DETERMINANTS OF HEALTH SEEKING BEHAVIOR AMONG HOUSEHOLDS WITH CHRONIC NON-COMMUNICABLE DISEASES IN KENYA

BY

KAMAU TERESIA WANJIKU

X53/7313/2017

A RESEARCH PAPER SUBMITTED TO THE SCHOOL OF ECONOMICS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF HEALTH ECONOMICS AND POLICY OF THE NAIROBI UNIVERSITY.

DECLARATION

This project is my original work and to the best of my knowledge has not been presented for a degree in any other University or any other award.
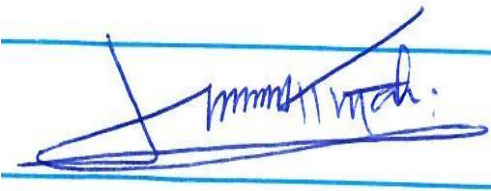
Kamau Teresia Wanjiku

X53/7313/2017

Signature: ………………………….   Date: 9.11.2021

I confirm that the candidate carried out the work reported in this project under my supervision

Dr. Urbanus Kioko

Signature: ——————————— Date: 9.11.2021

Department of Economics, Population and Development Studies

Faculty of Social Sciences

University of Nairobi,

Nairobi, Kenya.

DEDICATION

This project is dedicated to my mother. Though long departed, her kind, wise, insightful words still resonate a never-ending echo, encouraging me to go out there and be the best there can ever be; to my father, who has always been a strong pillar of hope; my brother whose support has been enormous; my sons and daughter who give me the reason to work hard and achieve my goals, and to my lecturers and colleagues who have dedicated their time to support me throughout my academic journey.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

BMI   Body Mass Index

CHE   Catastrophic Health Expenditures

CNCDs   Chronic Non-Communicable Diseases

CRD   Chronic Respiratory Diseases

CVD   Cardiovascular Diseases

DHS   Demographic and Health Survey

FAOSTAT   Food and Agriculture Organization Corporate Statistical Database

GDP   Gross Domestic Product

GoK   Government of Kenya

KDHS   Kenya Demographic and Health Survey

KHHEUS   Kenya Household Expenditure and Utilizations Survey

KNHA   Kenya National Health Accounts

LMIC   Low and Middle-Income Countries

MNL   Multinomial Logistic Regression

MOH   Ministry of Health

NCDs   Non-Communicable Diseases

NHIF   National Health Insurance Fund

OOP   Out of Pocket

SSA   Sub-Saharan Africa

WHO   World Health Organization

ABSTRACT

Chronic non-communicable diseases (CNCDs) contribute to over 70 % of total global mortality, with over 50% of Kenyans reported to suffer from more than one NCD. Over 55% of the Mortalities in Kenya are from CNCDs. There is limited knowledge on the socio-economic and demographic factors associated with health seeking behavior in kenya. The objective of this study was to assess the demographic and socio-economical determinants of health-seeking behavior among individuals with CNCDs in Kenya. The study adopted a cross-sectional study design using a secondary data from Kenya Household Expenditure and Utilization Survey (KHHEUS). The total data set had 31,622 households' records, out of which 7,079 households were found to meet the study requirements in terms of having CNCD cases. Binary probit regression was used to determine the effect of demographic and socio-economic factors on the health-seeking behavior for CNCD households in Kenya. Majority (73%) of individuals with CNCDs sought care from a health facility. The mean and maximum age of the individuals with CNCDs was 41 and 96 years respectively. Out of 7,079 study participants, 61% were female and 46% married. Majority (71%) indicated that they had attained post primary education level. Majority (64%) had informal employment. Only 17% had a health insurance, with 22% of the respondents indicating to have a comorbid condition. Majority (66%) lived in a rural setting. Only 11% came from the wealthiest quintile while 23% came from the lowest wealth quintile. Females were found to seek more qualified care for CNCDs than males (β=-0.109, p-value=0.002,). Age squared, (β=0.011, p-value=0.011,), being married (β = 0.148, p-value=0.031,), secondary level education, Formal employment (β= 0.215, p-value=0.046,), having a health insurance (β = 0.222, ρ-value = 0.000,), and higher wealth quintiles , Second lowest (β= 0.141, p-value=0.003,) middle (β= 0.233, p-value=0.000) second highest (β= 0.340, p-value=0.000,) highest (β= 0.215, p-value=0.000,), were all significantly associated with and increased ones' chances of seeking qualified care for CNCDs.   The study concludes that individuals owning insurance and being in higher income quintiles are main determinants influencing health seeking behaviour among individuals with CNCDs in Kenya. The study recommends that individuals with CNCDs be provided with subsidized health insurance schemes in order to increase their chances of health service utilization. In addition, the NHIF care package should be revised to comprehensively cover all CNCDs care and treatment.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Health seeking behavior has variably been described as a succession of events assumed by individuals as remedial to perceived ill-health (Ndarukwa et al., 2020). Consequently, various Strategic and targeted health programs and policies globally have been anchored on the knowledge of the health-seeking behavior of individuals and communities and the factors influencing these behaviors (Begashaw et al., 2016; Shaikh & Hatcher, 2005).

Early utilization of health care service for diagnostic and treatment purposes has been indicated to reduce morbidity, disability and mortality of individuals and communities (Jankovic et al., 2018). Chronic Non-communicable Diseases (CNCDs), on the other hand, are associated with poor prognosis, majorly due to treatment delays attributable to socio-economic and demographic factors like age, gender knowledge gaps and the associated out of pocket payments (Agarwal et al., 2011; Õiglane-Šlik, 2007).

CNCDs have been documented to be on the rise globally and have significantly featured as a priority in the global Health Organization platform from the '80s. In 2016, CNCDs were reported to account for 41 million deaths (71%) globally. Cardiovascular diseases (CVD) represented 31 percent, cancers 16 percent, chronic respiratory diseases 7 percent, diabetes Mellitus 3 percent and other CNCDs 15 percent of the global deaths. About 80 percent of all CNCDs deaths globally are reported to come from the Low- and middle-income countries (LMIC), where 85% are of premature nature, with the possibility of an adult dying from a CNCD being two-fold than that for an adult coming from a higher-income country (Lozano et al., 2012).

The burden of CNCDs in sub-Saharan Africa has been increasing over the decades and has been documented to be more than communicable, nutritional diseases, maternal, and neonatal reduced marginally across sub-Saharan Africa, age-standardized rates have however been noted to be on the upswing in some countries particularly for CNCDs such as diabetes mellitus and breast cancer. According to Gouda et al., 2019, the total Disability Adjusted life years (DALYs) due to CNCDs in sub-Saharan Africa increased by 67% between 1990 and 2017.

In Kenya, CNCDs have been recognized to contribute to more than half (50%) of all the inpatient admissions and 55% of all hospital mortalities (Ministry of Health, 2015). According to the 2019 statistics in kenya, cardiovascular illnesses were identified as the second most important cause of mortality in the country (www.statista.com).

Table 1. 1: Main causes of death in Kenya in 2019

	Disease	Mortality per 100,000
1.	HIV/ AIDS	104
2.	Cardiovascular diseases	81
3.	Tuberculosis disease & Respiratory infections	76
4.	Cancers	46
5.	Enteric illnesses	45
6.	Maternal & neonatal illnesses	44
7.	Digestive infections	41
8.	Diabetes & Kidney diseases	22
9.	Other infectious illnesses	21
10.	Malaria & Neglected tropical illnesses	17

Approximately 51 % of the Kenyan population is said to suffer from more than one NCD, with hypertension and cancers being the leading cause of illness and deaths respectively (Smit et al., 2020)

Whereas CNCDs are preventable, they have been noted to consume a substantial proportion of the country's healthcare budget taking away funds from other development needs through screening and treatment, (Who, 2010). NCDs accounted for 5.7% of the country's Total Health expenditure in 2016 which was a 0.5 decrease from what was spent earlier on in 2013 (Mwai, 2017).

Table showing distribution of Total Health expenditure by condition 2015/16

No.	condition	THE
1.	All other diseases & conditions	25.4%
2.	HIV/AIDS	20.1%
3.	Reproductive Health	12.1%
4.	Malaria	10.4%
5.	Respiratory tract infections	9.6%
6.	Vaccine preventable infections	8.7%
7.	Non communicable diseases	5.7%
8.	Injuries	3.7%
9.	Diarrheal diseases	2.7%
10.	Tuberculosis	1.4%
11.	Nutritional deficiencies	0.4%

CNCDs are associated with multi-morbidity, which is a state of having two or more CNCDs simultaneously. This state has been shown to pose an extra strain on the individual's health and the existing health care system. It is associated with higher mortality, increased healthcare-seeking behavior, poor quality of life and low social-economic standing (Jankovic et al., 2018). The chronic nature of CNCDs results in patients making several hospital visits for a check-up and drug re-fills which are long term, if not lifelong. They have also been linked with poverty from their lengthy and expensive treatments that can quickly drain households' resource reserves resulting in cycles of ill-health, borrowing to spend on health and debt, with the burden of managing CNCDs in the country like in other LMICs being largely borne by the households themselves through out-of-pocket spending (OOP), resulting to catastrophic health expenditures and impoverishment in some cases (Mwai & Muriithi, 2016; Salari et al., 2019)

Kenya has made significant advancement in the control and management of CNCDs. Kenya's Health policy 2014-2030 has prioritized CNCDs to slow its rising burden to the health system and households. Policy briefs on strengthening CNCDs interventions at the community level, have been produced in addition to the Kenya National strategy for the control and prevention of CNCDs 2015-2020 (Ministry of Health, 2015). These vital documents have continued to guide the health care system in providing care, support, prevention, and treatment CNCDs.

Treatment and care for CNCDs in Kenya are provided by public and private facilities, with costs of treatment being borne by the patients through out-of-pocket payments or health insurance schemes. Households out of pocket payments in Kenya have accounted for 26.1 percent of the total health expenditure, which negatively affects the utilization of health services (Mwai, 2017). In 2019 for instance, it was reported that slightly over one million individuals in the country had been pushed to poverty from catastrophic health spending through OOP (Salari et al., 2019). Health insurance has been documented to promote health-seeking behavior for people with CNCDs from the financial cushioning effect on healthcare payment (Ibanez-Gonzalez, 2014a). In Kenya, however, only about 20 percent of individuals are reported to have any form of health insurance. In Nairobi County, for instance, less than half of the population (41 percent) are said to have any form of health insurance cover, a situation that makes the majority of the households pay for their health care needs through OOP (Barasa et al., 2018).

Since health-seeking behavior has been described as a composite outcome influenced by an interplay of various factors, including socio-demographic, socio-economic, availability, access and affordability of medical services, an understanding of these factors has been noted to be very critical (Begashaw et al., 2016). The study intended to contribute to the knowledge of the factors affecting the health-seeking behavior of CNCDs in Kenya, which would add to the existing

knowledge on CNCDs and make policy recommendations that would improve their health-seeking behavior.

1.2 Statement of the Problem

According to the ministry of health Kenya, the country has been experiencing an epidemiological shift in disease burden from communicable to Chronic Non-communicable diseases, which contribute to over 50% hospital admission and over 55% hospital deaths with fifty-one percent of the NCDs mortalities reported to be from people aged 70 years and below. They have also been reported to contribute to 30.2 %of all the DALYs in Kenya, (Ministry of Health, 2015).

CNCDs apart from being reported to lead to premature deaths, and replenishing households of economic resources and productivity, also negatively impact on a nation's overall economic development, according to the world health organization. It is estimated that for every increase in CNCD prevalence, for instance, a country's annual income is reduced by 0.5 percent, with an individual losing an average of 2.36 days each month (Wang et al., 2015, 2016; Who, 2010). In addition, CNCDs have been found to contribute to catastrophic health spending, from their chronic nature, leading to impoverishment of households as a result of excessive borrowing and debt (Mwai & Muriithi, 2016; Salari et al., 2019).

Whereas CNCDs are preventable and largely controllable, there has been a persistent increase in the cases being reported owing to the increasing risk factors associated with these illnesses. According to the Kenya step-wise survey for NCD risk factors 2015, 13 percent of the Kenyan population is reported to consume some form of tobacco while a similar number consumes alcohol on a daily basis. Over 50 percent have never taken measurements for high blood pressure and 22 percent of those already diagnosed are not in any form of medication (Statistics, 2015). A study

conducted in several African countries found that the proportion of households with CNCDs not seeking medical care was on the rise, with over 70 percent of diagnosed CNCD patients reported not to be on treatment (Ibanez-Gonzalez, 2014b; Mohamed et al., 2018).

There is documented evidence on the negative implication of out of pocket payments on CNCDs health services utilization (Mwai & Muriithi, 2016). Whereas the health-seeking behavior is a composite outcome from an interplay of various factors, including OOP, information on how the various socio-demographic factors affect health seeking behaviour among households with CNCDs in Kenya is limited. This creates a difficulty in identifying possible gaps in the delivery of health services and financial security. Therefore, an understanding of determinants of factors influencing health seeking behaviour among households is essential for planning and in determining policy improvements and programs that can efficiently lessen CNCDs challenges, therefore encouraging the drive towards attaining the universal health coverage and securing movement towards attainment of the Sustainable Development Goals (SDGs). This study intended to fill this prevailing gap in the knowledge of CNCDs health-seeking behavior and the related influencing factors in Kenya.

1.3 Objectives of the study
The study aimed at examining the health-seeking behavior for CNCDs, and the various socio-economic and demographic factors that influence that behavior in Kenya.

1.3.1 Specific objectives
The specific objectives were:

    i.   To identify the factors that influence health seeking behaviour among individuals with CNCD in Kenya.

ii. To estimate the effects of socio-demographic and economic factors on health seeking behavior for individuals with CNCD in Kenya.

iii. To come up with policy recommendations based on the study findings.

1.4 Significance of the study

The study has identified potential socio-economic factors influencing individuals with CNCDs uptake of qualified health services. In turn, an understanding of these potential factors will create room for meaningful engagements in addressing potential gaps while providing and seeking for CNCD care and support by individuals. An understanding of these factors will also assist tackle possible service delivery system failures in effectively addressing CNCDs, which is also crucial in planning for policy improvements and programs that can effectually lessen the potential challenges posed by CNCDs, inspire the drive in attaining universal health coverage, and therefore secure movement in the attainment of Sustainable Development Goals (SDGs).

The study findings will benefit policymakers and planners, particularly in Kenya, with information on how various social-demographic and economic factors affect health-seeking behavior of CNCD households. This study findings showcase that financial empowerment is very crucial for individuals suffering from CNDs, therefore the need to make plans for financial support to ensure they receive financial protection while seeking care. Policy makers will be able to use these study findings to make policy reforms that would encourage movement towards universal coverage, in the attainment of the sustainable millennial goals.

The study findings would also assist in making better plans and inform decision on how to identify targeted health programs and policy reforms that would assist curb the challenges in CNCD service provision. For instance, the knowledge that more women seek care for CNCDs as compared to

men, would prompt policy makers restructure service provision to be more male-friendly in order to encourage them seek care more. The findings will also supplement an existing body of knowledge on household health-seeking behavior and their associated determinants. Other authors may also use the present study results to inform their studies on related study topics.

2.1 Introduction

This chapter looked at theoretical and empirical literature on the effects of various social-economic and demographic factors on CNCD health-seeking behavior.

2.2Theoretical Literature Review

2.2.1 Health Behaviour Model (HBM)

Psychologists trying to explain why people don't participate in health programs intended at averting or detecting diseases developed this model in the 1950s. According to Rosenstock (1974), demographic factors like socioeconomic, age, gender, ethnicity are associated with preventive health behavior patterns and affect health-seeking behaviors even where health care has been provided for free. However, these factors are not modifiable. Therefore, besides health education, other individual characteristics allied to health-related behavior could effectively be modified through health education, causing a shift in health behavior patterns. The health behavior model looks at two critical aspects of an individual: threat perception and behavioral evaluation. Threat perceptions considers an individual's belief in perceived vulnerability to health problems and the expected severity of the consequences after an ailment.

Charles and Paschal (2005) further observed that behavioral evaluation considers the beliefs regarding the benefits or efficacy of an acclaimed health behavior versus the cost and other barriers to enacting the health behavior. The HBM has evolved and has been applied to various populations and health behaviors in addressing multiple public health concerns. It covers several constructs theorized to predict why people employ various preventive, screening and health controlling programs. These constructs could effectively be applied, for instance, in trying to understand what

influences NCD patients from seeking health care and consequently what factors may hinder their health-seeking behavior.

TABLE 2. 1: THEORY OF HEALTH BEHAVIOUR ASPECTS

Construct	Definition	Application on health-seeking behavior of NCD patients
Perceived predisposition	Belief in getting a disease or condition,	Chances of getting NCD complications are high
Perceived severity	Belief on how severe the diseases are, and the consequences of leaving them untreated.	Losing carrier, family or even ones' life once complications of NCDs arise
Perceived benefits	Belief in possible helpful aspects of a health action	Seeking help and advice from doctors by visiting the health facilities could give one peace of mind and psychological rest
Perceived obstacles	Belief in possible undesirable aspects of a health action	Expenses associated with visiting a health facility, a second NCD being diagnosed in addition to the first one, hence heightening emotional stress
Hints to action	Factors that prompt action	Media advertisements and advocacy techniques by MOH on seeking health care for NCDs
Self-efficacy	A conviction that an individual can attain the behavior needed to execute an outcome.	Self-confidence that one knows the right doctors and hospitals to visit can access and afford health from a specific facility.

Personal characteristics like age, gender, socio-economic, ethnicity, and educational background, usually modify the individual perception of health and affect their health-seeking behavior.

2.2.2 The Anderson Behavioral Model

Anderson 1995 revisited the behavioral health model and summarized the constructs into predisposing factors or those leading to causation, especially for exogenous demographic and social structures. He also demonstrated that enabling factors are necessary for health services

utilization and demonstrating that need is critical for the actual usage of health services to take place. In addition, he stated that the external environment plays a crucial part in understanding health service use, including the political, physical, and economic components. Personal health practices like exercise, diet, and self-care influence health status outcomes as an essential input to health service utilization(Andersen, 1995).

This study adopted the Anderson behavioral model as it has categorized the various socio-economic and demographic factors into categories that makes it easy to analyze and interpret.
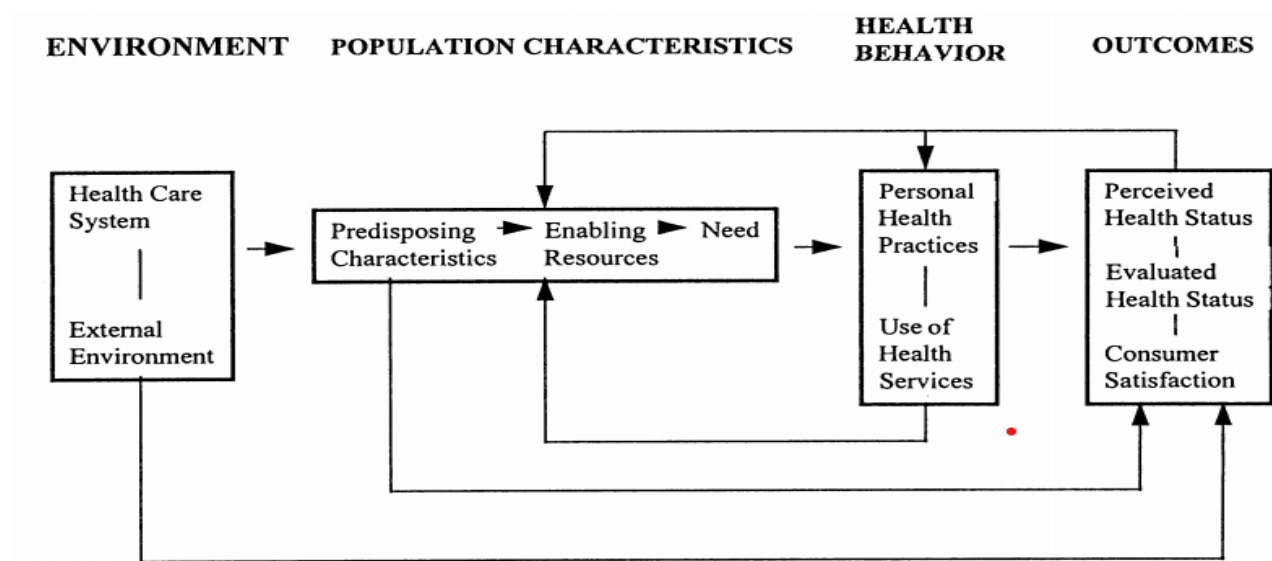
Figure 2. 1: Anderson behavior model

Table showing socio-demographic and economic factors influencing health-seeking behavior for CNCDs according to the Anderson behavioral model.

No.	Factor	Category
1.	Age	Need/ Predisposing
2.	Gender	Enabling/ need
3.	Education level	Enabling/ predisposing
4.	Marital status	Enabling
5.	Formal employment	Enabling
6.	Wealth Index	Enabling
7.	Insurance status	Enabling
8.	Residency	Predisposing/ enabling
9.	Comorbidity	Predisposing

2.3 Empirical Literature Review

2.3.1. Introduction

Etemadifar et al., (2014), showed that there are differences in the health-seeking behavior of households with regards to CNCDs. Health-seeking behavior has been noted to be crucial for personal, societal, and national development. Knowing a society's first treatment choice and the factors influencing that choice with regards to CNCDs is important because it can help create and strengthen a health care resource in the community.

2.3.2 Influence of demographic characteristics on CNCD health services seeking behavior of households.

Wang et al., (2015) undertook a study in Malawi on health-seeking behavior for NCDs, which revealed that more women opted not to seek health care (39.8%) compared to males at 34%. The study, further revealed that males who opted to go for NCD care, about 24% received informal care compared to 17.5% females. Begashaw et al. (2016) conducted a similar study in south-west Ethiopia using binary logistic regression to determine the factors related with health-seeking behavior. The study revealed that married couples were11 times more likely to seek out health care services for CNCDs compared to those who were single (OR, 11.3; 95% CI, 1.2– 110.2).

Jankovic et al., (2018) carried out a population-based study in Serbia to explore the association between non-communicable disease multi-morbidity and healthcare utilization. He assessed the socio-demographic predictors of NCDs and general practitioners' visits. Using multiple regression model, the findings showed that women more often sought health care services by making visits to general practitioners (73 percent) as compared to men (61 percent). The findings further showed that prevalence of NCDs was greater amongst individuals with low education compared to those with higher education (OR,34.4; 95% CI,31.8-36.9). The study findings also showed that health

service utilization was higher among patients with more than one NCD and among older males (OR 3.17) than females (3.14).

In assessing the determinants for CNCDs health-seeking behavior and the associated OOP expenditure in northern Bangladesh, Rasul et al. (2019) used multinomial logistic regression using a sample of 2500 households. The study found that 16 percent of individuals did not seek health care for NCDs, while 42 percent sought qualified care with a similar percent seeking care from *village doctors*, or traditional healers. The findings further showed that the likelihood of seeking health care for NCDs was higher among individuals with higher education (β= 0.624, p=0.007). In addition, more females were noted to seek self-care or no care compared to the males (45.3% vs 54.7%, p= 0.75). The study further indicated that being married was linked with seeking qualified health care compared to not being married. Urban residency was not statistically significant (*p*=0.24) as a factor influencing health seeking behavior for CNCD households.

2.3.3 Influence of social-economic factors on CNCD health services seeking behavior

In trying to understand NCD patients care-seeking dynamics, Karinja et al., 2019, carried out a study in Kenya and used multivariate regression on several variables. The study showed that the coefficient on health insurance was a positive predictor of health-seeking behavior (OR 2.46, 95% CI; 1.81-3.35).

Begashaw et al., 2016, did research in southwest Ethiopia to identify factors influencing the health-seeking behavior for CNCDs. He was able to show that the chances of individuals' seeking health care increased to almost 6 times, as their total monthly income earnings increased. The study used Binary logistic regression on several variables, amongst them monthly income and assets. From the study findings, there was a positive correlation between CNCD participants from

the 2nd and 3rd wealth quintiles (β = − 0.794, P = 0.03), (β = − 0.841, P = 0.02) respectively, in seeking qualified health care.

Ibanez-Gonzalez (2014b) conducted a study among women with NCDs in a South African. The study found that ownership of medical aid (p= 0.01) was the most significant factor influencing health services uptake among women with NCDs in South Africa. The study by Rasul et al., (2019), in northern Bangladesh examined factors influencing health-seeking behavior for CNCDs and the associated OOP expenditure. They used multinomial logistic regression on a sample of 2500 households. The study noted that respondents from the 2nd and 3rd asset quintile (p= 0.001) had a high likelihood of seeking health care, showing a positive correlation between economic empowerment and health-seeking behavior for CNCDs.

2.4 Overview of Literature review

CNCDs health-seeking behavior is positively correlated with one being older, with a higher education profile, in a marriage partnership and from the male gender, as observed in several studies (Begashaw et al., 2016; Rasul et al., 2019; 2019; Wang et al., 2015). Most of these studies contexctually focused on only one aspect geographically, hardly giving room for comparison of results from other aspects. Another study however showed that females with NCDs were noted to seek out healthcare more compared to the males, contrasting earlier findings. Having more than one NCD was assoaciated with increased chances of seeking qualified health care, according to Jankovic et al., 2018. This may not necessarily be true since financing for CNCD care has been noted to primarily be born by the individuals through out of pocket spending, a fact that may hinder consequent facility visits for qualified care.

Urban residency was not significantly associated with health seeking behaviour from Rasul et al 2019, a finding that is suprising since the expectation is that urban dwellers have more physical access to facilities. In contrast to earlier on findings, another study by Ibanez-Gonzalez, 2014b, showed that age did not significantly affect NCD patients' health-seeking behavior, which is also a suprising finding since the expectation is that as one ages, he/she becomes more prone to CNCDs, therefore increasing their chances of seeking qualified health serves.

Being economically empowered and having social support for treatment has also been shown to affect the health-seeking behavior of NCD households positively, while OOP noted to hinder NCDs households from seeking health care mainly due to direct costs of medication. (Rasul et al., 2019; Begashaw et al., 2016; Karinja et al.,2019; Ibanez-Gonzalez, 2014b, Wang et al., 2015). These studies show that economic empowerment is therefore very crucial as an enabling factor for CNCD households and individuals seeking qualified health care.

The context of these and many other studies that have tried to explain factors affecting healthcare services utilization by NCD households has been varied. This study used the Anderson behavioral health model which explains the health seeking behavior of individuals as influenced by various intrinsic and extrinsic factors categorized as predisposing, enabling and need factors. This study used probit regression to understand these factors in the Kenyan context which is a middle-income country and come up with policy recommendations that would create a more enabling environment for service provision.

CHAPTER THREE: STUDY METHODOLOGY

3 .1 Conceptual Framework

Reviewed literature shows that there are various demographic and social-economic factors that facilitate the health-seeking behavior of households. The willingness of an individual with CNCDs to seek medical care depends on the perceived benefits, in the context of enabling factors like cost affordability and the perceived need for care due to presence of comorbidities.
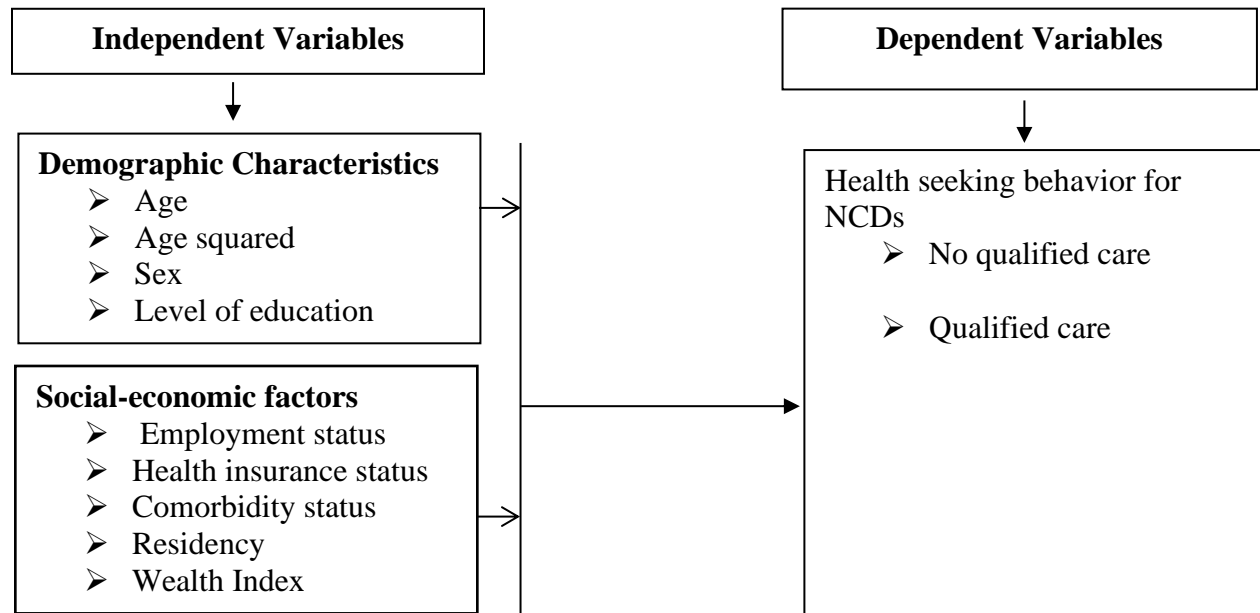
Figure 3. 1: **Socio-economic and demographic factors influencing health seeking behavior Constructed from a collection of factors as mentioned by Begashaw 2016; Rasul et al. 2019**

Explanatory variables used in the model were constructed from the Anderson health behavioral model (Andersen, 1995) that looked at the health-seeking behavior as an interplay of factors that predispose, permit and that necessitate that behavior. Predisposing factors were identified to include individual age and sex while allowing/enabling factors to consist of employment

status, wealth index, health insurance status, marital status, place of residence and education level of individuals. Comorbidity status was viewed as a proxy for perceived need.The study conceptualized that the dependent variable, health-seeking behavior of households with CNCDs, was dependent on several demographic and socio-economic factors. For the demographic factors, offering targeted information and education to a household on CNCDs screening and management could change or enhance their health-seeking behavior.

Additionally, application of appropriate socio-economic support mechanisms can help modify the socio-economic characteristics of the CNCDs households for instance enrollment into a social / private health insurance scheme. Payments for CNCDs is majorly from out-of-pocket payments, which presents potential hindrance to consecutive hospital visits by CNCDs households owing to the financial strain and drain to individuals. By availing targeted or subsidized health insurance schemes, or even employment however, the health-seeking behavior for CNCD households could be changed or enhanced positively. (Salari et al., 2019).

3.2 Definition, measurement, and expected effect of the variables

In this study, the primary outcome, health-seeking behavior for CNCDs was defined as the type of care sought by CNCD patients in the preceding four weeks prior to the Kenya household health and economic survey carried out in 2018. Health-seeking behavior was either qualified care or non-qualified care. Qualified care was where an individual visited or consulted a trained service provider in a hospital/ health center or clinic.(Expenditure & Survey, 2018). Non-qualified care was taken to be the case where an individual treated themselves by buying over the counter medication without a prescription from a qualified health professional, or following advice from a friend or relative (Rasul et al., n.d.; Wang et al., 2015).

The independent variables included;

- Age, which was defined as the age an individual had attained in completed years during their last birthday prior to the KHHEUS 2018 study period.

- Age squared was a quadratic function of age, which was used to measure the minimum age at which health starts depreciating in value.

- Sex is a dummy variable taking the value of 1 if the respondent was Male and 0 if the respondent was Female.

- Marital status was defined as the status that an individual assumed as at the KHHEUS 2018 period. The responses were; currently married, divorced, never married, widowed or separated. Never married was used as the reference category.

- Level of education was taken as the highest education level an individual had attained as at the KHHEUS 2018. It was categorized into below primary level, primary level, secondary level, and tertiary levels, with the secondary level being used as the reference category.

- Employment status was categorized into three categories, as formal employment where an individual was presently engaged in economic activities that attracted a wage/salary on a monthly or weekly basis, up to the last twelve months preceding the KHHEUS survey. Informal employment where an individual was engaged in economic activities though not attracting weekly or monthly wages, and unemployed, where one dint have a source of income whether formal or informal. Unemployed was used as the reference category.

- Health insurance status was defined as an individual having subscribed to either a social or private health insurance. It was a dummy variable of where 0= no health insurance, while 1= health insurance present.

- Comorbidity was defined as an individual responding to suffering from more than one NCD condition as at the KHHEUS 2018 period. It was a dummy variable where 0= no

comorbidity, while 1= comorbidity present.

- Residency was defined as the present area where the individuals were residing from for the last 6weeks preceding the KHHEUS 2018 study period. It was a dummy variable where 0= urban, while 1= rural.

- Wealth Index was defined as the measure of selected collective assets an individual owned as at the KHHEUS 2018 period. The variable was categorized into five quintiles, where , individuals in the lowest quintile were the poorest 20% of the study population, second lowest quintile had individuals slightly richer than those from the lowest quintile, making up the next 20% of the population, middle quintile formed individuals in the next 20% , slightly richer than those in the second lowest quintile, second highest quintile were from the next 20% population of those slightly richer than those from middle quintile, while the highest quintile formed individuals forming the richest 20% of the population. The lowest quintile was used as the reference category.

TABLE 3. 1: DEFINITION, MEASUREMENT, AND SIGNS OF VARIABLES

Variables	Measurements	Expected sign
Dependent		
Health-seeking behavior	0 = no qualified care; 1= qualified care	
Independent variables		0 = no qualified care
Age in years	Continuous variable	+/-
Age ^{2}	Continuous variable	+/-
Sex	0 = Female 1 = Male	+/-
Marital status	1=married, 0 = never married 1=Divorced, 0 =never married 1=Separated, 0 = never married 1=Widowed, 0 = never married	+/- +/- +/- +/- +/-
Education	1=Below primary level, 0= secondary level 1= primary level, 0= secondary level 1=tertiary level, 0= secondary level	− + + +

Employment	1= informal employment, 0= unemployed	–
	1 = formal employment, 0= unemployed	–
		+
Insurance	0 = no health insurance	-
	1 = health insurance present	+
Comorbidity	0 = no comorbidity	-
	1 = comorbidity present	+
Residence	0 = urban	-
	1 = rural	+
Social economic / asset quintile	1= 2nd lowest quintile, 0= lowest quintile	-
	1= middle quintile, 0= lowest quintile	+/-
	1= 2nd highest quintile, 0= lowest quintile	+/-
	1= highest quintile, 0= lowest quintile	+
		+

*

3.3 Model Specification

This study used binary probit regression to determine the association of the descriptive variables and the primary outcome, which is health-seeking behavior for CNCDs households. Binary probit regression was appropriate for the study since the primary outcome has two categories, (1= qualified care, 0= non-qualified care).

The model assumes the outcome of health seeking behavior for CNCDs and the descriptive variables have a linear relationship with an inverse standard normal distribution of the probability shown here.

$$y_i^* = \alpha + \beta x_i + \varepsilon \qquad\qquad (1)$$

Where:

y_i^* = the unobserved dependent variable [health-seeking behavior for CNCDs]

x_i = vector of independent variables

β = vector of parameters to be estimated

ε = error term

The observed outcome variable (y) is linked to the unobserved outcome variable (y_i^*) as shown here:

$$y_i = \begin{cases} 1 \; if \; y_i^* > \tau \\ 0 \; if \; y_i^* \leq \tau \end{cases} \tag{2}$$

Where τ is the threshold, seeking qualified care as $y = 1$ and no qualified care as $y = 0$. The cumulative distribution function of the probit model can then be conveyed as here shown:

$$prob(y_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{x_i\beta} e^{\frac{-(x_i - x_i\beta)^2}{2}} dx = \Phi x_i\beta \tag{3}$$

The equation 4 belowshows the probability of seeking qualified health care:

$$\Pr(y_i = 1) = \Phi(x_i\beta') \tag{4}$$

where; $\Phi(x_i\beta')$ is the cumulative distribution function that is used to calculate the maximum likelihood function (L) as follow:

$$L = \prod_{y=0} \Phi(-x_i\beta') \prod_{y=1}[1 - \Phi(-x_i\beta')] \tag{5}$$

The marginal effects at the mean of the probit model ($\frac{\partial y}{\partial x}$) will be calculated as follows:

$$y = \Phi(\beta_0 + \beta_1 x_1 + \beta_1 x_1 + \beta_1 x_1 + \cdots + \beta_n x_n) \; so \tag{6}$$

$$\frac{\partial y}{\partial x} = \beta_i \phi(\beta_0 + \beta_1 x_1 + \beta_1 x_1 + \beta_1 x_1 + \cdots + \beta_n x_n) \tag{7}$$

Interpretation of the probit model will be according to the coefficients. For the positive coefficients, an increase in the independent variable will increase the probability of the dependent variable while coefficients with a negative sign will show a decline in the probability of the dependent variable with each rise in the independent variable.

3.2.2 Estimable Model

The descriptive characteristics of the respondents and the degree of CNCD health seeking behaviour will be analysed by means of frequency tables and percentages in absolute numbers and weighted proportions. The survey weights are provided in the dataset. The statistical data analyses will be performed using STATA 14.0 with the significance level set at 0.05.

The model will be as follow:

$y = \beta + \beta_1(Age) + \beta_1(Age\ squared) + \beta_1(sex) + \beta_1(marital\ status) + \beta_1(Education) + \beta_1(Employment) + \beta_1(Health\ insurance) + \beta_1(comorbidity) + \beta_1(Residence) + \beta_1(wealth\ index) + \varepsilon.$

3.4 Estimation issues

3.4.1 Multicollinearity test

Multicollinearity tested the collinearity of the study variables, which occurs when the independent variables are correlated. This research used correlation matrix to create the relationship between health-seeking behavior for CNCD and the independent variables. The variance of inflation factors (VIF) was computed to confirm the multicollinearity of variables and the strength of the correlation. Variables with a VIF of more than 10, which is considered as being collinear, were dropped.

3.5 Data Type and Source

This research study used the Kenya Household Health Expenditure and Utilization Survey (KHHEUS, 2018) data, which was a cross-sectional national survey that collected data on factors influencing households' health care consumption and expenditure. The survey collected data from 31,622 households scattered in 1,500 rural and urban clusters within the 47 counties. Respondents were asked if they suffered from any chronic conditions like hypertension, diabetes, asthma,

cardiac disorder, mental illness in the preceding four weeks prior to the survey. The study extracted the data on socio-economic and demographic characteristics including age in completed years, sex of respondents (whether male or female), highest level of education reached, marital status, employment status, wealth index in quintiles, and insurance coverage. As such, 7,079 cases were found to meet the study parameters and were therefore extracted for analysis.

CHAPTER FOUR: STUDY RESULTS

4.1 Introductions

The results presented in this chapter have been structured into three sub-sections, including descriptive statistics of variables, diagnostics tests and probit analysis of factors influencing health care seeking behaviour for CNCD households in Kenya. The details are presented and discussed under the following sub-sections.

4.2 Descriptive Statistics

Table 4.1 presents descriptive statistics of variables used in the estimation of the econometric model.

Table 4.1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Healthseekingbehaviour	7079	0.729	0.444	0	1
Rural	7079	0.658	0.474	0	1
Male	7079	0.386	0.487	0	1
Age	7079	41.245	23.954	0	96
Agesq	7079	22.748	20.912	0	92.16
Nevermarried	7079	0.318	0.466	0	1
Married	7079	0.463	0.499	0	1
DivorSep	7079	0.064	0.245	0	1
Widowed	7079	0.155	0.362	0	1
BelowPrim	7079	0.290	0.454	0	1
Primary	7079	0.480	0.500	0	1
Secondary	7079	0.181	0.385	0	1
Tertiary	7079	0.048	0.214	0	1
Unemployed	7079	0.308	0.462	0	1
InformalEmp	7079	0.646	0.478	0	1
FormalEmp	7079	0.046	0.210	0	1

HealthInsur	7079	0.175	0.380	0	1
comorbidity01	7079	0.227	0.419	0	1
Lowest	7079	0.226	0.418	0	1
SecLowest	7079	0.226	0.418	0	1
Middle	7079	0.245	0.430	0	1
SecHighest	7079	0.195	0.397	0	1
Highest	7079	0.108	0.310	0	1

A total of 7,079 individuals were found to have CNCDs, which included hypertension, diabetes, asthma, cardiac disorder, and mental illness. The findings further shows that 73% of the respondents sought care from a health facility, indicating majority of households with CNCD relied on qualified care for managing CNCDs. The respondents had a mean age of 41 years, and a maximum age of 96 years old. Sixty one percent of the respondents were female while 46% were married. Majority (71%) of the respondents indicated that they had attained post primary education level. In terms of employment, majority (64%) of the respondents had informal employment while only 17% indicated to have a health insurance, with 22% of the respondents indicating to have a comorbid condition. Majority (66%) lived in a rural setting. Only 11% came from the wealthiest quintile while 23% came from the lowest wealth quintile.

4.3 Multicollinearity Analysis Diagnostic Tests

The KDHS data that informed the study was collected via a survey where study subjects were observed at the same point in time. This study performed multicollinearity analysis to detect whether there was high correlation among predictor variables which could have rendered the statistics inefficient. From the analysis, all the variables had a VIF tolerance value of less than 1 implying absence of multicollinearity, as here-in shown.

Table 4. 1: VIF Analysis

Variable		VIF	1/VIF
Age		39.42	0.025365
Agesq		29.12	0.034335
Married		4.55	0.219769
Widowed		3.62	0.276189
InformalEmp		3.3	0.302726
BelowPrim		2.45	0.408665
Primary		2.07	0.483542
DivorSep		1.9	0.527611
SecHighest		1.84	0.544174
Highest		1.84	0.544257
FormalEmp		1.77	0.566541
Middle		1.73	0.579437
SecLowest		1.61	0.620277
Tertiary		1.41	0.706871
Rural		1.29	0.774319
HealthInsur		1.21	0.824443
Male		1.13	0.888792
comorbidity01		1.05	0.953374
Mean VIF		**5.63**	

4.4 Econometric results

The study used Probit model to estimate the determinants of health seeking behaviour of CNCD individuals in Kenya. The results below show how the different socio-demographic and economic factors determined the health seeking behavious of individulas with CNCDs.

Table 4. 3: Probit regression results

Probit regression
Number of obs =   7,079

LR chi2(18) = 166.92				
Prob > chi2 = 0.000				
Log likelihood = -4052.0499				
Pseudo R^2 = 0.0202				
Hlthseekbehaviour	**Coef.**	**Std. Err.**	**z**	**P>z**
Rural	0.060	0.039	1.550	0.122
Male	-0.109*	0.035	-3.120	0.002
Age	-0.013*	0.004	-2.990	0.003
Agesq	0.011*	0.004	2.550	0.011
Not married	Reference variable			
Married	0.148*	0.069	2.160	0.031
DivorSep	0.122	0.090	1.350	0.177
Widowed	0.128	0.084	1.520	0.128
BelowPrim	-0.128*	0.056	-2.270	0.023
Primary	-0.155*	0.048	-3.250	0.001
Secondary	Reference variable			
Tertiary	-0.121	0.094	-1.290	0.199
Unemployed	Reference			
InformalEmp	0.048	0.060	0.800	0.422
FormalEmp	0.215*	0.108	2.000	0.046
HealthInsur	0.222*	0.049	4.510	0.000
comorbidity01	-0.065	0.039	-1.660	0.097
Lowest	Reference			
SecLowest	0.141*	0.047	2.990	0.003
Middle	0.233*	0.048	4.830	0.000
SecHighest	0.340*	0.055	6.170	0.000
Highest	0.414*	0.072	5.740	0.000
_cons	0.660*	0.088	7.460	0.000

The coefficient on gender was positive and statistically significant, implying that more females sought qualified care for CNCDs than males whose coefficient was negative (β=-0.109, p-value=0.002,). The coefficient on age squared which measures experience of an individual in seeking qualified health care was positive and statistically significant at the 5% level (β=0.01, p-value=0.011,). Those that were married (β = 0.148, p-value=0.031,) sought more qualified care while the unmarried sought similar care as the separated, divorced or widowed. Those that had attained primary level education (β=-0.155, p-value=0.001,) and below (β =-0.128, p-value=0.023,) sought less qualified care than those with secondary level education. There was no difference in seeking care between those with tertiary and secondary level education.

Formal employment (β= 0.215, p-value=0.046) was positively associated with seeking qualified care, while those unemployed and with informal employment sough qualified care to the same extent. Having a health insurance (β = 0.222, ρ-value = 0.000) was associated with one seeking more qualified care. Those from higher wealth quintiles sought more qualified care, with those from the middle quintile onwards seeking more care. Second lowest (β= 0.141, p-value=0.003,) middle (β= 0.233, p-value=0.000,) second highest (β= 0.340, p-value=0.000,) highest (β= 0.215, p-value=0.000,). Health seeking behavior was noted to be the same regardless of place of residence whether rural or urban.

4.5 Discussions

This study aimed at determining the effects of socio-demographic and economic factors on seeking qualified health care for CNCD households in Kenya. The results showed that being female (β=-0.109, p-value=0.002), increase in age (age sqare β=0.011, p-value=0.011,) , being married (β = 0.148, p-value=0.031,) ,primary education (β=-0.155, p-value=0.001,) and below primary

education (β =-0.128, p-value=0.023,) were significant predictors of seeking qualified health care for individuals with CNCDs.

The coefficients on primary and below primary level though negative show that secondary and post-secondary education levels were positively associated with seeking qualified care, since secondary level education was used as the reference category. The findings agree with earlier research findings by Rasul et al., (2019) and Wang et al., (2015) which found older individuals, those with higher education and those in a married relationship were significant predictors of seeking qualified care among CNCD households. The same results are confirmed by Jankovic et al., (2018) study which realized that more Serbian women (73%) sought qualified healthcare services as compared to men.

Being in a formal employment (β= 0.215, p -value=0.046,), having health insurance (β = 0.1624232, ρ-value = 0.025**,) and being in a higher wealth quintiles (Second lowest quintile: β= 0.141, p-value=0.003: middle quintile, β= 0.233, p-value=0.000; second highest quintile: β= 0.340, p-value=0.000; highest quintile: β= 0.215, p-value=0.000,) were all significant socio-economic predictors in determining the likelihood of seeking qualified care by individuals with CNCDs. The results are comparable to the findings by Karinja et al., (2019) and Begashaw (2016) who found having a health insurance and being in higher wealth quintiles important predictors of health seeking behavior among CNCD households. Our study further support the findings by Rasul et al., (2019) which showed that respondents of 2nd and 3rd asset quintile were likely to seek qualified care from formal health facilities.

Area of residency was not shown to have any effect on the health seeking behavior, rural (β=0.060, p-value=0.122,), a surprising finding since the expectation is that most urban dwellers have access to health facilities hence able to seek care more than their counterparts the rural dwellers. Rasul at

al 2019, also had similar surprising results (p-value = 0.24) hence could not conclusively associate urban residency with CNCD health seeking behavior. Comorbidity (β = -0.065, ρ-value = 0.097,), was non-significant and negatively associated with health seeking behavior for CNCD individuals. This is contrary to findings from a similar study by Jankovic et al.., 2018, who found out that individuals with comorbidity had almost a three times chance of seeking qualified health care.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarized the study findings and subsequently arrived at inferences constructed from the established connection amongst identified determinants and health seeking behavior by CNCD households in Kenya. Policy recommendations and areas of further research were later on suggested as a way of filling in the identified the gaps.

5.2 Summary of the study findings

The main goal of seeking healthcare is to help address an underlying condition in a more responsive way. This study was conducted with a view of assessing the factors related with health-seeking behavior for CNCDs in Kenya. Specifically the objectives were to identify and investigate the influence of socio-demographic and economic factors on CNCD health services seeking behavior for households in the country and to suggest policy recommendations based on the study findings. The study analyzed data from the latest KHHEUS (2018) survey in kenya.

The hypothesized relationship, was modelled using Probit regression to elucidate the influence of various factors related with health-care seeking behavior in Kenya. Three levels (1%, 5% and 10%) of significance were adopted in testing significance. Trends and patterns were both descriptive and

30

inferential. From the estimation of the model; the female gender, being married, higher education level, formal employment, higher wealth index, having a health insurance cover and increase in age, were found to be significant and positive predictors of healthcare seeking habits.

5.3 Conclusions

The estimated model posits that in Kenya as a country, which has both rural and urban settings, majority of CNCD patients seeking healthcare services either have a stable income, are from the female gender, have a formal employment, own a health insurance, are older, have financial assets, are married and have a higher education level. As such socio-economic empowerment is crucial for one to be able to seek qualified health care for CNCDs.

5.4 Policy Recommendations

The chronicity nature of CNCDs usually poses an extra strain on the health of individuals and has a direct impact on the socio-economic burden of individuals, owing to the several expected facilities visit associated with managing CNCDs. From this study findings, it is my recommendation that health insurance scheme targeting CNCDs be availed and or their benefit packages be comprehensive to cover all the CNCDs, in order to assist facilitate their frequent hospital visits, cushioning them from catastrophic spending as well as prevent self-care, in a bid to promote universal health coverage for all as outlined in the sustainable development goals vision 2030. In addition, individuals with CNCDs should be supported to become economically empowered, either through formal employment as this has been shown to enable them seek more qualified care which would facilitate their well being. From this study findings, social support in terms of marriage is crucial hence CNCD patients should be supported to stay in a marriage relationship as it has been shown to improve their health seeking habits. The facility setting should also be more friendly to the male gender in order to attract them and improve their health seeking habits as this study shows more females seeking qualified health care than males. Higher education should be advocated and made easily available to all, as it helps promote seeking qualified care, for a healthy community and nation. Younger CNCDs patients should be supported seek qualified health care either through support groups, or targeted follow-up programs as this study findings has revealed that they seek less qualified care compared to the elderly ones, which may shorten their lifespans while managing CNCDs.

5.5 Areas for Further Studies

This study focus was to assess social-demographic and economic factors influencing the health seeking behavior for CNCD individuals in Kenya. Of significance is the fact that the health seeking behavior of these individuals increased by 22% with one having any form of health insurance scheme. It would be important to study on the factors influencing uptake of health insurance schemes amongst CNCD households and come up with recommendations on the possibility of the Government coming up with subsidized schemes targeting CNCDs.

More data coupled with qualitative studies on socio-demographic factors affecting CNCD household and individuals' health seeking behavior need to be analyzed .

REFERENCES

Agarwal, A. K., Sethi, A., Sareen, D., & Dhingra, S. (2011). Treatment Delay in Oral and Oropharyngeal Cancer in Our Population: The Role of Socio-Economic Factors and Health-Seeking Behaviour. *Indian Journal of Otolaryngology and Head and Neck Surgery*, *63*(2), 145–150. https://doi.org/10.1007/s12070-011-0134-9

Andersen, R. M. (1995). Revisiting the behavioral model and access to medical care: does it matter? *Journal of Health and Social Behavior*, *36*(1), 1–10. https://doi.org/10.2307/2137284

Barasa, E., Rogo, K., Mwaura, N., & Chuma, J. (2018). Kenya national hospital insurance fund

reforms: Implications and lessons for universal health coverage. *Health Systems and

Reform*, *4*(4), 346–361. https://doi.org/10.1080/23288604.2018.1513267

Begashaw, B., Tessema, F., & Gesesew, H. A. (2016). Health care seeking behavior in

Southwest Ethiopia. *PLoS ONE*, *11*(9), 1–13. https://doi.org/10.1371/journal.pone.0161014

Binte Rasul, F., Kalmus, O., Sarker, M., Ishrath Adib, H., Shahadath Hossain, M., Zabir Hasan,

M., Brenner, S., Nazneen, S., Nazmul Islam, M., & De Allegri, M. (n.d.). *Determinants of

health seeking behavior for chronic non-communicable diseases and related out-of-pocket

expenditure: results from a cross-sectional survey in northern Bangladesh*.

https://doi.org/10.1186/s41043-019-0195-z

Brief, P. (n.d.). – *An Increasing Cause Of Health Loss*.

*Curbing the Burden of Noncommunicable Diseases in Kenya Using research to raise awareness

and empower country-led Symposium on Implementation Science Harnesses Efforts to Curb

NCD Prevalence Formulating a Research Agenda that Supports Kenya ' s National NCD

Strategy*. (2021). 1–4.

Expenditure, H., & Survey, U. (2018). *Ministry of health*. *July*.

Gouda, H. N., Charlson, F., Sorsdahl, K., Ahmadzada, S., Ferrari, A. J., Erskine, H., Leung, J.,

Santamauro, D., Lund, C., Aminde, L. N., Mayosi, B. M., Kengne, A. P., Harris, M.,

Achoki, T., Wiysonge, C. S., Stein, D. J., & Whiteford, H. (2019). Burden of non-

communicable diseases in sub-Saharan Africa, 1990–2017: results from the Global Burden

of Disease Study 2017. *The Lancet Global Health*, *7*(10), e1375–e1387.

https://doi.org/10.1016/S2214-109X(19)30374-2

Ibanez-Gonzalez, D. L. (2014a). Perspectives on healthcare, chronic non-communicable disease,

and healthworlds in an urban and rural setting. *Global Health Action*, *7*(1), 1–2.

https://doi.org/10.3402/gha.v7.25317

Ibanez-Gonzalez, D. L. (2014b). Perspectives on healthcare, chronic non-communicable disease, and healthworlds in an urban and rural setting. *Global Health Action*, *7*(1). https://doi.org/10.3402/gha.v7.25317

Jankovic, J., Mirkovic, M., Jovic-Vranes, A., Santric-Milicevic, M., & Terzic-Supic, Z. (2018). Association between non-communicable disease multimorbidity and health care utilization in a middle-income country: population-based study. *Public Health*, *155*, 35–42. https://doi.org/10.1016/j.puhe.2017.11.014

Karinja, M., Pillai, G., Schlienger, R., Tanner, M., & Ogutu, B. (2019). Care-seeking dynamics among patients with diabetes mellitus and hypertension in selected rural settings in kenya. *International Journal of Environmental Research and Public Health*, *16*(11), 1–15. https://doi.org/10.3390/ijerph16112016

Kenya. Ministry of Health. (2015). Kenya National Strategy for the Prevention and control of non-communicable diseases. *Kenya National Strategy*, 1–80.

Lozano, R., Naghavi, M., Foreman, K., Lim, S., Shibuya, K., Aboyans, V., Abraham, J., Adair, T., Aggarwal, R., Ahn, S. Y., AlMazroa, M. A., Alvarado, M., Anderson, H. R., Anderson, L. M., Andrews, K. G., Atkinson, C., Baddour, L. M., Barker-Collo, S., Bartels, D. H., … Murray, C. J. L. (2012). Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: A systematic analysis for the Global Burden of Disease Study 2010. *The Lancet*, *380*(9859), 2095–2128. https://doi.org/10.1016/S0140-6736(12)61728-0

Mohamed, S. F., Mutua, M. K., Wamai, R., Wekesah, F., Haregu, T., Juma, P., Nyanjau, L., Kyobutungi, C., & Ogola, E. (2018). Prevalence, awareness, treatment and control of hypertension and their determinants: Results from a national survey in Kenya. *BMC Public Health*, *18*(Suppl 3). https://doi.org/10.1186/s12889-018-6052-y

Mwai, D. (2017). *Kenya National Health Accounts FY 2015 / 16 Republic of Kenya Ministry of Health. December 2016*. https://doi.org/10.13140/RG.2.2.20647.65448

Mwai, D., & Muriithi, M. (2016). Catastrophic health expenditure and household impoverishment: A case of prevalence of Non-Communicable Diseases in Kenya. *Epidemiology Biostatistics and Public Health*, *13*(1), 1–7. https://doi.org/10.2427/11519

Ndarukwa, P., Chimbari, M. J., & Sibanda, E. (2020). Assessment of levels of asthma control among adult patients with asthma at Chitungwiza Central Hospital, Zimbabwe. *Allergy, Asthma and Clinical Immunology*, *16*(1), 1–7. https://doi.org/10.1186/s13223-020-0405-7

Õiglane-Šlik, E. (2007). *Dissertationes Medicinae Universitatis Tartuensis 134*. https://web-proxy.io/proxy/dspace.ut.ee/bitstream/handle/10062/2632/oiglane-shlik_eve.pdf?sequence=1&isAllowed=y

Park, H. A. (2013). An introduction to logistic regression: From basic concepts to interpretation with particular attention to nursing domain. *Journal of Korean Academy of Nursing*, *43*(2), 154–164. https://doi.org/10.4040/jkan.2013.43.2.154

Rasul, F. B., Kalmus, O., Sarker, M., Adib, H. I., Hossain, M. S., Hasan, M. Z., Brenner, S., Nazneen, S., Islam, M. N., & De Allegri, M. (2019). Determinants of health seeking behavior for chronic non-communicable diseases and related out-of-pocket expenditure: Results from a cross-sectional survey in northern Bangladesh. *Journal of Health, Population and Nutrition*, *38*(1), 1–14. https://doi.org/10.1186/s41043-019-0195-z

Salari, P., Di Giorgio, L., Ilinca, S., & Chuma, J. (2019). The catastrophic and impoverishing effects of out-of-pocket healthcare payments in Kenya, 2018. *BMJ Global Health*, *4*(6), 1–13. https://doi.org/10.1136/bmjgh-2019-001809

Shaikh, B. T., & Hatcher, J. (2005). Health seeking behaviour and health service utilization in Pakistan: Challenging the policy makers. *Journal of Public Health*, *27*(1), 49–54.

https://doi.org/10.1093/pubmed/fdh207

Smit, M., Perez-guzman, P. N., Mutai, K. K., Cassidy, R., Kibachio, J., Kilonzo, N., & Hallett, T. B. (2020). *Mapping the Current and Future Noncommunicable Disease Burden in Kenya by Human Immunodeficiency Virus Status : A Modeling Study*. *71*. https://doi.org/10.1093/cid/ciz1103

Statistics, B. O. F. (2015). *KENYA STEPwise SURVEY FOR NON COMMUNICABLE DISEASES RISK FACTORS 2015 REPORT*.

Wang, Q., Brenner, S., Kalmus, O., Banda, H. T., & De Allegri, M. (2016). The economic burden of chronic non-communicable diseases in rural Malawi: An observational study. *BMC Health Services Research*, *16*(1), 1–9. https://doi.org/10.1186/s12913-016-1716-8

Wang, Q., Brenner, S., Leppert, G., Banda, T. H., Kalmus, O., & De Allegri, M. (2015). Health seeking behaviour and the related household out-of-pocket expenditure for chronic non-communicable diseases in rural Malawi. *Health Policy and Planning*, *30*(2), 242–252. https://doi.org/10.1093/heapol/czu004

Who. (2010). Global status report on noncommunicable diseases. *World Health Organization*, 176.

www.statista.com/statistics/1221721/main-causes-of-deaths-in-kenya/