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Doping in athletics: Exploring attitudes among competitive runners in Tanzania

Avelina Shao . *Department of Recreation and Sports Management. Kenyatta University. Nairobi, Kenya.*
Elijah Gitonga Rintaugu. *Department of Recreation and Sports Management. Kenyatta University. Nairobi, Kenya.*
Edna Thangu. *Department of Recreation and Sports Management. Kenyatta University. Nairobi, Kenya.*

ABSTRACT

Doping continues to be a significant issue in competitive sports, posing ethical, health, and legal challenges while undermining fair play and integrity. Attitude toward doping is an important predictor of doping behaviour. This study aimed to assess the attitudes toward doping among Tanzanian running athletes and to examine how demographic factors of age, gender, education level, and experience, influence these attitudes. A self-administered questionnaire was used to collect data from 117 athletes across 12 running camps in the Arusha and Dar es Salaam regions. The data were analyzed using descriptive statistics, the Kruskal-Wallis test, and the Mann-Whitney test. The results indicated that Tanzanian competitive running athletes exhibited a less permissive attitude toward doping, with a PEAS score of 41.12 ± 11.09. Age significantly influenced attitude (p = .03), while gender, education level, and experience did not significantly impact attitude (p > .05). The study underscores the need to strengthen anti-doping education programs, raise awareness of the long-term health risks associated with performance-enhancing substances, and ensure that anti-doping policies are rigorously enforced. Future research should explore additional factors, such as peer influence and the specific competitive environments in which athletes train and compete, to better understand the complex factors that influence doping attitudes.

Keywords: Physical activity psychology, Athletes' age, Attitude towards doping, Education level, Experience, Gender, Performance enhancing substance.

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Corresponding author. *Department of Recreation and Sports Management. Kenyatta University. P.O. Box 43844-00100 Nairobi, Kenya.*
E-mail: aveshao@yahoo.co.uk
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INTRODUCTION

Doping remains a critical issue in competitive sports, undermining the principles of fairness, health, and integrity. The global prevalence of prohibited performance-enhancing substances (PES) and methods continues to pose a significant challenge, as athletes across various disciplines seek unfair advantages despite the serious ethical, legal, and health risks involved (Balk et al., 2023; Berger et al., 2024). The World Anti-Doping Agency (WADA) has established an international framework to combat doping through education, testing, and enforcement. While WADA's initiatives have enjoyed reasonable success in developed countries, their effectiveness is hindered in developing regions due to limited funding, inconsistent enforcement of anti-doping policies, and resistance rooted in cultural and social norms (Petroczi & Biley, 2020; Shelley et al., 2022). For instance, Sub-Saharan Africa faces unique challenges, such as insufficient testing, a lack of infrastructure, low access to doping information, and a shortage of tailored educational programs (Carreathers, 2020; Muwonge et al., 2015). Addressing these barriers requires localized approaches that consider regional disparities and constraints.

One of the key factors in combating doping is understanding doping attitudes—the predispositions that athletes have toward banned performance-enhancing substances (Muwonge, 2015). Doping attitude involves either a positive or negative evaluation of the use of these prohibited substances. Such attitudes are typically formed through a combination of cognitive, affective, and behavioral components, where athletes may develop beliefs about doping (cognitive), experience emotional reactions (affective), and potentially engage in doping behaviors (behavioral) (Petty et al., 2003). In the context of sports, attitudes toward doping are shaped by various factors, including personal experiences, socio-economic influences, cultural norms, and environmental conditions (Barkoukis et al., 2019; Carreathers, 2020; Filleul et al., 2024; Janarthanan et al., 2024; Puchades and Molina, 2020).

Research indicates that attitudes toward doping are significant predictors of doping behaviour. Individuals who have favourable views about the use of performance-enhancing substances and methods are more inclined to engage in doping practices (Chiang et al., 2018; Morente-Sánchez et al., 2019). For example, athletes who see doping as acceptable or justified within their sport may be more likely to use prohibited performance-enhancing substances (PES), especially if they believe these substances could give them a competitive edge (Mahendru et al., 2019; Varfolomeeva et al., 2023). On the other hand, negative attitudes toward doping, which may arise from ethical considerations or fear of repercussions, are likely to decrease the chances of athletes participating in such behaviours (Blank et al., 2021; Tahiraj and Hakaj, 2021; Varfolomeeva et al., 2023). Thus, comprehending attitudes toward doping is essential, as they not only provide insights into why athletes might resort to PES use but also form the basis for designing effective anti-doping programs. Secondly, understanding attitudes towards doping comprehensively will be apt in order to provide efficient intervention in potentially risky groups like runners in a developing country.

In sub-Saharan Africa, particularly in Tanzania, athletics (especially distance running) has gained significant international recognition. This visibility subjects athletes to various pressures that may encourage doping. Research conducted in several countries, including Croatia (Miskulin, 2020), Turkey (Ozkan et al., 2020), Slovakia (Tahiraj and Hakaj, 2021), Russia (Varfolomeeva et al., 2023), Kenya (Rintaugu and Mwangi, 2021), and Ethiopia (Mohammed et al., 2022), has revealed a complex interplay of factors influencing doping behaviours. These factors encompass financial incentives, a lack of awareness regarding anti-doping regulations, insufficient knowledge about prohibited substances, heightened competitiveness, and the influence of coaches and peers. Such studies indicate that doping is not simply an individual decision; rather,

it is often shaped by external pressures, including the need to meet societal and familial expectations, as well as the desire to remain competitive in an increasingly challenging global landscape.

Several studies have explored athletes' attitudes toward doping, providing insights into their beliefs, motivations, and behaviours. For example, Zmuda et al. (2023) found that Polish athletes predominantly hold negative views on doping, with most believing that high performance can be achieved without resorting to it. Similar negative attitudes were observed in Sri Lanka (Perera et al., 2023) and Turkey (Ozkan et al., 2020), where education levels, exposure to anti-doping initiatives, and competitive achievements were linked to these perspectives. In Nigeria, athletes voiced strong opposition to doping but also expressed empathy for individuals who use prohibited PES under certain conditions (Veltmaat et al., 2023). This highlights the complex viewpoints shaped by local socio-economic contexts. In contrast, Varfolomeeva et al. (2023) found a notable number of athletes who maintained a positive attitude toward doping, suggesting that they believe sports competitions become less exciting without it, reinforcing the notion that winning at any cost is acceptable. Moreover, Mahendru et al. (2019) revealed that some athletes adopt a positive attitude toward doping, convinced that "*the ends justify the means*" irrespective of performance quality. Additionally, Guessogo et al. (2021) reported that 96.3% of 138 athletes in Cameroon exhibited a positive attitude toward doping, even though 96.4% of them demonstrated a high level of understanding regarding doping issues.

Evidence suggests that younger athletes may be more susceptible to doping due to peer pressure and a lack of awareness of anti-doping rules (Mwangi et al., 2019; Tahiraj and Hakaj, 2021; Tsivitanidou et al., 2023). Conversely, less experienced athletes might justify doping to enhance their competitive performance or extend their careers (Miskulin et al., 2021). Gender differences have also been observed, with male athletes reportedly exhibiting more permissive attitudes toward doping compared to females, possibly due to societal expectations and differing perceptions of success (Girelli et al., 2020; Puchades and Molina, 2020; Sekulic et al., 2016). However, a study conducted in Korea suggested that female athletes may have a higher tolerance for doping than males, indicating the influence of cultural and contextual factors (Lee et al., 2024).

Despite Tanzania's growing participation in international athletics, there is a limited amount of research on doping attitudes among its running athletes. Existing literature primarily centers around awareness (Mijuza, 2022), highlighting a significant gap in understanding how Tanzanian runners feel about doping. Additionally, while studies conducted in other East African countries (Muwonge et al., 2015; Mwangi et al., 2019; Ogama et al., 2019; Rintaugu and Mwangi, 2021) offer valuable insights, they may not fully reflect the unique demographic and socio-cultural context of Tanzania, which can greatly influence attitudes toward doping. Consequently, findings from other countries may not be directly applicable to Tanzanian athletes due to various factors such as sporting culture, environmental conditions, training and coaching resources, sports infrastructure and economic issues. This gap impedes the formulation of targeted anti-doping policies and educational programs that are specifically designed for Tanzania's distinctive context. Thus, this study aimed to address this gap by examining the attitudes of competitive running athletes in Tanzania toward doping, thereby providing a clearer understanding of how these athletes perceive doping within their specific socio-cultural and sporting environment.

MATERIAL AND METHODS

Research design

The study was conducted from October to December 2023, utilizing a cross-sectional analytical research design. This design was well-suited for evaluating Tanzanian runners' attitudes toward doping at a specific point in time (Schmidt & Brown, 2021). The choice of this design was based on its efficiency in gathering data

without manipulating variables, as well as its capacity to offer a comprehensive overview of the population's current characteristics and trends.

Study participants

A census sampling method was employed to collect data from 117 competitive runners across 12 purposively selected training camps in the Dar es Salaam and Arusha regions. Among the participants, 73 (62.4%) were male, while 44 (37.6%) were female. In terms of age distribution, 14 athletes (12%) were under 15 years old, 73 (62.4%) were aged between 16 and 25 years, 27 (23.1%) were between 26 and 35 years, and 3 (2.6%) were aged between 36 and 45 years. Regarding running experience, 54 athletes (46.2%) reported having 0.5 to 3 years of experience, 43 (36.8%) had 4 to 7 years, and 20 (17.1%) had 8 or more years of experience. Concerning educational attainment, 29 participants (24.8%) had completed primary school, 67 (57.3%) had completed secondary school, 12 (10.3%) held a certificate, 3 (2.6%) had a diploma, and 6 (5.1%) had a university degree.

Recruitment of participants

A letter of invitation to participate in the study was sent to the managers of the athletic camps through Athletic Tanzania. The camp managers were asked to share the information with the athletes in their respective training camps. Following this, arrangements were made to meet with the athletes and provide more insights into the study's objectives and aspirations. During these meetings, the aim and objectives of the study were explained to the athletes. Participation in the study was entirely voluntary, and participants were informed that they could withdraw from the survey at any time without any negative consequences or pressure. Once participants agreed to take part, a meeting was scheduled for them. At this meeting, the researcher and research assistant provided the survey questionnaire after the participants signed the consent form. A total of 117 out of 120 targeted competitive running athletes from the two regions agreed to participate and completed the questionnaire.

Inclusion and exclusion criteria

The study involved both male and female athletes who had been training in camps located in the Dar es Salaam and Arusha regions for a minimum of six months before data collection. Athletes with less than six months of camp experience were excluded from the study, as they were considered to have insufficient competitive experience.

Data collection instruments

The study employed a modified self-reported questionnaire consisting of two sections. Section A gathered demographic information, including age, gender, training experience, education, and competition level. Section B assessed doping attitudes using the Performance Enhancement Attitude Scale (PEAS). This scale, developed by Petroczi and Aidman (2009), was specifically utilized for measuring general doping attitudes in this study as well. The PEAS comprises of 17 items, with responses recorded on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Scores can range from 17 to 102, with a theoretical midpoint of 59.5 as noted by Petroczi and Aidman (2009). A higher PEAS score indicates a more permissive attitude toward doping, while a lower score reflects a more intolerant stance.

Face and content validity were confirmed during pre-testing of the instruments which led to some adjustments in the questionnaire. According to Petróczi and Aidman (2009), a good reliability score for the PEAS is indicated by Cronbach's alpha values ranging from 0.71 to 0.91. In this study, the test-retest reliability resulted in a high index of 0.86. The doping attitude items were reviewed by supervisors who are research experts.

The questionnaires were self-administered after training sessions, and all were collected on the same day to minimize the risk of misplacement and ensure data integrity.

Research ethics

The survey adhered to the ethical guidelines established by the Kenyatta University Ethical Review Board (KUERB) under protocol number PKU/2759/11884. The necessary research permit was granted by the National Commission for Science, Technology, and Innovation (NACOSTI) in Kenya. Since the study was conducted in Tanzania, the researcher secured permission from the Ministry of Sport through Athletics Tanzania (AT) to engage the athletes. Participants were thoroughly informed about the purpose of the study, and their written consent was obtained prior to data collection. To ensure confidentiality, all data were collected and analysed anonymously.

Data analysis

Data were recorded, coded, and analysed using IBM SPSS version 27. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were employed to summarize demographic information and attitudes towards doping. The Shapiro-Wilk test indicated that the data were not normally distributed, leading to the use of the Kruskal-Wallis test to assess significant differences in doping attitudes based on demographic factors such as age, education, and experience. Additionally, the Mann-Whitney test was utilized to examine differences based on gender.

RESULTS

Attitude of athletes toward doping

The study aimed to explore athletes' attitudes toward doping. The overall mean score on the Performance Enhancing Attitude Scale (PEAS) for the athletes who participated in this study was 41.12 ± 11.09. This suggests that most athletes held a permissive attitude toward doping.

The study further aimed to assess whether there were significant differences in attitudes toward doping based on athletes' demographic factors, including age, gender, experience, and education level. The athletes' attitudes toward doping across different age groups in competitive running in Tanzania is presented in Table 1.

Table 1. Attitude towards doping based on athletes' age.

Age group	F	Mean	Std.
≤ 15	14	43.79	9.03
16-25	73	41.7	11.81
26-35	27	39.78	9.5
36-45	3	26.67	2.52

Table 1 indicates that the attitude of athletes towards doping changes negatively as they grow older. A Kruskal-Wallis test was conducted to examine differences in attitudes toward doping across various age groups, yielding a *p*-value of .03. Therefore, the null hypothesis, which states that there is no significant difference in doping attitudes based on age, was rejected.

Differences in attitude towards doping based on gender

The study explored whether attitudes towards doping were influenced by gender among competitive runners in Tanzania. The results indicate that male athletes exhibited a more negative attitude towards doping (40.48

± 10.21) compared to female athletes (42.18 ± 12.46). Mann-Whitney U test showed no statistically significant difference in attitudes towards doping between males and females, U(N males = 73, N females = 44) = 1511.50, z = 0.53, p = .595. Therefore, the null hypothesis, which suggests there is no difference in attitude based on gender, was not rejected. Consequently, gender does not influence attitudes towards doping among athletes in Tanzania.

Athletes' attitudes towards doping based on education level in competitive running

The study also aimed to determine whether educational level influences attitudes towards doping, and the results are presented in Table 2.

Table 2. Attitudes of athletes towards doping based on education level.

Education level	F	Mean	Std.
Primary education	29	40.7	10.7
Secondary education	67	41.76	11.79
Certificate	12	39	8.78
Diploma	3	44	14.93
University	6	37.83	7.73

Table 2 indicates a disparity in attitudes towards doping across different education levels among athletes, where those with a university level of education exhibited a less permissive attitude (37.83 ± 7.73) compared to others. The Kruskal-Wallis test indicated that there were no significant mean differences in attitudes towards doping among the athletes (H (4) = 0.768, p = .943). As a result, the null hypothesis that there is no significant difference in attitudes towards doping among athletes in competitive running in Tanzania based on education level, was not rejected.

Attitude of athletes towards doping based on running experience in competitive running

The study also examined how athletes' experience influences attitudes toward doping in competitive running in Tanzania, with the results presented in Table 3.

Table 3. Athletes' attitude towards doping based on experience in competitive running.

Years of experience	F	Mean	Std.
0.5-3	54	41.04	10.88
4,-7	43	42.58	12.46
8+	20	38.05	7.92

Table 3 shows that athletes who had participated in competitive running for more than 8 years exhibited a less permissive attitude toward doping (38.05 ± 7.92) compared to other groups. However, the Kruskal-Wallis test revealed that the years of experience in running did not result in a significant difference in attitudes toward doping among the three categories of running experience, H(2) = 1.649, p = .440. Therefore, the null hypothesis stating that there is no significant difference in attitudes toward doping among athletes in competitive running in Tanzania based on experience, was not rejected.

DISCUSSION

This study investigated the attitudes of running athletes toward doping and examined how demographic factors of age, gender, education level, and experience influence these attitudes. The findings offer valuable

insights into athletes' perspectives on doping, which could assist the Tanzanian government and sports organizations in creating more effective anti-doping education programs.

The findings revealed that the overall mean PEAS score for the athletes who participated in this study was (41.12 ± 11.09), which is below the theoretical mid-point of 59.5. This mean PEAS score was slightly higher compared to several previous empirical studies (Hincapie et al., 2020; Lee et al., 2024; Miskulin, 2020; Morente-Sánchez et al., 2019; Muwonge et al., 2015; Zandonai et al., 2024). For instance, a study conducted on Colombian athletes found their overall PEAS score to be 35.8 out of a possible 102 points (Hincapie et al., 2020). Additionally, research on Spanish athletes reported an overall PEAS score of 32.7 ± 10.2 (Zandonai et al., 2024), while Morente-Sánchez et al. (2019) found an average score of 34.02 ± 11.08 among Spanish football athletes. Moreover, a study involving professional and non-professional athletes in Croatia revealed a PEAS score of 31.00 (Miskulin, 2020), and a study on Korean athletes' doping attitudes reported an average PEAS mean score of 37.20 (Lee et al., 2024). Similarly, research among professional Ugandan athletes indicated an overall mean PEAS score of 39.8 ± 14.8 (Muwonge et al., 2015). These findings suggest that Tanzanian running athletes demonstrated more permissive attitudes toward doping compared to the above studies. This suggest a potential lack of awareness or education about the risks and ethical concerns of doping, weaker anti-doping enforcement, cultural or economic pressures to succeed, or limited access to anti-doping resources. This highlights the need for increased education, stricter monitoring, and awareness programs to address doping issues and promote fair competition in Tanzanian athletics. However, it's noteworthy that some empirical studies recorded higher PEAS scores than those found in the current research. For example, a study among Malaysian student-athletes reported an overall PEAS score of 44.63 ± 13.03 (Chiang et al., 2018), while research on doping attitudes of athletes in Sri Lanka found an overall PEAS score of 48.1 (Perera et al., 2023).

This variation in PEAS scores may be attributed to several factors, including cultural differences, the level of awareness regarding the risks associated with doping, and the distinct sports environments present in each country. It is likely that athletes in countries with more permissive attitudes toward doping encounter less stringent anti-doping policies or lower levels of education on the harmful effects of performance-enhancing substances, which could shape their attitudes (Chiang et al., 2018; Perera et al., 2023). Conversely, athletes in countries with lower PEAS scores, like Spain and Colombia, may benefit from more robust anti-doping educational programs or a stronger anti-doping culture, resulting in less tolerance for doping behaviours (Hincapie et al., 2020; Morente-Sánchez et al., 2019). Additionally, the discrepancies in scores could reflect socio-economic, cultural, and environmental influences. For instance, athletes in regions where there is intense pressure to perform or where doping is perceived as a quick route to success may exhibit a higher tolerance for doping practices. In contrast, in countries with better regulation, stronger anti-doping initiatives, and increased awareness of the long-term health risks, athletes may cultivate more negative attitudes toward doping. These discrepancies emphasize the need to consider regional and contextual factors when interpreting attitudes toward doping in sports.

The findings reveal that as athletes' age increases, their attitudes toward doping become less permissive, indicating a negative shift in their perspectives on doping as they grow older. For instance, athletes in the 36-45 age group displayed the least permissive attitudes toward doping, with a PEAS score of 26.67 ± 2.52. Furthermore, the statistically significant variation in attitudes toward doping across different age groups ($p < .05$) suggests that age plays a crucial role in shaping these attitudes. This finding aligns with previous studies indicating that older athletes tend to have more mature views on the risks and ethics associated with doping and thus show less permissive attitude toward doping (Kiani & Moghaddam, 2019). Additionally, Desalegn et al. (2020) found that as athletes age, there is a tendency to develop unfavourable attitudes toward doping.

Boit et al. (2015) also noted a more positive attitude among younger athletes in Kenya, suggesting that younger individuals may not fully grasp the associated risks and may be more susceptible to the pressures of competition.

The findings suggest that male athletes tend to have a slightly less permissive attitude toward doping compared to female athletes. This subtle difference in attitudes may be influenced by various social, cultural, or psychological factors that shape how male and female athletes perceive doping. However, the absence of a statistically significant difference ($p > .05$) indicates that this variation is not meaningful, implying that gender does not significantly influence attitudes toward doping among athletes in Tanzania. These results align with previous research indicating that gender may not be a major factor in shaping attitudes toward doping in certain sports (Gulu and Yapic, 2022; Königstein et al., 2021; Misculine et al., 2021; Muwonge et al., 2015). These studies suggest that male and female athletes often share similar views on doping, especially in sports focused on individual performance rather than gender-specific factors. In high-performance sports like athletics, the drive for success may overshadow gender differences, leading both male and female athletes to adopt comparable attitudes toward the risks and ethical implications of doping. On the other hand, some studies have identified significant differences in the attitudes of male and female athletes, suggesting that men may be more susceptible to doping choices than women due to their high participation rate and their priority to win (Girelli et al., 2020; Sas-Nowosielski & Budzisz, 2018; Shah et al., 2019).

The findings indicate a disparity in doping attitudes across different education levels where athletes with University level of education depicted less permissive attitude (37.83 ± 7.73) and athletes with Diploma level of education depicted more permissive attitude towards doping (44.00 ± 14.93). However, no significant differences were observed ($p > .05$). This outcome aligns with previous studies suggesting that education level might not be a strong predictor of doping attitudes among athletes. For example, Gulu and Yapic (2022) found that while education can influence knowledge about doping, it does not consistently lead to significantly varied attitudes or behaviour depending on educational status. Similarly, García-Grimau et al. (2021) reported that although higher education correlates with a better understanding of doping risks, it does not always result in a shift in attitudes, particularly when other factors, such as sports culture and external pressures, are involved. Thus, the absence of significant differences in this study implies that while education may enhance an athlete's awareness of doping, it does not necessarily lead to distinct changes in their attitudes toward it. However, studies like those by Perera et al. (2023) suggest that education level does significantly influence doping attitudes. Future research may be required to examine additional factors such as peer influence, sport-specific environments, or the type of competitive sport, which could play a more critical role in shaping these attitudes.

The findings also revealed that athletes with over 8 years of competitive running experience tend to have a less permissive attitude toward doping compared to those in other experience categories. However, no significant differences in attitudes toward doping were found among the three age groups ($p > .05$). These results align with previous studies indicating that experience in sports does not always correlate with distinctly different attitudes toward doping. For instance, Perera et al. (2023) noted that while longer participation in sports might enhance knowledge of doping, it does not consistently lead to significant attitude changes. In contrast, Gulu and Yapic (2022) observed that as elite athletes spend more time in their sport, their attitudes toward using banned substances for performance enhancement often become more favourable. Similarly, Miskulin et al. (2021) found that athletes with one to five years of participation tended to have more lenient attitudes towards performance-enhancing drugs. Thus, the current study emphasizes that the number of years of experience in competitive running may not significantly influence athletes' attitudes toward doping, suggesting that other factors could be more impactful in shaping these attitudes.

Strength and limitation of the study

The strength of the current study lies in its pioneering role in exploring anti-doping attitudes in Tanzania, providing valuable baseline data for future research and interventions in this area. As one of the first studies of its kind in the country, it helps to fill an important gap in understanding the attitudes of Tanzanian athletes regarding doping. However, the limitations include the cross-sectional research design, which only captures data at a single point in time, making it difficult to draw conclusions about cause-and-effect relationships or track changes over time. Additionally, the self-bias inherent in self-administered questionnaires may affect the reliability of the results, as athletes may be inclined to provide socially desirable responses or underreport their true attitudes or behaviours toward doping. This could lead to an overestimation of positive attitudes or concealment of actual doping practices, limiting the validity of the findings. Future studies with longitudinal designs and more objective methods of data collection could help address these limitations and provide deeper insights.

CONCLUSSION AND RECOMMENDATION

The findings of this study indicate that Tanzanian running athletes display relatively permissive attitudes toward doping. As athletes age, their attitudes toward doping become less permissive, with older athletes adopting a more negative stance on the issue. Gender may not be a major factor in shaping attitudes among Tanzanian athletes. Similarly, the study found that educational level did not significantly affect athletes' attitudes toward doping. Furthermore, the duration of competitive running experience did not play a significant role in shaping attitudes. However, athletes with over eight years of experience exhibited a notably less permissive attitude compared to those with fewer years of experience. This suggests that while experience is a factor, its influence may vary among different levels of competitive involvement.

To effectively reduce doping tendencies among Tanzanian athletes, it is crucial to enhance anti-doping education programs, increase awareness of the long-term health risks associated with performance-enhancing drugs, and ensure rigorous enforcement of anti-doping policies by Athletic Tanzania and the Ministry of Information, Culture, Arts and Sports of Tanzania. Future research should investigate additional factors, such as peer influence and the specific competitive environments in which athletes train and compete. This exploration will help provide a more comprehensive understanding of the complex elements that impact doping attitudes and ultimately inform more effective interventions and educational strategies.

AUTHOR CONTRIBUTIONS

Avelina Shao: conceptualization, project administration, data collection, data analysis, writing original manuscript draft, revision and editing, correspondence. Elijah Rintaugu: conceptualization, literature review, validation, methodology, data curation, revision and editing of the manuscript. Edna Thangu: methodology, literature review, interview schedules, revising and editing the manuscript.

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