

## Kenya Teacher Trainee Athletes' Awareness of Selected Performance-Enhancing Substances and Their Effects to Sports Performance

Janet Kamenju<sup>1</sup>, Andanje Mwisukha<sup>2</sup>, Rintaugu Elijah<sup>3</sup> & Hellen Muthomi<sup>4</sup>

### Abstract

It is in the public domain that amateur and professional athletes have used performance-enhancing substance (PES) with the aim of directly or indirectly improve performance. Research findings also indicate that athletes are not fully aware of physical, physiological and psychological effects of some of the substances and drugs used. Effects of the drugs and substances used have both short term and long term effects some of which are reversible after termination of the substance in use while others are irreversible. This paper discusses Kenya teacher trainee athletes' awareness of PES use in sports. Trainees after graduating from colleges are expected to teach Physical education besides other subject as well as be sports coaches to young athletes in primary and secondary school levels of education. It is therefore imperative that teacher trainees be fully aware of the effects of PES in order to guide young athletes in achieving sports potential through training without resorting to using illegal methods. A total of 422 (211 male and 211 female) teacher trainees drawn from public and private teacher training colleges responded to a self report questionnaire. The respondents were participants in national ball games and track and field athletics sports competitions under Kenya Teachers Colleges Sports Association (KTSCA). Athletes' awareness of PES and their effects of selected substances were assessed with items revolving around familiarity with the WADA anti-doping code, and extent of knowledge of use and effects of PES. This study findings show 49.3% of athletes knew of the WADA code while 43.3% were not aware of its existence. About 48.0% knew of the regulation as stipulated in the code but 42.7% did not know. Further athletes were not fully aware of effects of selected substances with 67.8%, 47.0%, 51.9%, 43.6% and 51.5% reporting that miraa (khat), marijuana, caffeine, anabolic steroids, and cocaine respectively do not enhance sports performance. It was recommended that a comprehensive anti-doping strategy at primary, secondary and, colleges be adopted where anti-doping education can be imparted beyond classroom. Investigation should be done on the level of awareness of doping/PES by athletes' personnel of collegiate teams. Research is necessary to establish the effectiveness of the doping content taught to the teacher trainees

**Keywords:** Performance- enhancing substances (PES), public colleges, private colleges, teacher trainee, Miraa (khat)

<sup>1</sup> University of Nairobi, Kenya.

<sup>2</sup> Kenyatta University, Kenya.

<sup>3</sup> Kenyatta University, Kenya.

<sup>4</sup> Kenyatta University, Kenya.

## Introduction

Various studies on awareness of doping have reported different findings. Study by Ama et al., (2003) on African amateur footballers in Yaoundé, Cameroon investigated athletes' use and awareness of lawful and unlawful substances. The results revealed that the footballers' knowledge of doping was vague. They recommended that preventive activities and an epidemiological study on doping among the footballers be carried out. The study was restricted to only footballers and did not factor in athletes in other games and track and field events participants. The study by Koch (2002) presents athletes as knowingly participating in doping regardless of being aware of the drugs' negative effects on health.

In a self-report study on athletes' attitude towards doping involving 446 athletes by Alaranta et al., (2006), 9% of the respondents believed that banned substances have performance effects while 30% of athletes agreed to have personally known an athlete who had doped and 35% of males and 25% of the females reported to personally know an athlete who was using banned drugs at the time of the study. Furthermore, 15% of the athletes noted they had been offered banned substances. A survey by Anshel and Russell (1997) of Australian athletes' knowledge on PES reports that majority of respondents were of the opinion that use of PES is unethical and immoral hence unacceptable as a means of gaining a competitive advantage over opponents.

A survey of 503 collegiate athletes and 154 body building athletes that aimed at measuring the extent of androgenic steroids (AS) abuse by Lubna et al., (2008) revealed that college athletes had no problems acquiring performance enhancing drugs as they knew where and how to get them. Both students and athletes noted that their friends and coaches were the major sources whereas the main reason for the use of PES was to improve performance and physical appearance. The study recommended the need to implement educational programmes to create awareness and enlighten students and mentors about the negative side effects of ASS on the health of the user as the drugs were increasingly becoming a public health concern.

Lack of awareness of anti-doping issues by athletes is equally presented in a study by Levent et al. (2005) where 54 % of respondents acknowledged they were not fully aware of the full doping drug potential and effects.

The study concluded that young athletes are likely to suffer most from health problems associated with the drugs as well as chances of being suspended from sports.

A survey of 200 Scottish athletes by Dimeo et al., (2013 ) established that majority of athletes were not aware of the current WADA legislation where article eleven of the WADC states that sanctions such as loss of points and disqualification can be meted on a team if three or more teammates are proven to have violated anti-doping regulations. To this effect Dimeo et al., (2013) recommended that awareness creation on the said legislation was needed because team sport athletes not aware of the consequences might promote anti-doping within their own team and since clean athletes would not want to feel cheated if they lose to a team found to have a number of doped participants. The study also showed that fear of being caught and shame that may befall the victim was the strongest factor preventing team athletes from considering use of PES.

### **Effects of PES Use to an Athlete**

The broad objectives of the World Anti-Doping Agency is to protect the health of the athlete, ensure fairness in sports competition by ensuring level playing ground and safeguard the image of sport (WADA, 2015). However, despite the existing anti- doping regulations, cheating is still prevalent and increased fan violence has to some extent been attributed to the sale of alcohol and other recreational drugs at sports events (Insel & Roth, 2002). As noted by Butcher and Weust ( 1999) over-emphasis on winning have detracted the value of sport and drawn many competitors to using illegal means of securing a trophy/medal or monetary rewards oblivion of effects of banned drugs on the athletes health and likely hood of getting banned from participation in competitions. In response to this declining sports ethics, sports governing bodies have sought to rectify the problem by imposing strict regulations (WADA, 2015).

Doping effects are as complex as the methods of doping and no benefits of winning a competition would be worth to justify risks associated with the vice (Somerville & Lewis, 2005). Apart from the danger of being suspended or getting a life ban from sports competitions, other implications include physiological, psychological, social and ethical /moral effects.

To ensure level playing ground, protect health of athlete and preserve the dignity of the sport, sports organizations such as IAAF, IOC, and WADA have listed banned substances and placed the onus of educating competitors on the implications of doping to local sports federations. However, despite the good intentions by WADA and sports organizations, PES use still persists in sports. Athletes are reported to use PES as they perceived the illicit drugs have positive impacts on athletics performance more than non-athletes. Such PES include anabolic androgenic steroids, amphetamines, human growth hormone/erythropoietin which they perceive would combat fatigue, relieve pain, and enhance injury recovery, increase strength and endurance among other perceived benefits. As reported by David, McDuff & David, (2005) athletes have also confessed to have used substances such as alcohol, cocaine, marijuana to 'fit in', boost self-confidence, escape problems and to have fun.

## **Methods**

This study used the survey method whereby participants comprised of 422 randomly selected male and female teacher trainee athletes participating in national track and field athletics and ballgames managed by the Kenya Teachers Colleges Sports Association. Participants age ranged between 18-21 (164) years, 22-26 years (229) and those above 26 years (27). A self-administered questionnaire was used for data collection with a return rate of 70%.

## **Results**

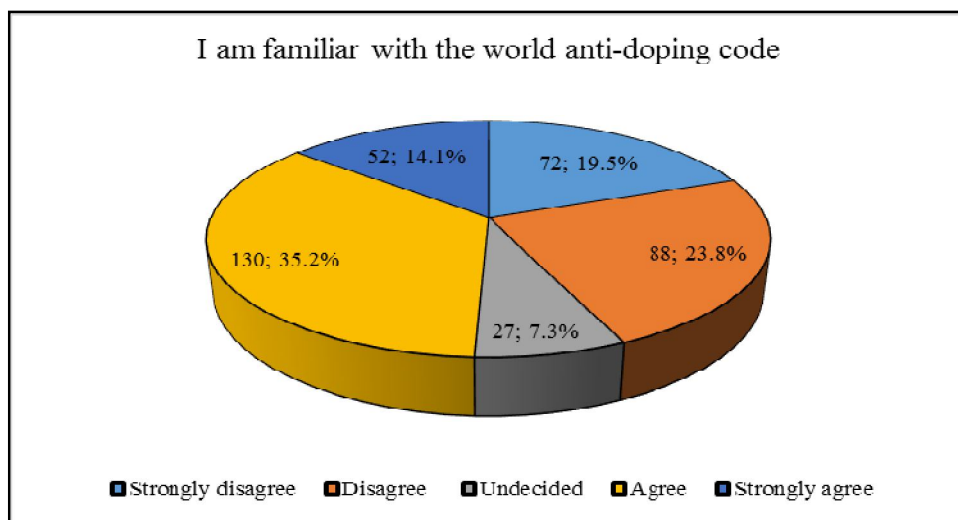
### **Awareness of PES among College Athletes**

The question on whether selected substances could enhance performance in sports, showed mixed reactions from respondents. According to a majority, alcohol was deemed as not enhancing performance (81.8%), so was miraa (khat) (67.6%), caffeine (51.9%) and cocaine (55.5%). Alcohol has negative effects to sports performance unlike the miraa and caffeine that has a positive effect that would give an athlete an advantage over non users. Only marijuana (53.0%) and anabolic (56.4%) were deemed to have performance enhancing abilities by more than half the respondents.

**Table 1: Teacher trainee athletes' responses to selected drugs/ substances effects to sports performance**

Substances/drug effects to performance	No (%)	Yes (%)
Alcohol	81.8	18.2
Miraa	67.6	32.4
Marijuana	47.0	53.0
Caffeine	51.9	48.1
Anabolic Steroids	43.6	56.4
Cocaine	55.5	44.5

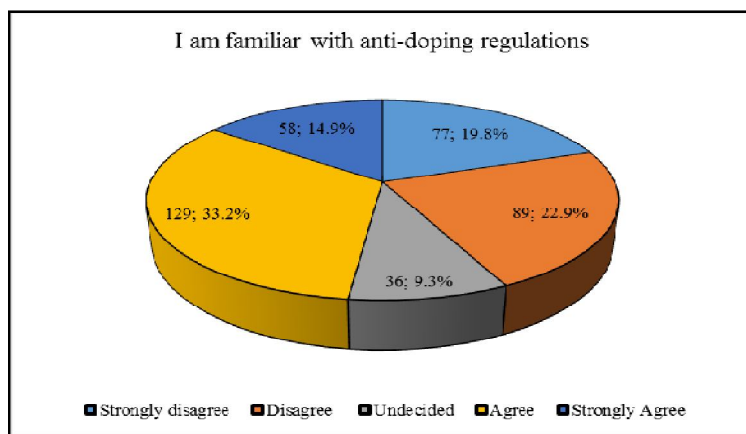
The awareness of use of PES among the athletes was also assessed with items revolving around familiarity with the WADA anti-doping code, use of PES and the extent of the knowledge on use of PES as well as anti-doping code. As indicated in figure 1 combined majority (49.3%) of the college athletes agreed to have knowledge of the WADA anti-doping code compared to almost equal the number (43.3%) who disagreed or strongly disagreed to having any knowledge of the anti-doping code.



**Figure 1: Familiarity with WADA code**

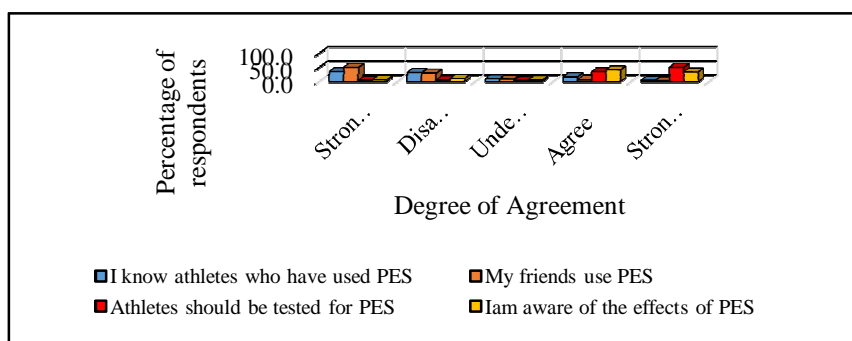
Further, the level of knowledge of the regulations outlined in the WADA code was ascertained with almost repeated frequencies with reference to the regulations of the code.

As shown in figure 2, 48.1% agreed in various levels to have known the regulations whereas 42.7% did not have knowledge of the regulations of the code.



**Figure 2: Familiarity with WADA Regulations**

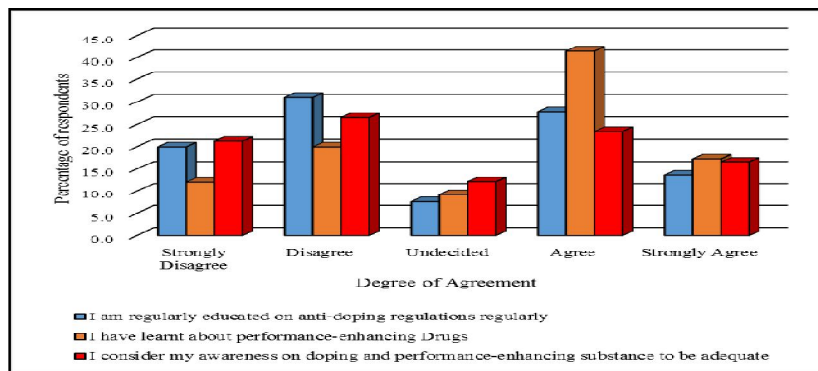
Figure 3 indicate there was a generally high level of agreement among the combined respondents (82%) that athletes should be tested for use of PES and drugs at all levels of competition. A similarly high number of the respondents (72.0%) were aware of the effects of use of PES and drugs while 80.0% noted their friends do not use enhancing substances and drugs. About 67.0 % of respondents did not know athletes using PES but about 20.0% knew athletes who dope.



**Figure 3: Athletes awareness of testing, effects and, use of PES**

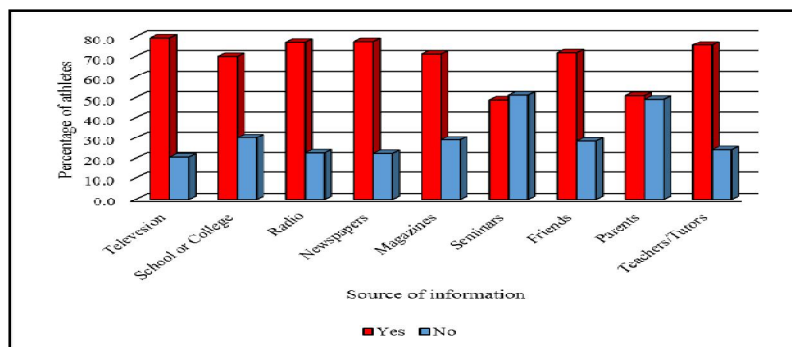
A combined majority (58.0%) agreed to having learnt about PES and drugs as shown in figure 4.

However, much as a majority agreed to having learnt about PES and drugs, less than half (36%) the respondents considered their knowledge PES use to be adequate. This was further reflected by the more than half (50.0 %) who alluded that they did not have regular education on anti-doping regulations.



**Figure 4: Athletes awareness/Anti-Doping Education**

Figure 5 indicate the knowledge teacher trainee athletes had about doping and use of PES was sourced by the majority from broadcast media such as Television (79.4%), radio (76.0%), newspapers (77.0%) and magazines (70.0%). The other important sources as indicated were friends (70.0%) and teachers or tutors (74.0%) at school or college (69.0%), seminars 48.0% and parents 50.0%. As also captured in figure 5 less than half of the athletes reported having received information from seminars whereas a sheer half had known about doping and PES from parents yet these two sources could be the most credible source of such critical information.



**Figure 5: Sources of awareness about use of P**

**Table 1: Awareness of PES among College Athletes**

Statement	Mean	Std. Deviation
I am familiar with the world anti-doping code	3.01	1.393
I personally know athletes/players who have used performance-enhancing substances/drugs	2.24	1.228
My friends use performance enhancing-substances/drugs	1.81	1.049
I am familiar with anti-doping regulations	3.01	1.398
I am regularly educated on anti-doping regulations regularly	2.84	1.383
Athletes should be tested for performance enhancing-substances/drugs at all levels of competition	4.21	1.077
I am aware of the effects of performance enhancing-substances	3.84	1.209

Composite means were computed for the purpose of further statistical analysis and testing for differences between various groups. As indicated by ANOVA, there were statistically significant differences of awareness on the use of PES and drugs with regard to teacher trainees' competitive experience,  $F(389) = 6.928$ ,  $p = 0.0001$ . Further, a Scheffe post-hoc test established the source of difference between athletes who had participated at national competition once and those who had competed four times ( $p = 0.0001$ ); twice and four times ( $p = 0.0001$ ); thrice and four times ( $p = 0.015$ ), and four times and more than four times ( $p = 0.006$ ). ANOVA test also revealed statistically significant differences in awareness of PES among athletes playing different ballgames at  $F(314) = 4.179$ ,  $p = 0.001$ . The difference was between those playing volleyball and basketball ( $p = 0.023$ ); volleyball and hockey ( $p = 0.018$ ).

In addition, there were statistically significant mean awareness differences between male and female athletes, the latter having a higher mean ( $t(406) = 5.718$ ,  $p = 0.005$ ). By virtue of this indication, male athletes were more aware of use of PES/drugs and the anti-doping regulations.

## Discussion

Almost half of the collegiate athletes (43.3%) were not aware of the existence of a WADC against 49.3% who knew about the existence of the same. Further, 42.7% were not aware of the regulations stipulated in the WADC regarding doping issues against 48.1% who knew of the regulations. This raises the question on whether an ignorant teacher can be trusted to guide young athletes to participate in 'clean' sports competition.



But, as reported by Morente-Sanchez & Zabala, (2013) it is not unusual for an athlete to be familiar with anti-doping rules but still display lack of knowledge. As indicated in Table 2, collegiate athletes displayed lack of awareness of the positive effects of miraa (khat) (67.6%) cocaine (55.5%), Marijuana (47%) caffeine (51.9%) to sports performance. With a majority of athletes observing that khat (*miraa*) could not enhance performance it is an indication that teacher trainee athletes lack awareness of doping and may be at risk of using PES unknowingly. The world anti doping code (WADC) stipulates that an athlete who unknowingly tests positive for banned substance shall be guilty of the offense.

Though majority of athletes (81.8%) knew alcohol is not an enhancer there were still 19.2 % who thought it could improve performance yet it can only impair performance. Although alcohol is not listed as banned substance by WADA, higher content levels in an athlete's blood than the 0.10 g/l quantity allowed could lead to a ban. If an athlete involved in competition is under the influence of alcohol, safety of other participants is at risk. Kenya colleges' athletes who reported alcohol as an enhancer probably were not aware that WADA has prohibited use of alcohol for particular sports including archery, air sports, automobile, karate, motorcycling, and power boating.

Considering that a Kenyan boxer was banned during 2004 Athens Olympics for testing positive to cathine teacher trainees need to be educated so that they become informed PE and sports coaches to student athletes in both primary and secondary schools after graduating from college. This level of ignorance should be a wakeup call for the Kenya sports federations and National Olympic Committee of Kenya (NOCK) to enhance anti-doping campaign to athletes at all levels of competition. Even though more than half the respondents knew marijuana and steroids could enhance performance, a large number still were of the view that they had no effects. This is a worrying situation considering that Physical Education is a compulsory area of study where curriculum has anti-doping content outlined for teaching yet some teacher trainees would display ignorance when they ought to have learnt of various substances effects.

Athletes had acquired anti-doping information from various sources including television 79.0%, newspapers 77.0%, radio 76.0%, magazines 70.0%, friends 70.0%, tutors/teachers 74.0%, and college/school 69.0%, seminars 48.0% parents 50.0%.

This indicates that not much has been learnt through seminars where credible anti-doping experts can be source of information. Parents were not rated highly yet some athletes are in age bracket whereby the influence of the parent could still be valuable and may be termed a more credible source of information. Perhaps the college athletes being young adults no longer consider parents as a source of information and prefer seeking information from friends. This may indicate likelihood of peer influence likely at college level since students mix freely and are bound to share information regardless of whether it is correct or incorrect.

Some sources of anti-doping knowledge such as television are questionable as noted by Nowesielki and Swiatkowaska, (2007) that media sometimes broadcasts more for- than against doping in sports. Similar sentiments are expressed by Morrison, Kalin and Morrison (2004) that print media and television have been used to portray 'ideal' male body, which in turn may encourage use of PES by young athletes in order to get the 'ideal' body. Portray by media of high profile athletes who have used PES may equally encourage young athletes into the doping behaviour. It is imperative to underline that raising awareness has not always translated to change in behaviour. In this study athletes (58.0%) observed they had learnt about PES yet their awareness of effects of substance use in sport isn't reflecting the same. This study also demonstrates that some college athletes had not received doping education since 40 % observed they had not learnt about doping hence to entrust such a teacher to the primary or secondary school athlete as a PE teacher or coach would not benefit upcoming young athletes as far as PES issues are concerned.

Athletes training/competing under a coach ignorant of anti-doping regulations/substances may unknowingly ingest banned substances and as a coach may give young athletes banned substances to ingest. Though majority of respondents noted that their awareness of PES was sufficient there was a contradiction in that a large number reckoned they lacked adequate knowledge on anti-doping issues despite being consumers of teacher education curriculum. Further contradiction is noted in that majority cited they were not regularly educated on anti-doping.

Similar contradictions are reported by Whitaker (2012) where majority of athletes noted they had been educated on banned substances yet they also admitted they would dope given an opportunity.

Recently a number of upcoming young Kenyan athletes have failed dope test and banned for a period between 2- 4 years (Ayumba A, 2015). Probably if these athletes had been educated on anti-doping while in school, they would not have been caught up in the vice. However unless the teachers are better informed on anti-doping regulations young potential athletes are likely to engage in doping vice either knowingly or unknowingly because they may graduate from school and probably get recruited into sports by local and foreign coaches and managers who may expose them to banned substances. Education on drugs and substance use in sports should start early before the teacher trainee is enrolled in college.

Although a combined minority (8.0 %) knew friends who were using PES, this may point to the probability of peer influence. Similar observation is made by the anti doping report (Republic of Kenya, 2014) where 17.9% of 357 respondents said they were using PES due to peer pressure. This could also be an indication that doping may be going on amongst college athletes. This may also have a bearing on the study report by NACADA, (2012) whereby respondents from post secondary institutions were using narcotics such as bhang and cocaine. NACADA, (2012) reports 9.3 % respondent in 18- 24 and 24-35 years age categories were using Khat (*miraa*). Kenya teachers colleges athletes fall under these age categories. The NACADA (2012) report further indicates that 2.0% of students were consuming khat (*miraa*). This is an indication that both teacher trainee and students may be in danger of using PES in sporting situations.

Majority of college athletes (82.0%) noted that athletes should be tested for performance enhancing substance. A large number of athletes (94.3%) further concurred that testing for banned substances should be done at all levels of competition. These positive responses indicate the willingness by athletes to embrace clean sports and desire for awareness on doping issues. The need for athletes testing for banned substance is also emphasized in the anti-doping task force report (Republic of Kenya, 2014) where it is noted that education and awareness on anti-doping regulations should be cascaded to the grass roots. Findings of this study tend to be in agreement anti doping studies in other countries. Lubna et al., (2008) reports Jordanian students and college athletes lacked awareness on doping, Feinberg (2009) reports on lack of awareness by polish athletes while Ama et al., (2003) has reported doping awareness by Cameroonian soccer players being vague and insufficient.

This study had hoped that since Physical Education in Kenya Teacher trainee education course is a compulsory subject where the content on doping and substance use is outlined in the curriculum; there would be significant awareness on doping among the collegiate-athletes. Statistical analysis indicate differences in doping awareness between gender ( $t(406) = 5.718, p = 0.005$ ). Some possible explanation for male athletes being more aware is that as reported by Kenya anti-doping taskforce (Republic of Kenya 2014), more male teams receive some doping information occasionally in seminars especially in soccer. Male athletes are probably more open in sharing information hence more male reported to be aware of doping issues.

Female athletes lacked awareness compared to male athletes similar to Corbin et al., (2004) findings of USA College where male athletes were better informed than female athletes. Significant differences in doping awareness between male and female athletes have also been reported by Green and Uryasz (2001). But Crabbe (2001) posits although male athletes had received more education on doping in sports they were still five times more likely to drink alcohol than their female counterparts despite its negative effects on sports performance. This seems to point that awareness of banned substances may not necessarily translate to good practice.

This study findings indicate significant differences in awareness among athletes with varying experience in national sports competitions  $F(389) = 6.928, p = 0.0001$ . The longer the athletes had participated in national competitions the higher the awareness. Differences were between athletes who had played for once and athletes who had played four times  $p = 0.0001$ , twice and four times  $p = 0.0001$ , thrice and four years  $p = 0.015$  and four and more than four times in competition  $p = 0.006$ . This may be an indication that an athlete who may not have been educated on anti-doping at primary and secondary school level he/she was likely to gain some level of awareness over time as they get exposed to competitions at higher levels. Since coaches and sports federations rarely hold seminars to discuss doping with athletes (Republic of Kenya, 2014) it is possible for college athletes to have participated for some years without learning about banned substances. After all majority of athletes (71.1%) reported to have participated in out-of-school sports competitions before collegiate sports, suggesting they may not have received anti-doping information even then. Generally this study findings show that the longer an athlete had participated at national competitions the more informed they were regarding PES. However this awareness may have been attained from the friend and through the media (fig. 5)

This notwithstanding, the large number of athletes not fully informed on performance enhancing substance use in sport calls for an urgent need for collaboration by all stakeholders on the need to educate athletes on performance-enhancing use in sports as most participants may be developing skills in readiness to taking sport as a career. The KTCSA would be expected to have instituted some form of forum where all participating athletes and sports personnel are inducted on the anti-doping code requirements and regulations well before the national competitions. After all WADA expects that sports federations/associations would raise athletes' awareness on anti-doping regulations.

As reported by Republic of Kenya (2014) there are athletes who are supplied with doping substances by the coaches, athlete-team staff and their friends. These sentiments are expressed in other studies by and Lubna et al., (2008) Alaranta et al., (2006) where coaches supplied athletes with PES. A member of the USA Olympic team is reported to have been doped by the coach with steroids without consent thus destroying his immune system and eventually stopping his career (Haley, 2003), and so were the Russian Olympic athletes doped unknowingly Corbin et al., (2004).

There is a call for strict measures to ban doping and to avail doping education to every sports participant regarding the need for honesty and hard work that would lead to success in performance without putting an individual at risk (Kumar & Joyti, 2013). Findings of this study seem to suggest that without proper information Kenya Teachers Colleges athletes on becoming PE and sports coaches may misguide or probably supply athletes in schools with doping substances. Teacher trainee athletes are expected/should graduate from college to be coaches of integrity and responsible in guiding and protecting young athletes from the negative effects of doping drugs and substances.

There were significant differences in awareness among competitors in various ball games,  $F(314) = 4.179$ ,  $p = 0.001$ . Differences were specifically between athletes in volleyball and basketball  $p = 0.023$ , and between volleyball and hockey  $p = 0.018$ . According to the anti-doping task force report Republic of Kenya, (2014), hockey and volleyball players have reported use of banned substances while none is reported by basketball players. Players in the two games used miraa, bhang, alcohol which are mostly purchased from the open market. Players noted that no doping education or testing is carried out among players.

Basketball players noted that there is a clause in their constitution on anti-doping but no education structures to execute it. However some studies by Corbin et al., (2004), Nowesielski and Swistkowska, (2007) and Feinberg (2009), portray team sports players having more awareness of PES.

Overall, findings of the study indicate Kenya teachers colleges athletes in 2015 KTCSA national sports competitions lacked awareness of banned substances in sports and may be at risk of contravening the anti-doping regulations in future.

### **Recommendations**

This study only investigated the teacher trainee athletes who were participating at the national ballgames and athletics competitions which is only a small portion of teachers' college's student population whose responses may not suffice for all students who consume sports competitively or as a recreation. There is therefore the need to;

- Investigate awareness, perception and attitude to PES use in sport by teacher trainees in general in order to establish whether findings of this study apply to them. This may also inform wider and far reaching strategies for the whole student population.
- It is necessary to establish primary and secondary schools athletes' awareness, and attitude to doping because they usually form the junior teams that represent Kenya at regional and international sports competitions. Some of them may find their way to teachers colleges as trainees and may be participating in sports competitions hence the need for their awareness to be raised early. They may also have opportunities to grow in career as teachers and coaches in sports.
- Coaches, trainers and team managers' at the teacher-college level should be investigated for their level of doping knowledge. They play a crucial role in teaching, and coaching athletes for competitions and future careers in sports.
- Evaluate the effectiveness of doping content taught in teacher training colleges in order to establish the college lecturers' competence in imparting college trainees with knowledge and right attitudes on doping and whether the content is sufficiently taught.

## References

- Ama P, F.M., Betnga. B., Moor Ama,V.J., & Kamga,J. P. (2003). Football and doping: *Study of African amateur footballers. British Journal of Sports Medicine.* 37: 307- 310.
- Anshel, M. H., & Russell, K. G. (1997). Examining athletes' attitudes toward using anabolic steroids and their knowledge of the possible effects. *Journal of Drug Education, 27(2)*, 121-145.
- Ayumba, A. (2015) On, "Up and Coming runner Jeruto handed four-year ban for failing Drug Test", Daily Nation Newspaper Publications. Saturday 3<sup>rd</sup> October 2015, Nairobi (pp.48).
- Corbin, B. C., Corbin, R. C., Welk, J. G., & Lindsey, R. (2004). *Concepts of fitness and wellness: A comprehensive lifestyle approach.* Boston: McGraw Hill.
- Crabbe. T, (2001). A sporting chance? Using sport to tackle drug use and crime. *Drugs: Education, Prevention and Policy, 7(4)*: 381-391.doi:10.1080/de.7.4.381.391
- David. R, McDuff, M.D & David M.D.(2005). Substance use by athletes. *A Sports Psychiatry Perspective: Clinic Sports Medicine, 24*:885-897
- Dimeo,p, Justine. A. Taylor. J. Dixon. S & Leigh. R. (2013).Team dynamics and doping in sport. A risk or a protective factor? World Anti-Doping Agency. *Target Research Scheme.* University of Sterling School of Sport.
- Feinberg, J. M. (2009). College students' perceptions of athletes who cheat: The role of performance and history. *Journal of sports behavior. 19 (4)* 320-322.
- Green, G, & Uryasz, F.D, (2001). NCAA study of substance use and abuse habits of College student-athletes. *Clinic Journal of Sport Medicine 11*: 51-56.
- Haey ,J. (2003). Performance enhancing drugs: At the issue. GeenHaven Press. New York
- Insel, P.M., & Roth, W.T. (2002). *Core concepts in health.* Boston: McGraw Hill.
- Koch, J. J. (2002). Performance-enhancing substances and their use among adolescent athletes. *American Academy of Pediatrics. 23*:310-317.
- Kumar,N. & Jyoti, R.(2013). A Study of perception by university students towards doping in Haryana, India. *Research Journal of Physical Education Sciences. 1 (1)* 2-6.
- Levent. O, Naim.N, Ihsan. B, Okay.B, Haldun. S& Gunduz.T (2005). Doping and performance enhancing drug use in athletes living in Siva, Mid-Anatolia: A brief Report. *Journal of Sports Science and Medicine (2005) 4*, 248-252.
- Morente-Sanchez,J.& Zabala, M. (2013). Doping in Sports: a review of elite athletes, beliefs, and knowledge. *Journal of sports medicine: 43:6*: 395-411.

- Morrison, T.G., Kalin, R., & Morrison, M. A (2004). Body-image evaluation and body-image investment among adolescents: A test of socio cultural and social comparison theories. *Adolescence*, 39, 571-592.
- NACADA (2012). Rapid Situational Assessment of the Status of Drug and Substance Abuse in Kenya. Nairobi. Kenya.
- Nowosielski K, S., & Swiatkowska, L. (2007) .The knowledge, of the world anti-doping code among Polish athletes and their attitude toward doping and anti-doping policy. *Journal of Human movement*. 8 (1): 57-64.
- Republic of Kenya (2014). Anti-Doping Taskforce Final Report. Ministry of Sports, Culture and Arts Department of Sports. Nairobi.
- Sommerville, S. J., & Lewis, M. (2005). Accidental breaches of the doping regulations in Sport: is there a need to improve the education of the sports people? *British journal of sports medicine*. 39: 512-516.
- WADA. (2015). *World Anti doing Code; Play True*. World Anti-Doping Agency.
- Whitaker, L. (2012). Performance enhancement in sports: summary of the findings. *Carnegie Research Institute*. Leeds Metropolitan University.