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Original research

Are usual concussion tools universally applicable? Challenges in concussion management in West African football – a qualitative study[☆]

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ABSTRACT

Objectives: To explore how sport-related concussions are recognised and managed in West African football, and to examine the applicability of international concussion tools in local contexts.

Design: Qualitative study using a grounded theory method.

Methods: Semi-structured interviews were conducted with eight physicians working in high-level football teams and national teams across Senegal, Mali and Gambia. Interviews were audio-recorded, transcribed, and then analysed through open, axial and selective coding.

Results: Six overarching categories emerged in the analysis: (1) the concussion burden is unclear due to under-reporting and lack of awareness, with concussion risks often overshadowed by other conditions perceived as more serious (e.g. cardiac); (2) protocols and tools such as SCAT are not applied; (3) organisational and resource gaps limit care; (4) clinical decisions are shaped by external pressures and absence of federation structures; (5) training remains insufficient and mostly theoretical; and (6) cultural norms (toughness, gender, mystical beliefs, and crowd influence) strongly affect practice.

Conclusions: Concussion management in West Africa is marked by under-recognition, limited applicability of international tools, organisational deficiencies and cultural pressures. Current guidelines remain largely theoretical in this context. Broader access to context-sensitive and local education, federation-level structures such as concussion leads, as well as culturally adapted strategies are needed to improve recognition and management of sport-related concussion in this context.

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Practical implications

- International tools such as SCAT6 remain theoretical with limited practical use in West African football.
- Locally organised education programs prioritise cardiac emergencies, leaving concussion poorly addressed in those countries.
- Return-to-play and emergency care protocols are inconsistently applied and left to the discretion of individual physicians.

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- Very often, players must show severe signs of concussion to be treated and removed from the pitch.
- Cultural norms and public pressure strongly influence return-to-play decisions in this context.

1. Introduction

Sport-related concussion is one of the most important health issues in football. Repetitive head impacts, whether intentional (such as heading) or accidental, have been associated with short-term cognitive impairment and, in the long term, with an increased risk of neurodegenerative disease.^{1–3} Large-scale studies in professional football players have demonstrated higher rates of dementia, Alzheimer's disease, and other neurodegenerative outcomes compared with the general population.^{3–5}

International governing bodies have responded to this issue with updated consensus statements and guidelines. The 6th International Consensus on Concussion in Sport highlighted the use of multidimensional assessment tools to evaluate concussions in sport, such as the Concussion Recognition Tool (CRT6) and the Sport Concussion Assessment Tool (SCAT6).^{6,7} A new tool, designed for subacute assessment, was also developed by the consensus group: the Sport Concussion Office Assessment Tool (SCOAT6).⁸ These tools are intended to enhance recognition and assessment but do not replace the clinical judgement of a qualified healthcare professional. The Federation International de Football Association (FIFA) and the Union of European Football Association (UEFA) have also issued football-specific recommendations, including concussion substitutions and protocols for return-to-play, whilst the Confédération Africaine de Football (CAF) provides courses on concussion management.^{9–11} In international football, FIFA's concussion campaign "Suspect and Protect" emphasises that any player exhibiting one or more signs or symptoms of concussion must be immediately removed from play, undergo a sideline assessment using clinical judgement supported by tools such as the SCAT6, and if concussion is suspected, should not return to play on the same day and follow a graduated return-to-sport protocol. Despite these advances and the use of video analyses during international tournaments, there is still a discrepancy between potential concussive events on the field and the frequency of medical assessments or player removals.^{12–14}

The challenges extend beyond elite football. Implementation of international guidelines at national and grassroots levels remains uneven, particularly in resource-limited settings. A recent systematic review underlined persistent gaps in concussion knowledge and education amongst players, coaches, and even medical staff, with attitudes often favouring continued play despite injury.¹⁵ Survey data from French-speaking countries similarly highlighted limited awareness of internationally recommended tools such as SCAT and CRT, especially outside specialised medical communities.¹⁶ Findings from the FIFA Women's World Cup 2023 confirm that even amongst experienced medical staff, external pressures and contextual barriers limit adherence to guidelines.^{14,17}

At the same time, the cultural and social dimensions of football profoundly shape concussion management. Norms that valorise toughness, the widespread acceptance of heading, and pressures from coaches and supporters can all discourage removal from play.^{14,15,18} Moreover, these pressures also discourage athletes from openly reporting concussion symptoms, further contributing to the under-recognition of sport-related concussions. These dynamics raise questions not only about knowledge and resources, but also about the cultural adaptability of international protocols.

Qualitative research offers a unique opportunity to capture these complexities. Exploring the lived experiences and perspectives of athletes, coaches, and medical staff can help explain why guidelines may not translate into consistent practice. Such approaches are increasingly used in sport medicine to complement epidemiological data and to guide culturally sensitive implementation strategies.^{19,20}

The current study aims to provide a situational analysis of concussion management in West African football. Specifically, it investigates stakeholders' knowledge of existing tools and guidelines, their perceived applicability in local contexts, as well as the influence of cultural and societal norms on injury mechanisms and clinical decision-making. This way, we seek to evaluate whether current international recommendations are truly feasible on the ground, and to identify pathways for improvements in concussion prevention and management in this region of the world.

2. Methods

2.1. Study design

A qualitative study design was employed, using a grounded theory approach to allow concepts and explanatory frameworks to emerge directly from the data, an approach particularly suited to under-researched contexts.²¹ The interview guide was iteratively refined throughout the study to incorporate insights and questions arising during data collection. Methodological rigour was ensured through adherence to the Consolidated Criteria for Reporting Qualitative Research (COREQ)²² and the Standards for Reporting Qualitative Research (SRQR).²³ Ethical approval was obtained by the Medical Ethics Committee of the University Hospital of Liège (2024/491) and by the Senegalese National Ethics Committee for Health Research (CNERS, SEN25/05). All participants were fully informed about the study procedures and provided written consent before participation.

2.2. Participants

Physicians and sport doctors, directly responsible for the medical care of professional football players competing at U17 (≤ 17 years old) or above in West Africa, were recruited using purposive sampling. Recruitment was facilitated by National Olympic Committees (who identified and connected potential candidates) as well as through indirect contacts provided by trusted intermediaries within the football community. This approach made it possible to access physicians actively engaged in elite football medicine in Senegal, Gambia and Mali. Sampling proceeded iteratively, with new participants recruited to explore underdeveloped concepts as analysis progressed and was concluded when saturation was achieved.

In total, 8 participants took part in the study and were interviewed (mean age = 37.7 ± 12.4 years old). All of them were actively engaged in football medicine at a high level (first national level or international level), with the majority of them having previous experience as team doctors during international competitions (9.5 years of experience on average). The final sample reflected diversity in terms of country (3 countries represented) and types of teams covered (2 physicians were responsible for women's teams and 6 for male teams), whilst remaining focused on the context of West African elite football. Data demographics are presented in Table 1. To preserve anonymity, pseudonyms were assigned for coding and analysis (e.g. MD1, MD2, etc.).

Table 1
Demographic data and characteristics of the participants.

Participant	Sex	Age	Years of experience	Level of players cared for
MD1	Male	40	15	National women's team
MD2	Male	41	11	National men's team (youth and U23)
MD3	Male	66	35	National Academy U20, official doctor for international events (UFOA, CAF, FIFA)
MD4	Female	28	1	National women's team
MD5	Male	29	1	National men's team U20
MD6	Male	36	7	National men's team U20
MD7	Male	29	3	National level club
MD8	Male	33	3	National men's team U17

2.3. Data collection

Data were collected via videoconference between July and September 2025. Semi-structured interviews were conducted by two researchers (LF and PT), respectively, a physiotherapist with experience in qualitative research and an orthopaedic surgeon in charge of a national football team in Europe. Both of them had a strong clinical expertise on concussion management. Interviews were conducted in French for participants from Mali and Senegal and in English for participants in Gambia, to limit the language barrier. They lasted on average 34 ± 10 min.

The interview guide was developed collaboratively by the research team and structured around several core domains relevant to concussion in football and the context. These included: (1) professional background and training of participants, (2) perceptions of concussion in football, (3) knowledge and recognition of concussions signs and symptoms, (4) management of concussion across different categories of play (youth, professional, female, amateur), (5) awareness and use of specific tools and protocols (e.g., SCAT6, CRT6, SCOAT6), (6) roles and responsibilities in decision-making, (7) perceived barriers and facilitators to appropriate care, and (8) cultural influences shaping concussion recognition and management. Each domain was explored through open-ended questions supported by contextual prompts, and questions were adapted to the role and expertise of the participant.

The interview process emphasised open dialogue, with particular attention to participant comfort and the opportunity for unanticipated themes to emerge. Field notes and reflective memos were systematically taken after each interview to capture contextual details and non-verbal observations. Consistent with grounded theory principles, the interview guide was adapted iteratively throughout the data collection process. Following each interview, the research team reviewed the material to identify new or insufficiently explored issues (e.g., concussion risk factors linked to African football, impact of cultural beliefs about concussion, clear identification of barriers to the applicability of concussion assessment tools), which were progressively incorporated into subsequent discussions to broaden and deepen the inquiry. All interviews were audio-recorded and transcribed verbatim using *Leexi software* (Leexi SA, Brussels, Belgium). Transcripts were translated into English and manually verified for accuracy.

2.4. Data analysis

Data were analysed following the three coding phases of grounded theory: open coding, axial coding, and selective coding. Analysis was conducted in English using *ATLAS.ti* (Scientific Software Development GmbH, Berlin, Germany). CT conducted all coding, guided by systematic comparison of the transcripts and iterative memo writing. Open coding allowed for the identification of initial concepts and the labelling of meaningful excerpts. In the axial coding phase, these concepts were grouped into categories and subcategories based on shared properties and relationships. Selective coding involved the integration of these categories in an explanatory framework. Conceptual links between categories were mapped using *Kumu software* (Kumu Inc., California, USA), a qualitative data visualisation platform. Coding decisions and categories were reviewed through discussions with LF and PT first, and then with the research team to ensure analytical coherence and reflexivity. Data saturation was declared once no new properties emerged during open coding.^{24,25}

2.5. Patient and public involvement

Whilst participants were not directly involved in the formal design of the research protocol, the development of the interview guide and the overall study approach were shaped from the outset by exchanges with local stakeholders. The guide was subsequently refined during the course of the study, incorporating participants' feedback and insights gained through field experience.

2.6. Equity, diversity, and inclusion statement

The study was designed to reflect a wide spectrum of experiences across different countries in West Africa. Efforts were made to include women in the sample. The research team combined expertise from Europe and Africa, representing different professional backgrounds.

3. Results

Six overarching categories were identified from the interviews: (1) perceived burden of concussion, (2) protocols and tool use, (3) organisational and resource constraints, (4) clinical decision-making on the field, (5) knowledge and training gaps, (6) cultural norms and pressures. Codes, sub-codes and illustrative quotations are presented in [Table 2](#).

3.1. Perceived burden and incidence

Participants expressed contrasting views regarding the frequency and visibility of concussions in West African football. For some, concussions appear infrequent, often described as isolated events in their medical practice. Others, however, reported that concussions are a recurring and increasingly pressing issue: *"We see concussions regularly—it is becoming a challenge in football here."*

These divergent perceptions are linked to several factors. First, physicians reported that athletes frequently concealed symptoms in order to remain on the field. Second, the absence of systematic surveillance or registries means that data on incidence are fragmented, often limited to anecdotal reports or experiences from a single club or competition. This can result in a likely underestimation of concussion incidence and major uncertainty regarding its true epidemiological burden in the region. Finally, differences in competitive level were highlighted. Whilst concussions are more visible in elite settings with medical coverage, they are perceived as under-recognised in community or grassroots competitions, where medical staff are often absent. Collectively, these perspectives suggest that the true burden of concussion in the region remains underestimated.

3.2. Protocols and tool use

One of the most consistent findings was the lack of standardised and consistently applied protocols for concussion assessment. In practice, many physicians reported relying on their own clinical judgement, observation of obvious signs, or a few quick questions, rather than structured instruments such as the SCAT6. As one participant explained: *"First, I would try to find out the mechanism and ask a few questions, but we don't really use any specific test."*

Several doctors described situations where CT scans or other imaging investigations were requested in the absence of clear clinical indications. In many cases, CT is performed as soon as a concussion is suspected, reflecting both a lack of confidence in field-based evaluations and limited familiarity not only with international guidelines but also with the diagnosis itself. Such reliance on imaging is often seen as a way to reassure players, coaches, or families, yet it also reveals uncertainty about the adequacy of local evaluation methods and creates a high risk of false reassurance ("nothing on CT" being interpreted as "nothing is wrong").

Even when participants were aware of existing protocols, they underlined how difficult it was to apply them in real match situations. Participants reported that coaches or athletes sometimes push for rapid return-to-play decisions, and time pressure or limited medical authority makes it challenging to enforce systematic assessments. As one participant explained: *"Even when there is a protocol, it is hard to apply because the coach wants the player back."* Moreover, insufficient training makes it challenging to correctly apply the different steps of concussion assessment and management protocols, including sideline evaluation

Table 2

Qualitative coding framework with categories/sub-categories and illustrative quotations.

Categories	Sub-categories	Illustrative quotations
Perceived burden and incidence	Perceptions of concussion frequency diverge	"We see concussions regularly—it is becoming a challenge in football here." (MD3) "Personally, I have faced very few concussions in my practice." (MD2)
	There is a lack of registry	"We don't have any data, only what we see in matches." (MD4) "In football here, concussions are rarely reported because there is no doctor present at most matches. And it's even worse in amateurs." (MD7)
	Concussions are underreported	"Players often hide their symptoms, so you don't see the real number." (MD1) "Most of these players will sustain a concussion and just manage it at home with painkillers, without ever reporting to a doctor." (MD8) "Even when there is a protocol, it is hard to apply because the coach wants the player back." (MD1)
Protocols & tool use	Standardised concussion protocols are rarely applied	"We don't have any formal protocol for return-to-play, so I just rely on rest and clinical judgement." (MD8)
	Observation is preferred to clinical testing	"First, I would try to find out the mechanism and ask a few questions, but we don't really use any specific test."
Organisational & resource constraints	Imaging is often considered the only option	"Sometimes the only option is to send the player for a scan, even if it is not really indicated."
	A complete medical team is often absent from the sidelines	"I had to take the player myself to the hospital because no ambulance was available." (MD5) "Most local teams don't have doctors, only physiotherapists with little training in concussion." (MD8)
	Coverage and resources vary greatly according to the level (national vs. club level)	"At national team level you have doctors, but in the clubs it is completely different." (MD1) "At the U20 level, we may have some coverage, but for the U15 girls, there is often no medical support at all." (MD6)
	Financial barriers prevent adequate follow-up	"Medical exams are too expensive, so most players cannot afford follow-up." (MD2) "Follow-up is rare; players only return to the hospital when things are really not going well." (MD8)
Clinical decision-making (RTP)	Decisions to remove are inconsistent	"Without a clear protocol, it depends on the doctor. Sometimes we let them continue, sometimes not." (MD3) "Sometimes I remove the player for a few minutes, but if he feels better, we let him continue." (MD6) "You have to explain your decision, otherwise they won't accept it." (MD1)
	Explaining decisions is essential to gain acceptance from the coaches and athletes	
	In the absence of designated concussion leads, responsibility falls on individual doctors	"In my federation, there is no concussion lead, so every doctor makes their own decision." (MD5) "We never had any opportunity to sit and establish a unified protocol or leadership on concussion." (MD8)
Knowledge & training gaps	Physicians are not comfortable with concussion assessment	"No, not specifically in my country. I need access to training, I don't feel comfortable making decisions in these cases." (MD2) "We never had formal training sessions on concussion; most of what I know comes from personal reading or discussions with colleagues." (MD6) "We hear more about cardiac arrest than about concussion during courses." (MD19)
	Training courses focus more on cardiac emergencies than on concussion	
	Training received does not translate into clinical practice	"In theory we are trained, but in practice most colleagues don't know how to react." (MD5) "I've heard about SCAT but never really used it in practice; I am not familiar enough with it." (MD8)
Cultural norms & pressures	Heading and physical contact are normalised as part of the game	"Sometimes the crowd or the coach will not accept that a player leaves the pitch for just a knock on the head." (MD3) "Players see concussion as a minor problem compared to broken bones or visible injuries, so they do not understand why they should stop." (MD7) "Men are seen as lions; they must stay strong, while women are taken out more easily." (MD1)
	Male athletes are expected to show toughness, whilst women are more easily removed	
	Some clinical symptoms are attributed to mystical beliefs	"Some families believe loss of consciousness is a mystical problem, not a medical one." (MD2)
	Local rivalries heighten resistance to medical advice	"During navetanes, it is very difficult to convince a player to stop because of the pressure of the village." (MD5)
	The crowd and coaches exert strong pressure against removal	"Sometimes the crowd or the coach will not accept that a player leaves the pitch for just a knock on the head. The supporters can become very aggressive." (MD4) "Young players often hide symptoms because they fear being seen as weak." (MD8)

(e.g., SCAT6), and making appropriate removal-from-play and return-to-play decisions.

Therefore, in most cases, medical staff perform a brief evaluation but then allow athletes to continue, despite doubts.

3.3. Organisational and resource constraints

Resource limitations strongly influence concussion management. Whilst national teams generally benefited from structured medical coverage, club and community settings often lack doctors, equipment, and emergency support. One physician explained: *"I had to take the player myself to the hospital because no ambulance was available."* In such scenarios, a critical dilemma arises: if the doctor leaves with the injured player, there is no physician left on the bench; if the doctor remains on the sideline, the concussed player may be inadequately supervised and miss timely medical attention. Lack of medical staff on the sidelines, absence of appropriate equipment, and financial barriers to imaging or follow-up care were also frequently cited. These constraints exacerbate reliance on ad-hoc decision-making and sometimes shift responsibility to non-medical staff or volunteers.

3.4. Clinical decision-making

Without clear protocols and consistent support, on-field decision-making varies widely. Some participants emphasised immediate removal in the presence of obvious symptoms, whilst others rely on reassurance from coaches. However, communication with athletes, families, and staff was described as essential to legitimising medical choices: *"You have to explain your decision, otherwise they won't accept it."* The lack of designated "concussion leads" (a medical reference person responsible for coordinating concussion management and ensuring consistency in clinical decisions) within federations means that individual clinicians often carry the full burden of responsibility.

3.5. Knowledge and training gaps

Participants consistently described limited knowledge and preparation in recognising and managing concussions. Educational initiatives led by CAF and FIFA were acknowledged but often regarded as too general or disproportionately focused on cardiac arrest and resuscitation rather than on head injuries and concussion. Several physicians

admitted feeling underprepared when faced with a suspected concussion: “No, not specifically in my country. I need more access to training... but I don't feel comfortable making decisions in these cases.”

The gap between theoretical exposure and actual clinical competence is a recurrent theme, illustrated in Fig. 1. Whilst several participants reported engaging in workshops and online courses, they emphasised that such experiences did not necessarily translate into confidence when confronted with live match situations. Others stressed that available training materials are poorly adapted to local realities, either too brief, too technical or not tailored to the level of resources on the ground. As a result, even when physicians were aware of the existence of international guidelines, they often lack the skills or support to apply them consistently. This mismatch leaves many clinicians dependent on personal experience and informal learning, contributing to variability in practice across contexts.

3.6. Cultural norms and pressures

Cultural and societal expectations emerge as powerful determinants of concussion management. Football is widely described as a highly physical game, where repeated heading and frequent collisions are seen as part of the sport. Such norms make it difficult to justify removing a player for what many perceived as a minor knock, even if there are some signs or symptoms of concussion. Pressure from the crowd and coaching staff often reinforce this perception: “Sometimes the crowd or the coach will not accept that a player leaves the pitch for just a knock on the head.”

Gender norms also shape decision-making. Female athletes are generally considered “more fragile” and therefore more likely to be withdrawn from play, whilst male players are expected to display resilience and continue despite symptoms. Several participants explained that this double standard was deeply embedded in sporting culture and influences both medical decisions and athlete behaviour.

In community tournaments such as the *navetanes* (a very popular inter-neighbourhood football competition organised during summer), where local prestige and rivalries are intense, the reluctance to remove players is even stronger, with medical recommendations frequently contested or ignored (when medical staff is available), putting the athletes even more at risk. Lastly, in some instances, concussive events or loss of consciousness are also interpreted through spiritual or mystical lenses, leading families or spectators to attribute the injury to causes outside medicine and consult a traditional practitioner in place of being examined by a physician. These cultural framings further complicated

clinical decisions and sometimes undermined the authority of medical staff.

4. Discussion

4.1. Perceived burden and incidence

Sport-related concussion is recognised as a major health concern in global football. Still, the findings of this study demonstrate that the recognition and management of this issue remain particularly challenging in West Africa. The absence of systematic monitoring mechanisms or registries induces unreliable epidemiological data, meaning the actual burden of concussion is obscured. This lack of reliable injury surveillance data has further consequences. Whilst medical emergencies such as cardiac events justifiably attract strong institutional attention due to their severity, sport-related concussion occurs far more frequently and therefore represents a public health and athlete-safety issue. The lack of reliable injury surveillance data contributes to underestimating this burden and undermines advocacy efforts within federations to prioritise concussion prevention and management.²⁶ In addition, under-reporting of symptoms from players due to pressure and cultural influence further increase the impact on underestimating concussion incidence as seen in other football contexts.^{6,14,27} Awareness campaigns, national or regional registries to better document concussion incidence, and greater investment from federations could have a positive impact on a better understanding of concussion issues in West African countries.

4.2. Protocols and tool use

The data also revealed a consistent absence of standardised protocols for the recognition of suspected concussion following head impacts and their management. At the same time, internationally validated tools, such as the SCAT6, CRT6, or SCOAT6,^{28–30} are rarely employed, despite their translation into French.^{32,33} Indeed, one physician explained that in most cases, “we don't really use any specific test,” reflecting a reliance on clinical judgement rather than structured assessment.

This gap is not primarily due to ignorance of their existence but to doubts about their practicality in the local environment, limited training on their use, as well as public and coaching pressures during competition. Importantly, whilst previous studies have raised concerns regarding the feasibility of using tools such as the SCAT in time-constrained clinical settings,^{34–36} physicians in our study did not primarily question

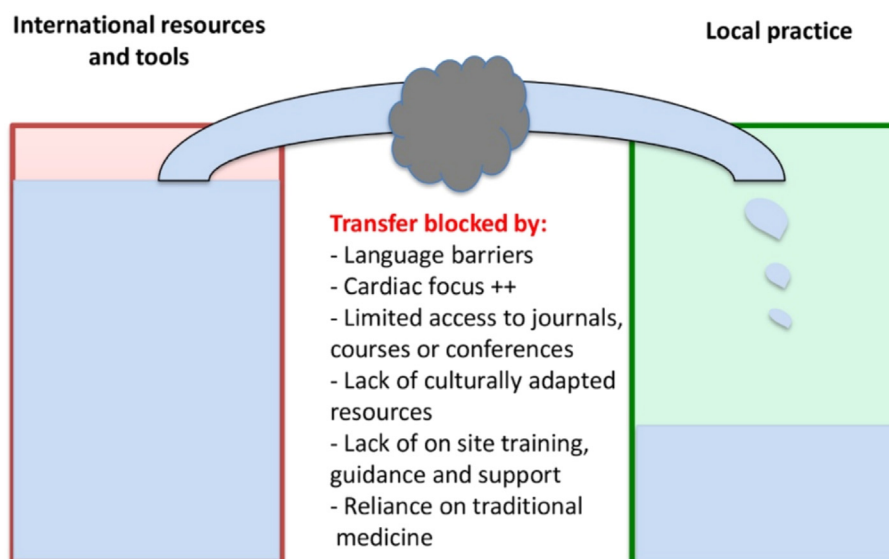


Fig. 1. Illustration of the gap between international guidelines/tools and local clinical practice (based on the communicating vessels concept).

the tool itself. Instead, they emphasised organisational and contextual barriers that limited its implementation during matches. Instead, they emphasised organisational and contextual barriers that limited its implementation during matches, including pressure from coaches and teams, limited medical authority, lack of trained personnel on the sidelines, and restricted medical resources. In the absence of federation-wide enforcement mechanisms or clearly identified concussion leads, the application of protocols and the use of the assessment tools depend almost entirely on individual clinicians. This leaves assessments and protocols vulnerable to contextual pressures and results in highly variable practices. Organisational measures such as appointing concussion leads within federations to ensure accountability and support return-to-play decisions, alongside national and international governing bodies, would have a positive impact on medical authority for concussion management.

4.3. Organisational and resource constraints

Beyond individual practices, the structural limitations of healthcare access also emerged as a barrier. At the national team level, physicians reported more comprehensive coverage and access to resources. However, at the club and community levels, medical support is highly inconsistent. Many competitions proceeded without a team physician on the sidelines, leaving responsibility to physiotherapists or coaches, who may have limited training in concussion management. Basic emergency equipment, such as stretchers or ambulances, was often unavailable. In some cases, physicians reported personally transporting injured athletes to hospitals, underscoring the fragility of emergency response systems.³⁷

Follow-up is described as rare for athletes' training and competing in their country and longitudinal monitoring of symptoms was virtually absent. This reality perpetuates a cycle where suspected concussions are insufficiently recognised and rarely followed by adequate monitoring or medical follow-up, increasing the risk of premature return-to-play and potential long-term consequences.^{2,38}

These organisational deficiencies are not isolated but part of broader governance challenges in African football. Structural analyses have documented persistent corruption, underinvestment and weak accountability mechanisms. Such systemic issues explain why even when funds are allocated for medical development, resources frequently fail to reach the community level.³⁹ For concussion, this translates into inadequate sideline support, poor dissemination of tools, and minimal follow-up structures.

4.4. Clinical decision-making

In the absence of clear organisational frameworks, clinical decision-making around concussion in West Africa often falls solely on the shoulders of individual physicians. The lack of designated concussion leads within federations is also an important gap. International best practice increasingly recommends the appointment of individuals with specific responsibility for concussion, ensuring consistency and accountability.^{6,10,40} This study highlighted that emergency, management, and return-to-play decisions depend heavily on personal judgement and negotiation, leaving physicians isolated in the face of external pressures. This exposes athletes to significant risk when decisions are swayed by sporting priorities rather than medical evidence.⁴¹ Educating stakeholders and appointing concussion leads within federations may strengthen communication, which is reported as essential in achieving compliance in concussion management.⁶

4.5. Knowledge and training gaps

The most important theme identified in this study was the limited knowledge and training available on concussion. This gap is not simply a matter of quantity but also of accessibility. Training opportunities tend

to be concentrated amongst a small group of internationally connected professionals, often the same individuals who travel abroad or attend CAF/FIFA courses.⁹ Regional and community-level physicians are frequently excluded, perpetuating inequities in knowledge distribution.

Language barriers exacerbate this issue, as many coaches and clinicians come from disadvantaged backgrounds where French or English is not their native language.⁴² In such contexts, even when materials exist, they may remain inaccessible in practice. Without practical workshops, mentorship, or contextualised training, theoretical knowledge fails to translate into clinical application. The result is a clinical environment where practitioners feel unprepared and uncomfortable in recognising and managing sport-related concussions. Providing practical, context-specific training²⁰ in French and the local language available for diverse stakeholders, regardless of their background, will enhance the effective dissemination of concussion management.

4.6. Cultural norms and pressures

Cultural expectations emerged as powerful determinants of concussion management. In male football, toughness and resilience are highly valorised. Athletes are expected to endure pain and continue playing; Therefore, leaving the pitch after a head impact, even if this is associated with signs or symptoms suggestive of concussion, may be interpreted as weakness. This cultural framing explains why players who can stand after a collision are rarely withdrawn, even if symptomatic. In contrast, female athletes were often described as being removed more readily, reflecting gendered stereotypes of fragility rather than evidence-based caution. This highlights the need for concussion education and awareness strategies that target both male and female athletes equally, promote the same standards of care regardless of gender, and explicitly challenge the idea that reporting symptoms or leaving the field constitutes a sign of weakness.

The role of the public and coaches has also been emphasised. Physicians reported intense pressure to keep key players on the field,⁴³ particularly during important matches. Supporters often interpret withdrawal as detrimental to the team or even to community pride. In the *navetanes*, local neighbourhood tournaments that hold deep social significance, this pressure is magnified by the rivalries between teams. These dynamics demonstrate how concussion management is embedded not only in clinical judgement but also in broader social relations. Cultural dynamics could be addressed through public campaigns reframing concussion as a medical issue and something important to consider.

In rare cases, participants reported that loss of consciousness is attributed to mystical or spiritual causes, further complicating clinical interpretation. Such beliefs highlight the importance of integrating cultural awareness into medical education and communication. Addressing these deeply held norms when implement international guidelines may help to avoid resistance.⁴⁴

4.7. Perspectives

Although this study focuses on West Africa, several challenges identified are not region-specific: symptom under-reporting, pressure to expedite return-to-play or inconsistent uptake of validated tools is also documented in European and North American settings.^{14,17} What distinguishes the West-African context is amplifying factors such as multilingual environments and language barriers, uneven sideline medical coverage, governance and accountability gaps, resource-constrained emergency pathways, and the social dynamics of community competitions (e.g., *navetanes*). Accordingly, responses should combine universal measures (baseline education, clear remove-from-play rules, independent medical authority, and simple surveillance/registries) with context-specific adaptations²⁰ (coach-centred training in French and local languages, low-cost field tools, designated federation concussion leads, and community-level implementation partnerships).

4.8. Limitations

This study still has several limitations. Although saturation was reached, the findings rest on interviews with only eight physicians and thus reflect a narrow slice of the wider community. Participants were self-selected and likely more interested in concussion, which could bias accounts towards higher awareness or motivation. In addition, we did not triangulate perspectives with players or coaches, potentially undercapturing on-field dynamics and decision pressures. Finally, because all interviews were with physicians, social desirability/self-presentation bias cannot be excluded.

5. Conclusion

This study explored how concussions are managed in West African football. A consistent finding was the gap between what international guidelines recommend and what can realistically be done on the ground. From emergency care to return-to-play, concussions are often missed or played down, and whilst some physicians have some knowledge about tools such as SCAT6 or CRT6,³¹ their use remains largely theoretical. In practice, assessments rely more on observation and clinical judgement than on structured instruments, reflecting both a lack of training and challenges for their implementation in local settings.

Limited resources and the absence of federation-level structures compound these challenges. Cultural expectations add another layer: male players are expected to “stay strong,” supporters and coaches press for a rapid return, and only in women's football is a more cautious approach sometimes seen.

Moving forward, there is a clear need to make concussion tools more practical and adaptable, to widen access to training beyond a small group of physicians, and to support clinicians through designated concussion leads. Building surveillance systems and investing in follow-up research will also be essential to capture the true burden of concussion and to guide future policies in the region.

CRedit authorship contribution statement

Conceptualisation and Methodology: all authors. Investigation: LF, PT. Data curation: CT, with data collection by LF and PT. Formal analysis: CT. Validation: all authors. Visualisation: CT. Writing—original draft: CT. Writing—review & editing: all authors. CT is the guarantor of the work.

Confirmation of ethical compliance

The study has been reviewed and approved by the Liege Hospital Medical Ethics Committee (2024/491) and the Senegalese National Ethics Committee for Health Research (CNER) (SEN25/05).

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Declaration of interest statement

CT is Associate Editor of the *Journal de Traumatologie du Sport* and is part of the Editorial Board of *Isokinetics and Exercise Science*. JFK and SL are members of the Editorial Board of the *Journal de Traumatologie du Sport*. JFK also serves on the Editorial Boards of *Science & Sports*, *ACER*, *ESPRM*, and *RMLg*. DH is a member of the medical board of the French Golf Federation. None declared for the other authors. RS is an Associate Editor for the British Journal of Sports Medicine. PT is a member of the Editorial Board of KSSA, Cartilage, Translational Sports Med as well as Sports Orthopaedics and Traumatology.

Data availability

Due to the qualitative and sensitive nature of the interviews, full transcripts are not publicly available. De-identified data may be shared upon reasonable request to the corresponding author and in accordance with ethical regulations.

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