Maternal and Child Health Journal (2022) 26:1833–1839
https://doi.org/10.1007/s10995-022-03460-z

The Use of Video in Delivering Maternal Health Education in Mountainous Areas: A Qualitative Exploration of the Experience of Health Workers

Thi Thanh Huong Nguyen[1] · Phuong Anh Hoang[1,2] · Thi Thuy Hao Mai[3] · Thi Hoa Huyen Nguyen[1]

Accepted: 18 July 2022 / Published online: 27 July 2022

Abstract

Background Health education via DVD/video has been demonstrated as a novel method to encourage a positive change and improvement in patients' health behaviors. A community health project was implemented in Cao Bang, a mountainous area of Vietnam, for health workers to use tablets, portable projectors, and television to disseminate health education messages via designed video clips.

Method and Objectives A qualitative study using semi-structured individual and group interviews was conducted with 25 health workers in Trung Khanh district to explore their experience of using video in providing health education.

Results The video was confirmed to be an accessible, interactive, and flexible tool supporting health education activities in this mountainous area. However, some health workers in the mountainous area struggled due to a lack of technological skills and responsibility for their work.

Conclusions for Practice More training on using technology for health professionals and incorporating video-based health education activities into labor contract-based responsibilities can alleviate present obstacles.

Keywords Maternal care · Technology · Health education · Mountainous area

Significance Statement

What is already known on this subject? Commune health workers have known to be effective in many public health interventions for rural communities such as immunizations, prenatal care, or community health education. Health education which is delivered via DVD/video has been globally demonstrated to provide a convenient, accessible, and cost-effective method to encourage a positive change and improvement in patients' health behavior.

What this study adds? Ethnic minority health workers seem to be confronted with barriers when delivering maternal care health education. The use of video brings them both chances and challenges. This study suggested that in order to utilize video in disseminating health education messages, a plan to improve the technological skills of health workers and engage them with the task should be taken into account.

Objectives

For many ethnic minority groups in mountainous areas, especially in low-/middle-income countries as Vietnam, maternal care is still facing challenges and difficulties (McBride et al., 2018; Say et al., 2014; Srivastava et al., 2015). In a mountainous area like Cao Bang, a northeast province of Vietnam with five minority ethnic groups living together, Mong people had the highest infant mortality rate in Vietnam at 46 per thousand live births (Knowles et al.,

✉ Thi Thanh Huong Nguyen
huong.ntt@vinuni.edu.vn

Phuong Anh Hoang
phuonganh97.hmu@gmail.com

Thi Thuy Hao Mai
amda.hao@gmail.com

Thi Hoa Huyen Nguyen
huyen.nth@vinuni.edu.vn

[1] College of Health Sciences, VinUniversity, Vinhomes Ocean Park, Da Ton, Gia Lam, Hanoi 100000, Vietnam

[2] Faculty of Nursing and Midwifery, Hanoi Medical University, Hanoi 100000, Vietnam

[3] ChildFund Vietnam, Hanoi 100000, Vietnam

2009; United Nations Children's Fund, General Statistics Office of Vietnam, United Nations Population Fund, 2011). The main reasons for these difficulties can relate to low economic issues, lack of transportation, insufficient knowledge, and inaccessibility to health care services of rural residents (Al Dahdah et al., 2015; McBride et al., 2018).

In the face of existing barriers, the practice of public health supported by mobile devices has emerged to be timely and effective. It might be related to the fact that the availability of mobile technology in low- and middle-income countries (LMIC) has been expanding recently (Hall et al., 2014; Zaidi et al., 2020), which brought a new concept for integrating health education into community programs. When exploring video-based health education as a community-based approach, Maya et al. confirmed the necessity of optimizing video-based health education for mobile dissemination in the future due to the updated advances of modern technology and the potential impacts of video-based educational tools (Adam et al., 2019).

Health education materials for either patients or the community in an audiovisual format with technological supports were considered more effective for educating patients than the other forms (Bidwell et al., 2010; Prieto-Pinto et al., 2019; Reitmaier et al., 2010). A study about the application of the internet in medical and health care conducted by Fang Hu et al. revealed numerous advantages of applying technology, including optimal medical assistance, lower medical costs and a higher level of satisfactory health services (Hu et al., 2013). However, the reduction of healthcare staff's workload remained a matter of argument. In a study examining the effectiveness of mobile video in educating from the midwives' perspective, the majority agreed on the mobile video as decreasing their workload, while some commented on doing additional work like explaining the video or discussing with the individual/ group of participants (Fiore-Silfvast et al., 2013).

With the aim of improving the quality of maternal health education in mountainous areas, a 3-year intervention program was implemented in four communes of Trung Khanh district, Cao Bang province. A novel method of delivering health education content via a video-based approach was applied for the first time in these areas. A set of video clips was developed focusing on promoting regular pregnancy check-ups (four times prior to birth), delivery at health facilities, and getting newborns' medical care within 24 h of labor. The videos maximized the participation of local people in creating content and casting to ensure they culturally fit with the local context. The video clips were set up on tablets as a tool for village health workers to communicate during home visits or to organize small group communication sessions in the village. Video clips were also shown at the health education sessions at commune health centers using televisions or low-cost LED projectors. The project was sponsored by ChildFund Vietnam and the Center for Creative Initiatives in Health and Population (CCIHP) to mentor professional content, support technology, and supply facilities. The purpose of this study is to explore the experience of healthcare workers in using video-based approach to deliver maternal health education in mountainous areas.

Methods

Design

This is a qualitative study following the COREQ criteria for reporting qualitative research.

Settings and Time

Four communes of the Trung Khanh district: Xuan Noi, Quang Han, Cao Chuong, and Quang Vinh, where the intervention project was implemented, were chosen to collect data in September 2020.

Participants

Health workers, including commune health workers, commune midwives, and village health workers, were included in this study if he/she:

1. Was over 18 years old at the time of the interview;
2. Was in charge of the maternal care in his/her work; and
3. Participated in the community health project using provided video-based approach to deliver maternal health education.

Prior to the interview process, participants were informed about the purpose of the study and invited to attend either an interview or a group discussion. Up on their agreement, participants were asked to sign in a written informed consent. The research team proposed the interview agenda and allocated suitable interviewees with matching time schedules. The research team used the principle of saturation (Polit & Beck, 2009) to determine the completion of the interviewing process when no more new information emerged. In total, 12 interviews and four group discussions involving 3–5 people were conducted in the four projects' communes.

Data Collection Process

Participants were involved in either in-depth interviews or focused group discussions. While group dynamics provide a powerful way to understand broader topics and generate new ideas, interviews allow more space for a deeper dialogue between the participant and the researcher. Therefore, a combination of both data collection methods helped enhance the data richness and trustworthiness of the findings.

Interview/group discussion guides were developed by a research team led by two researchers holding Ph.D. in health sciences with experience in women's health. The interview/group discussion guides were also under review by ChildFund Australia experts who were familiar with community projects in the local areas. The guides included three components: (I) basic demographic information of health workers, (II) their participation in video-based approach to deliver maternal health education, and (III) interview prompt questions to get feedback from health workers about their experience using video in providing maternal health education. Three pilot interviews were performed before main data collection process. Tape-recorded interviews and group discussions were conducted for approximately 30–45 min each in a private room at the local commune health center to ensure participants' privacy and comfort.

Data Analysis

A qualitative content analysis was performed utilizing the Krippendorff method (Krippendorff, 2004). Content analysis was used in making valid and replicable interferences. The authors removed all identifying data to keep the interviews confidential, and all interviews recorded were interpreted by the author(s) to get an overall impression of the contents. Meaningful units were identified and condensed, and after the processes for encoding and decoding, subcategories were identified and clustered into categories. Diagram 1 illustrates an example of the data analysis process.

Ethical Implications

The study is a part of the "Essential care for pregnant women and infants" project approved by ChildFund Vietnam in December 2017 (Project code: VN02-011), and Cao Bang provincial People's Committee (Decision no 433/QĐ-UBND). Prior to implementation of the parent project, all required approvals that matched Australian research project standards have been obtained.

Results

The total of 25 local health workers participated in this study, including 3 commune health workers, 4 commune midwives, and 18 village health workers. All participants used the video-based approach to deliver maternal health education for at least 1.5 years. Out of 25 local health workers, 8 from minority ethnic groups. Findings from these participants emerged into themes followed by a description with supporting direct quotes from participants. Three subthemes defining the video-based approach as an effective method, an interactive tool, and a flexible approach were analyzed and grouped as advantages of using video-based approach in delivering health education. In contrast, lack of technological skills and adherence to work were identified as barriers preventing health workers' performance.

Diagram 1 An example of the data analysis process

Step 1: Decontextualization *Identify meaning units*	"She was pregnant for the first time. She told me that she heard something about warning signs somewhere, but it was still hard for her to imagine it. However, after watching the video of a mother bleeding, she was more confident that the image is now in her mind and understand when she had to go to the doctor because she knows the signs that could harm her baby."	"We recognized the effectiveness of high-tech in saving time and in assuring the content if we can fully apply. However, sometime we are not familiar with the touch screen, if something happens then we may get loss."
↓		
Step 2: Recontextualization *Condense the key context*	Conveyed memorable health messages through visible content of health education	Unconfident in dealing with technological devices
↓		
Step 3: Sub-categorization Identify homogeneous themes	An accessible method of delivering health education content	Lack of technological skills
↓		
Step 4: Compilation Shape sub-categories to key categories	Advantages of applying technology in providing health education	Challenges of applying technology in delivering health education

Advantages of Using Video-Based Approach to Deliver Maternal Health Education

An Effective Method of Delivering Health Education Content

The use of video clips as a tool for health education was reflected as an effective approach to delivering the key health messages. While traditional methods of health education were mainly leaflets or oral speech, this new approach of using video clips showed advantages over the conventional.

The video clips conveyed memorable health messages through the visible content of health education. According to the experience of the local health workers, the topics of maternity management might be complex for ethnic minority mothers to understand. The use of visual images through video clips helps mothers understand medical terminologies and integrate those terms into everyday life in the simplest way. A midwifery shared a story about the effectiveness of health education using video clips in explaining warning signs during pregnancy that:

> *She was pregnant for the first time. She told me that she had heard something about warning signs somewhere, but it was still hard for her to imagine it. However, after watching the video of a mother bleeding, she said the image was deeply kept in her mind, and she understood when she had to go to the doctor because she knew the signs that could harm her baby.*

Visual health education through video clips was considered supportive mean for illiteracy. The fact is that a part of the ethnic minorities people cannot read or write. Traditional forms of health education using words and pictures printed on paper remained a barrier for this group of people to understand heath messages. Video clips with accompanying speech acted as an alternative method that help them to absorb health information through hearing. A commune health worker also mentioned that:

> Someone who has never gone to school, especially the Mong ethnic minority group, is not familiar with much of the theoretical context, but watching videos like this helps them understand better.

This method of providing health education contextualized the key health messages that parents expected to receive. While the actress and actors were local residents, the content of health education was built based on the real stories happening somewhere in the community. This approach made the parents feel that the accounts were truly closed to them. A village health worker shared that pregnant women in her village were excited to see their neighbors while watching video clips:

> I remember a video played by a couple who are neighbors of a woman. No strangers, real people, real stories, so most of the pregnant women feel agreeable and so they believe in what I was explaining to them.

An Interactive Tool for Health Education

The use of tablets and portable projectors to show health education video clips could increase the interaction between health workers and parents. The clips were designed with prompted questions in pause sections where parents and healthcare workers can further discuss the topics, express their understanding, or raise a question if anything needed to be clarified. A village health worker described how she hosted a successful group communication session at her village that:

> The videos were designed with questions inserted at the end of each part of the video. When the questions appeared, the parents were encouraged to reply using the context they had watched. Or in case they want to ask questions, or we need to explain more details, I may stop the video.

Video clips provided a specific guidance for healthcare workers to follow of a health education session step by step. Based on this guidance, healthcare workers were also better prepared for the questions asked by mothers or fathers. This was a valuable aid for village health workers in mountainous areas who may have received very limited professional training. A village health worker shared in an interview that tablets and portable projectors were useful tools that supported her during health education sessions:

> Using videos helped village health workers have a basis to deliver health education. Instead of having to remember and explain each scattered content, the videos fully covered the information to be conveyed. Tablets and portable projectors therefore make health workers become more professional, more confident, and more credible.

Flexibility in Health Education Scheduling

Video clips provided a more flexible option for health workers to conduct health education sessions. Previously, health education sessions were commonly held in the form of gathering local people at the same time in a commune health center, the use of video clips installed on tablets helped health education to be implemented in individual households or residential areas with the participation of individuals or small groups. A village worker said:

> We used tablets for home visits with individual parents and projectors for small group communication

> sessions at a mutual place in the village. Depending on the numbers of people involved, we can choose a suitable method instead of always gathering all people together in one day at the commune health station for a particular health education session.

With video clips, health education sessions could even be conducted during the waiting time while parents and children seeking for healthcare services. For example, on vaccination days, the videos were presented at the commune health station in the waiting area. Although it might not be a comprehensive session for an individual parent, but it truly had an impact to a larger group of parents.

> "In this commune, the 20th of every month is the vaccination day. On this day, commune midwife will show the videos on TV in the communication room for parents to watch while waiting for vaccination.", said a manager of the commune health station.

If the old forms of health education relied on face-to-face contact, video clips provided an opener opportunity for expected parents to access health information. According to health workers, expected mothers, fathers and even family members can save the video clips to their phones, share them via social networks, and re-watch in their free time. As many parents are now owners of smartphones, a village health worker shared that:

> The link of these clips is on YouTube; later, they can also use mobile phone, TV or other technological devices to access these videos online.

Challenges of Applying Technology in Delivering Health Education by Video Clips

Lack of Technological Skills

In the remote area, it was challenging for all health workers to be confident in the use of smart device to deliver health education via video clips. Also, it will be a long way until they can thoroughly apply technology in their work. A village health worker who performed several home visits shared the fact about difficulties in applying technology:

> We were trained how to use the LED portable projectors and how to give consultant. We recognized the effectiveness of high-tech in saving time and assuring the content if we can fully apply. However, sometimes we are not familiar with the touch screen; if something happens then we may get loss.

In spite of training courses at the beginning of the project and refresh training, the technological skills remained challenging, especially among middle-aged health workers who first used a smart device in their work. A village health worker said:

> During the project, we had flexible changes; for example, when we realized that the capacity of village health workers was inadequate in using technology, the support and refresh training courses were also provided. However, it took time for them to improve personal skills.

Lack of Adherence to Work

It is a fact that many health workers were paid incentive money for their additional work in project of using video-based approach to deliver maternal health education. Many health workers even just performed the work if they knew there was a project officer monitoring them. It raises a concern that whether the project ends when financial support will no longer be provided, the goals of using technology in delivering health education will not be met. A commune midwife mentioned the lack of responsibility of a few village health workers:

> They have set schedule, but we cannot follow up all the time they work; some of them only conduct group health education sessions when being supervised.

This lack of adherence might be that there was no alignment between health workers' activities in the project and labor contract-based tasks. In other words, the project did not intervene in order to change legislative documents that could describe the project's activities as daily routine tasks. Without this alignment, activities created by the project would be considered an additional workload for healthcare workers, which leads to the intention to work just to get incentive payment. In an interview with a manager of a commune health center, he emphasized the necessity of legal documents that support the sustainability of project's activities:

> In order to keep the project sustainable, it is important to have legal documents from the district and commune which guide the implementation of maternal health care services in terms of using video clips. The rights and responsibilities of health workers must be clear enough for them to voluntarily contribute to the activity.

Discussion

The use of video-based approach showed effective outcomes in delivering maternal health education for expected mothers and their family in Trung Khanh district, Cao Bang province of Vietnam. A study conducted by Maya et al. found that video-based health education was an iterative, collaborative

approach that easily matched with the needs and contexts of target communities (Adam et al., 2019). Similar to our findings, the films/video clips were agreed to be easier to attract audiences and explain the content of health education, as resulted in a study by Neha et al. (Kumar et al., 2015). Another study examining the use of mobile videos for patient education from midwives' perspective showed that multiple advantages to using video for patient education were recognized (Fiore-Silfvast et al., 2013), and the videos were the favorite component of the mobile devices.

Our study also found that tablets with downloaded videos were helpful tools assisting health workers in health education activities. This finding is similar to the study by Kumar et al. and Fiore-Silfvast et al. that, with support from technical aids rather than paper content, accredited social health activists or frontline health workers felt more confident. They also thought that the social status of their tasks was elevated (Fiore-Silfvast et al., 2013; Kumar et al., 2015). However, from other health workers' perspectives, some reported the use of video also led them multitask, which originated from the issues of dealing with technology (Fiore-Silfvast et al., 2013).

In this study, there were obvious reasons for local health workers' difficulties in using technology. The internal factors came from the capacity of healthcare workers that they lack of technological skills, proactivity and adherence to the new tasks. In fact, no village health workers participated in our study were trained professionally in information technology. A study about the quality of human resources in science and technology among ethnic and mountainous areas in Vietnam in 2018 revealed a lower level of quality of science and technology human resources, which could not meet the development requirements of the country in the upcoming stages (Anh & Cuong, 2018). More importantly, health workers in mountainous areas were getting used to paper-based tasks for a long time without any technical requirements. This challenged them to adjust to tablets and projectors from the very beginning. A study by Brittany et al. in India agreed that the entry of electronic data collection could benefit managers in managing the data but troubled the field workers more than using the replaced paper-based methods (Fiore-Silfvast et al., 2013).

The study provided an insight to the effectiveness of a video-based health education method in a mountainous area. However, the limitations should be considered in further studies to fully explore the advantages and disadvantages of the new educational approach. The small sample size of health workers involved may hinder some aspects of working experience. The study mainly focused on the application of technology in a specific community health project, which could not provide the full imagination of challenges of health workers in delivering healthcare services. Future health interventions programs on maternal care services among mountainous areas or among minority ethnic groups should consider the application of video-based approach in health education. Further training for commune health workers on both knowledge of maternal and child care and skills of health education will be crucial to successfully deliver health intervention projects.

Conclusion

Video-based approach appeared to be an effective method, an interactive tool, and a flexible accession for health workers in delivering health education. The existing challenges can be eliminated by providing more training sessions on using technology for health workers and integrating video-based health education activities as part of labor contract-based tasks of healthcare providers.

Author Contributions All authors contributed equally, have read and approved the final manuscript.

Funding Not applicable.

Data Availability Not applicable.

Code Availability Not applicable.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval Approved.

Consent to Participate Yes.

Consent for Publication Not applicable.

References

Adam, M., McMahon, S. A., Prober, C., & Bärnighausen, T. (2019). Human-centered design of video-based health education: An iterative, collaborative, community-based approach. *Journal of Medical Internet Research, 21*(1), e12128.

Al Dahdah, M., Du Loû, A. D., & Méadel, C. (2015). Mobile health and maternal care: A winning combination for healthcare in the developing world? *Health Policy and Technology, 4*(3), 225–231.

Anh, B. T., & Cuong, P. T. K. (2018). Quality of science and technology human resources in ethnic minority and mountainous areas. *Journal of Ethnic Minorities Research*, (21), 52–56.

Bidwell, N. J., Reitmaier, T., Marsden, G., & Hansen, S. (2010). Designing with mobile digital storytelling in rural Africa. In *Proceedings of the SIGCHI conference on human factors in computing systems*.

Fiore-Silfvast, B., Hartung, C., Iyengar, K., Iyengar, S., Israel-Ballard, K., Perin, N., & Anderson, R. (2013). Mobile video for patient education: The midwives' perspective. In *Proceedings of the 3rd ACM symposium on computing for development*.

Hall, C. S., Fottrell, E., Wilkinson, S., & Byass, P. (2014). Assessing the impact of mHealth interventions in low- and middle-income countries—What has been shown to work? *Global Health Action, 7*, 25606. https://doi.org/10.3402/gha.v7.25606

Hu, F., Xie, D., & Shen, S. (2013). On the application of the internet of things in the field of medical and health care. In *2013 IEEE international conference on green computing and communications and IEEE Internet of Things and IEEE cyber, physical and social computing*.

Knowles, J., Bales, S., Cuong, L., Oanh, T., & Luong, D. (2009). *Health equity in Viet Nam—A situational analysis focused on maternal and child mortality*. UNICEF.

Krippendorff, K. (2004). Reliability in content analysis: Some common misconceptions and recommendations. *Human Communication Research, 30*(3), 411–433.

Kumar, N., Perrier, T., Desmond, M., Israel-Ballard, K., Kumar, V., Mahapatra, S., Mishra, A., Agarwal, S., Gandhi, R., & Lal, P. (2015). Projecting health: Community-led video education for maternal health. In *Proceedings of the seventh international conference on information and communication technologies and development*.

McBride, B., Nguyen, L. T., Wiljer, D., Vu, N. C., Nguyen, C. K., & O'Neil, J. (2018). Development of a maternal, newborn and child mHealth intervention in Thai Nguyen Province, Vietnam: Protocol for the mMom project. *JMIR Research Protocols, 7*(1), e6.

Polit, D. F., & Beck, C. T. (2009). *Essentials of nursing research: Appraising evidence for nursing practice*. Lippincott Williams & Wilkins.

Prieto-Pinto, L., Lara-Díaz, M. F., Garzón-Orjuela, N., Herrera, D., Páez-Canro, C., Reyes, J. H., González-Gordon, L., Jiménez-Murcia, V., & Eslava-Schmalbach, J. (2019). Effectiveness assessment of maternal and neonatal health video clips in knowledge transfer using neuromarketing tools: A randomized crossover trial. *PLoS ONE, 14*(5), e0215561.

Reitmaier, T., Bidwell, N. J., & Marsden, G. (2010). Field testing mobile digital storytelling software in rural Kenya. In *Proceedings of the 12th international conference on human computer interaction with mobile devices and services*, Lisbon, Portugal. https://doi.org/10.1145/1851600.1851649

Say, L., Chou, D., Gemmill, A., Tunçalp, Ö., Moller, A.-B., Daniels, J., Gülmezoglu, A. M., Temmerman, M., & Alkema, L. (2014). Global causes of maternal death: A WHO systematic analysis. *The Lancet Global Health, 2*(6), e323–e333.

Srivastava, A., Avan, B. I., Rajbangshi, P., & Bhattacharyya, S. (2015). Determinants of women's satisfaction with maternal health care: A review of literature from developing countries. *BMC Pregnancy and Childbirth, 15*(1), 97. https://doi.org/10.1186/s12884-015-0525-0

United Nations Children's Fund, General Statistics Office of Vietnam, United Nations Population Fund. (2011). *Vietnam Multiple Indicator Cluster Survey (MICS), Ref. VNM_2011_MICS_v01_M*. https://microdata.worldbank.org/index.php/catalog/1308

Zaidi, S., Kazi, A. M., Riaz, A., Ali, A., Najmi, R., Jabeen, R., Khudadad, U., & Sayani, S. (2020). Operability, usefulness, and task-technology fit of an mHealth app for delivering primary health care services by community health Workers in Underserved Areas of Pakistan and Afghanistan: Qualitative study. *Journal of Medical Internet Research, 22*(9), e18414.