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Knowledge And Attitudes Towards Non-Communicable Diseases (ncd) Amongst Village Health Teams (vht) In Iganga And Mayuge Districts, Uganda.

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**KNOWLEDGE AND ATTITUDES TOWARDS NON-COMMUNICABLE DISEASES (NCD)
AMONGST VILLAGE HEALTH TEAMS (VHT) IN IGANGA AND MAYUGE DISTRICTS,
UGANDA**

MASTERS IN PUBLIC HEALTH THESIS

TEMITOPE TABITHA OJO

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ABSTRACT

Background: Community health workers (CHW) have successfully contributed to prevention, management and care for NCD interventions in several low and middle income countries (LMIC). In Uganda, the CHWs, known as Village Health Teams (VHT) are the initial point of care in their communities. Though their present roles only attend to infectious diseases, maternal and child health issues, their skills could potentially be utilized in national efforts to promote NCD prevention in communities.

Aim: To assess baseline knowledge of and attitudes toward NCDs and NCD care among VHT in Uganda as a step towards identifying a potential role for VHT in community NCD prevention and management.

Design: A knowledge, attitudes and practices questionnaire was distributed to 68 active VHT workers from Iganga and Mayuge districts, Uganda. In addition, four focus group discussions were conducted with these VHT workers (n=33). Discussions focused on NCD knowledge, current experience with NCD, and barriers and facilitators to incorporating NCD care into their role as community VHT. A thematic qualitative analysis was conducted to identify salient themes in the data.

Results: VHTs possessed some knowledge and awareness of NCDs but identified a lack of knowledge about NCDs in their communities. VHT were enthusiastic about incorporating NCD care into their role and thought that they could serve as effective conduits of knowledge about NCDs to their communities, if empowered through NCD education, the availability of proper reporting and referral tools, and visible collaborations with medical personnel. Current barriers to their participation in NCD care included lack of VHT education on NCD, lack of assistance/supervision from medical personnel, lack of medical services, medication, equipment and personnel and lack of VHT regard from community.

Conclusion: Ugandan VHT already possess some nuanced knowledge about NCD and their risk behaviors. With context-specific and culturally adapted training, VHT want to and could play a role in

spreading community awareness of NCD and reporting and referral of community members for NCD screening.

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INTRODUCTION

The rising burden of non-communicable diseases (NCD) and mortality related to NCD in low and middle-income countries (LMIC) has been established by recent studies (International Diabetes Foundation, 2014; Maher et al., 2011; Mondo, Otim, Akol, Musoke, & Orem, 2013; Tollman et al., 2008; World Health Organization, 2013). According to 2012 data from the World Health Organization (WHO), nearly 75% of deaths from NCD (28 million) occurred in LMIC, with 48% of those deaths occurring amongst people under 70 years old (World Health Organization, 2013). There is enough data available on the prevalence of NCD from some LMIC that corroborate the necessity for health interventions to tackle this issue (International Diabetes Foundation, 2014; Maher et al., 2011; Mondo et al., 2013; Tollman et al., 2008).

In Uganda, the four most prevalent NCD: cardiovascular diseases (CVD), cancer, diabetes and chronic lung diseases and their relevant risk factors have been studied (Maher et al., 2011; Mondo et al., 2013). In 2013, 22.1% of Ugandan men and 20.5% of women had hypertension, 15% of men and 16.8% of women were overweight, 9% of participants were diabetic and 9.6% were daily smokers (Mondo et al., 2013). Uganda has made efforts toward the design and implementation of interventions to target NCD burden. In 2006, the Programme for the Prevention and Control of NCDs, under the Department of Community Health was created by Uganda's Ministry of Health (Schwartz, Guwatudde, Nugent, & Mondo, 2014). In 2013, a nationwide needs assessment of health facilities was conducted to gauge the country's capacity to address NCD needs (Rogers, 2014; Schwartz et al., 2014). In 2014, a national WHO-STEPI survey on chronic diseases captured the prevalence and risk factors of the four most prevalent NCDs in Uganda (Uganda Ministry of Health, 2014). There have also been several multi-sectional collaborations within the country focused on addressing NCDs (Schwartz et al., 2014).

These efforts provided relevant, country-specific information that identified scarcity of trained health professionals for the treatment of NCD, and poor reporting and recording of NCD in health facilities, including health centers that serve most of rural Uganda (Rogers, 2014). As low-physician-to-population

ratio compounds NCD rising burden in Uganda, as in other LMIC settings, (Roger, 2014, India Ministry of Health and Family Welfare, 2010; Kar, Thakur, Jain & Kumar, 2007; World Health Organization, 2006), Community Health Worker (CHW) networks could potentially be used to deliver preventive services for NCD. The benefits of task-shifting within healthcare have been documented as effective, especially in resource-poor settings where the ratios of physicians to the population are very low (Cellesti et al., 2010; Lekoubou, Awah, Fezeu, Sobngwi, & Kengne, 2010)

There is an already established network of CHW in Uganda, known as Village Health Teams (VHT). The VHT are an established and recognized network of volunteers who are recommended by their respective communities to be trained for VHT work (Uganda Ministry of Health, 2015). With basic health training that lasts five to seven days (Uganda Ministry of Health, 2013, 2015), VHT serve as the initial point of contact for healthcare services in their communities. While VHT execute extensive community mobilization, empowerment for disease prevention, and health promotion for communicable diseases and maternal and child health (Uganda Ministry of Health, 2015), there is no simultaneous action on NCD at the community level. VHT workers, if given basic NCD training may be able to provide primary services addressing NCD in their communities.

To determine whether incorporating NCD screening and care into the VHT role may be possible in Uganda there is need to establish the knowledge base, perceptions and attitudes of VHT workers towards NCD and NCD care in order to i) identify potential roles for VHT in NCD prevention and care, ii) identify perceived barriers and facilitators of NCD prevention work, while operating within the VHT work frame.

Currently, there is no published or on-going research that documents the level of knowledge and information the VHT members have on NCD. Therefore, the primary aim of this research was to assess VHT baseline knowledge of NCD and their attitudes toward incorporating NCD care into their existing roles.

With the growing incidence of NCD at the community level, the existing interactions VHT have with the community and community health partners are likely to expose them to rudimentary knowledge/awareness of NCD. We hypothesize that VHT have an existing knowledge of NCD and risk behaviors contributing to NCD, sufficient to consider the VHT network for promoting community-level knowledge and awareness of NCD.

METHODS

A mixed method, cross-sectional study of VHT knowledge and perceptions of NCD and NCD risk behavior was conducted at the Iganga-Mayuge Health Demographic Surveillance Site (IMHDSS) in Eastern Uganda for 11 weeks, from June to August 2015. The IMHDSS, founded by the Makerere University, is a designated site for epidemiological and population research in Uganda. This site has a total population of 80,000 people, spread across 65 villages within Iganga and Mayuge districts (Makerere University, 2015).

Study Design and Data Collection

Study participants were active VHT workers within the DSS, who were 18 years or older. The first author (TTO) worked with IMHDSS staff to identify VHT workers that were operating within the IMHDSS during the duration of the research project. The active status of VHT workers was determined based on DSS records. There were 81 active VHT workers operating within the IMHDSS who were eligible for recruitment.

Field assistants consented VHT who understood the purpose and requirements of the study and collected basic contact information for scheduling of focus group discussions.

Six bilingual field assistants, fluent in English and Lusoga (the native language of the region) carried out interviewer-administered questionnaires and FGDs. The field assistants had an average of six years of field work within the IMHDSS. Field assistants were trained for two weeks, to be familiar with the study components and to review the data collection tools. Towards the end of the training, the data collection tools were pre-tested and the tools were revised, based on the feedback from the pre-testing.

Sixty-eight of the eligible participants completed a short, quantitative KAP questionnaire, which was translated from English to Lusoga and back translated to English. A simple randomization via computer-generated numbers from Excel was used to select the VHTs that completed the questionnaire. Given that there is no published literature that explicitly state the proportion of VHTs that have an existing knowledge of NCD and its risk factors in Uganda/sub-Saharan Africa, sample size was determined based on the assumption that 50% of VHT would or would not have an existing knowledge of NCD, at a significance level of 0.05. The questionnaire consisted of thirty questions, which were based on the 2014 WHO STEPs survey on NCD conducted in Uganda and a comprehensive KAP survey on NCD used in a 2010 Mongolian nation-wide study (Demaio et al., 2011; Mongolia Survey Report, 2011; Uganda Ministry of Health, 2014). The questionnaire collected demographic information such as age, gender, VHT occupation, education level, number of VHT work hours per week, years of active VHT work and explored the preconditions and determining factors related to common NCD health behaviors and practices (Demaio et al., 2011; Mongolia Survey Report, 2011; Uganda Ministry of Health, 2014).

Thirty six VHT were invited to participate in focus groups. The focus group discussions, facilitated by two trained field assistants in Lusoga, sought to compliment the questionnaire data by eliciting VHT workers' perceptions of NCD as an important health issue and their potential roles as CHW in tackling the problems of NCD in their communities. The interview guide for the focus groups, which consisted of nine questions, (see Table 5) was translated from English to Lusoga and back translated to English.

Focus group participants were selected based on their gender and the district they operated in. As reported in the 2015 report of the national VHT assessment in Uganda, communities respond differently to male and female VHTs (Uganda Ministry of Health, 2015) so researchers felt it was important to conduct focus groups in same-gender groups, to capture these differences. Four focus groups, made up of six to eleven VHT participants per group (total n=33) were formed - two female-only and two male-only groups. Focus groups were conducted in each district: at the Magada health center, Mayuge, where a set of male and female-only FGDs were held, and at the Nakigo town hall, Iganga, where another set of male and female only FGDs were held.

Before the start of each discussion, the field assistants introduced themselves to the group, and explained that the purpose of the discussions was to gather information on VHT workers' views about addressing NCD in their communities and their knowledge of NCD. Participants were assigned numbers and instructed to mention their assigned numbers before they responded to any questions. Before the discussions started, the participants read and signed the consent forms. The discussions lasted between 45 to 60 minutes. All discussions were audio-recorded by the principal investigator.

All data collection tools, consent forms and study proposal were reviewed and approved by the Yale University Human Subject Committee (HSC) in New Haven, Connecticut, USA and the Makerere School of Public Health Higher Degrees Research and Ethics Committee (HDREC) in Kampala, Uganda.

Data Management and Analysis

Data from completed questionnaires were double-entered in two separate excel files by two research members. R software was used to obtain descriptive demographic statistics about the VHT based on their responses to the KAP questionnaire. This consisted of their mean age, number of weekly hours spent on VHT work and the proportion of women to men. The number and percentages of VHT that responded to different answer options for each question was also calculated and tabulated. (Table 4)

Responses from the FGDs were translated and transcribed from Lusoga to English by the field assistants that conducted the FGDs. Transcripts were checked against the audio recordings for accuracy and cleaned to remove any identifying information.

Codes for the analysis were developed after an initial reading of all of the transcripts and field team notes, and were based on the main interview questions, prior literature in this area, and emergent concepts from the current data. To develop the codes two reviewers (TTO and NLH) independently reviewed one transcript and developed a coding structure. These codes were discussed and clarified and an initial coding scheme agreed upon. Refinement of the coding scheme was an iterative process as each of the focus group transcripts was reviewed. Any changes to the original coding scheme were applied to all previous transcripts. Each transcript was coded by both investigators, who coded independently before meeting to come to consensus.

A thematic analysis was conducted, in which individual codes were read in aggregate and a written summary of the code created. nine codes and forty-four sub-codes were identified and these were merged into four main themes: i) VHT understanding of NCD; ii) VHT role in preventing community NCD; iii) facilitators to VHT role in preventing community NCD and iv) barriers to VHT role in preventing community NCD. The analysis attempted to achieve equal and fair representation of the opinions of the focus group participants. Quotes presented were selected to illustrate the study findings, and participants' colloquial language was retained.

RESULTS

Sample Population Characteristics (Table 1 and 2)

On average, VHT participants were middle-aged and had spent a little over 6 years working as VHT. There were more female (70.3%) than male VHT (29.7%), reflecting the gender distribution of VHT in the region, and their major occupation outside their VHT work was farming.

Table 1 and 2 here

Questionnaire Response Themes (Table 3 and 4)

Questionnaire questions and responses are organized in three domains: VHT general knowledge related to NCD, VHT nuanced knowledge about specific NCD- high blood pressure, heart disease, stroke and diabetes, and identifying potential gaps that VHT could fill based on VHT perception of population risk behavior.

Table 3 and 4 here

VHT general knowledge related to NCD

The majority of the sample had some awareness of NCD burden in the general population as 94.1% of them acknowledged that NCD are not transmissible and 82% agreed that NCD are common in Uganda.

VHT knowledge related to specific NCD

There was a consistent measure of VHT having some knowledge of high blood pressure, CVD, diabetes and its complications. Of the 68 VHT workers surveyed, 70.6%, 61.8%, 52.9% and 63.2% know a little about high blood pressure, heart diseases, stroke and diabetes mellitus respectively. Based on a brief description of what heart diseases are (including heart attacks and strokes), 89.7% of the VHT workers perceived that CVD are becoming more common in Uganda. About 77.9% responded that diabetes is caused by high sugar levels in the blood. Over half of the VHT reported that diabetes can cause the

following complications: loss of sensation in the feet, damage to the heart and blindness. A little less than half thought diabetes was preventable.

Potential gaps VHT could fill based on VHT perception of population risk behavior.

All VHT surveyed thought active smoking affected one's health and was either harmful or very harmful to the lungs and the heart). Though the majority of them (83.8%) considered active smoking and second-hand smoke harmful, less than half of them (47.1%) currently talked to community members about the harms of smoking. Collectively, the VHT thought Ugandans drank a lot at once, particularly at celebrations and most of the VHT surveyed had advised community members on the harms of drinking.

All the VHT reported to varying degrees, that daily consumption of fruit and vegetables was important. Three-quarters of VHT surveyed thought lack of knowledge about the benefits of fruits and vegetables was the foremost reason Ugandans did not consume a lot of fruits and vegetables. Most of the VHT workers thought that the salt added by Ugandans to food contributed the largest amount of salt in a Ugandan's daily diet. The majority of the VHT (77.9%) thought exercising five or more times per week was required to stay healthy. They thought that lack of knowledge about exercise was responsible for Ugandans not exercising much.

Focus Group Discussion Themes (Table 5)

Table 5 here

VHT Understanding of NCD

When asked about their understanding of NCD, respondents either gave examples of specific diseases they understood to be NCD or they spoke to their mode of transmission. Diabetes, high blood pressure, heart disease, and cancer were frequently mentioned as examples of NCD. Some less frequently suggested were ulcers, anemia, and asthma.

Participants were confident in their knowledge that NCD were diseases not transmitted between individuals through air, sharing of space, cooking utensils, or by sexual relationships.

“Such diseases cannot be transmitted if you share the same utensils (cups, plates) or the same bed i.e. cancer” Participant 7-FGD1

“These are diseases that cannot be transmitted from one person to another. For example, if you share the same taxi with someone with NCD, it can’t be transmitted.” Participant 1- FGD2

As discussions progressed, it became evident that many focus group participants had more nuanced knowledge of these diseases, for example, some participants spoke to the lifestyle risk factors associated with NCD, particularly poor dietary intake, or susceptibility based on family history. Importantly, VHT were aware that NCD were chronic conditions, often only symptomatic after a long period of latency which they identified as a possible contributor to the lack of awareness about NCD in their communities.

“Due to ignorance, people are not aware of NCD. It is in the later stages that people go for check-ups, yet they had developed the diseases over a long time and now it cannot be prevented.” Participant 5-FGD2

“...Since NCD are diagnosed after a very long time, they tend to affect more because it is only when one sees the signs that one goes to the hospital and it would be too late to prevent.” Participant 3- FGD4

When asked about their recognition of NCD in their communities, respondents reported seeing and knowing of people with different NCD while carrying out the VHT work in the communities. Two of the respondents thought NCD were the most common diseases in their communities.

According to the participants, there is little or no community awareness of NCD, and no knowledge of causes, signs and symptoms of NCD. Participants associated the community’s unawareness of the causes, signs and symptoms of NCD to lack of knowledge on NCD and unavailability of screening services at

health centers. Respondents implied that community NCD awareness could be made better when knowledge about NCD is increased.

“People don’t know of NCD because they lack knowledge about it. At least, there should be programs organized to inform the community of NCD.” Participant 1- FGD2

VHT Role in Preventing Community NCD

When asked about their thoughts on the need to address NCD burden, respondents unanimously agreed that NCD are very important health issues that needed to be addressed in their communities. Increasing NCD screening and diagnosis was a major strategy participants suggested as a way to address community burden of NCD.

It was evident that VHT saw themselves as health connectors, who linked their communities to health services and care. They saw themselves as conduits of knowledge about NCD to their communities, on the condition that they as VHT receive training on NCD issues.

“As VHT, if we can get enough knowledge on NCD, we can return to the communities and teach our people about NCD.” Participant 5- FGD1

“I have to create friendships with people with NCD for easy referral. With closeness, counseling is easier.” Participant 7- FGD1

Positive interpersonal relations between medical personnel and the communities was a consistent theme that came up in the FGDs with regard to the VHT potential role in preventing NCD. Participants expressed the need for medical personnel to come down to the community level in order to foster a safe space in the communities to address NCD needs, rather than having community members travel to health centers.

“...If medical personnel could come to the villages and screen for NCD, it would be better.” Participant 6- FGD4

“...If medical personnel could organize workshops in communities to inform them about NCD, it will help in dealing with NCD.” Participant 3- FGD4

Without formal or required training for NCD as VHT, some participants expressed that they already take actions to address NCD by counseling community members to go in for regular check-ups or referring them to health centers when they get complaints about NCD-related issues from the community.

“When doing my VHT work, if I find someone with an NCD, I refer them to the hospital for tests.”

Participant 6- FGD1

“As a VHT, I always advise my community to go in for regular check-ups; I tell them not to sit and relax and only run to hospitals after having signs.” Participant 3- FGD4

Facilitators to VHT Role in Preventing Community NCD

VHT respondents identified NCD education as the foremost tool they need to possess in order to address NCD in their communities. Other structural changes they recommended were the availability of screening services and endorsement and collaboration of medical personnel with VHT. In particular, they emphasized the need for medical personnel to take up active roles in tackling disease burden by carrying out community outreaches, where they will screen for disease and also educate the communities about NCD. Importantly, VHT also felt that visible partnerships between them and medical personnel would boost VHT’s credibility in the community and promote their work as VHT.

“I need information about NCD from medical personnel for our communities; if medical personnel can come to our villages and inform us, it will ease our work as VHT. At least, they (community) will know that it was the personnel who have taught the VHT about NCD.” Participant 3- FGD3

According to participants, VHT’s role for NCD would be facilitated through the following: proper referral and record-keeping tools, availability of NCD medication, provision of medication and equipment for VHT, VHT transportation and monetary aid, and positive interpersonal interactions with medical

personnel. The respondents viewed education, screening services, proper referral and reporting tools and medical personal involvement as key facilitators for their potential roles in NCD prevention, rather than prioritizing monetary or personal support aids. Table 6 presents example statements from the VHT highlighting key facilitators to the incorporation of NCD care into their existing community role.

Table 6 here

Barriers to VHT Role in Preventing Community NCD

The major barriers participants saw to addressing NCD in their communities were the lack of formal VHT education on NCD, poor healthcare infrastructure and community poverty, discouraging attitudes from medical providers towards community members, and lack of assistance and support for VHT from medical personnel and the community (Table 7).

“Lack of equipment like counseling cards also affects our work as VHT. For instance, use of pictorial teaching materials in educating community members about NCD will help to reinforce the knowledge/information the VHT is giving (on smoking, drinking and the dangers).” Participant 8- FGD 2

It is evident that VHT identified the interconnectedness of the barriers to each other. For instance, respondents stated that when they refer community members to the health centers on NCD-related issues, and they encounter negative attitudes from medical personnel, or are not provided with testing or medications for their condition, such members return to their communities without getting any help and would be further reluctant to return to the VHT and the health centers for care.

“People go to the hospital and want to test for diseases but are not being rendered these services. There is poor management in health units which affects our work at the end of the day. When we refer other people, they refer to the failure of their (community) members to get the services they needed at the health units.” Participant 10- FGD 1

Table 7 here

DISCUSSION

In order to explore potential roles VHT could play in the prevention of NCD at the community level, focus group discussions and a NCD KAP questionnaire were conducted amongst active VHT in two Eastern districts in Uganda. The discussions revealed that VHT possess some knowledge and awareness of NCD and risk behaviors, despite a lack of formal training in this area, and identify a lack of NCD knowledge in their communities. Participants saw a role for themselves as conduits of knowledge to their communities about NCDs, on the condition that VHT could be empowered with knowledge through training and support from medical personnel. VHT were also able to articulate potential barriers and facilitators to incorporating NCD care into their existing roles.

VHT Understanding of NCD

VHT distinctly understood that NCD were not transmissible and spoke of some risk behaviors responsible for NCD. Based on their knowledge, they were confident that they were already encountering community members with NCD while they performed their official VHT work. This corroborates the existing global and national data that shows the growing incidence of NCD being documented in LMIC such as Uganda (World Health Organization, 2013); (Maher, 2011; Mondo, 2013). Many of these community members are likely undiagnosed and therefore unaware of their underlying disease (Guwatudde et al. (2015). As primary health service delivery improves in Uganda and the capacity for clinical identification of NCD risk factors and diagnosis of NCD increases, more people will be aware of their conditions and may benefit further from VHT counseling.

VHT linked the latent nature of NCD manifestation and unavailability of screening services at community health centers as contributors to the lack of NCD awareness in the communities. Factors suggested to have contributed to the lack of awareness of NCD and communicable diseases in Uganda include low socio-economic status (SES), lack of education about disease, rural location, long distances to health facilities as a constraining factor, poor quality of services, lack of medications, low knowledge/lack of awareness, poor staff attitudes, long waiting times, high costs, lack of skilled personnel and cultural

beliefs (Kiwanuka et al., 2008). Some of these factors were reflected in the VHT responses to existing barriers that would impact their roles as VHT in preventing NCD.

VHT Role in Preventing NCD in Communities

VHT thought their present roles in helping their communities to access health knowledge, care and services for maternal-child health and infectious diseases could be replicated for NCD prevention. They were enthusiastic about the expansion of their role into this area on the condition that they receive adequate training.

VHT prioritized NCD training, availability of screening services and proper referral and reporting system for NCD risk as a means of facilitating their potential roles in NCD prevention. A previous study in South Africa, where CHW were involved in ongoing care for NCD clients also recommended context-relevant and organized education for VHT and the provision of resources to build CHW capacity in NCD roles as significant facilitators for CHW roles in delivering NCD services (Tsolekile, Puoane, Schneider, Levitt, & Steyn, 2014).

Interwoven into the Ugandan VHT responses to facilitators and barriers of VHT roles, was the need for medical personnel to collaborate and support VHT to promote and validate their work in the communities. This speaks to VHT high motivation and willingness to engage in NCD prevention, as their collective priority was not based on personal and monetary benefits. Indeed, several interventions have shown the benefits of using CHW-medical personnel partnerships to promote NCD prevention and management in communities. In American Samoa, an intervention that employed Nurse-Community Health Teams in diabetes care increased the odds of reducing HbA1c levels by at least 0.5% amongst the intervention group, twice more than the odds for patients receiving usual care (DePue et al., 2013). Another multinational study, which involved medical partnership via training and supervision of CHW in measuring NCD risk, improved CHW's ability to assess cardiovascular risk in their communities. This in turn increased disease detection and diagnosis (Gaziano et al., 2015).

CHW have also served in successful roles for NCD care and prevention as NCD risk assessors, advisors to patients, providers of direct services to clients, monitors of clients' care, peer educators for newer CHW and as administrators, overseeing reporting and documenting of clients' care (DePue et al., 2013; Gaziano et al., 2015; Tsolekile et al., 2014). For example, data from a study in Iran showed that using Behvraz workers (CHW) for diabetes prevention and control lowered fasting blood glucose in the sample population analyzed (Farzadfar et al., 2012). Through extensive training and guidelines, Behvraz workers were able to conduct training sessions for high risk individuals on adopting healthy lifestyles and diets. Medical personnel also visited local communities to screen and treat for diabetes. Again, working together, medical personnel and Behvraz workers were able to keep high risk individuals in care. As resonated by the Ugandan VHT, it is beneficial when medical personnel create safe spaces for addressing NCD by visibly being involved in preventive efforts within the communities. In this study, VHT already engage in some of these NCD roles, such as referral of clients and rudimentary dietary counseling, outside of their official VHT roles. Potentially, Ugandan VHT can be equipped to perform any of the tasks mentioned above.

Naturally, VHT identified NCD education, availability of screening services and partnerships with medical personnel, as some of the key facilitators to their roles in NCD prevention. In terms of barriers to incorporating NCD care successfully into their roles, VHT spoke to the cycle of neglect where several barriers such as lack of services and medical personnel would hinder NCD preventive efforts at the community level. In LMIC, primary care systems are faced with unavailability of basic diagnostic instruments/services for NCD screening and detection, strained access to medications for treating most prevalent NCD, a shortage of healthcare professionals to handle NCD and poor reporting and referral systems (Mendis et al., 2012). The combination of unavailable and inaccessible components to NCD care at the community level contributes to failed health systems for tackling rising NCD burden in LMIC.

In the wake of the WHO Global Action Plan for NCD, several LMIC are making efforts to implement WHO recommendations to tackle NCD burden. Uganda has not yet adopted a national strategic plan for

NCDs. However, importantly, a WHO-Africa Region Framework for NCD is currently under development. According to the WHO, the involvement of the primary health sector in combating NCDs would ensure that health services targeting NCD are more equitable (World Health Organization, 2010). Given that CHW networks, as part of the primary health construct have the most geographic coverage and opportunities for individual interactions with high-risk individuals within their communities, (Hong Kong Department of Health; Uganda Ministry of Health, 2015), equitable access to health education and preventive measures addressing NCD can be conveyed through their network. Community health worker CHW networks are already known to provide primary care, mostly preventive, and would be an ideal human capacity to implement primary interventions, which target prevention of the onset of NCD; as well as secondary interventions such as screening for NCD risk factors through the registration of the health status of community members and referrals (Hong Kong Department of Health; Uganda Ministry of Health, 2015).

Further research should include VHT community-based participatory research for NCD using the same VHT recruited for this study. This intervention would engage VHT in culturally adapted training on specific roles such as increasing basic knowledge and awareness of risk attitudes for the most prevalent NCD within communities, conducting risk assessment for NCD and reporting NCD related events. This intervention which would include supervision and support from medical personnel, will measure specific outcomes such as increased use or demand for NCD screening at community health facilities, positive change in health behaviors among NCD- high risk community members (people with hypertension or diabetes). More qualitative studies should also be conducted to gauge community knowledge and perceptions about NCD in order to inform ongoing design of interventions to prevent community NCD.

Limitations and Strengths

One limitation to this study, however is that the KAP questionnaire did not sufficiently capture data on ongoing attitudes and practices of VHT related to risk factors for NCD. Though majority of the VHT workers surveyed reported that one can lead a normal and healthy life with diabetes, these responses

could not be substantiated as no standard scale was administered to assess VHT's understanding of quality of life.

A major strength of this study was the use of a mixed methods approach to explore existing knowledge and perceptions about NCD among the Ugandan VHT. This allowed the researchers to elicit as much information as possible from the VHT via the questionnaire and FGDs about their understanding of NCD and their perceptions of playing a potential role in preventing them.

Conclusion

This study was able to show that VHT already possess a rudimentary knowledge and understanding of NCD, especially around the mode of transmission, diet-related risk factors for NCD and the late manifestation of NCD symptoms. VHT acknowledged the health significance of NCD in their communities and identified their potential role as connecting their communities to knowledge and screening services for NCD. They identified VHT and community education on NCD, a strong presence of medical personnel in the communities, coupled with medical personnel alliance with VHT as means of preventing and treating NCD at the community level. Overall, VHT displayed willingness and motivation to engage in preventive efforts directed at NCD.

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