Supplements, Herbal, and Doping Products Usage Among Ugandan Athletes and Athlete Support Personnel

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Supplements, Herbal, and Doping Products Usage Among Uganda Athletes and Athlete Support Personnel

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5. Uganda Boxing Federation (UBF)
6. Uganda Weightlifting Federation (UWF)
7. Uganda Cycling Association (UCA)

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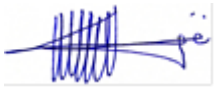

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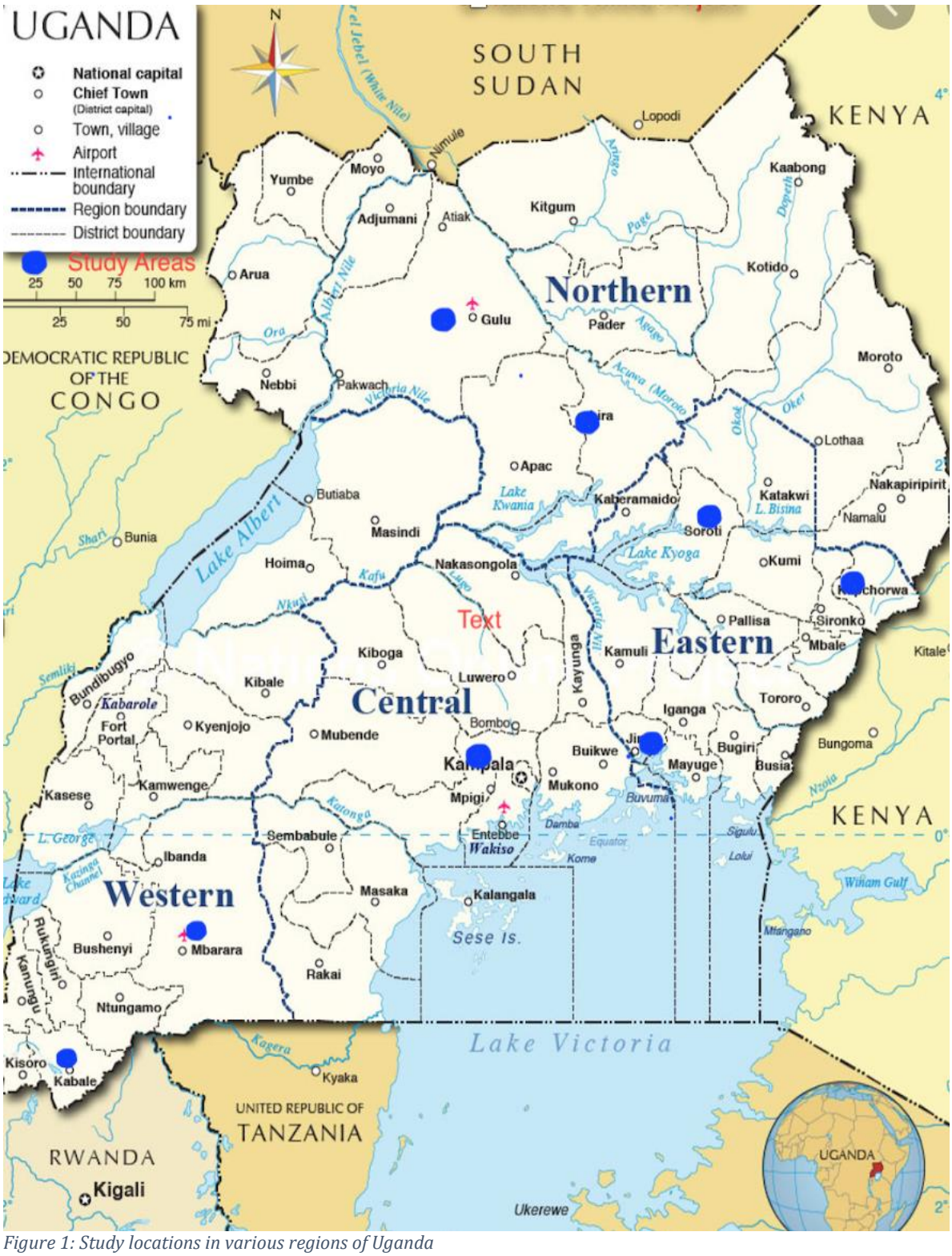

Figure 1: Study locations in various regions of Uganda

Abbreviations

- NADO: National Anti-Doping Agency
- PES: Performance Enhancing Substances
- SBS-REC: School of Biomedical Sciences Research Ethics Committee
- UOC: Uganda Olympic Committee
- UNCST: Uganda National Council of Science and Technology
- WADA: World Anti-Doping Agency

Figure 2: (Dr. Makubuya (standing second from right) with athletes and athletics coaches in Kapchworwa, Eastern Uganda)

List of Figures

List of Tables

Project Summary

Nutrition supplements are widely consumed in many regions of the globe today. In addition, the rise of potentially harmful substances sold under the umbrella of supplements has found a way in markets in developing countries. The marketing and use of herbal plants as medicines in Uganda has drastically increased in recent times (Asiimwe, Namutebi, Borg-Karlsson, Kamatenesi-Mugisha, Oryem-Origa, 2014; Joshi & Joshi, 2000; Kamatenesi-Mugisha, Oryem-Origa, 2005). Yet herbal products are categorized as dietary supplements and regulated in some countries (Sellami et al, 2018). In 2013, the government of Uganda approved the usage of herbal medicine for health care (Uganda gazette, 2013; WHO, 2013), leading to push by the Ministry of Health to incorporate the usage of herbal medicines in management of ailments, such as cancer. The phytochemical profiles of most medicinal plants, and herbal concoctions is still unknown, and yet some medicinal plants possess performance enhancing effects, with a potential to act as doping agents. More so, the consumption of a combination of supplements, herbal products and some untested products, may result in inadvertent doping by some athletes.

Available anecdotal evidence suggests that the usage of herbal remedies in various groups including sports participants in Uganda is on the rise (Ssemugabi, 2015). In fact, our recent studies indicate gaps in nutritional and doping knowledge among Ugandan athletes (Muwonge, Zavuga & Kabenge, 2015; Muwonge, Zavuga, Kabenge & Makubuya, 2017) and a lack of consistent education programming for support staff, which is absolutely vital. More so, athletes in Uganda's neighboring countries consume herbs as supplements due to a number of reasons including performance enhancement and to boast the nutrient content in their normal diets (Chebet, 2014, Otieno & Ofulla, 2009; Onywera, 2009; Orwa, 2002). This consumption is obviously noticeable among key Kenyan athletes, who have fallen into a trap of inadvertent doping from herbal supplements. This inadvertent doping revelation, particularly with the consumption of products such as strychnos have led to the banning of Felix Kirwa by the International Association of Athletics Federation (IAAF). Strychines are listed on WADA's list of banned substances, yet are regarded as useful medicine for athlete's foot, and tooth decay in Uganda (Tugume et al, 2016). Therefore, determining the prevalence of supplement usage including herbal products, doping agent usage and susceptibility amongst Ugandan athletes, can help to extrapolate the proportion of Ugandan athletes who could be at risk of inadvertent doping.

The objectives of this project were:

1. To evaluate supplement and herbal product usage amongst athletes from all major sporting codes in Uganda
2. To evaluate the usage of doping substances or methods amongst Ugandan athletes from all major sporting codes.
3. To determine the existing framework for intervening in herbal products usage among athletes and support personnel in Uganda
4. To examine the existence of anti-drug abuse interventions targeting the misuse of herbal products among Ugandan athletes and support personnel.
5. To determine the level of susceptibility to doping agent usage among Ugandan athletes and suggest recommendations for an intervention.

Table of Contents

1.0 Introduction

Performance enhancement substances (PESs) are widely consumed in many regions of the globe today. In addition, potentially harmful substances sold under the umbrella of supplements continue to find a way in markets in developing countries. On the other hand, the marketing and use of herbal plants as medicines in Uganda has drastically increased in recent times (Asiimwe, Namutebi, Borg-Karlsson, Kamatenesi-Mugisha, Oryem-Origa, 2014; Joshi & Joshi, 2000; Kamatenesi-Mugisha, Oryem-Origa, 2005). However, herbal products are categorized as dietary supplements and regulated in some countries (Sellami et al, 2018). In 2013, the government of Uganda approved the usage of herbal medicines for health care (Uganda Gazzette, 2013; WHO, 2013), leading to a push by the Ministry of Health to incorporate the usage of herbal medicines in the management of ailments, such as cancer. The phytochemical profiles of most medicinal plants and herbal concoctions are still unknown, and yet some medicinal plants possess performance-enhancing effects, with the potential to act as doping agents. Moreover, the consumption of a combination of supplements, herbal products and some untested products may result in inadvertent doping by some athletes.

Available anecdotal evidence suggests that the usage of herbal remedies in various groups, including sports participants in Uganda, is on the rise (Ssemugabi, 2015). In fact, our recent studies indicate gaps in nutritional and doping knowledge among Ugandan athletes (Muwonge, Zavuga & Kabenge, 2015; Muwonge, Zavuga, Kabenge & Makubuya, 2017) and a lack of consistent education programming for coaches, which is absolutely vital. Moreover, athletes in Uganda's neighboring countries consume herbs as supplements for a number of reasons, including performance enhancement and nutrient content boasting in their normal diets (Chebet, 2014; Otieno & Ofulla, 2009; Onywera, 2009; Orwa, 2002). For example, this consumption is obviously noticeable among key East African distance athletes, who have fallen into a trap of inadvertent doping from herbal supplements. This inadvertent doping revelation, particularly with the consumption of products such as strychnos, has led to the banning of Felix Kirwa by the International Association of Athletics Federation (IAAF). Strychnine is listed on WADA's list of banned substances but is regarded as a useful local medicine for athlete foot and tooth decay in Uganda (Tugume et al, 2016). Therefore, determining the prevalence of supplement usage, including herbal products,

doping agent usage and susceptibility amongst Ugandan athletes, can help to extrapolate the proportion of Ugandan athletes who could be at risk of inadvertent doping.

1.1 Study Objectives

General Objective

To assess supplement, herbal and doping product usage among Ugandan athletes and coaches.

Specific Objectives

1. To evaluate supplement and herbal product usage amongst athletes from all major sporting codes in Uganda
2. To evaluate the usage of doping substances or methods amongst Ugandan athletes from all major sporting codes.
3. To determine the existing framework for intervening in herbal product usage among athletes and coaches in Uganda
4. To examine the existence of anti-drug abuse interventions targeting the misuse of herbal products among Ugandan athletes and coaches.

1.2 Hypothesis

We hypothesized that a sizable number of athletes in Uganda are currently consuming supplements and herbs for medicinal and recreational usage but might inadvertently dope. We also hypothesized that there is no framework for intervening in herbal product usage among athletes and coaches in Ugandan sports. Furthermore, existing anti-drug abuse interventions through the National Drug Authority do not target the usage of herbal products among athletes and coaches. Furthermore, we hypothesized that in Uganda, some athletes are more susceptible to doping than others.

1.3 Methodology

1.3.1 Study design

Our study utilized a cross-sectional survey design involving a total of 346 professional and amateur Ugandan athletes and 196 coaches participating in regional and national competitions. The participants were selected from seven sports, including football, basketball, rugby, boxing, weightlifting, cycling and athletics, from the four main regions of Uganda (Northern, Western, Eastern and Central). Given the sensitivity of the study, a

nationwide survey of Ugandan athletes utilizing the WADA validated standard questionnaire on athletes' opinion on sports issues was chosen for this study. Focused group interviews were used to collect interpretive data from the coaches.

Figure 3: Dr. Samuel K. Lubega (in White) engaging Football Coaches in Central Uganda.

1.3.2 Study population

Male and female amateur and elite athletes from football, basketball, rugby, boxing, weight lifting, cycling and athletics who were 18 years and above and coaches from the same sports were recruited for this study across Uganda.

1.3.3 Exclusion criteria

Athletes and coaches not participating in regional and national sporting events

1.3.4 Sample size

Given the study population size of the athletes (i.e., 3,500) and coaches (i.e., 400) and using WADA's sample selection criteria (Table 2 WADA Research package), a representative sample of 346 athletes and 196 coaches was sampled, and we report a 100% response rate in this study.

1.3.5 Data collection Procedure

Permission to undertake the study was sought through the School of Biomedical Sciences Research Ethics Committee (SBS-REC) at Makerere University, and the study was additionally approved and registered by the Uganda National Council of Science and Technology (UNCST). To preserve the confidentiality of athletes and athlete coaches, information was kept on a password-protected computer. The university's cover letter invited the athletes and coaches to participate in the study on nutrition, herbs and doping agents in sports. The researchers utilized a modified WADA standard questionnaire to survey elite athletes' opinions on sports issues and their susceptibility to the products. Additionally, focus group discussions were conducted with coaches from various sports from each of the 4 regions of Uganda to provide an in-depth discussion on the variety of supplements and herbal products and the susceptibility of coaches to use products for themselves and their athletes. Furthermore, a review of policy documents from the Uganda National Drug Authority (the main regulator of drug use in Uganda), the National Anti-Doping Organization of Uganda, and the World Anti-doping Agency was conducted to disclose if any, the existing policy framework regulating supplement, herbal product and doping agent usage. Athletes and coaches were informed that their participation was voluntary and their responses were kept confidential, without easy identification from the questionnaire or interview scripts and that only group data were to be reported.

1.3.6 Data collection tools: Questionnaire

Our study utilized a modified version of the WADA questionnaire (Donovan, Jalleh & Gucciardo, 2015) that is available for use by anti-doping organizations. A copy of our modified questionnaire for Uganda is attached in Appendix I.

SOCIAL SCIENCE

RESEARCH PACKAGE FOR ANTI-DOPING ORGANIZATIONS

A research package, including a standard questionnaire, to assist anti-doping organizations (ADOs) measure athletes' beliefs and behaviors with respect to doping, and to assess the effectiveness of anti-doping programs.

By Rob Donovan[1], Geoffrey Jalleh[2] & Daniel Gucciardi[3]
August 2015

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1.3.7 Data collection tools: Focus group discussion guide

Our team drafted and pilot-tested a focus group discussion interview guide to fit Uganda as a unique population with varying contextual factors relating to sports education among athlete coaches. We validated our focus group interview protocol based on our expert reviews, which consisted of a district sports officer, veteran coaches and officials from various sports federations and ministry of education and sports. A copy of the focus group discussion guide is attached in Appendix II.

Figure 4: Mr. Samuel Mugaya leading a survey interpretation session at Kakyeka Stadium, Mbarara (Western Uganda)

1.3.8 Statistical Procedures

Data were entered into and managed by EpiData 3.0 software, and imported and analyzed using Stata 14.0 software. Continuous variables were summarized using means and standard deviations after assessing for normality of the data. Categorical variables will be summarized using frequencies and percentages. Chi-square was be used to compare between categorical variables and the t-test to compare two continuous variables. A P value < 0.05 at a 95% confidence interval was considered significant. Focus group interviews were audio recorded, transcribed and then coded using HyperResearch, a qualitative analysis software program.

Figure 5: Dr. Makubuya led a coaches' focus group discussion on a basketball court in Gulu (Northern Uganda)

2.0 Results

2.1 Study participant characteristics

Table 1: Participant socioeconomic and demographic characteristics

	Athletes	Coaches
Variables	n (%)	n (%)
Age(years) (mean ± SD)	24±6	32±14
Sex	(n=332)	(n=196)
Male	273(82)	101(51.5)
Female	59(18)	95(48.5)
Education level	(n=326)	(n=196)
Completed nursery school	6(2)	0(0)
Completed primary school	41(13)	73(37)
Completed O level	96(29)	53(27)
Completed A level	48(15)	19(10)
Some technical college	12(4)	14(7)
Some University	23(7)	9(5)
Currently enrolled in Technical college	2(1)	2(1)
Currently enrolled in University	44(13)	22(11)
Completed technical college	14(4)	0(0)
Completed University	40(12)	4(2)
Main sport	(n=334)	(n=196)
Basketball	53(16)	28(14)
Athletes	53(16)	28(14)
Rugby	37(11)	30(15)
Football	59(18)	26(13)
Weight lifting	43(13)	28(14)
Boxing	54(16)	28(14)
Cycling	35(11)	28(14)

A total of 346 athletes and 196 coaches took part in our study. Athletes and coaches who participated in the current study were recruited from six major sports: basketball, athletes, rugby, football, weight lifting, boxing and cycling.

The majority of these athletes were male (82%), and the ratio of male to female coaches who participated in the current study was approximately 1:1. The mean (±SD) age of the athletes was 24 (±6) years, whereas that of coaches was 32 (±14) years. Although we had a 100% response rate, there were instances where athletes' questionnaires had missing responses. At least 70% of athletes interviewed had completed high school (A level) and attained some university-level education.

2.2 Nutritional supplement usage amongst Ugandan Athletes

Table 2: Ugandan athletes' use of nutritional supplements in the past 12 months

	Rarely or Never n (%)	Sometimes n (%)	Frequently n (%)	Systematically n (%)
Vitamins or mineral supplements	203 (64)	67(21)	35 (12)	11(3)
Herbal products	231 (76)	49(16)	13 (4)	13(4)
Creatinine	220 (74)	51(17)	13 (5)	12(4)
Sports energy drinks	161 (53)	87(28)	40 (13)	18(6)
Energy bars	240 (78)	36(12)	19 (6)	12(4)
Caffeine	240 (79)	28(9)	24 (8)	13(4)
Protein-carbohydrate shakes	186 (61)	70(23)	33 (11)	17(5)

Generally, sports energy drinks were the most consumed nutritional supplements (47%) in the past 12 months, followed by protein-carbohydrate shakes (39%), vitamins or mineral supplements (36%), creatinine (26%), herbal products (24%), energy bars (22%) and then caffeine (21%). Except for sports energy drinks, almost two-thirds of athletes had never or rarely used either vitamins or mineral supplements, herbal products, creatinine, energy bars, caffeine, or protein-carbohydrate shakes in the past 12 months prior to the interview. Specifically, 76% of the interviewed athletes had never or only rarely used herbal supplements to boast performance in the past 12 months, and of the 75 participants who had used herbal supplements in the last 12 months, only 26 frequently used them.

Association between vitamin and mineral supplement use and athlete perceptions and characteristics

We used chi-squared test to test if there was any association between use of vitamin or mineral supplements and athlete perceptions and demographic characteristics (table 3). Significantly, we found an association between use of vitamin and mineral supplements and whether an athlete has ever considered using a banned substance ($X^2 = 11.34$, P=0.024). In addition, use of vitamin and mineral supplements was significantly associated with likelihood of avoiding a positive test during competition ($X^2 = 6.23$, P=0.044).

Table 3: Athlete characteristics associated with use of vitamin or mineral supplements

Characteristic	Used vitamins or mineral supplements		Chi-square value	P-value
	Never used n(%)	Ever used n(%)		
Considered using banned substance			11.34	**0.024**
Never	153(67)	75(33)		
Thought briefly about using	18(60)	12(40)		
Thought quite a bit	6(43)	8(57)		
Still think occasionally	19(63)	11(37)		
Ever used	1(14)	6(86)		
Likely avoiding a positive test during competition			6.234	**0.044**
Not likely	43(58)	31(42)		
Likely	84(60)	55(40)		
Don't know	74(74)	26(26)		

Association between caffeine use and athlete perceptions and characteristics

Chi-squared test was also used to test if there was any association between athlete use of caffeine and their perceptions and demographic characteristics (table 4). With regard to athlete demographic characteristics, we found as significant association between caffeine use and participant sporting category ($X^2 = 13.31$, P=0.045), as well as duration for which the athlete has been competition in that sport either at regional or national level ($X^2 = 9.62$, P=0.022). Additionally, athlete perceptions on whether they had ever considered using a banned performance enhancing substance or method ($X^2 = 12.40$, P=0.012), and their thoughts on whether using performance enhancing substances or methods is moral ($X^2 = 10.81$, P=0.007) were also significantly associated with athlete consumption of caffeine.

Table 4: Athlete characteristics associated with use of caffeine

Characteristic	Used caffeine		Chi-square value	P-value
	Never used n(%)	Ever used n(%)		
Main sport involved				
Basketball	37(74)	13(26)	13.31	**0.045**
Athletes	42(84)	8(16)		
Rugby	34(92)	3(08)		
Football	46(82)	10(18)		
Weight lift	30(79)	8(21)		
Boxing	30(63)	18(37)		
Cycling	21(81)	5(19)		
Duration of sport				
Less than 1 year	25(76)	8(24)	9.62	**0.022**
1 -2 years	36(78)	10(22)		
3-4 years	40(65)	22(35)		
5 or more years	133(84)	26(16)		
Consider using banned substance				
Never	186(83)	39(17)	12.40	**0.012**
Thought briefly about using	18(67)	9(33)		
Thought quite a bit	10(71)	4(29)		
Still think occasionally	18(67)	9(33)		
Ever used	3(43)	4(57)		
Personal feeling about deliberately using banned substance			10.81	**0.007**
Morally wrong under any situation	162(82)	35(18)		
Morally ok under some situations	66(75)	22(25)		
Morally ok under any circumstance	9(50)	9(50)		

Association between athlete doping perceptions, sociodemographic characteristics, and herbal products usage

The only athlete demographic characteristic that was significantly associated with usage of herbal products was sporting category ($X^2 = 18.77$, P=0.005). With regard to athlete doping perceptions, the perceived likelihood of avoiding a positive doping test during competition was the only significant athlete doping perception associated with usage of herbal products ($X^2 = 7.26$, P=0.026) (table 5).

Table 5: Athlete characteristics associated with use of herbal products

Characteristic	Used herbal products		Chi-square value	P-value
	Never used n(%)	Ever used n(%)		
Main sport involved			18.77	0.005
Basketball	42(84)	8(16)		
Athletes	45(90)	5(10)		
Rugby	30(83)	6(17)		
Football	39(91)	16(29)		
Weight lift	26(67)	13(33)		
Boxing	30(59)	21(41)		
Cycling	19(76)	6(24)		
Likely avoiding a positive test during competition			7.261	0.026
Not likely	48(65)	26(35)		
Likely	102(76)	32(24)		
Don't know	81(75)	75(25)		

Association between athlete doping perceptions, sociodemographic characteristics, and usage of sports drinks

As shown in table 6 competition in events for disability was significantly associated with consumption of sports drinks in our study ($X^2 = 4.66$, P=0.031). The only athlete doping perception significantly associated with use of sports drinks in our study was the likelihood of avoiding a positive doping test out of competition ($X^2 = 9.46$, P=0.009).

Table 6: Athlete characteristics associated with use of sports drinks

Characteristic	Used sports drinks		Chi-square value	P-value
	Never used n(%)	Ever used n(%)		
Competing in events for disability athletes			4.661	**0.031**
Yes	22(71)	9(29)		
No	139(51)	136(49)		
Likely avoiding a positive test out of competition			9.462	**0.009**
Not likely	30(38)	48(62)		
Likely	74(56)	59(44)		
Don't know	58(61)	37(39)		

2.3 Usage of banned performance-enhancing substances or methods among Ugandan athletes

In this study, the majority of Ugandan athletes interviewed had never used a banned performance-enhancing substance (97%), with less than 3% of athletes reporting having used a banned performance-enhancing substance.

Table 7: General self-reported use of banned performance-enhancing substances among Ugandan athletes

	n(%)
I have never considered using a banned performance-enhancing substance	234(73)
At one stage I thought briefly about using a banned performance-enhancing substance	31(9.6)
At one stage I thought quite a bit about using a banned performance-enhancing substance	16(5)
I still think occasionally about using a banned performance-enhancing substance because other athletes are using them	31(9.6)
I briefly used a banned performance-enhancing substance in the past but no longer do so	5(1.6)
I occasionally use a banned performance-enhancing substance now for specific purposes	1(0.3)
I regularly try or use banned performance-enhancing substances	3(0.9)
Total	321(100)

Table 8: Ugandan athletes' self-reported use of specific banned performance-enhancing substances and methods in 'last 12 months'

	Have never used	**Did not use in the last 12 months**	**1 to 2 times**	**3 to times**	**6 to 10 times**	**More than 10 times**
Anabolic steroids	270(84)	25(8)	13(4)	6(2)	4(1)	5(1)
Beta-blockers	260(86)	24(8)	6(2)	10(3)	2(<1)	1(<1)
Designer steroids like Tetrahydrogestrinone (THG)	264(85)	19(6)	15(5)	9(3)	2(<1)	3(<1)
Erythropoietin (EPO) and other similar substances	259(85)	20(7)	9(3)	10(3)	5(2)	2(<1)
Human growth hormones (hGH)	261(85)	20(7)	10(3)	10(3)	3(1)	3(1)
Diuretics	264(86)	18(6)	11(4)	5(2)	6(2)	3(<1)
Doping methods	257(84)	20(7)	18(6)	3(<1)	3(<1)	5(2)

When probed for the use of specific banned performance-enhancing substances and methods within the 'last 12 months', almost similar proportions of Ugandan athletes had used 'anabolic steroids' (8%), 'beta-blockers' (6%), 'designer steroids' (approximately 8.5%), 'EPO' (approximately 8.5%), 'hGH' (8%), 'diuretics' (approximately 8.5%), or other 'doping methods' (approximately 8.5%) more than once.

2.4 Ugandan athletes' beliefs about Societal Influences on Doping

Athletes who believe that sports and Olympics have become too commercialized would be more likely to dope if given the opportunity (Donovan, 2015). Similarly, athletes who perceive tremendous pressure by their sponsoring organizations and governments to win at high profile, high economic stake tournaments such as the Olympics are also more likely to dope if given the opportunity (Strulik, 2012).

Table 9: Perceived pressure exerted by the Ugandan government on athletes to win Olympic gold medals

	n(%)
No pressure at all	88(26)
A little pressure	93(28)
Moderate pressure	92(28)
A lot of pressure	59(18)
Total	**332(100)**

Our study demonstrated that a substantial proportion (74%) of Ugandan athletes feel somewhere from 'a little pressure' to 'a lot of pressure' by the Ugandan government to win Olympic gold medals, with 18% nominating 'a lot of pressure'.

Table 10: Effect of commercial influences on doping attitudes among professional Ugandan athletes

	Had no effect	**Increased a little**	**Increased somewhat**	**Increased a lot**
To what extent, if at all, do you think commercial influences on the Olympics and sport in general have increased a 'win at all costs' attitude amongst elite athletes?	40(12)	86(26)	48(15)	157(47)
To what extent, if at all, do you think commercial influences on the Olympics and sport in general have increased the temptation amongst elite athletes to use banned performance enhancing substances?	71(22)	110(33)	37(12)	110(33)

The majority of Ugandan athletes who participated in this study felt that the increasing commercial influences in today's sport have contributed to the markedly high (88%) 'win at all costs' attitude, as well as the temptation to dope (78%) amongst them. This is a large risk with regard to increased susceptibility to doping among athletes.

2.5 Likelihood and desirability of potential positive outcomes for performing well in sports

Next, we determined their likelihood and desirability for different positive outcomes in sports (table 7) and to what extent the sport they played offered those outcomes (table 8).

Table 11: Desirability of the positive outcomes for performing well in sports

	A lot n(%)	**A little n(%)**	**Not at all n(%)**
Personal best achievements	246(84)	37(13)	9(3)
Opportunities for remaining in the sport as coach, trainer or administrator	205(68)	80(27)	14(5)
Lucrative sponsorship deals	215(72)	61(21)	20(7)
National celebrity status	217(69)	77(24)	21(7)
Future financial security	204(69)	70(23)	23(8)
International celebrity status	197(65)	77(26)	27(9)

Table 7 demonstrates motivations or desires behind Ugandan athletes' engagement in sports. 'Personal best achievements' was the most desired outcome ('a lot': 97%), followed by 'opportunities for remaining in the sport as coach, trainer or administrator'.

Table 12: Likelihood of different positive outcomes for performing well in sports

	A lot n(%)	**A little n(%)**	**Not at all n(%)**
Personal best achievements	177(60)	95(32)	25(8)
Opportunities for remaining in the sport as coach, trainer or administrator	172(57)	99(33)	32(10)
Lucrative sponsorship deals	124(42)	123(41)	51(17)
National celebrity status	171(55)	110(35)	29(10)
Future financial security	133(43)	112(38)	50(17)
International celebrity status	144(47)	114(38)	46(15)

Table 8 shows that for this sample of Ugandan athletes, the greatest likelihood that participating in a sport would provide a positive outcome was highest for 'personal best achievements' ('a lot': 92%), followed by 'opportunities for remaining in the sport as coach, trainer or administrator' (90%) and 'national celebrity status (90%). 'Future financial security' (81%) was the least perceived positive outcome for the athletes.

2.6 Moral Stance of Ugandan athletes with regard to usage of banned PESs.

Table 13: Personal moral stance on banned performance-enhancing substance use

Question	N (%)
I believe deliberately using banned performance-enhancing substances to improve performance is morally wrong under any circumstance	210(64)
believe deliberately using banned performance-enhancing substances to improve performance is morally OK under some circumstances, but wrong under others	93(29)
I believe deliberately using banned performance-enhancing substances to improve performance is morally OK under any circumstances	22(7)
Total	

More than two-thirds of the athletes believed that it is morally wrong to use a banned performance-enhancing substance to improve performance, with the rest thinking that it is morally okay to use them under some or all circumstances (Table 9). These data suggest a fairly good moral norm against doping in these athletes, even though the percentage of those who thought it was morally wrong to use PES was below the recommended 70% or more. Thus, it is prudent that concepts of morality and moral and ethical reasoning are incorporated into the planning anti-doping education program.

2.7 Ugandan athletes' beliefs about the benefits of doping measures

According to Becker (1974), the likelihood of adopting a behavior to prevent a health problem is based on an individual's (a) perceived susceptibility to that particular health problem; (b) their perceived severity of the health problem; (c) the perceived benefits of averting the health problem; and (d) the costs or constraints of adopting the behavior (Becker, 1974).

2.7.1 Ugandan athletes' perception of the effects of banned substances and methods

To determine the extent to which Ugandan athletes would be likely to use banned performance-enhancing substances and methods, we first determined their perception on the extent to which the use of various types of performance-enhancing substances would lead to improved performance in their sports.

Table 14: Perceived impact of performance-enhancing substances on sport performance

	Anabolic steroids	Beta-blockers	Designer steroids like Tetrahydrogestrinone (THG)	Erythropoietin (EPO) and other similar substances	Human growth hormones (hGH)
Definitely would not n(%)	65(20)	56(18)	60(19)	36(12)	58(18)
Probably would n(%)	28(9)	18(6)	25(8)	15(5)	30(10)
Might or might not n(%)	44(13)	35(11)	36(11)	49(16)	25(8)
Probably would n(%)	56(17)	39(13)	42(13)	55(18)	41(13)
Definitely would n(%)	66(20)	73(23)	48(15)	71(23)	82(26)
Don't know n(%)	68(21)	90(29)	105(33)	85(27)	78(25)

Table 10 shows that in a sample of Ugandan athletes, 'erythropoietin (EPO) and other similar substances' was perceived to be the most beneficial to sport performance ('definitely/probably would': 41%), followed by 'human growth hormones (hGH)' (39%) and 'anabolic steroids' (37%), followed by 'beta-blockers' (36%) and 'designer steroids like tetrahydrogestrinone (THG)' (28%).

2.7.2 Ugandan athletes' perceived health risks following regular use of banned performance-enhancing substances

Because athletes who believe fewer or no health risks may befall them following regular use of banned PES or methods may be more susceptible to doping, we set out to determine Ugandan athlete perceptions on whether regular use of banned PES of methods may be associated with any harm (Table 11).

Table 15: Perceived health risks following regular use of six banned performance-enhancing substances

	No harm n(%)	A little harm n(%)	Some harm n(%)	A lot of harm n(%)	Do not harm n(%)
Anabolic steroids (n=325)	24(7)	37(11)	55(17)	120(37)	90(28)
Beta-blockers (n=312)	16(5)	34(11)	56(18)	103(33)	100(32)
Designer steroids like tetrahydrogestrinone (THG) (n=301)	15(5)	30(10)	45(15)	107(35)	106(35)
Erythropoietin (EPO) (n=297)	23(8)	43(14)	48(16)	85(28)	107(35)
Human growth hormones (n=312)	31(10)	31(10)	39(13)	105(34)	105(34)
Diuretics (n=308)	19(6)	32(10)	40(13)	109(35)	114(36)

As shown in Table 11, far greater proportions of athletes perceive harm from 'regular' use of 6 banned PES, with the greatest perception of harm from regular usage of anabolic steroids (65%).

2.8 Ugandan athletes' beliefs about the availability of banned PES or methods

Next, we determined the perceptions of Ugandan athletes with regard to the availability of performance-enhancing substances (table 11) and the likelihood that different support groups would help them access banned performance-enhancing substances or methods (table 12).

Table 16: Perceived availability of six performance-enhancing substances

	Probably impossible	Very hard	Fairly hard	Fairly easy	Very easy	Don't know
Anabolic steroids	54(17)	67(21)	59(18)	27(8)	33(10)	83(26)
Beta-blockers	35(11)	71(23)	57(18)	38(12)	18(6)	92(30)
Designer steroids like Tetrahydrogestrinone (THG)	37(12)	64(20)	54(17)	32(10)	21(7)	105(24)
Erythropoietin (EPO) and other similar substances	36(12)	55(18)	57(19)	36(12)	23(7)	100(33)
Human growth hormones (hGH)	40(13)	67(21)	49(15)	38(12)	25(8)	92(29)
Diuretics	33(11)	59(19)	48(15)	30(10)	29(9)	111(36)

Our study found that the majority of Ugandan athletes either 'don't know' of the availability of these performance-enhancing substances or find it 'very hard' to get them able (Table 12). Nevertheless, most athletes believe that it is easier for them to obtain human growth hormones (20%) compared to other PESs.

Table 17: Groups that would help Ugandan professional athletes access banned performance-enhancing substances

	Would definitely help	Would probably help	Might or might not help	Probably wouldn't help	Definitely wouldn't help	Do not know
Coach	65(20)	26(8)	46(14)	39(12)	103(32)	46(14)
Parents	24(8)	18(6)	35(11)	40(13)	137(45)	51(17)
Teammates	50(16)	50(16)	67(22)	31(10)	70(23)	42(14)
Team doctor	50(16)	40(13)	47(15)	37(12)	85(28)	47(15)
Sports psychologist	40(13)	29(9)	44(14)	47(15)	80(26)	66(22)
Trainer	54(17)	29(9)	49(16)	38(12)	84(27)	60(19)

With regard to who would help athletes access banned performance-enhancing substances, the majority of the interviewed athletes fronted 'teammates' (32%), closely followed by 'team doctor' (29%) and then 'coaches' (28%). This is much higher than the acceptable figure of less than 15% proposed by WADA. 'Parents' were the least preferred choice (14%) with regard to assisting with access to banned performance-enhancing substances (table 13).

2.9 Ugandan athletes' beliefs about the affordability of doping methods/substances

Athletes' perceived affordability of doping methods/substances helps to determine whether a National Anti-doping Agency should be targeting specific drugs (Donovan, Egger, Kapernick, & Mendoza, 2002).

Table 3: Ugandan athletes' perceived affordability of six performance-enhancing substances

	Very cheap	Quite cheap	Neither	Quite expensive	Very expensive	Don't know
Anabolic steroids	16(5)	8(2)	22(7)	48(14)	113(34)	121(37)
Beta-blockers	8(3)	15(5)	14(4)	41(13)	95(31)	135(44)
Designer steroids like Tetrahydrogestrinone (THG)	8(3)	13(4)	24(8)	42(13)	90(28)	139(44)
Erythropoietin (EPO) and other similar substances	13(4)	15(5)	15(5)	45(14)	91(29)	134(43)
Human growth hormones (hGH)	9(3)	24(8)	18(6)	42(13)	89(28)	131(42)
Diuretics	11(4)	14(5)	20(6)	35(11)	88(28)	145(46)

Concerning Ugandan athletes' perceived affordability of PES, the majority of the athletes reported that they either 'don't know' whether they are affordable, or if they knew their

price, they found them 'very expensive' (table 14). A high percentage of 'don't knows' with regard to perceived affordability is deemed to be a desirable result by WADA.

2.10 Ugandan athlete beliefs about reference groups 'endorsement of doping substances/methods

If athletes perceive that their doping behavior is disapproved of by people who are important to them, then they will be less likely to engage in doping because it could potentially result in the disapproval of these people (Donovan, et al, 2002). Consequently, we sought to determine how Ugandan athletes thought the different people close to them would react to them using banned PES or methods (table 14).

Table 19: Reference group endorsement of doping methods/substances

	Would probably approve	Would care approve	Wouldn't care either way	Probably disapprove	Definitely disapprove
Coach	64(20)	22(7)	48(15)	52(16)	132(42)
Parents	32(11)	29(10)	39(13)	36(12)	160(54)
Teammates	47(17)	35(12)	64(23)	54(19)	84(30)
Team doctor	50(17)	16(5)	44(15)	60(20)	124(42)
Close friends	56(19)	33(11)	40(14)	57(20)	104(36)
Trainer	48(16)	27(9)	56(19)	49(16)	120(40)

For the majority of athletes in our study, various reference groups (coaches, parents, teammates, team doctors, close friends and trainers) would 'disapprove' of doping. However, the proportion of Ugandan athletes who reported that their coaches would 'approve' of them to dope (27%) was much higher than that recommended by WADA, signaling an urgent need to increase deterrence efforts targeting coaches.

2.11 Evaluation of athlete doping control measures in Uganda

To evaluate doping control measures implemented by NADO-Uganda, we sought athlete perceptions on the likelihood of being tested in and out of competition (table 15), the likelihood of evading detection if using PES substances/methods (table 16), the seriousness (table 17), and effectiveness (table 18) of authorities in preventing trafficking of banned performance enhancing substances in Uganda, the fairness of the Uganda National Anti-doping Agency in treating all athletes equally (table 19), and the security of Uganda National Anti-doping Agency drug testing procedures (table 20).

Table 20: Perceived likelihood of being tested in and out of competition at least once a year

	In competition n(%)	Out of competition n(%)
Very likely	95(29)	53(17)
Quite likely	51(15)	35(11)
A little likely	41(12)	36(11)
Total likely	**187 (56)**	**124 (39)**
Not likely	59(18)	50(16)
Not at all likely	45(14)	92(29)
Do not know	40(12)	49(16)
Total	**331 (100)**	**315 (100)**

In our study, more athletes were more likely to be tested during competitions (56%) than out of competition (39%). This figure is below 90% and 80% for the likelihood of in- and out-of competition testing recommended by WADA for elite athletes, respectively, although they are slightly above the 25% and 50% likelihood of in- and out-of competition testing considered a level of concern by WADA (table 16).

Table 21: Perceived likelihood of evading detection if using performance-enhancing substances in and out of competition

	In competition n(%)	Out of competition n(%)
Very likely	59(18)	68(20)
Quite likely	39(12)	38(11)
A little likely	54(16)	43(13)
Total likely	**152(46)**	**149(45)**
Not likely	45(14)	40(12)
Not at all likely	31(9)	43(13)
Do not know	105(32)	100(30)
Total	**333(100)**	**332(100)**

With respect to evading detection if using a banned substance, a substantial proportion of athletes thought this to be less likely both in (55%) and out (55%) of competition. This figure is below 90% and 80% respectively for likelihood of evading detection if using PES or methods during in- and out- of competition testing as recommended by WADA for elite athletes, even though they are slightly above 25% and 50% likelihood of evading detection if using PES or methods during in- and out- of competition testing considered as a level of concern by WADA.

Table 22: Perceived fairness of the Uganda National Anti-doping Agency in terms of treating all athletes equally

	n(%)
Very fair	74(22)
Fair	68(21)
Unfair	54(16)
Very unfair	34(10)
Don't know	101(31)

Participants were asked about how fair the Uganda National Anti-doping Agency in terms of treating athletes equally, out of 331 participants who replied, 22%(74) said it is very fair, 21%(68) said it is fair, 16%(54) said it is unfair, 10%(34) said it is very unfair, and 31%(101) said they do not know.

Table 23: Perceived security of Uganda National Anti-doping Agency drug testing procedures

	n(%)
Very secure	61(18)
Quite secure	73(22)
Not really secure	54(16)
Not at all secure	16(5)
Do not know	129(39)
Total	**333(100)**

Participants were also asked about the security of the Uganda National Anti-doping Agency drug testing procedure, of the 333 participants who replied, 18%(61) said it is very secure, 22%(73) said that it is quite secure, 16%(54) said it is not really secure, 5%(16) said it is not at all secure, and majority 39%(129) said they do not know.

Table 24: Perceived seriousness of authorities in preventing trafficking of banned performance-enhancing substances in Uganda

	Not at all serious	Not serious	A little serious	Quite serious	Very serious
Police	98(29)	49(15)	86(26)	37(11)	67(20)
Customs	51(16)	65(21)	70(21)	69(22)	61(19)

A substantial number of Ugandan professional athletes do not think that authorities ('police' (44%); 'customs' (37%)) are serious enough to prevent the trafficking of banned PES.

Table 25: Perceived effectiveness of authorities in preventing trafficking of banned performance-enhancing substances in Uganda

	Not at all effective	Not effective	A little effective	Quite effective	Very effective
Police	92(27)	66(20)	70(21)	51(15)	57(17)
Customs	54(17)	64(21)	63(20)	67(22)	62(20)

A substantial number of Ugandan professional athletes do not think that authorities ('police' (47%); 'customs' (28%)) are effective in preventing the trafficking of banned PES. This in turn could facilitate an athlete's decision to seek or accept a banned substance.

Association between athlete doping perceptions, sociodemographic characteristics, and likelihood of doping testing

Next, we determined if athlete socio-demographic characteristics or their doping perceptions were associated with a likelihood of being tested for a doping substance or method (table 26) . As expected, highest level of competition of the athletes in our study was significantly associated with a likelihood of being tested for a doping substance or method (X^2 = 17.76, P=0.003). The other athlete demographic characteristics that were significantly associated with likelihood of getting a doping test in our study included; competition in events for athletes with disabilities (X^2 = 7.44, P=0.006), and holding a title at regional, national or international level (X^2 = 5.60, P=0.018). Whether the doping testing experience was traumatic (X^2 = 5.72, P=0.017), whether doping testing personnel are courteous (X^2 = 16.39, P=0.001), whether doping testing personnel are helpful (X^2 = 14.53, P=0.001), and whether doping testing personnel are sensitive (X^2 = 17.02, P=0.001) were the athlete doping perceptions found to be significantly associated with likelihood of ever being tested for a doping substance or method in our study.

Table 26: Athlete characteristics associated with likelihood of ever being drug tested.

Characteristic	Ever been drug tested		Chi-square value	P-value
	Yes n (%)	No n (%)		
Highest level of competition			17.76	**0.003**
Olympic games	5(36)	9(64)		
World championship	18(37)	31(63)		
National competition	21(18)	96(82)		
State competition	3(27)	8(73)		
Regional competition	9(17)	44(83)		
City/District competition	4(7)	53(93)		
Competing in events for disability athletes			7.44	**0.006**
Yes	12(38)	20(62)		
No	49(17)	233(83)		
Ever held a title			5.60	**0.018**
Yes	29(28)	76(72)		
No	32(16)	166(84)		
Is testing experience traumatic?			5.72	**0.017**
Yes	24(63)	14(37)		
No	33(40)	50(60)		
Testing personnel courteous			16.39	**0.001**
Courteous	39(76)	12(24)		
Rude	6(50)	6(50)		
Neither	12(33)	24(67)		
Testing personnel helpful			14.53	**0.001**
Helpful	42(75)	14(25)		
Unhelpful	2(50)	2(50)		
Neither	5(26)	14(74)		
Testing personnel sensitive			17.02	**0.001**
Sensitive	39(80)	10(20)		
Insensitive	4(57)	3(43)		
Neither	5(26)	14(74)		

2.12 Interview of coaches on their perceptions, knowledge and attitudes towards PES

We conducted a total of 16 focus group discussions (FGDs) in the four regions of Uganda (North, Eastern, Western, and Central). These FGDs consisted of varying numbers of participants (4-10) who were coaches from the seven sports indicated. The participants were both male and female. Our findings resulted in five main themes that focused on understanding and belief, knowledge of the current status, prevalence of herbs, secureness of samples and sensitization of both athletes and coaches.

2.12.1 Coaches' understanding of performance-enhancing substances and methods

At the start of a focus group discussion session, coaches from several regions of Uganda were asked to give their views on what they thought performance-enhancing

substances were. Below are excerpts of some of the responses. Majority of coaches thought that performance enhancing substances and methods are substances or methods if used would boast or increase the performance of the individual using them as evidenced from the following responses.

> **"**Performance enhancing substances are substances used for boosting one's energy levels to enable them compete favourably". (Basketball Coach, Central Uganda)
>
> "Actually these are substances a player uses and abuses for example drugs to boost them in the ring to be the best". (Boxing Coach, Northern Uganda)
>
> "These are items that help you perform well in sport. Such items may include foods, drinks. However, these may also include drugs". (Cycling coach, Central Uganda).
>
> "Actually these substances, usually in the form of powder or liquids that give an athlete an edge over others if put in use during sports". (Rugby coach, Central Uganda).
>
> "These are supplements an individual takes to add on what they already have to improve on their performance". (Athletics coach, Eastern Uganda)
>
> "Performance enhancing substances are used to boost players' performance, that is to say, if one is a poor performer, these substances improve the player's performance to become better". (Boxing coach, Eastern Uganda).
>
> "Performance enhancing substances are drugs that boost energy and enable one do extraordinary things in the ring". (Boxing coach, Northern Uganda)

However, other coaches believed performance enhancing substances or methods to be those that are harmful to one's health.

> **"**These are substances that cause danger to the body in the long run if put in use without the help of physician". (Football Coach, Western Uganda)
>
> **"**I have friends who are players that use performance enhancing substances but in hiding. They take the substance as a drink and are very active in the pitch while playing but at night, they sleep feeling very weak and I think this is a side effect". (Basketball Coach, Eastern Uganda)

2.12.2 Status of herbal substance usage in Uganda

During the FGDs, coaches indicated the following as the five most widely consumed herbs amongst athletes: Marijuana (Cannabis Sativa), Mairunji (Catha edulis Forsk), Mulondo (Mondia Whitei), pepper (Capsicum frutescens) and Aloe vera (Asphodelaceae). However, Coaches had varying views on the status of use of performance enhancing substances (PES). Some coaches believed that use of PES was quite high and rampant. This view was shared across different sporting disciplines.

- "In Uganda, performance enhancing substances are used. In my field as a coach, most of the players use these supplements but in hiding because it's considered to be odd and a laughing matter. Traditionally, people using such substances are considered to be very weak". (Cycling Coach, Central Uganda)
- "I personally think there is no control on the use of performance enhancing substances and people use them knowingly and unknowingly, though it's illegal to use them". (Football Coach, Western Uganda)
- "Here in Sebei, coaches encourage runners to train hard and use local herbs from mountain Elgon to regain or recover. For example, "lakweki" is a combination of honey and local herbs." (Athletics coach, Eastern Uganda)
- "The use of performance enhancing substances in Uganda is high, reason being that most youths use them before even getting into the sport and when they join, they still use them even more". (Boxing coach, Northern Uganda).

Whereas other coaches believed use of PES in Ugandan sport was low or non-existent.

- "Usage of performance enhancing substances amongst cyclers is very low. The reason is that discipline and character of cyclers, inherited from their ancestors is good. Additionally, performance enhancing substances are expensive, and the laws of the country does not allow use of some performance enhancing substances, such as Marijuana". (Cycling coach, Central Uganda)
- "In Uganda, use of performance enhancing substances is very low. The reason for the low use maybe that most Ugandans do not know what they are and how they can be used". (Cycling coach, Central Uganda)
- "Among Ugandan athletes, I have never heard even witnessed an athlete using performance enhancing substance." (Athletics coach, Eastern Uganda)

- The use of performance enhancing substances its moderate reason being coaches discourage their athletes from using these substances by mentioning the side effects. (Rugby coach, Northern Uganda).

Some coaches postulated that the prohibitive high cost of PES, coupled with poverty among Ugandan athletes was the major factor impeding use of PES amongst Ugandan athletes.

- "The performance enhancing substances are many in the market but not in use reason being they are quite expensive. I have been to the gym and interfaced with people who want to build up their muscles using enhancing substances but they have failed because they cannot afford these products. For example, one tin of such products can cost up to four hundred thousand Uganda shillings (400,000/) and this should be used continuously. So it is very expensive even for those who would like to use such substances". (Powerlifting Coach, Northern Uganda).
- "The sports in Uganda has not developed so much to have enhancement substances so it's not easy to access them and also the financial implication is high since they are expensive." (Athletics coach, Eastern Uganda)

One particular coach believed that because testing for banned PES substances at regional and national level is still very low, it is very difficult to accurately predict whether Ugandan athletes are using PES.

- "In Uganda, the status of use of performance enhancing substances cannot be gauged. The reason why it is hard to gauge the status of use of these substances in Uganda is because we do not carry out doping tests. In other words, we are still behind regarding testing for performance enhancers in Uganda." (Rugby coach, Central Uganda)

2.12.3 Status of use of performance-enhancing substances in Uganda

Coaches also had different views regarding use of PES amongst athletes. However, majority thought that use of PES was unnecessary, and could even be harmful to the body in some circumstances.

- "Personally, I believe using Performance enhancing substances is not necessary because they slow you down, thus degrading the game especially in basketball". (Basketball Coach, Central Uganda)

- "Most performance enhancing substances, especially the banned ones are not good for the body". (Cycling Coach, Central Uganda).
- "Using Performance enhancing substances is cheating, but I also think that some supplements work even though they are risky and may have unknown health side effects. But they work and they can help someone get a good contract". (Rugby coach, Central Uganda).

Coaches who were opposed to using PES thought that these substances are banned to be used by athletes, or are too expensive for Ugandan athletes to afford, or could have harmful effects on the body.

- "I believe these substances are impossible to afford, and that doping substances are not healthy as they can affect the kidney and reproductive system. Just supplementing the training workout with proper diet can be sufficient." (Athletics coach, Eastern Uganda).
- Personally, I believe using food supplements helps a player for a short while, but in the long run the side effects to the body are many and dangerous. (Boxing Coach, Northern Uganda).
- I believe all these substances work; it depends on how an individual uses them and for how long. Long-term use can lead to dependency. (Rugby coach, Northern Uganda).

However, a few coaches thought that use of PES was actually good for the body, as they would help restore what is lacking in the body, could help strengthen the body and improve performance

- "Using nutritional and herbal supplements as performance enhancing substances cures something in the body that is lacking." (Athletics coach, Eastern Uganda)
- "Personally, I believe using Performance enhancing substances like supplements works, especially multivitamins. They help the body to regain strength" (Boxing coach, Eastern Uganda).
- "Personally, I believe using Performance enhancing substances like supplements is helpful because it is nutrition and everybody needs proper nutrition. That is to say, an athlete trains hard causing their immune system to go down so supplements are helpful." (Athletics coach, Eastern Uganda).

2.12.4 Secureness of the Uganda National Anti-doping agency drug testing procedures in Uganda.

Because testing at regional and national sports tournaments is not usual, many coaches were not familiar with the procedures for doping testing, as reported by a cycling coach for a team in Central Uganda.

- "Testing in Ugandan competition is very rare, and I or my cyclists have never been tested while participating in any national competitions. So I cannot know". (Cycling Coach, Central Uganda)

However, as opposed to cyclists, athletics coaches were more familiar with the process, as many Ugandan runners have competed in many international events, in which doping testing was the norm. Many of them reported that NADO Uganda does a good job.

- "I believe NADO Uganda does their job perfectly, and the samples are secure because most of the times the coach is always present during sample collection and in addition, samples are sealed and given serial numbers for follow up." (Athletics coach, Eastern Uganda).

However, it was observed by a few coaches due to the wide-spread culture of corruption that still plagues different socio-economic sectors of Uganda, it is very unlikely that NADO-Uganda could be exempt from corrupt tendencies, as explained by a basketball coach from Central Uganda.

- "In the Ugandan system, nothing is secure because of the high levels of corruption. People pay and get the results they want regardless of whether they are users of performance enhancing substances or not". (Basketball Coach, Central Uganda).

2.12.5 Sensitization on sports nutrition and doping prevention

When coaches were asked if and how they had previously been sensitized on sports nutrition and doping prevention, majority reported that they had never been educated on these matters. Many noted that for the start, these trainings should at least be incorporated into the coaches training courses.

- "In body building we have not gotten the opportunity as coaches to attend any seminar". (Body building coach, Central Uganda).
- "As coaches we don't have the knowledge on sport nutrition, and thus we need capacity building in order to properly advise our athletes" (Athletics coach, Eastern Uganda.)

- "Most coaches are not educated on nutrition and doping since the unions don't organise training workshops, so most coaches have no knowledge about doping. It's so unfortunate that beginner courses for coaches don't cover Nutrition or Doping as topics." (Rugby coach, Northern Uganda).

One of the few coaches that had received some form of training described it to be unstructured and superficial.

- "Sensitisation is done on television mainly at the national level and usually only saying that drugs are prohibited, but at the local level, nothing much is done to share information on doping". (Boxing coach, Northern Uganda)

2.12.6 Recommendations on control of usage of performance enhancing substances.

When coaches were asked what advice they would give for the controlled usage of herbal supplements, and other performance enhancing products in Ugandan sports, some reported that courses for both athletes and coaches should be organised at all levels.

- "Capacity building of coaches should be put forth; more effort to educate other people especially athletes on the use of performance enhancing products is needed". (Basketball coach, Central Uganda).
- "Sport seminars and workshops should be organized more often to educate and build capacity of the coaches because coaches can easily reach their players and this will make information sharing easy". (Athletics coach, Eastern Uganda).
- "I would advise a number of sport courses to be introduced in institutions so that most sport men and women can enrol and build their capacity by gaining knowledge on some sensitive topics that can help them as coaches to advise their players appropriately". (Rugby coach, Northern Uganda).
- "Coaches should also work in pairs with partners, especially to share knowledge but also to safeguard the wellbeing of athletes by reporting those coaches who give athletes drug (Soccer coach, Eastern Uganda)

In a focus group discussion held in central Uganda, one coach tasked the Government of Uganda to invest in doping testing centres, as well as support NADO-Uganda.

- "The Uganda government through the ministry of education and sports should invest in establishing testing centres or support the anti-doping agency to function as it should". (Basketball coach, Central Uganda).

There was also a general sentiment among coaches that the manufacturing and marketing process, especially for herbal products should be more tightly regulated by all stakeholders, including NADO-Uganda.

- "The federations like NADO-Uganda should work hand in hand with the producers of the products because some may contain substances that are banned". (Rugby coach, Central Uganda)
- "Commercialisation of herbs in Uganda through government bodies like the Uganda National Bureau of Standards should be done. Such bodies should monitor the drinks and other products so as to avoid people using performance enhancing substances unknowingly by checking the ingredients and content." (Boxing coach, Eastern Uganda).

2.13 Review of policy documents from the National Agencies

We utilized Uganda's National Drug Authority's website and documents from the Office of the Auditor General to access and analyze documents pertaining to specific policies regarding drug usage in sports. The review established that Uganda's National Drug Authority currently has not completed statutory instruments for regulating the advertisement of many herbal drugs and supplements, leading to an increased exposure risk for the public through misleading information about drugs on the market (NDA, 2010). In contrast, Uganda's neighbor, Kenya, has legal provisions for regulating the manufacturer, marketing, and use of herbal as well as doping agents, as stipulated in Kenya's Pharmacy and poisons, and anti-doping acts. (Okumu et al., 2017).

We also utilized Uganda's National Olympic Committee's website to access and analyze the documents pertaining to specific policies regarding drug usage in sports. The review found out that the parliament of the republic of Uganda passed the "Traditional and Complementary Medicine Bill", in February 2019, which was assented in to law by the President in September 2020. This law mandates the establishment of the National Council of Traditional and Complementary Medicine Practitioners Council, which, among other roles, registers. The law further licenses, and monitors the activities of traditional and complementary medicine practitioners, sets standards and quality control measures and assurances for traditional and complementary medicine practitioners in Uganda (Parliament of the Republic of Uganda, 2019).

2.14 The Agali Awamu Mini-Educational Intervention

The term "Agali Awamu" is a Luganda (Uganda's predominant local language) term used to reinforce the need and impact of collaborative efforts in doping prevention. This term was introduced by Dr. Makubuya in his effort to heighten participants' awareness of how various stakeholders in Uganda's sports can work collaboratively and achieve better results in the doping fight. This athlete-centered and collaborative approach is in line with WADA's 2020-2024 key priorities. As part of the intervention, the research team implemented the intervention through a sports science workshop on anti doping. This interactive workshop was organized in concert with the Uganda Olympic Committee (UOC) and hosted by the Department of Sports Sciences at Kyambogo University.

"The Agali Awamu: Enhanced Training Against Doping (ETAD) intervention" is informed by our preliminary findings on the current knowledge, attitudes and beliefs of athletes and ASP on doping in Uganda (Muwonge, Makubuya, Lubega & Zavuga, 2022). These findings serve as baseline data and support our previous hypothesis of low levels of anti-doping knowledge among athletes and ASP in Uganda.

Our team implemented a multi-component intervention based on learning theories such as Social Cognitive theory (Bandura, 1977, 1978) and experiential learning theory (Kolb, 2014). The main objective of ETAD was to increase anti-doping knowledge and awareness through the various components and principles of doping education programs in Uganda. This was achieved by designing interventions based on educational theories such as social learning theory (Bandura, 1977) and experiential learning theory (Kolb, 2014). These were delivered through both facilitator and peer leader-centered formats. Peer-based learning, discussions, and role-playing were embedded in the participants' learning activities. ETAD was designed in order to increase anti-doping awareness, and to enhance anti-doping knowledge among a selected group of athletes and ASP from the four regions of Uganda (n=49). This selected and broader group of athletes, and ASP (including coaches, sports administrators, district sports officers, team managers, physical education teachers and sports masters from various schools and districts in Uganda) was an almost even distribution of male and female participants, with a diverse national representation (Table 22).

2.14.1 Agali Awamu Workshop

The workshop included results dissemination and anti-doping education. This format for results presentation was in form of a power-point presentations, and an interactive session conducted by a WADA certified anti-doping educator, and another interactive session on the usage of digital tools in doping prevention. During the digital tool sessions, participants co-created knowledge and furthered the discourse on supplements, herbal and doping products in Uganda, particularly highlighting the heightened usage of herbal products that has been publicly noted during the COVID-19 pandemic.

Below is the schedule for the first Agali Awamu workshop held in Central Uganda.

KYAMBONGO UNIVERSITY
Sportscience Work-shop on **ANTI-DOPING**
Saturday 26th March, 2022
Venue: Central Teaching Facility conference Hall (CTF, Room 105)

FINAL SCHEDULE

Agali Awamu Anti-Doping Workshop: A collaborative approach to anti-doping Education in Uganda

Organizers: Dr. Samuel K. Lubega (KYU), Dr. Haruna Muwonge (MUK), Dr. Aya Nakitanda (UOC) & Dr. Timothy Makubuya (UMSL).

8:00 am: Registration

8:30 am: Introductions- Dr. Lubega

9:00 am: Anti-doping Education (part 1)- Dr. Nakitanda and UOC Team

10:00am: Presentation of Current Doping Trends in Ugandan Athletes- Dr. Muwonge

10:30am: Breakfast

11:00 am: Views on Doping Prevention in Ugandan Athlete Support Personnel-Dr. Lubega

11:30am: Using Digital Tools in Doping Education- Dr. Makubuya

12:00 pm: Exit slips

12:15 pm: departure

CONTACT PERSON: Dr. SK Lubega

salubega@kyu.ac.ug **/0789217543/whatsapp +27655023509**

2.14.2. Agali Awamu Mini-Education Components

The entire Agali- Awamu education intervention was implemented as a two-and-a-half-hour interactive session between the researchers, research assistants, WADA anti-doping educator, selected athletes from the seven sporting codes (Athletics, Basketball, Boxing, Cycling, Rugby, Soccer, and Weight Lifting) and ASP. The components of the anti-doping education intervention included;

- Results Dissemination from the athlete questionnaires and FGDs from ASP
- introduction to doping, Role of WADA, RADOs and NADOs
- The World Anti-Doping CODE
- The Anti Doping Education Learning platform, ADEL.
- Digital Tools for doping prevention.

Figure 6: Uganda's WADA Anti Doping Educator introducing the Anti Doping Education Learning platform (ADEL) and World Anti Doping CODE information with Agali Awamu participants

2.14.3. Workshop Invitations

Stakeholders (including athletes, athlete support personnel, media, among others) were contacted through phone calls, using an invitation letter sent and shared via social media (primarily via WhatsApp), and by word of mouth. Participants were informed of this one-day short and interactive workshop with a breakfast, transportation reimbursement, and a certificate of attendance issued by the Department of Sports Sciences at Kyambogo University. District Sports Officers were also reimbursed by their respective districts to travel to and from Kampala (Central Region), where the workshop was held. The majority of participants (95%) responded favorably to the workshop invitations and requested the designing of anti-doping educational materials in digital forms, as well as in various regional languages. The participants urged that by translating the anti-doping informational resources into local languages, this promotes a community-based anti-doping effort, as well as enhance doping education even during periods when in-person workshops can't be conducted, and thereby easing the sharing of information. The usage of cell phones is an avenue through which participants could share reputable information from the anti-doping community via social media platforms.

2.14.3. 1. Participants

We noted that 52% of the participants identified as male whereas 48% of the participants identified as female. Table 22 indicates the regions of Uganda from which the workshop participants came from.

Table 27. Regional Representation of Workshop Participants

Region	**n(%)**
Central	23 (56.1)
Western	5(12.2)
Eastern	8(19.5)
Northern	5(12.2)
Total	41(100)

2.14.4 Sample of Workshop Interactive Activities

Figure 7: Introductory Slide for Dr. Muwonge's presentation at the Workshop

In this interactive presentation, Dr. Muwonge provided a background on a category of substances and methods that were prohibited by WADA. The participants were introduced to exogenous anabolic steroids, endogenous anabolic steroids, peptide hormones, hormone and metabolic modulators, diuretics and masking agents, and other anabolic agents which are prohibited at all times, manipulation of blood and blood components, chemical and physical manipulation, gene and cell doping as prohibited methods. In addition, participants were educated on stimulants, narcotics, cannabinoids and glucocorticoids as substances and methods prohibited in-competition. Finally, participants were introduced to sport-specific prohibitions such as those for beta-blockers that are prohibited in-competition and out-of-competition in archery, automobile, billiards, darts, golf, shooting, skiing/snowboarding and underwater sports.

In his presentation, Dr. Muwonge highlighted that that protein-carbohydrate shakes, sports energy drinks and vitamins or mineral supplements were most consumed by Ugandan athletes as per the recently concluded survey. Furthermore, athletes were taught on how to check nutrition labelling and expiry dates on all the products that they consume. A considerable number of athletes (24%) had considered using doping products or methods in comparison to a small proportion of the sample

(3%) who acknowledged having used doping products or methods. The majority of Ugandan athletes (73%) who participated in our study had never used doping products/methods. The commonest herbal products among Ugandan athletes were Cannabis Sativa (Enjayi or Enjaga), and Mondia Whitei (Omulondo), which are considered therapeutic remedies for a number of illnesses in Uganda including measles, body weakness, and erectile dysfunction (Kamatenesi-Mugisha & Oryem-Origa, 2005; Ssozi, Kabiito, Byaruhanga & Kanata, 2016; Tabuti et al, 2012; Tugume et al, 2016).

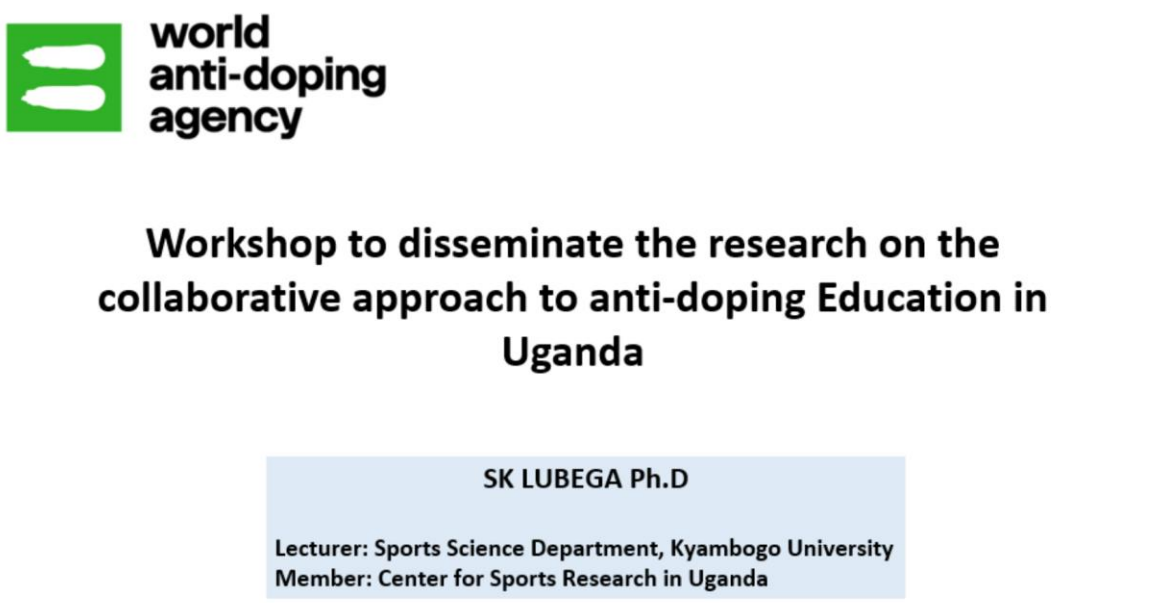

Figure 8: Introductory Slide for Dr. Lubega's presentation of findings from coaches' focus group discussion

In this interactive presentation, Dr. Lubega engaged the participants in ways in which they too can contribute to the anti-doping process by being supportive to local and national sports policy formulation as well as amendments. Participants were knowledgeable on Uganda's long standing post colonial sports policy which needs urgent attention and amendments necessary to revise physical education curricula for both primary and secondary schools to prioritize anti-doping education.

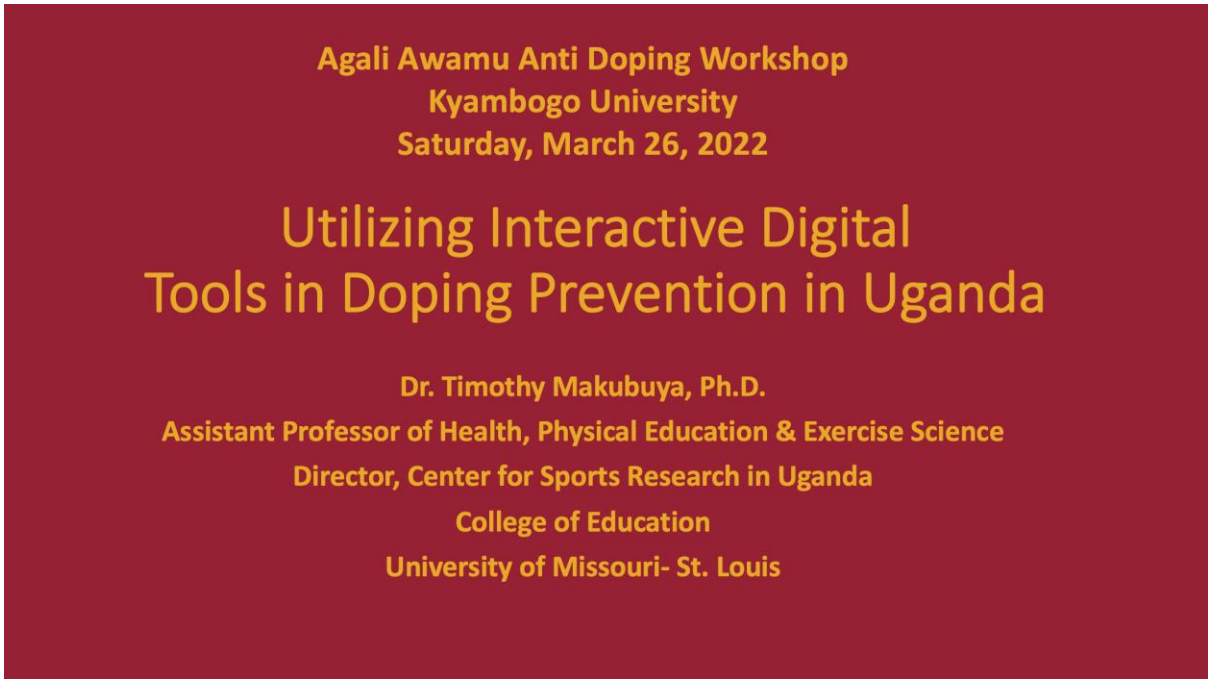

Figure 9: Introductory Slide of Dr. Makubuya's presentation on enhancing digital literacy among athletes and ASP

This interactive digital session emerged from participant requests for dissemination of materials, to enhance athletes understanding of the anti-doping knowledge and practices in an interactive and differentiated form of learning. This session was led by Dr. Makubuya, who noted the current need for digital literacy among teachers and educators in sub-Saharan Africa (Kerkhoff & Makubuya, 2021) and the potential application of digital literacy in anti-doping intervention, through which information could be shared, discussed, and translated in local languages for easy interpretation in various groups of participants in a way to enhance their doping literacy. There is currently insurmountable evidence on the usage of digital tools in health education and promotion globally (Alanzi et al, 2016; Cheung et al, 2015, and in SSA (van der Kop, 2018), particularly in delivering health information cost-effectively. For example, the sharing of humanitarian information and dissemination of COVID-19 information by the United Nations in Kenya (Hargreaves, Zenner, Wickramage, Deal & Hayward, 2020) and in the dissemination of hygiene infromation, also in humanitarian contexts (Vujcic, Ram, Blum, 2015). There is potential to scale the dissemination of information and the necessary interpretation of doping prevention mechanisms in Uganda via digital platforms as evidenced by the ready availability of cellphones in Uganda. It is important to note that WhatsApp has been effectively utilized in Singapore to share health information during the COVID-19 global pandemic (Legido-Quigley et al,

2020). Some scholars have argued that utilizing WhatsApp could be more effective than one-way messaging as it allows for the storage of infromation on participants phones, encourages asking follow up questions using audiorecording (which participants can do in their local languages). It is therfore possible to scale up anti-doping prevention interventions using peer leaders and anti-doping educators or navigators nationally.

Digital Tools Activity # 1

In this activity, participants were introduced to the idea of experiential learning by asking them to identify anti doping resources from all sources that they could think of. Many participants simply resorted to their cell phones and mentioned that digital tools such as webistes and social media handles (Facebook, WhatsApp, Twitter, YouTube) provide some information on doping through various platforms. Participants were cautioned on how to auntheticate such information. Participants were then tasked with sharing only resources from reputable sources amongst themselves and then invite researchers to engage in the discourse. This form of experiential learning (Kolb, 2014) allowed participants to engage in reflective observations of other peers and groups.

Figure 10: Agali Awamu workshop participants using Digital Tools

Digital Tools Activity # 2

In this activity, the reearchers shared four four resources from WADA with four peer leaders, who then disseminated them amongst their group members. On researchers instructions, participants were to able to model the behaviors them observed while researchers and peer leaders shared information. This form of observational learning that manifested itself through the group presentations of artifacts (Figure 12) is unique to the Social Learning theory (Bandura, 1977).

Figure 11: Agali Awamu workshop ASP participants engaging in an interactive digital tools group activity

2.14.7. Digital Tools Training Artifacts

After engaging in the digital tools session to impart knowledge, participants were then engaged in a group activity that involved sharing four distributed materials on doping prevention including (WADA's Dangers of Doping: Get the facts, Anti-Doping: Important Facts and Highlights from WADA's Athlete Guide, The Doping Control Process, The 11 Stages of doping Control, Athlete Rights and Responsibilities, and information on WADA Play True Quiz). Using this information, participants in four groups that allowed participants from various regions to mingle and interact, produced learning artifacts that contained various lessons learnt and questions posed during their group discussions on digital prevention strategies. These peer interactions were guided by

both evidence on usage of athletes as effective peer educators in substance prevention (Tricker, 2009), and building on the co-coaching education framework among coaches in Uganda (Makubuya, 2019).

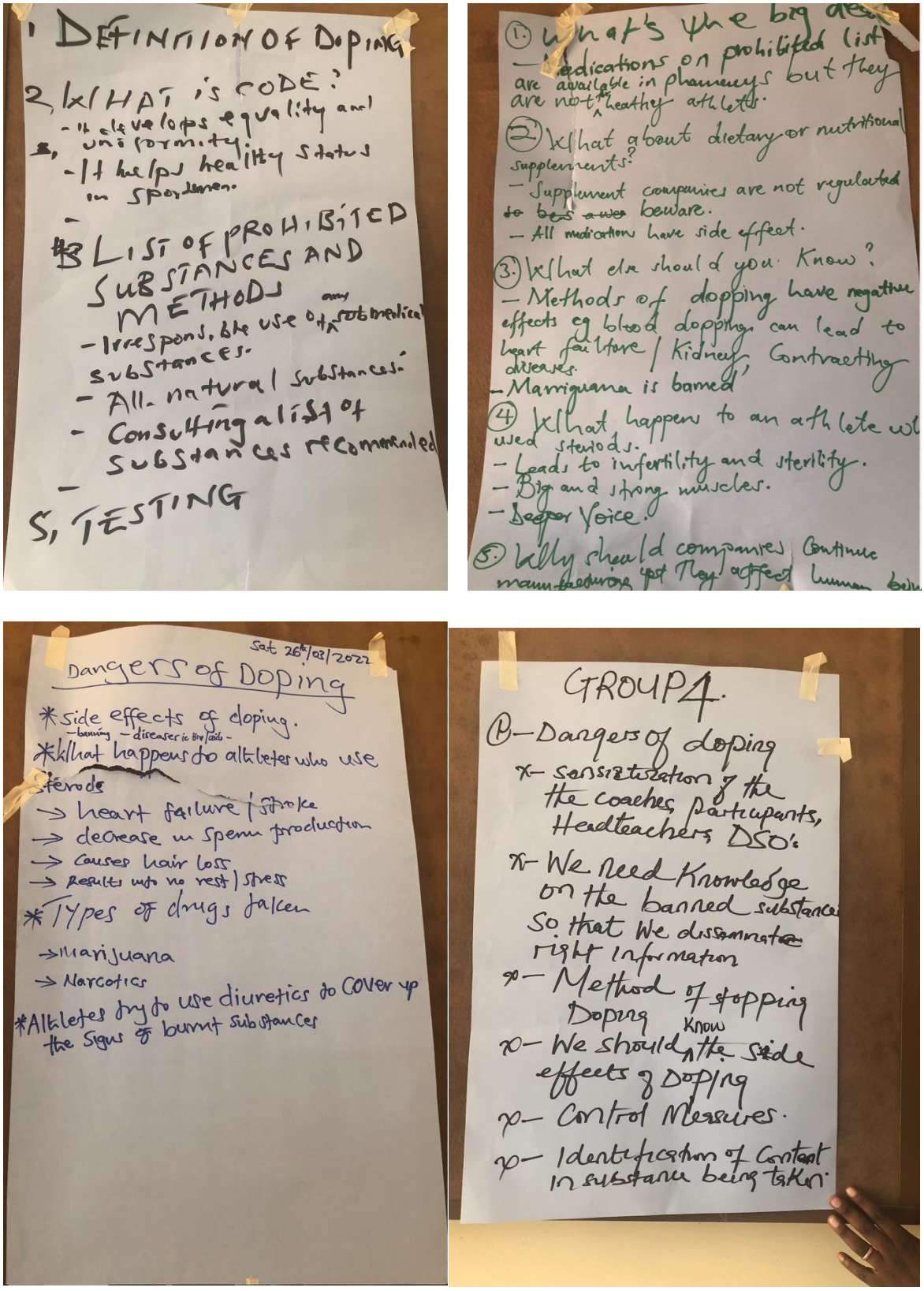

Figure 12: Artifacts from the Agali Awamu Workshop Activities

2.14.8. Emergence of Peer Leaders

During the digital group discussions, researchers identified peer leaders who embodied various communication skills, and emerged as peer leaders, who routinely engaged the research team for for further inquiry. These peer leaders could be utilized as ambassadors to enhance further dissemination of the doping prevention information to the grassroots in various regions of Uganda.

2.14.8.1 Emerging Questions from Participants

Several questions were posed by participants in the workshop who were particularly seeking clarification on athlete rights and responsibilities, therapeutic use exemptions (TUEs) as well equity issues surrounding African and Black athletes that seem to be unfairly targeted in instances of doping in comparison to their non-African and non-Black athletes globally.

2.14.9. Exit Slips

We designed a workshop exit slip to capture participants' knowledge and understanding of the components of the Agali Awamu: Enhanced Training on Anti Doping (ETAD). A sample of the closed and open-ended questions that made up the exit slips included;

- Are you an athlete or ASP?
- What is your understanding of the anti-doping prevention mechanisms in Uganda?
- What is your role in anti-doping prevention in Uganda?
- What digital tools do you think can help to fight doping in Ugandan sports?

Only 31% of the participants who completed the exit slips identified as athletes whereas 59% identified as ASP.

2.14.10. Certificate of Attendance

At the conclusion of the workshop, participants were issued an attendance certificate endorsed by the principal investigator and the head of department at the host institution.

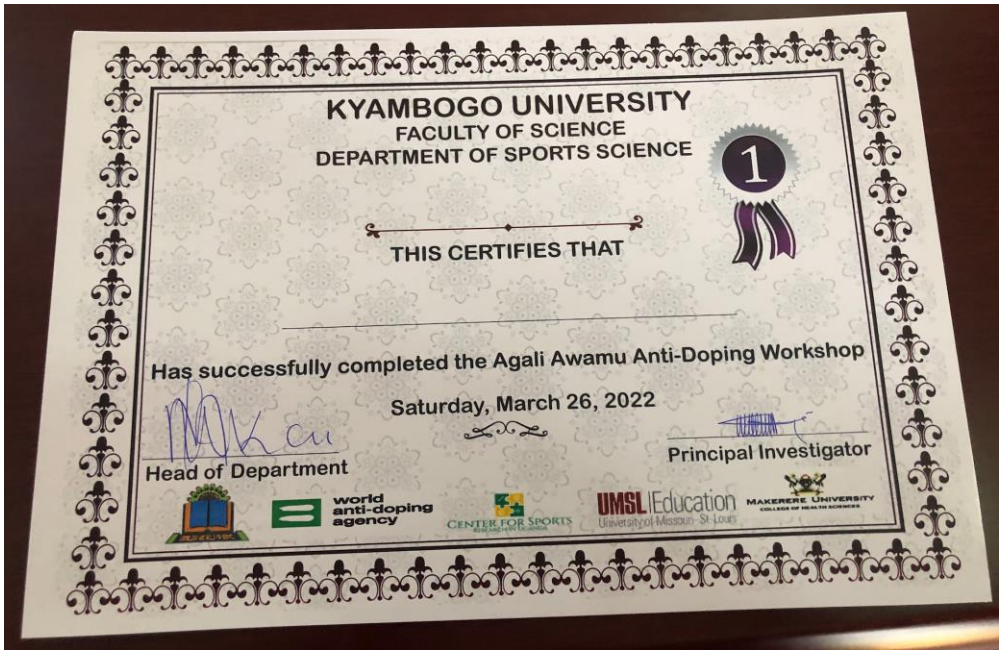

Figure 13: A sample of a certificate awarded to workshop participants

3. Discussion

In Uganda, available reports suggest an increase in the popularity of herbal products, supplements and doping agents among Ugandan sports participants (Ssemugabi & Bugembe, 2015). This purported increase occurs at the time when the rate of using allopathic medicine is being overtaken by alternative medicine (Muwonge, Zavuga, Kabenge, & Makubuya, 2017). Many African plants, particularly those that grow in tropical climates, contain performance-enhancing agents (Sellami et al, 2008). Furthermore, reports of inadvertent doping stemming from usage and contamination of nutrition supplements and herbal formulations have been previously highlighted as huge possibilities in some African countries (van der Merwe & Grobbelaar, 2002; Martinez-Sanz, et al, 2017; Muwonge, et al, 2017). Moreover, countries such as Uganda are at increased risk for inadvertent doping, both from commercial sale of herbal concoctions (Williams, 2006) and plant-based products that are locally acquired. Most of the existing literature has focused on the detection of herbal extracts and contamination by other agents that are banned by WADA (Martinez-Sanz, 2017), with a dearth of studies focusing on inadvertent doping from herbal products. Unlike in other countries, where herbal products rich in Ginseng, tribulus terrestris, and kava are some of the common sources of herbal supplements (Antonio, Uelmen, Rodriguez, & Earnest, 2000; Williams, 2006), herbal products in Uganda include Cannabis sativa and Capsicum frutescens (Ssozi, Kabiito, Byaruhanga & Kanata, 2016; Tabuti, Kukunda, Kaweesi & Kasilo, 2012, Tugume et al, 2016). Herbal products such as capsicum frutescens have been documented to reduce physical fatigue and improve exercise performance in animal samples (Hsu, et al, 2016).

Our study reveals key findings that include the high rate of using protein-based supplements. Our findings of high usage of protein-carbohydrate supplements are in line with previous findings of protein-based supplements that are rich in amino acids (Bianco et al, 2011). Furthermore, our study revealed that less than 3% of athletes in Uganda acknowledged having consumed banned performance-enhancing products. This is, however, lower than the 3.9% of Ugandan athletes who have acknowledged consumption of the same previously (Muwonge, Zavuga, Kabenge, & 2015). It is therefore possible that although the reported consumption rates are relatively lower than previously reported, doping among Uganda athletes is merely subjective and bound to misrepresentation of the actual doping prevalence.

Our study also revealed that Uganda as a country values the role that tropical and herbal medicines, such as those mentioned by coaches, play in its healthcare industry. Therefore, it is possible that the consumption of herbal products and concoctions of the same will always remain high in Uganda. Moreover, for over two decades, conversations around other plant-based herbal products, such as cannabis, have become more contentious (Huestis et al., 1996; Huestis et al., 2011; Substance Abuse and Mental Health Services Administration, 2011), with some scholars suggesting a continual impasse (Smith & Stuart, 2015; Vlad, Hancu, Popescu & Lungu, 2018). The usage of both traditional and nontraditional supplements, including herbal products, has continued to gain traction, even among collegiate athletes globally. A previous study reported that approximately 17% of female collegiate athletes in a developed country consume herbal/botanical supplements and recommended the need for nutrition education on supplements (Herbold, Visconti, Frates & Bandini, 2014). There is, however, no known literature of the same in developing countries such as Uganda.

Our results on coaches' perception of performance enhancing drugs, where the majority of coaches believed that performance enhancing substances and methods are substances or methods if used would boast or increase the performance of the individual using them, are in line with previous findings (Backhouse & McKenna, 2012). However, these beliefs and perspectives are just supported by scant literature. Moreover, those fewer coaches who objected to the idea that performance enhancing substances increase athletic performance highlight the placebo effect that would normally motivate athletes to compete harder, yet assuming the benefit of the performance enhancing substances (Szabo & Muller, 2016).

Our results of coaches' varying views on the status of use of performance enhancing substances (PES), where a significant proportion of coaches believed that use of PES was quite high and rampant, are in line with previous findings (Muwonge et al, 2015; Muwonge et al, 2017). However, new evidence on the status of usage emerged from regions in Uganda that were previously known to have low levels of performance enhancing substances. For example, coaches in regions that are close to Uganda's boarders in the east attribute the usage and infiltration from athletes who travel across the border. Moreover, this view was shared across different sporting disciplines, as most coaches believed that Uganda's neighbours might have a higher usage than Uganda. This revelation is in line with previous research highlighting high substance

usage in Western Kenya and (Atwoli, Mungila, Ndungu, Kinoti & Ogot, 2011) and high usage of herbal products in southern Sudan (Karar & Kuhnert, 2017).

Ugandan coaches' differing views regarding use of PES amongst athletes was based on the premise that use of PES was unnecessary, and could even be harmful to the body in some circumstances. However, there is evidence that suggests that rather than perceiving PES as harmful and unfair in sport, we should rather allow them (Savulescu, Foddy & Clayton, 2004). A few Ugandan coaches urged that if the illegal usage of PES is addressed, then it would be fair to all athletes to have a level playing field. This argument is however supported by coaches who argue medical supervision, co-coaching and increased sensitization (Weising, 2011, Makubuya, 2019).

With regards to the secureness of doping agencies, testing procedures and samples, most coaches in Uganda were timid than forthcoming in their focus group responses, and might possibly imply that these coaches were not aware of the security measures in place to safeguard the collection samples or they are aware of the flaws in the system that are exacerbated by socio-economic and political factors (Houlihan, Hanstad, Loland & Waddington, 2019). However, this level of timorousness can also be connected to evidence of false positives in urine samples (Narciso & Bettencourt da Silva, 2019), that could erode athletes and coaches trust in the anti-doping control system.

Among the control measures that were discussed in the recommendations on control of usage of performance enhancing substances (PES), were coaching workshops, pairing coaches, also known as co-coaching (Makubuya, 2020), as well as other methods of sensitizing coaches and athletes through educational institutions. These practices have recently been advocated for in Uganda, however, with limited or no implementation (Makubuya, 2019; Makubuya, 2020; Makubuya & Kalibbala, 2020)

4. Conclusion

Understanding the role of performance-enhancing substances in sports performance is paramount in the promotion of clean sports behaviors among athletes and coaches. The eminent dangers associated with consuming banned and illegal performance-enhancing substances have been widely researched with extensive literature at hand. However, most of this literature is from the global north, leading to scant evidence and a lack of focused educational initiatives at all levels, especially in the global south, particularly in developing countries such as Uganda.

In Uganda, for instance, our team of researchers conducted a study to understand the current level of knowledge, attitudes and beliefs of athletes and coaches pertaining to doping products and methods in Ugandan sports. Our findings revealed that although there are currently no athletes that have been banned by national or international organizations, there is a need to further sensitize athletes and their coaches to updated information with regard to performance enhancement and methods.

Uganda's anti-doping efforts are currently spearheaded by the Uganda Olympics Committee's Medical Commission, which is mandated by the World Anti-Doping Agency (WADA), as the National Anti-Doping Organization (NADO). It is also important to note that Uganda still lacks an independent and government-supported anti-doping agency.

One of the outstanding outcomes following a research discussion with the participants (coaches) from Uganda's sports industry was to introduce approved interventions. Interventions should not only promote knowledge on anti-doping rules and policies among stakeholders (athletes, coaches, administration, and the public) but also improve social and life skills. Vivid examples of such interventions would include a standard curriculum that incorporates such life skills training, as well as introduces an annual anti-doping workshop in Uganda. The above programs would increase sensitization and awareness of anti-doping at local, regional, and national levels.

While the Uganda Olympic Committee has embarked on anti-doping education among elite Ugandan athletes, evidence collected from the field suggests a need to sensitize sub-elite and amateur athletes (and their coaches) at local and regional levels, including secondary and technical schools. Our current efforts to determine

the prevalence of supplements, herbs and doping products among athletes and coaches in Uganda's sports activities and the rates at which athletes are using them are part of our eventual goal to collaborate and learn from countries with independent anti-doping agencies.

Although the level of reported substance usage among Ugandan sports participants remains relatively low, new evidence from the field suggests that there is a need for grassroots interventions that involve an education component on the role of these substances in derailing sports performance and causing both short-term and long-term consequences. Among the most consumed substances that were highlighted in various regions were herbal products such as Mondia Whitei (Apocynaceae), which is locally called "*Mulondo"*. This substance has, however, been suggested to be a remedy for various ailments, and many of the participants highlighted its marketability in various urban areas in Uganda. This substance is currently not listed among the banned substances in sports by NADO, RADO or WADA. However, Cannabis sativa, which is locally called "Enjayi", is listed on the WADA's banned list. The recent approval for the commercial growth of this plant in Uganda is also grounds for the needed sensitization of the youth on both short- and long-term effects, particularly for those without ailments or those engaging in daily strenuous activities, such as those in sport practices.

More so, numerous participants highlighted the availability of various performance-enhancing substances and their easy access through local pharmacies as being available for purchase without needing a physician prescription. This suggests a need for government intervention to curb the consumption of various products, some of which could result in intentional or inadvertent doping among Ugandan athletes.

Finally, a vast majority of participants were convinced that many Ugandan sports personnel do not engage in the usage of doping agents. The few participants who remained anonymous suggested that the practice is currently merely underreported. Regarding nutritional supplements, a majority of both athletes and coaches were convinced that they were highly consumed in Uganda. There were worries about the adequate amounts, correct dosages and types of supplements to consume for endurance, stamina and strength development, thus warranting sensitization.

5. Dissemination

Thus far, we have shared our findings through the following platforms;

- Agali Awamu education Workshop held at Kyambogo University (March 26, 2022).
- Partnership for clean competition's (PCC 2021) virtual poster session.

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7. Appendices

7.1 Appendix I: Study Questionnaire

MAKERERE UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF BIOMEDICAL SCIENCES
Department of Human Physiology

Survey of **Elite Athletes' Opinions on Sport Issues**

Thank you for completing this survey. This survey asks for your attitudes and opinions on sport issues.

Participation in this survey is voluntary. No question is compulsory. There is no right or wrong answers. We just want your opinion. All your responses are strictly confidential. Do not write your name on this survey. All completed surveys will be returned to Makerere University for processing.

Your participation in completing this survey is very much appreciated.

Instructions:

For most questions, there is a choice of answers. Simply pick the one that's true for you and circle the number corresponding to it. There are some questions where you need to write in an answer. For these questions, a space will be provided for you. It is important that you answer every question as best as you can. There are no right or wrong answers, we just ask you to be completely honest.

Please start with Q1.

Q1. What is the main sport you are or have been involved in?

_____

Q2. How many years have you competed in your main sport?

Less than 1 year (or season) 1
1 or 2 years (or seasons 2
More than 2 but less than 5 years (or seasons.....3
5 or more years (or seasons.....4

Q3. What is the highest level you have competed at?

Olympic games.....1
World championship events/international events.....2
National competition 3
State competition.....4
Regional competition.....5
City/district competition.....6

Q4. Do you hold or have you ever held titles?

Yes – National title 1

Yes – International title.....2
Yes – State title.....3
No.....4

Q5. Have you ever had a Therapeutic Use Exemption?
Yes – and still have.....1
Yes – but no longer 2
No.....3

Q6. Do you compete in events for athletes with a disability?
Yes.....1
No.....2

Q7. How much would you personally like these outcomes for performing well in your sport?

	A lot	A little	Not at all
1. National celebrity status	1	2	3
2. Lucrative financial sponsorship deals	1	2	3
3. Personal best achievements	1	2	3
4. Opportunities for remaining in the sport as coach, trainer or administrator	1	2	3
5. Future financial security	1	2	3
6. International celebrity status	1	2	3

Q8. To what extent does your sport offer athletes these outcomes if they perform well?

	A lot	A little	Not at all
1. National celebrity status	1	2	3
2. Lucrative financial sponsorship deals	1	2	3
3. Personal best achievements	1	2	3
4. Opportunities for remaining in the sport as coach, trainer or administrator	1	2	3
5. Future financial security	1	2	3
6. International celebrity status	1	2	3

Q9. If you were to use the following substances, how likely is it that these substances would improve your performance in your sport?

	Definitely would not	Probably would not	Might or might not	Probably would	Definitely would	Don't know
1. Anabolic steroids	1	2	3	4	5	9
2. Beta-blockers	1	2	3	4	5	9
3. Designer steroids like tetrahydrogestrinone (THG	1	2	3	4	5	9
4. Erythropoietin (EPO) and other similar substances	1	2	3	4	5	9
5. Human growth hormones (HGH).	1	2	3	4	5	9

Q10. If you were to use a banned performance enhancing substance of your choice, how likely is it that you

would improve your performance in your sport?

Definitely would not.....1
Probably would not 2
Might or might not 3
Probably would.....4
Definitely would 5
Don't know 9

Q11. How much pressure, directly or indirectly, do you think the Uganda government or the Uganda Olympic Committee puts on elite athletes to win Olympic gold medals?

No pressure at all.....1
A little pressure 2
Moderate pressure.....3
A lot of pressure 4

Q12. To what extent, if at all, do you think commercial influences on the Olympics and sport in general have increased a 'win at all costs' attitude amongst elite athletes?

Had no effect.....1
Increased a little 2
Increased somewhat 3
Increased a lot 4

Q13. To what extent, if at all, do you think commercial influences on the Olympics and sport in general have increased the temptation amongst elite athletes to use banned performance enhancing substances?

Had no effect.....1
Increased a little.....2
Increased somewhat.....3
Increased a lot.....4

Q14. Have you ever been drug tested?

Yes.....1
No.....2 → Go to Question Q18.

Q15. Have you been drug tested in the past year?

Yes.....1
No.....2

Q16. Did you find the experience of being tested traumatic or upsetting in any way?

No.....1
Yes – somewhat 2
Yes – very much 3

Q17. How would you describe the conduct of the testing personnel?

(a) Courteous OR Rude Or Neither
1.....2 3
(b) Helpful OR Unhelpful Or Neither
1.....2 3
(c) Helpful OR Unhelpful Or Neither
1.....2 3
(d) Sensitive OR Insensitive Or Neither
1.....2 3

Q18. Failing is a natural part of athletic pursuits. The following statements capture the different ways in which athletes might respond to or interpret failure. Please rate the extent to which you believe each of the following statements based on how you would currently describe yourself.

Do not believe at all Believe 100% of the time

1. When I am failing, I am afraid that I might not have enough talent.....1 ..... 2.....3 ..... 4..... 5
2. When I am failing, it upsets my "plan" for the future .....1 ..... 2.....3 ..... 4..... 5
3. When I am not succeeding, people are less interested in me .....1 ..... 2.....3 ..... 4.....5
4. When I am failing, important others are disappointed.....1 ..... 2.....3 ..... 4..... 5
5. When I am failing, I worry about what others think about me .....1 ..... 2.....3 ..... 4.....5

Q19. To what extent do you think that athletes who have been given Therapeutic Use Exemptions have been thoroughly evaluated and that their exemptions are justified?

None justified 1
Most not justified 2
Some are justified, others are not.....3
Most justified.....4
All justified.....5
Don't know 9

Q20. How much harm to your health do you think would be caused by using each of the following substances <u>for a short time</u> say up to two months?

	No Harm	A little harm	Some harm	A lot of harm	Don't know
1. Anabolic steroids	1	2	3	4	9
2. Beta-blockers	1	2	3	4	9
3. Designer steroids like tetrahydrogestrinone (THG)	1	2	3	4	9
4. Erythropoietin (EPO) and other similar substances	1	2	3	4	9
5. Human growth hormones (hGH).	1	2	3	4	9
6. Diuretics.	1	2	3	4	9

Q21. How much harm to your health do you think would be caused by using each of the following substances <u>regularly</u>?

	No Harm	A little harm	Some harm	A lot of harm	Don't know
1. Anabolic steroids	1	2	3	4	9
2. Beta-blockers	1	2	3	4	9
3. Designer steroids like tetrahydrogestrinone (THG)	1	2	3	4	9
4. Erythropoietin (EPO) and other similar substances	1	2	3	4	9
5. Human growth hormones (hGH).	1	2	3	4	9
6. Diuretics.	1	2	3	4	9

Q22. How expensive would it be for you personally to buy each of the following types of substances?

	Very cheap	Quite cheap	Neither	Quite expensive	Very expensive	Don't know

1. Anabolic steroids ..... .1 ..... 2.....3 .....4.....5.....9
2. Beta-blockers .....1 ..... 2.....3 .....4.....5.....9
3. Designer steroids like
tetrahydrogestrinone (THG) .....1 ..... 2.....3 .....4.....5.....9
4. Erythropoietin (EPO) and other similar
substances .....1 ..... 2.....3 .....4.....5.....9
5. Human growth hormones (hGH) .....1 ..... 2.....3 .....4.....5.....9
6. Diuretics.....1 ..... 2.....3 .....4.....5.....9

Q23. How easy or difficult would it be for you to get each of the following types of substances if you wanted to?

	Probably impossible	Very hard	Fairly hard	Fairly easy	Very easy	Don't know
1. Anabolic steroids	1	2	3	4	5	9
2. Beta-blockers	1	2	3	4	5	9
3. Designer steroids like tetrahydrogestrinone (THG)	1	2	3	4	5	9
4. Erythropoietin (EPO) and other similar substances	1	2	3	4	5	9
5. Human growth hormones (hGH)	1	2	3	4	5	9
6. Diuretics	1	2	3	4	5	9

Q24. If you wanted to get and use a banned performance-enhancing substance, which of the following people,if any, do you think would help you if you asked them to do so?

	Would definitely help me	Would probably help me	Might or might not help me	Probably would not help me	Definitely would not help me	Don't know
1. Your coach	1	2	3	4	5	9
2. Parents	1	2	3	4	5	9
3. Team mates/training partners	1	2	3	4	5	9
4. Team doctor	1	2	3	4	5	9
5. Sports psychologist	1	2	3	4	5	9
6. Trainer	1	2	3	4	5	9

Q25. If you wanted to use a banned performance-enhancing substance, how easy would it be to get good medical advice on how to use the substance?
Probably impossible.....1
Very hard.....2
Fairly hard 3
Fairly easy.....4
Very easy.....5
Don't know.....9

Q26. Do you intend to use prohibited substances or methods to enhance my performance or gain a competitive edge against your opponents during this season?
Definitely not.....1
Probably not.....2
Might or might not.....3
Probably will.....4
Definitely will 5

Q27. How often have you used any of these nutritional supplements in the past 12 months?

	Never	Rarely	Sometimes	Frequently	Very Systematically

frequently

1. Vitamin or mineral supplements.....1 .....2.....3 ..... 4.....5.....6
2. Herbal products .....1 ..... 2.....3 ..... 4.....5.....6
3. Creatine.....1 .....2.....3 ..... 4.....5.....6
4. Sports drinks .....1 ..... 2.....3 ..... 4.....5.....6
5. Energy bars .....1 ..... 2.....3 ..... 4.....5.....6
6. Caffeine.....1 ..... 2.....3 ..... 4.....5.....6
7. Protein-carbohydrate shakes.....1 .....2.....3 ..... 4.....5.....6

Q28. In the last 12 months, how often have you used any of the following, for whatever reason?

	Have never used	Did not use in the last 12 months	1 to 2 times	3 to 5 times	6 to 10 times	More than 10 times
1. Anabolic steroids	1	2	3	4	5	6
2. Beta-blockers	1	2	3	4	5	6
3. Designer steroids like tetrahydrogestrinone (THG)	1	2	3	4	5	6
4. Erythropoietin (EPO) and other similar substances	1	2	3	4	5	6
5. Human growth hormones (hGH)	1	2	3	4	5	6
6. Diuretics	1	2	3	4	5	6
7. Doping methods	1	2	3	4	5	6
8. Alphabodies	1	2	3	4	5	6

Q29. How serious do you feel the following authorities are in preventing trafficking of banned performance enhancing substances in Uganda?

	Not at all serious	Not serious	A little serious	Quite serious	Very serious
1. Police	1	2	3	4	5
2. Customs officers	1	2	3	4	5

Q30. Overall, how effective do you feel the following authorities are in preventing trafficking of banned performance enhancing substances in Uganda?

	Not at all effective	Not effective	A little effective	Quite effective	Very effective
1. Police	1	2	3	4	5
2. Customs officers	1	2	3	4	5

Q31. Which one of the following most applies to you?

I have never considered using a banned performance-enhancing substance 1

At one stage I thought briefly about using a banned performance-enhancing substance 2

At one stage I thought quite a bit about using a banned performance-enhancing substance 3

I still think occasionally about using a banned performance-enhancing substance because other athletes are using them 4

I briefly used a banned performance-enhancing substance in the past but no longer do so 5

I occasionally use a banned performance-enhancing substance now for specific purposes 6

I regularly try or use banned performance-enhancing substances 7

Q32. If you were offered a banned performance enhancing substance under medical supervision at low or no financial cost and the banned performance enhancing substance could make a significant difference to your performance and was currently not detectable, how much consideration do you think you might give to this offer?

None at all.....1
A little consideration.....2
Some consideration 3
A lot of consideration.....4

Q33. Given the pressures athletes are often under to win, how confident are you that you could refuse
this offer?

Very confident could refuse.....1
Quite confident could refuse 2
Not very confident could refuse 3
Not confident at all could refuse 4
Wouldn't want to refuse.....5

Q34. How confident are you in being able to resist pressure from your team mates to use a banned substance?

Very confident could resist 1
Quite confident could resist.....2
Not very confident could resist.....3
Not confident at all could resist.....4
Wouldn't want to resist 5

Q35. Regardless of whether you believe performance enhancing substances or methods (PESM) should be banned or allowed, which of the following statements best describes your own personal feelings about deliberately using banned PESM?

I believe deliberately using banned PESM to improve performance is morally wrong under any circumstances.....1
I believe deliberately using banned PESM to improve performance is morally OK under some circumstances, but wrong under others.....
2
I believe deliberately using banned PESM to improve performance is morally OK under any circumstances.....3

Q36. If you were caught using banned performance enhancing substances or methods, to what extent would you experience the following feelings:

	Not at all			A great extent
1. Ashamed	1.....	2	3.....4.....	5
2. Embarrassed	1.....	2	3.....4.....	5
3. Guilty.....	1.....	2	3.....4.....	5

Q37. If you decided to use a banned performance enhancing substance, to what extent do you think each of the following people would approve or disapprove, or would not care either way if you did that?

	Would definitely Approve	Would probably Approve	Wouldn't care either way	Probably Disapprove	Definitely Disapprove

	approve	way	disapprove	disapprove
1.Your coach	1	2	3	4	5
2.Parents	1	2	3	4	5
3.Teammates/training partners	1	2	3	4	5
4.Team doctor	1	2	3	4	5
5.Close friends	1	2	3	4	5
6.Trainer	1	2	3	4	5

Q38.The following statements are intended to provide an insight into your beliefs regarding other athletes' use of doping.

Percentage (%)

1.Out of 100%, how many athletes in your sport do you believe engage in doping to enhance their performance?....._____

2.Out of 100%, how many elite athletes in Uganda do you believe engage in doping to enhance their performance?....._____

3.Out of 100%, how many elite athletes do you believe will be engaged in doping during the next 2 years to enhance their performance?....._____

4.Out of 100%, how many coaches in your sport do you believe would encourage their athletes to use doping to enhance their performance?....._____

5.Out of 100%, how many coaches in elite sports in Uganda do you believe would encourage their athletes to use doping to enhance their performance?....._____

Q39. How likely is it that athletes at your level would be drug tested at least once a year?

(a) In competition at least once a year:

Very likely.....1
Quite likely. 2
A little likely.....3
Not likely 4
Not at all likely.....5
Don't know.....9

(b) Out of competition at least once a year:

Very likely.....1
Quite likely 2
A little likely.....3
Not likely 4
Not at all likely.....5
Don't know.....9

Q40. It has been said that athletes who take banned substances can use various methods to avoid testing positive.

(a) From what you know or have heard, if you were to take banned performance-enhancing substances

<u>while competing</u>, how likely do you think that you could get away with it if you really tried to?

Very likely.....1
Quite likely 2
A little likely.....3
Not likely 4
Not at all likely.....5

Don't know.....9
(b) From what you know or have heard, if you were to take banned performance-enhancing substances
out of competition, how likely do you think that you could get away with it if you really tried to?
Very likely.....1
Quite likely. 2
A little likely.....3
Not likely 4
Not at all likely.....5
Don't know.....9
Q41. From what you know or have heard, are the penalties for a positive drug test in your sport severe or lenient?
Very severe.....1
Fairly severe 2
Fairly lenient 3
Very lenient.....4
Don't know.....9
Q42. How fair is the Uganda National Anti-Doping Agency in terms of treating all athletes equally?
Very fair 1
Fair.....2
Unfair.....3
Very unfair.....4
Don't know. 9
Q43. How secure is the Uganda National Anti-Doping Agency's drug testing procedures in Uganda? That is, in the taking of samples and the care of samples?
Very secure 1
Quite secure. 2
Not really secure.....3
Not at all secure.....4
Don't know 9
Q44. How accurate do you feel the current drug tests are in terms of being able to correctly identify the
following substances?
Q42.How fair is the Uganda National Anti-Doping Agency in terms of treating all athletes equally?

Very fair.....1

Fair.....2

Unfair.....3

Very unfair.....4

Don't know.....9

Q43.How secure is the Uganda National Anti-Doping Agency's drug testing procedures in

Uganda? That is, in the taking of samples and the care of samples?

Very secure 1

Quite secure.....2

Not really secure.....3

Not at all secure.....4

Don't know.....9

Q44.How accurate do you feel the current drug tests are in terms of being able to correctly identify the following substances?

	Very Accurate	Quite accurate	A little accurate	Not accurate	Not at all accurate	Don't know
1.Anabolic steroids	1	2	3	4	5	9
2.Beta-blockers	1	2	3	4	5	9
3.Designer steroids like tetrahydrogestrinone (THG)	1	2	3	4	5	9
4.Erythropoietin (EPO) and other similar substances	1	2	3	4	5	9
5.Human growth hormones (hGH)	1	2	3	4	5	9
6.Diuretics	1	2	3	4	5	9

Q45. How satisfied are you that athletes who appeal a positive test in Uganda will be given a fair hearing?
Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied.....3
Very dissatisfied.....4
Don't know 9
Q46. How satisfied are you that athletes in your sport who test positive will be given a fair hearing before a decision is made about applying a penalty?
Very satisfied 1
Somewhat satisfied 2
Somewhat dissatisfied.....3
Very dissatisfied.....4
Don't know 9
Q47. How satisfied are you that athletes who appeal a positive test before the Court of Arbitration in Sport will be given a fair hearing?
Very satisfied.....1
Somewhat satisfied.....2
Somewhat dissatisfied 3
Very dissatisfied 4
Don't know.....9

Q48. What is your age?

..... _____

Q49. Are you:

Male 1

Female.....2

Q50. What is your highest level of education?

Completed nursery school 1

Completed primary school.....2

Completed o level.....3

Completed A level.....4

Some technical college.....5

Some University 6

Currently enrolled in technical college 7

Currently enrolled in University.....8

Completed technical college.....9

Completed University 10

Q51. To what extent do you currently derive income from your participation in sport? Include here both direct payments and winnings as well as sponsorships, endorsements and scholarships.

No income at all from sport.....1

Occasional income from sport.....2

Regular income but less than half of total income 3

About half my income from sport.....4

More than half from sport, but not all my income.....5

All or almost all of my income from sport 6

Q52. What is your total annual income from all sources? (Uganda)

Less than 100,000/= 1

100,000/= to 199,999/= 2

200,000/= to 299,999/= 3

300,000/= to 499,999/= 4

500,000/= to 699,999/= 5

700,000/= to 999,999/= 6

1,000,000/= or more 7

Thank you for completing this survey. Please return it in the reply paid envelope provided.

7.2 Appendix II: Focus Group Discussion Guide

MAKERERE UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF BIOMEDICAL SCIENCES
Department of Human Physiology

Coaches' Focus group interview on Sports Issues

Focus Group Script[1]

Welcome and thank you for being here today. The purpose of this gathering is to get your feedback about how we can better understand sports issues relating to supplements, herbs an other performance enhancing substances and methods in Uganda. Specifically, we want to understand your attitudes, beliefs and knowledge. Once we understand these key components, we will be able better support coaches in Uganda. You have a better understanding of what works than we do. That is why we are talking with you.

Let me introduce myself. I am _____ and I will be the moderator in today's discussion. The format we are using is a focus group. A focus group is a conversation that focuses on specific questions in a safe and confidential environment. I will guide the conversation by asking questions that each of you can respond to. There are no right or wrong answers to these questions. Just be honest. If you wish, you can also respond to each other's comments, like you would in an ordinary conversation. It is my job to make sure that everyone here gets to participate and that we stay on track. _____ is here to record and summarize your comments.

Before we get started, I want to let you know two things. First, the information we learn today will be compiled into a final report. That report will include a summary of your comments and some recommendations. It will be shared with the Director of the World Anti Doping Agency (WADA) and the WADA staff that is supporting this study. Secondly, you do not have to answer any questions that you do not feel comfortable with. This focus group today is anonymous and confidential. "Anonymous" means that we will not be using your names and you will not be identified as an individual in our report of this project. "Confidential" means that what we say in this room should not be repeated outside of this room. Obviously, I cannot control what you do when you leave, but I ask each of you to respect each other's privacy and not tell anyone what was said by others here today. Although we hope everyone here honors this confidentiality, please remember that what you say here today could be repeated by another focus group member. So please, do not say anything that you absolutely need to keep private. As you can see, we will be tape recording this focus group. The recording will only be used to

make sure our notes are correct and will not be heard by anyone outside of this project.
Let's begin with introductions.
Opening Question: Please share with us your name, the sport you coach and something you enjoy to do in your free time
Transition Question: What is your understanding of performance enhancing substances and methods?
Transition Question: To the best of your knowledge, what is the status of performance enhancing substance usage in Uganda?
Key question: From what you know or have heard, if your athletes were to take banned performance enhancing substances out of competition, how likely do you think they could be caught? [1]
Key question: What is your personal belief of supplements, herbal products and other performance enhancing substances in sport?
Follow up question: Which herbal products and supplements do you recommend for you athletes? How exactly do these products work?
Probing question (if necessary): Is there anyone you know that has found significant help from these products?
Key question: From what you know or have heard, if you were to give your athletes banned performance enhancing substances out of competition, how likely do you think that you will be caught?
Follow up question: Talk about the secureness of Uganda National Anti-Doping Agency's drug testing procedures in Uganda. (That is in taking samples and care of samples).
Follow up question: How serious do you feel the Uganda Anti-Doping Agency is in preventing banned performance enhancing substance use in Uganda?
Key question: Overall, how effective do you feel the Uganda National Anti-Doping Agency is in preventing banned performance enhancing substances use in sport in Uganda?
Key question: From what you know or have heard, how are most Ugandan coaches currently sensitized in areas of sports nutrition and doping prevention.
Ending question: What advice would you give for the controlled usage of herbals, supplements and other performance enhancing products usage in Ugandan sports?

At the end.
I see our time is up. Thank you so much for sharing this useful information with us. As a token of our appreciation, please accept this 35,000/=.

[1] Muwonge, Makubuya, Lubega & Zavuga (2020).

7.3 Appendix III: Research Ethics Approval letter from SBS-REC

MAKERERE UNIVERSITY

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COLLEGE OF HEALTH SCIENCES
SCHOOL OF BIOMEDICAL SCIENCES
RESEARCH AND ETHICS COMMITTEE

6th March 2020

SBS-REC-764

To: Dr. Haruna Muwonge
Principal Investigator
Department of Physiology

Category of review
[X] Initial review
[ ] Continuing review
[ ] Amendment
[ ] Termination of study
[ ] SAEs

Decision of the School of Biomedical Sciences Research Ethics Committee (SBS-REC) at their 98th REC meeting held on 19th Dec 2019.

In the matter concerning the review of a research proposal entitled, **"Supplements, herbs and doping products usage among Ugandan athletes and coaches." SBS-REC - 764**

The investigators have met all the requirements as stated by **SBS-REC** and therefore, the protocol is **APPROVED.**

The approval granted includes all materials submitted by the investigators for **SBS-REC** review including;

1. Protocol version 2 of March 2020
2. English participant informed consent form version 1 of March 2020
3. Luganda Informed consent form version 1 of March 2020
4. Lunyankole informed consent form version 1 of March 2020
5. Lusoga informed consent form version 1 of March 2020
6. Lugbara informed consent form version 1 of March 2020
7. English questionnaire version 1 of March 2020
8. English Focus Group Discussion guide

and is valid until **18th Dec 2020**.

Please note that the annual report and the request for renewal where applicable, should be submitted six weeks before expiry date of approval.

Any problems of a serious nature related to the execution of the research protocol should be promptly reported to the **SBS-REC**, and any changes to the research protocol should not be implemented without approval from **SBS-REC**, except when necessary to eliminate apparent immediate hazards to the research participant(s).

MAKERERE UNIVERSITY
SCHOOL OF BIOMEDICAL SCIENCES
APPROVED
VALID UNTIL
18 DEC 2020
RESEARCH & ETHICS COMMETTEE

You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

Signed.....

Dr. Jackson Mukonzo
Vice Chairperson, School of Biomedical Sciences Research and Ethics Committee.

7.4 Appendix IV: Research Ethics Approval letter from UNCST

Uganda National Council for Science and Technolo

(Established by Act of Parliament of the Republic of Uganda)

Our Ref: SS507ES **8 December 2**

Haruna Muwonge
MAKERERE UNIVERSITY COLLEGE OF HEALTH
SCIENCES
Kampala

Re: Research Approval: **SUPPLEMENTS, HERBS AND DOPING PRODUCTS USAGE AMONG UGANDAN ATHLETES AND COACHES**

I am pleased to inform you that on **08/12/2020**, the Uganda National Council for Science and Technology (UNCST) appr the above referenced research project. The Approval of the research project is for the period of **08/12/2020** to **08/12/2021**.

Your research registration number with the UNCST is **SS507ES**. Please, cite this number in all your future correspondenc with UNCST in respect of the above research project. As the Principal Investigator of the research project, you are responsible for fulfilling the following requirements of approval:

1. Keeping all co-investigators informed of the status of the research.
2. Submitting all changes, amendments, and addenda to the research protocol or the consent form (where applicable) the designated Research Ethics Committee (REC) or Lead Agency for re-review and approval **prior** to the activati of the changes. UNCST must be notified of the approved changes within five working days.
3. For clinical trials, all serious adverse events must be reported promptly to the designated local REC for review wit copies to the National Drug Authority and a notification to the UNCST.
4. Unanticipated problems involving risks to research participants or other must be reported promptly to the UNCST. New information that becomes available which could change the risk/benefit ratio must be submitted promptly for UNCST notification after review by the REC.
5. Only approved study procedures are to be implemented. The UNCST may conduct impromptu audits of all study records.
6. An annual progress report and approval letter of continuation from the REC must be submitted electronically to UNCST. Failure to do so may result in termination of the research project.

Please note that this approval includes all study related tools submitted as part of the application as shown below:

No.	Document Title	Language	Version Number	Version Date
1	Questionnaire	English	1	03 July 2020
2	Focus group discussion guide	English	V1	06 July 2020
3	Consent form Luganda	Luganda	1	18 December 2019
4	Consent form Lugbara	Lugbarati	1	18 December 2019
5	Consent form Runyankole	Runyankore	1	18 December 2019
6	Signed FGD guide	English	1	18 December 2019
7	Luganda Consent form-coaches	Luganda	V1	20 November 2020
8	Runyankore consent form-coaches	Runyankore	V1	20 November 2020
9	Lugbaratisi Consent form-coaches	Lugbaratisi	V1	20 November 2020
10	Lusoga Consent form-coaches	Lusoga	V1	20 November 2020
11	Revised FGD Guide	English	V2	20 November 2020
12	Project Proposal	English	1	
13	Approval Letter	English	1	2020-07-03

Yours sincerely,

Hellen Opolot
For: Executive Secretary
UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY