

# Awareness and Self-Reported Application of the “10 Golden Rules” for Cardiovascular Prevention among Amateur Weekend Athletes in Douala, Cameroon: A Cross-Sectional Study

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**How to cite this paper:** Siddikatou, D., Mouliom, S., Ouankou, C.N., Mandeng Ma Linwa, E., Ndob, V., Ndom, M.S., Timnou Bekouti, J., Mboulley, A., Tsague Kegni, H.N. and Kamdem, F. (2026) Awareness and Self-Reported Application of the “10 Golden Rules” for Cardiovascular Prevention among Amateur Weekend Athletes in Douala, Cameroon: A Cross-Sectional Study. *Open Journal of Therapy and Rehabilitation*, 14, 49-61.  
<https://doi.org/10.4236/ojtr.2026.142005>

**Received:** March 15, 2026

**Accepted:** April 21, 2026

**Published:** April 24, 2026

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## Abstract

**Background:** The “10 Golden Rules” provide evidence-based guidance to reduce cardiovascular risk during recreational sport, but their awareness and application in sub-Saharan African settings remain largely unknown. This study assessed awareness and self-reported application of these rules among amateur recreational athletes in Douala, Cameroon. **Methods:** A cross-sectional survey was conducted from September 2025 to January 2026 in two major sports centres in Douala. We enrolled adults ( $\geq 18$  years) who self-reported regular recreational physical activity at least once every two weeks, primarily on weekends (operational definition of “weekend athlete”), excluding professional or competitive athletes. Data collection included standardized anthropometric and blood pressure measurements, plus interviewer-administered questionnaires assessing awareness (“already heard of”: yes/no) and self-reported application frequency (“never”/“sometimes”/“often”/“always”/“not applicable” if the situation never occurred) of each rule. **Results:** Participants (median age 43 years; 54.5% women) were highly educated (69.1% university level) but exhibited a substantial cardiometabolic burden: median BMI 28.7 kg/m<sup>2</sup> (49.1% overweight, 36.4% obese), 79.1% with abdominal obesity, and 26.4% with diastolic hypertension. Awareness exceeded 70% for five rules: warm-up/recovery (89.1%), avoidance of smoking (70.9%) and illicit drug consumption (76.4%), and symptom consultation (73.6%). Application was

low overall. Among participants to whom symptom-related rules applied (*i.e.*, excluding “not applicable” responses), “never” applying remained high (e.g., 46.4% for chest pain consultation overall; restricted estimates similar or higher). “Never” applying was reported by 46.4% for chest pain consultation, 50.9% for palpitations, 50.9% for malaise, and 64.6% for age-based pre-participation medical screening. Awareness was lowest for hydration every 30 minutes (22.7%) and the age-based medical check (Rule 10, 45.5%). Exploratory stratification showed numerically lower awareness of Rule 10 among women (41.7%) than men (50.0%), with particularly low levels in the groups to whom the rule directly applies: 48.7% among men  $\geq 35$  years and only 25.9% among women  $\geq 45$  years. Only 13.6% reported knowing how to perform chest-compression CPR. **Conclusion:** In this urban Cameroonian sample of recreational athletes, a high prevalence of cardiometabolic risk factors coexists with gaps in awareness and particularly low self-reported application of key cardiovascular safety rules, especially symptom recognition and pre-participation screening. These findings parallel behavioural patterns described in France, suggesting similar challenges in translating awareness to action. Context-appropriate educational interventions in local sports facilities may be needed to address these prevention gaps.

### Keywords

Sudden Cardiac Death, Cardiovascular Prevention, Amateur Athletes, Physical Activity Safety, Sub-Saharan Africa, Health Behaviour

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## 1. Introduction

Regular physical activity reduces the incidence of cardiovascular disease, type 2 diabetes and all-cause mortality [1] [2]. However, physical exertion, especially when intense, irregular, or undertaken by deconditioned individuals, can paradoxically precipitate acute cardiac events, including sudden cardiac arrest [3] [4]. While the global incidence of sports-related sudden cardiac arrest range from 0.13 to 13.0 per 100,000 person-years [5], a study in Cameroon estimated the incidence at 1.7 per 100,000 athletes per year [6]. Outcomes are often catastrophic, with case-fatality rates remaining extremely high in sub-Saharan Africa. This is largely attributable to delayed access to emergency medical services, a scarcity of publicly accessible automated external defibrillators (AEDs), and limited bystander cardiopulmonary resuscitation (CPR) training [7] [8].

In response to this global public health concern, the Club des Cardiologues du Sport published ten simple, evidence-based behavioural recommendations in 2006, known as the “10 Golden Rules” [9]. These rules, subsequently endorsed by the French National Academy of Medicine and several sports federations—are designed to mitigate the risks associated with sports participation. They address: 1) consulting a physician for chest pain or abnormal dyspnoea during effort; 2) consulting for palpitations during effort; 3) consulting for malaise during effort;

4) performing a 10-minute warm-up and recovery; 5) hydrating every 30 minutes; 6) avoiding sport during fever or extreme heat; 7) avoiding smoking before sport; 8) avoiding doping substances or self-medication; 9) undergoing a medical evaluation before resuming intense activity after an interruption; and 10) undergoing a medical evaluation before intense sport for men  $\geq 35$  years and women  $\geq 45$  years [9].

Cameroon, like many low- and middle-income countries, is undergoing a rapid epidemiological transition [10]. Sedentary behaviour is rising in urban areas while, concurrently, leisure-time physical activity is increasing among the middle class [6]. This shift occurs against a backdrop of a high prevalence of cardiometabolic risk factors; obesity, abdominal obesity, and hypertension are now highly prevalent in cities like Douala [11]. Despite this context, no previous study in Central Africa has evaluated awareness or application of internationally recognized prevention rules, such as the “10 Golden Rules”, among amateur athletes. The present study therefore aimed to: 1) characterize the anthropometric and clinical profile of weekend athletes in Douala; 2) quantify awareness and self-reported adherence to each of the ten rules; and 3) identify priorities for targeted prevention programmes in this population.

## 2. Methods

This descriptive cross-sectional study was conducted and reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional studies [12].

### 2.1. Study Design

The investigation was a single-contact, cross-sectional survey combining self-reported questionnaire data with standardised anthropometric and clinical measurements. No follow-up was performed.

### 2.2. Setting

The study was conducted at two highly frequented sports facilities in Douala, Cameroon: one public municipal stadium and one private fitness centre. Both facilities primarily serve urban, middle-class adults engaged in recreational physical activity. Data collection occurred between September 2025 and January 2026.

### 2.3. Participants

Eligible participants were adults aged  $\geq 18$  years who self-reported regular recreational physical activity at least once every two weeks, primarily on weekends. For the purposes of this study, this operational definition constituted a “weekend athlete.” Professional or competitive athletes were excluded.

A convenience sampling approach was used. Trained research assistants approached individuals present at the facilities during weekend sessions, provided a brief explanation of the study, and invited them to participate. All eligible indi-

viduals who were approached provided verbal informed consent and were enrolled consecutively. The questionnaire was piloted on 10 non-study recreational athletes to assess clarity, comprehension, and timing. Interviewers received standardized training on neutral phrasing, measurement protocols, and assurance of anonymity.

## 2.4. Variables

The primary outcomes were:

- Awareness of each rule (“already heard of”: yes/no)
- Self-reported frequency of application of each rule (“never,” “sometimes,” “often,” “always,” or “not applicable” when the situation had never occurred)

For symptom-related rules (Rules 1 - 3) and Rule 10 (age-based screening), the “not applicable” option was offered if the symptom or situation had never occurred or if the age criterion was not met. In such cases, “never” indicated non-application despite applicability.

Secondary outcomes included:

- Anthropometric measures (height, weight, waist circumference, body mass index [BMI])
- Resting blood pressure and heart rate
- Self-reported cardiometabolic history (hypertension, diabetes, dyslipidaemia, chronic kidney disease, smoking, prior stroke)
- Physical activity profile (types of activity, weekly frequency, session duration, perceived intensity)
- Basic emergency-response knowledge (recognition of sudden cardiac arrest, first action, CPR awareness, familiarity with defibrillators)

All variables were defined a priori using standardized criteria. BMI was categorized according to World Health Organization (WHO) guidelines [13]. Abdominal obesity was defined using International Diabetes Federation (IDF) thresholds ( $\geq 94$  cm for men,  $\geq 80$  cm for women) [14]. Hypertension was defined as systolic blood pressure  $> 140$  mmHg and/or diastolic blood pressure  $> 90$  mmHg.

## 2.5. Data Sources/Measurement

Data were collected using a structured, paper-based questionnaire in French, administered face-to-face by trained interviewers (medical or paramedical students) to minimize misinterpretation. The questionnaire comprised 35 closed-ended items, including the verbatim wording of the ten Golden Rules. A complete list of the rules is provided in Appendix A. Minor adaptations were made for local context (e.g., “very hot outside” for hot weather in Rule 6).

Anthropometric measurements were performed by the same trained personnel using calibrated equipment:

- Height: portable stadiometer (nearest 0.1 cm).
- Weight: digital scale (nearest 0.1 kg), with participants in light clothing without shoes.

- Waist circumference: non-stretchable tape measured at the umbilicus level (nearest 0.1 cm).
  - Blood pressure and heart rate: automated oscillometric device (Omron), with the mean of two readings recorded after  $\geq 5$  minutes of seated rest in a quiet area.
- All measurements followed standard operating procedures to ensure consistency across participants.

## **2.6. Bias**

Potential sources of selection bias (convenience sampling in sports centres potentially selecting healthier or more motivated individuals) and information bias (self-reported application potentially leading to social desirability over-reporting) were acknowledged but could not be fully eliminated in this design. Interviewers were trained to use neutral phrasing and to reassure participants that responses were anonymous. No incentives were offered.

## **2.7. Study Size**

A formal sample size calculation was not performed, given the descriptive aim of the study. Instead, a target sample of 110 participants was set based on feasibility considerations. This sample size provides a margin of error of approximately  $\pm 9\%$  for a 50% proportion at the 95% confidence level, which was considered acceptable for the study's descriptive objectives.

## **2.8. Quantitative Variables**

Continuous variables (age, BMI, waist circumference, blood pressure, heart rate) were summarized using medians and interquartile ranges (IQR) due to non-normal distributions. Categorical variables were reported as frequencies and percentages. BMI was categorized according to WHO criteria; blood pressure thresholds and abdominal obesity followed international guidelines as described above. No transformations were applied.

## **2.9. Statistical Methods**

Analysis was primarily descriptive. Percentages were calculated using the denominator of all valid responses. Exploratory subgroup analyses examined awareness and application by sex and age (dichotomized at Rule 10 thresholds: men  $\geq 35$  years, women  $\geq 45$  years) using frequencies and proportions; no formal hypothesis testing was conducted due to the sample size and descriptive design. For symptom-related rules, application frequencies were calculated both including and excluding "not applicable" responses. Missing data were 0% for core variables.

# **3. Results**

## **3.1. Participant Characteristics and Cardiometabolic Profile**

The study included 110 participants (response rate 100%). Median age was 43

years (IQR 36 - 50; range 22 - 73), with 54.5% women and 69.1% holding a university degree (**Tables 1-3**).

**Table 1.** Anthropometric and clinical characteristics (n = 110).

Variable	Median	IQR	Min	Max
Age (years)	43.0	36.0 - 50.0	22.0	73.0
Weight (kg)	81.0	78.3 - 88.0	51.0	121.0
Height (m)	1.7	1.6 - 1.7	1.5	1.9
BMI (kg/m <sup>2</sup> )	28.7	26.1 - 31.5	17.4	38.7
Waist circumference (cm)	94.0	89.2 - 101.0	67.0	120.0
Systolic BP (mmHg)	120.0	107.0 - 129.7	98.0	178.0
Diastolic BP (mmHg)	80.5	73.2 - 92.0	54.0	112.0
Heart rate (bpm)	69.0	60.2 - 81.0	46.0	100.0

**Table 2.** Categorical characteristics and cardiometabolic risk factors (n = 110).

Characteristic	Category	Frequency	%
Sex	Female	60	54.5
	Male	50	45.5
Education	University level	76	69.1
	Secondary level	28	25.5
	Primary level	5	4.5
	None	1	0.9
BMI category	Underweight (<18.5)	1	0.9
	Normal (18.5 - 24.9)	15	13.6
	Overweight (25 - 29.9)	54	49.1
	Obesity grade I (30 - 34.9)	32	29.1
	Obesity grade II (35 - 39.9)	8	7.3
Abdominal obesity (IDF)	Yes (≥94 cm men/≥80 cm women)	87	79.1
Systolic BP > 140 mmHg	Yes	14	12.7
Diastolic BP > 90 mmHg	Yes	29	26.4

**Table 3.** Physical activity habits (n = 110)

Item	Category	Frequency (n)	%
Most frequent activities (% Yes)	Brisk walking	71	64.5
	Resistance training/fitness	44	40.0
	Running	42	38.2
	Football	23	20.9

**Continued**

	Stretching/yoga	35	31.8
	Dance	17	15.5
	Swimming	16	14.5
	Cycling	7	6.4
Weekly frequency (all activities)	3 - 4 times	60	54.5
	1 - 2 times	21	19.1
	<1 time	15	13.6
	≥5 times	14	12.7
Session duration	>60 minutes	71	64.5
	30 - 60 minutes	30	27.3
	<30 minutes	9	8.2
Perceived average intensity	Moderate	90	81.8
	Light	11	10.0
	High	9	8.2

Self-reported medically diagnosed conditions were uncommon: treated hypertension 3.6%, diabetes 0.9%, dyslipidaemia 0.9%, chronic kidney disease 0.9%. Current smoking was reported by only 0.9% of participants.

### 3.2. Awareness and Self-Reported Application of the 10 Golden Rules

Awareness of the rules varied widely across the ten items. The highest recognition was observed for Rule 4 (warm-up and recovery: 89.1%), followed by Rule 8 (no doping substances or self-medication: 76.4%), Rule 1 (consult for chest pain/abnormal dyspnoea: 73.6%), Rule 7 (no smoking before sport: 70.9%), and Rule 3 (consult for malaise: 70.0%). Awareness was lowest for Rule 5 (hydration every 30 minutes: 22.7%) and Rule 10 (age-based medical screening: 45.5%).

Overall, application was low, particularly for symptom-related and screening rules. Considering all participants, the proportion reporting “never” applying the rule was 46.4% for Rule 1 (chest pain consultation), 50.9% for Rule 2 (palpitations), 50.9% for Rule 3 (malaise), and 64.6% for Rule 10 (age-based screening).

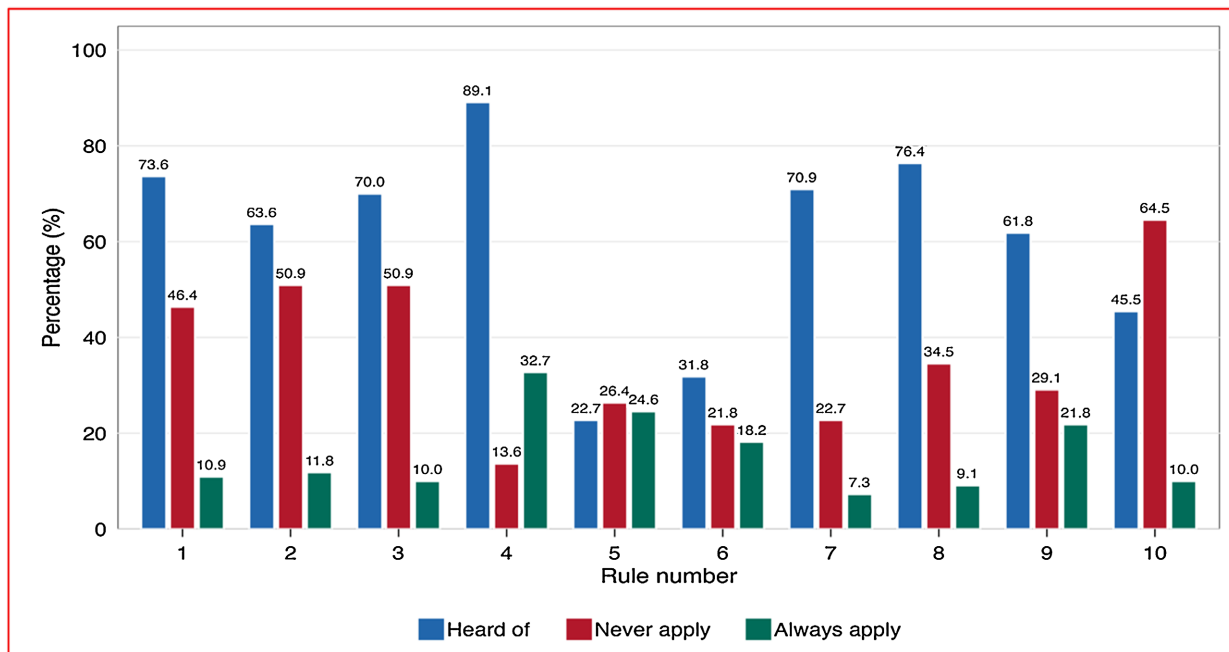
When analysis was restricted to participants to whom symptom-related rules applied (*i.e.*, excluding those who responded “not applicable” because the symptom had never occurred), the proportion reporting “never” consulting a healthcare provider remained high: 48.2% for chest pain, 52.5% for palpitations, and 51.8% for malaise. Consistent application (“always”) was limited even for well-known rules; for example, only 32.7% reported “always” performing warm-up and recovery.

Exploratory subgroup analysis for Rule 10 revealed that awareness was lower among women (41.7%, 25/60) than men (50.0%, 25/50). Among participants to

whom the rule directly applied, awareness was 48.7% (19/39) in men aged  $\geq 35$  years and only 25.9% (7/27) in women aged  $\geq 45$  years.

### 3.3. Knowledge on Emergency Measures after Cardiac Arrest

When asked what to do first if someone collapses from a presumed cardiac arrest, 69.1% correctly answered “call emergency services”. However, only 13.6% reported knowing how to perform chest compressions, and 63.6% had never heard of an automated external defibrillator. Despite this, 90.0% considered learning CPR and/or defibrillator use “very important” (Figure 1).



#### Rule key

Rule 1: I consult a doctor for any chest pain or abnormal shortness of breath occurring during exercise, regardless of my age, level of training, performance, or the results of any previous cardiology check-up.

Rule 2: I consult a doctor for any heart palpitations occurring during exercise or immediately after exercise, regardless of my age, level of training, performance, or the results of any previous cardiology check-up.

Rule 3: I consult a doctor for any malaise (feeling faint / dizzy / near-fainting) occurring during exercise or immediately after exercise, regardless of my age, level of training, performance, or the results of any previous cardiology check-up.

Rule 4: I always respect a 10-minute warm-up and a 10-minute cool-down / recovery period during my sporting activities.

Rule 5: I drink water every 30 minutes during training and competition.

Rule 6: I avoid intense physical activity when the weather is very hot outside (high heat and humidity).

Rule 7: I never smoke before doing sport.

Rule 8: I never take doping substances, and I avoid self-medication in general.

Rule 9: I do not practise sport when I have a fever or the flu (or any acute infectious illness).

Rule 10: If I am over 35 years old (men) or over 45 years old (women), I have a medical check-up before resuming or starting an intense sporting activity.

Figure 1. Awareness and application of the 10 Golden Rules for safe exercise.

## 4. Discussion

In this cross-sectional survey of 110 urban recreational athletes in Douala, Came-

room, a high burden of cardiometabolic risk factors coexisted with uneven awareness and low self-reported application of the 10 Golden Rules for cardiovascular prevention during sport. The median BMI of 28.7 kg/m<sup>2</sup>, combined with 79.1% abdominal obesity and 26.4% diastolic hypertension, reflects the epidemiological transition occurring in urban Cameroonian settings [11]. These findings are particularly concerning given that this population is already engaged in regular physical activity, a group typically considered at lower cardiovascular risk.

Awareness exceeded 70% for only five of the ten rules. Notably, while awareness of symptom consultation rules was relatively high (70.0% - 73.6%), self-reported application was poor. Among participants who had experienced relevant symptoms, nearly half reported never consulting a healthcare provider. This gap between awareness and action mirrors findings from France (2006), where the rules originated: a 2006 survey reported that 30% of amateur athletes over 40 did not report warning symptoms such as chest pain, palpitations, or malaise, with under-reporting rising to 52% - 62% during high-intensity activity [15].

The lowest awareness was observed for hydration every 30 minutes (22.7%) and age-based pre-participation medical screening (45.5%). The latter is particularly concerning given that 39 men  $\geq$  35 years and 27 women  $\geq$  45 years in our sample would be eligible for screening under Rule 10. Among these subgroups, awareness was only 48.7% in men and 25.9% in women. This suggests that current health promotion efforts are not effectively reaching those at highest risk.

Several factors may contribute to these gaps. First, despite high general education levels (69.1% university-educated), exercise-specific health literacy appears limited, reflecting Nutbeam's observation that health literacy extends beyond basic functional skills and is not automatically conferred by general education [16]. Second, economic barriers may deter medical consultation, particularly in a context where out-of-pocket healthcare expenditures are common [17]. Third, the rules have not been formally promoted in Cameroonian sports facilities, unlike in France where they have been endorsed by national sports federations and the National Academy of Medicine [18] [19]. Fourth, broader health-system limitations, including limited access to emergency medical services and scarce public defibrillators, may reduce the perceived utility of symptom recognition [7] [8].

Emergency-response knowledge was strikingly low, with only 13.6% reporting familiarity with CPR. This is consistent with prior reports from sub-Saharan Africa indicating low rates of bystander CPR training [8]. Encouragingly, 90.0% of participants considered learning CPR and defibrillator use very important, indicating a receptive audience for educational interventions.

The findings of this study have several practical implications. Sports centres in Douala could serve as platforms for prevention by incorporating the 10 Golden Rules into membership materials, coach training, and visible facility campaigns. Prioritizing symptom recognition (Rules 1 - 3) and age-based screening (Rule 10) may yield the greatest immediate impact. The strong interest in CPR and defibrillator training offers opportunities for facility-based sessions that combine emer-

gency-response training with basic cardiovascular screening. At the policy level, endorsement by the Cameroon Cardiology Society, Ministry of Sports, and Ministry of Public Health could support the integration of adapted guidelines into national sports safety efforts.

Several limitations should be acknowledged. First, convenience sampling at two urban sports facilities may have introduced selection bias, potentially including healthier or more health-conscious individuals than the general population of recreational athletes. Second, self-reported application is susceptible to social desirability bias, which may have led to over-reporting of adherence. Third, the cross-sectional, descriptive design precludes causal inferences. Fourth, no electrocardiograms or stress testing were performed, so silent cardiovascular conditions could not be detected. Fifth, the sample size, while adequate for descriptive precision, limited the ability to perform adjusted subgroup analyses. Sixth, the study was conducted exclusively in Douala, which may limit generalizability to rural or other urban settings in Cameroon. Despite these limitations, the study has notable strengths: it is the first evaluation of these rules among amateur athletes in Central Africa; it used interviewer-administered questionnaires to minimize misinterpretation; it included standardized anthropometric and blood pressure measurements; and it achieved a 100% response rate.

## 5. Conclusions

In this urban Cameroonian sample of recreational athletes, a high prevalence of cardiometabolic risk factors coexists with substantial gaps in awareness and self-reported application of key cardiovascular safety rules, particularly regarding symptom recognition and pre-participation screening. These findings highlight the need for context-appropriate educational interventions integrated into local sports facilities to promote safer recreational physical activity in Cameroon and similar urban African settings.

### What is known about this study

- Sports-related sudden cardiac arrest incidence in Cameroon has been estimated at 1.7 per 100,000 athletes per year, a rate comparable to those reported in some Western populations.
- The “10 Golden Rules” for cardiovascular prevention during sport were published by the Club des Cardiologues du Sport in 2006 and have been endorsed by multiple European federations and the French National Academy of Medicine.
- Data from France, where the rules originated, indicate that behavioural risk factors are prevalent even in high-income settings: 30% of athletes over 40 years old do not report warning symptoms such as chest pain, palpitations, or malaise, and this under-reporting increases to 52% - 62% during intensive activity.

### What this study adds

- This is the first study in Africa to evaluate awareness and self-reported application of the “10 Golden Rules” among amateur athletes, revealing that awareness exceeds 70% for only half the rules while “never” application predomi-

nates for symptom-alert rules (46% - 51%) and age-based screening (65%).

- Despite high educational levels, critical gaps exist in health literacy regarding exercise safety, particularly for hydration during exercise (only 22.7% aware) and pre-participation medical evaluation (45.5% aware).
- The high prevalence of cardiometabolic risk factors (79.1% abdominal obesity, 26.4% diastolic hypertension) in this physically active population, combined with poor awareness of emergency-response (only 13.6% know CPR), identifies urgent targets for intervention within existing sports structures.

## **Declarations**

## **Acknowledgements**

The authors wish to thank the sport coaches and the amateur athletes for facilitating the data collection phase.

## **Reporting Checklist**

The authors have submitted the STROBE reporting checklist as part of their submission.

## **Data Availability Statement**

The datasets generated and analysed during the current study can be obtained from the corresponding author (SD) upon reasonable request.

## **Funding**

This research did not benefit from any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## **Ethical Approval**

Ethical approval for this study was obtained from the Regional Human Health Research Ethics Committee for the Littoral (Reference: 2024/CE/CRERSH-LITTORAL). All participants provided verbal informed consent prior to enrolment, and all procedures were conducted in accordance with relevant ethical standards.

## **Author Contributions**

Study conception and design: SD and EMM. Data acquisition: EMM. Data analysis and interpretation: EMM. Manuscript preparation and review: All authors. Overall supervision: KF. SD and EMM had complete access to all study data and assume full responsibility for the integrity of the data and the accuracy of the data analysis. All authors have reviewed and approved the final version of the manuscript for submission.

## **Conflicts of Interest**

The authors declare no conflicts of interest regarding the publication of this paper.

## References

- [1] Liu, X., Wu, Z. and Li, N. (2022) Association between Physical Exercise and All-Cause and CVD Mortality in Patients with Diabetes: An Updated Systematic Review and Meta-Analysis. *African Health Sciences*, **22**, 250-266. <https://doi.org/10.4314/ahs.v22i3.27>
- [2] Chrysant, S.G. and Chrysant, G.S. (2023) Association of Physical Activity and Trajectories of Physical Activity with Cardiovascular Disease. *Expert Review of Cardiovascular Therapy*, **21**, 87-96. <https://doi.org/10.1080/14779072.2023.2174102>
- [3] Wasfy, M.M., Hutter, A.M. and Weiner, R.B. (2016) Sudden Cardiac Death in Athletes. *Methodist DeBakey Cardiovascular Journal*, **12**, 76-80. <https://doi.org/10.14797/mdcj-12-2-76>
- [4] Marijon, E., Uy-Evanado, A., Reinier, K., Teodorescu, C., Narayanan, K., Jouven, X., *et al.* (2015) Sudden Cardiac Arrest during Sports Activity in Middle Age. *Circulation*, **131**, 1384-1391. <https://doi.org/10.1161/circulationaha.114.011988>
- [5] Mohananey, D., Masri, A., Desai, R.M., Dalal, S., Phelan, D., Kanj, M., *et al.* (2017) Global Incidence of Sports-Related Sudden Cardiac Death. *Journal of the American College of Cardiology*, **69**, 2672-2673. <https://doi.org/10.1016/j.jacc.2017.03.564>
- [6] Tchanana, G.M.K., Ngantcha, M., Yuyun, M.F., Ajijola, O.A., Mbouh, S., Tchameni, S.C.T., *et al.* (2020) Incidence of Recreational Sports-Related Sudden Cardiac Arrest in Participants over Age 12 in a General African Population. *BMJ Open Sport & Exercise Medicine*, **6**, e000706. <https://doi.org/10.1136/bmjsem-2019-000706>
- [7] Talle, M., Bonny, A., Scholtz, W., Chin, A., Nel, G., Karaye, K., *et al.* (2018) Status of Cardiac Arrhythmia Services in Africa in 2018: A PASCAR Sudden Cardiac Death Task Force Report. *Cardiovascular Journal of Africa*, **29**, 115-121. <https://doi.org/10.5830/cvja-2018-027>
- [8] Bonny, A., Ngantcha, M., Scholtz, W., Chin, A., Nel, G., Anzouan-Kacou, J., *et al.* (2019) Cardiac Arrhythmias in Africa: Epidemiology, Management Challenges, and Perspectives. *Journal of the American College of Cardiology*, **73**, 100-109. <https://doi.org/10.1016/j.jacc.2018.09.084>
- [9] Club des Cardiologues du Sport (2006) Les 10 règles d'or. Club des Cardiologues du Sport. <https://www.clubcardiosport.com/10-regles-or>
- [10] Tatah, L., Mapa-Tassou, C., Shung-King, M., Oni, T., Woodcock, J., Weimann, A., *et al.* (2021) Analysis of Cameroon's Sectoral Policies on Physical Activity for Noncommunicable Disease Prevention. *International Journal of Environmental Research and Public Health*, **18**, Article 12713. <https://doi.org/10.3390/ijerph182312713>
- [11] Bonny, A., Tibazarwa, K., Mbouh, S., Wa, J., Fonga, R., Saka, C., *et al.* (2017) Epidemiology of Sudden Cardiac Death in Cameroon: The First Population-Based Cohort Survey in Sub-Saharan Africa. *International Journal of Epidemiology*, **46**, 1230-1238. <https://doi.org/10.1093/ije/dyx043>
- [12] von Elm, E., Altman, D.G., Egger, M., Pocock, S.J., Gøtzsche, P.C. and Vandenbroucke, J.P. (2007) The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: Guidelines for Reporting Observational Studies. *The Lancet*, **370**, 1453-1457. [https://doi.org/10.1016/s0140-6736\(07\)61602-x](https://doi.org/10.1016/s0140-6736(07)61602-x)
- [13] WHO (1995) Physical Status: The Use and Interpretation of Anthropometry, Report of a WHO Expert Committee. WHO Technical Report Series; 854. 1-452.
- [14] Alberti, K.G.M., Zimmet, P. and Shaw, J. (2005) The Metabolic Syndrome—A New Worldwide Definition. *The Lancet*, **366**, 1059-1062.

- [https://doi.org/10.1016/s0140-6736\(05\)67402-8](https://doi.org/10.1016/s0140-6736(05)67402-8)
- [15] Chevalier, L. and Guy, J.M. (2006) Risques cardiaques chez les sportifs amateurs: 10 règles d'or. *Medscape*. <https://francais.medscape.com/voirarticle/2751927>
- [16] Nutbeam, D. (2000) Health Literacy as a Public Health Goal: A Challenge for Contemporary Health Education and Communication Strategies into the 21st Century. *Health Promotion International*, **15**, 259-267. <https://doi.org/10.1093/heapro/15.3.259>
- [17] Bitran, R. (2014) Universal Health Coverage and the Challenge of Informal Employment: Lessons from Developing Countries. World Bank. <https://hdl.handle.net/10986/18637>
- [18] Marijon, E., Karam, N., Anys, S., Narayanan, K., Beganton, F., Bougouin, W., *et al.* (2021) Prévention de la mort subite du sportif: État des lieux. *Archives des Maladies du Coeur et des Vaisseaux—Pratique*, **2021**, 2-9. <https://doi.org/10.1016/j.amcp.2021.04.003>
- [19] Étienne, A., Christine, A., Pierre, C., Pascal, C., Michel, D., Henri, J., *et al.* (2018) Arrêt cardiaque subit: Pour une meilleure éducation du public. *Bulletin de l'Académie Nationale de Médecine*, **202**, 1341-1353. [https://doi.org/10.1016/s0001-4079\(19\)30200-6](https://doi.org/10.1016/s0001-4079(19)30200-6)