Study Protocol: Improving the health literacy of Community Health Workers (CHWs) in rural Southern Africa

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Abstract

Background

Community health workers in rural Southern Africa provide basic care to large numbers of the rural population. However, their impact on health outcomes is suboptimal due to a lack of training and low health literacy. This study uses a collaborative approach to develop and formatively evaluate an interactive health literacy intervention for Community Health Workers.

Methods

The study is taking place across two districts in KwaZulu-Natal Province, South Africa. Later rollout of the intervention and its evaluation is likely to take place in a further district in KwaZulu-Natal Province, as well one district each in Swaziland and Lesotho. The current study is comprised of four-Phases, which will be used to develop and deliver a contextual training intervention with alpha- and beta- tests from qualitative fieldwork, the collection of contextual ethnographic data and a mixed methods evaluation of larger roll-out. The intervention is being developed in collaboration with key stakeholders, in one district (Phase 1), then implemented on a small scale in two districts and formatively evaluated (Phase 2), revised and re-implemented on a larger scale in both districts and formatively evaluated (Phase 3). The data collected in Phases 1-3 will form a mixed methods evaluation used to inform and plan the roll-out of the intervention and evaluation (Phase 4).

The mixed methods are: 1) interviews and focus groups with stakeholders, Community Health Workers and their clients, 2) pre/post assessments of knowledge and understanding of Community Health Workers, 3) ethnographic fieldwork and 4) collection of resource use data.

Discussion

The contextual training materials reflect local and national Department of Health priorities and continuous feedback from Community Health Workers are enabling us to refine the intervention. The mixed methods approach provides a unique perspective on the role of Community Health Workers in improving health outcomes in rural Southern Africa.

Keywords

Southern Africa, Community health workers, health literacy, women's health, child health, education/training.

Background

In 2015 South Africa's child mortality rate was twice the target set by the Millennium Development Goals (1) and maternal and child mortality were twice as high in rural areas compared with urban areas and four times higher for black South Africans compared with white South Africans (2). Infections including HIV/AIDS are a leading cause of death for both mothers and children under five (3). The country faces many other challenges such as tuberculosis and women's health, the latter including uninterrupted availability of contraception, sexually transmitted diseases and intimate partner/domestic violence.

Reasons for the poor health outcomes include difficulties in accessing primary and secondary healthcare owing to distance, transport costs and limited opening hours of primary care facilities. Furthermore, some rural Southern African women may lack health literacy (4), defined by the World Health Organization as "the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health" (5), which has been shown to have a positive effect on health outcomes (6).

Community Health Workers (CHWs) provide health advice and care to households in rural Southern Africa and have a crucial role to play in widening access to health care. CHWs have been identified as a key contributor to the achievement of health-related MDGs (7) and are defined as: "*members of the communities where they work, selected by the communities, answerable to the communities for their activities, supported by the health system but not necessarily a part of its organization, and have shorter training than professional workers*" (8). CHWs support the formal health care system by providing support to clients with hypertension (9) and HIV (10, 11). They also provide women with information and support on reproductive health, child health and general health advice. Such work has significant potential given evidence that health messages are more effectively taken up and understood if they are delivered by a peer educator (12).

There remains a shortfall of CHWs across sub-Saharan Africa as a whole (7), based on an overall average of one CHW per 650 rural inhabitants. Yet, extending the current CHW coverage of the rural population of Southern Africa would not, by itself, be a panacea to the absolute and relative poor health outcomes of this population. This is partly because the quality of the health care that can be provided by CHWs is currently limited by their inadequate standard of training (13, 14), and thus their own lack of health literacy. A technical understanding of the causes of disease may conflict with culturally determined views of disease causation (15). The aim of this study is to develop and implement an

intervention focusing on enhancing the health literacy of CHWs. In order to achieve this aim we will develop an intervention that will accord with the social and cultural background of CHWs and enable them to meet their clients health and information needs. CHWs would attend training sessions to enhance their health literacy skills and active knowledge about pertinent health issues, conditions and the referral system. The intention is that they would then be able to pass on their knowledge and expertise to their clients and hence ultimately contribute to improved health.

The current project, as described in this protocol, is focused on developing a contextually appropriate intervention and planning its roll-out and evaluation. The specific objectives of this project are to:

(1) Develop a training intervention for CHWs,
(2) Undertake a mixed methods evaluation of the intervention,
(3) Plan the roll-out and evaluation if pre-specified criteria are met.

Methods

The study is being conducted over 18 months (October 2015 to March 2017) and includes three Phases of intervention development and formative evaluation (Table 1) and a final Phase during which the subsequent roll-out and summative evaluation will be planned.

Setting

The study is being undertaken in two districts in KwaZulu-Natal Province in South Africa. We will call them district A and district B. KwaZulu-Natal has a well-developed CHW system providing access to this cadre for our work. The districts were selected because Alex Plowright was already active and in touch with CHWs and their organisations in those districts. It is intended that the educational intervention will later be rolled out in a further district in KwaZulu-Natal Province, and one each in Lesotho and Swaziland. There are a number of differences between district A and district B that make it important to include both in the intervention development stage; however each is similar to one of the two additional countries for roll-out, meaning that our final intervention should be appropriate for all five districts. In this study we are working with CHWs from a number of community areas in both district A and district B.

District A is located in the interior of the province. The intervention will be developed in four community areas within this district. IsiZulu is spoken in these areas which have a patriarchal patrilocal household structure. Each community area has a male-led committee,

which is focussed on provision of and access to health and other services. These committees operate in collaboration with the Department for Cooperation of Governance and Traditional Affairs and the relevant local municipality. There are five schools that serve the four areas, two primary schools, one combined primary and two secondary. The closest basic health clinic is 30km away. There is a primary care centre located in the main village, which provides additional services and a mobile clinic service. The mobile clinic is headed by a staff nurse and visits around once every six weeks. CHWs are supported by Sizabantu (a Non-governmental organisation (NGO) training provider), other NGOs or the KwaZulu-Natal Department of Health. However, there are no ward-based outreach teams operating in this district.

District B is located on the coast of KwaZulu-Natal. The district is characterised by high migration, both domestic and international. People move as individuals and families to the area in search of employment opportunities on sugar cane farms, and in tourism. There are four community areas that are involved in the development of the intervention. The different areas of district B are provided with resources and infrastructure by the government, with allocation coordinated by a Department for Cooperation of Governance and Traditional Affairs representative and associated committee. The diversity of the population in the district and area-level management results in a disparity in service provision between areas. CHWs linked to Sizabantu, other NGOs and some who are government-employed operate across four community areas. Again, there are no ward- based outreach teams in operation.

In Phases 1 and 2, we worked with NGO-employed CHWs who operate in the two districts. However, in Phase 3, we are implementing the redeveloped and refined intervention on a larger scale in the two districts, and inviting CHWs who are government-employed to participate in the study.

Table 1: Study plan for Phases 1-3

	Phase 1 Oct 2015 to Jan 2016: 4 months	**Phase 2** Feb to May 2016: 4 months	**Phase 3** Jun to Nov 2016:6 months
Aim(s)	Preliminary intervention development	Intervention alpha testing, formative evaluation and refinement	Pilot intervention beta-testing and formative evaluation
District(s)	District A	District A and B	District A and B
CHW participants	N=8: NGO employed. Must be working as a full time CHW, and must hold no other full time working role.	N=8 from each district: NGO employer. Must be working as a full time CHW, and must hold no other full time working role.	N=32 from each district: No restrictions on employer. Must be working as a full time CHW, and must hold no other full time working role.
Tasks and data collection activities	Initial draft of curriculum and pedagogy. Focus group with participating CHWs. Individual interviews with participating CHWs. Informal discussions with participating CHWs and stakeholders. Each participating CHW to be shadowed at least once during the Phase. Rapid ethnographic assessment of District A. Curriculum development for delivery in Phase 2.	Rapid Ethnographic Assessment of District B. Pre-workshop semi-structured individual interview with each participating CHW. Delivery of intervention v1. Assessment of knowledge and beliefs (pre/post). Post workshop feedback questionnaire. Post-workshop focus group. Observation of a random sample of CHW household interactions.	Delivery of intervention v2. Assessment of knowledge and beliefs (pre/post using adapted Solomon design). Post workshop feedback questionnaire. Fieldworker to shadow CHWs undertaking their visits: random sample of around 5% of all visits made by CHWs including completion and collection of CHWs' visit reports. One quarter of the training workshops to be observed by an independent fieldworker. Observational data on resources used to deliver training collected.
Outcomes and Outputs	Pilot curriculum and pedagogy v1	Pilot curriculum and pedagogy v2. Knowledge and beliefs assessment. Resource use data collection proforma.	Pilot curriculum and pedagogy v3, tailored for each district as required. Refined knowledge and beliefs assessment as required. Results of formative evaluation: (a) Change in knowledge and beliefs and (b) Qualitative evidence regarding effectiveness and explanations for results. Design of evaluation for roll-out (if criteria met). Identification of quantitative outcome measures for summative evaluation from visit reports. Design of assessment for summative evaluation. Preliminary economic evaluation.

Phase 1: Preliminary intervention development

During Phase 1 we worked with eight consenting NGO-employed CHWs selected at random from those who operate within the four community areas located in district A. We developed the curriculum and pedagogy for the intervention from existing curricula (16, 17), initial field work (outlined below), our previous experience in the field and consultation with diverse stakeholders and expert advisors, including health professionals.

We conducted focus groups with the eight CHWs participating in this Phase to enable us to have a nuanced contextual understanding of their varied motivation, work, roles and difficulties. These discussions were supplemented with informal conversations about the role of the CHW, and each of the eight CHWs were shadowed for a minimum period of one day. In addition, there were interviews with community leaders and other stakeholders such as health professionals.

An ethnographic study of the two districts was conducted during Phases 1 and 2. This consisted of rapid ethnographic assessment (18) of the locations served by the CHWs. This provides an understanding of the context of the setting of the intervention, as well as, for example, the current services provided to households and for training CHWs and any gaps in provision of either. The rapid ethnographic assessment also provided detail about the socio-cultural context of the different community areas in the two districts, and will assist with identification of any comparison between the two districts.

The content and format of the participatory and interactive training workshops to be delivered in Phases 2 and 3 will be informed by the data collected. We also have consulted with domain experts in the two topic areas selected. These areas are:-

1) HIV/AIDS sexually transmitted disease and tuberculosis (HAST).
2) Women's sexual and reproductive health and rights (WSRHR).

These topics were selected in keeping with the government's focus that CHWs should widen their remit from focussing purely on HIV. We considered including non-communicable chronic diseases such as hypertension, obesity or diabetes. However we felt that this would exceed the resources and time-scale available. The final curriculum was informed with advice from Department of Health employed individuals and nurse educators.

Phase 2: Pilot intervention refinement

The eight CHWs from the four community areas located in district A who were involved in Phase 1, participated in Phase 2 along with a further eight CHWs from across the four community areas in district B who were selected at random from CHWs who responded to a call for applicants. All 16 CHWs were invited to participate in the training workshops that were developed during Phase 1.

The workshops were held in community halls and transport to the venues was provided by Sizabantu. Each group of CHWs participated in two workshops. Each workshop was two days long, and took place at a time acceptable to the participating CHWs. The training sessions were delivered by Sizabantu staff, in collaboration with an expert advisor who had been involved in Phase 1. We kept a log of what resources were used to deliver the training intervention to develop a data collection proforma for use in the preliminary economic evaluation.

Formative evaluation of Phase two will comprise four elements:

(1) An individual, semi-structured interview was conducted with each CHW prior to participating in the workshops to explore their perspectives on their role.
(2) Multiple choice format assessments are administered prior to the start and at the end of each workshop to evaluate CHWs' knowledge acquisition.
(3) CHWs are asked to complete a post-training survey in order to obtain feedback and suggestions for further development of the content of the training.
(4) Each of the participating CHWs participates in a focus group conducted towards the end of the Phase that explores their views about the relevance of the training to their work and provides an opportunity for group feedback on their participation in the programme.
(5) A proportion of the participating CHWs' household visits are shadowed by a fieldworker, who l completes a visit report form including referrals made and followed up, and the use and accuracy of the content of topics addressed in the training workshops by the CHWs during interactions with women in households.

We will amend the educational intervention (organisation, intent and delivery) on the basis of the above four elements.

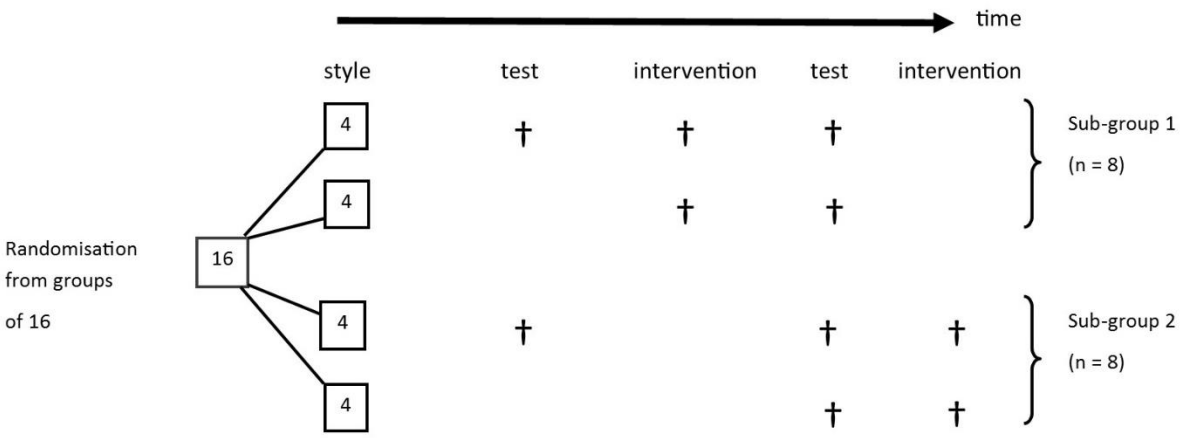
Comparing evaluation findings from the two districts and synthesising such data with our Phase 1 experiences will enable us to determine the extent to which the intervention needs to be tailored for each site.

Phase 3: Pilot intervention beta-testing

The revised training intervention will be rolled out in additional community areas in districts A and B, with the aim to recruit 64 CHWs not involved with the previous Phases of the study. Ideally, we will select participants at random from CHWs volunteering to participate, as in the previous two Phases of the study. However, as this Phase is likely to include government-associated CHWs, it is unlikely that we will have full control over selection. Half of the participant CHWs will be recruited from each of the districts. Within each district the 32 participants will be divided into two groups of 16 based on location. Each of the 16 will attend two workshops (2 days each). One topic will cover (HIV and TB and Sexually transmitted disease (HAST) and the other will cover women's sexual and reproductive health and rights).

Formative evaluation will comprise the same four elements as used in Phase 2; with around 5% of CHWs' household visits being observed. We will also modify delivery of the multiple choice assessment using an adapted Solomon four-group design to reduce the bias introduced by interaction between pre-test sensitisation and the training (19). The adapted Solomon Design is shown in Figure 1.

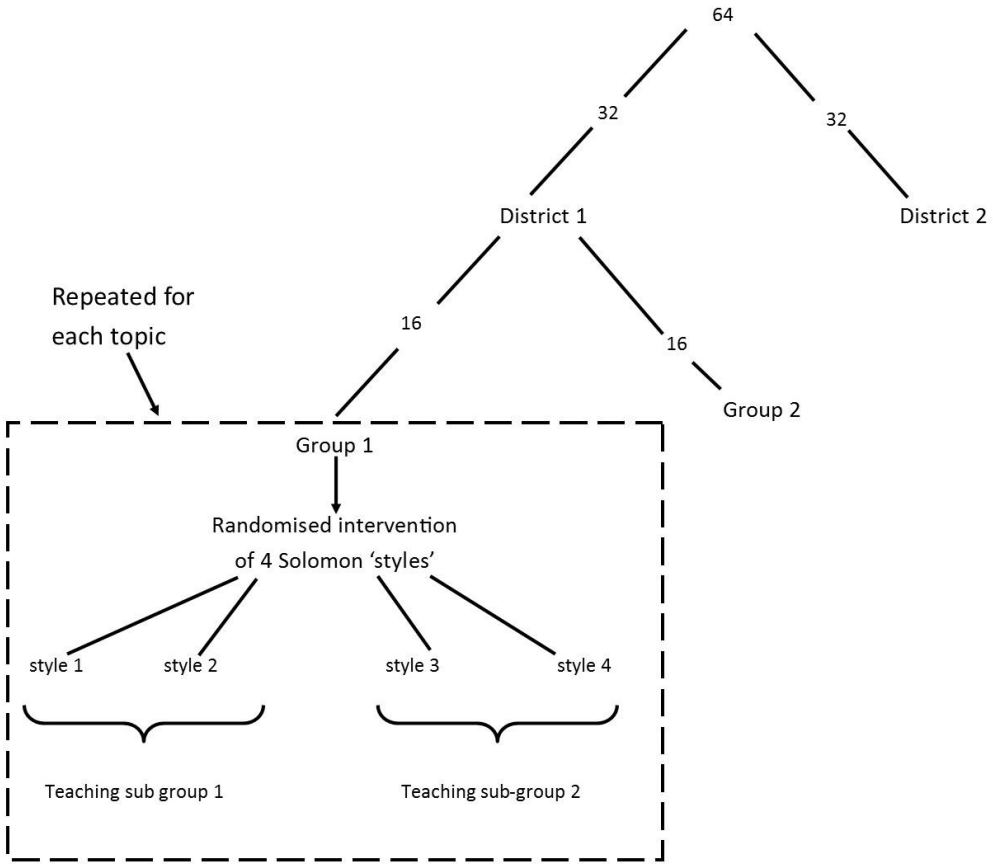
Figure 1. Representation of the adapted Solomon Design



The adaption to the 'pure' Solomon design ensures that no CHW is completely excluded from having the intervention. This means that the intervention is delivered (for each topic) to a group of 8, one group having the intervention in phase 1 and the other in phase 2. Each group of 16 is randomised by picking names from a hat. We will consider the rather informal method of randomisation suitable for a field experiment. The names shuffled in public view

and base-line measurement will, we believe, be able to re-assure critics. The full design is laid out in Figure 2.

Figure 2. Representation of dispensation of all 64 CHWs in phase 3.



There will be two additional forms of data collection in Phase 3:

(1) Resource-use data will be collected using the proforma developed in Phase 2.

(2) A randomly selected sample of around one quarter of the training workshops from each district in Phase 3 will be observed by an independent fieldworker for audit purposes.

Phase 4: Planning for roll-out

Visits to sites in Swaziland and Lesotho will be undertaken to develop relations with collaborators to facilitate roll-out of the intervention. We started this process in January 2016 for the planned roll-out or on receipt of additional funding, on completion of Phase 3.

We will triangulate research findings from Phases 1-3 to complete our mixed methods evaluation of the intervention and use the results to make any necessary amendments to the content of the intervention prior to roll-out. We will design the evaluation for the roll-out possibly using a step-wedge design (20, 21). We will use the data available from the visit reports collected in Phases 2 and 3 to identify feasible health behaviours to use as outcome measures and which are related to the content of the sessions. We will then model improved health contingent on changes in these health behaviours and combine this with the resource use data collected in Phase 3 to undertake a preliminary economic evaluation and sample size calculation for the roll-out evaluation.

Participants – CHWs

A sample of CHW participants who are employed by or work in connection with Sizabantu, the training provider, or other NGOs were invited to participate in Phases 1 and 2; a combination of NGO-employed and KwaZulu-Natal Department of Health (government-employed or associated) CHWs will be invited to participate in Phase 3 of the project (Table 1). All CHWs will work within one of the two districts (A and B) and will have a caseload of households that they interact with on a regular basis with a caseload of between 25 to 120 households. There will be no monetary gain for any participants, however CHWs should benefit from participation in the training programme, and the enhanced knowledge this will provide them with in order to improve their own practice. There will be no cost for CHWs to participate, and they will not lose wages for time spent participating. The workshop dates will be confirmed in consultation with all participating CHWs. CHWs will be given the opportunity to opt out of participation in the intervention and opting out will have no negative effect on the CHWs' professional or financial status. Each CHW will be given a unique identifier number for their participation in the study, which will facilitate anonymity and confidentiality of all data obtained through surveys, interviews and focus groups.

Data analysis

Interviews and focus groups: All interviews and focus groups will be recorded and transcribed in English prior to thematic analysis using NVivo 10. Of particular importance will be: (1) a comparison of findings from the two districts, (2) a comparison of the experiences of CHWs and their households/clients according to CHWs' gender and (3) linking results between an individual CHW and their clients to enable us to identify barriers and facilitators in the relationship between clients and CHWs.

Phase 2-3 pre/post knowledge and beliefs assessment: We will use data collected in Phase 2 to provide feedback on the intervention and validate the items used in the assessment through a qualitative analysis of items where scores did not change or remained relatively low in the post-training assessment. We expect sufficient data to be available from Phase 3 to enable an evaluation of the assessment's internal consistency using Cronbach's alpha. We will consider item-level performance and amend any items that are not performing as expected (e.g. where responses on a single best answer item are split between two answer options we will check for ambiguity). The adapted Solomon four-group design will allow us to identify interactions between the pre-test and workshop, including whether the pre-test influenced performance in the workshop, or whether the pre-test alone produced knowledge gain.

Phase 2 and 3 ethnographic study: notes and photographs will be thematically analysed and used to develop a case study for each of the two districts, which will be used to inform the local context and appropriateness of the workshop content.

Preliminary economic evaluation: data on resource use will be integrated with standardised resource unit costs to estimate the cost of delivering the intervention in a typical district in Southern Africa based on the class size used in Phase 3. We will estimate the effect on health outcomes that would accrue from changes in each of the health behaviours identified as outcome measures from CHWs' visit reports using evidence available in the literature. We will then use country-specific cost-effectiveness thresholds, based on per-capita GDP (22) in a 'headroom' approach to analysis (23) to estimate the level of change in health behaviours required for the intervention to be cost-effective.

It would not be prudent to consider rolling-out the intervention, without evidence from the formative evaluation undertaken in the current study that such roll-out could be cost-effective. We have therefore established the following criteria for pursuing roll-out, which will assessed in the formative evaluation, and may be used to develop the pilot, after Phase 4 of this study:

- At least 50% of CHWs invited to participate in the intervention agree to do so.
- At least 80% of CHWs who agree to participate attend all of the training sessions and complete both pre and post assessments.
- Scores between pre and post assessments in Phase 3 increase.
- Sufficient women in households that comprise the caseloads of the participating CHWs are willing to participate in the evaluation to enable us to gather meaningful qualitative feedback from clients.

- The cost of intervention delivery is less than the value of potential benefit at each country's threshold for cost-effectiveness given optimistic assumptions of effectiveness.

Discussion

CHWs can improve health outcomes – and are likely to do so cost-effectively (24, 25). However, their training can be sub-optimal, in terms of quantity, quality and frequency (13, 14, 26) and this means that CHWs' potential effectiveness is not being fully realised. One reason for sub-optimal training provision may be a lack of evidence on how it can best be developed and delivered (27); a deficit this study seeks to remedy.

The use of both qualitative and quantitative analysis of the role of CHWs and of the training intervention integral to this study provides a unique opportunity for developing an understanding of the role of the CHW, as well the need, costs, challenges and opportunities of implementing community-tailored training. We will also provide evidence regarding the dynamics between CHWs and their communities, households within their caseloads, local socio-cultural contexts and the place of the CHW in relation to the state health system.

A key challenge for this study is to identify valid and reliable quantitative outcome measures relating to reproductive, maternal and child health that could be feasibly employed in an evaluation of the roll-out of the training intervention. We aim to collect such data from CHWs' visit reports, rather than a separate data collection exercise. Such work is critical if we are to be able to provide the much-needed evidence on how best to provide cost-effective training for CHWs in resource-poor settings (25, 28).

The study we propose incorporates a multi-stakeholder contextual approach: engaging stakeholders in a planned and repeated cycle of development, testing, reflection and formative evaluation. This involvement of CHWs, their employers, communities and other stakeholders from the very beginning thus ensuring that local socio-cultural norms, gender and household dynamics are acknowledged and negotiated throughout.

List of abbreviations

CHW: Community Health Worker
NGO: Non-governmental organisation

Declarations

Ethics and informed consent

The protocol for Phases 1-4 has been approved by the Biomedical Sciences Research Ethics Committee at the University of Warwick Medical School (Reference REG0-2015-1663). It has also been approved by the South African Human Sciences Research Committee.

Informed consent will be obtained from all participants. Information sheets in isiZulu or English will be provided to all potential participants and a local information session will be held. Informed consent forms will be obtained from all participating CHWs and households, who will be provided with an information sheet and their requested participation will be explained in detail. All potential participants will be offered a period of 24 hours in which to assimilate the information, and they will be reassured that they are not required but being invited to participate. After the 24 hour period has elapsed, a signed consent form will be collected from the household member or CHW, or confirmation of their non-participation. Both participating CHWs and households will be advised that they are able to withdraw from the research at any point without negative repercussions.

Consent for publication

Not applicable.

Availability of data and material

The finalised training materials will be available on request from AP following review after Phase 3 delivery. Quantitative data from the study would be available, in a suitably anonymised form, on request from AP and further detail will be provided in a publication presenting these data. Qualitative data are unlikely to be available given the potential that an individual could be identified.

Competing interests

AP is a trustee of Sizabantu, the project implementation partner. The other authors declare they have no competing interests.

Source of funding and role of the funder

This study is funded by the UK Medical Research Council's Public Health Intervention Development Scheme. The funder is independent of the study design, implementation and reporting processes.

Authors' contributions

AP concieved the study and drafted the initial study protocol. CT, JS and RL provided intellectual input on the protocol submitted for funding, on which this paper is based. GLH provided intellectual input relating to the qualitative aspects of the study, DD on the education and assessment aspects and CT on the health economic aspects. All authors provided comments on earlier versions of this paper and approved the final version for submission.

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