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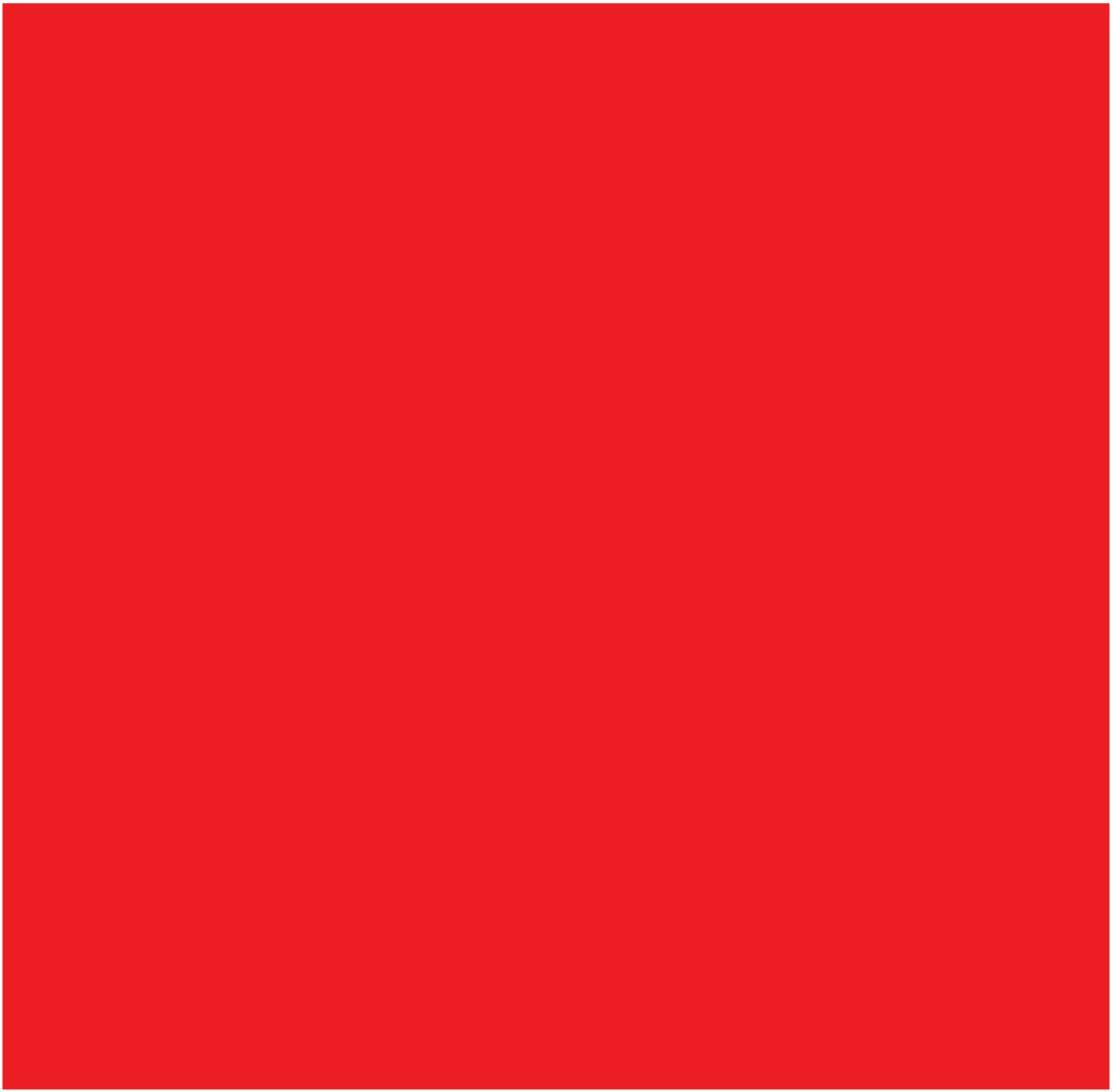
EARLY WARNING LATE ACTION: WHY IMPACT MATTERS

THE NEED FOR IMPACT BASED FORECASTS TO SUPPORT ANTICIPATORY HUMANITARIAN ACTION IN THE GREATER HORN OF AFRICA



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ABBREVIATIONS

DRR	**-**	**Disaster Risk Reduction**
FbF	**-**	**Forecast-based Financing**
GFCS	**-**	**Global Framework for Climate Services**
GHA	**-**	**Greater Horn of Africa**
GRFC	**-**	**Global Report on Food Crises**
HIGHWAY		**High Impact Weather Lake System**
IARP	**-**	**Innovative Approaches to Response Preparedness**
ICPAC		**IGAD Climate Prediction and Applications Centre**
KMD		**Kenya Meteorological Department**
MHEWS		**Multi-hazard Early Warning Service**
NCAS		**National Centre for Atmospheric Science**
NMHS		**National Meteorological and Hydrological Services**
NOAA		**National Oceanic and Atmospheric Administration**
OSM		**OpenStreetMap**
RCRC		**Red Cross Red Crescent**
SENAHMI		**Peruvian Meteorological Service**
SHEAR		**Science for Humanitarian Emergencies and Resilience**
SWIFT		**Science for Weather Information and Forecasting Techniques**
WISER		**Weather and Climate Information Services for Africa**
WMO		**World Meteorological Organization**

LIST OF FIGURES

Non-communicable diseases (NCDs) are a major public health concern with significant social and economic implications in terms of health care needs, lost productivity and premature death. NCDs are thus a serious setback to the attainment of social, health and economic targets in Kenya. The study looked at how communities, healthcare workers at county and sub-county level perceive non-communicable diseases. Of note is that, knowledge, socio cultural, economic, individual perceptions and health systems factors influence the health seeking behaviour of the communities in Nairobi and Nyeri County. Furthermore, the study sought to understand what prevents knowledge from being translated into health seeking behaviour within communities, what factors shape access to NCDs care services and how is knowledge translated into NCD control and prevention.

The study found that knowledge of NCDs symptoms, in particular hypertension and diabetes did not influence the perception of the community on the severity of NCDs. This was attributed to low level of knowledge on NCDs symptoms. However, knowledge on the risk factors significantly

influenced the perceived susceptibility to getting NCDs. Hence, the perception in susceptibility due to exposure to risk factors influenced the decision for undergoing screening. In terms of perceived severity or seriousness of NCDs, a discussion with participants introduced another aspect indicating that for a disease to be taken seriously there has to be pain experienced to warrant their seeking of treatment services. They further indicated that symptoms have to be debilitating and have to affect their performance of daily duties to warrant their visit to a health facility. Participants in both counties showed a high likelihood of seeking screening services if they believe that they can be cured of the disease.

while those who thought they were not very serious were likely not to seek screening or treatment services. This is an indication that for participants in Nairobi, an individual has to consider themselves at risk of being affected by NCDs and its potential consequences. In Nyeri however, there was no relationship between perceived seriousness of a condition and uptake of screening and treatment services. Participants who thought NCDs were serious and those who thought NCDs are not very serious conditions were both likely to seek screening services.

Health system factors played a key role in the choice made by participants with regards to NCD screening and curative services. The lack of drugs or its limited supply has hugely impacted on the communities' motivation to visit a government health facility which is affordable

1.0 BACKGROUND

1.1 INTRODUCTION

Non-communicable diseases (NCDs) are a major public health concern with significant social and economic implications in terms of health care needs, lost productivity and premature death. NCDs are thus a serious setback to the attainment of social, health and economic targets[1]. According to the WHO, 39.5 million (70%) out of 56.4 million deaths that occurred in 2015 were due to NCDs. The burden of NCDs is rising disproportionately in low- and middle-income countries where more than 30.7 million (three quarters) of these NCD deaths occurred. Cardiovascular diseases accounted for 17.7 million deaths (45%); cancer - 8.8 million (22%); respiratory diseases, including asthma and chronic obstructive pulmonary disease - 3.9 million deaths; and diabetes - 1.6 million deaths.

Each year, 16 million people die prematurely before the age of 70 from NCDs. Strikingly, four out of five of these deaths occur in developing countries, making such diseases one of the major development challenges of the 21st century[2]. In Kenya, NCDs account for 27% deaths[3]. In 2000, NCDs accounted for 19.4% of the total disability-adjusted life years (DALYs - are defined as years of healthy life lost). By 2013, across all ages and genders these proportion had risen to nearly 30%[4] in Kenya.

The Nyeri County Integrated Development Plan 2013-2017 places the prevalence of hypertension in the county at 11% and notes a general increase in cancer, diabetes and hypertension. The prevalence of diabetes in Nyeri is recorded as 12.6%, the highest in Kenya[5] Nairobi County however has no documentation of the prevalence of NCDs.

According to the WHO, 39.5 million (70%) out of 56.4 million deaths that occurred in 2015 were due to NCDs.

The burden of NCDs is rising disproportionately in low and middle-income countries where more than 30.7 million (three quarters) of these NCD deaths occurred.

[1]*Kenya stepwise survey for non-communicable diseases risk factors 2015 report, Ministry of Health, Kenya, 2015*
[2]*WHO. Non-communicable diseases progress monitor 2015. Geneva: World Health Organization; 2015.*
[3]*WHO. Non-communicable diseases country profiles 2014.*
[4]*A report produced by the Institute for Health Metrics and Evaluation and the International Centre for Humanitarian Affairs. (2016). 'The global burden of disease generating evidence, guiding policy In Kenya'*
[5]*Kamau LN, Mbaabu MP, Mbaria JM, Karuri GP, Kiama SG (2016). Knowledge and demand for medicinal plants used in the treatment and management of diabetes in Nyeri County Kenya Journal of Ethno Pharmacology 189: 218-29.*
[6]*Shaikh BT, Hatcher J. Health seeking behaviour and health service utilization in Pakistan: challenging the policy makers. J Public Health (oxf) 2005; 1:49–54*
[7]*Kroeger A. Anthropological and socio-medical health care research in developing countries. Soc Sci Med. 1983; 17:147–161.*
[8]*Ogunlesi TA, Olanrewaju DM. Socio-demographic Factors and Appropriate Health Care-seeking Behavior for Childhood Illnesses. J Trop Pediatr. 2010; 56(6):379–385.*
[9]*Katung PY. Socio-economic factors responsible for poor utilization of primary health care services in rural community in Nigeria. Niger J Med. 2001;1 0:28–29*

1.2 HEALTH SEEKING BEHAVIOUR

The health seeking behaviour (HSB) of a community determines how health services are utilised and in turn the health outcomes of populations[6]. HSB is defined as, 'a sequence of remedial actions that individuals undertake to rectify perceived ill-health.' Physical, socio-economic, cultural or political factors influence health behaviour[7]. Environmental conditions, socio-demographic factors, knowledge about the facilities, gender issues, political environment, and the health care system also influence the utilization of the health facilities and services[8,9], . A key determinant for health seeking behaviour is the organisation of the health care system[10], cost of services, limited knowledge on illness and wellbeing, and cultural prescriptions have been shown to be barriers to the provision of health services[11].

Research findings have proved that there are factors (social, economic, etc.) that affect people's HSB. A study conducted in Yemen on actors affecting HSB for common childhood illnesses found that symptom type, caretakers' education, and perception of illness severity are the predictors of HSB[12]. In Ghana, a study found that cost and perceived quality of health care providers are the most significant factors in the health decision-making process[13]. Another study undertaken in Nairobi slums found that service quality, information about this quality, wealth, user fees, and gender, are the main determinants of patients' choice among alternative medical treatments[14]. A study conducted in Kenya found that level of education and cost of seeking treatment influenced HSB[15].

A qualitative study conducted in Western Kenya to identify barriers and facilitators to linkage and retention in chronic care identified personal

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[6]*Shaikh BT, Hatcher J. Health seeking behaviour and health service utilization in Pakistan: challenging the policy makers. J Public Health (oxf) 2005; 1:49–54*
[7]*Kroeger A. Anthropological and socio-medical health care research in developing countries. Soc Sci Med. 1983; 17:147–161.*
[8]*Ogunlesi TA, Olanrewaju DM. Socio-demographic Factors and Appropriate Health Care-seeking Behavior for Childhood Illnesses. J Trop Pediatr. 2010; 56(6):379–385.*
[9]*Katung PY. Socio-economic factors responsible for poor utilization of primary health care services in rural community in Nigeria. Niger J Med. 2001;1 0:28–29*
[10]*Shaikh BT, Hatcher J. Health seeking behaviour and health service utilization in Pakistan: challenging the policy makers. J Public Health (oxf) 2005; 1:49–54.*
[11]*Hunte P, Sultana F. Health seeking behaviour and the meaning of medication in Balochistan, Pakistan. Soc Sci Med. 1992;34(12):1385–1397*
[12]*Webair, H. H., & Bin-Gouth, A. S. (2013). Factors affecting health seeking behavior for common childhood illnesses in Yemen. Patient Preference and Adherence, 7, 1129–1138. http://doi.org/10.2147/PPA.S51124*
[13]*Stephen Russell (2008). Demand-side Factors Affecting Health Seeking Behavior in Ghana. GUJHS. 2008 Apr; Vol. 5, No. 1.*
[14]*Moses K. Muriithi (2013). the determinants of health -seeking behaviour in a Nairobi slum, Kenya. European Scientific Journal edition vol.9, No. 8 ISSN: 1857 – 7881 (Print) e -ISSN 1857-7431151*
http://www.eujournal.org/index.php/esj/article/viewFile/884/927
[15]*Prosser Trish (2007). Utilization of health and medical services: factors influencing health seeking behavior and unmet health needs in rural areas of Kenya. Edith Cowan University. http://ro.ecu.edu.au/cgi/viewcontent.cgi?article=1046&context=theses*

drive, patient-provider relationships, distance to health facility and the need for social and peer support as facilitators and barriers[16]. Cultural and religious beliefs and social norms were found to negatively impact linkage and retention. Additionally, the perception of how severe a disease is or how one experiences the disease contributed to the decision of study participants on whether to engage in care or not.

1.3 COMMUNITIES PERCEPTIONS ON NCD

A study in Kenya investigating community perceptions of CHWs including perceptions of their roles in chronic disease management in Western Kenya used in depth interviews and focus group discussions amongst study participants purposively sampled from three sites[17]. While a number of facilitating aspects of CHWs were uncovered, several barriers were also found to be present. The two main ones focused on the training of CHWs and confidentiality. Concerns around the training of CHWs was reflected in conversations in which the community members felt that there were cases where CHWs could not answer the questions of the community members adequately and/or provide adequate information regarding the disease condition. Concerns around confidentiality were reflected in the perception that since CHWs came from within the communities it might be easier for them to divulge information. However, this notion was a mixed response from the study participants with some mentioning that a facilitating aspect of the CHWs actually being confidentiality. Nonetheless any negative perceptions of CHWs may impact their effectiveness at supporting linkage and engagement with chronic disease care and management. It is noteworthy that issues related to inadequate training have been reported in other studies within Kenya[18,19].

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[16]*Rachlis et al., Identifying common barriers and facilitators to linkage and retention in chronic disease care in Western Kenya BMC Public Health (2016) 16:741*
[17]*Rachlis B et al., Community Perceptions of Community Health Workers (CHWs) and Their Roles in Management for HIV, Tuberculosis and Hypertension in Western Kenya. PLoS ONE 2016, 11 (2)*
[18]*Sander LD et.al. Time savings-realized and potential-and fair compensation for community health workers in Kenyan health facilities: a mixed-methods approach. Human Resourse Health. 2015; 13: 6*
[19]*McCollum R et al., Exploring perceptions of community health policy in Kenya and identifying implications for policy change. Health Policy Plan. 2015; in press*

1.4 PURPOSE OF STUDY

A baseline study undertaken as part of the project pointed to a knowledge behaviour gap evidenced by the existence of awareness on NCD but a lack of awareness on preventive measures and a low uptake of screening services. More than half (56%) of Kenyans have never been measured for raised blood pressure. Among those who reported to have been previously diagnosed with hypertension, only 22.3% were currently on medication prescribed by a health worker. Overall, 87.8% of Kenyans had never been measured for raised blood sugar and among those previously diagnosed with elevated blood sugar, less than half (40.1%) were currently taking medication. Majority of Kenyans (97.7%) have never been measured for cholesterol levels with only 13.3% of respondents who reported to have been diagnosed with elevated cholesterol levels being on medication. In addition, the survey found that four in ten adult Kenyans have heard of cervical cancer screening test but only 11.3% of the women have ever been screened for cervical cancer .

[20] *Kenya Stepwise Survey for Non-Communicable Diseases Risk Factors 2015 Report*

22.3%, 40.1% and 13.3% of the people previously diagnosed with hypertension, diabetes and elevated cholesterol respectively were currently on medication prescribed by a health worker.

It is with this background that the study was undertaken to further explore the community perspectives that act as drivers of HSB and uptake of NCD prevention and control service in Starehe and Makadara sub-counties in Nairobi County and Mathira sub-county in Nyeri County. Here, the focus was to understand the attitudes and practice in the target communities in relation to access and utilisation of NCD prevention and control services. The study also sought to understand what prevents knowledge from being translated into health seeking behaviour within communities, what factors shape access to NCDs care services and how is knowledge translated into NCD control and prevention.

1.5 METHODOLOGY

A descriptive cross-sectional study design was adopted for this research. The research adopted a qualitative and quantitative approach to arrive at its findings. The qualitative methods included key informant interviews (KIIs) and focus group discussions (FGDs) with various groups of respondents, while the quantitative method involved household interviews with a sample representation of the members of the general public within the targeted sub-counties. The adoption of qualitative and quantitative methods was used to allow for triangulation of data.

This study was conducted within the project catchment areas; Mathira East and Mathira West sub-counties in Nyeri County and Makadara and Starehe sub-counties in Nairobi County. The study population included the community members of the aforementioned sub-counties consisting of adults above 18 years of age, school children aged 11-16 years old in the targeted schools,

The households to be sampled per sub-county were calculated based on a probability proportional to size (PSS) method using the 2009 Kenya Census data.

community health workers, support group members, care givers and county and sub-county health team members. The households to be sampled per sub-county were calculated based on a probability proportional to size (PSS) method using the 2009 Kenya Census data. A total of 148 households were sampled in Starehe, 144 in Makadara and 131 in Mathira. Household data was collected using KOBO Collect, a mobile-based survey platform.

The FGD participants were selected based on pre-defined criteria of population characteristics, willingness to participate and therefore giving consent, availability during the data collection period and in the case of the school children consent from the school head. FGDs were conducted among five different groups in each of the sub-counties; three male groups (18 years and above), three female groups (18 years and above), three support groups comprising diabetic and hypertensive patients, one caregivers group and three school children (aged 11-16 years) and two-

community health worker (CHW) Group. The school children were selected based on their involvement in the project and consent from their guardians through the health club leads and the head teachers was obtained

The KIIs were conducted with opinion leaders and individuals in key leadership positions within the county and sub-county levels. The selection of KII participants was done purposively using pre-determined criteria: their involvement in NCD related activities within the sub-counties, their availability and willingness to participate. They included community health extension workers, public health officers, NCD counsellors, NCD coordinators, medical officers, health promotion officers, community strategy focal persons and development partners involved in NCD work.

Prior to conducting the study, approval was obtained from African Medical and Research Foundation Institution Ethics Review Committee. Permission to conduct the research was also sought from Nairobi and Nyeri counties through the health operation research units/committees. Informed consent was also obtained from each of the research participants.

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2.0 RESEARCH FINDINGS

2.1 WHAT PREVENTS KNOWLEDGE FROM BEING TRANSLATED INTO HEALTH SEEKING BEHAVIOUR WITHIN COMMUNITIES?

According to the health belief model[21], perceived susceptibility to and seriousness of a disease are the first cue towards taking action in prevention and control of diseases. In terms of NCDs, the level of knowledge on NCD modifies these perceptions. The study found out that knowledge of NCDs symptoms, in particular hypertension and diabetes did not influence the community perception of NCDs seriousness. This was attributed to low level of knowledge on NCDs symptoms. However, knowledge on the risk factors significantly influenced the perceived susceptibility to NCDs. Hence, the perception on susceptibility-influenced screening.

The FGD and KII participants in both counties voiced a concern that beyond the knowledge on major NCDs (Figure 1) most community members have inadequate knowledge on the symptoms, preventive measures and curative options available for the NCDs. The chronic nature of the NCDs was also unclear to several participants who indicated that many community members that have diabetes or hypertension

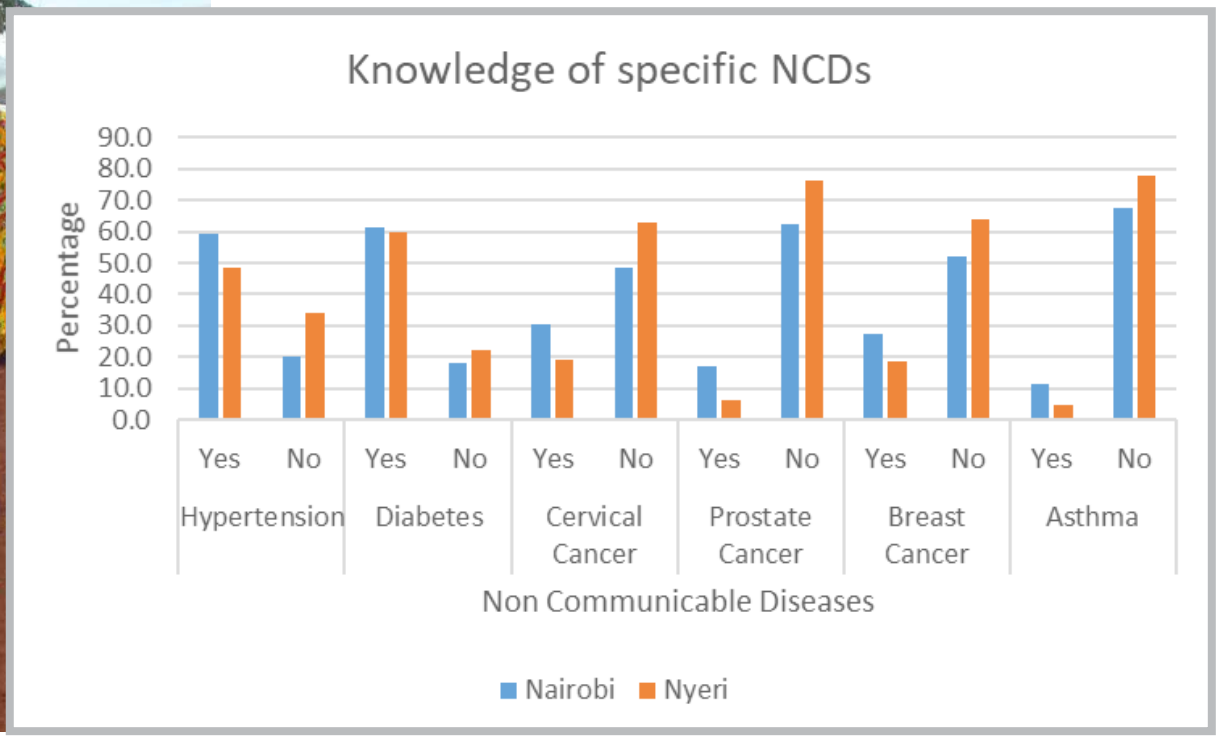

Figure 1: Knowledge on Specific NCDs

[21] *Hochbaum, Rosenstock and Kegels*

take medication with the knowledge that the condition will be cured and they shall be off medication. An FGD with support group members in Nairobi indicated that participants were aware that NCD prevention could be achieved by screening, which will lead to early detection of an NCD. When participants were asked how they think knowledge can be shared better they indicated that there should be more forums where health workers and community health volunteers (CHVs) speak about NCDs rather than having them once in a long time.

While participants agreed that CHVs conduct house-to-house visit educating them on NCDs they voiced concerns over the technical language used by health care workers in the health facility when explaining symptoms, course of treatment, management regimen and symptoms making it hard for them to grasp what is being shared.

When this was explored with the health care workers in both counties, they indicated that they sometimes have challenges translating terminology and lack visual aids to help them explain about NCDs to community members in a simple language/way. A partner in Nairobi who said that sometimes NCD information that is shared is too technical for the general community also underscored this. They reported that training of CHWs has not been adequately done with regards to specific NCDs so that affects the skills they have on sharing knowledge with their clients. KIIs also reported a big shortage of staff in the health facility with one health care worker expected to cover a wide array of duties therefore not having sufficient time to explain to a client in detail about NCDs.

"We have a challenge, look at HIV for example. They have clearly defined protocols that detail how a health worker should engage a patient from when they show up to the clinic to following up in the event that they miss a scheduled visit. NCD however has nothing of the sort so we are groping in the dark." ~ Key informant, Nyeri

"I have never been trained and neither have all my staff so I have to use the knowledge that I got in school to inform my actions, but medicine changes so I am not updated." ~ Key informant, Nairobi

In terms of perceived severity or seriousness of NCDs, a discussion with FGD participants introduced another aspect indicating that for a disease to be taken seriously there has to

be pain experienced to warrant their seeking of treatment services and screening services. They further indicated that symptoms have to be debilitating and have to affect their performance of daily duties to warrant their visit to a health facility. They mentioned that most NCDs are “not painful” in their early stages and therefore community members do not prioritize screening or treatment services in this phase. They reported that most community members would seek these services when symptoms are unbearable which is often in advanced stages of the disease.

> *“If I have not experienced pain and I can still go to work, why should I go to hospital?” ~ FGD participant, Nyeri*

> *“They seek temporary solutions for symptoms that do not have pain.” ~ FGD participant, Nairobi*

Participants in both counties showed a high likelihood of seeking screening services if they through they could be cured of the disease. FGD participant in Nairobi wondered why they should seek medical services in the first place given that they will never be cured and the disease will be there for the rest of their lives. In addition, they also questioned the benefit or motivation behind the screening given that they have heard that the facilities lack medicine to manage the NCDs.

“There are no drugs in the facilities so when the CHW screens me and keeps telling me to go to hospital what am I going to do?" ~ FGD participant, Nairobi

“I won’t be cured anyway, and if I go, there are no drugs so why should we visit the facility for screening?” ~ FGD participant, Nairobi

2.2 WHAT ARE SOME OF THE FACTORS THAT SHAPE ACCESS TO NCD CARE SERVICES?

The research explored the perceived cost of NCD related services. Most participants in Nyeri thought that NCD screening and treatment services were expensive regardless of whether they had previously paid for the services. The monthly income for the participants in Nairobi and Nyeri counties was below KShs 10,000. The FGD participants in the two counties also reported that within the community there are

other competing factors as they are often faced with a decision between food, and school fees, or healthcare especially in relation to screening services. Of importance was that health was only given a priority financially if symptoms were severe and debilitating therefore interrupting their normal duties.

"*The cost of living is very high and medication is expensive which prevents people from seeking medical services, most people don't get full tests done because of the cost. Health isn't a priority to most people as long as it is not debilitating or interferes with daily activities." ~ FGD participant in Nyeri*

FGD participants in Nyeri reported the existence of a cultural belief that cervical cancer is as a result of unmet dowry agreements resulting in a curse from the ladies' parents. The CHWs also reported a misconception that cervical cancer is caused by disagreements during dowry negotiations or the lack of dowry payment thus the affected women are sent back to their parents to ask for forgiveness so that they can get well. In Nairobi, some FGD participants reported that there are beliefs that NCDs are as a result of witchcraft. This was related to the increasing number of community members who seek the services of the traditional.

In addition, key informants in Nyeri reported an increase in the number of traditional healers within the community and shopping centres who have long queues on a daily basis. CHVs reported that some of the individuals they had encountered opted for traditional healers after visiting hospitals and not getting better, others believed that their condition was as a result of witchcraft or a curse.

In Nyeri, FGD participants indicated that there is stigma associated with NCDs. Given the cost implications, there was fear of being a burden to the family upon being diagnosed with an NCD resulting with affected members opting to remain silent until the symptoms are unbearable.

"My sister had diabetes since she was in Class 6, she got married and got pregnant. The mother-in-law rejected the pregnancy and discriminated her due to her condition and the expenses associated with it." ~ FGD participant, Nyeri

In addition, participants also reported that NCD patients are perceived as weak and therefore employers do not engage them. There are even cases of landlords refusing to lease houses to them for fear that they will not manage to pay rent.

"Landlords refuse to lease houses and employers refuse to engage people with an NCD." ~ FGD participant, Nyeri

"Hard labor jobs require strong men but it's not viable if you have an NCD." ~ FGD participant, Nyeri

In Nairobi, FGD participants reported that those with NCDs are stigmatised due to beliefs that they have a transmittable condition hence they are isolated.

"You don't tell anyone because there is victimization, the community thinks its HIV/AID." ~ FGD participant, Nairobi

In Nyeri, support groups[22] for NCD patients were a key-driving factor for HSB. The support groups are formed by the nurse-in-charge of a facility and comprised hypertensive and diabetic patients. The members reported that they enjoyed access to drugs and screening services at a cheaper price because of their monthly contributions during meetings that were then used to procure drugs in bulk when they were not available in the health facilities. The meetings also allowed them to share their experiences with the health care worker, health promotion officer, or CHV that was always present to give health education. Sadly, not all members can make the contributions consistently.

In Nairobi, support groups are also formed by health facility workers and also comprise of hypertensive and diabetic patients. The groups are mainly created for peer support and as a forum for patients to encourage each other. The challenge faced by facility health workers in forming such groups is that their clients are

[22]*Support groups are defined as a forum in which individuals with experiential knowledge based on a sharing of similar diseases or conditions share their experiences in daily life with their colleagues. E.g. people with hypertension are chosen to educate other patients with hypertension. This is done to assist members with the day-to-day management of a disease, provide emotional and social support, link to clinical care while having a proactive, flexible attitude towards fellow patients.*

drawn from different locations including outside Nairobi County thus attendance was affected. They also reported that some groups did not perform well and later collapsed.

Participants confirmed that encouragement to adopt healthy behaviour, attend clinics regularly and easier access to medication were among the benefits of belonging to a support group.

"They [health care workers] make sure you get drugs and are screened. We contribute money and buy our drugs at a cheaper price when there are no drugs in the hospital. We are also taught in every meeting about how to take care of ourselves to better manage the disease." Support group member – Nyeri

"The community only takes the disease seriously when they know that there is a group because the language used is kikuyu and is understandable, the health workers explain properly and in detail. This has helped many of us." FGD participant, Nyeri

Costs associated with travelling to meeting points were listed as some of the factors challenging the effective functioning of support groups.

"We live far and sometimes you lack funds to come for the meeting. Poverty levels contribute to not progressing the group." FGD participant, Nyeri

In addition, health care workers in Nyeri reported better adherence to treatment and improved outcomes for participants in support groups. A partner in Nairobi underscored the importance of support groups reporting that the peer exchange of information on NCD improves the patients' adherence to treatment regimens.

Participants in the two counties reported that CHVs have greatly contributed to their knowledge of NCDs and how they can be prevented as well as screening them for hypertension and sometimes diabetes within the comfort of their homes. They were also perceived to being key in follow-ups because they remind community members about their hospital check-up dates and the importance of the general community to be screened. Health care workers also underscored the importance

of having CHVs because they not only refer patients to health facilities but also provide support on follow-ups and health education.

"CHVs visit us in our homes and educate us on NCDs. They remind us about hospital appointments and how we should eat and live, they are really a blessing." FGD participant, Nyeri

A few participants also reported that the low numbers of CHVs is a challenge because they have to handle a large number of people within the community. This was also voiced by KIIs who indicated that one CHV per community unit (1,000 households and an approximate 5,000 individuals) in Nyeri and four per community unit in Nairobi were trained on NCD screening and health education making.

"Those CHVs are very few and we are many." FGD participant, Nyeri

A partner in Nairobi also reported a shortage of CHVs trained in handling NCDs are few and stressed the need for health actors to maximize the community strategy to ensure that every household is visited by the CHVs regularly.

Most participants lived within 10 kilometres of a health facility but only half of those interviewed had been screened. This was because in some instances the facilities lacked the required services forcing the community members to travel far away in search of the same.

"I live near a health centre but most of the time they do not have the services I am need for so I still have to travel to another far off place to get the service." FGD participant, Nairobi

Majority of the FGD participants in Nairobi and Nyeri reported a shortage of drugs and screening services in the health facilities that they have visited. This is what informed their decision to stop visiting a facility.

"The CHV will come and screen you and encourage you to go to hospital but when you go, there are no drugs and you have to buy, sometimes you have to be referred to hospitals in Nyeri or even Nairobi which is expensive." FGD participant, Nyeri

"I have had to buy medicine on so many occasions, medicine is rarely in the hospital." FGD participant, Nairobi

"They tell you to go and measure your blood sugar at the hospital but when you get there the nurse tells you they have no supplies (glucose strips)." FGD participant, Nyeri

"There is no blood pressure medicine in the health centre, people have to go to Karatina District Hospital and they are charged." FGD participant, Nyeri

Male FGD participants in Nyeri and Nairobi raised concerns about the methods of screening, particularly for prostate cancer, while a few women find cervical cancer screening uncomfortable and intrusive. Key Informants in both counties also reported a big shortage of drugs, screening services and equipment required to effectively manage NCDs.

"Infact, we did not receive medicine in a facility for more than 2 years from Nov 2014 to January 2017." Key Informant, Nairobi

"We rarely have glucose strips and are therefore unable to offer diabetes screening services." Key Informant, Nyeri

In Nairobi, a partner indicated that the public health facilities have erratic supply of NCD drugs and screening materials highlighting that both affect the uptake of screening and treatment services.

"Nairobi has a number of health facilities but most health centres do not have a consistent supply of NCD medication and supplies so they are forced to refer clients to higher level hospitals like Kenyatta National Hospital." Development Partner, Nairobi

An insufficient number of healthcare workers to provide adequate NCD services was also highlighted by key informants. A health worker is assigned several duties in a day cutting across several departments and therefore the time they have to fully attend to one patient and provide them health education is limited. In addition, they reported that aside from a few trainings held by partners on NCDs there has been no structured training system or protocols to continuously update the healthcare workers on current protocols and regimen. In Nyeri, community members also reported that they have to wait in long queues in some facilities to be attended to because of the limited number of staff, a facility may have one or two staff covering all the cases that resent to the health facility.

"We have limited staff, a facility can have one staff at a given time and the patients are many so where do they get the time to attend to them to the extent of providing health education? In addition, they are not well updated on current management of NCD so they may not be aware of what information to give the clients." Key Informant, Nyeri

2.3 HOW IS KNOWLEDGE TRANSLATED INTO NCD CONTROL AND PREVENTION?

According to the health belief model, perceived seriousness, perceived susceptibility, perceived benefits, perceived barriers, cues to action, motivating factors and self-efficacy, influence health behaviour. This study focused on the first four (perceived susceptibility/seriousness, perceived benefits, perceived barriers and perception on cure) and how they were influenced by knowledge and behaviour.

Most of these perceptions were influenced by knowledge which then influenced HSBs. The HSB in turn influenced the impact of NCDs on the respondents. For instance, where an NCD was perceived to be a serious condition, they were likely to seek medical attention such as seeking screening services. A good example on how knowledge is translated into health seeking behaviours and further contributing to NCD control and prevention was the feeling of invasion of one's privacy in cervical and prostrate screening discouraged some individual from seeking screening services.

3.0 DISCUSSION

Knowledge is key in any decision making process. It is vital for an individual to understand the chronic nature of NCDs to improve their chances of seeking screening services, and adhering to the treatment regimen. Knowledge of hypertension and diabetes within Nairobi and Nyeri counties exceeds knowledge of cancer and chronic respiratory diseases. The reason for this could be that most NCD projects focus on hypertension and diabetes. Despite the efforts towards sharing NCD information with community members in urban and rural set ups the research findings show that making sure that this shared information can be easily understood is equally important.

The language and method used in sharing information have been presented as reasons for the gap between shared information and an individual's understanding of the information. Insufficient training of healthcare workers and lack of guidance on health education with regards to NCDs are health system factors that also contribute to this gap. Health systems require appropriate information, education and communication materials using a language that is easily understood by the target audience. The findings in this report resonate with a research conducted in rural Tanzania that found knowledge was significantly associated with cancer screening uptake[23]. A study conducted in Western Kenya found that lack of hypertension information was a barrier affecting cues to action[24].

The key individual perceptions that were found to influence uptake of NCD services were perceived seriousness and perceived benefits. In Nairobi, the findings show that when participants thought NCDs were serious

[23]Lyimo, F. S., & Beran, T. N. (2012). *Demographic, knowledge, attitudinal, and accessibility factors associated with uptake of cervical cancer screening among women in a rural district of Tanzania: Three public policy implications. BMC Public Health, 12, 22. http://doi.org/10.1186/1471-2458-12-22*

[24]Naanyu, V., Vedanthan, R., Kamano, J. H., Rotich, J. K., Lagat, K. K., Kiptoo, P., … Inui, T. S. (2016). *Barriers Influencing Linkage to Hypertension Care in Kenya: Qualitative Analysis from the LARK Hypertension Study. Journal of General Internal Medicine, 31(3), 304–314. http://doi.org/10.1007/s11606-015-3566-1*

they were likely to seek screening and treatment services while those who thought they were not that serious were unlikely to seek screening or treatment services. This is an indication that for participants in Nairobi, an individual has to consider themselves at risk of being affected by NCDs and its potential consequences. In Nyeri however, there was no relationship between perceived seriousness of a condition and uptake of screening and treatment services. Participants who thought NCDs were serious and those who

thought NCDs are not that serious were both likely to seek screening services.

The findings in Nyeri could be because pain and debilitating conditions were termed as a driving factor in seeking medical services. The lack of symptoms associated with the initial stages of diabetes, hypertension and most cancers results in the notion that the condition is not serious enough to warrant going for screening. Lack of symptoms and cost of treatment have been known to discourage uptake of hypertension health care[25]. There was an established relationship between the perceived benefits and the uptake of screening with participants who thought there were benefits highly likely to seek screening services. There was however no relationship between the perceived benefits and uptake of treatment services. This is because a significant portion of the participants did not understand why they should seek medical services if there are no drugs in the facilities. In addition, the chronic nature of NCDs was also a contributing barrier with participants wondering why they should take medication if they are not going to be cured. This shows a strong inclination towards taking action with regards to health when an individual thinks they will be affected by it and that the services they seek will reduce their risk. This can be linked to the lack of sufficient understanding of the nature of NCD.

NCD diagnosis and treatment was perceived as expensive by majority of participants in Nairobi and Nyeri. This was despite the fact that perception on cost was regardless of whether participants had previously paid for or gone for screening and treatment services or not. The perceived cost of NCD diagnostic and treatment was directly linked to the uptake of NCD screening and treatment services. In both Nairobi and Nyeri, there was no relationship between cost and uptake of screening. However, in both counties, participants who thought that it was expensive to diagnose and treat NCDs were highly likely to seek NCD treatment services. The key factors hindering the uptake of screening and treatment services were the cost of drugs and screening services and in some cases the cost of transportation.

Interestingly in these populations, costs were linked to the ill equipped government health facilities that they have access to. This results

[25]*Gervasoni JP, Mkamba M, Balampama M, Lengeler C, Paccaud F. Low utilization of health care services following screening for hypertension in Dar es Salaam (Tanzania): a prospective population-based study. BMC Public Health. 2008; 8:407.*

in referrals to private hospitals, higher-level government facilities or private chemists where the cost of seeking services is higher especially since drugs are not subsidised. Monthly income in both populations was low and therefore community members have to decide whether to use their own finances to seek medical services or use them for other equally important needs. The World Health Organization (WHO) identifies financial affordability as a factor that affects access to healthcare and acknowledges that it is not only due to the price of the health services but also indirect costs like the costs of transportation to and from facilities and of taking time away from work. It also identifies the wider health financing system and household income as factors that influence affordability. Financial constraints have been shown to discourage the initiation of care[26,27,28].

The key social factors affecting the uptake of NCD services and care in the two counties were stigma associated with NCDs and cultural beliefs. Cultural factors were shown to influence the choice of where to seek health services. The belief in Nyeri that cervical cancer is due to a curse and in Nairobi, the chronic nature of NCDs led people to seek the services of traditional healers. A study conducted at the Kenyan Coast found that the decision to go for traditional healing was motivated by the perceptions of the cause of the illness and the duration, severity and chronicity of the illness with conditions taken to traditional healers largely thought to arise from supernatural causes such as spirit possession, witchcraft and breaching of taboos[29]. Studies from Tanzania have pointed towards the preferences of patients seeking alternative treatments (herbal, religious, traditional healers etc.) over conventional medical therapy[30]. This was mostly true for disease symptoms were thought to be of a spiritual nature traditional healers were preferentially chosen for treatment[31,32]. In some studies participants acknowledged interrupting their medical treatment to seek alternative

[26]Kotwani P, Balzer L, Kwarisiima D, Clark TD, Kabami J, Byonanebye D, et al. *Evaluating linkage to care for hypertension after community-based screening in rural Uganda. TropMed Int Health: TM & IH. 2014; 19(4):459–68.*
[27]Govindasamy D, Ford N, Kranzer K. *Risk factors, barriers and facilitators for linkage to antiretroviral therapy care: a systematic review. AIDS. 2012; 26(16):2059–67.*
[28]Iwelunmor J, Airhihenbuwa CO, Cooper R, Tayo B, Plange-Rhule J, Adanu R, et al. *Prevalence, determinants and systems-thinking approaches to optimal hypertension control in West Africa. Glob Health. 2014; 10:42.*
[29]Abubakar, A., Van Baar, A., Fischer, R., Bomu, G., Gona, J. K., & Newton, C. R. (2013). *Socio-Cultural Determinants of Health-Seeking Behaviour on the Kenyan Coast: A Qualitative Study. PLoS ONE, 8(11), e71998. http://doi.org/10.1371/journal.pone.0071998*
[30]Emmy Mettam et.al., *Public policy, health system, and community actions against illness as platforms for response to NCDs in Tanzania: a narrative review Glob Health Action 2014, 7: 23439*
[31]Foster D and Vilendrer S. *Two treatments, one disease: childhood malaria management in Tanga, Tanzania. Malar J 2009; 8: 240*
[32]Comoro C et.al. *Local understanding, perceptions and reported practices of mothers/ guardians and health workers on childhood malaria in a Tanzanian district, implications for malaria control. Acta Tropica 2003; 87: 305_13.*

treatment and the primary reason was that alternative therapy was less expensive[33] and consequently, more affordable in comparison to mainstream medical treatment.

Stigma related to having an NCD is also a key barrier to seeking health services in both counties. The fear of being discriminated upon, perceptions of the community and fear of being a burden to the family members leads to avoidance of screening and treatment services. The stigma is as a result of the treatment received by NCD patients within the community. These could be closely associated with the lack of understanding of NCDs such as believing that it can be transmitted to them, the burden, financially, associated with the treatment of the disease and the belief that the NCD patients can no longer work to sustain their daily expenses.

Support groups were documented as a key facilitator for seeking NCD services. Findings indicated that support groups perform better in the rural setting (Nyeri) than in the urban settings (Nairobi). The reason could be that in urban areas the population is dynamic and the patient visiting a particular facility may be drawn from different areas that have unique characteristics rather than in the rural set-up where participants visiting a facility are likely to be from areas around the facility. In the areas that findings indicated they have worked well, participants reported improvement in adherence to medication and health education. They also reported that it is a good forum to share information with community members, make follow up with patients and share with them health information. In Nyeri, support group members made monthly contributions that enabled them procure drugs in bulk for members when the drugs were not available in the health facilities and they also procured glucose strips to allow them check their blood sugar. In Western Kenya, a study found positive outcomes for peer-led, in-person support groups with improved blood sugar and blood pressure after six months[34].

CHVs are key facilitators in the uptake of screening and care services. Community members in Nairobi and Nyeri alike welcome the convenience that it gives them to have

[33]Kolling M et.al. *Research "for someone who's rich, it's not a problem." Insights from Tanzania on diabetes health-seeking and medical pluralism among Dar es Salaam's urban poor. Globalization and Health 2010; 6: 8*

[34]Park, P. H., Wambui, C. K., Atieno, S., Egger, J. R., Misoi, L., Nyabundi, J. S., … Kamano, J. H. (2015). *Improving Diabetes Management and Cardiovascular Risk Factors Through Peer-Led Self-Management Support Groups in Western Kenya. Diabetes Care, 38(8), e110–e111. http://doi.org/10.2337/dc15-0353*

a CHV in close proximity to screen them whenever they are available and provide health education. CHVs are members of the communities they work in and therefore make it easier to approach community members. Diabetes and hypertensive patients within the community reported that they visited them to continuously check on how they are doing and remind them of health facility visits/clinics while educating them on lifestyle changes. A study has shown that CHVs have multiple roles in the care of NCDs including health education, advising, rehabilitating, support group facilitation, screening for complications of illness and assist community members to navigate the health system[35]. A study conducted in Western Kenya[36] investigating community perceptions of CHVs found that CHVs are well received in the communities they serve and have the capacity to promote awareness and positive health-seeking behaviors. CHVs are an important link in the health system, promotion of primary health care and the generation of awareness about the relevant health issues affecting the communities in which they serve. They are well placed to break down social barriers and make health

Access to healthcare services as **a result of poorly equipped health facilities** was also identified as a barrier to services because clients were referred to more expensive and distant health facilities requiring transport costs.

[35]Tsolekile, L. P., Puoane, T., Schneider, H., Levitt, N. S., & Steyn, K. (2014). *The roles of community health workers in management of non-communicable diseases in an urban township. African Journal of Primary Health Care & Family Medicine, 6(1), 693. http://doi.org/10.4102/phcfm.v6i1.693*

[36]Rachlis, B., Naanyu, V., Wachira, J., Genberg, B., Koech, B., Kamene, R., … Braitstein, P. (2016). *Community Perceptions of Community Health Workers (CHWs) and Their Roles in Management for HIV, Tuberculosis and Hypertension in Western Kenya. PLoS ONE, 11(2), e0149412. http://doi.org/10.1371/journal.pone.0149412*

information interpretable and comprehensible to their fellow community members and even demystify the healthcare system and therefore encourage uptake of NCD services.

Health system factors played a key role in the choice made by participants with regards to NCD screening and curative services. The lack of drugs or its limited supply has hugely impacted on the communities' motivation to visit a government health facility, which is affordable. This has further impacted on their decision to seek the services in the first place. The alternative they have is to visit private health facilities or higher level government health facilities that are not always within their reach and it is quite expensive so they resort to not seek medical attention until they receive a report that the government facility has drugs or there is an outreach to screen them. Screening methods were also identified as a key determinant in cervical cancer and prostate screening given that it involves pelvic examination which is a body part that is considered private and not to be exposed to strangers. The feeling of invasion of one's privacy therefore discourages some individuals from seeking screening services. The reports provided by those who have gone for the screening further influence this decision. A study conducted in Western Kenya had similar findings indicating that women who knew how cervical cancer screening is conducted are less likely to get screened. This is because cervical cancer screening involves a pelvic examination, a procedure that may be perceived as invasive, possibly painful and culturally insensitive[37].

The shortage of health care workers was also listed as a contributing factor to the uptake of NCD services. Health care workers feel insufficiently equipped to manage NCDs given the lack of training and continuous update. This coupled by the fact that they are few impacting greatly on the services offered. The proper management of NCDs is dependent on the healthcare workforce given that they make decisions on how to handle patients. They therefore have to be adequately equipped for this role. Accessibility to healthcare services was also identified as a barrier to services. Accessibility in this case was linked to inadequately equipped health facilities warranting the clients to be referred to other health facilities that are either more expensive or are in distant places requiring transport costs.

[36]*Orang'o EO, Wachira J, Asirwa FC, Busakhala N, Naanyu V, Kisuya J, et al. (2016) Factors Associated with Uptake of Visual Inspection with Acetic Acid (VIA) for Cervical Cancer Screening in Western Kenya. PLoS ONE 11(6): e0157217. https://doi.org/10.1371/journal.pone.0157217*

4.0 CONCLUSION AND RECOMMENDATIONS

This cross sectional research demonstrates that; knowledge is a key factor in determining the HSB of an individual with regards to NCDs. It further demonstrates that the language and methods used to share knowledge and the capacity of healthcare workers to effectively share NCD information is critical in ensuring that community members fully understand the information relayed to them. Cultural factors and stigma were also identified as negative influencers of health behaviour. NCD programmes will improve their effectiveness if these beliefs are identified before projects are rolled out to adequately address them in health education sessions. The screening methods used were a key factor in prevention of knowledge translation to health seeking behaviour.

Individual perceptions regarding the seriousness of a condition and cost implications have also been demonstrated to be key in determining engagement in risky behaviour and HSB. In addition, the level of income and cost of services also influences the decision to seek services. Thus, it is important that these factors are considered while designing NCD services and in health education session. Support groups and community health volunteers are key motivators to seeking NCD services.

The factors shaping access to NCD are availability of drugs and screening services, shortage of healthcare workers and the resulting long waiting periods. This means that while information may be shared with individuals regarding NCDs on a regular basis, a number of factors are required to motivate behaviour change such as, availability of facilities. For information or knowledge to be converted into behaviour, complementary resources are required such as, knowledge on physical activity to be converted into exercise, health clubs and wellness clubs must be made available. It also requires that NCD programmes consider the various ways that these factors have an effect in successful implementation.

RECOMMENDATIONS

1. Health education: The health actors in the NCD field need to examine the information that is shared regarding NCDs. They should ensure that information is not only shared extensively but that community members understand it. It is crucial that individuals understand that their actions with regards to lifestyle (diet, physical activity, smoking and alcohol use), uptake of screening, uptake of treatment services and adherence to medication directly influence the prevention and control of NCDs. With well-informed populations it is then possible for members to make informed decisions regarding NCD services. With this regard it is proposed that health education:

- Is tailored to the community in terms of language and culture to ensure that there is maximum understanding.
- Emphasise that early diagnosis of NCDs is possible due to screening, which is crucial in prevention and management.
- Aim to make audience understand that there may be no symptoms in the early stages of the NCDs.
- Clarify that NCDs are chronic conditions meaning that they may be there for a lifetime once an individual is diagnosed but with adherence to medication an individual can live a quality and healthy life and prevent further complications
- Emphasise that despite the high cost of treatment and screening, in some occasions the benefits outweigh this cost

2. Supply side factors: For information or knowledge to be converted into behaviour, complementary resources are required. For instance, to convert knowledge on physical activity into exercise health clubs and wellness clubs at workplaces are necessary. An innovative approach in partnership with the private sector/business people would see establishment of health clubs with equipment in a business model environment that is sustainable.

3. The project must borrow ideas and practices from similar projects that have been implemented elsewhere and adapt them to

their context both socio cultural, economic or geographical

4. Advocacy role: The Kenya Red Cross has an auxiliary role to the Government of Kenya and has extensive presence in all 47 counties of Kenya. KRCS is therefore well placed to advocate for health in relation to NCD services with the Ministry of Health. While KRCS can occasionally support with procurement of screening equipment and supplies and conduct outreach services in various communities, this may not always be the case. Advocacy opportunities with both national and county governments for more 'commitment' towards NCD services are continuously available. KRCS should therefore focus on advocating for:

- Development of national NCD protocols, training manuals, tools and indicators to provide informed decision making for NCD intervention in the Country and within specific counties.
- Capacity building activities for health care workers to be adequately equipped to manage the rising burden of NCDs. This should be disease specific e.g. diabetes, hypertension etc.
- Allocation of adequate financial resources towards equipping of health facilities with equipment and medical supplies required to efficiently screen for and manage NCDs.
- Production of standardised information, education and communication materials that can be used by all key players providing health education on specific NCDs. These should be translated to Swahili and must include visual aids. The materials should take into account the various groups, their needs and also emphasise the benefits of screening whether they have symptoms or not, proper diet, exercise and the role of smoking and alcohol.
- Health facilities to introduce 'opportunistic screening', which takes advantage of individuals who visit the health facility on a daily basis in other clinics. For example, a mother visiting the antenatal clinic can be screened for NCD.
- Gradual increase of human resource dedicated to the management of various NCDs in addition to maximising the benefits of the community health strategy by engaging more CHVs.
- Conduct studies that generate more evidence on interventions for a range of leading NCDs particularly addressing longer-term outcomes and in a greater range of country settings.

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