SCIENTIFIC JOURNAL OF SPORT AND PERFORMANCE

ORIGINAL ARTICLE

Motivational climate and attitudes towards doping among Kenyan endurance runners

Kevin K. Kipchumba . *Department of Physical Education, Exercise and Sports Science. Kenyatta University. Nairobi, Kenya.*
Elijah G. Rintaugu. *Department of Sports and Recreation Management. Kenyatta University. Nairobi, Kenya.*
Francis M. Mwangi. *Department of Physical Education, Exercise and Sports Science. Kenyatta University. Nairobi, Kenya.*

ABSTRACT

Doping is a worldwide problem that harms athletes' health and undermines the spirit of sport. Studies have shown that male athletes are more prone to doping than female athletes. Athletes with mastery climate have been associated with anti-doping attitudes, while those with performance climate have pro-doping attitudes. However, it is unclear whether motivational climate is equally important to attitude towards doping for males and females. Data were collected from 323 runners in Elgeyo-Marakwet County, Kenya, using cross-sectional survey design. Runners self-reported their motivational climate using Perceived Motivational Climate in Sport Questionnaire and attitudes towards doping using Performance Enhancement Attitude Scale. Correlational analysis indicated significant inverse relationship between mastery climate and doping attitude (rho = -.242; $p < .001$) and significant positive correlation between performance climate and doping attitude, (rho = .362; $p < .001$). Hierarchical regression analysis revealed performance and mastery climate were significant predictors of attitudes towards doping ($F(3, 319) = 28.24$, $p = .001$), and gender did not moderate the relations between motivational climate and doping attitudes ($\beta = -.028$, $p = .621$). MANOVA results showed male athletes were significantly lower in performance climate scores ($p = .045$) and non-significantly low in mastery climate scores ($p = .075$) and doping attitude scores ($p = .595$) than females. In conclusion, performance climate was associated with doping attitudes in females- but not in males. Therefore, policy frameworks that buttresses the aspects of mastery climate as opposed to performance climate in females is likely to promote anti-doping attitudes.

Keywords: Physical activity psycology, Gender differences, Mastery climate, Performance climate, Performance-enhancing substances, Achievement motivation.

Cite this article as:
Kipchumba, K. K., Rintaugu, E. G., & Mwangi, F. M. (2022). Motivational climate and attitudes towards doping among Kenyan endurance runners. *Scientific Journal of Sport and Performance*, *1*(3), 179-191. https://doi.org/10.55860/PRNO5834

Corresponding author. *Department of Physical Education, Exercise and Sports Science. Kenyatta University. P.O. Box 43844-00100, Nairobi, Kenya.*
E-mail: Kevinkipchumba@gmail.com
Submitted for publication July 14, 2022.
Accepted for publication September 20, 2022.
Published September 22, 2022.
Scientific Journal of Sport and Performance. ISSN 2794-0586.

doi: https://doi.org/10.55860/PRNO5834

INTRODUCTION

Doping is a worldwide problem affecting both competitive athletes and non-competitive athletes (Donovan et al., 2002) and is a phenomenon that continues to evolve despite numerous negative consequences it poses to the health of the users, integrity and overall reputation of the sport (Barkoukis et al., 2013). Consequently, World Anti-Doping Agency (WADA) and National Anti-doping Agencies (NADO's) have developed and implemented various preventive and deterrence activities as part of efforts to fight this menace. Alongside these measures, studies have opined that identifying individual athletes and understanding situational factors that may positively or negatively influence athletes' doping intentions may assist in doping prevention (Lazuras et al., 2015; Petróczi et al., 2015). Similarly, Backhouse et al. (2012) opine that targeted anti-doping education on athletes about PES use and its associated risks will help mitigate harmful and disastrous consequences of doping and reduce its prevalence.

Research studies has shown that male athletes are more prone to doping than female athletes (Bloodworth et al., 2012; Devcic et al., 2018; Lata & Mondello, 2010; Peters et al., 2005; Petróczi, 2007; Sas-Nowosielski & Budzisz, 2018; Sas-Nowosielski & Swiatkowska, 2008; Soltanabadi et al., 2015). The motives for doping among male athletes is improvement in performance, the glamour associated with winning, and encouragement by coaches and peers (Peters et al., 2005; Petróczi,2007). On the other hand, female athletes have a reduced propensity to doping because they are more concerned about the harmful effects of doping, including emotions of humiliation and shame when caught doping compared to male athletes (Zaletel et al., 2015). However, there is scarcity of studies that have examined the contributions of gender and psychological constructs in predicting doping attitudes among Kenyan endurance runners.

Theoretical framework and previous studies

Achievement Goal Theory (AGT) (Nicholls, 1989) has been found to be useful in understanding certain psychological attributes associated with attitudes towards doping in sports (Allen et al., 2015; Donovan et al., 2002; Mwangi et al., 2019). The theory postulates that how individuals assess success and competence in achievement tasks (goal orientation) and how their social context is shaped (motivational climates) have an impact on motivated behaviour.

Motivational climate refers to salient goals and prominent values in the achievement context like sports (Ames, 1992). Motivational climate is categorized into mastery (or task) and performance (or ego) climate. Mastery climate is where success and competence are assessed through self-referenced perceptions, cooperative learning, equal treatment of each athlete by the coaches, and coaches fostering hard work and personal improvement of athletes, while performance climate is where competence and success are defined in reference to others, such as athletes outperforming others and winning, coaches favouring some athletes more than others, as well as intra-team rivalry, and punishing athletes when they make mistakes (Allen et al., 2015; Newton et al., 2000).

Motivational climate in sports consists of the external achievement expectations of Athlete Support Personnel (ASP), as perceived by athletes (Petróczi & Aidman, 2008). Therefore, athletes' interactions with ASP will influence how they perceive teamwork, competition, ability, effort, and outcomes in sport participation. Among the ASP, coaches have been reported to be the most influential in athletes' sport participation compared with other ASP (Bartholomew et al., 2010; Karjane & Hein, 2015; Stenling, 2016). For instance, coaches perform important leadership roles in motivating athletes achieve excellence by building competence, confidence, connection, and character using different types of knowledge, skills, and training (Stenling, 2016). In addition,

coaches have been cited as critical influencers towards athletes' attitudes, intentions, and behaviours towards PES use in sports (Huybers & Mazanov, 2012).

Studies in Motivational climate have linked mastery climate with sportpersonship behaviours in sports, including respect for team officials, game rules, teammates, and opponents, while performance climate has been linked to unsportspersonlike behaviours such as taking shortcuts, cheating, injuring or disadvantaging other athletes (Kavussanu, 2007; Ntoumanis & Biddle, 1999; Sage & Kavussanu, 2008; Stanger et al., 2018; Selfriz et al., 1992). In this regard, McArdle and Duda (2002) found athletes with high-performance climate to be more prone to cheating in sports to increase their chances of winning than those with mastery climate. Similar studies in doping in sports have associated mastery climate to negative attitudes towards doping, whereas performance climate has been associated with positive attitudes towards doping (Moran, Guerin, Kirby, et al., 2008; Sage & Kavussanu, 2008). Therefore, fostering of coach motivational climate that buttresses the aspects of mastery climate as opposed to performance climate may aid in anti-doping efforts as mastery climate is protective to doping in sports (Allen et al., 2015; Sas-Nowosielski & Swiatkowska, 2008).

Attitudes towards doping have been used widely in determining doping prevalence in sports. For example, it is believed that athletes who have permissive attitudes towards PES use are more likely to engage in doping and PES use than athletes who have negative attitudes towards doping and PES use (Petróczi & Aidman, 2008; Petróczi et al., 2015). Studies have argued that prediction of athletes' attitudes in sports has been shown to predict the actual situation (Boit et al., 2012; Jalleh et al., 2014; Ntoumanis et al., 2014; Petróczi & Aidman, 2009). In a related study, Allen et al. (2015) submit that investigating athletes doping attitudes is critical in understanding the factors that influence the attitudes and thereby help in the formulation of policies at the individual and situational factors.

Studies have shown that knowledge on doping among athletes helps prevent the development of pro-doping attitudes but helps in the formation of anti-doping attitudes (Backhouse et al., 2007; Blank et al., 2014). Similarly, Fung and Yuan (2006) submit that coaches must prove their knowledge and ethically correct attitudes towards doping for coaches to function as role models. In addition, coaches must be more informed on the importance of creating an optimal motivational climate free from doping (Moran et al., 2008). This is also supported in (Allen et al., 2015; Bae et al., 2017), where coach-created motivational climate was found to have implications on athletes' task or ego goal orientation, and this orientation is in turn closely linked to pro-doping and anti-doping in sports.

Kenya is known globally as the powerhouse in distance running. Over the years, researchers have attempted to elucidate various factors that contribute to Kenya's extraordinary performances in distance running, including but not limited to associations between genetic predisposition (Scott & Pitsiladis, 2007); physiological and socio-cultural factors (Wilber & Pitsiladis, 2012); ethnicity (Tucker et al., 2015) and somatotypical characteristics (Eksterowicz et al., 2016). However, these extraordinary performances by Kenyan runners stand threatened with reports in the recent past revealing that Kenyan runners have been placed on the WADA compliance watch list after more than 40 athletes tested positive for PES use between the year 2011 and 2016 (Henning & Dimeo, 2018). Similar reports indicate that Kenyan endurance runners have produced more Adverse analytical findings (AAFs) on doping compared to all sports tested in Kenya between the year 2004 and 2018 (WADA, 2018). Indeed it was found that majority of Kenyan endurance runners had inadequate training in doping, with athletes support personnel (ASP) abetting and encouraging doping in Kenya (WADA, 2018). In a related study, Wambui and Waiya (2018) attributed doping by Kenyan

endurance runners to drug abuse legislation, peer pressure, and money in athletics, including endorsements, sponsorships, and championship payments.

A review of previous studies found that performance climate positively predicts doping intentions and is associated with positive attitudes toward doping among athletes, whereas mastery climate negatively predicts doping intentions and is negatively associated with attitudes toward doping (Allen et al., 2015; Backhouse & McKenna, 2012; Bae et al., 2017; Mwangi et al., 2019; Sage & Kavussanu, 2008). Related studies on doping amongst Kenyan endurance runners have centered on the knowledge, attitudes, and practices of doping (Boit *et al*., 2012; Chebet,2014). However, none of the previous studies examined the effect of motivational climate on attitudes toward doping among Kenyan endurance runners. A study of this kind was considered necessary in order to improve our understanding of the relationships between motivational climate and attitudes toward doping. Gender differences may have a significant role in moderating the relationships between motivational climate and doping attitudes among Kenyan endurance runners, a population where little is known. The purpose of this study was to examine the moderating effect of gender in the relationship between motivational climate and attitudes towards doping among Kenyan endurance runners. The findings of this study provides new explanations in understanding the moderating effect of gender in the relationship between motivational climate and doping attitudes and thereby inform policy and actions.

METHODOLOGY

Study design, location and participants

A cross-sectional survey design was used in this study. Data was collected from Kenyan runners who were purposefully sampled from Elgeyo-Marakwet County (EMC), Kenya. The selection criteria focused on Kenyan endurance runners who had been training in EMC training camps for more than 6 months, were 14 years old or older, and had never failed doping control tests. Similarly, the target population included Kenyan endurance runners competing in races ranging from 800 meters to 10,000 meters, including track races, road races, cross-country races, and marathons in Elgeyo-Marakwet County, Kenya. Elgeyo-Marakwet County was purposefully chosen from among 47 counties in Kenya because it has a high concentration of endurance runners ranging from amateur to elite, hence priding herself as the "*home of champions*". In addition, Elgeyo-Marakwet County (EMC) has been cited as a golden region in terms of her contribution to World Athletics and, more specifically, Kenya's athletics success (Njehia, 2021).

A total sample of 323 endurance runners took part in the study, with 215 (66.6%) males and 108 (33.3%) females. The ages of the participants ranged between 14 and 45 years (M = 22.85; SD = 5.75) and runners' length of experience ranged between 8 months and 22 years (M = 5.68; SD = 4.43).

Data on study participants' demographics were stratified into categories for the purpose of statistical analysis. All participants were classified in two groups according to age: junior runners (aged 14 to 20 years) and senior runners (aged 20 years and above). Further participants were stratified in two groups according to gender: male runners (junior and senior male runners) and female runners (junior and senior female runners). The length of athletics running experience was also categorized in three categories as follows: short length running experience (one to seven years), medium-length running experience (8 to 14 years) and long length running experience (15 or more years).

Instrumentation

A self-report questionnaire with three sections was used for data collection. Section "*A*" contained items on athletes' demographic information such as age, gender and runner's length of athletic experience. Items in Section "*B*" on athletes' perceptions of coach motivational climate were assessed using an adapted version of the Perceived Motivational Climate in Sport Questionnaire (PMCSQ-2) (Newton et al., 2000). The scale consisted 33 items weighted on a 5-point Likert type scale ranging from (1) strongly disagree to (5) strongly agree that measured the various dimensions of mastery climate and performance climate. Items in Section "*C*" focused on athletes attitudes towards doping in sport. These were assessed using 17 items modified version of Performance Enhancement Attitude Scale (PEAS) (Petróczi & Aidman, 2009). The athletes responded to the 17 items weighted on a Likert type scale ranging from (1) strongly disagree to (5) strongly agree.

Reliability tests were done for the study instruments prior to data collection using the internal consistency technique. Acceptable internal reliability was established in advance for each measure used at .70 (Nunnally, 1978). Cronbach's Alpha reliability indices demonstrated acceptable reliability: PMCSQ-2 reported (.82) mastery climate and (.76) performance climate and PEAS scale reported (.89).

Ethical considerations

The study received ethical approval from Kenyatta University Ethical Review Board with reference approval number PKU/1074/11124. Before the start of data collection, participants were provided with informed consent that highlighted the nature of the study, the voluntary nature of their participation, the confidentiality of their responses, and their right to pull out of the study at any time without penalty. They were also encouraged to be honest in their responses and instructed not to write their actual names in the questionnaire. Informed consent was obtained from participants (except junior athletes aged between 14 and 18 years) who agreed to participate in the study and then given the questionnaire. For junior athletes (those between the ages of 14 years and 18 years), consent forms from both the coach and the athlete were obtained before the completion of the questionnaires.

Data analysis

Descriptive statistics (i.e., mean and standard deviation) were calculated to give summary values and bivariate correlations using Spearman's rho Correlation were calculated to examine the relationship between motivational climate and doping attitudes. Moderated Hierarchical regression analysis was used to determine whether the participant's gender moderated the relationship between Motivational climate (mastery and performance) and attitudes towards doping. Before conducting the analysis, assumptions for Moderated Hierarchical regression analysis that included normality, linearity, multi-collinearity and homogeneity of variance were executed on the questionnaires to determine if the sample distribution of the data met the assumptions (Tabachnick et al., 2007). The attitudes towards doping mean total score was entered as the dependent variable in the regression model. In step one, mastery climate and performance climate were entered as independent variables. In step two, three-way interactions terms (gender multiplied by mastery climate multiplied by performance climate) were entered. This procedure was consistent with the recommendations of Aiken et al. (1991). The scores of the independent variables were converted into z-scores to reduce the correlation between these predictors and their interaction term.

To determine gender differences in the levels of motivational climate and doping attitudes, one-way multivariate analyses of variance (MANOVA) was used. However, initial evaluation of the data showed that it violated normality by reporting Shapiro-Wilk test results of ($p < .001$, df = 323). Consequently, Pillai's trace was used in interpreting MANOVA results as recommended by (Field, 2018).

RESULTS

Table 1. Descriptive Statistics and Correlations for all study variables (N = 323).

Variable		Mastery Climate	Performance Climate	Doping Attitudes
Mastery Climate	*(rho)*	1	-.076	-.242**
	Sig. (2-tailed)		.171	.000
Performance Climate	*(rho)*	-.076	1	.362**
	Sig. (2-tailed)	.171		.000
Mean		4.17	2.88	2.32
Standard Deviation		.62	.62	.70

*Note. **. Correlation is significant at the .01 level (2-tailed).*

Descriptive statistics (i.e., mean, standard deviation and Spearman's rho Correlations) were calculated for all variables as shown in Table 1. Results indicate that the runners returned a mean and standard deviation of (4.17 ± .62) in mastery climate, performance climate (2.88 ± .62) and (2.32 ± .70) in attitudes towards doping. Spearman's rho Correlational analysis results indicated that performance climate is significantly and positively correlated to doping attitudes (*rho* = .362; $p < .001$), whereas mastery climate is significantly and negatively correlated with doping attitudes (*rho* = -.242; $p < .001$). However, the interaction between gender and motivational climate variables is uncorrelated (*rho* =.001; $p = .982$).

Table 2. Hierarchical Regression Analyses Predicting Attitudes towards doping (N = 323).

Regression	Variable	Beta	Df	Sig.	F	R	R^2	ΔR^2	sr^2	Sig. *for* ΔF
Step 1										
	Mastery Climate	-.20	(3,319)	.000	28.24		.21	.21	4.04	.000
	Performance Climate	.42	(3,319)	.000	28.24		.21	.21	18.00	.000
Step 2										
	Interaction	-.03	(4,318)	.621	.245	.46	.001	.001	.001	.621
	Mastery Climate	-.19	(4,318)	.001	21.20	.46	.001	.001	.03	.000
	Performance Climate	.42	(4,318)	.000	21.20	.46	.001	.001	.17	.000

*Note. *. Significant at the .05 level.*

Moderated hierarchical multiple regression analyses were used to test whether gender moderated the relationship between motivational climate and doping attitudes, as presented in Table 2. Results indicated that in Step 1 of the regression model, results were significant, $F (3, 319) = 28.24$, $p < .001$, revealing that motivational climate (mastery and performance) were significant predictors of attitudes towards doping. Motivational climate variables accounted for 21% of the variance in athletes' attitudes to doping. Examination of the individual beta weights indicated that mastery climate ($\beta = -.202$, $p < .001$) was a significant but negative predictor of attitudes towards doping, whereas performance climate ($\beta = .419$, $p < .001$) was a significant and positive predictor of attitudes towards doping.

Semi-partial correlations revealed that performance climate alone uniquely accounted for 17% of the variance explained in attitude towards doping. On the other hand, mastery climate negatively predicted doping attitudes and independent of the effects of performance climate accounted for 3% of the variance explained in attitudes towards doping.

In the second step of the model, when gender was the moderator, the interaction did not predict doping attitudes over and above what motivational climate variables were able to predict in step 1 with a very weak and small change in variance (R^2) and non-significant F change (β = -.028, p < .621). This finding showed that gender did not moderate the relations between motivational climate and doping attitudes (β = -.028, p < .621). This finding implies that the interaction of gender and motivational climate variables did not predict doping attitudes. However, the greatest predictor of doping attitudes in the second step remained performance climate (β = .424, p < .001) and the predictions made by mastery climate remained negative to doping attitudes (β = -.190, p < .001) and still stronger than the interaction (β = -.028, p < .621).

Table 3. Differences between Male and Female athletes on attitudes towards doping and perceived motivational climate (N = 323).

	Male	**Female**				
	M	*M*	*F*	*Df*	*Sig.*	η^2
Mastery Climate	4.13 ± .67	4.26 ± .54	3.184	(1,321)	.075	0.010
Performance Climate	2.83 ± .62	2.98 ± .62	4.033	(1,321)	.045	0.012
Doping Attitudes	2.30 ± .69	2.35 ± .73	.284	(1,321)	.595	0.001

*Note. *. Significant at the .05 level.*

One-way Multivariate analyses of variance (MANOVA) was used to determine gender differences in the levels of motivational climate and doping attitudes and the results are presented in Table 3. MANOVA results was not significant (Pillai's trace = .021, F = 2.325 (3,319), p < .075), η^2 = .021), indicating that there were no significant differences between males and females in the relationship between motivational climate and doping attitudes. Pillai's trace effect size (η^2 = .021) indicates that 2.1% of the variance in the dependent variables can be explained by gender.

Male athletes were significantly lower in performance climate scores compared with female athletes. Although male athletes had low scores in mastery motivational climate and attitude towards doping compared with female athletes, the same was not statistically significant. The effect sizes were small and weak for all the study variables; mastery climate (η^2 = .01), performance climate (η^2 = .01) and doping attitude (η^2 = .001). The effect size indicates that mastery climate, performance climate and doping attitudes are explained by little percentages, with mastery climate explaining 1%, performance climate 1.2% and doping attitudes 0.1% of the variance in the dependent variable (gender).

DISCUSSION

The purpose of this study was to examine the moderating effect of gender in the relationship between motivational climate and attitudes towards doping among Kenyan athletes. Studies have provided associations between motivational climate and doping attitudes (Allen et al., 2015; Bae et al., 2017; Hodge et al., 2013; Kavussanu, 2016; Moran et al., 2008; Stanger et al., 2018) and that gender also seems to play a key role (Mwangi et al., 2019; Peters Jr et al., 2005; Petróczi,2007; Zaletel et al., 2015). However, researchers have not examined the contribution of gender differences in explaining this relationship amongst Kenyan athletes. Therefore, it was critical to investigate the moderating role of gender in the relationships between motivational climate and attitudes towards doping to ensure that policy and anti-doping measures are gender-specific.

The results indicated that performance climate and mastery climate were associated with attitudes towards doping, with mastery climate showing a significant inverse relationship between mastery climate and doping

attitude, suggesting that mastery climate was associated with attitudes towards anti-doping. On the other hand, performance climate and doping attitude indicated a significant positive relationship implying that performance climate was associated with attitudes towards pro-doping. Thus, the findings of the present study are in agreement with previous studies that have associated coach-created performance climate to positive attitudes towards doping and PES use in sports, while coach-created mastery climate is linked to negative attitudes towards doping in sports (Allen et al., 2015; Bae et al., 2017; Hodge et al., 2013; Kavussanu, 2016; Moran et al., 2008; Stanger et al., 2018). Further, the study showed performance climate and mastery climate were predictors of attitudes towards doping: mastery climate was a significant negative predictor of attitudes towards doping, whereas performance climate was a significant and positive predictor of attitudes towards doping.The findings of the current study corroborate previous studies in motivational climate where performance climate had been shown to positively predict doping intentions among the athletes, whereas mastery climate has been shown to negatively predict doping intentions (Sage & Kavussanu, 2008; Backhouse & McKenna, 2012; Allen *et al*., 2015; Bae *et al*., 2017; Mwangi et al., 2019). This finding could be explained in part by increased salient values between coaches and athletes in Kenyan training camps, as well as existing anti-doping deterrent and preventative initiatives conducted by ADAK, such as coach education and testing.

However, the results are in contrast to several previous studies in that gender was not significantly related to attitudes towards doping indicating that being either male or female did not significantly relate to one's attitudes towards doping (Petróczi,2007; Sas-Nowosielski & Swiatkowska,2008; Lata & Mondello,2010; Bloodworth et al., 2012; Soltanabadi, Tojari, & Esmaeili,2015; Devcic et al., 2018; Sas-Nowosielski & Budzisz,2018). The results further showed that gender did not moderate the relationship between motivational climate and doping attitudes, indicating that gender did not significantly influence the relationship between motivational climate and doping attitudes. This finding implied that the interaction of gender and motivational climate variables did not predict doping attitudes. Moreover, the results indicated no significant gender differences in doping attitude and mastery climate. These findings were surprising given the fact that previous studies has shown that male athletes were more likely to be prone to doping than female athletes (Bloodworth et al., 2012; Devcic et al., 2018; Lata & Mondello,2010; Petróczi,2007; Sas-Nowosielski & Budzisz,2018; Sas-Nowosielski & Swiatkowska,2008; Soltanabadi et al., 2015; Zaletel et al., 2015). This finding could be attributed to the fact that both male and female endurance runners in Kenya train in the same coaching environment, attend anti-doping seminars together and most of the time attend athletic competitions together.

Generally, Kenyan endurance runners in this study reported low attitudes towards doping, suggesting a low propensity to engage in doping among the Kenyan endurance runners. The general low scores on attitudes towards doping among the runners are consistent with previous studies (Allen et al., 2015; Morente-Sánchez et al., 2013; Mwangi et al., 2019; Petroczi & Aidman, 2009). In terms of gender, male endurance runners reported insignificant lower attitudes towards doping than female athletes, indicating that female athletes are more susceptible to doping and PES than their male counterparts. On the other hand, endurance runners in this study reported experiencing a high mastery climate in comparison to performance climate, indicating that coach created environment as perceived by endurance runners is the one typified by teamwork through cooperative learning, hard work, effort and personal development, and the runners feeling valued by having an important role in the team during practice and competitions. This finding demonstrates positive outcomes associated with mastery climate, which is supported in previous studies (Gencer & Öztürk, 2018; Mwangi et al., 2019; Selfriz et al., 1992). Therefore, a high mastery climate may protect Kenyan endurance runners from doping and PES use (Allen et al., 2015). In addition, female athletes portrayed stronger mastery and performance climate scores than male athletes, suggesting that female athletes assess their success and

competencies in sports with reference to personal improvement, effort, teamwork, learning, winning and comparative performances.

The significant differences in performance climate between males and females indicate that female endurance runners in Kenya could easily be predisposed to doping compared to their male counterparts. The significance of low performance motivational climate scores in males compared with females indicate that male endurance runners in Kenya are at a lower "*risk*" of doping or using PES than female athletes. This could be attributed to the fact that most female athletes in Kenya are faced with two-fold challenges of being caregivers in their families and attending demanding athletic training and competitions. Like their male counterparts, females also face numerous psychosocial difficulties exacerbated by insufficient social acceptance, excessive reliance on close relatives, isolation, and a lack of mentorship and peer support. These challenges affect female athletes negatively in their athletic participation and performances.

Similarly, these challenges might provide challenging situations to some coaches leading to them condoning cheating and other unorthodox means in an effort to achieve success. This is buttressed in research examining doping in sport, where athletes' perceptions of coach performance motivational climate have been positively associated with attitudes towards doping (Allen et al., 2015; Mwangi et al., 2019). On average, athletes in this study reported experiencing less performance climate, which is a predictor of negative attitudes towards doping as indicated by Allen et al. (2015); thus, Kenyan endurance runners had more favourable attitudes towards anti-doping.

Strengths and limitations of the study

The current study has demonstrated significant relationships between motivational climate and attitudes towards doping among Kenyan endurance runners - a population where little is known about these relationships. In addition, gender differences that may moderate this relationship have also been elucidated. However, the study acknowledged certain limitations that should be considered in interpreting the findings of this study. For instance, the study is correlational, therefore, limiting the ability to tell if prior experience with PES and doping influenced present doping attitudes. Additionally, all data were gathered using minimal demographic information and a self-report questionnaire. As a result, we could not account for other confounding factors that could have contributed to doping attitudes.

CONCLUSIONS

Athletes in this study had a high mastery climate, which is associated with strong anti-doping attitudes, indicating that athletes in Kenya adhere to the tenets of sportspersonship. On the other hand, performance climate was the best predictor of doping attitudes amongst Kenyan athletes. In terms of gender differences, female athletes had a high performance climate than male athletes, which may mean that female athletes are at greater risk of PES use and doping than their male counterparts. The findings of the present study have implications in the way coaches nurture and interact with their athletes and the associated consequences of such actions. Therefore, creation of coaching climate that buttresses the aspects of mastery climate as opposed to performance climate in females is likely to promote anti-doping. Follow up studies are encouraged on the need to explore how the various psychological variables relate with actual doping behaviour. Similarly, a longitudinal study would be necessary to ascertain how attitudes evolve over time and experience.

AUTHOR CONTRIBUTIONS

All authors contributed to the study's conception, discussion and editing the manuscript. Data preparation, data collection and analysis were performed by Kevin Kiprotich Kipchumba.

SUPPORTING AGENCIES

No funding agencies were reported by the authors.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

ACKNOWLEDGEMENTS

We express our gratitude to the Kenyan endurance runners who took part in the study, their coaches and team management who assisted in facilitating access to the athletes. Additionally, we appreciate the contribution of research assistants to the data collection process.

REFERENCES

Aiken, L. S., & West, S. G. (1991). Multiple regression: Testing and interpreting interactions. Newbury Park, CA: Sage.

Allen, J., Taylor, J., Dimeo, P., Dixon, S., & Robinson, L. (2015). Predicting elite Scottish athletes' attitudes towards doping: Examining the contribution of achievement goals and motivational climate. Journal of Sports Sciences, 33(9), 899-906. https://doi.org/10.1080/02640414.2014.976588

Ames, C. (1992). Achievement goals and the classroom motivational climate. Student Perceptions in the Classroom, 1, 327-348.

Backhouse, D. S., Kenna, P. J., Robinson, P. S., & Atkin, M. A. (2007). Attitudes, Behaviours, Knowledge and Education - Drugs in Sport : Past, Present and Future. Carnegie Research Institute Leeds Metropolitan. Report Prepared for World Anti-Doping Agency, 199.

Backhouse, S. H., & McKenna, J. (2012). Reviewing Coaches' Knowledge, Attitudes and Beliefs regarding Doping in Sport. International Journal of Sports Science & Coaching, 7(1), 167-175. https://doi.org/10.1260/1747-9541.7.1.167

Backhouse, S. H., Patterson, L., & McKenna, J. (2012). Achieving the Olympic ideal: Preventing doping in sport. Performance Enhancement & Health, 1(2), 83-85. https://doi.org/10.1016/j.peh.2012.08.001

Bae, M., Yoon, J., Kang, H., & Kim, T. (2017). Influences of perfectionism and motivational climate on attitudes towards doping among Korean national athletes: A cross sectional study. Substance Abuse: Treatment, Prevention, and Policy, 12(1), 1-8. https://doi.org/10.1186/s13011-017-0138-x

Barkoukis, V., Lazuras, L., Tsorbatzoudis, H., & Rodafinos, A. (2013). Motivational and social cognitive predictors of doping intentions in elite sports: An integrated approach. Scandinavian Journal of Medicine & Science in Sports, 23(5), e330-e340. https://doi.org/10.1111/sms.12068

Bartholomew, K. J., Ntoumanis, N., & Thøgersen-Ntoumani, C. (2010). The Controlling Interpersonal Style in a Coaching Context: Development and Initial Validation of a Psychometric Scale. Journal of Sport and Exercise Psychology, 32(2), 193-216. https://doi.org/10.1123/jsep.32.2.193

Blank, C., Leichtfried, V., Fürhapter, C., Müller, D., & Schobersberger, W. (2014). Doping in Sports: West-Austrian Sport Teachers' and Coaches' Knowledge, Attitude and Behavior. Deutsche Zeitschrift Für Sportmedizin, 65(10). https://doi.org/10.5960/dzsm.2014.133

Bloodworth, A. J., Petróczi, A., Bailey, R., Pearce, G., & McNamee, M. J. (2012). Doping and supplementation: The attitudes of talented young athletes. Scandinavian Journal of Medicine and Science in Sports, 22(2), 293-301. https://doi.org/10.1111/j.1600-0838.2010.01239.x

Boit, M., Dimeo, P., Onywera, V., Theuri, G., Kiplamai, F., Sigei, S., Stewart, D., & Cronin, L. (2012). Doping Education Status in Kenya: Evaluation of Knowledge, Attitudes and Practice of Doping Among Elite Kenyan Athletes. University of Stirling, 1-92. Report compiled for the World Anti-Doping Agency.

Chebet, S. (2014). Evaluation of Knowledge, Attitudes, and Practices of Doping among Elite Middle and Long Distance Runners in Kenya [Unpublished Ph.D. Thesis]. Kenyatta University.

Devcic, S., Bednarik, J., Maric, D., Versic, S., Sekulic, D., Kutlesa, Z., Bianco, A., Rodek, J., & Liposek, S. (2018). Identification of Factors Associated with Potential Doping Behavior in Sports: A Cross-Sectional Analysis in High-Level Competitive Swimmers. International Journal of Environmental Research and Public Health, 15(8), 1720. https://doi.org/10.3390/ijerph15081720

Donovan, R. J., Egger, G., Kapernick, V., & Mendoza, J. (2002). A conceptual framework for achieving performance enhancing drug compliance in sport. Sports Medicine, 32(4), 269-284. https://doi.org/10.2165/00007256-200232040-00005

Eksterowicz, J., Napierała, M., & Zukow, W. (2016). How the Kenyan Runner's Body Structure Affects Sports Results. Human Movement, 17(1), 8-14. https://doi.org/10.1515/humo-2016-0002

Field, A. (2018). Discovering Statistics Using IBM SPSS Statistics 5th ed. sage. SAGE Publications: London, UK.

Fung, L., & Yuan, Y. (2006). Performance enhancement drugs: Knowledge, attitude, and intended behavior among community coaches in Hong Kong. The Sport Journal, 9(3).

Gencer, E., & Öztürk, A. (2018). Goal Orientation and Motivational Climate in University Student-Athletes. Asian Journal of Education and Training, 4(4), 290-294. https://doi.org/10.20448/journal.522.2018.44.290.294

Henning, A. D., & Dimeo, P. (2018). The new front in the war on doping: Amateur athletes. International Journal of Drug Policy, 51, 128-136. https://doi.org/10.1016/j.drugpo.2017.05.036

Hodge, K., Hargreaves, E. A., Gerrard, D., & Lonsdale, C. (2013). Psychological mechanisms underlying doping attitudes in sport: Motivation and moral disengagement. Journal of Sport and Exercise Psychology, 35(4), 419-432. https://doi.org/10.1123/jsep.35.4.419

Huybers, T., & Mazanov, J. (2012). What Would Kim Do: A Choice Study of Projected Athlete Doping Considerations. Journal of Sport Management, 26(4), 322-334. https://doi.org/10.1123/jsm.26.4.322

Jalleh, G., Donovan, R. J., & Jobling, I. (2014). Predicting attitude towards performance enhancing substance use: A comprehensive test of the Sport Drug Control Model with elite Australian athletes. Journal of Science and Medicine in Sport, 17(6), 574-579. https://doi.org/10.1016/j.jsams.2013.10.249

Karjane, K., & Hein, V. (2015). Controlling coache's behaviour, psychological need thwarting, motivation and results of the colleyball competitions. Acta Kinesiologiae Universitatis Tartuensis, 21, 51-60. https://doi.org/10.12697/akut.2015.21.05

Kavussanu, M. (2007). Morality in sport. Social Psychology in Sport, 265-277. https://doi.org/10.5040/9781492595878.ch-019

Kavussanu, M. (2016). Doping in soccer: A moral psychology perspective. Science and Football VIII (pp. 220-229). New York, NY: Routledge. https://doi.org/10.4324/9781315670300-24

Lata, J., & Mondello, M. (2010). An analysis of goal achievement orientation and sport morality levels of Division IA nonrevenue collegiate athletes. Journal for the Study of Sports and Athletes in Education, 4(1), 69-94. https://doi.org/10.1179/ssa.2010.4.1.69

Lazuras, L., Barkoukis, V., & Tsorbatzoudis, H. (2015). Toward an integrative model of doping use: An empirical study with adolescent athletes. Journal of Sport and Exercise Psychology, 37(1), 37-50. https://doi.org/10.1123/jsep.2013-0232

McArdle, S., & Duda, J. K. (2002). Implications of the motivational climate in youth sports. Children and Youth in Sport: A Biopsychosocial Perspective, 2, 409-434.

Moran, A., Guerin, S., Kirby, K., & MacIntyre, T. (2008). The development and validation of a doping attitudes and behaviour scale. Report Submitted to the World Anti-Doping Agency & The Irish Sports Council.

Morente-Sánchez, J., & Zabala, M. (2013). Doping in sport: A review of elite athletes' attitudes, beliefs, and knowledge. Sports Medicine, 43(6), 395-411. https://doi.org/10.1007/s40279-013-0037-x

Mwangi, F. M., Rintaugu, E. G., & Toriola, O. (2019). Influence of achievement goals and motivational climate on attitudes toward doping among East African university athletes. African Journal for Physical Activity and Health Sciences, 25(4), 547-562.

Newton, M., Duda, J. L., & Yin, Z. (2000). Examination of the psychometric properties of the Perceived Motivational Climate in Sport Questionnaire-2 in a sample of female athletes. Journal of Sports Sciences, 18(4), 275-290. https://doi.org/10.1080/026404100365018

Nicholls, J. G. (1989). The competitive ethos and democratic education. Cambridge: Harvard University Press.

Njehia, J. (2021, August 16). Athletics-Kenya's golden region seeks new champions after steeplechase setback. Reuters. Retrieved from: https://www.reuters.com/article/olympics-2020-kenya-golden-village-idAFL8N2PK1EQ

Ntoumanis, N., & Biddle, S. J. (1999). A review of motivational climate in physical activity. Journal of Sports Sciences, 17(8), 643-665. https://doi.org/10.1080/026404199365678

Ntoumanis, N., Ng, J. Y. Y., Barkoukis, V., & Backhouse, S. (2014). Personal and Psychosocial Predictors of Doping Use in Physical Activity Settings: A Meta-Analysis. Sports Medicine, 44(11), 1603-1624. https://doi.org/10.1007/s40279-014-0240-4

Nunnally, J. (1978). Psychometric theory (2nd ed.). New York, NY: McGraw-Hill.

Peters, R. J., Adams, L. F., Barnes, J. B., Hines, L. A., Jones, D. E., Krebs, K. M. A., & Kelder, S. H. (2005). Beliefs and social norms about ephedra onset and perceived addiction among college male and female athletes. Substance Use and Misuse, 40(1), 125-135. https://doi.org/10.1081/JA-200030517

Petróczi, A. (2007). Attitudes and doping: A structural equation analysis of the relationship between athletes' attitudes, sport orientation and doping behaviour. Substance Abuse Treatment, Prevention, and Policy, 2(1), 1-15. https://doi.org/10.1186/1747-597X-2-34

Petróczi, A., & Aidman, E. (2008). Psychological drivers in doping: The life-cycle model of performance enhancement. Substance Abuse Treatment, Prevention, and Policy, 3(1), 7. https://doi.org/10.1186/1747-597X-3-7

Petróczi, A., & Aidman, E. (2009). Measuring explicit attitude toward doping: Review of the psychometric properties of the Performance Enhancement Attitude Scale. Psychology of Sport and Exercise, 10(3), 390-396. https://doi.org/10.1016/j.psychsport.2008.11.001

Petróczi, A., Backhouse, S. H., Barkoukis, V., Brand, R., Elbe, A.-M., Lazuras, L., & Lucidi, F. (2015). A call for policy guidance on psychometric testing in doping control in sport. International Journal of Drug Policy, 26(11), 1130-1139. https://doi.org/10.1016/j.drugpo.2015.04.022

Sage, L. D., & Kavussanu, M. (2008). Goal orientations, motivational climate, and prosocial and antisocial behaviour in youth football: Exploring their temporal stability and reciprocal relationships. Journal of Sports Sciences, 26(7), 717-732. https://doi.org/10.1080/02640410701769716

Sas-Nowosielski, K., & Budzisz, A. (2018). Attitudes Toward Doping among Polish Athletes Measured with the Polish Version of Petroczi's Performance Enhancement Attitude Scale. Polish Journal of Sport and Tourism, 25(2), 10-13. https://doi.org/10.2478/pjst-2018-0008

Sas-Nowosielski, K., & Swiatkowska, L. (2008). Goal Orientations and Attitudes Toward Doping. International Journal of Sports Medicine, 29(7), 607-612. https://doi.org/10.1055/s-2007-965817

Scott, R. A., & Pitsiladis, Y. P. (2007). Genotypes and Distance Running. Sports Medicine, 37(4), 424-427. https://doi.org/10.2165/00007256-200737040-00039

Selfriz, J. J., Duda, J. L., & Chi, L. (1992). The relationship of perceived motivational climate to intrinsic motivation and beliefs about success in basketball. Journal of Sport and Exercise Psychology, 14(4), 375-391. https://doi.org/10.1123/jsep.14.4.375

Soltanabadi, S., Tojari, F., & Esmaeili, M. R. (2015). Variance analysis of sport motivation, doping attitude and behavior among pro athletes of team sports. Journal of Applied Environmental and Biological Sciences, 5(3), 254-258.

Stanger, N., Backhouse, S. H., Jennings, A., & Mckenna, J. (2018). Linking Motivational Climate With Moral Behavior in Youth Sport: The Role of Social Support, Perspective Taking, and Moral Disengagement. Sport, Exercise, and Performance Psychology, 7(4), 392-407. https://doi.org/10.1037/spy0000122

Stenling, Andreas. (2016). Sports coaches' interpersonal motivating styles: Longitudinal associations, change, and multidimensionality [PhD Thesis]. Umea universitet.

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). Using multivariate statistics (Vol. 5). Pearson Boston, MA.

Tucker, R., Onywera, V. O., & Santos-Concejero, J. (2015). Analysis of the Kenyan distance-running phenomenon. International Journal of Sports Physiology and Performance, 10(3), 285-291. https://doi.org/10.1123/ijspp.2014-0247

WADA. (2018). Doping in Kenya (Intelligence and Investigations Department, p. 12) [Stakeholder Project Report]. Retrieved from: https://www.wada-ama.org/sites/default/files/final_public_report_on_kenya.pdf

Wambui, L., & Waiya, M. (2018). Selected Factors on the Rising Cases of Doping Among Kenya Athletes. Scholars Journal of Arts, Humanities and Social Sciences, 5374.

Wilber, R. L., & Pitsiladis, Y. P. (2012). Kenyan and Ethiopian distance runners: What makes them so good? International Journal of Sports Physiology and Performance, 7(2), 92-102. https://doi.org/10.1123/ijspp.7.2.92

Zaletel, P., Veršić, Š., Perić, M., Zenić, N., Sekulić, D., & Kondrič, M. (2015). Toward (more) effective antidoping policy in sports: What should we target in antidoping efforts? Medicina Dello Sport, 68(3), 447-460.