"I am now 5 steps ahead"- How co-design platforms sustain Kenyan community health volunteer engagement

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ABSTRACT:

Objectives The aim of this study is to examine how human centered design (HCD) as a platform for co-production might function to explain CHV motivation in self-directed and self-funded community health activities. Sustaining engagement has been difficult for CHVs who lack monetary incentives, expense reimbursement, and are rarely given opportunity to give their own voice to local health priorities.

Design Qualitative study utilized focus group discussions 12 months post intervention and included both an inductive and deductive level of analysis.

Setting Three community health units (CHU) representing Kenya's diversity were selected with the local Ministry of Health including peri-urban slum, rural agrarian, and a unit where informal day labor and rented housing was the norm.

Participants The participants were selected according to the Kenya's community health strategy norms and had previously had the standard basic community health training.

Intervention A 3-day training rooted in HCD utilized multiple quality improvement tools (asset mapping, root cause analysis, key drivers) in order to help CHVs uncover unarticulated community needs and assumptions and encourage behavior change. Action plans with Plan-Do-Study-Act cycles were tracked longitudinally.

Results Key themes were self-interest, common goal, gratitude/ indebtedness. Additional thematic analysis identified altruism as supporting sustained engagement.

Conclusion This study supports HCD as a platform for sustained CHV engagement. It builds the evidence for self-interest, common goal, and gratitude/indebtedness as sustaining factors. These factors are also seen in process-based theories that operationalize and measure trust building reciprocity cycles that mirror the iterative P-D-S-A cycles seen in HCD.

KEYWORDS: Community health, Trust, Sustainable Development, Behavior Change, Reciprocal Relationships, Kenya, Human Centered Design, Community Health Partnerships

Background

Community health workers (CHWs) and volunteers (CHVs- will be used henceforth) have been identified as key actors in addressing the shortage of health professionals in low- and middle-income countries (LMICs) [1, 2]. They play multiple roles to extend health services and to deliver behavior change strategies so healthier behaviors are adopted at the household level. They work to create trust between the health system and the community [3]. CHVs provide a special link between health care professionals, government officials, and the community, often supporting the translation of evidenced based medicine into the local context [4, 5]. Sustaining the motivation and engagement of this cadre, however, has been notoriously problematic [6]. CHVs frequently work in the informal sector and do not receive compensation for the time they invest into community work [7, 8]. This reality has driven interest in examining a broad range of factors that influence the motivation and retainment of the CHVs.

Factors that influence motivation and performance of CHVs are multi-dimensional. Both intrinsic and extrinsic factors have been identified [9-11]. Financial incentives are discussed as a both facilitators and barriers [12, 13]. There is a substantial negative impact on motivation when external donors leave. When performance-based financing for CHVs stops, it raises legitimate concerns about short term donor funding versus a longer-term policy driven perspective [8, 14]. At the same time, volunteerism and serving the community are consistently reported as important motivators [15].

Supervision and training are also described in multiple studies. In a review of 29 case studies of large scale CHV programs the lack of supervision and training were seen as negatively impacting

CHV motivation and the importance of the relationships between the supervisor and the CHVs was noted [16, 17].

Recurring descriptions of facilitators and barriers of motivation point to the highly relational nature of the work done by CHVs. These relationships, among CHVs, between CHVs and other healthcare professionals, and community members are significant [15, 18-23]. This also points to the importance of trust as a core element working within or between health system actors [3, 24-26].

Human-centered design (HCD) and design thinking in general, poses a new perspective on addressing the issue of sustaining CHV engagement and building trust through working together [27]. Increasing CHV agency and engagement in the planning and prioritizing of their work might be a source of additional motivation. HCD pushes for the co-production of solutions that are culturally relevant and not 'pre-determined' [28]. It allows for more flexibility and for re-designing processes from the bottom-up and can provide a pragmatic framework for sustained engagement [29]. Since CHVs fill a position between household decision makers and the formal health system [7, 30] they are a natural partner for culturally relevant co-design processes.

Human Centered design has been utilized across a broad range of health issues [31]. The use of HCD is relatively new in the context of CHVs however. Anderson et al., describe using HCD with CHVs in northern Kenya to develop and test four different solutions to supply chain problems. Direct engagement of CHVs yielded critical insights that allowed local adaptations [32]. This growing body of HCD work in health systems [33, 34] and with CHVs, supports the idea that

HCD might be a co-design platform on which increased CHV agency can influence engagement and sustain motivation.

Kijabe Maternal Newborn Community Health (KMNCH) based in Kenya at Kijabe Hospital, aims to strengthen CHVs and support implementation of the Kenya Ministry of Health's community strategy [35]. KMNCH has a more than 10- year history of partnership supporting the MoH and capacity building in different community health units in the region. KMNCH works on an invitation basis with local MoH to address their priorities. The relationships between KMNCH and institutions as well as with the community have grown organically as a result of the embedded and long-term commitment to the region. In Kenya, CHVs are unpaid volunteers based on the national Community Health Strategy. Since there are no financial incentives, identifying ways to keep CHVs engaged is an important priority.

The KMNCH team developed a three-day workshop theoretically rooted in HCD named SALT (Strengthen, Appreciate, Learn, Transform) [36], as a response to the need for motivation strategies. The workshop prioritized partnership building and altered the traditional hierarchical structures by bringing CHVs into a new role, that of planning and co-designing interventions for their communities. The goal of SALT is to "enable local stakeholders to self-define health action plans and implement, measure and be accountable to them in their communities, using only locally available resources"[37].

A year after this SALT workshop took place, and in the absence of any funding, CHVs remained engaged and were still active in the iterative process of making plans, implementing, and adjusting them. This study aims to determine what sustains the engagement of CHVs in activities

that address the spectrum of social determinants of health using only their own resources, 12 months post intervention.

Methods

Study Design

This qualitative study is nested within a larger longitudinal study, with the objective of evaluating the impact of a 3-day workshop rooted in HCD called SALT. The longitudinal evaluation tracked action plans, quality improvement markers like plan-do-study-act cycles, and the public health impact on a range of social determinants of health. These data are reported elsewhere [37]. Data collection occurred by conducting focus group discussions (FGDs) and direct observations at three-, six-, nine- and 12-months post SALT training. As part of this larger study we performed a qualitative analysis using the data collected at the 12-month FGD in order to investigate the current study question of what sustained CHV engagement over the course of the study period.

Setting

Two community health units (CHUs) from Kiambu County were located in rural agrarian areas and represented the subsistence farming economy. One CHU was located in a village with a mid-sized commercial center consisting of one room open store fronts and other small-scale informal businesses, including motorcycle transport options and the local matatu (small vans) transport hub. The CHU in Nakuru county was from a peri-urban high-density informal settlement adjacent to commercial flower farms where day laborers worked. The three CHUs were

purposefully selected in conjunction with the local MoH to represent the spectrum of economic as well as living contexts present within CHUs in Kenya.

Participant Selection

CHV selection for the SALT training followed Kenya's Community Health Service protocol. During the HCD workshop, all CHVs were assigned to a working group, each composed of six to eight men or women, and were then invited to participate in quarterly follow-up FGDs. Inclusion criteria for these FGDs was participation in the SALT workshop. Participation was voluntary.

Data Collection Procedures

KMNCH project staff, who also facilitated the SALT training, conducted the FGDs which lasted 45 minutes to two hours. An interview guide was used during the discussions and an observer took notes on group interaction. The interview guide consisted of open-ended questions beginning with, "We would like to ask you about your experience with your SALT team." Probes were used to encourage participants to elaborate. Participants were asked to report on how the action plan they developed during the SALT workshop had proceeded, how they overcame obstacles, what results they had seen in the community, and how SALT had benefitted them personally. The recorded FGDs were transcribed and translated for semantic meaning from the vernacular language to English and the 12 transcripts stored on password protected project servers.

Ethical considerations

The study was approved by the Kijabe Hospital Institutional Review Committee. Individual informed consent was written and verbally recorded.

Data Analysis

Data analysis of the 12-month FDG transcripts occurred in three separate stages. Due to data quality issues two of the transcripts were excluded, leaving 10 for analysis.

Stage 1: Inductive analysis

The analysis was performed in separate steps by a 7-person multi-disciplinary and international team comprised of KMNCH (national as well as international) staff and two external researchers (HR) (DO). A rich understanding of the research context and vernacular languages by the embedded research team was enhanced with the independent and alternate analysis provided by the two external researchers. The Kijabe field staff reviewed several transcripts and generated codes based on initial impressions using a constant comparative and iterative process to arrive at an initial inductive coding structure. This was compared to the initial inductive coding structure developed by a member of the research team (DO) who was completely blind to any of the SALT work. This step provided the first level of control for bias of the embedded research team. These two initial coding structures were reviewed by the senior researchers who found substantial agreement between the inductive coding structure developed by the embedded research team and the completely blinded experienced qualitative researcher. This structure was cross-checked with the Kijabe Field staff. To further control for bias, a second external researcher (HR) also performed a separate independent examination of several transcripts and developed an initial inductive coding structure, also using a constant comparative and iterative process. Senior researchers examined these coding structures and found high alignment. At this

point two members of the research team (WM and HR) were tasked with developing the final coding structure. They met to negotiate consensus over any remaining differences and decided upon a final code structure. This was reviewed by the team. Using the qualitative software Dedoose, HR and WM independently applied the final coding structure to three transcripts to test inter-rater reliability. At several stages throughout, feedback from the other team members helped refine the code definitions. After discussing differences in coding and again refining the code book, WM and HR systematically coded all remaining transcripts.

Stage 2: Deductive analysis

Transcripts were coded using a deductive process based on pre-set codes from an original theoretical framework in the published literature on trust building in health systems [38]. This deductive step was critical in examining if the HCD practice framework could be linked to theoretical behavior change processes that supported sustained CHV engagement.

Stage 3: Inductive coding

Excerpts, not coded previously, were labelled with codes from the inductive code structure in order to draw out nuances that would otherwise be missed.

Results

Sixty CHVs were actively engaged at 12-months post SALT workshop, in the absence of any external incentives. The groups connected on a regular basis and actively engaged in their community, using their own resources to achieve activities related to social determinants of

health. CHVs ranged in age from 18-81. Most (78.6%) were not formally employed, 66% were women and 63% were married (Table 1).

Insert Table 1 about here:

Themes identified

We present key themes that emerged from both inductive (bottom-up approach, where codes emerge from the data) and deductive analysis (top-down approach, using pre-set codes based on theory found in the published literature on trust building in health systems). Inductive coding resulted in themes that largely corresponded to the ones used in deductive coding. We focus on the deductive results here, holding the inductive results as confirmation of validity and bias-check to examine if sustained engagement corresponded to the process-based theory of reciprocal relationships for trust building proposed by Adam et al.[38].

Deductive Coding

The three main themes used in deductive coding were self-interest, common goal, and gratitude/indebtedness.

Self-interest

The CHVs reported that they benefited from the HCD workshop – be it financially, personally or from seeing transformation in the community. Sub-themes of self-interest include extrinsic and intrinsic motivation. Extrinsic motivation refers to an increase in sense of power, reputation, or status. Intrinsic self-interest describes personal development, increased sense of self-worth, belonging or self-efficacy.

CHVs' motivations are illustrated by these quotes: "*we wanted to develop ourselves and make profit*" (IV, p.4)[1].

"...I learned that I do not have to look for resources far away from me. I have to look at what I have around me and use it to my advantage..." (X, p.4)

"...We can now afford vegetables in our meals and live a healthy life...You can save a total of Kes300 a day when the vegetables and fruits are from your kitchen garden..." (II, p.3).

The action plans the groups developed had the dual effect of addressing their intrinsic self-interest (having access to cash, increased awareness of available resources) as well as the extrinsic self-interest (increasing status).

"...Whenever I walk around the town, people have now recognized me as a CHV..." (X, p.4)

Common Goal

Common goal is demonstrated in the action plan CHVs developed. These plans ranged from building tippy taps (a rudimentary hand-washing contraption), starting table banking or 'merry-go-rounds' (group-based funding/lending strategies), reaching their communities with health messages, and kitchen gardens (planting staple vegetables in small spaces near the house). CHVs designed the action plans in ways to benefit themselves (saving money, healthier nutrition), as well as to benefit others and so fulfill their mandate of delivering health promotion messages (such as the importance of eating greens and vegetables)

When asked why, one participant explained,

1 Transcripts are coded using roman numerals. Key can be found elsewhere.

"...we wanted to make our village a cleaner place and eradicate diseases like cholera… if we tell people the importance of having tippy taps in their homes, we will be able to reduce the diseases like diarrhea amongst the children…" (p.2).

"The kitchen garden can help in saving of money. Some of your neighbors and relatives may start kitchen gardens of their own when they see on at your place. This can help spread the good news of eating organic vegetables…" (V, p.4).

One group member reported that she now harvests most of her vegetables from her own garden and that at least 50 women have followed her example. Six of the 10 groups started a group financing strategy ('table banking' or 'merry-go-rounds') as an additional plan that enabled them to invest in livestock, stoves, water tanks or other household items. Their mutual financial investment seems to demonstrate the high level of trust that grew.

"...During the training, we were asked to meet and discuss with our team members on how to grow the group. We decided to hold meetings every week to know how the rest of the team members were doing…" (IX, p.2)

CHVs were entrusted with co-designing plans. As benefits appeared, this progress was recognized with high levels of thankfulness.

Gratitude/Indebtedness

To a large extent, CHVs saw and celebrated the changes that occurred. They expressed gratitude towards the KMNCH team and the SALT workshop. Recognizing the benefits, the CHVs

expressed a desire to continue their work and see even more positive change. The following quotes give insight into these interactions:

"...SALT has really helped us. We have been able to communicate effectively with the general public. It was so hard for us in the beginning and especially me. I was very shy. I could not speak in front of people but now I feel so empowered to do so. I have seen some great improvement in my life. I am now five steps ahead..." (X, p.1)

CHVs explicitly expressed gratitude for the follow-up with the KMNCH team-identifying the importance of relationships. One participant thanked the Kijabe team for "*always thinking about us and visiting us" (I, p.1)* and another stated *"we are happy that Kijabe has been following up on us" (X, p.6).*

Inductive Coding

Inductive coding occurred at multiple levels. As stated earlier, the inductive results corresponded to the key deductive themes. Inductive analysis, however, identified two additional themes: altruism and barriers.

Altruism

Altruism also appeared to motivate CHVs to stay engaged. In a volunteer setting, this is a slight nuance to self-interest and yet distinct enough to stand alone. There were several instances in which CHVs went above and beyond what their 'job-description' required. One female CHV explains:

"...A few weeks ago, I received a call at 11pm from a lady saying that her daughter was very sick and that she needed my help. I went to meet her and found her carrying a sick child in her

arms. They have assumed that I offer all the medical help they need. At that time, I had no money with me. We had to ask a stranger to offer a lift to the nearest hospital. Sometimes it really pushes you to dig deep in your pocket to help someone…" (X, p.4).

In this situation, this CHV went out of her way late at night to help the sick child.

One male participant shared that they, as a group, will continue visiting the households to check on the tippy taps and to remind people to maintain hygiene. He concluded by saying, *"not for our sake but for their own benefit" (V, p.7).*

Altruistic motives are present in the data and may influence the motivation of CHVs to remain engaged.

Barriers

CHVs described cultural as well as structural barriers and shared about being disappointed by their government leaders. Cultural challenges included the communities' general fear and mistrust towards the health system:

"…Most people are suffering in homes with the fear of coming to hospital. I asked around what could be the reason preventing people from coming to hospital and this is what I was told. The rule in the hospitals is that you have to get tested for HIV before you can see a doctor. People are scared of knowing their status…" (IIX, p.4)

"…Most community members have refused to seek medical care. Some of them believe that the illnesses they have are as a result of witchcraft" (IIX, p.4).

CHVs reported frustrations over vandalism and that many times their work was destroyed or stolen:

"...It is the same story all over. The idea is good but it has a problem. It's hard getting the materials. Once we get access to these materials and build tippy taps, they get destroyed" (IV, p.3).

Structural challenges included issues with the education system, corruption or with the nature of volunteering.

"...The public health officer asked us to collect household data and give reports. We did exactly that. I think we should get rewarded for the work we do. The health officials could be using money allocated to CHVs to benefit themselves. It is very unfair. We are in the dark..." (IX, p.3)

"...Some of them (community members) say that we get paid for the work we do in the community and ignore anything we tell them" (I, p.3).

CHVs are expected to show results yet receive no payment. The assumption from the community, however, is that CHVs *are* receiving money, leading some community members to dismiss them. Additionally, CHVs face disappointing relationships with public health hierarchy upstream:

"...There is little communication between the county government and the CHVs. The staff at the local health center does not recognize us. We do a lot of work for the public health office yet get nothing in return. We feel so demoralized." (IX, p.3).

When CHVs failed to make progress on their action plans, they tended to focus on excuses and often returned to asking for external resources, forgetting their ability to create solutions using locally available resources.

Discussion

In this study we examined the factors associated with sustained CHV engagement. Key themes identified were self-interest, common goal, gratitude/indebtedness, altruism, and barriers. HCD and co-production processes directly align with three of the major themes: self-interest, common goal, and gratitude/indebtedness. We saw multiple CHVs identify self-interest as they described ways the HCD workshop had benefitted them as an individual, express pride in the achievement of common goals, and documented the expressions of gratitude/indebtedness.

The way core elements of HCD are operationalized in the key themes expressed by CHVs is important to notice [29, 39, 40]. HCD approaches require high levels of collaboration and teamwork- essentially requiring agreement upon a common goal. Empathy, another central element of design, grows from gaining an understanding of "others" experiences and perspective [27]. Empathy is operationalized in the (1) valuing of others' contributions and (2) celebrating their success. Celebration is a form of expressed gratitude. Gratitude and indebtedness are two sides of

the same coin see the importance and value of the other. Self-interest is present in HCD less explicitly but again is driven from the process where co-designers must have sufficient investment and trust to continue to come to engage in the process to share their ideas, otherwise the process stagnates.

These initial findings describe that HCD, because of how it functions with common goals, expressions of self-interest, and empathy driven gratitude and indebtedness, may also support the growth of trusting relationships. These relationships add motivation toward sustained engagement. Trust and teamwork matter [25]. Trusting relationships grow via the mediating effect of reciprocity, which in turn is influenced by the "achievement of common goals, fulfillment of shared self-interests and expression of gratitude/indebtedness" [37].

In spite of the ways in which HCD supported sustained engagement, barriers persisted. CHVs still faced mistrust and barriers from community members and government officials (both down- and upstream in the hierarchy), something also described in previous studies [41-43]. When upstream officials notice positive developments in their communities, CHVs might be given more voice, but it is likely that more is required before trust will bridge dominant power structures within the health system hierarchy. Downstream, CHVs face cultural barriers and alternative views on health, such as witchcraft and mistrust towards the health care system. Yet the HCD directed SALT intervention provided an enabling context for small teams to make their own decisions, and through reciprocal cycles of self-interest, common goals and gratitude, nurture the growth of trust.

Individuals with a selfless disposition may be more likely to become CHVs, given the nature of this work. This is consisted with other studies done in Africa [42, 44]. Altruism as a factor that *sustains* engagement, however, may be due to the supportive environment described by Ostrom and Walker in their book *Trust and Reciprocity* [45]. The authors discuss that reciprocal altruism depends upon a "particular history of interaction", and an environment where there is repeated interaction between individuals and an outlook to receiving benefits. Further investigation of the role of reciprocal altruism may be important in the discussion of sustained volunteering in LMICs and goes beyond the discussion of what *initially* motivates CHVs.

This study has some limitations. One year is relatively short to measure impact. Additionally, only two counties were represented in the study, however, these contexts represent a large portion of the reality in Kenya. Elements of meaning may have gotten lost in the process of translation in spite of translation for semantic meaning. Response-bias may have skewed the CHVs responses in favor of the SALT workshop. Further research is needed to examine HCD approaches to see if they consistently support sustained engagement in (1) various settings, (2) longer term impact, and (3) the association of HCD with theoretical models of trust building.

Conclusion

The purpose of this study was to gain insight into what sustains CHVs in their engagement in activities in the community that address the spectrum of social determinants of health, 12 months after an HCD intervention. Individual and group level factors, such as pursuing self-interests as well as common goals, and expressing gratitude, appear to influence sustained proactive

engagement. These early findings suggest that HCD processes may promote reciprocal relationships and trust-building, making it a potential platform to achieve long-term results. The HCD approach entrusts CHVs with a voice, valuing their role as agents of behavior change and facilitating delivery of health messages in a context-appropriate way. HCD approaches may be helpful in reducing the evidence-implementation gap and in supporting CHVs sustained engagement.

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Author contributions

Author contributions: MA and AD were responsible for study design. SM WNM and WK were responsible for data collection, translation and transcription. All authors worked on data analysis. HR drafted the first version of the manuscript. All authors reviewed versions of the manuscript and all authors approved the final version of the manuscript.

Competing Interests Statement

None declared.

Patient consent for publication

None required.

Ethics and consent

The Kijabe Hospital Ethics Review Committee approved implementation of the SALT workshop and longitudinal follow up under research protocol. Individual level informed consent was written and documented verbally on recordings, appropriate to the Ethics Review Committee oversight standards and consistent with community norms and expectations. All participation was voluntary, consistent with Kenya's Community Health Strategic goals. Participation included invitation and acknowledgement of the local chief's and the area Ministry of Health.

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Table 1: Socio-demographic characteristics of CHVs

Characteristic (N=70)	**n (%)**
Present at 12-month FDG or excused absence	60 (85)
Gender	
Male	23 (32.9)
Female	47 (67.1)
Age group (years)	
18-24	2 (2.9)
25-34	14 (20)
35-44	16 (22.9)
45-54	11 (15.7)
>55	9 (12.9)
Education level	
None	4 (5.7)
Primary	25 (35.7)
Secondary	30 (42.9)
Tertiary	9 (12.9)
Marital Status	
Married	44 (62.9)
Single	20 (28.6)
Employment	
Informal	55 (78.6)
Formal	2 (2.9)

Note: Some demographic data is missing. Participants could choose not to answer any question.