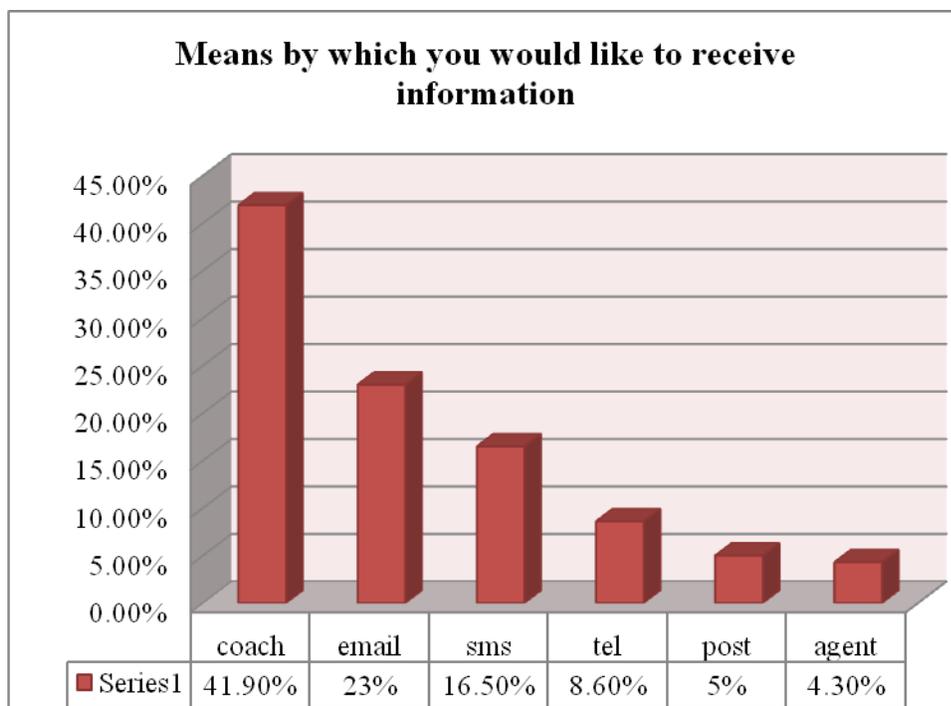


Figure 21: Preferred means of receiving information about drug-free sport

Effects of Age and Gender on Knowledge of Doping issues

An overall score was computed for knowledge of all the specific areas of doping. This was used to establish possible relationship with age of athletes. One way ANOVA was then used to establish the effect of age on knowledge of doping issues. Findings indicated a significant correlation with a p value of 0.001. A further comparison of means for different age groups revealed that senior athletes had the higher mean score of 52.3%, while those below 18 years had a mean of 42.3%.

To assess effect of gender, an overall mean score was generated for the four areas tested; knowledge of prohibited substances, testing procedures, athletes’ rights and responsibilities and risk of use of supplements. Overall mean score for the entire sample population was 46.4% (Table 10). Male athletes had a slightly higher mean score than females. However a one-way ANOVAs did not indicate a significant relationship between the two variables (p = 0.2).

Gender of respondents	Mean	N	Std. Deviation
Male	47.7120	191	20.34093
Female	44.7721	136	20.62360
Average	46.4893	327	20.47891

Table 10: Effect of gender on knowledge

Effect of Length of Experience on Knowledge of Doping Issues

Although a one-way ANOVA did not indicate a significant relationship between knowledge scores and length of experience, a close comparison of the mean scores of athletes with various years of experience showed a variation of the mean score. Athletes with experience of 10 years and above had a greater mean score of 52.6%, closely followed by those between 5 and 10 years with 48%. Recent athletes with 4 years and below had the lowest mean score of 42.6%, (Table 11).

Effect of Experience on Knowledge

Length of experience	Mean Score	N
10 years & A above	52.6%	58
5 – 10 years	48.0%	52
4 years % below	42.6%	202

Table 11: Effects of experience on knowledge***Effect of Access to Doping Information on Doping Knowledge***

A chi square test was conducted to establish possible effect of access to doping information on knowledge scores of athletes. The result does indicate, though vaguely, that access to doping information may have some influence on doping knowledge. Two specific areas showed a significant relationship between access to information, and knowledge of doping, the Drug Information Database with $\chi^2 = 0.001$ and Drug information leaflets with $\chi^2 = 0.04$, In all other areas, access to drug information sources does not appear to have significant influence on doping knowledge (Table 12).

Effect of access to doping information on doping knowledge (Pearson's correlation)

	Drug informati on Data base	Drug informati on Email	Drug informatio n Line	Drug informati on Card	Drug informati on Leaflets	Competit or and Officials
Prohibited substance	0.37	0.41	0.28	0.30	0.46	0.39
Testing procedures	0.4	0.24	0.33	0.34	0.45	0.41
Athletes rights & responsibilities	0.34	0.44	0.47	0.32	0.48	0.29
Risk of supplement	0.25	0.31	0.37	0.42	0.32	0.25
Cross tab χ^2 value (p_value)	0.001	0.125	0.747	0.08	0.04	0.26

Table 4. 1: Effect of access to doping information

DISCUSSION

Knowledge of doping among Kenyan athletes

Findings of the study indicated that elite Kenyan athletes have sufficient knowledge about substances that are classified as prohibited in sports. This is in line with other research which has been carried out in other countries. For example, a study by Ohaeri [64] conducted in Nigeria, among professional sportsmen and women, revealed that knowledge levels of banned substances was reasonably high, ranging from 55% to 93% among different groups

However, studies from Africa seem to contradict those from the developed world. Results from a study conducted by Ama and colleagues [49] found that amateur football players in Cameroon indicated low levels of knowledge of banned substances, with 60% reporting they have never heard of cocaine and 74% indicating they have never heard of amphetamines. However, the wide variation in knowledge may be due to the methods used (e.g., sampling techniques utilized, the sample used, research methods employed, etc.).

The outcomes of this study suggest that Kenyan athletes are not always fully aware of testing regulations and many athletes who consume herbal or natural substances may be risking a positive test. This finding is similar to that of Albrech et al. [65] who studied the extent to which college athletes are informed of drug testing procedures employed by their institutions. This study indicated that 36% of college athletes were ignorant of testing taking place at their institution, 70% were unable to identify the testing protocol, while only a small percentage were aware they were susceptible to testing.

According to the present study, athlete's knowledge concerning supplements is fairly good, with 46% of respondents having high to very high knowledge about supplements compared to 30% who indicated that they had low to very low knowledge levels. These vary from those of Ama et al [49] which indicated very high scores of knowledge of unlawful substances (93%), lawful substances (55%), and food supplements (84%). Results from Ama and colleagues study revealed that 42% of respondents believed that they often excelled due to supplement intake,

while a slightly higher proportion (45%) expressed that their performance was not due to dietary supplements [49].

Attitudes of Kenyan athletes towards doping

The results of this study suggest that most Kenyan athletes do not value doping as a means for exemplary performance. Other studies conducted in other countries show similar results. For example, a study by Alaranta et al. [15] found that 90% of elite Finnish athletes believed it is possible to attain the highest level of performance without doping.

In terms of predicting behavioural outcomes, attitude has been extensively reported to be associated with doping practices [67]. The present study found that the majority (91%) of respondents disagreed that doping was necessary for exemplary performance in sports, yet a good number (49%) admitted that athletes take drugs to improve their performance. This contradiction can only be explained when we assume that many athletes regard intention to use as an admission of use. This line of reasoning is supported by other studies. For example, Field and colleagues [68] documented that high school students routinely use supplements and performance enhancing substances for a variety of sport and non-sport purposes. A drug testing program among high school athletes did not result in a significant reduction in drug use after a campaign about the risks of drug use [69]. Instead it increased some risk factors such as beliefs in one's own athletic ability and permissive attitudes toward substance use. This is an indication that the development and commercialization of sport may lead to greater doping in sport.

The intriguing question here is what compels athletes to risk their health or reputation for outstanding sports performance and what factors make athletes vulnerable to doping. In terms of attitudes, athletes' self-reported reasons for taking performance enhancing substances are mainly related to achieving better performance or an inner desire to win. Reasons for using drugs also include: allowing the athletes to train longer, to avoid sickness, and perceived pressure from the coach, doctor and or nutritionist [70, 71]. A substantial number (78%) of athletes indicated that they can do without performance enhancing drugs and at the same time 40% indicated that doping is a big problem in their sport. This indicates a fear among athletes that competitors have a chemically or medically enhanced advantage and prompts athletes to use drugs. For example,

Yesalis and colleagues found that most respondents were willing to dope because competitors may have an advantage through doping [72].

Doping practices among Kenyan athletes

The findings of this study indicated a very low usage of doping substances and methods amongst Kenyan athletes. However, it is possible that the prevalence rate might be much higher than indicated because most athletes may not wish to admit to doping. In other words, these prevalence rates could be due to the method of questioning. In this regard, Otieno and Ofulla [34] propose that young people may feel comfortable to answer a question about the opportunity to use drugs rather than a question about actual drug use. This is because the opportunity to use drugs is less likely to be illegal or particularly sensitive. However, these researchers also indicated that the accuracy of this approach may also be open to debate.

The study's findings are consistent with a number of previous studies. A study conducted by Wroble and colleagues on American athletes' also indicated a low prevalence rate (1%) for anabolic steroids, with a higher percentage in males than female [73]. Previous studies with athletes also indicate a general denial of drug usage.

On the issue of whether doping was associated with social drugs, a good percentage (41%) did not find social drugs to be an influencing factor as compared to performance enhancement. These findings are consistent with those of Wroble's study [73], where reasons given included: improving performance (56%), personal appearance and peer pressure (34%).

Use of herbal and nutritional supplements

A small percentage of Kenyan athletes (21%) admitted using supplements, while the majority did not. This finding is in line with Backhouse et al. [61] who found a small percentage (6%) of amateur and professional players reported using liboga (a plant root with stimulating effects) before matches. As indicated earlier, the level of supplement knowledge is high, which may indicate why only a small amount of athletes risk using supplements.

In a study conducted by Scarpino and colleagues, 10% of elite Italian athletes stated that amphetamines were being used frequently at national or international level [74]. The study also indicated that 30% of athletes, coaches and managers thought athletic performance could be

enhanced by doping. Findings from this study and those published in the literature seem to suggest that elite athletes are generally poorly informed about prohibited doping substances, especially if the substance is contained in nutritional or herbal supplements.

Factors that influence the doping practices of Kenyan athletes

A number of studies have been carried out on factors that influence performance of Kenyan middle and long distance runners. Among the influences on performance are: historical and physiological factors [13], economic factors [9], psychological advantage and athlete motivation [4]. However, these studies did not explore the potential use of doping substances or ergogenic aids to boost performance. The present study indicated that doping was probably not a factor that influences the performance of Kenyan athletes.

On the question of what may influence athletes to dope, the most commonly cited factors were money prize (54%) and lack of knowledge of banned substances (18%). Others were influence by friends or trainers (14.4%), ignorance of side effects (8%) and easy access to drugs (6%). This is comparable to most studies in Africa [28, 69, 71], which indicate the influence of friends on drug taking. The findings of this reveal similar reasons given in an old study conducted by Scarpino (1990) among Italian athletes. According to this study the major reason for doping as indicated by the athletes were: to win in competition (63%), to improve training performance (9%), to reduce pain (6%) and to comply with a coaches request (6%). The majority of these athletes believed that they had been put under external pressure to use drugs or doping practices. Three-quarters of athletes indicated that access to illegal substances was not a difficulty. A greater number of athletes indicated that doping was potentially harmful but was efficacious in improving performance.

The findings of this study reveal five major factors as having the greatest influence on the doping practices of Kenyan athletes: the desire to excel, attitude, external pressure, ease of access to substances and a lack of sufficient knowledge of supplements. These findings are in line with other studies. For example, in Backhouse report presented to WADA (61) the authors concluded that many doping offences occur due to ignorance of what constitute lawful and unlawful substances. Additionally, Scarpino and colleagues proposed that the growing popularity and increasing commercialization of sports is urging young athletes to dope in order to succeed [74].

Sources of doping information used by Kenyan athletes

The present study suggests that athletes' sources of information are fairly limited. Previous studies have also found limited knowledge about doping. For example, Otieno and Ofulla [34] found that only 11% of athletes had seen their country's anti-doping regulation. They also argue that without access to information, athletes find out about drugs predominantly through friends, the media and their trainers.

The findings of this study suggest that most athletes are uninterested in using the internet to find information on doping or simply don't care about doping information. Similar findings have been reported by Bell and Richard, who indicated most athletes in Africa don't use the internet as a source of sporting information [75]. They also noted that only 30% of respondents were using the internet for anti-doping information. From these findings it emerges that Athletics Kenya is an important source of information for athletes in Kenya. Therefore, Athletics Kenya can be used to improve doping awareness amongst Kenyan athletes.

SUMMARY

Demographic information

Three hundred and twenty seven people participated in this study, giving a response rate of 82%. They consisted of 190 (59%) males and 137 (41%) females. Of the 327 athletes, majority (61.7%) were senior athletes (over 18 years) while only 38.2% were under 18.

The majority (62.6%) of the athletes first joined elite athletics between the year 2006-2010, 17.7% joined calibre between 2011-13, 17.4% between 2000 and 2005 and only 2% joined between 1980-1999. The most common (58.1%) athletic discipline was long distance track events (> 800 meters).

Assessment of doping knowledge

With regard to knowledge of prohibited substances and methods, the study found that the majority (43%) of athletes had a low level of knowledge, 27% had a medium level of knowledge while 30% had a high level of knowledge. With regard to knowledge of testing procedures, 46% had very little knowledge, 37% had a medium level of knowledge, while 17% had a high knowledge level. As far as athletes' rights and responsibilities were concerned, the study found that 12% of athletes had a very low knowledge level, 21% had a low knowledge level, 36% had a medium level of knowledge, 26% had a high knowledge level, while only 5% displayed a very high knowledge level. The study also investigated athletes' knowledge about supplements. Results showed that 46% of athletes had a high to very high knowledge level of supplements, 23% had a medium knowledge level and 31% had a low to very low knowledge level.

Attitudes of Kenyan athletes towards doping

Majority (92%) of athletes either: strongly disagreed, disagreed or slightly disagreed with doping. This implies a strong negative attitude towards doping. A small percentage (8%), though indicated a positive attitude towards doping. This means given an opportunity, this group is likely to engage in doping. When asked whether doping is necessary to be competitive, 78% strongly disagreed, 12% disagreed, 2% slightly disagreed, while only 8% either strongly agreed or agreed. Athletes were also asked whether: "it is only the quality of performance that should

matter, not the way athletes achieve it". Majority of the athletes (71%) strongly disagreed with this statement, 18% disagreed, 4% slightly disagreed, while only 7% either agreed or strongly agreed. Some slight variations in attitudes towards doping were noticed among the athletes. For example, when they were asked whether athletes who take drugs, use them because they help them in sport situations, 49% of athletes agreed, 22% strongly agreed, while only 29% disagreed. So it seems that the athletes don't agree with the use of P.E.D.s, but understand that they do improve athletic performance.

Doping practices among Kenyan athletes

Results of this study found that most (40%) athletes admitted that doping is a major problem in their sport, 7% said it was a problem to a 'good extent', 11% said it was 'neither a high or low problem', and 34% indicated that it is 'not a problem at all'. However, when asked whether they have ever used performance enhancing drugs either ignorantly or purposely, 4% said 'yes' while 96% said 'no'. Those respondents who suggested that doping is a major problem were further asked for the reasons for doping. The majority (41%) felt doping was used to enhance performance, 25% indicated that doping is used for both performance enhancement and as a social drug, while 26% indicated they did not know.

Those who indicated that they had used herbal or nutritional supplements were further asked to indicate which supplements they had used. The results indicated that apart from multivitamins which 17% of the respondents admitted using or having used, all other supplements had only been used by less than 3.3% of the athletes. The major reasons cited for using supplements were: to enhance endurance (16%), to train longer (6%), to avoid getting sick (3%), and due to the advice of a doctor or nutritionist (2%).

Factors that influence doping practices amongst Kenyan athletes

The main reasons athletes gave for doping were desire for money prize (54%) and lack of knowledge of banned substances (18%). Others were; influence by friends or trainers (14.4%), ignorance of side effects (8%) and easy access to drugs (6%).

Sources of doping information used by Kenyan athletes

The study established that the most common sources of doping information for athletes are Athletics Kenya (31%), followed by the IAAF (19%), World Anti-Doping Agency (9%) and NACADA (7%). The results also reveal that a substantial number (20%) of athletes have never received information on drug-free sport, while 9% indicated that they have received information on drug-free sport but are uncertain about the source.

The preferred websites for information on drug-free sport were: Athletics Kenya (40.3%), World Anti-Doping Agency (12%), IAAF (6%). The results reveal two distinct categories of athletes; those who use the internet (64%) and those who indicated they had no time to spend browsing the internet (36%).

When respondents were asked to name sources of anti-doping information, 27% said the media, 17% listed coaches, 15% said Athletics Kenya officials /offices and 14% indicated chemists.

Effect of age, gender and experience on athlete's attitudes and doping practices

This study found that younger athletes were more likely to have the attitude that doping leads to better performance in sport, that doping is not cheating and athletes take drugs to enhance sporting performance. Such results would indicate that age influences doping attitudes. Neither gender nor experience had any effect on doping attitudes.

CONCLUSION

From this study, one can conclude that Kenyan athletes have an average knowledge level of prohibited substances that enhance performance in sport. This may be the result of exposure to testing/ drug issues during international events and information from their coaches. This finding is similar to other African studies of drug use in sport [49, 64].

The present study also found that a good number of Kenyan athletes know of a fellow athlete that uses P.E.D.s. However, the athletes in this study believe that it is possible to excel without using P.E.D.s, but pressure from colleagues, friends and coaches causes athletes to use drugs. Another finding of this study was that ease of access and weak testing procedures influence the use of P.E.D.s. This study also found that younger athletes displayed a more tolerant attitude towards P.E.D.s than older athletes. Finally, we found that access to information increased athletes doping knowledge but did not affect doping practices.

RECOMMENDATIONS

Based on the findings of this study, a number of recommendations can be made. First, sports organisations within Kenya should educate the athletes and coaches about doping issues. Secondly, since doping practice is constantly influenced by the fluid situational and environmental factors that relate to the ever-increasing pressure to win, availability and access to P.E.D.'s and doping, alternative performance enhancement methods, current use of nutritional supplements and prior experience with prohibited PE methods, we recommend continuous ME programmes tailored to identify factors that predispose athletes to doping use.

REFERENCES

1. Onywera, V.O., Scott, R.A., Boit, M.K. and Pitsiladis, Y.P., Demographic characteristics of elite Kenyan endurance runners, *Journal of Sport Sciences*, 2006, 24(4), 415-422.
2. Scott, R.A., Fuku, N., Onywera, V.O., Boit, M., Wilson, R.H., Tanaka, M., Goodwin, W.H. and Pitsiladis, Y.P., Mitochondrial Haplogroups Associated with Elite Kenyan Athlete Status, *Medicine & Science in Sports and Exercise*, 2009, 123-128.
3. Baker, J. and Horton, S., East African running dominance revisited: a role for stereotype threat? *British Journal of Sports Medicine*, 2003, 37, 553-555.
4. Hamilton, B., East African running dominance: what is behind it?, *British Journal of Sports Medicine*, 2000, 34, 391-394
5. Fudge, B.W., Westerterp, K.R., Kiplamai, F.K., Onywera, V.O., Boit, M.K., Kayser, B. and Pitsiladis, Y.P., Evidence of negative energy balance using doubly labelled water in elite Kenyan endurance runners prior to competition, *British Journal of Nutrition*, 2006, 95(1), 59-66.
6. Prommer, N., Thoma, S., Quecke, L., Gutekunst, T., Volzke, C., Wachsmuth, N., Neiss, A.M. and Schmidt, W., Total Hemoglobin Mass and Blood Volume of Elite Kenyan Runners, *Medicine and Science in Sports & Exercise*, 2010, 42(4), 791-797.
7. Scott, R.A. and Pitsiladis, Y.P., Genotypes and distance running: clues from Africa, *Sports Medicine*, 2007, 37(4), 424-427.
8. Scott, R.A., Moran, C., Wilson, R.H., Onywera, V., Boit, M.K., Goodwin, W.H., Gohlke, P., Payne, J., Montgomery, H. and Pitsiladis, Y.P., No association between Angiotensin Converting Enzyme (ACE) gene variation and endurance athlete status in Kenyans, *Comparative Biochemistry and Physiology*, 2005, 141, 169-175.
9. Onywera, V.O., East African Runners: Their Genetics, Lifestyle and Athletic Prowess. *Medicine and Sports Science*, 2009, 54, 102-109.

10. Darby, P., The new scramble for Africa: the African football labour migration to Europe. *European Sport History Review*, 2001, 3, 217-44.
11. Fudge, B.W., Easton, C., Kingsmore, D., Kiplamai, F.K., Onywera, V.O., Westerterp, K.R., Kayser, B., Noakes, T.D. and Pitsiladis, Y.P., Elite Kenyan endurance runners are hydrated day-to-day with ad libitum fluid intake, *Medicine and Science in Sports and Exercise*, 2008, 40(6), 1171-1179.
12. Elbe, A-M., Madsen, C. and Midtgaard, J., A cross-cultural comparison of motivational factors in Kenyan and Danish middle and long distance elite runners, *Journal of Psychology in Africa*, 2010, 20(3), 421-428.
13. Bale, J. and Sang, J., *Kenyan Running: Movement Culture, Geography and Global Change*, London, 1996.
14. Entine, J., *Taboo: why black athletes dominate sports and we're afraid to talk about it*, Public Affairs, New York, 2000.
15. Alaranta, A., Alaranta, H., Holmila, J., Palmu, P., Pietila, K. and Helenius, I., Self-Reported Attitudes of Elite Athletes towards Doping: Differences Between Type of Sport, *International Journal of Sports Medicine*, 2006, 27(10), 842-846.
16. Kimiywe, E. and Simiyu, N.W., The extent of dietary supplements use by male rugby players in Kenya, *Journal of Applied Biosciences*, 2009, 22, 1306-1311.
17. Chappell, R., *Kenyan Sport in the Aftermath of the Commonwealth Games*, Manchester 2002, *Sport in Society*, 2004, 7(2), 175-191.
18. Pitsiladis, Y., Bale, J., Sharp, C. and Noakes, T., *East African Running: toward a cross-disciplinary perspective*, Routledge, Oxon, 2006.
19. Gill, D.L., *Psychological dynamics of sport*, Human Kinetics, Champaign, IL, 1986.
20. Boit, M.K., *In Search of Olympic Glory*, Jomo Kenyatta Foundation, Nairobi, 2004.

21. De Bosscher, V., De Knop, P., Van Bottenburg, M. and Shibli, S. A., Conceptual Framework for Analysing Sports Policy Factors Leading to International Sporting Success, *European Sport Management Quarterly*, 2006, 6(2), 185-215.
22. Green, G.A., The Role of Physicians, Scientists, Trainers, Coaches, and other Non-athletes in Athlete's Drug Use, 2009, In Murray below.
23. Donovan, R.J. , Toward an Understanding of Factor's Influencing Athlete's Attitudes about Performance Enhancing Technologies: Implications for Ethics Education, 2009. In Murray below
24. Murray, T.H., Maschke, K.J. and Wasunna, A.A., Eds., Performance-Enhancing Technologies in Sports: Ethical, Conceptual and Scientific Issues, The John Hopkins University Press, Baltimore, 2009.
25. Waddington, I., Sport, Health and Drugs: a critical sociological perspective, Spon Press, London, 2000.
26. Chepyator-Thomson, J.R., Kenyan Scholar-Runners in the United States: Their Thirst for Education and Intercollegiate Experiences, *Avante*, 2003, 9(3), 31-39.
27. Darby, P., The new scramble for Africa: the African football labour migration to Europe. *European Sport History Review*, 2001, 3, 217-44.
28. Poli, R., Migrations and trade of African football players: historic, geographical and cultural aspects, *Afrika Spectrum*, 2006, 3, 393-414.
29. Cornelissen, S., Sport Mobility and Circuits of Power: The Dynamics of Football Migration in Africa and the 2010 World Cup, *Politikon*, 2007, 34(3), 295-314.
30. Jarvie, G. , The Promise and Possibilities of Running In and Out of Africa., In Pitsiladis, Y., Bale, J., Sharp, C. and Noakes, T., eds., *East African Running: toward a cross-disciplinary perspective*, Routledge, Oxon, 2007.
31. Lukalo, F.K., (Mis)-understanding Nation and Identity: Re-imagining Sport in the Future of African Development, *African Journal of International Affairs*, 2005, 8, 123-135.

32. Mugisha, F., Arinaitwe-Mugisha, J. and Hagembe, B.O., Alcohol, substance and drug use among urban slum adolescents in Nairobi, Kenya, *Cities*, 2003, 20(4), 231-240.
33. Beckerleg, S., How 'Cool' is Heroin Injection at the Kenyan Coast., *Drugs: Education, Prevention and Policy*, 2004, 11(1), 67-77.
34. Otieno, A.O. and Ofulla, A.V.O., Drug Abuse in Kisumu Town in Western Kenya, *Ajfang Online*, 2009, 9(3), 847-858.
35. Balmer, D.H., Gikundi, E., Billingsley, M.C., Kihuho, F.G., Kimani, M., Wang'ondy, J., and Njoroge, H., Adolescent Knowledge, values, and coping strategies: implications for health in sub-Saharan Africa, *Journal of Adolescent Health*, 1997, 21(1), 33-38.
36. Nanyingi, M.O., Mbaria, J.M., Lanyasunya, A.L., Wagate, C.G., Koros, K.B., Kaburia, H.F., Munenge, R.W. and Ogara, W.O., Ethnopharmacological survey of the Samburu district, Kenya, *Journal of Ethnobiology and Ethnomedicine*, 2008, 4, 14-25.
37. Gituma, A., Masika, M., Muchangi, E., Nyagah, L., Otieno, V., Irimu, G., Wasunna, A., Ndiritu, M. and English, M., Access, sources and value of new medical information: views of final year medical students at the University of Nairobi, *Tropical Medical International Health*, 2009, 14(1), 118-122.
38. Bussman, R.W., Gilbreath, G.G., Solio, J., Lutura, M., Lutuluo, R., Kunguru, K., Wood, N., & Mathenge, S.G., Plant use of the Maasai of Sekenani Valley, Maasai Mara, Kenya, *Journal of Ethnobiology and Ethnomedicine*, 2006, 5(2), 22.
39. Njoroge, G.N. and Kibunga, J.W., Herbal medicine acceptance, sources and utilisation for diarrhoea management in a cosmopolitan urban area (Thika, Kenya), *African Journal of Ecology*, 2007, 45, 65-70.
40. Wargovich, M.J., Woods, C., Hollis, D.M. and Zander, M.E., Herbals, Cancer Prevention and Health, *The Journal of Nutrition*, 2001, 131, 3034S-3036S.
41. Kiringe, J.W., A Survey of Traditional Health Remedies Used by the Maasai of Southern Kaijiado District, Kenya, *Ethnobotany Research and Applications*, 2006, 4, 61-74.

42. Njoroge, G.N. and Busmann, R.W., Traditional management of ear, nose and throat (ENT) diseases in Central Kenya, *Journal of Ethnobiology and Ethnomedicine*, 2006, 27(2), 54.
43. Wirz, J., *Run to Win: The Training Secrets of Kenyan Runners*, Meyer & Meyer Sport, Oxford, 2006.
44. Carrier, N., 'Miraa is Cool': the cultural importance of miraa (khat) for Tigania and Igembe youth in Kenya, *Journal of African Cultural Studies*, 2005, 17(2), 201-218.
45. Aden, A., Dimba, E.A., Ndolo, U.M. and Chindia, M.L., Socio-economic factors of khat chewing in north eastern Kenya, *East African Medical Journal*, 2006, 83(3), 69-73.
46. Dhaifalah, I. and Santavy, J., Khat Habit and Its Health Affect. A Natural Amphetamine, *Biomedical Papers*, 2004, 148(1), 11-15.
47. Warfa, N., Klein, A., Bhui, K., Leavey, G., Craig, T. and Stansfeld, S.A., Khat use and mental illness: A critical review, *Social Science and Medicine*, 2007, 65, 309-318.
48. Carrier, N., Is Miraa a Drug?: Categorizing Kenyan Khat, *Substance Use & Misuse*, 2008, 43, 803-818.
49. Ama, P.F.M., Betnga, B., Ama Moor, V.J. and Kamga, J.P., Football and doping: study of African amateur footballers, *British Journal of Sports Medicine*, 2003, 37, 307-310.
50. Kimiywe, E. and Simiyu, N.W., The extent of dietary supplements use by male rugby players in Kenya, *Journal of Applied Biosciences*, 2009, 22, 1306-1311.
51. Roux, R., The world anti-doping code: A South African perspective, *South African Journal for Research in Sport, Physical Education and Recreation*, 2004, 26 (1), 65-78.
52. Kiawi, E.C., Performance enhancing drug-use among amateur sportsmen and women in Cameroon: A study of knowledge, attitudes and practices, *Social Science Research for WADA*, African Research Institute for Development (AFRID), 2006.
53. Eben-Moussi, E., Sport, Ethics and Doping: Current Problems, An action plan for Africa? In Mpobi-Keou, F.X., ed., *Health and Sports in Africa: A challenge for development*, John Libbey Eurotext, UK, 2008.

54. Jeruto, P., Mutai, C., Ouma, G., Catherine, L., Nyamaka, R.L., and Manani, S.D., Ethnobotanical survey and propagation of some endangered medicinal plants from south Nandi district of Kenya, *Journal of Animal and Plant Sciences*, 2010, 8(3), 1016-1043.
55. Orwa, J.A., Herbal medicine in Kenya: evidence of safety and efficacy, *East African Medical Journal*, 2002, 79(7), 341-342.
56. Dimeo, P., *A History of Drug Use in Sport: 1876-1976*, Routledge, London, 2007.
57. Waddington, I. and Smith, A., *An Introduction to Drugs in Sport*, Routledge, London, 2009.
58. Moller, V., *The Ethics of Doping and Anti-Doping*, Routledge, London, 2010.
59. Mottram, D., ed., *Drugs in Sport*, 5th edn., 2011.
60. Kalix, P., Cathinone, a natural amphetamine, *Pharmacological Toxicology*, 1992, 70, 77-86.
61. Backhouse, S., McKenna, J., Robinson, S. and Atkin, A., *International Literature Review: Attitudes, Behaviours, Knowledge and Education - Drugs in Sport: Past, Present and Future*, Report prepared for World Anti-Doping Agency (WADA), Carnegie Research Institute, Leeds Metropolitan University, 2007.
62. Wekesa, M., *Regulation of doping in sports: Implications for Kenya*, Doctoral dissertation, University of Nairobi, 2010.
63. Kenya to train more Anti-doping experts, 2013, Retrieved from: <http://www.sportsnewsarena.com/?Kenya-to-train-more-Anti-doping-experts.html>
64. Ohaeri J., Ikpeme E., Ikwuagwu U., et al., Use and awareness of effects of anabolic steroids and psychoactive substances among a cohort of Nigerian professional sport men and women, *Hum Psychopharmacol*, 1993, 8, 429-32.
65. Albrecht, R. R., W. A. Anderson, C. A. McGrew, D. B. McKeag, and D. O. Hough. (1992). Institutionally based drug testing: Do our athletes know the rules of this game. *Medicine Science in Sports and Exercise*. 24:242-246.

66. WADA, (2011), World Anti Doping Agency Resource Guide, <http://www.wada-ama.org/>
67. Lucidi, F., Grano, C., Leone, L., Lombardo, C., and Pesce, C., Determinants of the intention to use doping substances: An empirical contribution in a sample of Italian adolescents, *International Journal of Sport Psychology*, 2004, 35,133-148.
68. Field A.E, Bryn, A, Carlos, A, Barr, T.C, Ruth, H., Keith, J.L. & Graham, A.C, (2005), Exposure to Mass Media, Body Shape Concerns and Use of Supplements to Improve Weight and Shape Among Male and Female Adolescents, Division of Adolescent Medicine, Harvard Medical School, Boston, Massachussets.
69. Goldberg, L., Elliot, D.L., MacKinnon, D.P., et al., Outcomes of a prospective trial of student-athlete drug testing: the Student Athlete Testing Using Random Notification (SATURN) study. *Journal of Adolescent Health*, 2007, 41(5), 421-429.
70. Laure, P., Lecerf, T., Friser, A., and Binsinger, C., Drugs, recreational drug use and attitudes towards doping of high school athletes, *International journal of sports medicine*, 2004, 25(2), 133-138.
71. Peretti-Watel, P., and Lorente, F.O., Cannabis use, sport practice and other leisure activities at the end of adolescence, *Drug and alcohol dependence*, 2004, 73(3), 251-257.
72. Yesalis III, C.E., Self-Reported Use of Anabolic-Androgenic Steroids by Elite Power Lifters, *Physician and sports medicine*, 1988, 16(12), 90-94.
73. Wroble, R.R., Gray, M., and Rodrigo, J.A., Anabolic steroids and preadolescent athletes: prevalence, knowledge, and attitudes, *Sport J*, 2002, 5(3), 1-8.
74. Scarpino, V., Garattini, S., La Vecchia, et al., Evaluation of prevalence of" doping" among Italian athletes, *The Lancet*, 1990, 336(8722), 1048-1050.
75. Bell, Richard (2009). It's Time to Work Together to Stop Doping in Sports. Retrieved April 2, from The Sports Journal Web site <http://www.thesportjournal.org/article/its-time-work-together-stop-doping>

APPENDIX



Kenyatta University



KENYA 2012 World Anti-Doping Agency Survey

Thank you for taking part in KENYA 2012 WADA Survey

WADA is committed to leading a world-class anti-doping program. Educating athletes about drug-free sport, and about their rights and responsibilities, is a vital part of that commitment.

We would like to find out what you think about drugs issues and testing procedures. So please complete this survey to the best of your ability and return it to the interviewer or post to Kenyatta University using the envelopes provided. Please be assured that your responses will remain

confidential and that nothing that appears in the final report will be attributable to any individual athlete.

Demographic information

- 1 What is your age ?
A. Below 18
B. 18 and above

- 2 What is your gender?
A. Male
B. Female

- 3 What is your highest level of formal education?
A. Primary level
B. Secondary level
C. Tertiary Level

- 4 In which year did you first join the elite athletics in Kenya?

Which is your major Athletic Discipline _____

General Knowledge and Attitude assessment

How well-informed are you about the following procedures with regard to doping Please answer using a scale of 1 to 5, where 1 means you are very well-informed and 5 means that you are very poorly informed.

- 5 Drug testing procedures - ie. the procedures that operate from the time you are notified about a test to the time that your sample arrives at the testing laboratory?
 - 1 Very well-informed
 - 2
 - 3
 - 4
 - 5 Very poorly informed

6 The procedure that follows if and when the laboratory reports a positive test?

1 Very well-informed

2

3

4

5 Very poorly informed

7 Have you ever undergone any drug test either in or out of competition?

1 Yes

2 No

If No, go to Question 11

8 If yes, how many times have you been tested before?

1 1-3 times

2 4-6 times

3 7-10 times

4 10+ times

6 Not sure/don't know

Thinking about the last occasion you were tested in competition, to what extent were you satisfied:

9 With the explanation you received about the testing process?

- 1 Very satisfied
- 2 Satisfied
- 4 Dissatisfied
- 5 Very dissatisfied
- 7 I didn't receive any explanation

10 That the test was carried out fairly and accurately?

- 1 Very satisfied
- 2 Satisfied
- 3 Dissatisfied
- 5 Very dissatisfied

Assessment of Common Sources of doping Information

11 From which of the following sources do you most often receive information on drug-free sport? *(please circle one number only)*

- 1 Athletics Kenya
- 2 NACADA
- 3 IAAF
- 4 World Anti-Doping Agency
- 5 Other
- 6 I have received information on drug-free sport but I don't know the source(s)
- 7 I have never received information on drug-free sport

12 Which of the following websites (if any) are you most likely to use to keep up-to-date with drug-free sport issues and testing procedures? *(please circle one number only)*

- 1 Athletics Kenya
- 2 National Governing Body website
- 3 International Federation website
- 4 World Anti-Doping Agency website
- 5 Other website
- 6 I don't really spend any time looking for information about drug-free sport issues and testing procedures

13 How useful did you find the following resources and services. Please answer using a scale of 1 to 5, where 1 means you found them very useful and 5 means that you didn't find them useful at all.

	Very useful				Not at all Useful
Drug Information Database	1	2	3	4	5
Drug Information Email	1	2	3	4	5
Drug Information Line	1	2	3	4	5
Advice Card	1	2	3	4	5
Testing Procedures Leaflet	1	2	3	4	5
Competitors and Officials Guide	1	2	3	4	5

14 Have you ever attended a workshop on drug-free sport?

- 1 Yes
- 2 No
- 3 Don't know

If No, go to Question 17

15 How useful did you find the workshop (s)? Please use a scale of 1 to 5 to answer this question where 1 means you found the workshop very useful and 5 means that you didn't find the workshop useful at all.

- 1 The workshop(s) was very useful
- 2
- 3
- 4
- 5 The workshop(s) was not at all useful

16 Have any of the following people ever provided you with information and/or advice about drug-free sport? (Please circle one number for each type)

	Yes	No	Not sure/ Can't remember	Not applicable
Your coach (current or previous)	1	2	3	4
Your GP (current or previous)	1	2	3	4
Your team doctor (current or previous)	1	2	3	4
Your team physio (current or previous)	1	2	3	4
An official from your Governing Body	1	2	3	4
An official from AK (not including a Doping Control Officer)	1	2	3	4
Another athlete	1	2	3	4
Researchers	1	2	3	4
Others	1	2	3	4

Assessment of Prevalence of Doping Substances and Practices

17 To what extent do you consider there is a doping problem in your sport? Please answer using a scale of 1 to 5, where 1 means there is a major problem and 5 means there is no problem at all.

- 1 Doping is a major problem in my sport
- 2
- 3
- 4
- 5 Doping is not a problem in my sport at all

18 **If you answered (1), (2) or (3) above,** would you say that the problem is mostly associated with: *(please circle one number only)*

- 1 Performance enhancing drugs
- 2 Social drugs
- 3 Both performance enhancing and social drugs
- 4 Don't know

19 Do you use or have you used herbal or nutritional supplements?

- 1 Yes
- 2 No
- 3 Don't know what herbal or nutritional supplements are

If 'No' or 'Don't Know', go to Question 23

20 Which supplements have you used or do you use? (please circle any number that applies)

- 1 Creatine
- 2 Iron
- 3 Ginseng
- 4 Multivitamins

- 5 Vitamin C
- 6 Caffeine
- 7 Magnesium
- 9 Whey Protein
- 10 Echinacea
- 11 Khat
- 12 Others (please specify)_____

21 Why do you use supplements? (please circle any number that applies)

- 1 Because I don't have enough time to prepare nutritious meals/snacks
- 3 To maintain my strength
- 4 To enhance my endurance
- 5 To allow me to train longer
- 6 To avoid getting sick
- 7 To overcome an injury
- 8 Because my doctor/nutritionist told me to take them
- 9 Because my governing body provides them to us
- 10 Other reasons _____

22 Have you ever used performance enhancing drugs either ignorantly or purposefully?

- 1 Yes
- 2 No

23 Have you ever heard of colleague athletes in your country who use performance enhancing drugs?

- 1 Yes
- 2 No

24 Have you ever heard of a chemist, medical practitioners or agents that supply performance enhancing drugs in your country?

- 1. Yes
- 2. No

25 Have you or any of your colleagues whom you train with ever been offered performance enhancing substances or methods?

- 1 Yes
- 2. No

Assessment of Knowledge on Specific Areas

Topic 1: Prohibited Substances and Methods

(A therapeutic use exemption (TUE) allows an athlete to take a medication deemed necessary for their health which appears on the list of prohibited substances in sport).

26 I have to submit a TUE application even if I am prescribed a prohibited medication by my doctor.

- 1 True
- 2 False
- 3 Don't know

27 If I buy a medication that's permitted in Kenya, the same medication purchased overseas will be safe

- 1 True
- 2 False
- 3 Don't know

28 In terms of the anti-doping rules, I am solely responsible for what I swallow, inject or apply to my body?

- 1 True
- 2 False
- 3 Don't know

29 Caffeine is a substance on the 2009 prohibited List

- 1 True
- 2 False
- 3 Don't know

Assessment topic 2: Testing Procedures

30 If I am notified that I am to be tested at an inconvenient time, I can refuse to be tested?

- 1 True
- 2 False
- 3 Don't know

31 I should stay in full view of the doping control officer or chaperone once notified of doping control

- 1 True
- 2 False
- 3 Don't know

32 My name should be on the form that goes to the laboratory so they can identify me?

- 1 True
- 2 False
- 3 Don't know

33 In most cases urine testing is more effective in terms of detection than blood testing?

- 1 True
- 2 False

3 Don't know

Assessment topic 3: Athlete Rights and Responsibilities

34 I cannot take a representative of my choice to the Doping Control Station once I am notified of doping controls?

- 1 True
- 2 False
- 3 Don't know

35 During Sample Collection only a Doping Control Officer of the same sex should be present?

- 1 True
- 2 False
- 3 Don't know

36 I cannot warm down or attend a medal ceremony before going to the Doping Control Station?

- 1 True
- 2 False
- 3 Don't know

37 It is my responsibility to be available for testing at any time

1 True

2 False

3 Don't know

Assessment topic 4: Supplements

AK can tell me which nutritional supplements are safe to use?

- 1 True
- 2 False
- 3 Don't know

38 If a nutritional supplement is bought from the pharmacy (over-the-counter), it must be safe to use.

- 1 True
- 2 False
- 3 Don't know

39 If a nutritional supplement contains a prohibited substance, it will always say so on the label.

- 1 True
- 2 False
- 3 Don't know

40 I can be sanctioned if I test positive after taking what I thought was a safe supplement.

- 1 True
- 2 False
- 3 Don't know

Assessment Topic 5: Knowledge of Health Consequences of Doping

41 Doping may have severe negative effects on personal health even long after stopping it

- 1 True
- 2 False
- 3 Don't know

41 Doping has the potential to cause heart attack and infertility among athletes

- 1 True
- 2 False
- 3 Don't know

42 If I am found guilty of doping I will be banned from athletics for life

- 1 True
- 2 False
- 3 Don't know

43 If I am found to have doped ignorantly I will not be penalized

- 1 True
- 2 False
- 3 Don't know

Assessment of Factors that Influence Doping

- 44 Which of the following factors best represent the reason why Kenyan athletes would practice doping?
1. Prize money/to boost economic status
 2. Pressure from coaches, family and colleague athletes
 3. Lack of confidence/pressure from self
 4. Lack of knowledge of health consequences of doping
 5. Lack of knowledge of doping control practices and regulations

Athlete's Recommendations

- 45 Are there any improvements you would like to see made to the drug-free sport system – eg. drug-testing procedures, anti-doping programmes etc? (*open question*) 1. Yes 2. No --Elaborate

- 46 Are there any specific drug-free sport issues and/or testing procedures about which you would like to receive more or more regular information? (please circle any number that applies)

- 1 World Anti-Doping Code
- 2 anti-doping rules of your sport
- 3 testing procedures
- 4 prohibited substances and methods
- 5 Therapeutic Use Exemptions
- 6 results management process
- 7 appeals
- 8 other (please specify)

- 47 By which means would you prefer to be alerted to news about drug-free sport issues or changes to testing procedures? (circle one number only)

- 1 Post
- 2 Telephone

- 3 Fax
- 4 SMS
- 5 Email
- 6 Coach
- 7 Agent

48 What do you think are the effects of doping and anti-doping practices.....

.....
.....
.....
.....
.....
.....
.....

49 What are the common sources of anti-doping dissemination materials

.....
.....
.....
.....
.....
.....
.....

50 State the factors that influence resistance to anti-doping regulations and policies among the Kenyan athletes

.....
.....
.....
.....
.....
.....
.....

51 State the banned substances and techniques commonly used by elite Kenyan athletes

.....
.....
.....
.....
.....
.....
.....
.....

52 State the legal nutritional supplements and stimulants commonly used by elite athletes in Kenya

.....
.....
.....
.....
.....
.....
.....
.....

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

Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
1	2	3	4	5	6

Doping is necessary to be competitive sport.	①	②	③	④	⑤	⑥
Doping is not cheating since everyone does it.	①	②	③	④	⑤	⑥
Athletes often lose time due to injuries and drugs can help to make up the lost time.	①	②	③	④	⑤	⑥
Only the quality of performance should matter, not the way athletes achieve it.	①	②	③	④	⑤	⑥
Athletes are pressured to take performance-enhancing drugs.	①	②	③	④	⑤	⑥
Athletes, who take recreational drugs, use them because they help them in sport situations.	①	②	③	④	⑤	⑥
Athletes should not feel guilty about breaking the rules and taking performance-enhancing drugs.	①	②	③	④	⑤	⑥
The risks related to doping are exaggerated.	①	②	③	④	⑤	⑥
Athletes have no alternative career choices, except sport.	①	②	③	④	⑤	⑥
Doping should be legalized	①	②	③	④	⑤	⑥
Doping is an unavoidable part of competitive sport.	①	②	③	④	⑤	⑥
Recreational drugs help to overcome boredom during training.	①	②	③	④	⑤	⑥
There is no difference between drugs, fiber glass poles, and speedy swimsuits that are all used to enhance performance.	①	②	③	④	⑤	⑥

