Establishing Relations: Health Workers' Views on Integration of Mobile Phones during Follow-Up

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Abstract: *Kenya like other developing countries faces constraints in health system performance and access to services in hard-to-reach areas. The effectiveness of the use of mobile phones in iCCM (integrated Community Case Management) within specific cultural settings are yet to be established through the views of CHVs(Community Health Volunteers) and other stakeholders. This study aimed to examine the views of health workers in the integration of mobile phones within iCCM.The study design was ethnographic. The study population consisted of 25 CHVs trained and supervised in iCCM and having access to mobile phones, 4 KIIs with Nyaguda dispensary incharge, CHEW Nyaguda sub-location, a clinical officer and matron in-charge of MCH at Bondo sub-County hospital, 4 FGDs with the caregivers, community health workers, CHEWs within the intervention sites of iCCM and Bondo sub-county health management team. Data collection methods included; in-depth interviews, KIIs, FGDs, and direct observation. Data was analyzed through content analysis through the examination of the themes that emerged to explain specific objective of the study. Ethical standards were followed by obtaining informed consent and respecting confidentiality. It is hoped that the findings of this study will contribute to strengthening the existing initiatives and practices in integrating mhealth in the Kenyan healthcare system and contribute to improving health policy.*

Keywords: Health workers, mobile phone, relationships

1. Introduction

Child health programs put in place to address under-five mortality rates in the developing countries have been faced with challenges such as limited infrastructure including limited technology, lack of hospital resources, health care workers and lack of supervisory and management systems (Curioso & Mechael, 2010). Mobile phones have the potential to revolutionize healthcare. This has been revealed particularly in pilot mhealth projects in developing countries such as Uganda, Tanzania, Rwanda and Kenya (Tamrat & Kachnoski, 2012). According to Mechael (2010), individuals around the world are using mobile technologies to access health services and information and this is often done informally. Technology has the potential to help human beings exist in the social relations that they have created (Geertz, 1973). According to Pfaffenberger (1992), technology unifies almost every aspect of human endeavor. Studies on the integration of mobile phones in the management of childhood illnesses fail to adequately explain the social and cultural contexts of the places where the technology is being put to use. It is important to win the hearts and minds of CHVs by taking into account their cultural issues such as language and illustrations as well as the ecological setting within which the mobile phone is being used (Tariq & Akter, 2011). However, in this study by Tariq & Akter (2011), they only acknowledged the challenge yet did not address the problem of health workers' social and cultural views in relation to their ecological setting. This would be best understood by examining the perceptions of the key users and those targeted who are mainly the health workers and the caregivers within the health systems.

2. Literature Review

Communication and social mobilization is one of the key benchmarks for the implementation of integrated case management of common childhood illnesses (WHO/UNICEF, 2012). The joint statement by WHO/UNICEF (2012) further notes that at the lowest level, the community members or caregivers will constantly keep in touch with the community health workers who are supervised by the health management team members. Accessing, affording and the achievement of quality health care are problems experienced around the world (West, 2013). West (2013) further states that, there are disparities based on income and geography. The high costs of health care present affordability challenges for many different people making the achievement of quality care a challenge. Health care delivery can be improved through the use of mobile health applications, sensors, medical devices and remote patient monitoring products. According to West (2013), these products can help lower costs by facilitating the delivery of care and connecting people to their health care providers. The increasingly ubiquitous access to mobile phone provides one of the solutions to the problems of disconnectedness, distance, time and access to information. Mobile phones provide communication which is an essential ingredient to reach out remote and isolated tribal and rural communities. They therefore make proper healthcare accessible to the rural population. The perception of value offered by mobile phones eventually influences acceptance (Chib, Lwin & Jung, 2009). Acceptance according to Kim, Chan & Gupta (2007) refers to the general benefits of technology. The perception of value and for example, self-efficacy according to Chib et al. (2009) also influences perceived of use. Therefore, the introduction of a new technology and in this case the formal use of mobile phones

can also be enhanced by educational assistance which enhances user confidence. The theory of Cultural ecology is helpful through its focus that culture in particular the mobile phones as part of the material culture helps human populations adapt to their environments and live within the means of their ecosystem (Steward 1955). Therefore, to ensure sustainability of the integration of mobile phones into healthcare, it is necessary to acknowledge the views of various stakeholders within a given ecological and cultural context. A study by Jones et al. (2012) in Kenya revealed that SMS text messaging was enthusiastically received by the participants, the content on malaria was also perceived to be useful active reminder of best practice and did not examine the use of mobile phones on the other common childhood illnesses such as diarrhea, pneumonia and malnutrition.

The acceptability of the intervention to health workers in the study by Jones et al. (2012) concurs with findings of other projects conducted in India where MMS was used to support CHV practice. In this study conducted in India messages were viewed by health workers as important since they came from an expert (Treatman & Lesh, 2012). A study conducted in Tanzania focused on reinforcing timely home visits by CHVs. The study also revealed that CHVs had considerable enthusiasm with the use of mobile phones within the health care system (DeRenzi et al. 2012). These studies are however, yet to further explain the frequency of message delivery, duration of messaging and SMS interaction with participants. These views on the frequency and duration of sending messages are important within each specific contexts. This is because they will eventually determine the sustainability of the integration of mobile phones especially within iCCM. These studies have also not utilized other functions of the mobile phone such as voice calls. This makes it difficult to ascertain the views of the CHVs with the use of the other general functions of mobile phones.

3. Methodology

3.1 Research Design

An ethnographic study design was employed. The entry point for this ethnographic study was Nyaguda health center within the study area. This is where selection of health workers concerned with the management of childhood illnesses was done. The selection was based on the health workers who have been trained on integrated community case management for children less than five years old and who are consulted by caregivers who reside in hard-to-reach areas. The second phase entailed following-up the health workers within their natural setting of work and conducting interviews with them.

3.2 Study population

The study population comprised of 25 health workers in Nyaguda sub-location trained and supervised in integrated community case management of childhood illnesses and have access to mobile phones. The study also targeted 20 caregivers who are involved in the decision making process of where to seek health care during the illness of a child less than five years old. Information was also received from 4

key informants who included community health and extension workers, key hospital workers both in Nyaguda health center and Bondo-sub district hospital where most of the children are referred to when the illness is severe will also interviewed. These will include the in-charge of Nyaguda health center, the matron and a clinical officer in the maternal child health unit at the Bondo sub-district hospital. The unit of analysis is the health workers concerned with the management of childhood illnesses among children under five and who used mobile phones informally to manage childhood illnesses.

3.3 Sampling selection Procedures

The target population was the health workers tasked with the management of childhood illnesses. Twenty Community health workers concerned with the management of childhood illnesses were selected purposively and interviewed in each of the seven villages in Nyaguda sub-location (Minya, Nyaguda, Orengo, Otuoma, Uhendo, Wichlum and Wichlum Uhendo).The need for thick description makes it necessary that samples are small (Hammersley and Atkinson, 2007). Small samples do not permit generalization to a larger population. The aim of this study is not to generalize but rather to have an in-depth understanding of the situation without losing sight of the whole (Hammersley and Atkinson, 2007).It provides the researcher with a much more comprehensive holistic perspective than other forms of research. The participants were sampled purposively. Data gathered during these interviews were audio recorded and also noted in the field note-books. FGDs were conducted homogeneously selected groups until a level of saturation was achieved. These groups included; female caregivers, community health workers, Community Health and Extension workers of areas within Bondo sub-county where integrated community case management has been implemented, members of Bondo sub-county health management team who are often involved in iCCM supervision process. The FGDs each comprised of eight participants. During the Focus Group Discussions, a field assistant assisted with the note-taking. The discussions were also audio-recorded and later transcribed. Direct observations were made on the various ways used by care-givers and community health workers to manage common childhood illnesses, especially using mobile phones and how the community health workers and the health personnel handle children with common illnesses. The behavior of people around the child with a particular common illness was also observed. Observation was made on the housing structures, cultural settings and general living conditions that may have prompted the occurrence of the common childhood illnesses among children under five and also how such conditions influence the use of mobile phones in the management of common childhood illnesses. These observations were guided by an observation check list. The reliability of the tools in this study was achieved through pre-testing of the tools by taking a sample of 10% of the various data collection tools and administering them in a setting similar to Nyaguda where iCCM has been conducted before though not within the study area. This aided in finding out if there are any errors to be addressed in the data collection tools before conducting the actual study. Validity on the other hand is concerned with the meaning and

interpretation of data collection tools which was be achieved through triangulation.

3.4 Data analysis and presentation techniques

The study employed qualitative data analysis techniques. The interviews were recorded having obtained consent and verbally transcribed. The data was coded and themes presented through descriptive texts, analyzed reports and narratives. Information from the qualitative data was coded and analyzed using latent content analysis. This was done by theoretically relating the emerging themes from the texts. The content latent analysis examined the specific objectives of the study.

4. Results and Discussions

4.1 Establishing Relations: Health workers' views on integration of mobile phones during follow-up

Community Health Volunteers (CHVs) perceived the use of mobile phone to be a useful tool for their work. They stated that mobile phones are useful during follow-ups not only to find out about the health of the sick under-five child but to also establish the health status of the other family members. One of the Community health volunteers stated that;

> During my consultations with the caregiver of the sick child I will first and foremost establish and find out how the caregiver is faring on and the health of her family members before I embark to finding out how the child who is under treatment is faring on with the medications and if there is any improvement or any concern in the health of the child (42 year old, female CHV).

The cultural context of Nyaguda sub-location is geared towards ensuring community unity and solidarity. This is because the rural setting of Nyaguda sub-location still fosters oneness and togetherness where members are concerned about the welfare of each other. Therefore, when a CHV calls the caregiver to find out how the sick child who received healthcare management is doing, the CHV will further ask about the health of the other family members. This culture has helped the CHVs to establish the health of all the family members and not the health of the sick child alone. This opens us further spaces of care for all family members because if another member is unwell, the CHV can further give guidance and encouragement to the member to seek health care. Human cultures have adapted their technologies to suit their environment, and these culture's use of resources have led to changes in the physical and biological characteristics of their surroundings as well as modifying behavior on a range of issues that affect human lives (Steward, 1955). The CHVs use the mobile phone as an important tool used to establish relations despite the physical environment of Nyaguda sub-location which is a hard-to-reach-area. This is because it is used to extend care even to the other members of the household who may not be feeling well yet have not sought for health care. The conversation with the CHV with the caregiver will help the CHV know if there is a health problem that needs to be addressed. The

above narration shows how the mobile phone helps to navigate the aspects of care to the entire household members and not just to the sick child who had received healthcare. These interactions between the CHV and the family members helps to open up spaces of care for the family members. This is through the CHV having received the message that there is a sick person in the family, the CHV will take the next important step and visit the family to ascertain problem and provide that appropriate care needed. The mobile phone is used to help provide information yet at the same time still reinforcing the existing relations.

The mobile phones are also used when the caregiver had seen the doctor and received treatment. The CHVs would get feed-back from the doctor on what the child was suffering from and the steps that have been taken and what needs to be done when the caregiver gets back to the community. This strategy therefore forms different layers of health care management within the expanded spaces of care that enhances the effectiveness of the existing healthcare system. In the event that the doctor does not call, the CHV would call either the doctor at the facility or the caregiver and establish the way forward in helping the child towards achieving proper care and eventually good health. This is exemplified through a narration by one of the CHVs;

> It helps me to confirm whether the caregiver whom I referred arrived at the health facility before the caregiver even returns the referral form with specific instructions from the facility in-charge on how follow-up is to be done (35 year old, female CHV).

The mobile phone has created new spaces in which lives are cared for. For example, the above narrative shows that it is through the use of mobile phones that the patients get connected with the CHV. The CHV then connects the clients with the facility in-charge especially for cases that she cannot handle and hence has to refer. The patient after receiving treatment most of the time gets also to communicate via the mobile phone with the CHV explaining the directions given by the facility in-charge. This is unlike the physical follow-up whereby the CHV would at times be needed to accompany the caregiver with the sick child to hospital then follow-up the client all through the treatment process physically. The integration of mobile phones within iCCM has meet met the expectation of Mort, May and Williams,(2003); Bashshur and Shannon,(2009) who noted that network connectivity was expected to render distance meaningless and to break down barriers to the provision of health care. The mobile phone used within iCCM to ensure the CHV receives feedback from the facility in-charge concerning the health care that has been given to the patient ensures the CHV is well furnished with guidelines on how to follow-up on the patient. The networking function of the mobile phones, therefore, helps in distributing knowledge towards ensuring that the relations between various stakeholders in health are still reinforced. This is in ensuring that the health care of children less than five years is well managed. Studies assessed the use of mHealth tools to reach geographically dispersed CHWs with accurate and timely clinical information, shared through multimedia formats (Florez-Arango et al, 2011,Lemay et al, 2012). These studies however, focused on the use of multimedia formats yet this

study focused on the use of basic phones that are accessible to the CHVs.

Through communication via the mobile phone the CHV knows which commodities to carry for treatment. This is because through the use of the phone they can be told the symptoms that the child is suffering from and take with them only the needed equipment instead of carrying too much that is not necessary. The mobile phone has made work more convenient for the CHVs. For example, to the CHVs would not always carry their heavy bags with all commodities given the vastness and the topography of the area. For example, a caregiver may call and inform the CHV that the child has been having fever and no coughs prompting the CHV to just carry the Rapid Diagnostic Kit (RDT) for malaria, Artemether Lumefantrine (AL) and paracetamol. This was explained by one of the CHVs;

> The process of going out to offer treatment to the community members has made work easier for the CHVs through the use of mobile phone. This is because the caregivers with sick children would call the CHVs first and explain the illness of the child which guides the CHV on which equipment to carry to that particular household instead of carrying all the commodities which are usually heavy for all their visits (48 year old, female CHV).

Connectivity through the use of mobile phones has made healthcare management less burdensome for the CHV. The mobile phones have reshaped and reordered the lives of the CHV and generally the lives of the people of Nyaguda sub-location. This view concurs with the notion by Schillmeier and Domènech (2010) who state that technological and scientific innovations associated with solving the 'problem of care' are expected to produce societal transformations. Schillmeier and Domènech (2010) further mention that technological and scientific innovations question and alter common social relationships. They also evoke and stabilize, a new ordering of everyday life.

Therefore, the use of mobile phone though still at the informal level in Nyaguda sub-location has induced considerable reconfiguration and intermingling of the community members' private and public spatial arrangements. New care and care systems technologies, such as telecare (Percival and Hanson, 2006) shape and reshape the practices and spatialities of care (Milligan 2001; Poland, Lehoux, Holmes and Andrews 2005). The informal use of mobile technology within Nyaguda sub-location has indeed shaped and reshaped practices and opened spaces of care due to the open communication among all the stakeholders of healthcare.

It was also noted that through calling which was interactive in nature, the health workers and especially the CHEWs and the hospital personnel would immediately confirm cases and episodes of illnesses. For example, in case of new cases of illnesses, there can be a quick consultation on how best to address the issue before it gets out of hand. One of the CHV reported that;

> There was a period when diarrhea cases were too many in my area. Having the mobile phone I just called the CHEW who came immediately with the facility health officer to help identify and deal with the problem. The problem was solved in good time and health information passed on to the community members on the importance of having pit latrines in their homes, need to boil or treat drinking water and the benefits of hand washing before eating and after visiting the toilet (52 year old, male CHV).

The use of mobile phones has been useful in addressing emergent cases of illnesses among children less than five years old. The key health stakeholders would interact through the use of mobile phones and ensure that despite the emergent illnesses compliance to guidelines and standards are still followed. This is to ensure that healthcare is provided efficiently and effectively. This concurs with a study conducted by Jones et al. (2012) who noted that mHealth tools have been used to ensure CHW compliance to standards and guidelines for health services in the field, most prominently through decision support, and alert and reminder tools. For example, a study using text messaging to improve outpatient malaria care in 107 government health facilities in Kenya led to improvements in drug management both immediately after the intervention, and six months post-intervention (Jones, 2012).

5. Conclusion

It can therefore be concluded that, the mobile phone within the hard-to-reach context of Nyaguda sub-location is an important aspect of culture as noted by the CHVs. Interactions between the CHV and the family helps to open up spaces of care for members of Nyaguda sub-location. Within the context of Nyaguda sub-location the interactive features were used and noted to be helpful in navigating healthcare not only to children less than five years but to all members of the society. Therefore, the mobile phone as a cultural tool is used to distribute knowledge in ensuring that relationships are reinforced among the various stakeholders concerned with the health of children less than five years.

References

[1] Bashshur, R.L., &Shannon,G.W. (2009). The History of Telemedicine: Evolution, Context, and Transformation. New Rochelle, NY: Mary Ann Liebert Incorporated.

[2] Chib, A., Lwin, M.O., & Jung, Y. (2009). Adoption of mobile phones to enhance health care: A technology acceptance study of maternal care workers in Indonesia. *Media Asia, 36(4), 216-222.*

[3] Curioso, W.H., Mechael, P.N. (2010). "Enhancing 'm-health' with south-to-south collaborations." Health Affairs, Supplement. 2010; 29(2):264-267.

[4] DeRenzi, B., Findlater, L., Payne, J., Birnbaum, B., Mangilima, J., Parikh, T., Borriello, G. & Lesh, N. (2012). Improving Community Health Worker Performance through Automated SMS. *Proceedings of the Fifth International Conference on Information and Communication Technologies and Development.*

Association for Computing Machinery 25–34. ACM, New York, NY, USA.

[5] Florez-Arango, J.F., Iyengar, M.S., Dunn, K., Zhang, J. (2011). Performance factors of mobile rich media job aids for community health workers. J Am Med Inform Assoc 18: 131– 137.

[6] Geertz, C. 1973. The Interpretation ofCultures. New York: Basic Books.

[7] Hammersley, M & Atkinson, (2007), Ethnography: Principles in Practice (3rd ed). Routledge, London.

[8] Jones, C.O., Wasunna, B., Sudoi, R., Githinji, S., Snow, R.W. & Zurovac, D. (2012). "Even if you know everything you can forget": health worker perceptions of mobile phone text-messaging to improve malaria case-management in Kenya. *PLoS One, 7, 6*.

[9] Kim, H. W., Chan, H. C., & Gupta, S. (2007). Value-based adoption of mobile Internet: An empirical investigation. *Decision Support Systems, 43(1), 111– 126.*

[10] Mechael, P., Batavia, H., Kaonga, N., Searle, S., Kwan, A., Goldberger, A., Fu, L. & Ossman, J. (2010). *Barriers and Gaps Affecting mHealth in Low and Middle Income Countries: Policy White Paper.* New York: Center for Global Health and Economic Development Earth Institute, Columbia University.

[11] Milligan, C.H. (2001). Geographies of Care. Space, Place and the Voluntary Sector. Farnham: Ashgate.

[12] Mort, M., May, C.R., &Williams, T. (2003). 'Remote Doctors and Absent Patients: Acting at a Distance in Telemedicine?' Science, Technology & Human Values 28, no. 2: 274–95.

[13] Lemay, N.V, Sullivan, T., Jumbe, B., Perry, C.P. (2012) Reaching remote health workers in Malawi: baseline assessment of a pilot mHealth intervention. J Health Commun 2012: 17: 105– 117.

[14] Percival, J. & Hanson, J. (2006). Big Brother or Brave New World? Telecare and its implications for older people's independence and social inclusion. Critical Social Policy, 26, 888–909.

[15] Pfaffenberger, B. (1992). Social Anthropology of Technology. *Annual Review of Anthropology 21, 491– 516.*

[16] Poland, B., Lehoux, P., Holmes, D. & Andrews, G. (2005). How Place Matters: Unpacking Technology and Power in Health and Social Care. Health and Social Care in the Community, 13(2), 170–180.

[17] Steward, J.H (1955).*Theory of Culture Change*. Urbana: University of Illinois Press. Schillmeier, M. &Domènech, M. (eds.) (2010) New technologies and emerging spaces of care. Farnham: Ashgate.

[18] Tamrat, T. & Kachnowski, S. (2012). Special delivery: An analysis of mHealth in maternal and newborn health programs and their outcomes around the world. *Maternal Child Health Journal, 16, 1092–1101.*

[19] Tariq, A. & Akter, S. (2011). *An assessment of m-Health in developing countries using task technology fit model. AMCIS 2011 Proceedings (pp. 1-12).* Detroit, USA: Association for Information Systems.

[20] West, D. (2013). "*How mobile devices are transforming healthcare*, "in Brookings: Issues in Technology Innovation, Brookings.

[21] World Health Organization (WHO) (2012). UNICEF: Integrated Community Case Management (iCCM): An equity-focused strategy to improve access to essential treatment services for children. [*http://www.unicef.org/health/ files/iCCM_Joint_Statement_2012.pdf*].