

Knowledge and Use of Performance Enhancing Drugs Among Nigeria Elite Athletes

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Abstract: *The use of drugs to enhance sports performance by athletes is currently a world wide social problem. Although, sports administrators are doing a lot to discourage the practice, yet the incidence appears to be on the increase. It is against this background that the study investigated the knowledge and use of performance enhancing drugs among Nigerian elite athletes. Also, it examined the influence of chronological age of a selected sample of elite athletes and type of sports they engage in on the use of performance enhancing drugs. A total of 220 athletes were randomly sampled from eleven popular sports in Nigeria. A set of questionnaire developed and validated by the researcher was used to collect data for the study. The data collected were analyzed using descriptive statistics, t-test and Analysis of Variance (ANOVA). The results showed that all the participants had heard about and seen each of the performance enhancing drugs identified in the study. Also, there was a significance influence of the sex of athletes and types of sports in drug use habits. Athletes in this study had used ephedrine, caffeine, anabolic steroids and dianabol. Participants in this study used performance enhancing drugs to perform beyond their ability, control weight and to excel at competitions. Based on the findings, it was recommended that Nigerian government should embark on a comprehensive and effective implementation of preventive drug educational programmes for athletes and athletes' support personnel.*

Keywords: *athletes' support personnel, drug abuse, elite athletes, ergogenic aids, placebo, sports performance.*

I. Introduction

In the last two decades, there have been a number of studies on drug use during adolescence. Previous researchers [1, 2, 3 & 4] provide a vital base for establishing prevalence of the rate and trends in adolescent drug use. However, as a result of the characteristics and physiological effects of some of these drugs, they have found wide patronage amongst athletes. The drugs under this category are referred to as performance enhancing drugs. These include any compounds taken to increase strength, power, speed or endurance or to change body weight or composition for the sake of boosting athletics performance [5].

For many years, the various performance enhancing substances and procedures offer an opportunity to gain that elusive competitive advantage. Cyclists, track and field athletes, swimmers and weight lifters are among those athletic groups most often implicated in using banned substances or procedures to enhance performance [6]. Such banned substances include, psychoactive stimulants (cocaine, amphetamines and heroine), steroids, stanozolol, nandrolone, dianabol and other substances with similar chemical effects. Other prohibited substances under restriction are alcohol, marihuana, local analgesics and beta-blocker [7, 8]. For instance, stimulants are used to increase alertness and prevent tiredness and fatigue [9]. They are often used by athletes who need endurance and strength. The drugs were originally used during competitions in an attempt to enhance performance in strenuous events or reduce the sensitivity to pain. However, many athletes now use stimulants during training.

Experience has shown that most young Nigerians, especially sportsmen and women who abuse psychoactive drugs begin in the early life, even though the habit can be initiated at any time [6]. The attitudes of Nigerian sportsmen and women towards the use of drugs are influenced largely by the adults in the society, since they are significant role models in the life of youths. Furthermore, in Nigeria, the free purchase of drugs by the citizens without regard for age, sex and religious restrictions had encouraged the taking of various psychoactive drugs for social, rather than for prescribed medical reasons. This fact seems to account for the alarming rate of use among youths who are potential sportsmen and women [10]

Further, it appears that many youths of diverse demographic backgrounds are now willing to experiment with various types of psychoactive drugs to enhance their performances. Studies [11, 12] reported that many youths involved in the use of various drugs such as tobacco, amphetamine, lysergeic-acid-diethylamide (LSD), cocaine, analgesics and other performance enhancing substances did so for various psycho-social reasons [11, 12, 1]. Such psycho-social reasons include escape from reality, identity and identification, frustration, expectation of failure in competition, shyness, boredom, pressure from team mate, peer approval and social recognition. However, excellent sports performances under the use of performance enhancing drugs are

with health consequences such as nervousness, insomnia, ulceration of the nasal septum, cancer, damage to the cardiac muscle, high blood pressure, impairment of brain-function, loss of weight, coma or death [13, 14]. The use of performance enhancing drugs is often associated with health risks. For instance, in 1965, the use of stimulants in sports led to the death of one cyclist [15]. Similarly, a Nigerian athlete was reported dead during Milo prize giving marathon race in the commercial capital, Lagos, due to intake of performance enhancing drugs [16].

The use of drugs to enhance performance by elite athletes is currently a social problem. This phenomenon has been a source of embarrassment not only to governments but also to sports administrators, coaches and spectators [17]. Although, sports administrators are doing a lot to discourage the practice, yet the incidence appears to be on the increase. It stands to reasons that the increase in the use of performance enhancing drugs is the result of overriding urge by athletes to win at competitions at all costs. As a result of this urge, the athletes resort to trying special diets, drugs and other feasible means to achieve their goals. Thus, the use of drugs to improve performance and achieve superiority over their colleagues have become a worldwide problem.

It is not out of place to reason that the increase in the use of drugs to aid sports performance is to savour the benefits that await the "high performer" from governments, cultural institutions, philanthropists and other enterprises after winning. Such gifts in the form of scholarship, cash and other career prospects bring about the "winning at all cost syndromes" which promotes the use of drugs in sports.

Another reason it seems, for the growing incidence of the use of drugs among the elite athletes may be the fact that competition is becoming tougher with increasing standards and stringent rules governing sports [18]. Furthermore, with an increase in the number of sports participants, the techniques of selection and training programmes have become more rigorous with technological innovations. Thus, the rewards for winning are so high today and the penalties for losing are so severe that sports administrators, coaches, and athletes succumb to the temptations to want to win at all costs. In this, athletes may not care what methods they employ as long as they win. It is not surprising therefore, that modern day athletes go to great lengths in devising ways to enhance their performance.

The issue of drug use in sports is assuming an alarming rate and it has become a big problem which is threatening the organization of sports. It seems that the aspect of unfortunate use of drugs in sports is that, is often led by sports superstars around the world. These are who supposed to serve as role models to the youths. It was an assumption in the past that African sportsmen and women were not involved in the use of performance enhancing drugs, however evidences [19, 20] have proved the assumption wrong as there were cases of doping against African sportsmen and women. With Nigeria, as one of the leading nations in African sports, incidence of her sportsmen and women being free from the use of performance enhancing drugs is yet to be documented. Based on this assertion, the present study is designed to investigate the knowledge of Nigerian elite athletes on the use of performance enhancing drugs and secondly, determine the extent to which the elite athletes actually used the identified drugs, if at all they do.

The finding from this study may provide information on the extent to which Nigerian athletes use performance enhancing drugs. This will assist the Nigerian government in formulating purposeful policies, social and campaign strategies against drug abuse in relation to sports performance and in the other aspects of community life at large. The study would be useful to sports support personnel (coaches, team managers, trainers, sports psychologists and physicians) who deal directly with the athletes.

II. Previous Research

Considerable attention has been focused on the use of drugs as means of enhancing athletic performance by both amateur and professional athletes. The use of performance enhancing drugs became a social problem during the 1984-Olympic Games in Los Angeles, also in 1988 -Seoul Olympics and re-enforced in the 1996-Atlanta Olympics Games [20]. Synthetic Reports [14] revealed that 37 elite athletes from two sports federations were tested for doping and 12 (32%) out of the sample taken tested positive. In 1992, 62 athletes tested positive in 56 sports federations. From meta-analysis of the reports on sportsmen and women and doping, the percentage of athletes in involved [21] varied from 10% to 90%. This also, considered demographic factors such as age, sex, types of sports engaged in and educational institutions attended.

The most common drugs used as performance enhancing agents by athletes include anabolic agents, amphetamines, cocaine, ephedrine, caffeine and diuretics. Though the question of whether certain drugs could have a positive bearing on athletes' competitive ability is still controversial, no one is left in doubt that many outstanding performers tested positive to these set of drugs. Researches regarding the ergogenic effects of amphetamines have been reported in literature. The ingestion of amphetamines may improve swimming, running, weight throwing performance, reaction time and balance under some conditions but the drugs do not have consistent effect in all individuals or a reproducible effect on any one individual [22]. Also, it has been reported [23] that swimmers, baseball players, runners and weight throwers performed better after the administration of amphetamines. In the same vein, amphetamines can affect athletic performance by directly

interacting at sympathetic nerve terminals and indirectly by evoking a release of catecholamine [5]. Thus, amphetamines can increase mental alertness and possibly contribute to competitiveness and aggression.

In another study designed to investigate the effects of ephedrine on sports performance, it was reported that ephedrine (24mg) increased heart rate and blood pressure during exercise, but did not lead to enhanced hand-eye coordination, muscle strength, endurance, power, or VO₂max [24]. Also, ephedrine supplementation of 1mg/kg of body weight failed to improve endurance performance of athletes [25]. However, researchers [26] reported that combining ephedrine with caffeine can enhance sports performance. The greatest concern associated with ephedrine is that it is common in over-the-counter remedies and prescription drugs. For instance, in the 1972 Olympic Games, one of the American gold medalists had to return his medal and was disqualified from further competition after been tested positive for ephedrine [27].

Caffeine is a mental stimulant, but it may impair motor performance in activities that require great manual dexterity and calmness such as target shooting, archery, golf and billiards [28]. Hitherto, it was discovered that caffeine ingested at doses ranging from 3 to 12 milligrams per kilogram of body weight about one hour prior to exercise increases endurance performance in cycling, running and swimming [29].

Anabolic steroids used by athletes belong to a powerful group of natural or synthetic compounds similar in chemical structure to the natural hormone of the male. Common examples are nandrolone, stanozolol, testosterone and boldenone. The practice of taking anabolic steroids began with body builders and weight lifters in the late 1950's and has gradually spread to athletics and to other sports. In some sports, the addition of weight is considered ergogenic, hence some athletes use anabolic steroids with intent of gaining weight. Also, some athlete belief that these drugs will improve strength and therefore enhance athletic performance. Based on this belief, anabolic steroids have been promoted as an aid to the development of muscle mass and strength to enhance athletic performance [30].

Studies carried out in different parts of the world showed no significant effect of steroids on muscular strength. A study [31] involving groups of men who trained with weight and took steroids and another group that trained with placebo pills (pills that the participants may take for steroids but which actually consisted of sugar) was carried out. The participants on the sugar pill tend to get stronger because they thought they took a strength promoting substance. However, another study [32] found a significant advantage of steroid treatment over placebo. The result may be so, because the researcher failed to control the dietary intake of the participants. Such failure may affect the results since anabolic steroids need dietary protein supplementation to be effective. Based on the available literature, it is difficult to assess the long term effects of the administration of massive doses of androgenic anabolic steroids on athletic performance.

From the foregoing, it appears there is no authoritative proof that the success of an athlete or a team during competition is brought about by the influence of any drug, ethical principles of athletic competition as set forth by many of the sport governing bodies [33] forbid Sportsmen and women from it. Many athletes use pharmacologic agents, with the believe that the specific drug can improve their skills, strength, power, or endurance, but medical facts [5] have emerged to slow the adverse effects of such drugs ranging from nausea, hair loss, nervous irritability to severe consequences such as sterility, liver disease and even death caused by liver and blood cancer.

III. Research objectives

Specific objectives of this study are to: -

- 1.1 find out the knowledge of Nigerian elite athletes about the types of performance enhancing drugs used in sports,
- 1.2 determine the extent to which the elite athletes have actually used the performance enhancing drugs identified,
- 1.3 determine among the elite athletes, the influence of chronological age, sex of participants and type of sports on the use of performance enhancing drugs,
- 1.4 investigate the reasons for using performance enhancing drugs by drug users and non-users.

IV. Research Method

The study adopted a descriptive type of survey research. The survey research typology enables information to be obtained from a representative sample of the population so as to describe situations as they exist. The population of this study includes all the athletes who have represented Nigeria at least once at an international competition.

The rationale for sampling this category of athletes is based on their experience and exposure to international competitions which afford national athletes the opportunity to mix and interact freely with athletes from other countries, some of who might have used drugs to enhance their (foreign athletes) sports performance. This contact presumably, might be the forum through which Nigerian athletes learn about or get some of the drugs used as ergogenic aids.

A total of 220 athletes (male – 135, female – 85) were sampled for the study. The participants were randomly selected from eleven popular sports in Nigeria. These sports are those usually competed for at international level. These sports include; Individual sports (athletics and weight lifting), Dual sports (badminton, table-tennis, tennis and boxing) and Team sports (basketball, football, handball, hockey and volleyball). The participants were stratified by their sex (either male or female) and by the type of sports (Individual, Dual and Team Sports) they were involved in.

Data for this study were collected using a self-developed questionnaire which was designed on the bases of literature relating to drug use in sports. Also, a scheduled oral interview was carried out with 20 athletes and 10 coaches. The results of this initial interview assisted the researcher to include more relevant questions on drug use among the athletes. The instrument consisted of two sections. The first part requested for demographic data such as gender, age, religion and type of sports involved in. The second section was designed to identify drug users and non-users and to determine the reasons influencing drug use among Nigerian elite athletes.

In order to determine the reliability of the questionnaire and its applicability in the Nigerian context, a pilot study was undertaken. In the pilot test, copies of the questionnaire were administered on 60 athletes (male = 30, female = 30) at two weeks interval. The participants for the pilot study were outside the actual participants used for the study. The scores from the two sets of responses were correlated using Pearson Product Moment Correlation method to determine the reliability coefficient. The instrument yielded reliability coefficient of 0.80. This shows that the questionnaire is stable and appropriate to be used for data collection for the study.

Copies of the questionnaire were administered personally to national athletes while training in three designated camps in Lagos, Ibadan and Ilorin for international competitions. The researcher sought and received the permission and assistance of the coaches of different sports before administering the questionnaire to the athletes. Instructions and explanations were given to the athletes where necessary. It was assumed that all responses given by the participants were sincere since no name was written on the questionnaires. It is relevant to add that the researcher was a former national and international sportsman and hence had little or no difficulty in interacting and communicating with the athletes and coaches. The participants spent not more than thirty-five minutes on the average to complete the questionnaire. Copies of the questionnaire were completed independently to decrease the possibilities of comparing notes and discussing the questionnaire items.

The data collected were subjected to simple percentages conversion, t-tests analysis and Analysis of Variance (ANOVA). In the ANOVA analysis, the independent variables were sex of participants as factor A(a₁ = male, a₂ = female) and type of sports as factor B(b₁ = individual sports, b₂ = dual sports and b₃ = team sports). The dependent variable was the scores obtained from the responses of the participants. The level of statistical significance for each analysis was set at 0.05. The statistical analyses were carried out at the SAMCOM computer centre, Ekiti State University, Ado – Ekiti using the procedure of statistical package for the social sciences (SPSS/PS).

V. Results

5.1 Knowledge and Extent of drugs used by Participants

Initial treatment of the data examined the percentage distribution of the knowledge of and extent of performance enhancing drugs used by the participants. The participants were asked to check from the identified drugs in the study, the ones they had heard about, seen, and the extent to which they actually used such drugs. The responses are reported in Table 1.

Table 1
Percentage Analysis on the Knowledge and Extent of drugs used by Participants

Types of drugs	Heard about	Drug seen	Used but discontinued	Used currently	Never used
Anabolic steroids	141 (61.1)	27 (12.3)	4 (1.8)	8 (3.6)	208 (94.5)
Stanozolol	74 (33.6)	11 (5.0)	0 (0.0)	1 (0.5)	219 (99.5)
Diamabol	63 (28.6)	11 (5.0)	2 (0.9)	6 (2.7)	212 (96.4)
Nandrolone	30 (13.6)	2 (0.9)	0 (0.0)	0 (0.0)	220 (100.0)
Heroin	150 (68.2)	22 (10.0)	0 (0.0)	5 (2.3)	215 (97.7)
Morphine	89 (40.2)	9 (4.1)	1 (0.5)	2 (0.9)	217 (98.6)
Methadone	62 (28.2)	9 (4.1)	2 (0.9)	4 (1.8)	214 (97.3)
Opium	82 (37.3)	16 (7.3)	4 (1.8)	0 (0.0)	220 (100.0)
Amphetamines	81 (36.8)	22 (10.0)	0 (0.0)	2 (0.9)	217 (98.6)
Ephedrine	109 (49.5)	45 (20.1)	1 (0.5)	18 (8.1)	201 (91.4)
Cocaine	161 (73.2)	46 (20.9)	1 (0.5)	5 (2.3)	214 (97.3)
Caffeine	97 (44.1)	44 (20.0)	1 (0.5)	11 (5.0)	208 (94.5)
Phenobarbital	59 (26.8)	26 (11.8)	2 (0.9)	2 (0.9)	216 (98.2)
barbiturates	78 (35.5)	22 (10.0)	1 (0.5)	1 (0.5)	218 (99.1)

% in parents

The data in table 1 showed that more than half of the participants had heard about anabolic steroids (61.1%), heroin (68.2%) and cocaine (73.2%). About 12.3% of those who had heard about anabolic steroids had seen it, while 10% of those who had heard about heroin had seen it. Also, 20.9% of those who heard about cocaine had seen it.

The data showed that there was a wide gap between having heard about or seen a particular drug and actually trying or using it. While a high number of participants heard about or saw the drugs, only a few of them had actually used or tried them. On the whole, participants indicated that they were currently using ephedrine (8.1%), caffeine (5.0%), anabolic steroids (3.6%) and dianabol (2.7%). Out of the fourteen identified drugs, only two had not been tried by the participants. These were nandrolone and opium.

A two-way analysis of variance (ANOVA) was further performed on the responses to determine the extent of drug use by sex and age of athletes. The results of ANOVA (table 2) was statistically significant ($F_{1, 210} = 35.02$; $P < 0.05$) for sex of participants. Scheffe post-hoc analysis showed that male participants used drugs more significantly higher their female counterparts. However, the sex by age (A x B) interaction effect were not statistically significant.

Table 2

Summary of two-way Analysis of Variance on the use of performance enhancing drugs by sex and age of participants

Source	Ss	df	Ms	F
Sex (A)	43.41	1	43.41	35.02*
Age (B)	3.11	4	.78	.63
Interactions (A x B)	1.48	4	.37	29
Error Terms S/AB	260.33	210	1.24	

* Significant results

5.2 Extent of Drug use by Type of sports

One-way analysis of Variance (ANOVA) was computed to determine the extent of drug use by type of sports. In the analysis, athletics and weight lifting were grouped as individual sports while badminton, table-tennis, tennis and boxing were categorized under dual Sports. Also, the team sports consist of basketball, football, handball, hockey and volleyball. The results of the findings are presented in table 3

Table 3

Summary of One-way Analysis of Variance on the use of performance enhancing drugs by type of sports

Source	Ss	df	Ms	F
Between Groups	18.47	2	9.24	6.79*
Within Groups	295.33	217	1.36	
Total	313.80	219		

* Significant results

The results of the Analysis of Variance (table 3) on the use of performance enhancing drugs in the three main sports was statistically significant ($F_{2, 217} = 6.79$; $P < 0.05$). further analysis of the main effect revealed that participants in team sports used drugs higher than those participants in individual and dual sports.

5.2 Reasons for using performance enhancing drugs

The participants were asked to indicate from a list the reasons why an athlete may want to use performance enhancing drugs. Table 4 showed the results of the t-test analysis for drug users and non-users.

Table 4

Comparison (by t-test) of drug users with non-users on reasons for using performance enhancing drugs

Source	Drug Users (N = 80)		Non-Users (N = 140)		T _{cal} (df, 218) Never used
	\bar{X}	SD	\bar{X}	SD	
Perform beyond ability	2.06	1.00	2.71	0.93	1.08
Weight control	2.52	1.00	2.42	0.95	-0.79
Pain reduction	2.66	0.98	2.95	0.99	2.21*
Desire to experiment	2.52	1.00	2.42	0.95	-0.76
Fear of failure	3.03	0.87	3.02	0.84	-0.03
Nervousness	3.06	0.91	3.02	0.95	-0.76
Frustration	2.65	1.06	2.35	0.86	-0.76
Desire to excel at	2.08	0.97	2.38	0.94	2.28*

competitions	2.46	0.90	2.40	0.94	-0.49
Arousal elevation	15.16	3.01	14.96	3.20	-0.46
Monetary/Material reward	1.99	0.88	2.02	0.88	-0.46
Self-confidence	1.68	0.78	1.79	0.86	0.96
Athletes interaction	2.26	0.98	2.13	0.92	-1.02
Social recognition	2.18	0.87	2.25	0.92	0.59
Coach/physician influence	3.26	0.91	3.25	0.86	-0.04
Advertisement	3.18	0.79	3.17	0.80	-0.03
Peer group interaction	3.08	0.67	3.05	0.69	-0.39
Acceptable by others					

* Significant results

Table 4 showed that there were differences in the mean scores of drug users as compared with those of non-users on all the reasons identified in the study. In order to test for statistical significance of the differences in each of the reasons, the t-test analysis was computed. The results showed that there was a significant difference on only two of the reasons. 't' value of 2.21 was established for nervousness and a value of 2.28 was established for self confidence. The t-calculated values in the two areas were greater than the table value of 1.96 at 0.05 level of significance. Thus, the views of the participants who were non-drug users on these two reasons were significantly higher than the views of drug users. For other reasons, the t-calculated values were less than the table value of 1.96 at df=218 and P< 0.05 level of significance. However, drug users and non-users seemed to agree that reasons such as performing beyond ability (\bar{X} = 3.26 for drug users, \bar{X} = 3.25 for non-users), weight control (\bar{X} = 3.18 for drug users; \bar{X} = 3.17 for non-users) and the desire to excel at competitions (\bar{X} = 3.03 for drug users; \bar{X} = 3.02 for non-users) may prompt an athlete to try performance enhancing drugs.

VI. Discussion

Results from this study indicated that many of the participants were not ignorant of performance enhancing drugs. More than half of the participants had heard about anabolic steroids, heroin, cocaine, and ephedrine. Almost all the athletes under study identified themselves with one form of performance enhancing drugs or the other. This finding is in line with the earlier studies [34, 34]. These researchers reported that their participants were aware of doping agents used in sports. However, the finding of this study contradicted an earlier report [36] that Nigerian athletes were ignorant of performance enhancing drugs. This unexpected discovery could be attributed to the fact that majority of the participants denied their knowledge of drug use for the fear of being followed up. It is interesting to note that participants in this study were not only aware of drugs that could improve sports performance, they were also able to identify such drugs.

In the current study, results indicated that the drug of choice for drug users included ephedrine, caffeine, anabolic steroids and dianabol. This finding was consistent with the works of previous researchers [37, 38, 39, 40, 35] who found out that Nigerian athletes were occasionally users of drugs. This result paralleled the findings of earlier studies [36, 41] which revealed that athletes including soccer players had negative attitudes to drug use in enhancing their sports performance. However, these researchers did not consider sex of participants as a factor of drug use in their studies. The studies of these researchers were limited in scope to either secondary school or university athletes. Also, these researchers did not make any attempt to identify drug users and non-users with respect to some variables such as sex of participants, age and type of sports. Attempt was made in the present study to investigate the influence of these variables on drug use habits. It was discovered that sex of participants and type of sports influenced significantly the use of performance enhancing drugs [19, 42, 43].

There may be many reasons which may prompt an athlete to use performance enhancing drugs. The results of this study showed that majority of drug users were influenced by reasons which included social recognition, desire to perform beyond ability, weight control, pain reduction, arousal elevation and the desire to excel at competitions [44, 45, 46]. However, the influence of nervousness and self-confidence which seem not be important factors of drug use among drug users were found to be significant when compared with the mean score of non-users. Thus, those athletes who did not take performance enhancing drugs recognized nervousness and self-confidence as strong factors that motivated an athlete to experiment with drugs. For other factors of drug use identified in this study, the results followed the same trend of slight difference between drug users and non-users.

VII. Conclusion

The results of the present study showed that all the sample athletes had heard about and seen each of the drug identified in the study. Also, the number of male athletes who used performance enhancing drugs was significantly higher than the number of female athletes who had used the identified drugs. Similarly, there was a significant influence of types of sports on drug use among the elite athletes.

The confirmation of drug use by Nigerian athletes in this study has strong implications for policies and other strategies so far adopted to address the issue on multiple levels in the form of comprehensive drug education programmes for Nigerian athletes and athletes' support personnel. The National Sports Commission needs to intensify efforts towards testing athletes for doping during preparations for national and international competitions. Stiffer penalties to be more than the present 2 years ban should be meted out to those tested positive to any of the banned substances. The culprit should also be made to undergo counseling therapy.

The findings of the study should be interpreted in the light of some limitations. Like other studies on the use of ergogenic aids among athletes, the findings are based on athletes' self-report in which some athletes might hold back their drug use habits. Also, this study was conducted during the training session for an international competition, hence an initial problem of getting cooperation from the athletes. Nevertheless, the results of this study could be considered valid because the limitations identified did not in any way affect the findings of the study.

The present study would provide basis for the research unit of the National Drug Law Enforcement Agency (NDLEA) in conducting widescale investigation in the area of drug use as it relates to mental and social health status among Nigerian athletes, youths and adults in sports.

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