Implementation and evaluation of a pilot WHO community first aid responder training in Kinshasa, DR Congo: A mixed method study

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ABSTRACT

Introduction: Prehospital care in many low- and middle-income countries is underdeveloped and needs strengthening for improved outcomes. Where formal prehospital care systems are under development, integration of a layperson first responder programme may help improve access for those in need. The World Health Organization recently developed the Community First Aid Responder (CFAR) learning program in support of this system, providing that it may require adaptation to be contextually suitable and sustainably implemented at country level. This study assesses a pilot WHO CFAR course in Kinshasa, Democratic Republic of Congo, to inform future rollouts and related research.
Methods: We conducted a 3-day in-person pilot CFAR training with 42 purposively selected community health workers. Data collection involved quantitative and qualitative phases. The first consisted of structured pre- and post-training surveys, and a course evaluation by participants. The second consisted of two focus group discussions involving purposively selected community health workers in one group, and a convenience sample of course instructors and organisers in the other. Perceptions regarding course content, perceived knowledge acquisition and self-confidence gain were analysed using descriptive statistics for the quantitative data and content analysis for qualitative data.
Results: Course participants were predominantly male (76.3 %) with a median age of 42 years and most (80.5 %) had no prior first aid training. Most were satisfied that the learning objectives were reached, the logistics were adequate, and that the content and teaching language were appropriately tailored to local context. The majority (94.7 %) found the 3-day duration insufficient. There was a significant self-confidence gain regarding first aid skills (average 17.9 % in pre- to 95.3 % in post-training, $p < 0.001$). Favourable opinions on the course structure, content, logistics and teaching methods were noted.
Conclusion: A CFAR course pilot was successfully conducted in Kinshasa. The course is appropriate for context and well received by participants. It can form a key component of developing prehospital care systems in resource-constrained settings.

African relevance

- Prehospital emergency care systems in Africa need to be developed to address a growing burden of disease and improve outcomes.
- Minimal data exist on first responder systems in the low socioeconomic setting of Sub-Saharan Africa and the Democratic Republic of Congo in particular.
- This study assesses a pilot World Health Organisation's first responder course in a peri-urban suburb of Kinshasa, Democratic Republic of Congo, to inform future rollouts and related research.

- The study findings provide key indications on the potential outcomes of the course in resource-constrained settings and guide necessary adaptations at country or regional level.

Introduction

Lack of organised emergency care systems (ECS) greatly contributes to substantial preventable death and disability in low- and middle-income countries (LMIC) [1–3]. As a key component of an ECS, well organised prehospital care systems save lives [4,5]. Where formal

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prehospital care systems are under development, integration of a layperson first responder programme may help improve access for those in need [6]. The World Health Organization (WHO) recently developed the Community First Aid Responder (CFAR) learning program in support of this system development. The CFAR course emphasises community participation and empowers people to initiate emergency care in the community; its strategy is to train targeted community members and integrate them into a despatch and response system, reducing time to arrival of a trained responder at the scene of an emergency [7,8]. Similar short courses can meaningfully impact emergency care and training layperson responders has proven effective in LMIC [9–11]. As is commonly observed in LMICs, the Democratic Republic of Congo (DRC) suffers from a significant burden of ill health across all age groups and disease categories, and health indicators point towards an urgent need for health system strengthening [12,13]. The country's recent ECS strategic planning identified key system deficiencies [14] and a household survey showed substantial unmet needs in the supply of emergency care to communities in Kinshasa, the capital city [15]. One solution to help address this need lies within prehospital care systems, and the CFAR programme is ideally suited to support system development in the DRC. Several studies on layperson first aid [9–12] yielded well documented educational outcomes. The WHO-endorsed CFAR course builds on these courses mostly through the emphasis on integration to the health system and a context adaptive curriculum (language, burden of disease…). For the course to be contextually appropriate and successfully implemented, an adaptation to the specific local context may be required. This is usually best accomplished through piloting [16] and its evaluation, which involves a systematic collection of descriptive and judgemental information necessary to make decisions related to selection, adoption, and modification of various instructional activities [17].

Given the need in the DRC, we piloted the CFAR course in Kinshasa as a small-scale feasibility assessment aimed to describe and evaluate the process, resources, course content and teaching methodology. It also captures the perceived knowledge and self-confidence gain from the perspectives of both organisers and participants to inform future rollouts and related research.

Methods

Study design

Sequential mixed methods.

Setting

This study was conducted in the DRC's capital city Kinshasa, home to approximately 12 million people [18]. The DRC is located in central Africa, with an estimated population of 100 million [19]. The healthcare system is under-resourced, underdeveloped and most health indicators are concerning [13]. There is no formal prehospital system and a lack of trained emergency care providers [20]. The training was conducted in the suburb of Mbankana located 130 km from central Kinshasa, in the health zone of Maluku 2. This suburb was purposively selected because of its peri-urban nature, its high burden of disease potentially amenable to emergency care (including high trauma prevalence), clearly identified health facilities receiving most emergencies and the presence of a functioning Community Health Workers (CHW) network.

Study population and sampling

Participants were CHWs, a group of laypersons with no medical background registered with the health zone, not on a payroll, and already involved in various health promotion programs such as family planning, malnutrition, childhood immunisation, malaria prevention, etc. Their French designation of "relais communautaires" embodies the crucial role they play, bridging the health system and the community.

Table 1
Participant background.

	n	%
Gender		
Male	29	76.3
Female	9	23.7
Age (years)		
18–27	6	15.8
28–37	10	26.3
38–47	12	31.6
48–57	7	18.4
58–67	3	7.9
> 67	0	0
Level of education		
None	0	0
Primary	4	10.5
Secondary	26	68.4
Tertiary	8	21.1
Time as health volunteer (year)		
< 1	7	18.4
1–5	13	34.2
6–10	9	23.7
>10	9	23.7
Previous trainings attended as community health volunteer		
None	11	28.9
1–2	5	13.2
3–5	5	13.2
>5	17	44.7
Previous First Aid training		
Yes	4	10.5
No	34	89.5
Has an occupation other than health volunteer		
Yes	35	92.1
No	3	7.9
Knowledge of French		
None	1	2.6
Average	15	39.5
Good	18	47.4
Excellent	4	10.5
Knowledge of Lingala		
None	0	0
Average	2	5.3
Good	26	68.4
Excellent	10	26.3
Owns a mobile phone		
Yes	35	92.1
No	3	7.9

Forty-two participants completed the surveys and the course evaluation, of which two responses were irretrievably lost during uploading and two others excluded for incompleteness, meaning a total of 38 responses.

The 42 participants (background presented in Table 1) were purposively selected amongst the 375 active CHWs by the health zone leadership to ensure representation of all health areas within the zone and a mix of gender, age, and length of service.

Training structure and content

The 3-day in-person training (24 classroom hours) was conducted both in a mixture of French and Lingala (vernacular), and locally led by the Emergency Medicine Association of the DRC. The course curriculum was developed from the South African emergency first aid responder (EFAR) [21] and Zambian CFAR [9] courses by a team of WHO experts, and initial versions underwent subsequent iterative reviews. The evidence from various layperson first aid courses helped refine the teaching strategy and determine clear learning objectives. The course was adapted specifically for a greater emphasis on practical skills, amongst other adaptions shown in Table 2. The course instructors (all Congolese) were two certified CFAR trainers assisted by four certified WHO Basic Emergency Care (BEC) instructors from the same professional society (giving a participant: instructor ratio of 7:1). A course coordinator oversaw the organisation assisted by two local health zone staff. The course had three main sections: interactive lectures (7 modules); case

Table 2
Summary of DRC pilot adaptations.

Course component	WHO standard CFAR course (Zambia CFAR)* (South Africa EFAR)**	DRC CFAR pilot
Target audience	WHO: Laypersons explicitly linked into prehospital response system, e.g., CHWs, community brigades, firefighters, civil defence – No general bystanders Zambia: General laypersons SA: General laypersons	CHWs registered/integrated with the health system at district level
Duration	WHO: 3 days Zambia: 3 days SA: 1 day	3 days
Curriculum	WHO: 7 lectures (1hr each) Case discussions (20 min) 15 skills stations (No CPR) Zambia: 54 topics and 26 skills. No CPR SA : 4 modules, trauma +++. Video recorded lectures. + CPR	7 lectures (30 min each) 6 core cases discussions (30 min) 16 skills stations (No CPR) (Added: Snakebite, burns, febrile convulsions)
Language	WHO: English, French Zambia: English SA: English + Afrikaans	Lingala (75 %) + French (25 %)
Instructors	WHO: Not defined Zambia: Drs (foreigners + local) SA: Drs (foreigners + local) + local EFAR champions	Local doctors (BEC certified)
Costs	Variable	60$ per trainee per day (per diem, meals and FA kits)
Knowledge and competency assessment	WHO: MCQs in post-test. 75 % pass mark Zambia: Post-test. 75 % pass mark SA: Post-test. 75 % pass mark Certificate of competency	No objective knowledge and competency assessment. Post-test for confidence and perceived knowledge gain (Likert scale) Certificate of participation

* **Zambia CFAR**: Pigoga JL, Cunningham C, Kafwamfwa M, et al. Adapting the emergency first aid responder course for Zambia through curriculum mapping and blueprinting. BMJ Open 2017;7(12):e018389. Doi: 10.1136/bmjopen-2017–018,389 [published Online First: 2017/12/13].

** **South Africa EFAR**: Sun J., Wallis L. The emergency first aid responder system model: Using community members to assist life-threatening emergencies in violent, developing areas of need. Emergency medicine journal. 2019. Vol 29, Page 673–78. DOI 10.1136/emermed-2011–200,271/.

studies (after each lecture); and 16 practical skills stations. Anticipating a mismatch between the original course curriculum and the local context, the study team methodically reviewed and consensually adopted initial modifications mainly guided by the refined Zambia curriculum contextualised by mapping and blueprinting [9], the South African EFAR [21] curriculum and disease burden reports available at the health zone. The list of lecture modules, the practical skills stations, the equipment list, and the course schedule are presented as Supplementary materials 1 (Appendices 1–4).

Data collection and analysis

1. **Quantitative phase**
   - ○ **Data collection:** Data were collected from pre-, and post-test (Appendix 5 and 6) and a course participant evaluation (Appendix 7), all derived from the WHO BEC and Zambia CFAR course after iterative reviews and consensus amongst co-authors. The data provide insight on participants demographics, trends in perceived knowledge and self-confidence gain, as well as perceptions on the course. Responses were captured on mobile devices on to the Kobo Collect application [22], downloaded into an Excel spreadsheet and securely stored on a password-protected computer. Survey

responses were checked by the research assistant (AM) for adequacy and quality assurance.
   - ○ **Data analysis:** Descriptive statistics were used to interpret the data.
2. **Qualitative phase**
   - ○ **Data collection:** Two focus group discussions (FGD) were conducted in-person at the end of the training. The first involved seven purposively selected participants taking into account the gender mix and health areas representation. The second involved a convenience sample of four course instructors and three organisers. Two separate facilitation guides were developed and used to structure the discussions. The co-authors developed two separate facilitation guides by iterative reviews process and consensus to structure the discussions, expand on aspects not covered in surveys and stimulate additional comments on key others. FGD were facilitated by first author (KD - male) and the research assistant (AM - female) respectively, both with experience in conducting FGD. Facilitators introduced themselves and a relationship was established prior to discussion commencement. Discussions were conducted in French and lasted approximatively 50 min. They were audio recorded, transcribed, translated into English, and checked by the first author who is fluent in both languages.
   - ○ **Data analysis:** Content analysis was conducted in NVivo 14 software (© QSR International, Melbourne, Australia) [23] by co-author EM, who was not involved in any aspect of the data collection. De-identified transcripts were imported to NVivo version and analysed. The coding process was flexible and iterative, allowing for the refinement and development of codes which were checked by the KD and EM during analysis process until consensus was reached. Relationships between the initial codes were established and codes were then grouped into broader themes and subthemes, facilitating the identification of patterns within the data. KD then made comparisons with original transcripts to determine coherence, and EM verified the process.

Trustworthiness

In keeping with Guba's constructs [24], we ensured qualitative rigour. Credibility was ensured by using well-established methods to collect data from consenting participants, debriefing sessions after FGD and the checking of translations and transcriptions [24]. Dependability was ensured through the detailed description of the methods that were employed for data collection and analysis, and through the reflective commentary related to prior assumptions and regular debriefings [24]. Confirmability was bolstered by regular debriefings and reflective commentary [24]. The use of the COREQ reporting checklist (COnsolidated criteria for REporting Qualitative research) ensured transparency and further supported the dependability [24].Though transferability of our results cannot be guaranteed, the detailed description of the setting and the sampled population will assist readers in making a judgement related to the generalisability of the findings.

Ethics

Approval was obtained from the School of Public Health of the University of Kinshasa (REF ESP/CE/160/2022) and the University of Cape Town (HREC 056/2023). Participants were informed of the study purpose, associated risks, and benefits, and how confidentiality will be maintained. They were also told they were free to withdraw at any stage. Written informed consent was received from all participants.

Results

Quantitative phase

Participants surveyed were predominantly male (sex ratio 3:1), with

a median age of 42-years and mostly of a secondary education level or below (78.9 %) (Table 1). Regardless of their length of service, close to a third of those surveyed had never attended a training of any kind and only one out of ten received first aid training. Participants were significantly more proficient in the local language (Lingala: 94.7 %) compared to the course language (French: 57.9 %) ($p<0.001$), hence the predominant use of the former during the course.

There was a significant shift between participants' pre- and post-training self-confidence (average 17.9 % in pre- to 95.3 % in post-training, $p<0.001$) (Table 3), including the readiness to perform first aid when required (31.6 % to 97.4 %, $p<0.001$); the self-reported awareness of scene and personal safety (34.2 % to 84.2 %, $p<0.001$) and the ABCDE approach to life support (7.9 % to 97.4 %, $p<0.001$). Surveyed participants rated the key aspects of the course organisation highly (Table 4). They were overwhelmingly (99.6 %) satisfied with the overall quality of the course components and materials, and strongly commended the course logistics. The instructors' effectiveness was reflected in 97.4 % stating they would recommend the course to others, despite 94.7 % expressing that the course duration was insufficient.

Qualitative phase

A summary of the qualitative findings is presented in Table 5. Instructors were satisfied that the course learning objectives were relevant, clear, and achieved. CHWs particularly highlighted the value of community-based emergency care as an additional component in their package, considering the great need identified within communities.

…The objectives have indeed been achieved. Today, they (participants) are able to identify an emergency in the community, assess it according to the ABCDE approach by looking, listening, and feeling, then appropriately apply lifesaving skills before facilitating the transfer for further adequate care… We can say that the objectives were achieved in 90–95 % of what was planned (Instructor).

Regarding the course structure and content, participants were satisfied with the main components of the course. The emphasis on practical aspects and the hands-on approach emerged as a key determinant in the course's perceived quality and participants' satisfaction.

…The training was of high quality (CHW)

Challenges requiring adaptations and improvements were mainly related to the course duration, the language, and the lack of participant manual. The 3-day duration was deemed insufficient, more so by participants than instructors, which raises the question if this is real or motivated by external factors such as enthusiasm or per diem for course attendance.

Table 3
Pre- and Post-test results.

	Pre-test			Post-test		
Part 1: Agreement with the following statements						
	Agree n (%)	Neutral	Disagree	Agree n (%)	Neutral	Disagree
I feel comfortable assisting any member of the community requiring first aid	9(23.7)	0	29	37(97.4)	0	1
I feel nervous seeing community members in an emergency	22(57.9)	2	14	4(10.5)	2	32
I feel that many around me have the knowledge and skills necessary to take care of emergency patients	6(15.8)	0	32	6(15.8)	2	28
I feel like I don't have the skills to provide care in most emergencies	28(73.7)	2	8	3(7.9)	3	30
I feel ready to help members of my community in an emergency	12(31.6)	2	24	37(97.4)	0	1
I feel confident in front of very sick community members.	8(21.0)	1	29	37(97.4)	0	1
I feel comfortable using standard first aid protocols in an emergency	10(26.3)	5	23	38(100)	0	0
I believe I understand the ABCDE approach in first aid	3(7.9)	5	30	37(97.4)	1	0
I feel I have a methodical approach that allows me to be prepared to perform first aid in emergencies	6(15.8)	2	30	38(100)	0	0
I doubt my first aid knowledge and skills.	26(68.4)	0	12	4(10.5)	0	34
I feel comfortable ensuring the safety of a scene where there is an accident or a patient in an emergency	13(34.2)	3	22	32(84.2)	1	5
I believe that first aid training for community members is important.	35(92.1)	1	2	33(86.8)	2	3
I am confident assisting transportation of a sick or injured person to a health facility for definitive care after first aid	10(26.3)	0	28	29(76.3)	4	5
I feel I have a basic understanding of how community-based emergency care is integrated with the overall health system	14(36.8)	2	22	28(73.7)	3	7
Part 2: Self-confidence in the following circumstances or skills						
(FA = First Aid)	Confident n (%)	Neutral	Not confident	Confident n (%)	Neutral	Not confid.
FA principles for the adult	9(23.7)	2	27	37(97.4)	0	1
FA principles for a child	6(15.8)	4	28	36(94.7)	0	2
FA for the adult with trauma	8(21.0)	0	30	37(97.4)	0	1
FA for the child with trauma	7(18.4)	2	29	37(97.4)	1	1
FA for the patient in shock	4(10.5)	1	33	37(97.4)	1	1
FA of the unconscious person	5(13.1)	2	31	35(92.1)	2	2
FA for a person choking	3(7.9)	3	32	37(97.4)	1	0
Use of the basic elements of first aid kit	6(15.8)	0	32	36(94.7)	1	1
FA maneuvers to open the airway	5(13.1)	4	29	36(94.7)	2	0
FA skills of case of respiratory distress	5(13.1)	3	30	37(97.4)	1	0
FA skills to stop an external bleeding	9(23.7)	1	28	33(86.8)	4	1
FA skills to immobilise a limb fracture	10(26.3)	1	27	37(97.4)	0	1
FA skills to immobilise an injured person	7(18.4)	1	30	38(100)	0	0
Put a person in recovery position.	4(10.5)	2	32	36(94.7)	1	1
Move/transport a sick/injured person	9(23.7)	4	25	36(94.7)	1	1
Seek further help after providing FA	11(28.9)	2	25	36(94.7)	2	0
Ensure the safety of an accident scene	7(18.4)	2	29	38(100)	0	0
Teach other community members FA skill	8(21.0)	2	28	33(86.8)	3	2
Average confidence	**17.9 %**			**95.3 %**		

Table 4

Course evaluation by participants (*n* = 38).

	Unfavourable opinions			Favourable opinions	
Clarity and language of the below course components/materials					
	Very unclear	Unclear	Neutral	Clear	Very clear
Slides	0	1	0	25	12
Lectures	0	3	0	25	10
Quick cards	0	1	0	27	10
Case scenarios	0	1	0	27	10
Skills stations	0	2	0	16	20
Case report form	0	1	0	16	21
Average	**9/228 (3.95 %)**			**219/228 (96.05 %)**	
Overall quality of the below course components/materials					
	Unacceptable	Poor	Neutral	Good	Excellent
Lectures	0	1	0	12	25
Quick cards	0	0	0	23	15
Case scenarios	0	0	0	21	17
Skills stations	0	0	0	20	18
Revisions/recaps	0	0	0	19	19
Case report form	0	0	0	25	13
Average	**1/228 (0.40 %)**			**227/228 (99.6 %)**	
Level of modules content					
	Very difficult	Difficult	Appropriate	Simple	Very simple
	1	2	20	11	4
Relevance of modules content to the local context					
	Very inappropriate	Inappropriate	Neutral	Appropriate	Very appropriate
	0	0	0	30	8
Preference for receiving a course workbook prior the training?					
		Yes	No		
		35	3		
Duration of 3-days of the course is appropriate?					
		Yes	No		
		2	36		
	If No	**Prefers shorter**	½ day	1 day	2day
		0	–	–	–
		Prefers longer	4 days	5 days	6 days or more
		36	3	10	23
Agree or disagree on the below points:					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Course venue	2	0	10	17	9
Catering	0	0	1	13	24
Expectations met	0	0	0	22	16
Instructors' effectiveness	0	0	1	4	33
Productive use of my time	0	0	0	20	18
Course equipped me with FA skills	0	0	0	19	19
Would recommend course to others	0	0	1	19	18
Average	**2/266 (0.7 %)**		**13/266(4.9 %)**	**251/266 (94.4 %)**	

Table 5

Focus group discussions summary.

Category	Code
Objectives of the course	Objectives were clear and relevant.
	Objectives were achieved.
	The venue was suitable.
Resources including logistics	Catering was adequate.
	Training equipment was mostly home-made and adapted.
Course content and structure	Case discussions were useful.
	Skills stations were valued.
Course instructors and participants	Participants were enthusiastic and committed.
	Instructors were had good teaching skills
Main challenges and suggested improvements	The 3-day duration was insufficient.
	Mixing both French and Lingala during the course was commendable
	Participants coming from far need accommodation during the course.
	Ideal to distribute course manuals to participants
Course dissemination and sustainability	Disseminate the training with no or minimal modification
	Monitoring and further studies

…As this training is crucial, 3 days are insufficient because there are several concepts and skills to cover during the training. If it could be extended to 5 or 6 days (CHW)

Instructors anticipated the need to refrain from only using French during the course, cognisant of the setting and the usual CHWs education profile. The predominant use of Lingala was welcomed, though all written materials in French were still in some way a limiting factor.

…Had the trainers taught in French only, I would have recommended that to be changed (CHW)

Both groups recommended the dissemination of the training with no or minimal modifications as dictated by ongoing evaluations and research to fine-tune it.

We hope the training (i.e., as we received it) is rolled out. What will need to be added (i.e., further adaptations) will depend on findings of future studies (CHW)

Discussion

This study is a small-scale feasibility assessment which describes and evaluates key aspects of the implementation of a pilot WHO CFAR training to inform future rollouts. The study findings provide key indications on the potential outcomes the course and guide necessary adaptations [10,25,26].

Evidence shows that emergency care short courses (including layperson first aid courses [10,11,27,28]) increase participants' confidence, knowledge, and skills [29–32]. The WHO CFAR course curriculum was developed with clear learning objectives, a context adaptive content, a rational delivery mode and a well-defined target audience: all key factors for effective learning [33]. Participants, instructors, and organisers agreed that the DRC pilot satisfied these core criteria. The curriculum adaptations for this type of course all reflect local prevalence of emergencies and health system resources, such as interpersonal trauma and CPR in South Africa, and addition of snakebite, burns and febrile convulsions in DRC.

The choice of CHWs as target audience was judicious as they are trusted lay members of their communities who serve as a bridge to the health system which they understand and are part of. This ensured integration with the health system, a fundamental characteristic differentiating CFAR from most existing first aid trainings and representing a core pillar of a successful first responder system [34]. Police officers, taxi drivers, teachers, and other laypersons have been the recipients of emergency responder trainings in other settings [10,11, 30–32]. CHWs roles and activities are tailored to meet the specific needs of the communities they serve [35], including the mitigation of deficiencies in prehospital emergency care [11]. In the context of underdeveloped healthcare system and healthcare worker shortage, it is expected that their role will be further defined as they develop new competencies (such as first aid skills) that relate to CHW–health system integration [36].

Other key areas of adaptation of our pilot are related to the language proficiency and literacy level of participants. The language proficiency of a class correlates with the quality of learning [37]; learning difficulties have been demonstrated in low literacy and illiterate adults [38]. Considering the latest data on adult literacy rate in sub-Saharan Africa (67 %) [39], it is crucial for community-based courses to be kept as basic as possible in this setting, covering a few fundamental concepts and skills well rather than attempting to teach a larger number of topics [10]. Lingala (vernacular) was preferred to French during discussions and skills stations. Participants appreciated the emphasis on practical skills rather than lectures, which correlates with the evidence that workshop-based skills teaching, as well as case study-based discussions are more effective than lecture–based classes in medical education [40, 41]. Cost-effectiveness (not analysed in the DRC pilot) is undeniably a crucial factor of an intervention's sustainability, particularly in resource–constrained settings [42]. The low-tech low-cost approach of a lay responder course enhances self-sustainability [34,43], and rollout in most environments [10]. Although many participants wanted a longer course duration, there did seem to be overall satisfaction and a positive perception of skills and knowledge acquisition; this may therefore warrant further scrutiny.

Our data showed a significant self-confidence gain regarding first aid skills amongst participants, which most likely correlated with self-reported knowledge increase. However, this is not necessarily associated with objective knowledge acquisition. Similar gains have been shown for the WHO BEC course [29,30], and other short courses [10,21, 27]. Knowledge essentially stems from learning and training and is anchored by practice [44]. Ongoing training and objective assessments are needed to retain knowledge [45]. A deviation from the original course was the omission of formal summative competency assessment in the DRC pilot, rooted in the study team's perception of the inadequacy of multiple–choice questions in French to assess knowledge and competency in this setting. Validated skills-based competency assessments tailored to the layperson literacy would be ideal. Although positive perceptions on a course and immediate educational impact as we demonstrated may not necessarily equate to long-term effectiveness of such a layperson emergency care training, a 10-year review of the South African emergency first aid responder course [34] suggests that a comprehensively rolled out adapted CFAR system could potentially increase out-of-hospital capacity and affect outcomes in prehospital care.

Limitations

This study has several limitations. Our self-reported data infer bias. Non-probability sampling of course participants may have incurred selection bias. The relatively small sample size for the quantitative phase limits statistical inferences from the results. However, the significant trends noted in the participant surveys were supported by qualitative data and would most likely be replicable with a bigger sample. The lead instructor facilitation of one of the two FGD may have biased dynamics; but it is unlikely that this played a major role in a group who informally knew one another by that stage, with a facilitator who endeavoured to remain neutral. Another possible shortcoming relates to generalisability of our findings; participants were from a single health zone, and the context variability of a mega city like Kinshasa (35 health zones) is such that the findings may not necessarily be valid for all its urban or peri-urban suburbs, let alone the DRC as a country. However, we have no reason to believe the results would be different elsewhere.

Conclusion

This mixed method analysis of the small-scale implementation and feasibility assessment of the WHO CFAR training in DRC provides informative data on potential contextualisation needs and improvements for a greater educational impact. Participants, instructors, and organisers were mostly satisfied with the key aspects of the adapted course. This satisfaction was correlated with self-confidence gain following training. The predominantly positive feedback is a robust indication that trained community health workers will most likely use the skills learned. Further research is needed to fine-tune some aspects of the training and better understand other facets such as the objective assessment of skill gain, objective knowledge acquisition and retention, cost-effectiveness, *in situ* behavioural change amongst trainees and ultimately the likely impact on health emergencies outcomes.

Dissemination of results

A French translation of this article can be found as Supplementary file 2. The findings of this study will be collated into reports for the DRC Ministry of Health to help inform first responder programmes planning and development.

Authors' contribution

Authors contributed as follow to the conception or design of the work; the acquisition, analysis, or interpretation of data for the work; and drafting the work or revising it critically for important intellectual content: KD contributed 50 %, LAW 20 %, EM 10 %, CC 10 %, and PH 10 %. All authors approved the version to be published and agreed to be accountable for all aspects of the work.

Declaration of Competing Interest

The authors declared no conflicts of interest.

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Supplementary materials

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