

The usefulness of nutrition and health videos displayed on mobile phones in rural Uganda: Experiences of community health workers and mothers

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Abstract

Improvements in community health workers' (CHWs) knowledge and practices in low-income countries increasingly involve mobile phones and videos. However, little data exists on CHWs' and mothers' experiences of using such phones and videos. In this study, educational videos on nutrition, health and hygiene were downloaded onto mobile phones, which were given to 12 CHWs in rural Uganda. In 2018, these CHWs used the videos for a period of 3 months to support their work during their visits with families. We subsequently conducted individual interviews with eight CHWs and held four focus group discussions with 16 mothers. From the inductively analysed data, we identified four key themes: impact, competence, meaningfulness and choice, which are also dimensions of the Intrinsic Task Motivation Model. The model describes the motivation of workers and has previously been used in connection with CHWs. In our study, CHWs and mothers considered that the videos had more strongly impacted their learning than traditional teaching methods, and they felt the videos improved the child feeding and caring competence of both CHWs and mothers. Furthermore, the CHWs found that the videos enhanced the meaningfulness of their work, as they felt more greatly appreciated and necessary. In addition, they experienced more freedom of choice in their ability to influence their working routines. This study shows that educational videos are well received among CHWs and mothers. Educational videos are a promising method to maintain and improve the motivation of voluntary CHWs and influence correct child feeding and hygiene practices in Uganda.

KEYWORDS

behaviour, infant and child nutrition, knowledge, low income countries, nutrition education, support

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1 | INTRODUCTION

Despite continuous efforts to improve infant and young child nutrition (Arikpo et al., 2018; Bhutta et al., 2012; Dewey & Adu-Afarwuah, 2008; Lartey, 2008), undernutrition remains the underlying cause of 45% of global child mortality (World Health Organization, 2020). While other factors contribute, breastfeeding and nutrition education are critically important for infant and young child feeding (IYCF) outcomes (Abebe et al., 2016; Arikpo et al., 2018; Ickes et al., 2017). Additionally, the development of trust between a mother and educator is central to determining successful information uptake (Grant et al., 2017; Mishra, 2014; Singh et al., 2015). Distrust may lead to messages being ignored (Grant et al., 2017; Singh et al., 2015) or leave mothers feeling ashamed to ask for help (Athavale et al., 2020). However, mothers who are adequately informed and encouraged can defy adverse traditions and follow recommendations (Burns et al., 2016). By contrast, receiving conflicting information on IYCF may cause uncertainty among mothers about their own abilities, leaving them unable to translate information into practice (Athavale et al., 2020).

Shortages of health care workers have emphasized the role of community health workers (CHWs) in nutrition, hygiene and health education, especially in low-income countries (Braun et al., 2013; Lehmann & Sanders, 2007). CHW programs have helped reduce childhood malnutrition, morbidity and mortality (Mays et al., 2017; Perry et al., 2014; Scott et al., 2018). In addition to family members and friends, CHWs are often the only source of information for mothers living in remote locations (Abebe et al., 2016). However, many CHWs possess little formal education and may struggle with inadequate training and insufficient IYCF knowledge (Bandhari et al., 2004; Lehmann & Sanders, 2007). Gaps in CHW knowledge have resulted in ineffective knowledge transfer to mothers and have been associated with child stunting (Abebe et al., 2016). Moreover, lack of training has caused distrust of CHWs within communities and has adversely affected CHW confidence (Mays et al., 2017; Singh et al., 2015; Smittenaar et al., 2017).

Additional problems faced by CHW programs include CHW legitimacy (Singh et al., 2015), that is, villagers' acceptance of CHWs as a part of the health care system, and high attrition rates (Lehmann & Sanders, 2007; Ludwick et al., 2014). Thus, maintaining the motivation of voluntary CHWs is essential to the continuation of these vital programs (Dil et al., 2012; Lehmann & Sanders, 2007; Ludwick et al., 2014; Mays et al., 2017). Kane et al. (2016) assessed CHW work motivation in six REACHOUT project countries: Bangladesh, Ethiopia, Indonesia, Kenya, Malawi and Mozambique. The REACHOUT project aims to build understanding and increase the development of the role of CHWs in Asian and African healthcare (REACHOUT Consortium, 2013). In their assessment, Kane et al. (2016) used a model derived from the Intrinsic Task Motivation Model (ITMM) (Thomas & Velthouse, 1990). The ITMM describes impact, competence, meaningfulness and choice as key cognitive components in the execution of a task. Fulfilment of these cognitive components leads to intrinsic motivation among workers (Thomas & Velthouse, 1990).

KEY MESSAGES

- Mobile phones with nutrition education videos can effectively improve CHW motivation in rural Uganda.
- Videos enhanced impact, meaningfulness, competence and choices of perceived CHW work.
- CHWs and families felt that learning from videos was easier compared with traditional education.
- Mothers reported improvements in child feeding and hygiene practices during the intervention.
- Educational videos are a promising method to improve child feeding and hygiene in Uganda.

Improving IYCF knowledge and practices requires suitable educational materials (Altobelli, 2017). Consequently, increases in the usage of mobile phones among CHWs (Agarwal et al., 2015; Braun et al., 2013; Feroz et al., 2020; Källander et al., 2013) and videos in IYCF education (Coetzee et al., 2018; Desta et al., 2014; Dougherty et al., 2016; Mutanda et al., 2016; Schneider et al., 2021) have occurred even in low-income countries. Studies exist concerning the use of video as part of nutrition and health education in low-income countries; however, these studies are relatively few, and the findings are inconsistent. Videos have proven effective in improving engagement (Coetzee et al., 2018), the recall of messages (Desta et al., 2014), maternal knowledge (Schneider et al., 2021) and end results, such as responsive feeding (Dougherty et al., 2016) and hygiene (Dougherty et al., 2016; Schneider et al., 2021). However, many of the studies focus on just one area of family health, and video is often used for simultaneously targeting a larger group of individuals (Desta et al., 2014; Dougherty et al., 2016; Mutanda et al., 2016; Schneider et al., 2021). Moreover, few studies concern CHWs using videos while visiting families (Coetzee et al., 2017; Ramachandran et al., 2010). In a rural part of Uganda, we studied the experiences of CHWs who used a library of short educational videos on nutrition and health downloaded onto mobile phones. While CHWs facilitate learning, mothers primarily make decisions about nutrition and health. Thus, we also studied the reflections of mothers whom the CHWs had visited on video education. Finally, we compared the CHWs' reflections on their experiences to the ITMM.

2 | METHODS

2.1 | Study area

The study location was Kirewa subcounty, situated in Tororo district, Bukedi sub-region, East-Uganda. Kirewa subcounty is one of the poorer areas of the country, with farming being the main livelihood. The Bukedi sub-region is similar to other regions outside the capital and central part of the country: most women (84.5%) have at least some primary education; 39.2% cannot read; 4.5% have accessed the Internet at some point in their lives, and 11% watch television. Moreover, in this

sub-region, 81.8% of women are employed, mostly in agriculture, though many of them are not paid for their work. Women in the area have an average of 7.4 children, with the first baby born at a median age of 18.5 (Uganda Demographic and Health Survey, 2016). This area suffers from seasonal food insecurity and suboptimal health- and nutrition practices; IYCF knowledge is particularly poor, and diets are extremely monotonous (World Vision Finland, 2012). Moreover, electricity is available only in the local health centre; families cook with charcoal.

In Uganda, CHWs are called village health teamers (VHTs). VHTs are volunteers who are selected from their own communities. VHTs visit families in their homes, educate them—especially on hygiene, sanitation, malaria prevention, and, to some extent, nutrition—and encourage mothers to utilize the services offered at health centres (Musoke et al., 2020). VHT visits usually last approximately 1 h and primarily target mothers. However, fathers commonly participate whenever at home, as do children and sometimes grandmothers. VHTs, who are unpaid, are motivated by the desire to serve and improve their community. VHTs are answerable for their work to the Ugandan government (Ministry of Health Republic of Uganda, 2019).

2.2 | Study design and implementation

In collaboration with local families and health care professionals in Kenya, we produced a set of 47 IYCF videos based on WHO recommendations. We studied these videos in a health care-centre setting in Kenya in 2016 (Schneider et al., 2021). The videos, which are 2–3 min long, teach correct

nutrition and basic childcare through filmed depictions of families or animations. Table 1 presents the video topics. The videos and their production are described in detail elsewhere (Schneider et al., 2021). For this study, the videos were translated into Dhaphadhola, the local language in the study area and a voiceover was added to each of them. The videos were downloaded onto nine simple smartphones and one tablet.

Using convenience sampling, the midwife from the local health centre selected 12 VHTs who worked in villages in the Kirewa area. We gave nine simple smartphones to the 12 VHTs and a tablet computer to the midwife, all with videos downloaded onto them. The VHTs and midwife were shown how to access the videos on the devices, although they were not instructed on how to utilize the videos during visits with families. Instead, they were given the liberty to decide this amongst themselves to promote ownership and allow them to find the best way for their community to benefit from the videos. The phones were shared and rotated between the participating VHTs and brought to the health centre for charging each night. During a period of 3 months, from August to October 2018, the VHTs used the videos during their usual visits with families. Each visit lasted between 1 and 2 h, and the VHTs showed the family one, two, or three videos. The VHTs visited the families between one and four times during the intervention period.

2.3 | Data collection

After 3 months, in November 2018, we conducted individual interviews with eight VHTs and held four focus group discussions (FGDs)

TABLE 1 The topics of the study videos

Breastfeeding	Complementary feeding	Nutrition	Childcare
Care after delivery ^a	Starting complementary feeding at 6 months ^b	Food groups ^b	Kangaroo care ^a
Colostrum ^c	Enriching porridge ^a	The 7 food groups for children ^b	Vaccinations ^b
Physiology of lactation ^b	Quantity of food with age ^a	Minimum dietary diversity ^b	Growth monitoring ^a
Exclusive breastfeeding ^c	Complementary feeding at 7–8 Months ^a	Proteins ^c	Cognitive development ^a
Breastfeeding benefits ^c	Complementary feeding at 9–11 Months ^a	Anaemia ^c	Feeding during illness ^a
Breastfeeding positions ^a	Complementary feeding at 1–2 years ^a	Prevention of anaemia ^b	What about Dad ^a
Breastmilk vs. animal milk ^c	Complementary foods from family foods ^a	Sources of iron ^b	Stunting ^c
Sufficiency of breastmilk ^b	Snacks and finger foods ^a	Folate ^b	Malaria ^c
How often to breastfeed ^b	Replacing sugary foods with fruits ^b	Vitamin A ^b	Diarrhoea ^c
Breastfeeding problems ^c	HIV and complementary feeding ^c	Iodine ^c	Worms ^b
Milk expression ^a		Diabetes ^b	Hygiene ^b
The working mother ^a			Hygienic cooking ^a
HIV and breastfeeding ^c			What does HIV do ^c

Note: For more information about the videos visit <https://www.glocalnutrition.com>.

^aLocal video.

^bLocal video with animation.

^cAnimation.

TABLE 2 Participant characteristics of the VHTs and mothers

	VHTs, <i>n</i> (%) (8)	Mothers, <i>N</i> (%) (16)
Sex		
Male	5 (63)	0 (0)
Female	3 (38)	16 (100)
Age (years)		
18–23	0 (0)	6 (37)
24–29	0 (0)	5 (31)
30–36	3 (38)	3 (19)
37–43	1 (13)	2 (13)
44–50	2 (25)	0 (0)
51≤	2 (25)	0 (0)
Number of children		
1–2	0 (0)	7 (44)
3–4	2 (25)	7 (44)
5–6	4 (50)	2 (13)
7–8	1 (13)	0 (0)
9–10	0 (0)	0 (0)
11–12	1 (13)	0 (0)
Age of youngest child (months)		
0–2	1 (13)	10 (63)
3–5	1 (13)	5 (31)
6–8	4 (50)	1 (6)
9–12	2 (25)	0 (0)
Age of oldest child (years)		
0–3	0 (0)	5 (31)
4–7	1 (13)	3 (19)
8–12	2 (25)	4 (25)
13–17	0 (0)	0 (0)
18–22	3 (38)	4 (25)
23–27	0 (0)	0 (0)
28–32	3 (38)	0 (0)
Number of people living in the household		
≤5	0 (0)	6 (38)
6–7	3 (38)	6 (38)
8–9	2 (25)	4 (25)
10–11	0 (0)	0 (0)
12–13	2 (25)	0 (0)
14–15	1 (13)	0 (0)
Living with		
Core family	3 (38)	5 (31)
Relatives	5 (63)	11 (69)

TABLE 2 (Continued)

	VHTs, <i>n</i> (%) (8)	Mothers, <i>N</i> (%) (16)
Grandchildren if any		
Yes	3 (38)	3 (19)
No	5 (63)	13 (81)
Completed education		
Less than primary school	0 (0)	3 (19)
Primary school	1 (13)	5 (31)
Lower secondary school	6 (75)	8 (50)
High school	1 (13)	0 (0)
Employment		
Farmer	2 (25)	16 (100)
Teacher	1 (13)	0 (0)
VHT	5 (63)	0 (0)
Years AS VHT		
6	1 (13)	-
7	1 (13)	-
8	2 (25)	-
9	2 (25)	-
Not available	2 (25)	-

Abbreviation: VHT, village health teamer.

with 16 mothers from the study area. We asked all VHTs who had participated in the intervention to participate in the interviews; however, four were unavailable. The midwife chose mothers from the study villages using convenience sampling, selecting those who were available at the time of the FGDs. The inclusion criterion was that the mothers had been visited at least once by a VHT who showed videos. One of the researchers (MM) conducted the interviews aided by a local interpreter, either the female area midwife or a male laboratory technician. We used thematic, semi-structured discussion guides, with one set of questions for all the VHT interviews (Figure S1) and another set for the FGDs with mothers (Figure S2). All discussions were audio recorded.

All participants provided their written informed consent. The Makerere University School of Health Sciences Research and Ethics Committee provided ethical approval.

2.4 | Data analysis

The interviewer asked participants questions in English and the interpreter gave their answers, which were transcribed. The participants were assigned a code to ensure their anonymity. Two of the researchers (LS and MM) read the texts multiple times and subsequently inductively analysed the data following the principles of content analysis (Krippendorff, 1980). The VHT interviews were

analysed separately from the FGDs with mothers. The lead author (LS) identified segments of text with similar meanings and labelled them with codes. These were then sorted under initial subcategories and subsequently placed within broader main categories (Graneheim & Lundman, 2004). These categories were then thoroughly evaluated in collaboration with the researcher (MM) who had collected the data to ensure coherence with the field experience. We then agreed on the final categories and subcategories that best described the data. After this process of inductive analysis, we identified similarities with the ITMM (Thomas & Velthouse, 1990). Consequently, we decided to use the cognitive components of the ITMM as our broader themes, creating a theoretical framework for understanding VHT behaviour.

3 | RESULTS

3.1 | Participant characteristics

Of the eight VHTs interviewed, five were male and three were female. Their average age was 44, with the youngest 30 years old and the oldest 58. They had an average of 6.3 children, and three had grandchildren. All but one had completed lower secondary school, and three had other jobs in addition to their work as VHTs. The 16 mothers who participated in the FGDs were, on average, 27.4 years old, with their ages ranging from 18 to 40. They had an average of three children and most lived in an extended family. Three mothers had no schooling, five had attended primary school and eight had participated in lower secondary school. All were farmers by trade (Table 2).

3.2 | Results from the VHT interviews and focus group discussions with mothers

Below we describe the four categories of the intrinsic task motivation model in relation to the VHT interviews—impact, competence,

meaningfulness and choice—together with demonstrative quotations. Figure 1 presents a conceptual model of the categories and themes related to intrinsic task motivation along with the reflections on these in the mother FGDs; the categories are further explained in the text.

3.3 | Impact—Impact experienced on community

In this context, impact concerns reported changes noticed by both VHTs and mothers. Impact on community was the primary reason for participants wanting to become a VHT and the primary motivating factor for their work. The videos were seen as a more impactful tool than traditional teaching methods; thus, the videos enhanced the motivation generated by perceived impact:

I see there are a lot of changes in people's homes. Seeing that has helped me. Previously they didn't know that it is good to eat a variety of foods, but now they try to bring in a variety of foods. Also, they used to sell the fruit they grow, but now they also eat it (VHT, Female 30 years, 4 children, lower secondary school).

The videos were considered a catalyst for change, primarily as people found learning easier by seeing videos than only hearing explanations:

With the video, it is very easy. They keep on remembering and they keep on practicing. The changes take place better and faster than before (VHT, Male 36 years, 4 children, lower secondary school, farmer).

Learning from the videos had helped VHTs and parents alike to better understand nutrition and the consequences and signs of malnutrition:

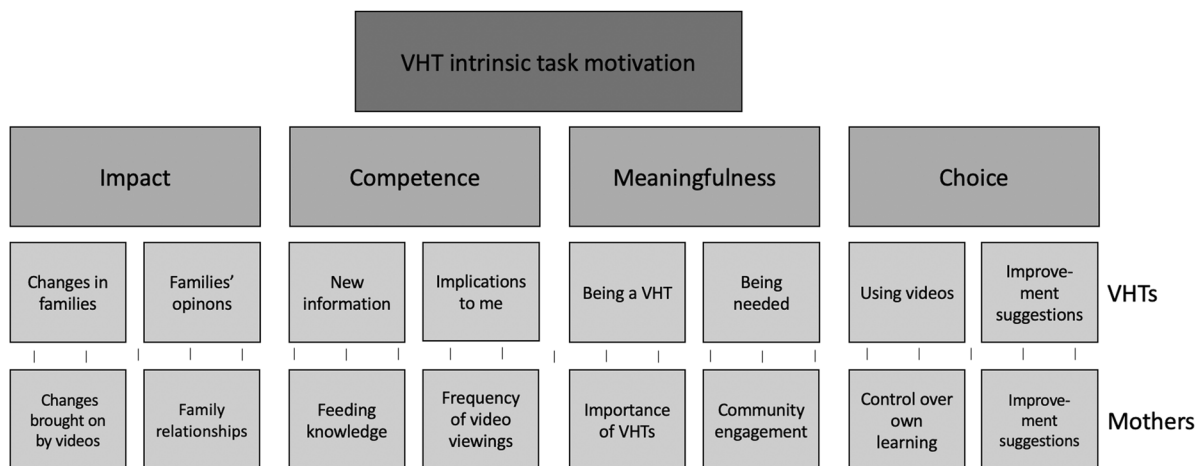


FIGURE 1 The categories and themes from the VHT interviews and reflections in the FGDs with mothers. FGD, four focus group discussion; VHT, village health teamer

Most of them used to think this baby is sick. Now when I show the video and explain, they come to realize that this baby is suffering from malnutrition (VHT, Female 36 years, 6 children, lower secondary school).

The VHTs reported that families were pleased with the videos. When they visited a parent without their spouse, the parent often asked the VHT to come back when their husband was at home or to show the videos to their wife.

Those men [at the trading center] like the videos and they always comment that I should go show those videos to their wives (VHT, Male 45 years, 6 children, lower secondary school).

Following the introduction of the videos, mothers also reported a number of changes in their families. These changes included improvements in wellbeing resulting from a more varied diet and improvements in the quality of family life, for example, increased family time and shared meals:

Now when we sit together, the children eat with a good appetite. My husband feels happy when we all eat together, and sometimes he even adds his food to the children's plates (Mother, 36 years, 6 children, lower secondary school, farmer).

In families where the father had seen the videos, the mother described him as becoming more involved, for example by bringing food home for their children:

My husband has changed so much. When he comes home, he buys something for the children, such as bananas. He always asks what the children have eaten that day (Mother, 29 years, 4 children, lower secondary school, farmer).

3.4 | Competence—Perceived increases in competence of VHTs and mothers

In this context, competence concerns perceived increased knowledge from the videos. The VHTs reported having first watched the videos together with their families. Their deepened knowledge allowed the VHTs to introduce improvements in their own homes, which they associated with being model community members and leading by example; they were proud of these changes:

As others come to visit my home, they see that things are going well. It is easier for them to implement what I tell them because I practice it (VHT, Male 58 years, 12 children, high school, teacher).

The videos improved the VHTs' knowledge of child feeding and hygiene; consequently, they felt their competence in teaching others had improved:

I didn't know much about good feeding, balanced diet, and other things, but when this video came in, it taught me a lot. I have knowledge even to teach others and have ways of implementing what is in the video (VHT, Male 45 years, 6 children, lower secondary school).

The VHTs described the videos as important, helpful and easy to understand. Working as a VHT had also become easier with the videos:

Before the videos it was a bit difficult, but now when we are using the video, we show them, we talk to them, it becomes easier (VHT, Female 30 years, 4 children, lower secondary school).

The perception of gained competence among mothers translated into a feeling of self-confidence, which was reflected in the behaviour of the entire family, as reported by some mothers:

From the time when the VHT came and showed the videos, a lot has changed. The children are bright and listen to me more than before. Even myself, I am healthy and stress free (Mother, 36 years, 6 children, lower secondary school, farmer).

When asked about the things they had learned, one mother's answer was vague: 'I have not watched much, but I have learned a little' (Mother, 23 years, 4 children, primary school, farmer); however, other mothers reported having gained knowledge in several areas. Moreover, about half described how they had improved their children's diet.

As the VHTs could decide how to use the videos, the mothers watched them at different rates, with each video usually viewed two or three times. In addition, two mothers had visited the midwife at the health centre to see more videos. The more times they viewed the videos, the better the mothers felt they understood the messages and could change their practices.

I would have made some changes [if I had only seen the videos once] but not as much as now because I would not have learned properly (Mother, 33 years, 4 children, lower secondary school, farmer).

3.5 | Meaningfulness of the VHT work

In this context, meaningfulness concerns a sense of the importance of and satisfaction derived from work performed. The VHTs reported

that the videos had helped change their role in the community from that of a health inspector to that of a teacher in the eyes of mothers. This reported change both brought more meaning to their work and helped mothers value the work of the VHTs. One VHT described how mothers would previously run away from her, whereas they now were receptive to visits. Thus, the VHTs described being able to connect with families:

The videos have created more relationship. Our visits have become something unique. Those children, those mothers, they really like it when you go show them videos (VHT, Male 58 years, 8 children, lower secondary school).

The VHTs described how the videos had helped them forge a stronger relationship with local families. In addition, both the VHTs and mothers considered the videos had brought the whole community together in an effort to improve nutrition, hygiene and health:

The video showings have created a relationship between us and the community at large. It has really formed a lot of improvement and created something like teamwork in the community (VHT, Female 40 years, 6 children, lower secondary school, farmer).

The mothers echoed this sentiment. Based on what they had learned in the videos, eight mothers had begun teaching their friends; one mother reported that her teenage children were also eagerly discussing the videos with friends. The mothers hoped the whole community would make a mutual effort to improve child feeding:

I would like to see that these VHTs moved around the whole community so everyone could watch these videos so we could change our community behavior (Mother, 40 years, 4 children, no education, farmer).

The videos also improved the credibility of the VHTs. Previously, a VHT T-shirt was the sole means to prove their role, so the videos were a welcome addition:

Sometimes those mothers used to tell me that you are also a woman like me, and you want to tell me what to do; I am even older than you. Now, as I use the video, my work is so easy compared to before (VHT, Female 36 years, 6 children, lower secondary school).

By contrast, none of the VHTs considered that the videos threatened their role as a teacher. On the contrary, the VHTs felt indispensable, as the videos alone would have been insufficient to educate families in their community. Uneducated parents, in particular, required the support of the VHT to internalize the messages in the videos and begin practicing what the videos taught:

Without the VHTs, this video cannot work because this mother or family will just watch the video as a movie. The work of the VHTs is to tell them that this is how you are also supposed to do it (VHT, Male 45 years, 6 children, lower secondary school).

The mothers echoed the opinion of the VHTs: videos were viewed as an important and trustworthy information source and discussions with the VHTs aided the mothers in their learning:

After the VHT showed me videos, we discussed. Otherwise, I would not have understood it as well (Mother, 25 years, 5 children, primary school, farmer).

3.6 | Choice—Power to make decisions about VHT work

In this context, choice concerns the opportunity for VHTs to make decisions about their working routines. The videos added some perceived freedom of choice to their work by providing them with a wider variety of topics to teach, as they were able to choose which topics to introduce in any given home. Previously, the choice of topic had been mostly limited to correcting hygiene practices and instructing on basic child feeding:

I always open the video according to the situation I find [in a home] (VHT, Male 50 years, 5 children, primary school).

VHTs usually visit families, primarily mothers, in their homes. We found that after the introduction of videos, the VHTs decided to extend their visits to catching families after church or meeting men at the trading centre:

It has become our daily activity, almost every day you walk around, even during evenings you carry the videos on every occasion (VHT, Male 58 years, 8 children, lower secondary school).

During their weekly meetings with the midwife and other VHTs, the VHTs could discuss the best ways of utilizing the videos and therefore affect their work routines, as they jointly discussed best practices. They also offered improvement suggestions, such as buying phones with a longer battery life and purchasing tablets with large screens.

The mothers in this study were asked about their preferences on how to arrange video showings in the future. They expressed a desire to watch a greater number of videos, and with greater frequency, either on their husbands' phones or in group viewings.

The VHT should have the videos, and perhaps on certain days they could gather us somewhere and

show us these videos so we could learn (Mother, 24 years, 1 child, lower secondary school, farmer).

4 | DISCUSSION

We aimed to study the experiences of VHTs who used educational videos during their visits with families and to analyse mothers' reflections on this video education. We conducted interviews with VHTs and held FGDs with mothers, and the results demonstrated that they found the video education useful: many mothers reported having consequently improved their child feeding and hygiene practices. In addition, we discovered that our results mirrored the components of the ITMM (Thomas & Velthouse, 1990). Previously, Kane et al. (2016) also used the ITMM to describe the motivation of CHWs in six countries.

The VHTs in our study described impact on community as the primary reason for wanting to become a VHT, as also seen in earlier studies (Greenspan et al., 2013; Sanou et al., 2016; Takasugi & Lee, 2012). Similar to our results, impact has previously been described as the ability to guide community members to make good choices and build a healthier society (Kane et al., 2016). The respondents in our study perceived videos to be more effective in achieving impact than traditional teaching methods, especially when viewed multiple times. Similar findings were reported both in Niger, where women considered internalizing messages easier when messages were shown instead of spoken (Dougherty et al., 2016), and in Kenya, where frequent video viewings were associated with better IYCF and hygiene knowledge, attitudes and practices (Schneider et al., 2021). The positive effects of educational videos on health have also been reported in other parts of Uganda (Mutanda et al., 2016) and in other African countries (Desta et al., 2014; Dougherty et al., 2016; Schneider et al., 2021). Additionally, videos have increased the interest and credibility of CHW messages (Coetzee et al., 2018).

The VHTs felt they had learned from the videos, which is evidence of improved competence. They established ownership by first watching the videos at home and subsequently noticing changes. This process helped them feel like model citizens, which enhanced their confidence as teachers. Improved competence as a CHW motivator has also been found elsewhere (Callaghan-Koru et al., 2012; Dil et al., 2012; Sanou et al., 2016). Singh et al. (2015), however, found that VHTs in rural Uganda lacked confidence in their own competence while simultaneously facing extreme pressure to educate caregivers. Competence is crucial for CHWs to advise mothers consistently and correctly. Additionally, competence is required to reassure mothers of the correctness of promoted practices while increasing their confidence to implement these practices (Athavale et al., 2020; Burns et al., 2016). Furthermore, improving competence is crucial, as incorrect beliefs among CHWs have been associated with negative practices involving newborn babies (Smittenaar et al., 2020).

The VHTs felt that the videos helped to change attitudes towards the VHT program and improved the acceptance of the messages

delivered, which brought meaningfulness to their work. The VHTs reported being able to form better relationships with families, while the mothers expressed gratitude for the VHT visits. Carrying videos also improved the VHTs' perceived credibility. Finally, the respondents expressed their desire for the whole community to unite in changing child feeding practices.

Meaningfulness of work is a commonly described motivator for CHWs (Callaghan-Koru et al., 2012; Greenspan et al., 2013; Sanou et al., 2016). Meaningfulness is often derived from holding a position in a community and being respected (Dil et al., 2012; Kane et al., 2016; Takasugi & Lee, 2012). However, VHTs in Uganda struggle with respect and credibility, as the enduring fear that they are hygiene inspectors has created mistrust towards them and government programs (Singh et al., 2015). This fear occasionally causes parents to refuse to listen to VHTs' messages (Dil et al., 2012; Singh et al., 2015). Educational videos carried on mobile phones reportedly increased the acceptance of CHWs in India (Ramachandran et al., 2010), and educational videos on tablet computers improved the credibility of CHWs in South-Africa (Coetzee et al., 2018). Additionally, the need described by our respondents to both belong to a community and act together for change was also found in Ghana (Dil et al., 2012). Finally, the mothers in our study discussed sharing video messages among peers, and similar discussions were reported in Kenya (Schneider et al., 2021), South Africa (Coetzee et al., 2018) and Niger (Dougherty et al., 2016).

The VHTs in our study felt that the videos allowed them greater choice to perform their work. The area midwife allocated the decision of how to use videos to the VHTs; consequently, the VHTs could affect their work routines. We found that granting the VHTs the freedom to choose how to use the videos worked well, although it should be noted that others have reported less successful outcomes for this practice (Ramachandran et al., 2010). In addition, the videos increased the VHTs' teaching repertoire, thus allowing them greater choice over what to teach during any given appointment. The finding that videos can even improve the cognitive component of choice is of special importance, as lack of choice has previously been a limiting factor in CHW motivation (Kane et al., 2016).

An additional outcome of allowing VHTs to choose how to use the videos in their work was increased outreach to fathers. Facilitation of this outreach involved the VHTs carrying the phones with them outside their appointed home visits so they could play the videos when the opportunity arose. Combined with the messages in the videos, this outreach manifested itself in increased reported paternal involvement in the home. These findings echo those of other studies. For example, community videos increased paternal involvement in child feeding also in Niger (Dougherty et al., 2017); moreover, addressing fathers in videos was effective in changing beliefs in Ethiopia (Desta et al., 2014). Educating fathers can improve child feeding, as a mother's ability to feed children according to her wishes often depends on financial support from her husband (Burns et al., 2016; Musoke et al., 2017). In addition, educating fathers improves breastfeeding (Bich et al., 2019; Tadesse et al., 2018) and dietary diversity (Gebremedhin et al., 2017), while negative effects on child

feeding occur when husbands fail to help with household chores (Mchome et al., 2020). In addition, other studies have reported shifts in paternal involvement in childcare (Moyo & Schaay, 2019).

Contrary to the issues reported in other types of mobile solutions targeted at CHWs (Feroz et al., 2020), our study experienced no problems with technical support or Internet connectivity. This indicates that downloadable videos could be a suitable format for remote settings. Furthermore, our study population was poor and the study location remote, demonstrating that video education can work even in such conditions.

The strengths of this study include our discussions with both VHTs and mothers to reveal their first-hand experiences of the influence of video education as well as the study's demonstration of the adaptability of the ITMM to CHWs, as all the cognitive components of the model were evident in the VHT interview data. In turn, a key limitation of the study was the need for an interpreter, which may have resulted in nuances and parts of the responses becoming lost in translation. We attempted to minimize this risk through the presence of one of the researchers, who made observations and asked the interpreter to specify details. Another potential limitation concerns the selection of participants by the area midwife, who may have chosen those mothers she thought would be receptive to the use of videos. Moreover, it is also possible that the four VHTs who were unable to participate in the interviews had different experiences using these videos. However, all our VHT participants were highly experienced, and while the VHTs we interviewed mentioned meeting frequently with the other four, there were no reports of additional difficulties or negative experiences. Additionally, our study results are restricted to one area in Uganda, and thus further research is required on the use of videos in other settings in different parts of the low-income world.

5 | CONCLUSIONS

Since this study indicates that educational videos used by VHTs enhance the perceived impact, competence, meaningfulness and freedom of choice of VHT work, reflecting improved intrinsic task motivation, we conclude that educational videos are a promising method to maintain and improve the VHT program in Uganda. In addition, the method we presented demonstrates strong potential for influencing correct child-feeding and hygiene practices in Uganda and possibly other low-income countries.

The grass-roots acceptance of the videos used in our study suggests that both learners and teachers are receptive to educational videos and mobile-assisted learning methods. However, such videos and learning methods require both commitment and financial support from governments and NGOs. The content of the videos used in this study was based on WHO guidelines and thus corresponds to governmental policies on IYCF. Therefore, the videos would be easily applicable to any program. However, further research is required to determine the effectiveness of the videos in interventions and to identify effective ways of scaling up individual video interventions

into efficient governmental educational programs in low-income countries.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

Lauriina Schneider, Marja Mutanen and Sari Ollila designed the study. Lauriina Schneider prepared the interview and discussion guides. Marja Mutanen conducted the interviews. Lauriina Schneider and Marja Mutanen analysed the data. Lauriina Schneider wrote the manuscript. Marja Mutanen and Sari Ollila commented on the manuscript. All authors read and approved of the final manuscript.

DATA AVAILABILITY STATEMENT

The data that supports the findings of this study are available from the corresponding author upon reasonable request.

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