

BMJ Open Qualitative study exploring surgical team members' perception of patient safety in conflict-ridden Eastern Democratic Republic of Congo

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ABSTRACT

Objective: To identify potential barriers to patient safety (PS) interventions from the perspective of surgical team members working in an operating theatre in Eastern Democratic Republic of Congo (DRC).

Design: In-depth interviews were conducted and analysed using qualitative content analysis.

Setting: Governmental referral teaching hospital in Eastern DRC.

Participants: We purposively selected 2–4 national and expatriate surgical team members from each specialisation. Of the 31 eligible surgical health workers (HWs), 17 volunteered to be interviewed.

Results: Economics issues affected PS throughout the entire health system, from human resources and hospital management, to access to healthcare for patients. Surgical team members seemed embedded in a paternalistic organisational structure and blame culture accompanied by perceived inefficient support services and low salaries. The armed conflict did not only worsen these system failures, it also carried direct threats to patients and HWs, and resulted in complex indirect consequences compromising PS. The increased corruption within health organisations, and population impoverishment and substance abuse among health staff adversely altered safe care. Simultaneously, HWs' reported resilience and resourcefulness to address barrier to PS. Participants had varying views on external aid depending on its relevance.

Conclusions: The complex links between war and PS emphasise the importance of a comprehensive approach including occupational health to strengthen HWs' resilience, external clinical audits to limit corruption, and educational programmes in PS to support patient-centred care and address blame culture. Finally, improvement of equity in the health financing system seems essential to ensure access to healthcare and safe perioperative outcomes for all.

INTRODUCTION

Perioperative adverse events (AEs) cause \approx 1 million (1.8%) of the estimated 55 million annual deaths worldwide.^{1–2} Before, during,

Strengths and limitations of this study

- This study addresses a gap in qualitative research exploring surgical team members' perception of patient safety (PS) in areas of armed conflict.
- The qualitative research design helped capture the context and involvement of health teams to suggest interventions that are responsive to needs and existing local capacity, but does not estimate the burden of PS in this context.
- Though the results cannot be transferred to other contexts, the approach used here can help identify early solutions to increased PS issues in conflict situations, particularly with regards to occupational health, health equity and external assistance.

or after the 234 million surgeries performed yearly,^{3–4} \approx 7 million people experience AEs including nosocomial infections; wrongly administered equipment, drugs, blood products, gas or diet; and faulty equipment.⁵ Research has focused on resource constraints^{6–7} and health-system failure^{8–11} to explain the greater number of AEs in developing countries.^{6–12–14} Only two studies^{15–16} examined national safety culture which influences both risk levels and potential success of interventions aiming to improve perioperative patient safety (PS). The lack of publications on health workers' (HW) perceptions on safety culture in developing countries reflects the global gap in PS research in low-resourced settings.^{17–18}

Safety culture is defined as 'the product of individual and group values, attitudes, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's health and safety programmes'.¹⁹ Perception of safety and consequent preventive measures are highly influenced by social interaction,

culture, beliefs, fatalism and overall perception of risk.²⁰ This culture can translate to human errors, organisational hierarchy or blame culture, leadership or management disinterested in PS, and fragmentation of communication and teamwork.^{16 21–25} Over the past decade, overcoming blame culture, AE reporting and standardisation of practice²³ have been emphasised to ensure accurate identification of patients and samples, capacity to prevent and manage anaesthesia-related AEs and postoperative infection risk and surgical count, so that no foreign objects are left back in patients' bodies; communication between surgical team members and hospital surveillance systems.¹ Proactive PS measures (eg, checklists) and reactive PS measures (eg, reporting, root cause analysis) successful in the West^{5 26} are rare in low-resource settings,²⁷ and may be ineffectual due to hierarchical structures, blame culture and multifactorial barriers to PS.^{28–30} WHO launched the African Partnership for Patient Safety (APPS) in 2009 aiming to build direct partnership between African and Western hospitals to target PS issues.³¹ While this programme now includes 11 English and French sub-Saharan African countries, Democratic Republic of Congo (DRC) remains to be involved.

The influence of war-related social changes, resilience and individual post-traumatic disorder on PS remains unstudied in the DRC.^{5 32} Since independence in 1960, DRC has experienced economic crises, political instability gangrened by corruption, wars fuelled by greed for local mineral resources, human rights violations and war crimes.³³ Chronic conflict continues in the eastern provinces today,³⁴ resulting in displacement,³⁵ post-trauma stress disorder,³⁶ and anything between 0.8 and 2.8 million dead³⁷ due to war-induced infections or malnutrition, rather than violence.³⁸ Chronic conflict, resource constraints and endemic corruption may affect the population's safety and culture, and impact PS in hospitals in DRC.^{39–41} The present study explores HWs' perceptions of PS in an operating theatre (OT) in Eastern DRC to identify and further overcome potential barriers to surgical PS interventions in a conflicted and resource-poor area.

METHODS

Design

Using in-depth interviews (IDIs), we explored the perception of PS of HWs from different specialisations and origins working in surgery in a teaching hospital in Eastern DRC.⁴² IDIs allowed individual disclosure away from collegial scrutiny and potential loss of trust.⁴³ All documents were labelled with pseudonyms and the studied hospital as 'H'.⁴² The study was approved by the ethics committees at the University of Liverpool and local University (local institution and organisation names are withheld to maintain anonymity of participants) and permitted by the Ministry of Health, hospital administration and international organisation (IO) management. All

participants gave their written informed consent. The research process followed the requirements for obtaining a Master in Public Health degree.

Setting, participant selection and recruitment

Participants were recruited from a conveniently chosen 100 surgical bed governmental referral teaching hospital in Eastern DRC in order to tailor PS interventions to this conflict area. During the study period (March–May 2014), there were no ongoing armed conflicts in the immediate vicinity of the hospital; however, numerous conflict-related incidents affecting populations and the healthcare system were regularly reported with more than 30 armed groups still perpetrating violence across eastern DRC in June 2014.⁴⁴ Recruitment process was assumed to be protected from any strong conflict-related influences considering the chronic status of the armed conflict in eastern DRC, low level of violence within the hospital neighbourhood and study broad focus.

All surgical team members from any specialisation, whether Congolese or expatriate, were eligible, provided they were not students, had >6 months experience in an OT and, if expatriate, >1 month experience in this particular location. No financial incentive was given. None claimed the travel reimbursement offered for after-hours interviews.

We purposively selected 2–4 national and expatriate surgical team members from each specialisation,^{42 45} aiming for 12–18 participants. Information about the study was given to the team through flyers posted in the OT inviting all eligible team members, and repeated at team meetings. We did not invite individuals according to their specialisation to avoid perceived coercion, but let team members know that we wanted to recruit 2–4 team members from each specialisation from national and expatriate staff. We gave interested staff members a Participant Information Sheet 48 h before any interview. Of the 31 eligible surgical HWs, 17 volunteered to be interviewed; one interview was excluded because of participant focus on salary and unresponsiveness; translator's lack of neutrality; and researcher's partial loss of control on proceedings. The translator was working for the IO at an administrative position not related to the hospital programme. Although he occasionally might translate from Ki-Swahili to French for expatriate staff, he had never performed IDIs simultaneous translation prior to this study. Translator's lack of experience in this function, and FL's lack of practice in conducting IDIs through simultaneous translation might have triggered such difficulties. Along with the IDIs and their debriefing, neither of the two interviewees who required translation expressed any fear of misinterpretation, and they appeared to speak freely.

Sixteen IDIs (45–75 min) both with Congolese (N=14) and expatriate (N=2) surgical team members from all specialisations were conducted, recorded (IC-Recorder, Sony) and analysed from March to May 2014.

Conducting the interviews

FL conducted 13 interviews in French, 2 in English and with the help of the translator, 2 in Ki-Swahili in private environs in an office at 'H' (n=15), IO office and private accommodations (1 each) per participant preference. The semistructured interview guide (table 1) contained seven open-ended questions⁴⁶ that explored individual experiences of AE in OT and their perceptions on various dimensions of safety culture, such as, communication, teamwork, management and organisational culture.¹⁹ Participant responses to these questions led to further probes to explore these dimensions, particularly if related to recurring themes from previous interviews.

Data collection, capture, coding and analysis

FL audio-recorded and transcribed IDIs verbatim and into English. Qualitative content analysis of transcripts followed an inductive process to identify 97 unique

thematic codes^{47 48} categorised in domains which were reviewed along with definitions by one IO HW in Eastern DRC not directly involved in surgery.

FL and AS monitored code frequency per participant to identify salient codes and thematic saturation.⁴⁹ Most (91%) of the codes appeared in the first eight interviews (88/97) fading to a single new code in the last four interviews. With $\geq 50\%$ OT staff interviewed, thematic saturation was reached before the expected twelfth IDI.⁴⁹ All interviews were filtered by code in Excel software programme to synthesise information and capture the most illustrative quotes.⁴⁸ Participants' speciality was considered if unique and in comparison with other specialities.

Positionality

A social constructionist paradigm guided our approach to capture the subjective individual experience and its construction by organisational and sociocultural context while remaining mindful of our positionalities.⁵⁰⁻⁵³ Entirely an outsider,⁵⁴ AS provided an academic external perspective to local barriers to PS, deepening and widening results analysis and interpretation. FL was an outsider, a Muzungu, and an insider in the surgical team, working as expatriate anaesthetist.⁵⁵ Muzungu in Eastern DRC means more than 'white-skinned person' to include the underlying power imbalance due to colonialisation including coercion in public health research^{54 56} and, currently, westernisation.⁵⁴ The humanitarian Muzungu are associated with cultural barriers, power imbalance and (false) promises,⁵⁷ possibly complicating interactions with FL. However, due to her year-long team membership, FL generated interest and support for the study.⁵⁸ FL could interpret the data drawing on her technical expertise on PS and her knowledge of hierarchical and sociocultural influence on interactions. FL's 'dual practitioner-researcher identity'⁵⁵ allowed participants to discuss AEs without fear of compromising the hospital, colleagues or themselves. Within the social constructionist approach, the interpretive truth is deeply linked to social context, this paradigm acknowledges the influence of research on participants' and researchers' perspectives, and their relationships⁵¹; therefore, dual position is believed to have deepened understanding of local specificities⁵⁹ and practitioner-researcher perspectives.

RESULTS

Sample characteristics

The 16 participants represented the multiple disciplines that make up a team working in the OTs (table 2). They were predominantly men (n=12), Francophone (n=13) and 30-49 years old (n=12), with 1-12 years of surgical experience in conflict areas.

Qualitative content analysis

Content analysis reveals participants' perceptions on the main influencers of PS in the OT. We categorised recurring themes in two domains, differentiating between

Table 1 Interview open-ended questions

Interview questions
1 When patients come to the operating theatre to undergo surgery, they expect to receive the best possible care and to be discharged healthy without any complications. What do you think, in an ideal world, would be important to provide these safety conditions in an operating theatre?
2 From your experience, in this operating theatre or in other hospitals where you have been working in Eastern Democratic Republic of Congo (DRC), what do you think about local patient safety conditions?
3 Adverse events are very frequent in all operating theatres, most of them being minor. Could you talk about one adverse event that happened to you or one of your colleagues? What did happen? In your opinion, what were the main causes of this event? What could have prevented it? What did you learn following this event? Do you think it could happen again?
4 In your experience, what has been done to improve patient safety in this operating theatre? What are the remaining problems and challenges to be solved?
5 If you were the hospital director or the Medical Provincial Inspector, what would you like to change to improve patient safety in the operating theatres of the hospital or Province?
6 Existing tools, such as surgical checklist, have been developed in other countries to try to disclose any potential error and anticipate adverse events through a dedicated time to communication within surgical team before any surgical procedure. In which ways do you think such a tool could be or could not be useful in your operating theatre?
7 In your opinion, how does the armed conflict in Eastern DRC influence, or does not influence, patient safety in this operating theatre?

Table 2 Participants characteristics (N=16)

Occupation	Language of interview	Age range	Sex	N	Surgical experience in a conflict area (range in years)
Assistant surgeon	French	19–29	M	2	1–1.5
Expatriate surgeon	English	60–69	M	1	4
Senior surgeon	French	30–39	M	1	4
Recovery nurse	French	30–39	F	1	3–6.5
OT nurse	French	40–49	M	1	1.5–6
		19–29	F	1	
		30–39	M	1	
Expatriate OT nurse	English	40–49	M	2	1
		30–39	F	1	
		30–39	M	1	
Anaesthetist Technician	French	30–39	M	1	10–11
Anaesthetist doctor	French	40–49	M	1	2
		30–39	M	1	
Orderly	Ki-Swahili; French	30–39	F	1	2–12
		40–49	M	1	

OT, Operating theatre.

those found in any resource-constrained setting, and those particular to chronic conflict from the unique lenses of our participants working in conflict-prone areas. Domains, themes and a sample of codes are presented in [table 3](#).

General determinants of PS

Human factors

All participants stressed the importance of HWs' professional ethics and expertise in providing safe surgical care.

Most participants had a good opinion about the overall surgical PS in 'H', emphasising professionalism within the team. Nonetheless, simultaneously, they pointed out recurrent misbehaviour, such as alcoholism and tardiness, which threatened PS and the working climate. All expressed a sense of powerlessness against these misbehaviours with issues remaining unresolved and subject to repetitive and ineffective discussion. Even where staff were suspended, they were still on payroll leading to perceived impunity and frustration for colleagues:

We punished people and after a while, the sanction was removed and the worker was still earning his wages during the sanction. It was the same as giving him 2 or 3 months holidays with paid leave. Joseph

HW expertise was recognised as crucial to PS. All interviewees highlighted the need for continuous medical education while underscoring inequity in access to training:

Here there is an emphasis on doctors, and we forget nurses. Dr Henri

HWs also mentioned the importance of skills in dealing with patient fears as 'it can be the source of

complications'. Such patients may refuse surgery or hide past medical history. Hence, establishing a trustful relation with patients was considered by many as the first step in PS. However, patients' decisions regarding their medical care was considered poor, particularly among those with low educational levels, which was considered a barrier to informed consent.

When someone didn't receive education, then he cannot understand the surgical procedure. It is a kind of mystery when they are going to the operation theatre. Dr Henri

Belief in witchcraft was mentioned only by one participant not originally from Eastern DRC. If surgical death is believed to be caused by sorcery, attempts at root cause analysis and 'litigation' against medical staff might appear futile.⁶⁰

Participants pointed out that knowledge does not necessarily lead to good surgical practice for reasons ranging from lack of will, expressed as 'laziness' and 'lack of dynamism', to lack of means. The will for good practice is often balanced against potentially life-saving measures as mentioned by one OT nurse left with no choice but to use expired devices. The lack of human resources could also alter PS despite individual expertise; when one HW has to work in two rooms at the same time 'either he will do it wrong; [or] he won't do it at all'.

Operating theatre management

Participants highlighted several aspects of the OT management influencing PS, from hierarchical organisation to teamwork and the management of AEs whenever a surgical complication occurred.

Paternalistic management and medical dominance of doctors over nurses within a culture of respect for elders influenced PS. For most, the chief was expected to 'consolidate and promote cohesion among staff' and 'to implement constraints'. Participants had positive perceptions

Table 3 Main codes, themes and domains

Domain	Theme	Subtheme	Main codes		
General determinants of PS	Human factors	Professional ethics	Global perception of the level of local PS conditions; powerlessness; failure in implementation of punishment and blame related to misbehaviour; professional ethics; staff misbehaviour and patient risk		
		Expertise	Experience/on the job training; overseas training; need for continuous medical education; HW staff theoretical knowledge; lack of continuous education for nurses; patient information to be adapted based on patient education level		
		Knowledge-practice gap	Cultural specificities; flexibility of surgical HW in resource-constrained environment; mistakes and resource constraints; knowledge practice gap; litigation		
		OT management	Hierarchical organisation	Leadership in OT; power conflict between seniority and hierarchical/professional position; doctor/nurse differences in setting priority related to work organisation; inequity in accountability related to hierarchical position	
			Work organisation	Hygiene in OT; equipment check, OT check before surgery; operating schedule (or lack of); work organisation/distribution; OT rules and regulation; medical record	
			Teamwork	Teamwork and knowledge about team members expertise, capacity; work climate and teamwork; team communication; multidisciplinary team	
	Hospital management	Support services Resources	AE management	Interest and understanding of surgical checklist principles; AE reporting system; AE and individual responsibility, accountability; AE management; AE prevention system; Evaluation of practice; supervision; expertise in anaesthesia, anaesthesia monitoring and anaesthesia risk	
			Management	Access to support services; blood bank issues; drug supply Lack of human resources; availability of surgical equipment; staff salary and incentives	
		Direct influence	Management	Perceived influence of the chronic conflict in PS	Communication between hospital management and HW Ethnic issues and patient lack of trust in HW; impact of armed conflict on HW/managers' private life, own safety; chronic conflict and psycho-socio-economic consequences; armed conflict and work load; impact of criminality/armed conflict in healthcare access; armed conflict and security issues between patients/relatives; health centres targeted by criminality/armed groups; HW attitude towards ethnic differences; HW neutrality in healthcare
				Indirect influence	Individuals
Hospital management	Corruption; hospital management (board of directors) commitment and accountability; national/provincial governance				
Humanitarian aid	Humanitarian aid support and PS; gap in safety conditions between IO theatre and other OT in the same hospital; modernisation, new technologies				
		Environment	Impact of economic context on HW performance; lack of access to surgical care for poor people		

AE, adverse event; HW, health worker; OT, operating theatre; PS, patient safety.

towards authority, 'respect of the hierarchy' with strong top-down organisation to police and improve PS. However, this paternalistic organisational structure revealed some weaknesses towards PS when, for example, a young surgeon strongly embedded in this hierarchy, considered 'the boss', de facto, protected from any punishable mistakes, or when an orderly remains 'silent' when a superior misbehaves. Age trumped medical dominance with a

young doctor declaring 'you will never be able to manage [the senior nurses]'. Conversely, doctors' dominance in the organisation was perceived as a source of disorder, as expressed by a nurse who regretted that 'doctors schedule patients as they want' without planning according to local resources.

As expected from any OT staff, most participants perceived OT preparation and hygiene as well as

'collaboration' within a multidisciplinary team as essential to safe surgery. However, AEs were mainly perceived as HW's individual responsibility, managed by 'blame' and 'punishment'. One single nurse mentioned that responsibility 'should be to the whole team' when surgical complication occurred, especially if one team member was not fit for work, for example, after alcohol intoxication.

Anaesthesia was considered as major patient threat after several incidents of anaesthesia-related complications with fatal outcomes. Some participants highlighted the increased risk of AEs due to the lack of 'supervision' of inexperienced trainees in surgical care. Nonetheless, a teaching organisation with regular medical meetings could also generate a 'collective memory', and further awareness in AE prevention. Evaluation of practice aiming to prevent AEs was not implemented for unarticulated reasons, with one surgeon simply saying that they did not 'feel the importance of such things'. Finally, when questioning informants about the surgical checklist, most of them understood its principle. However, while some HWs saw it as a tool 'to save energy and time', two doctors questioned its usefulness, fearing that staff would check and tick boxes without effectively performing any verification.

Hospital

Most informants perceived hospital support services, resources and management as important factors in surgical PS.

Lack of available or trustworthy blood banks, laboratory and radiology services were often perceived as barriers to surgical PS, and associated with prior experiences of poor patient outcomes. All interviewed anaesthetists, and some surgeons, expressed concerns about pharmacy, from stock out to quality of drugs and disposable devices where 'purchasers are focusing on low costs and not on the quality'.

All interviewees mentioned the lack of surgical equipment and human resources. Salary issues were raised by nurses and orderlies advocating for financial incentives as a 'serious point' influencing their motivation and level of care:

Yes, in any case, a worker who is not well paid, at times he will say 'but why I have to spend all my time at work and it doesn't change anything in my monthly salary?'
Eric

Lack of communication between hospital management and HWs was highlighted by nurses and orderlies, whereas lack of involvement of hospital administration towards PS issues, where 'no one cares', was perceived by all:

Ah, the negative points, perhaps I can go first through the administration of the hospital. Floribert

Despite these criticisms, surgeons and anaesthetist technicians positively received recent improvements in staffing, expertise and equipment for anaesthesia monitoring, decided and financed by the hospital management.

Perceived influence of the chronic conflict in PS

Chronic conflict was perceived as posing threats to PS both directly, where violence interfered with healthcare, and indirectly, where it worsened operating conditions while providing opportunity for empowerment, resilience and foreign aid.

Direct influence

Lack of access to healthcare and increased workload during acute conflict were perceived as threats to PS. Several participants reported direct attacks on hospitals which destroyed health infrastructure, and in one instance, 'they took us as hostages'. Ethnic grouping on either side of the conflict generated patient distrust of HW or each other, and could compromise HW attitudes towards one particular ethnic group. However, most HWs claimed neutrality, 'whether they are Hutu, whether they are Tutsi, whether they are Congolese', highlighting their role in hiding patients from enemies irrespective of ethnicity.

Indirect influence

The armed conflict seemed to variously influence individuals, work organisation, hospital management and environment.

HWs from all backgrounds highlighted resilience towards the armed conflict. Being isolated by the conflict from western provinces and the capital city, HWs 'learned to deal and work with what [they] had', developing their own training institutions and networks to support health organisations resulting in local empowerment. A surgeon also mentioned feeling rewarded when 'you know that you saved his life', after successful treatment of war wounded.

The armed conflict seemed to intensify insecurity and managerial corruption. Some interviewees discussed the influence of organised crime when responsible staff would not dare to take action as it might impact their own safety. Perceived lack of accountability of hospital management towards national health authorities, and weak 'institutional responsibility' was also mentioned by some HWs as root causes for downstream failures. Lack of transparency and issues of patronage in human resource management, when 'people who are supported by authorities at the higher level' are beyond any control, were reported as sources of OT disorganisation and subsequent patient risk. According to some HWs, this corruption gangrened the whole human resource system, from staff recruitment to management.

HWs expressed mixed feelings about humanitarian aid. They noted both increased availability in material resources related to IO support and the disparity in

quality of resources and routine practice. The difference in practice created 'a kind of barrier between the two; here is Africa and there, it is another world'. Reasons behind transient changes in behaviour, such as checking and maintaining equipment in OT, were thought to be related to an 'external glance' from IO team members. Interviewees observed inequity in quality and supply of drug and surgical disposable items between the IO and other three OTs. Also, inappropriate donations from Europe of expired or broken devices that could be sent 'right away for incineration' generated mixed feelings as hope of worthy donations was still alive. Although some HWs considered donations of surgical equipment as improvement in patient care, others perceived it as a stress to the system, rendering it 'more fragile' in a non-conducive environment ranging from unexpected power cuts to lack of staff expertise in its use and repair.

Participants thought that the current local economic crisis considerably influenced PS. The out-of-pocket patient fee system was perceived as a major medical threat for poor patients who 'won't get the same level of care compared to someone richer'. This economic barrier was perceived as 'the most dominating parameter' in access to safe surgery. Some participants blamed the armed conflict as the worsening factor in the economic failure 'because repeated wars impoverished them, people became poorer'.

DISCUSSION

This study was designed to explore how HWs perceived PS at a university hospital in conflict-ridden Eastern DRC. The two major themes on perceived PS barriers were resource constraints and chronic conflict that both worsened things and fostered resourcefulness. These findings give an insight for further interventions and support a comprehensive and context-based approach to PS in conflict settings.

In Eastern DRC, violence has reshaped the entire social system creating separate political and economic powers against which the national government and international community struggle for implementing a successful peace process.⁶¹ Social and health consequences of civil war and ethnic conflicts are complex, generating long-term social fractures and unhealed wounds between the different communities, as seen in Eastern Europe and East Africa.^{62–64}

The dual influence of the conflict on social and economic development positions HWs as key actors in restoring equity and rebuilding an effective health system. Bornemisza *et al*⁶⁵ qualified conflict as 'key social determinant of health' which deepens inequities in disease exposure, vulnerability and outcomes. The impoverishment of the population, displacements, and reduced access to education and healthcare⁶⁴ clearly threatens PS. HWs sustain socioeconomic losses during direct attacks. As reported in other conflicts, such as in Syria or Bahrain, physicians' neutrality is regularly

threatened,⁶⁶ and interferes with patient–doctor relationship, preventing the trustful relationship needed for PS.^{62 67 68} However, chronic conflict can also be a source of economic resources for health infrastructures and empowerment for HWs, as cited by some study participants who acknowledged the development of skills, resourcefulness and positive impact of aid on hospital resources and PS.

A strengthened health system could have a broader positive impact on further state-building processes in a postconflict context.⁶⁹ A learning organisational culture⁷⁰ can support HWs as active change agents, in spite of the challenges posed by persisting armed conflict, and the difficult peace-building process in the region.⁷¹ Managerial disinterest compromises the quality of purchases, laboratory, pharmacy and blood bank facilities essential to implement perioperative PS.^{1 72 73} Although top-down paternalistic management is widespread in health organisations,⁷⁰ it might be reinforced by surrounding violence related to armed conflict.⁶¹ Indeed, most Eastern DRC inhabitants experienced violence³⁵ with structural and cultural consequences³² that reinforce blame and punishment.¹⁰ This blame culture endorsed by interviewed HWs includes control-based human resource management, and hierarchical organisational structure, and is known for altering team communication, decreasing HW motivation, and eventually increasing AEs.⁷⁰ Funds to develop a just culture involving HWs and lay populations could help standardise practice, reporting and learning, rather than finding blame for mistakes.^{23 70}

Just human resource management is key to PS in conflict setting. As found in Uganda,⁶ participants stressed that lack of resources and staff compromised PS. Social expectations of FL notwithstanding, nurses' and orderlies' report of demotivation due to low salaries may be a reflection of the wide income gap between medical professionals related to systemic corruption with the poorest being the most affected.⁷⁴ HWs need occupational health programmes that go beyond infectious diseases in DRC⁷⁵ to address non-communicable diseases and mental health issues relevant to HWs and PS. Participants reported lethal complications related to alcoholism at work, a possible outcome of experienced or witnessed violence.^{76–78} Patronage and nepotism in human resource management might affect any attempt to implement reporting systems, as corruption might obstruct action against protected staff.^{28 33} Corruption is a classic barrier to healthcare performance, impairing health access and outcomes.⁴¹ This corruption has been fed by the dispute over natural resources in Eastern Congo, enhanced by the tradition of nepotism since Mobutu's regime, and reinforced by the conflict when the lords of war become the most powerful politicians.^{33 61} The influence of corruption in PS highlights the importance of context knowledge when implementing PS interventions that could interfere with existing balance of powers. With the support of an external auditor in the reporting, the

auditing process could foster the process of redistributing power and limiting nepotism.

Patient-centred equitable care strengthens health systems. User fees limit health equity with only $\approx 4\%$ of the Congolese budget allocated to health from 2006 to 2010 rendering donors' health expenditure of an estimated 300% of the national budget less than effective.⁶⁶ This context necessitates a health system approach such as community-based health insurances to overcome national governance disruption, and improve access to safe and equitable surgical and other aspects of healthcare.^{79–81} Patients' remain silent about PS, and experienced AEs due to low educational level and cultural beliefs in disease causation. Alternate and lay-person medical models must be understood and incorporated into medical discourse to enable HWs to give patients accurate and accessible medical information^{60 67 82 83} and involve them in health-care decisions and evaluations.⁸⁴ Surgical teams need training to involve populations and patients in PS, a strategy shown to improve HWs accountability and quality of care.^{85 86} Though, as found elsewhere,²⁵ most participants felt powerless against organisational and structural barriers to PS, training programmes could meet their perceived need of expertise and provide grounds for further interventions.^{86 87} In particular, medical students can transform patient-physician relationship⁸⁸ when taught patient-centred care and about PS measures.⁸⁹

Transparent foreign aid can support local health system strengthening efforts. In Eastern Congo, foreign assistance has been blamed for exacerbating the conflict following the 1996 Rwandan genocide.⁹⁰ A thorough analysis of the context, neutrality in assistance, and combined protection of the communities seems fundamental to any successful aid intervention in conflict contexts.⁹¹

Study limitations

Specific weaknesses are related to the choice of the method and sample. A comprehensive participatory approach, such as action research from inquiry to intervention would have been mutually beneficial in increasing knowledge on PS and facilitating creativity and innovation in designing interventions to address health inequities and AEs in conflict settings.^{92–94} Unfortunately, time and resource constraints prevented involvement of surgical team members in building their own PS interventions related to the current study.

Moreover, a mixed-methods design⁹⁵ could have helped estimate the local PS burden. Although focus-group discussion with a multidisciplinary team could have enhanced team exchange about PS, we decided against it to avoid unnecessary psychosocial harm for participants in a context of strong hierarchical organisation and blame culture. IDIs were chosen given time and resource constraints, but did not include administrative staff and patients, key stakeholders in PS. The study explored perceptions of PS among HWs working in a single large referral and teaching hospital in Eastern DRC which may have limited discussions on their experiences in smaller facilities. The majority of study

participants were male, reflecting the gender balance in the OT, but limiting female insight on the repercussions of gender and sexual violence on PS.⁹⁶ Still, this study has several strengths. It summarises the lack of literature on HWs' perceptions of surgical PS in developing countries and in armed conflict; uses qualitative methods appropriate for exploring the sociocultural dimensions of PS;⁹⁵ and, gives a voice to orderlies who often go unheard. Understanding the context and involvement of the teams are foundational to the success of interventions,^{28 95} to ensure a response based on needs and the existing local capacity.^{97 98}

CONCLUSION

This qualitative evaluation of surgical PS provides preliminary information needed to build context-sensitive interventions. Results highlight the importance of approaching surgical PS from a broad health systems perspective instead of focusing on the operating room. Although existing and worthy of attention, resource issues are only part of the problem. HWs can provide local solutions targeting equity-based health policy, system strengthening and shift towards patient-centred care.

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Contributors FL conceived the concept, designed the study, collected data and conducted data analysis and interpretation. AS supervised the study design, data collection and assisted in data analysis and result interpretation. FL wrote the first draft of the paper, and both authors contributed, read and approved the final version of the manuscript.

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Competing interests FL received support from the international organisation to cover the Ki-Swahili translator fees during the conduct of the study, and received personal fees from the same international organisation, outside the submitted work. AS declared no competing interests.

Ethics approval The study was approved by the Ethics committees of the Congolese Medical University, the University of Liverpool and the participating organisations.

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Data sharing statement The code book can be made available on request to the corresponding author at flabat@wanadoo.fr.

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