HEALTH LITERACY AND DOCTOR-PATIENT COMMUNICATION AMONGHIV/AIDS PATIENTS IN HOMA BAY COUNTY, KENYA

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Health Literacy and Doctor-Patient Communication among HIV/Aids Patients in Homa Bay County, Kenya

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

Signature……. Date…….…….

Dennis Butto Amarch

This thesis has been submitted for examination with our approval as university supervisors.

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DEDICATION

This work is dedicated to all the People Living with HIV/AIDS in Kenya. Your courage and perseverance in the face of stigma and discrimination is second to none.

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ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
CASCO	County Aids and STI Control Coordinator
CHL	Communicative Health Literacy
CRHL	Critical Health Literacy
DPC	Doctor Patient Communication
GOK	Government of Kenya
HIV	Human Immunodeficiency Virus
FHL	Functional Health Literacy
HL	Health Literacy
MOH	Ministry of Health
NACC	National Aids Control Council
NACOSTI	National Commission for Science, Technology and Innovation
NGO	Non-Governmental Organization

OPERATIONAL DEFINITION OF TERMS

Doctor-Patient Communication Interpersonal communication taking place between health provider and the patient in the hospital context

Communicative Health Literacy Communicative health literacy is advanced skills that allow a person to extract health information, derive meaning from different forms of communication, and apply new information to changing health situations.

Critical Health Literacy Critical Health literacy is a more advanced skill for critically analyzing health information and using information to exert greater control over life events and situations

Doctor A health practitioner, either a medical doctor or clinical officer who serves the HIV/AIDS patients at the Comprehensive Care Centers in Homa bay. It has the same meaning as health provider in this study.

Functional Health literacy Functional health literacy is the basic level of reading and writing skills that enables someone function effectively in day to day situations within the healthcare environment.

ABSTRACT

Effective health provider-patient communication, a precursor to building a wholesome, trusting relationship, has been recognized as a vital factor in cultivating suitable self-management practices among patients with chronic infections like HIV/AIDS. However, inadequate health literacy among patients is a well-known barrier to effective doctor patient communication. Therefore, the goal of the study was to investigate the influence of health literacy on doctor patient communication amongpatients with HIV/AIDS in Homa Bay County in Kenya. Specifically, focused on the influence of, communicative, functional and critical health literacy, as well as patient demographics' moderating effect on doctor patient communication. It was a cross- sectional, hospital-based survey conducted among 362 HIV/AIDS patients receiving care at the eight sub-county hospitals of Homa Bay County. Data was collected using a self-administered structured questionnaire. Cronbach's alpha and confirmatory factoranalysis tests were used to ascertain the reliability and validity of study instruments, while the Chi-square test was used to establish the relationship between demographic factors and doctor patient communication. Logistic regression and multiple logistic analyses were used to measure the independent variables' influence on the dependent variable. In summary, 51% of the respondents were females, and the majority (30.9%)of respondents fell in the age group of 45 years and above. Gender, educational level, marital status, and illness duration were all significantly associated with doctor patient communication in this study at p values less than 0.05. The respondents' functional and communicative health literacy levels were inadequate at weighted means scores of 3.23 (SD 1.31) and 3.392 (SD1.152), respectively. Most respondents described doctor patient communication as effective (mean score 3.60, and SD 1.164). Even though functional, communicative, and critical health literacy all had a significant positive influence on doctor patient communication, the study established that critical health literacy had the greatest influence (Nagelkerke R square=0.461) followed by communicative health literacy (Nagelkerke R square= 0.408) and functional health literacy (Nagelkerke R square= 0.318) respectively. The findings of this study have placed health literacy at the center of doctor patient communication. Therefore, effort should be made to profile patients with inadequate health literacy for special consideration during hospital visits if meaningful interaction is to be achieved, especially in the context of chronic conditions like HIV/AIDS.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Patient involvement in the health care process has been documented as a critical component of successful disease management. (Van De Bovenkamp, Trappenburg, & Grit, 2010). Every patient is increasingly expected to be in control of his or her wellbeing and to be associated with choices regarding disease prevention and self-management (Urval, Ullal, Acharya, Singh, & Kamath, 2018). This is generally in acknowledgment of the moral commitment to incorporate patients completely in decision-making about their health at all care-seeking processes, and because of the growing evidence that active patient involvement has a lot of benefits (Slater, Huang, & Dalawari, 2017). Some of these advantages include enhanced patient knowledge, expanded patient endorsementof treatment decisions, reduced pressure, and improved treatment adherence and management (Vahdat, Hamzehgardeshi, Hessam, & Hamzehgardeshi, 2014).

Offering care that is respectful of and responsive to an individual patient's inclinations, needs, and values are considered one of the key components of quality care (Lindsay C.Kobayashi, Wardle, Wolf, & Von Wagner, 2016). This is especially important for a chronic condition like HIV/AIDS, which requires widespread, continuing patient self- care outside the hospital environment. Health provider patient communication is a crucial avenue for supporting patients to understand and engage in the self-managementof HIV/AIDS. Several problems can be avoided with improved communication in medical practice. For instance, 54% of patient complaints and 45% of patient concerns

are not elicited by healthcare providers during clinical visits leading to inappropriate diagnosis and lack of patient contentment (Smith et al., 2016). Psychosocial and psychiatric problems are not uncommon in general medical practice; however, these diagnoses are missed in 50% of cases. In 50% of visits, the patient and the health providerdo not agree on the main presenting problem (Slater et al., 2017). A study by

Williams,Baker, Parker, & Nurss (1998) found out that patients had been interrupted by doctors almost immediately they began describing their presenting complaint that they failed toreveal other considerable worries.

Therefore, a patient's skills in obtaining, understanding, and applying health informationcan substantially impact how they collaborate with medical staff, adhere to self- management guidelines, and overall disease outcomes. These abilities have, as of late, been named as health literacy. The Healthy People 2010 and the Institute of Medicine (IOM) have both described health literacy as "The degree to which persons acquire, process, and comprehend basic health information and services needed to make suitable health choices" (US Department of Health & Human Services, 2009). Similarly, the World Health Organization (WHO) defines health literacy as "the intellectual and social aptitudes which determine the motivation and capacity of people to gain access to, comprehend, and use information in a manner that promotes and maintains great wellbeing" (Van De Bovenkamp, Trappenburg, & Grit, 2010). These definitions, therefore, suggest that health literacy is a set of individual skills that allow the person to gain and utilize new health information. Health literacy incorporates, for instance, the ability to understand health information from pamphlets, obtain applicable health information during an interview with health experts to not only access, but also assess health information from the internet and other digital platforms (Liu et al., 2018).

Nutbeam (2009) developed a health literacy version that includes three levels: functional, communicative, and critical health literacy. Functional health literacy is the primary level of reading and writing competencies that enables a person to function effectively in everyday situations. Communicative health literacy is superior capabilities that enablesomeone to extract information, derive meaning from various forms of communication, and apply new information to dynamic circumstances. Conversely, critical health literacyis more superior capability for critically assessing information and applying it to gain better control over life circumstances.

1.1.1 The global perspective of health literacy

Previous studies showed that many adults have challenges with health literacy. For example, in the United States of America (USA), approximately 45% of the adult population had health literacy skills below satisfactory level (Van den Broucke, 2016). Although fewer studies on this topic have been conducted in Europe, a recent report on eight European Union member states indicated comparable figures whereby 47% had inadequate health literacy. In the Netherlands, 25% of the population did not have adequate health literacy (Van den Broucke, 2016).

Notably, populations in all likelihood to experience low health literacy were older adults, racial and ethnic minorities, individuals with less than a high school training, people withinadequate income, non-native speakers of English as well as people with poor health status (Smith et al., 2016). In addition, education, language, lifestyle, access to assets and age were all factors that had effects on someone's health literacy skills. Hence, health literacy consisted of numeracy skills such as calculating cholesterol, blood sugar levels, measuring medications and knowledge of nutrition labels, all of which required mathematics abilities (U.S. Department of Health and Human Services, 2014). Contrasted with those with good health literacy, patients who had limited health literacylevel experienced challenges in health and healthcare access. Too, they had a poorer understanding of their disease progression, medication regimens and techniques for dealing with their disease. Importantly, limited health literacy could also lessen the effectiveness of health services offered, thereby contributing to poorer health outcomes such as higher incidence of hospitalization and infrequent utilization of preventive services, both of which were associated with higher healthcare costs (Farmanova, Bonneville, & Bouchard, 2018).

1.1.2 Health literacy in the African context

It is important to note that studies in the health literacy field in Africa is not as widespread as in other parts of the world. However, the scanty literature available demonstrates a low degree of health literacy in developing nations, Kenya included. Shofoyeke (2014) documented that very low health literacy rates were centered mainly in three geographical regions: South Asia, West Asia and sub-Saharan Africa.

In a study conducted in Zambia to assess health literacy levels, six out of every ten respondents had low health literacy level (Schrauben & Wiebe, 2017).

Meanwhile, the individual's attributes that appeared to be related to low health literacy included female gender, young age, marriage or previously married status. Overall, the predictors of high health literacy in Africa were related to the level of education, dwelling in urban regions and financial stability (Schuster et al., 2017). Likewise, higher education level has also been associated with improved health literacy (Slater et al., 2017). However, in 3 out of ten respondents who had optimal education, low health literacy was noted (Slater et al., 2017). Of primary concern, Africans, especially in sub- Saharan region, faced a myriad of systemic and other deep-rooted barriers to accessing healthcare. For instance, language barriers adversely impacted health care information exchange; a cultural belief that considered disease as a punishment or a curse; the tendency to seek medical attention for a cure rather than prevention which was often seen as a 'Western luxury' and financial hardships (Pleasant, 2013).

1.1.3 Health literacy interventions and HIV/AIDS situation inHoma-Bay County

Worth noting here, the Kenyan government embraced the WHO's seventh Global Conference on Health Promotion goals on health literacy and health promotion. The fourth track of this meeting underscored the importance of health literacy on health behavior and general health outcome. Further, article 35 of the Kenyan constitution promulgated in the year 2010 retained the government's privilege to access all citizens' information. Additionally, through the Ministry of Health, the government has distributed key publications including strategic documents such as the communication strategy to increase knowledge on health issues. The concept of health literacy falls under the public education policy efforts, with the general goal of transferring healthcare information to those otherwise marginalized, difficult to reach and incorporates individuals living with HIV/AIDS as well as other disabilities (Bruhn & Ahlers, 2017).

According to the National Aids Control Council (2018), Homa Bay county has about 24 implementing partners fighting the HIV/AIDS pandemic. Through Community

Health strategy implementation, the partners have reached households with health information through community health workers and other community-based organizations. Other health literacy interventions in Homa Bay include creating health information dialogues and reading tents, where specialists not only blend with the community but also examine the community's prevailing health challenges. Crucially, these dialogues come up with advanced suggestions that are better suited to mitigate health challenges, thereby enhancing community participation in health-seeking behavior (MOH; National AIDS Control Council (NACC); Nairobi - Kenya, 2018).

Despite these efforts, Homa bay county still bears the greatest burden of HIV/AIDS in the Country. In 2017, the NACC estimated that about 138,921 (20.7%) persons in this county were living with HIV/AIDS, which represented 9.3% of the 1,493,383 people with HIV and AIDS in Kenya. Furthermore, AIDS-related deaths were still high in the county. For instance, according to NACC estimates of 2018, there were 420 children and1907 adults reported deaths in Homa Bay county (NACC, 2018).

HIV/AIDS, like any other chronic condition, puts a lot on emphasis on a patient's abilityto modify his or her health behavior and participate in self-management from time to time. Even though literacy in health issues has been found to have a critical bearing on patient self-management, effective doctor patient communication is equally very important (Schuster et al., 2017). Hence, different strategies have been suggested to enhance communication with patients having inadequate health literacy during hospital visits. The Agency for Healthcare Research and Quality, for example, developed a health literacy toolkit intended to improve spoken and written communication as well as tools for strengthening self-management (Cebo, 2020). Moreover, according to Erber & Erber (2017), the use of plain language, clear, concise and simple messages may assist a person with low literacy capabilities to comprehend information during interaction with healthcaregivers.

While there was an emphasis on lowering jargon and increasing the use of simple language, a patient with a chronic condition such as HIV/AIDS, cardiovascular disorders, or diabetes shall eventually come across long, unfamiliar phrases, mostly being used by healthcare experts and/or in health educational materials (Smith et al., 2013). For example, terms like CD4 cells, viral load, opportunistic infections, names ofdrugs are frequently used by health care providers, which may have impact on self-management of HIV/AIDS (Smith et al., 2014). Given this, documenting health literacylevels and how it influences doctor patient communication is fundamental in improvingself-management and general outcome in patients living with HIV/AIDS.

1.2 Statement of the problem

The HIV/AIDS prevalence in Homa Bay County has remained high at 20.7%, comparedto the national average of 4.8% (NACC, 2018). Effective health provider patient communication, which is a precursor to developing a healthy, trusting relationship, has been recognized as a significant factor in cultivating appropriate self-management practices among patients with chronic infections like HIV/AIDS (Rademakers & Heijmans, 2018). In view of that, a patient should comfortably engage in any verbal communication that seeks information, provides information, expresses concerns and asserts preferences or opinions (Dunn, 2016). In addition, communication between patients and his/her healthcare provider during a hospital visit should prompt a shared understanding of the medical problem and present a mutually agreed-upon plan of management (Reisi et al., 2016).

However, poor health literacy among patients has been found to be a major barrier to effective patient health care provider communication. Indeed, many patients were limited in their "capacity to carry out basic reading and numerical tasks required to function inside the health care environment"(Menendez et al., 2017). Consequently, patients with limited health literacy not only asked fewer questions during hospital visits but also found it difficult to understand medical terms used by their health providers. They may also experience difficulty in understanding written health information. Additionally, these patients also have problems taking their

medications as instructed and in managing chronic illnesses like HIV/AIDS (Menendez et al., 2017).

Accordingly, inadequate health literacy contributed to negative health outcomes, including increased hospitalizations, morbidity, mortality and frequent emergency department use. Likewise, limited health literacy was associated with higher readmission rates, incomplete understanding of self-management instructions and post-discharge related undesired effects (Ezemobi et al., 2017). This is especially critical at such a time when the high incidence of chronic diseases and related comorbidities place increased demand on patients to be competent in self-monitoring of their conditions outside the hospital setting, which, by and large, depend on the effectiveness of health provider patient communication.

Previous studies have found that inadequate health literacy could have a negative effect on various patient behaviors and health outcomes (Rademakers & Heijmans, 2018). These included a study by Mehzabin, Hossain, Moniruzzaman, & Sayeed (2019), carried out to establish the relationship of functional health literacy and blood sugar control among the urban diabetic population of Bangladesh, and Dunn (2016), that focused on understanding the health literacy competencies among patients with cardiovascular conditions and diabetes. However, how HIV/AIDS patients with inadequate health literacy coped with health system dynamics was not clearly understood. Apart from being a chronic disease, HIV/AIDS is also associated with a lot of stigma and discrimination, which may increase vulnerability among affected patients. This study was carried out to first determine the level of health literacy in the Kenyan context and secondly to investigate how health literacy influences interpersonal communication involving the patient and their health care provider.

1.3 Objectives of the study

The study aimed at addressing the following objectives.

1.3.1General Objective

The general objective was to determine the influence of health literacy on doctor -

patient communication among HIV/AIDS patients in Homa Bay county, Kenya.

1.3.2 Specific Objectives

1. To establish the influence of functional health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya.
2. To determine the influence of communicative health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya.
3. To establish the influence of critical health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya.
4. To assess patients' demographic factors' moderating influence on the relationshipbetween health literacy and doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya.

1.4 Research Hypothesis

1. Ho 1: There is no influence of functional health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay County, Kenya.
2. Ho 2: There is no influence of communicative health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay County, Kenya.
3. Ho 3: There is no influence of critical health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay County, Kenya.
4. Ho 4: Patients' demographic factors have no moderating influence on the relationship between health literacy and doctor-patient communication among HIV/AIDS patients in Homa Bay County, Kenya.

1.5 Significance of the study

The patient's health literacy level is a major pointer to doctor-patient interaction and overall patient management outcome. Therefore, this study is important for various stakeholders including HIV/AIDS patients, health professions, researchers and even

policymakers.

1.5.1 HIV/AIDS patients

The study established the level of health literacy among HIV/AIDS patients and found out how health literacy influenced the doctor's-patient communication, an important care concept, especially in HIV/AIDS. This discovery would positively affect the healthcare provider's skills to profile and give special considerations to patients with inadequatehealth literacy.

1.5.2 Health profession

Since this study allowed patients to appraise the communication process with their careproviders, health providers would benefit from knowing what the patients think of the communication process to improve their skills.

1.5.3 Policymakers

Additionally, the findings of this study provide meaningful information to policymakers for evidence-based decision making and in designing of health messages as well as effective communication methods meant for patients with different health literacy levels.

1.5.4 Scholars and academicians

This study offered a good insight into the important field of health literacy, which will benefit researchers with interest in this area.

1.6 Scope of the study

1.6.1Geographical scope

This study was based in Homa Bay, one of the 47 counties in Kenya. The county bordersKisumu and Siaya counties towards the North, Kisii and Nyamira to the East, Migori county towards the South and Lake Victoria and the Republic of Uganda towards the West. Administratively, the county is split into eight sub-counties of

Homa Bay town, Mbita, Ndhiwa, Rangwe, Karachuonyo, Kasipul, Kabondo, and Suba (KNBS, 2017). Homa Bay county has a total population of 1,149,024 of which 553,411 (48%) male, 595,583 (52%) female, 533,114 (46%) children below 15 years and 235,957 (21%) youths aged 15-24 years KNBS (Population Projections, 2017). The county currently has the highest number of people who have HIV/AIDS in Kenya. Although the Kenya epidemic is geographically diverse, Homa Bay county is disproportionately affected, with the highest HIV/AIDS prevalence of 26% compared to the national prevalence of 5.9% (AVERT, 2016). In 2015, for example, Homa Bay County had 15.1% and 13.6% of all new HIV infections in Kenya among children and adults, respectively.

1.6.2 Theoretical scope

The study was majorly informed by three theories; social penetration theory, planned behavior theory, and socioecological model.

1.6.3 Methodological scope

The study utilized a cross-sectional, quantitative survey design to collect information regarding health literacy levels and perception of doctor-patient communication qualityfrom people living with HIV/AIDS in Homa Bay county.

1.7 Limitations of the study

In collecting data for this study, a written questionnaire was administered to respondents to fill in at their convenience. It is possible that some respondents received assistance incompleting the questionnaire. Secondly, illness duration could be an aspect that might have influenced health literacy levels and the perception of doctor-patient communication found in this study. Most of respondents had lived with HIV/AIDS for quite a long time, which may have influenced the study results. Additionally, it is conceivable that we overrated the degree of health literacy among the respondents because of the nature of the data collection, as individuals with very low levels of healthliteracy may not have taken part in a study that utilized a written questionnaire. Lastly, the information was gotten utilizing a cross-sectional study

design, and as such, it onlyprovided an association but not causal relationships

1.8 Delimitations of the study

The research assistants were well trained in administering and explaining the study consent, including the benefits of the study to the respondents. This made the study participants to provide accurate information since they understood the significance of participating in the study. Additionally, the research team were available to the participants to clarify any issues that arose from any aspect of the study. This also ensured that all the questionnaires distributed were returned for analysis.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of existing academic works related to health literacy and doctor-patient communication. It also presents the theories informing this study and the conceptual framework. Additionally, this study's main variables, which were the three dimensions of health literacy, patients' demographic elements and doctor-patient communication, were extensively reviewed. A critique of existing and relevant empirical literature was done, and research gaps were identified.

2.2 Theoretical framework

This section outlines the theories and models used to establish the theoretical basis of this study. A theory is a set of principles or constructs and interrelations, which are assumed to exist among them and contain generalizations and hypothesized principles that can be logically tested (Dauphiné, 2017). Therefore, theories can be used as analytical instruments to understand, clarify and make predictions about a given topic. Essentially, they form the base on which a study is founded by providing prior expectations (Dauphiné, 2017). For that reason, this study was informed by three theories; social penetration theory, theory of planned behavior, and the socioecological model.

2.2.1 Social penetration theory

Psychologists Irwin Altman and Dalmas Taylor (1966) developed the social penetration theory (SPT) to appreciate relationships among people. The authors suggested that relationships involved various degrees of social penetration. The theory proposes that, as relationships grow, communication between two individuals moves from relatively shallow, non-intimate tiers to deeper, greater intimate ones (Taylor & Altman, 1966).

Further, the theory states that relationship growth happens mainly through intentionally disclosing non-public information such as personal motives or desires, emotions and experiences to a third party. This theory was likewise guided by the assumption that relationship growth was systematic and predictable. By way of self-disclosure, relationship growth follows a unique trajectory, starting from superficial layers of interactions to more intimate levels (Erber & Erber, 2017). Hence, self-disclosure is one of the most important factors in bringing a relationship to a greater level of intimacy. In health provider patient interaction, the trust that a patient puts on the doctor permits him/her to disclose even some disease history features in the hidden domain.

The social penetration theory is primarily based on 4 (four) main assumptions. First, relationship development progress from superficial layers to more intimate ones. For instance, on a first encounter, individuals tend to show their outer images only, discussing general issues like hobbies. This is quite crucial given that in the medical interaction, the time taken is always very short, and patients often meet different health providers during each visit. Secondly, interpersonal relationships broaden in a generally systematic and predictable way. Thirdly, relationship progress may flow backward, leading to de-penetration and dissolution. Fourthly, self-disclosure is what drives relationship growth (Erber & Erber, 2017).

Therefore, the significance of social penetration theory is in the area of interpersonal communication, like health provider patient communication being investigated in this study. For that reason, developing a socially penetrative relationship between a patient and a health provider is critical to the patients (Erber & Erber, 2017). Too, health providers may find this theory useful during their daily engagement with patients during consultations and instructions. Since this study had the outcome variable as doctor- patient communication and considering that HIV/AIDS patients may require to visit the doctor's office for a long period, the social penetration theory was important in understanding this interaction.

2.2.2 Theory of Planned Behavior

The theory of planned behavior is the modified version of the theory of reasoned action by Ajzen & Fishbein (1980), in which the additional variable of 'perceived behavioral control' has been included. The theory of reasoned action initially suggested that any mediation attempting to change conduct ought to focus on beliefs, as these influenced attitudes and expectations in turn, impacting intentions as well as behaviors. It was subsequently observed that behaviors aren't under 'volitional control,' and the model was reviewed and expanded to include 'perceived behavior control' (Branscum & Qualls Fay, 2019). Hence, the theory of reasoned action was revised and renamed planned behavior(Ajzen, 1991). Likewise, the theory of planned behavior follows a similar hypothesis asthe theory of reasoned action with 'behavioral control' as a determinant of behavioral aimand change.

Overall, the theory of planned behavior posits that the closest determinant of behavior aims to accomplish or not accomplish that behavior (Manzoor, Ali, Khokhar, Hussain, & Sulleman, 2018). Thus, the theory's principal determinant of behavior depends on the individual's intention to perform that behavior. Subsequently, three elements determine intention: the first one being the attitude to the behavior with balancing the pros and cons of performing the behavior or the risks and rewards they associate with that choice. Thesecond is the subjective norm, which focuses on social pressure from significant others, for example, peers, media, or family and lastly, perceived behavioral control for example, the perception that a person has about their ability to perform the behavior.

The applicability of this theory in communication behavior during medical encounters has been assessed in several reviews, for example by Costello (2016), who investigated the relationship between intentions and behavior. During provider patient communication, the health provider's intentions to provide patients with information were related to their attitudes and in combination with self-efficacy and their behavior (Costello, 2016).

2.2.3 Socioecological model

The social-ecological model is a staggered approach, including individual elements, genetic, constitutional factors, social factors and financial status (Cerin, Leslie, & Owen, 2009). The various dimensions of the impact of the social-ecological model incorporates an intrapersonal level, including the attributes that influence behavior; the interpersonal level involving associations with family, friends, peers and the community level. It alsoinvolves institutional variables like rules and guidelines.

Therefore, health provider patient communication may result from the interaction of health literacy, health system, the educational framework, culture and society (Chung, 2013). The socioecological model can fit into a conceptual model for the development of health literacy described by Lesgold and Welch-Ross (2012), which incorporates thelearner, their knowledge, education, language foundation; the learning environment, likeculture and experience; the instructional methodology, tools and the literacy activity.

Principally, Health literacy is defined in terms of reading abilities, numeracy, navigating the health system and communicating with healthcare experts. Therefore, Health literacy can be made of individual, social and environmental attributes mediated via schooling, sub-culture as well as language (Nielsen-Bohlman et al., 2004). The socioecological model can offer a better knowledge of how information is obtained and applied at different levels of health literacy. This is necessary for designing effective instructionalstrategies in the health system. '*Teach to Goal'* is an example of an intervention developed to build health literacy abilities by staging and conveying small sections of educational material over time to patients with heart failure (Farkas, Sedlar, & Lainscak,2018).

2.3 Conceptual framework

A conceptual framework is a tool that attempts to connect all aspects of research inquiry from the problem statement, the rationale of the study, the literature review, the methodology up to the analysis of data and presentation (Huyler & McGill, 2019). The conceptual framework presents three independent variables for the study:

functional, communicative, critical health literacy, one moderating variable (patient demographic factors) and one dependent variable, doctor-patient communication. Therefore, the patients' levels of health literacy, moderated by the demographic factors, including age, gender, marital status, education levels and illness duration influence the effectiveness of interaction between the health provider and his or her patient.

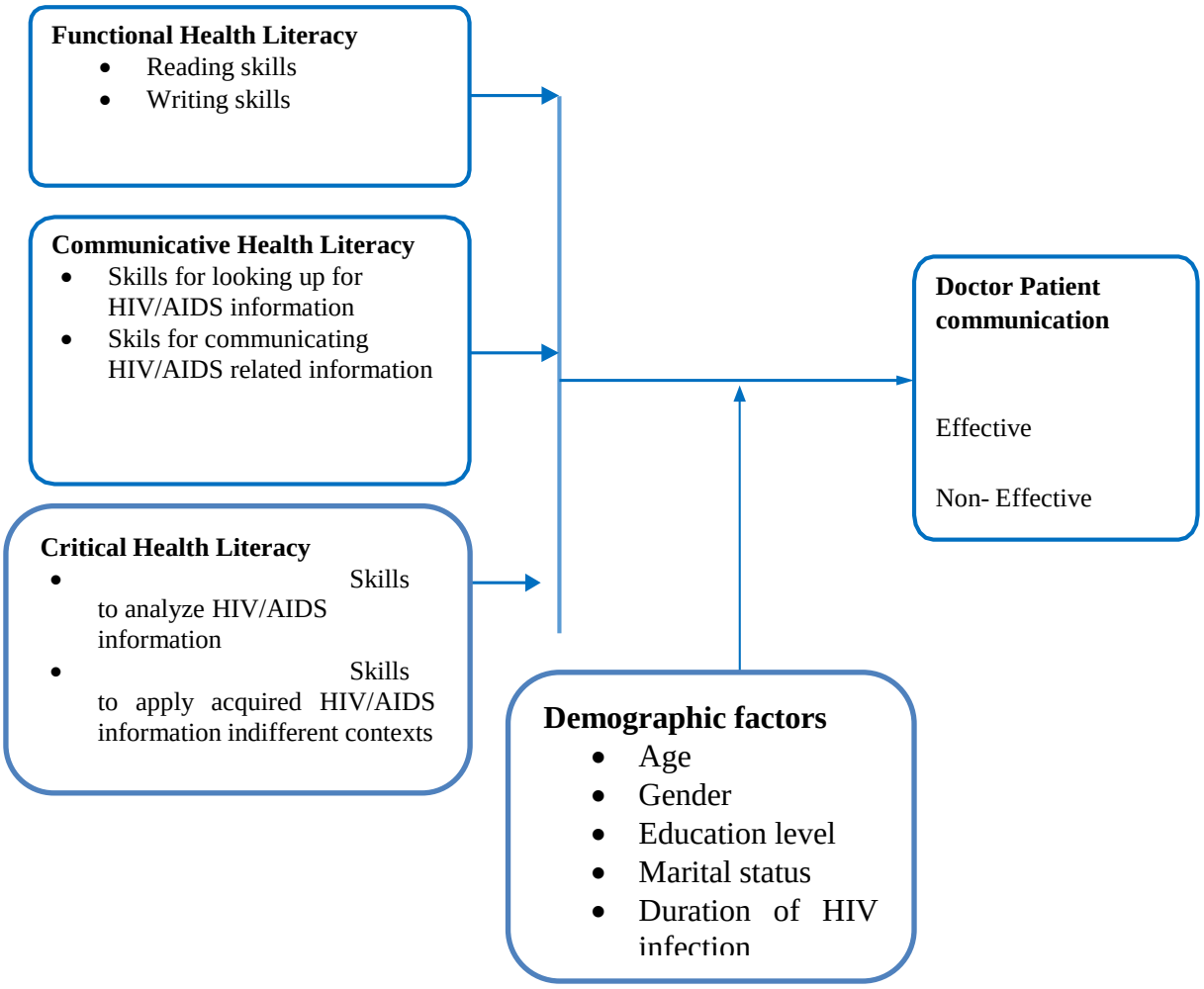

Figure 2:1: Conceptual Framework

2.3.1 Functional Health Literacy

Fundamentally, literacy is acquired through the process of learning to read and write.

Then again, functional literacy is characterized by the reading and writing abilities as well as the information that empower a person to be involved in the specific activities ofthe area that requires this contribution (Horning, 2019). Hence, applying this idea to the field of health, functional health literacy can be depicted as the cognitive capacity to comprehend, interpret and apply written or oral health information. Thus, someone witha great literacy level would have a better health condition than one with a limited literacylevel, who would be less cognizant of the significance of preventive practices for instance, or problems in understanding guidelines on medication (Rademakers & Heijmans, 2018). Therefore, this has placed functional health literacy at the center of interest among researchers, health experts and public policy-consultants involved in health promotion as several studies have given evidence of people's low functional healthliteracy (Paasche-Orlow & Wolf, 2016). Although the exact level of health literacy is not known in our set up, it's expected to be low going by studies from other regions. Forinstance, in the North American population, 9 out of every 10 adults lacked requisite competency to manage their health and prevent diseases (Disler, Glenister, & Wright, 2020). Previous studies have shown that in the United Kingdom, the United States of America, Australia, and Canada, 20% to 50% of the population had low functional healthliteracy, which can have negative effects on an individual's health status (Bradley, 2013;Ishikawa, Yano, 2008).

Over the past decade, scholars have come up with various tools to measure health literacy. The Rapid Estimate of Adult Literacy in Medicine (REALM) and the Test of Functional Health Literacy in Adults (TOFHLA) are the most widely recognized and approved measures of functional health literacy (Nutbeam, 2015). The REALM tests word recognition, while the TOFHLA tests how well a person can interpret what is read and the meaning of numbers presented to them (Rademakers & Heijmans, 2018). A briefversion of the TOFHLA, the S-TOFHLA that contains fewer questions, simpler to administer compares well to the TOFHLA in its consistency. It utilizes an adjusted Cloze methodology where an individual reads a health-related passage in which every 5^{th} to 7^{th} word is omitted and the right word is selected (Liu et al., 2018). The other tool known as 'the Newest Vital Sign' is a general evaluation of health literacy which lasts only three minutes, is easy to apply, and is comparable to more comprehensive evaluations of health literacy like REALM and the S-TOFHLA.

However, it is not always related with healthoutcomes (Mehzabin et al., 2019).

Ishikawa et al. (2008) advanced a self-reported health literacy scale, which is in line with Nutbeam's version. Unlike other health literacy measurement tools, this scale, which measures all three levels, seems to be a promising tool for estimating the full range of health literacy. The functional, communicative and critical health literacy scales are not complicated, were easy to apply and have been validated for use as a screening tool in research settings (Lai, Ishikawa, Kiuchi, Mooppil, & Griva, 2013).

2.3.2 Communicative Health Literacy

Communicative or interactive health literacy is an advanced ability that allows the patient to extract health information, derive meaning from various types of communication and make use of the new information in different situations in the healthcare framework (Nutbean, 2009). As a result, communicative health literacy increases a person's capacity to ask questions and recognize one's very own information gaps. Thus, an individual with poor communicative literacy may encounter difficulties explaining health problems or discussing them with health experts. On the other hand, a person having adequate interactive health literacy abilities can communicate his/her health issue without any difficulty and discuss it, asking questions to gain more understanding (Mehzabin et al., 2019).

Alternatively, someone with communicative health literacy issues might also have less experience in the healthcare environment. To such a person, most of the things are newand to be discovered. Since, they perceive interaction with medical experts as hierarchical and unequal, they might be hesitant to ask questions since they would prefer not to "waste health workers time." and may quickly forget the information discussed inthe discussion when stressed and mentally blocked (Griffey et al., 2016).

Communicative health literacy entails elevated levels of communicative and social abilities needed to extract and discuss information with others. Hence, patients with high abilities exhibit confidence to act freely on recommendations and relate successfully with the health care system and professionals (Reisi et al., 2016). Consequently, sufficient communicative health literacy is crucial for self-

management of chronic conditions like HIV/AIDS since it has been positively associated with patients' ability to take medicines, participate in decisions about treatment and plan for follow-up togetherwith their doctors (Slater et al., 2017).

2.3.3 Critical Health Literacy

Nutbean (2009) described critical health literacy as very advanced cognitive abilities that, in combination with social skills, could be utilized to examine information critically,utilize this data to oversee life events and circumstances.Taken in a real sense, the 'basic' part of basic wellbeing proficiency might be depicted as a more elevated level mental ability (Schillinger et al., 2002). Assuming wellbeing proficiency is the capacity to get to, fathom, evaluate and apply wellbeing data, then, at that point, basic wellbeing education is a higher-request process that might be made through preparing to basically survey the data of importance to wellbeing (Geboers, 2017).

Critical health literacy has additionally been defined as empowerment in which being critically health literate could infer going about personally or in a gathering to further develop wellbeing through the political system or social activism (Liu et al., 2018). Very much like wellbeing proficiency might be depicted as 'new wine into old jugs' of strengthening so basic wellbeing education, with its emphasis on local area ability to make a move on friendly and monetary determinants of wellbeing, is a basic component for local area improvement (Rademakers and Heijmans, 2018).Taking basic wellbeing education starting here of view and getting from Freire, basic wellbeing proficiency is, similar to local area development, an interaction where in individuals become illuminated on issues, partake in the significant discourse, and check out decision making for their wellbeing (Herndon, Chaney, and Carden, 2011).

Even though the seventh Global Conference on Health Promotion recognized improving health literacy as a method for fostering community engagement and empowerment, critical health literacy may be considered to be the neglected area of wellbeing proficiency, scarcely getting any concentration or commitment which can fundamentally contribute towards this result. Certain individuals’ fight that negligible thought given to the mental develops in the meaning of basic wellbeing

education might prompt wellbeing proficiency taking a fairly mental concentration and that wellbeing results are substantially more liable to be accomplished while the division among information and mental builds become less articulated (Kripalani, Jacobson, and Mugalla, 2012). Basic wellbeing proficiency might give an opportunity to beat the above challenge. The shortfall of thought the idea has been given may be a direct result of an absence of applied models and systems researching basic wellbeing education (Persell, Osborn, Richard, Skripkauskas, and Wolf,2007). Then again, it very well may be the eventual outcome of troubles and disarray in getting what precisely strengthening based abilities incorporate and in what the future held be improved (Sim, Yuan, and Yun, 2016). While such disarray might exist, this idea's part in further developing wellbeing results can't be neglected.

2.3.4 Moderating effects of demographic factors on doctor-patient communication

Social determinants of health, which include, among others, levels of education and income, together with age, gender as well as marital status were essential elements of the activity intend to make a superior wellbeing educated custom (Omary, 2020). While instructive factors, for example, language hindrances and openness can affect somebody's ability to appreciate the wellbeing messages being given to them, monetary variables might affect their capacity to apply the data (Nutbeam, 2009).

Accordingly, prior know-how, for example, an individual's disposition and information prior to perusing wellbeing related materials or addressing a medical services master, might be made out of jargon (perceiving the significance of individual words) and reasonable information (getting parts of the world, for example, how bits of the bodywork for sure threat is and the way that it is unsafe to the body (Saunders, Palesy, and Lewis, 2018). Jargon is not the same as understanding familiarity, despite the fact that the two are very related, since individuals aggregate a lot of their jargon by perusing. Despite the fact that the more extensive meanings of wellbeing proficiency in like manner consider applied information as a feature of wellbeing education, calculated information may likewise be seen as an asset that an individual has that helps wellbeing proficiency however doesn't in itself comprise wellbeing education (Liu et al., 2018).

Crucially, reading fluency enables a person to extend one's vocabulary and also acquire conceptual knowledge. Therefore, vocabulary and background information on the general topics canvassed in composed materials can work on an individual's information on these materials. Thusly, it is more straightforward to peruse and comprehend materials that have recognizable jargon as well as ideas. Subsequently, two individuals with equivalent general perusing familiarity might have shifting abilities to peruse and grasp wellbeing related data due to differentiating gauge information on wellbeing jargon and ideas as indicated by Lindsay Clare Kobayashi, (2016).

Health literacy amongst cultural and ethnic groups can vary and often healthcare delivery is not in every case socially and semantically touchy to patients whose general and wellbeing education might be lacking. Accordingly, this presents various provokes for such assorted networks to grasp and deal with their sickness conditions (Reisi et al., 2016). Past the difficulties of specialized language, patients with a social foundation unique in relation to that of the medical services proficient can convey into the correspondence cycle their own convictions on the body or wellbeing, which might go against the medical care master (Baker, 2016). For example, a few patients might relate a disease interaction to different causes and search for alleviation from elective sources other than clinical science, making correspondence about their wellbeing testing (Ezemobi et al., 2017). Furthermore, the distinction and power displayed by the wellbeing supplier could likewise deter patients from suggesting conversation starters that might be valuable in clearing up mistaken assumptions, hence allow an opportunity to pose extra inquiries since these patients might feel humiliated of their little comprehension of their illness condition or their deficient correspondence limit (Horning, 2019).

2.3.5 Health Provider-Patient communication

In the past three decades, the bio-psychosocial ideal of health has become progressively critical in the powerful arrangement of wellbeing administrations. Fundamental to this model is the weight on regarding the patient in general substance, including the natural, mental, conduct and social elements in their

wellbeing (Sim et al., 2016). Fundamental parts of the wellbeing expert patient commitment comprise of spoken and non-spoken correspondence, effective addressing and passing of data, explanation of compassion and concern, organization and shared navigation (Vaughn, 2017).

The human communication process's early concept was majorly based on the "sender- receiver" model (Planer & Godfrey-Smith, 2020). This generally used theory conceptualized correspondence between people as including a shipper, a channel and a beneficiary. As utilized inside the medical services climate, the shipper beneficiary model caused an overall assumption that a medical care expert "sends" data to a patient during an emergency clinic visit. It was expected that the patient had grasped or received the messages passed on which probably won't be valid in all circumstances. Deterrent emerging from the "channel" all through up close and personal verbal correspondence may now and then misshape messages even without the source or beneficiary's mindfulness. As George Bernard Shaw noticed, "the absolute most genuine test with correspondence is the dream that it has happened" (Sharon, 2012). Correspondence between a medical care supplier and his/her patient during a clinical experience is one region where this deception isn't unprecedented ((DeVoe, Wallace, and Fryer Jr, 2009).

Patient adherence, which is the level to which patients adhere to the guidelines given by their medical care suppliers is a striking proportion of the result of the course of medical care. As seen across a few infection conditions, inability to follow avoidance and sickness the executives exercises, which might incorporate meds, arrangements, screening, work out, diet, midpoints 25% of patients. In a few ailments or emergency clinic settings, adherence can be pretty much as low as 50% (Schuster et al., 2017). The WHO proposes that adherence is impacted generally by unfortunate supplier patient connections (Paasche-Orlow and Wolf, 2016).

The connection between patient adherence and specialist patient correspondence has been noted in hypothetical and survey writing that found that specialist patient correspondence was basic in improving adherence through different systems. Powerful correspondence adds to patients' appreciation of sickness and the benefits

and weaknesses of therapy (Vaughn, 2017). Great supplier patient correspondence likewise improves support, sympathy, understanding, shared navigation, and patient-centered collaboration (Schuster et al., 2017).

Successful health supplier patient correspondence is likewise a basic clinical capacity. The resulting verbal and non-verbal trade is the heart, specialty of medication and a critical component in conveying clinical benefits. The essential goals of current wellbeing supplier patient verbal trade are fostering an enduring relational relationship, empowering the smooth trade of data, as well as guaranteeing that patients are completely associated with direction (Begum, 2015). A reasonable specialist patient commitment is affected to a great extent by how the specialist acts while taking care of the patient, which those patients see as a significant marker of their wellbeing supplier's overall ability (Paasche-Orlow and Wolf, 2016). In this way, compelling wellbeing supplier patient commitment might possibly be helpful in directing patients' feelings, empower a superior comprehension of clinical data and take into consideration more noteworthy acknowledgment of patients' discernments and wants.

2.4 Empirical literature reviews relevant to the study

Health literacy has been used in the health literature for at least 30 years (Ad Hoc Committee on Health Literacy, 1999). In many contexts, the term is used to describe and give details on the relationship between patient health literacy levels as well as their ability to comply with prescribed therapeutic regimens (Slater et al., 2017). This approach assumes that ‘adequate health literacy means applying literacy skills to health-related materials such as prescriptions, appointment cards, medicine labels, and instructions for home health care’(Kaphingst et al., 2014). Subsequently, research-based on this definition has shown, for example, that poor functional health literacy posed a major barrier to educating patients with chronic diseases (Mehzabin et al., 2019) and may represent a major cost burden to the health care through inappropriate use of medicines (Dunn, 2016).

In a hospital-based cross-sectional study that looked at health literacy in relation to cancer treatment, Paasche-Orlow & Wolf, (2016) noted that 'health literacy was context-specific and that it was likely that many individuals at all literacy levels lacked a clear understanding of cancer control guidelines and screening

recommendations. The study further concluded that individuals who had for example been screened for cancer might lack a basic understanding of test results. Likewise, cancer patients may not have adequate knowledge of treatment recommendations and self-management options.

Further, it failed to get a correlation between literacy and health literacy. Therefore, an individual's health literacy may be worse than his or her general literacy (Ad Hoc Committee on Health Literacy, 1999).

According to Geboers (2017), people with inadequate health literacy often lack the ability to read well, knowledge about the body, it's functioning and the nature and causes of different types of disease conditions. This compromises their ability to manage their disease (Paasche-Orlow & Wolf, 2016). Beyond reading, other communication skills, and knowledge of relevant health topics, making sense of health information as well as the healthcare system also requires numerical skills, such as disease risk or the normal range of values such as blood pressure or cholesterol (Griffey et al., 2016).

Compared with those with adequate health literacy, patients with limited health literacy experienced disparities in health and access to healthcare (Pelikan et al., 2017), had poorer knowledge about their disease processes (Kaphingst et al., 2014; Pignone, 2004), medication regimens (Parekh et al., 2018; Urval et al., 2018) and strategies for managing their disease (Mehzabin et al., 2019). Nonetheless, limited health literacy is relatively common among patients suffering from chronic diseases like HIV/AIDS, diabetes, and other cardiovascular conditions (Begum, 2015). This reduces the effectiveness of offered health services, thereby contributing to poorer disease outcomes (Kaphingst et al., 2014). The above finding was further supported by a study

by Lee (2018) conducted among people living with HIV/AIDS. The study found that 'HIV-infected people with lower health literacy had lower CD4 cell counts, higher viral loads, were less likely to be taking antiretroviral medications, reported a greater number of hospitalizations and had poorer health than those with higher health literacy'.

Regarding the three domains of health literacy, a study by Reisi et al. (2016), communicative health literacy showed the strongest correlations with all outcome measures, followed by critical health literacy. Functional health literacy contributed to abetter way to cope with the consequences of a chronic illness, more knowledge and more confidence during consultations with professionals, but not to more active involvement in treatment or better recognition and management of symptoms. Additionally, Passamai, Sampaio, Iorio Dias, & Cabra (2012) found out that critical health literacy significantly contributed to perceived knowledge, an active role in treatment, general self-management and confidence in medical consultations.

In a study by Sim et al. (2016) that focused on self-management activities outside the consultation room, they found out that critical health literacy was strongly related to activities dependent on individual capacities than to activities that were a shared responsibility of patient and professional. They operationalized critical health literacy ashigher-order cognitive skills in a medical context. In another paper, Sykes & Wills (2018) reported critical health literacy as a broader concept than just higher-order cognitive skills in the context of acquiring and using health information. According to Sykes, critical health literacy includes advanced personal, social skills, (health) knowledge, information skills, effective interaction between service providers and users,informed not only decision making but also empowerment, including political actions. In that way, Sykes' broad definition may better fit the reality of daily living with a chronicdisease like HIV/AIDS.

Significantly, research has shown that low health literacy was associated with low self- efficacy and less interaction in physician-patient encounters, which, combined with physicians' use of complex medical language, may contribute to poor physician-patient communication (Vaughn, 2017). There is ample evidence to support that patient– provider communication was a key attribute in measuring patient preferences and satisfaction with the delivery of healthcare services (DeVoe, Wallace, & Fryer, 2009).

In a hospital conducted cross-sectional study on the association between health literacy and physician-patient communication quality among medical patients,

Kripalani et al. (2010) used the 27-item Interpersonal Processes of Care in Diverse Populations Questionnaire (IPC) to rate the clarity and quality of physicians' communication during the hospitalization. This was along with the eight domains of general clarity, responsiveness to patient concerns, explanation of patients' problems, explanation of processes of care, explanation of self-care after discharge, empowerment, decision making, and consideration of patients' desire and ability to comply with recommendations. The study found out that health providers received poor in almost all the eight areas with the worst ratings on their consideration of patients' desire and ability to comply with recommendations. Similarly, patients with inadequate health literacy experienced lower quality and clarity of hospital communication along with multiple domains. The study concluded that more attention to effective health communication was warranted in the hospital.

Another study by Parekh et al. (2018) established that patients have difficulty understanding written health materials, medical terminology and other provider-patient communication aspects. Such communication challenges can be magnified during initial contact between the provider and patients or at transitions of care like hospital discharge. The study concluded that patients often received a large amount of information in a short period at discharge, which may be delivered in a way that was not straightforward or standardized. When asked, patients reported a poor understanding of important self-care instructions, such as how to take medications upon returning home.

One study even showed that more than half of the patients did not recall anyone providing instructions about how they should take care for themselves after hospitalization (Geboers, 2017) . As a result, poor medication management after hospital discharge contributed to adverse events, inadequate disease control and in the setting of cardiovascular disease, higher mortality (Slater et al., 2017). Thus, most adverse events after hospital discharge could be prevented through relatively simple means that included better communication among patients and providers (Kaphingst et al., 2014). Greater attention to communication and care transitions could also reduce the number of unplanned re-admissions.

2.5 Critique of existing literature relevant to the study

Significantly, research on health literacy has been on the rise in the past few decades, which has seen multiple and partially conflicting definitions of health literacy being fronted by various scholars. The most cited definition to date is the definition proposed in the Institute of Medicine's initial report on health literacy as well as Healthy People 2010 and 2020 initiatives in the USA, that define health literacy as "the degree to which individuals can obtain, process and understand basic health information as well as services needed to make appropriate health decisions (Brach & Harris, 2021; U.S. Department of Health and Human Services, 2000). This widely used definition limits health literacy to just a "patients' ability" and thus reflects their mission and explicitly emphasizes clinical settings over public health or other contexts. It also does not take care of the third dimension of health literacy; the critical health literacy, which Nutbeam (2019) describes as more advanced cognitive skills which, together with social skills, can be applied to analyze information critically use this information to exert greater control over life events and situations not limited to the hospital environment.

In line with the aforementioned, Ishikawa et al. (2008) developed a self-reported health literacy scale in line with Nutbeam's model. Unlike existing health literacy instruments based on the above definition, this scale, which measured all three levels, is a promisingtool for measuring the full spectrum of health literacy. The functional, communicative and critical health literacy scales are not only simple, easy to use but also have been validated for use as a screening tool in research settings (Lai, Ishikawa, Kiuchi, Mooppil,& Griva, 2013).

As hitherto mentioned, the study by Geboers (2017) that investigated the role of healthliteracy in self-management and health behaviors among older adults found out people with inadequate health literacy often lack not only the ability to read well but also the knowledge about the body, it's functioning and the nature and causes of different types of disease conditions. The study findings were similar to that of Griffey et al. (2016) that further concluded that beyond reading and other communication skills, as well as knowledge of relevant health topics, making sense

of health information and the healthcare system also requires numerical skills, such as disease risk or the normal rangeof values such as blood pressure or cholesterol. In all the aforementioned studies, like much research conducted in health literacy, the focus has been predominantly on functional literacy, ignoring communicative and critical dimensions. Critical health literacy has also been described as empowerment where being critically health literate might mean acting individually or collectively to improve health through the political system or membership of social movements (Liu et al., 2018). This is through a processin which citizens become aware of issues, participate in critical dialogue and become involved in decision making for health (Herndon et al., 2011), which is mainly importantespecially in chronic conditions like HIV/AIDS.

Nonetheless, research in health literacy in Africa is not as widespread as in other parts of the world. However, one common thing in the few studies from Africa reviewed have all reported very low health literacy levels. In line with that, Shofoyeke (2014) documented that extremely low health literacy rates were focused mainly on three regions of South Asia, West Asia, and sub-Saharan Africa. Similarly, another study conducted in Zambia to assess health literacy in developing countries found out that 6 out of 10 respondents had low health literacy level (Schrauben & Wiebe, 2017). For that reason, it would be very important to conduct further inquiry into this topic in the Africancontext.

In their study on the relationship between health literacy and screening for chronic diseases in African communities in the district of Columbia Metropolitan area, Ezemobi et al. (2017), this cross-sectional study focusing on hypertension and diabetes reported a significant association between health literacy and the uptake of screening services. Other studies focused on cardiovascular diseases, diabetes and cancer (Mehzabin et al.,2019; Parekh et al., 2018; Urval et al., 2018). However, very few studies have been conducted among patients living with HIV/AIDS, most probably because HIV/AIDS was not a major public health problem in Europe where the bulk of health literacy studieshave been conducted.

2.6 Knowledge and research gaps

Despite significant previous studies on health literature, obvious gaps in knowledge suchas the lack of basic understanding of how the three dimensions of health literacy influence communication between the health provider and the patient exist. Moreover, previous health literacy studies have mainly focused on functional health literacy, ignoring communicative and critical aspects that are important, especially among patients dealing with chronic conditions. Too, the bulk of these studies have also been conducted outside the African context thus have validity concerns as it is difficult to generalize and/or apply the current findings to African settings. Additionally, there is a gap in understanding how HIV/AIDS patients with limited health literacy cope with health system dynamics as previous studies have mainly focused on cardiovascular disease, cancer, and diabetes.

2.7 Summary

The chapter reviewed the literature examining the theories that are relevant to this study. The theories were evaluated to demonstrate relevance to the study variables. Specifically, the reviewed theories included the social penetration theory, planned behavior theory, and the socioecological model. The chapter also discussed the independent variables, namely functional, communicative, and critical health literacy domains, in addition to the patients' demographic factors, which were the moderating variable of this study. Health provider patient communication, the study dependent variable, was also discussed in detail. The chapter also reviewed and critiqued previous relevant research that has been done. It is from the critique that the knowledge and research gaps were identified.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the methods used in the study, including design, population, sample size, sampling techniques and procedure, data collection methods, data collectioninstruments, pre-testing, data collection procedure, data analysis as well as measurementof variables.

3.2 Research design

Research designs are procedures and plans that facilitate a researcher's decision-making process to deal with assumptions and develop tangible solutions to the research problem (Huyler & McGill, 2019). This study utilized a cross-sectional, quantitative survey design to determine the influence of health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay county. The cross-sectional design is the mostappropriate to studies aimed at finding out the prevalence of a phenomenon, situation, problem, attitude, or issue, by taking a "snap shot" or cross-section of the population (Huyler & McGill, 2019).

3.3 Target population

The target population is the entire list of items or individuals from which the researcher wishes to generalize the study findings (Kothari, 2013). As a rule, the target population has differing qualities and it is otherwise called the hypothetical population. In this study,HIV/AIDS patients in Kenya were the target population. On the other hand, the study population is a subset of the target population to which the scientists can apply their conclusions. The NACC (2018) estimated that there were about 138,921 HIV/AIDS patients in Homa Bay county. Hence, this study targeted these people living with HIV/AIDS within Homa Bay county.

3.4 Sampling frame

As indicated by Kothari (2013), a sampling frame is a list of all individuals in the population from which a representative sample is drawn for research purposes. Accordingly, the sampling frame of the study was the register of the 16,625 HIV/AIDSpatients enrolled for care at the Comprehensive Care Centers (CCC) of the eight (8) hospitals in Homa Bay county namely; Homa Bay county referral hospital, Mbita sub- county hospital, Ndhiwa sub-county hospital, Rangwe sub-county hospital, Karachuonyo sub-county hospital, Kasipul sub-county hospital, Kabondo sub-county hospital and Suba sub-county hospital.

3.5 Sample size and sampling technique

3.5.1 Sample size

A sample is a skillfully chosen sub-group that illustrates the population on which inference about the total is made (Huyler & McGill, 2019). Therefore, sampling helps researchers to reduce costs, gives more accuracy, adaptability and speed (Kothari, 2013). An ideal sample size ought to be able to satisfy the prerequisites of effectiveness, representativeness, unwavering quality and adaptability. In this study, the sample size was determined according to Cochran (1977) formulae designed for large populations.

According to Cochran: n = [(Z/2. δ) /(E)] 2

where **n** is the sample size, **E** is the margin error, **Z** is the critical value from the **Z** distribution, **δ** is the population standard deviation. A simpler version of Cochran's equation as presented by Smith (2013) is: Sample Size = (Z-score) ^{2} – Std Dev*(1StdDev) / (margin of error) ^{2}.

In this study, confidence levels of 95%, which usually correspond to a Z-score of 1.96, were used, the standard deviation chosen as 0.5 and the margin of error of +/- 0.05 was used.

Hence, the sample size = (1.96) ^{2} x .5(.5)) / (.05) ^{2} = **384.16**. Therefore, a total of **384**

respondents were required for this study.

3.5.2 Sampling technique

A stratified random sampling method was applied to select the respondents in the eight hospitals in Homa Bay County or the eight strata for this study. In stratified random sampling, a researcher first divides the population into sub-populations (strata) based onsupplementary information (Kothari, 2013). According to the Homa Bay county'sHIV/AIDS and STI Control Coordinator (CASCO, 2019), the number of HIV/AIDS clients registered for care at these hospitals were as follows; Homa Bay 7214, Mbita 3226, Sori 2232, Rangwe 554, Karachuonyo 873, Kasipul 975, Kabondo 1223 and Ndhiwa 328. With proportionate stratified sampling, the number of elements from each stratum in relation to its proportion in the total population was selected. Subsequently for this study, the proportionate samples were arrived at by dividing the sample size by the client populations at respective hospitals' CCC, as shown in Table 3.1. The researcher then sampled randomly within strata using systematic sampling. Similarly, the sampling interval was arrived at by dividing the clients' population and the required samples in the respective health facilities, as shown in the Table 3.1.

Table 3.1: Proportionate samples and sampling intervals for each hospital

Hospital	Clients population	Stratified sample	Sampling Interval
ıa Bay county Referral	7214	166	43
Mbita sub-county	3226	74	44
Suba sub-county	2232	54	41
Rangwe sub-county	554	13	43
Ndhiwa sub-county	328	8	41
Karachuonyo sub-county	873	20	44
Kasipul sub-county	975	26	38
Kabondo sub-county	1223	27	45
Total	**16,625**	**384**	

3.6 Data collection instruments

This study adopted the use of a structured self-administered questionnaire. The choice was informed by the fact that it was less costly and less time consuming since the questionnaires could be easily distributed to respondents. Additionally, it is free from interviewer bias, can reach difficult respondents and is ideal for quantitative surveys (Huyler & McGill, 2019). A five-point Likert scale was used in the survey questions to obtain respondents' level of health literacy and doctor-patient communication level as perceived by the respondents. On a Likert-type question, respondents indicated their levels of agreement or disagreements with a particular statement or question using an ordinal scale (Croucher & Cronn-Mills, 2018).

Regarding measures for various variables, the seven items measure of health literacy developed by Chew et al. (2004) and adopted from An & Muturi (2011) was used to measure functional health literacy. The respondents were asked to respond to seven questions using a scale ranging from never (1) to always (5). On the other hand, communicative and critical dimensions of health literacy were measured from the scales adopted from Ishikawa, Takeuchi, & Yano (2008). Likewise, a five and four-item scalewere used to measure communicative and critical literacy respectively in this study.

Finally, to measure doctor-patient communication, 15 questions adapted from the Consumer Assessment of Healthcare Providers and Systems (CAHPS) health literacy item set were used. The CAHPS health literacy item set is a validated tool developed to assess provider communication about medicines, tests and medical conditions. The study adopted the five response categories standard for CAHPS ("never," "rarely," "occasionally," “regularly” and "always"). For all but 2 of the CAHPS questions, "always" represented the most positive response. Nevertheless, for the questions that asked about providers using medical jargon and speaking too fast, the "never" response was the most favorable. Thus, the coding for this question was reversed in order to be consistent with the other CAHPS questions. A weighted mean score was calculated for each CAHPS survey collected, with possible scores ranging from 1 (lowest rating of provider communication) to 5 (highest possible provider

communication rating).

3.7 Data collection procedure

The method for gathering information was through the use of structured, self-administered questionnaires. The study participants were HIV/AIDS clients booked at the CCC in the eight hospitals in Homa Bay county during March 2020. The structured questionnaire was used to obtain data on the level of functional, communicative and critical health literacy. The tool also measured the effectiveness of health provider patient communication and collected the respondent's demographic data.

The names of prospective respondents were obtained from the sampling frame and selected using the sampling intervals, as shown in Table 3.1 above, randomly starting from the first name on the list. The clinic appointment dates for selected patients were then noted and clients approached at the registration department of the clinic where their informed consent was sought and questionnaires issued to those who consented. The questionnaires were picked from respondents after they had completed the treatment process. This process was repeated until the desired sample size was obtained.

3.8 Validity and reliability of research instruments

3.8.1 Pilot test

A pilot study is a small-scale preliminary study to evaluate practicability, time-frame, cost, adverse events for improving the research processes and procedures before conducting a full-scale project. Hence, pilot experiments are important in assessing the respondents' understanding of the concepts the researcher is studying (Croucher & Cronn-Mills, 2018).

Pilot studies are often used to test the full-scale research design, which then can be modified depending on the feedback received. It is a potentially valuable insight and should anything be missing in the pilot study; it can be added to the full-scale experiment to improve the chances of a clear outcome. For that reason, pilot studies

are also used to assess the accuracy and flow of questions asked as well as the approximate time neededfor each tool (Hazzi & Maldaon, 2015).

In this study, 30 participants drawn from HIV/AIDS patients at Rongo sub-county hospital in the neighboring Migori county were involved during the pilot study conducted between 22rd – 24th January 2020. Previous literature have suggested that 30 participants were adequate for a pilot study (Wilmoth, 1982; Drake & Walcerz, 2004: Huyler & McGill, 2019). Conducting the pre-test in the neighboring Migori county therefore, ensured that the main study's internal validity is not affected since the similarsite characteristics as the participants who would be included in the main study. This is in line with Hazzi & Maldaon (2015), who suggests that a pilot group should be demographically similar to the specific target population.

3.8.2 The validity of research instruments

Validity is concerned with establishing the appropriateness, quality and accuracy of the procedures a researcher adopts for finding answers to the research questions. According to Huyler & McGill (2019), 'validity refers to the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration. There are threekinds of validity; content validity which deals with face validity and sampling validity, while empirical validity deals with the relationship between a measuring instrument and the measurement outcome. Furthermore, construct validity connects the measuring instrument to the theoretical framework of the research. Hence, the study ensured the validity of the questionnaire by asking several sets of questions to cover different aspectsof concepts in the research. Further, two specific strategies of behaviour coding and individual debriefing suggested by Martin & Rast (2020), were also used to assess the study tool's validity. Additionally, factor analysis was also used to confirm the validity of this study.

3.8.3 The reliability of study instruments

Reliability is assessing the degree of consistency between multiple measurements of a variable (Martin & Rast, 2020). In view of that, the reliability test was done using Cronbach's Alpha test, which has been the most common tool for measuring

reliability.

This test's main reason was to measure the internal consistency of the study componentsin the survey questionnaire.

3.9 Ethical considerations

An introductory letter as a Ph.D. candidate at Jomo Kenyatta University of Agriculture and Technology (JKUAT) in the Department of Media Technology and Applied Communication (MTAC) and approval from the Board of Post Graduate Studies were obtained. In addition, the researcher obtained a permit from the National Commission for Science, Technology, and Innovation. In Homa Bay county, the county director for health and the chief executive officer, Homa Bay County Teaching and Referral Hospital, granted the study's authority. To effectively administer the questionnaire, eightpeer educators/treatment supporters attached to the CCCs were recruited and trained forone day. The training orientated the enumerators on data collection procedures, including confidentiality issues and standardizing the whole process.

An informed consent was obtained from each participant after they were assured of anonymity, confidentiality and informed of the purpose, procedures, risk, benefits and voluntary participation. This information was reinforced with an informed consent form whose content was verbally presented to each participant. To ensure further confidentiality, no personal identifying information was included in the tool or report and participants were informed that their involvement or lack of it would not affect theircare at the clinic.

3.9 Data analysis and presentation

The study utilized both parametric and non-parametric methods in data analysis. The logistic regression model was used for parametric data where the dependant variable was categorized as either effective or non-effective. This was done by first obtaining the observed indicator variables' average weights under the dependant variable then categorizing the data into two. Consequently, values between 3.5 to 5 were

categorized as effective and those below 3.5 as non-effective, treating the dependant variables as a binary type of data. On the other hand, the observed values' average weight for independent variables was computed and used as a continuous random variable for the logistic regression analysis. The overall models without moderator and with moderator for the study were: -

$$Y = \ln\left(\frac{1}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e \qquad \text{and}$$

$$Y = \ln\left(\frac{1}{1-p}\right) = \beta_0 + \beta_1 X_1 * Z + \beta_2 X_2 * Z + \beta_3 X_3 * Z + e$$

where:

Y = Doctor patient communication among HIV/AIDS patients

X_1 = Functional health literacy

X_2 = Communicative health literacy

X_3 = Critical health literacy

Z = Demographic factors (Moderator X)

For the non-parametric methods, a contingency table was developed and a chi-square test conducted to establish the relationship between independent variables and the dependent variable. Therefore, the independent variables were also categorized into two: adequate or inadequate health literacy for values equal to or greater than 3.5 and valuesless than 3.5, respectively.

Non-parametric methods were conducted before the application of the above mentioned logistic model. In this case, the null hypothesis tested was, there is no association between dependent and independent variables based on the contingency table developed. Other tests conducted to ascertain whether data set are suitable for the above-proposed model were multicollinearity, normality test and outlier tests.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Introduction

This Chapter provides in detail the findings of the study. It utilizes tables, graphs, and figures to present the results and compare them to other similar previous studies. The chapter begins with an evaluation of the response rate, then the results of the pilot study followed by presentations of descriptive statistics for all the study variables. Regression analysis was conducted and an optimal modal for the study presented.

4.2 Pilot study findings

As previously mentioned, a pilot study involving 30 respondents from the Rongo sub- county hospital was conducted, as described in chapter three, to ascertain the study instrument's reliability and validity. The results are presented as follows:

4.2.1 Reliability of research instrument

Reliability is an assessment of the degree of consistency between multiple measurements of a variable (Martin & Rast, 2020). In this study, the instrument's reliability was tested using Cronbach's alpha constant, which measured the internal consistency and average correlation among the indicators under consideration. Cronbach's values usually range between 0 and 1, with the commonly accepted alpha value of at least 0.70 (Martin & Rast, 2020). For Functional Health Literacy, there were seven items/indicator variables under scrutiny and from the finding, no item was expunged since the alpha coefficient recorded was above 0.7 (0.723). For Communicative Health Literacy, the alpha coefficient was 0.716, with no item removed out of the five items tested since the coefficient was above the threshold. The four items for Critical Health Literacy had an

alpha value of 0.791. The overall alpha coefficient recorded was 0.732, which was

also more than 0.7. Additionally, the alpha coefficient for variables constituting doctor- patient communications was found to be 0728.

In conclusion, the alpha test for all the items was found to be reliable because the reliability coefficient was found to be above the recommended threshold of 0.7. The findings are shown in Table 4.1.

Table 4.1: Reliability of Research Instrument

Variables	Items	Scale mean if Item Deleted	Scale varianceif Item Deleted	Corrected Item-Total (R)	cronbach's Alpha if Item Deleted	cronbach's Alpha	Cronbach's Alpha Based on Stdzd Items	No. of Items
Functional Literacy	FHL1	19.72	15.327	.005	.417	**.723**	**.723**	**7**
	FHL2	19.41	14.071	.220	.285			
	FHL3	19.47	13.811	.223	.282			
	FHL4	19.17	13.593	.293	.246			
	FHL5	19.50	13.781	.224	.281			
	FHL6	19.41	15.496	.028	.394			
	FHL7	19.29	14.253	.144	.328			
Communicative Health Literacy	CHL1	13.73	9.407	.440	.575	**.716**	**.716**	**5**
	CHL2	13.56	9.579	.407	.591			
	CHL3	13.13	9.544	.427	.582			
	CHL4	13.70	9.317	.421	.584			
	CHL5	13.77	10.630	.304	.636			
Critical Health Literacy	CRHL1	10.81	6.354	.542	.485	**.791**	**0.791**	**4**
	CRHL2	10.42	7.006	.411	.579			
	CRHL3	10.63	7.189	.373	.606			
	CRHL4	10.43	6.961	.367	.612			
Doctor patient communication among HIV/Aids Patients	DCP1	50.63	55.074	.398	.706			
	DCP2	50.47	55.007	.412	.705			
	DCP3	50.43	55.065	.421	.704			
	DCP4	50.34	55.467	.418	.705			
	DCP5	50.29	55.104	.428	.703			
	DCP6	50.24	56.817	.318	.715			
	DCP7	50.94	62.140	-.005	.748			
	DCP8	51.07	60.506	.065	.744	**.728**	**.728**	**15**
	DCP9	50.98	60.483	.072	.742			
	DCP10	50.34	54.804	.450	.701			
	DCP11	50.44	54.440	.468	.699			
	DCP12	50.51	55.154	.417	.704			
	DCP13	50.56	54.294	.447	.701			
	DCP14	50.75	55.495	.368	.709			
	DCP14	50.31	0.127	.370	.709			
Overall Alpha						**0.732**	**0.774**	**7.333**

4.2.2 The Validity of research instrument

Kim (2016) defined validity as the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration. Contrastingly, factor analysis, which detects construct validity, highlights variability among observed variables and also checks for any correlated variables to reduce redundancy in data (Verma, 2012) was utilized. The factor loadings are categorized as; 0.32 (poor), 0.45 (fair), 0.55 (good), 0.63 (very good) or 0.71 (excellent). In this study, factor loadings values of 0.5 and above were considered (Verma, 2012).

In summary, all the items for measuring Functional, Communicative and Critical Health Literacy, together with doctor-patient communications, have factor loadings raging between 0.563 and 0.768, as shown in Table 4.2 below, making them valid to measure the respective variables of the study.

Table 4.2: Factor Loading

Functional Health Literacy	Factor Loadings
How often are appointment cards written in a way that is easy to read and understand?	.731
How often are medical forms difficult to understand and fill out?	.642
How often do you have difficulty understanding written information yourhealth care provider gives you?	.721
How often do you have problems learning about your medical condition because of difficulty in understanding written information?	.692
How often do you have someone (like a family member, friend, hospital/clinic worker, or caregiver) help you read hospital materials?	.718
How often are you confident filling out medical forms by yourself?	.622
How often are you confident following the instructions on the label of amedication bottle/packet?	.646
Communicative health literacy	**Factor Loadings**
Since being diagnosed with HIV, how often do you collect HIV/AIDSrelated information from various sources?	.591
Since being diagnosed with HIV, how often have you obtained HIV/AIDS related information that you wanted?	.563
Since being diagnosed with HIV, how often have you understood theobtained HIV/AIDS related information?	.647
Since being diagnosed with HIV, how often have you applied the obtained information to your daily life?	.623
Since being diagnosed with HIV, how often have you communicatedyour thoughts about your illness to someone else?	.612
Factor loadings for Critical Health Literacy	**Factor Loadings**

Since being diagnosed with HIV, how often have you considered whether the information given to by healthcare provider is applicable to your situation?	.768
Since being diagnosed with HIV, how often have you considered the credibility of the information given to you by your doctor?	.693
Since being diagnosed with HIV, how often have you checked whether the information given by your doctor was valid and/or reliable?	.571
Since being diagnosed with HIV, how often have you collected information to make health-related decisions	.573

Doctor patient communication among HIV/AIDS patients	**Factor Loads**
How often does your doctor listen carefully to you?	.722
How often does your doctor explain your health concerns in a way that is easy to understand?	.613
How often does your doctor give you easy to understand instructionsabout taking care of your health problems?	.596

Functional Health Literacy	**Factor Loadings**
How often does your doctor seem to know the important information about your health problems?	.576
How often does your doctor show respect for what you tell him/her?	.619
How often does your doctor spend enough time with you?	.582
How often does your doctor use medical words that you do not understand?	.547
How often does your doctor talk too fast when talking with you?	.641
How often does your doctor use pictures or drawings or models to explain issues to you?	.517
How often does your doctor give you easy to understand instructionsabout how to take your medicines?	.544
How often does your doctor explain the possible side effects of your medicines?	.647
How often does your doctor explain medication side effects in a	.607

way that is easy to understand?

How often does your doctor suggest ways to help you remember to take your medicines?	.526
How often does your doctor explain the results of your blood test, X-ray,or other laboratory tests in a way that is easy to understand?	.651
How many times do you sense that the doctor cares about you as a person?	.658
Total	**.609**

4.2.3 Response rate

Response rate, also known as completion rate or return rate, is the number of participants who responded to the survey divided by the number of people in the sample. In this study, a total of 384 self-administered structured questionnaires were issued to HIV/AIDS clients at various CCC's in Homa Bay county. The respondents returned allthe 384 questionnaires. However, 22 questionnaires were either not filled completely or just had a section of the items responded to. Only participants who fully completed the study instrument (362) were included in the final data analysis. Therefore, this study's response rate was 94%, which was excellent for analysis as proposed by Verma (2012).

4.3 Tests of assumptions

4.3.1 Multicollinearity Test

Multicollinearity arises if independent variables in a regression model are correlated. This correlation is a problem because independent variables should be independent.

Therefore, if the degree of correlation between variables is high, it can lead to challenges when fitting the model and interpreting the result (Brett, 2004). In this study, Variance Inflation Factor (VIF) and corresponding tolerance were used in testing multicollinearity. According to Brett (2004), the threshold value for the presence of multicollinearity is 10 and above, with corresponding tolerance statistic

values below 0.1 and 0.2 indicating serious and potential problems, respectively.

Table 4.3 below shows that the VIF value for Functional Health Literacy was 1.155 witha corresponding tolerance statistic value of .866 in the absence of moderator and VIF value of 1.174 with a corresponding tolerance statistic value of .851 in the presence of amoderator. On the other hand, VIF for Communicative Health Literacy was 1.936 with a corresponding tolerance statistic value of 0.517 in the absence of a moderator and 1.941 with a corresponding tolerance statistic value of 0.515 in the presence of a moderator. Further, VIF values for Critical Health Literacy was found to be 1.907 with a corresponding tolerance statistic value of 0.524 in the absence of a moderator and VIF value of 1.924 with a corresponding tolerance statistic value of 0.520 in the presence ofa moderator. In the presence of a moderator, VIF values of 1.017 with corresponding tolerance statistic value of 0.983 were obtained. Therefore, it was concluded from the findings that the independent variables were not related to each other and hence no multicollinearity.

Table 4.3: Multicollinearity Test

Collinearity Statistics			**Collinearity Statistics**	
No Moderator			**Presence of Moderator**	
	Tolerance	**VIF**	**Tolerance**	**VIF**
Functional health literacy	.866	1.155	.851	1.174
Communicative health literacy	.517	1.936	.515	1.941
Critical health literacy	.524	1.907	.520	1.924
Functional health literacy *Z	-	-	.983	1.017
Communicative health literacy *Z	-	-	.998	1.002
Critical health literacy *Z	-	-	.983	1.017

4.3.2 Normality Test

To test for normality of the independent variables, skewness and Kurtosis was used in this study. Skewness shows the deviation of distribution from symmetry, while Kurtosis illustrates the peakness of distribution (Kar et al., 2019). Kar et al. (2019) further suggested that skewness should have values within the range of +1 and -1 for

data set tobe considered normally distributed, while values of Kurtosis should range between -2 and +2. Table 4.4 below shows that skewness and kurtosis values for all the variables were within acceptable ranges and were considered normal.

Table 4.4: Skewness and Kurtosis

Statistics	**Functional health literacy (x1)**	**Communicative health literacy (x2),**	**Critical health literacy (x3)**
Number of observed values	362	362	362
Mean	3.8583	4.0080	4.1281
Median	3.7084	3.9075	4.2137
Std. Deviation	.67434	.84607	.93610
Skewness	.690	-.094	-.240
Std. Error of Skewness	.125	.125	.125
Kurtosis	.542	-.443	-.332
Std. Error of Kurtosis	.248	.248	.248
Remark	Normally Distributed	Normally Distributed	Normally Distributed

4.3.3 Outliers test

Outliers are extreme observations from other observations in a given data set, which normally makes the data not assume normality (Arenas et al., 2017). Therefore, it is important to test outliers' presence and expunge them from the data set for the normality condition to be achieved. In this study, two outlying observations were identified and removed to boost data sets' normality, making them suitable for logistic regression analysis, as illustrated in Table 4.5 below.

Table 4.5: Outliers detected

Variables	**Position of observedOutliers**	**Total number of Outliers**
Functional health literacy	-	0
Communicative health literacy	61, 226	2
Critical health literacy	-	0

4.4 Descriptive Statistics findings

4.4.1 Demographic characteristics of the study participants

The respondents' demographic characteristics included age, gender, marital status, and education level. The respondents were also asked to state the year they were first diagnosed with HIV infection from which illness duration was calculated. The results are illustrated in Tables 4.6 and 4.7 below.

Table 4.6: Demographic characteristics & Doctor Patient Communication

Doctor -Patient Communication				**Total**
Patients' demographic factors		**Effective**	**Non-effective**	
	18-24 years	12 (21.1%)	45 (78.9%)	57(100.0%)
	25-31 years	44(65.7%)	23 (34.3%)	67(100.0%)
Age	32-38 years	37 (71.2%)	15 (28.8%)	52(100.0%)
	39-45 years	56(77.8%)	16 (22.2%)	72(100.0%)
	Above 45 years	80(71.4%)	32 (28.6%)	102(100.0%)
	Total	**262 (72.4%)**	**100 (27.6%)**	**362 (100.0%)**
	Married	137(72.5%)	52(27.5%)	189(100.0%)
Marital	Divorced	21(72.4%)	8(27.6%)	29(100.0%)
status	Widowed	40(74.1%)	14(25.9%)	54(100.0%)
	Single	60(66.7%)	30(33.3%)	90(100.0%)
	Total	**258 (71.3%)**	**104 (28.7%)**	**362 (100.0%)**
	Class 8 or less	79(79.0%)	21(21.0%)	100(100.0%)
	Some High School	86(72.9%)	32 (27.1%)	118(100.0%)
	High school completed	69(74.2%)	24(25.8%)	93(100.0%)
lucation				
Level				
	College/University	69(74.2%)	16 (31.4%)	51(100.0%)
	Total	**269(74.3%)**	**93(25.7%)**	**362(100.0)**
	Male	123(70.7%)	51(29.3%)	174(100.0%)
Gender	Female	140(76.1%)	44 (23.9%)	184(100.0%)
	Others	3(75.0%)	1(25.0%)	4(100.0%)

	Total	**266 (73.5%)**	**96 (26.5%)**	**362 (100.0)**
HIV Duration	0-5 years	49(73.1%)	18(29.9%)	67(100.0%)
	6-10years	80(74.8%)	27 (25.2%)	107 (100.0%)
	11-15 years	74(81.3%)	17 (18.7%)	91(100.0%)
	16-20 years	58(81.7 %)	13(18.7%)	71(100.0%)
	21 years and above	14 (53.8%)	12(46.2%)	26 (100%)
	Total	**275 (76.0%)**	**87 (24.0)**	**362 (100.0)**

Table 4.7: Chi-square Test on Demographic characteristics and Doctor Patient Communication

		Value	**df**	**Asymp. Sig. (2-sided)**
Age	Pearson Chi-Square	3.614[a]	4	.0461
	Likelihood Ratio	3.658	4	.0454
	Linear-by-Linear Association	.064	1	.0800
	N of Valid Cases	362		
Gender	Pearson Chi-Square	2.220[a]	2	.033
	Likelihood Ratio	2.477	2	.029
	Linear-by-Linear Association	2.062	1	.015
	N of Valid Cases	362		
Marital Status	Pearson Chi-Square	1.034[a]	3	.01793
	Likelihood Ratio	1.015	3	.01798
	Linear-by-Linear Association	.616	1	.01433
	N of Valid Cases	362		
Education	Pearson Chi-Square	2.065[a]	3	.005
	Likelihood Ratio	2.054	3	.005
	Linear-by-Linear Association	1.618	1	.002
	N of Valid Cases	362		
:ation of HIV Infection	Pearson Chi-Square	2.350[a]	4	.011
	Likelihood Ratio	2.647	4	.013
	Linear-by-Linear Association	2.152	1	.012
	N of Valid Cases	362		

4.4.1.1 Gender of the respondents

The respondents were asked to state the gender with which they identify themselves,

and the option of male, female, or others was given. As a result, 184 accounting for 51.05%, were female while 48.69 were male and a further 0.26% chose 'others' without giving further details, as illustrated in Table 4.6 above. The above results illustrate that there was almost parity in terms of the gender of the respondents, even though the female gender was a slight majority. This was in agreement with previous studies on HIV/AIDS prevalence in Homa Bay county where women had significantly higher HIV prevalence than men at 6.9% compared to 4.4%; $P < 0.0001$ (Ngetich, 2018 and Kimanga et al., 2014). In a study conducted by Maleki Chollou et al. (2020) on the association of health literacy level and self-care behaviors and glycemic control, males were found to have poor disease outcome, similar to the findings of this study where 76.1% of females described doctor-patient communication as effective compared to 70.7% of their male counterparts as illustrated in Table 4.6 above. The gender of the respondents also had a significant influence on doctor patient communication in this study (p=0.033) as shown in Table 4.7 above.

4.4.1.2 Age of the respondents

The respondents' age distribution was between 18 years and 69 years, with the majority (31%) aged above 45 years followed by 25-31 years (21%), while young people aged between 18-24 years made up 16% of the respondents as illustrated in Table 4.6 above. In agreement, Kimanga et al. (2014) also found out that HIV prevalence increased with age, peaking at age 35–39 years among women and age 45–54 years among men. This could be due to better and consistent use of HIV/AIDS live-saving medication, which prolongs life expectancy. However, aging with HIV infection presents special challenges for preventing other diseases because both age and HIV may increase the risk for cardiovascular disease, lung disease, bone loss, and certain cancers (Cebo, 2020). Regarding doctor-patient communication, older patients seemed to communicate better with their doctors than younger patients, as 78.9% of respondents aged between 18-24 years described doctor-patient communication as non-effective compared to only 28.6% of respondents aged above 45 years (Table 4.6). This may be because adults were less curious than younger patients who may have a lot of gaps, they want to be filled in during a single hospital visit. The HIV/AIDS services offered may also not meet the criterion for ‘youth

friendly' services making the unattractive to the youths. (Murigi, Mogale, & Moagi, 2020).

4.4.1.3 Marital status of the respondents

Regarding the respondent's marital status, the majority (52%) were married, 25% single, while 15% and 8% were widowed and divorced, respectively, as shown in Table 4.6 above. However, these results contrasted other previous studies that found HIV prevalence to be highest among persons who had been widowed or formally married, separated, or divorced probably due to the loss of the absent spouse to HIV/AIDS (Fagbamigbe et al.,2016). The finding herein gives hope that with good adherence to HIV/AIDS lifesaving drugs and good self-management skills, a patient can live normallyeven if their partner died of HIV/AIDS. This study further found a significant positive association between marital status and doctor patient communication, p=0. 01793, as shown in Table 4.7 above.

4.4.1.4 Educational level of the respondents

As shown in Table 4.6 above, 57% of the respondents had post-primary school education, even though 31% of this did not finish high school. 28% were educated up toclass eight, while a further 14% were college or university graduates. The level of education had a significant positive association with doctor-patient communication (*P*=0.005), with 74% of respondents who had college/university education describing communication between them and their doctors as effectively compared to only 21% ofrespondents who had class eight or below education. The results were in support of the findings by Aelbrecht et al. (2019), which concluded that patients with lower education level were more likely to experience negative interactions with their physicians. Other previous studies have further noted that lower educated patients' preferences were more towards the expert opinion in doctor-patient communication than the middle and higher educated ones, who had specific issues they wanted addressed (Aelbrecht et al., 2014). Thus, patients' educational level seems to influence their perspective on communicationstyle and should be taken into account by healthcare providers during hospital visits.

4.4.1.5 Duration of HIV/AIDS infection

Table 4.6 above shows that the majority (30%) of the respondents were those who had been having HIV/AIDS infection for between 6-10 years, followed by 25% who had been with the infection for between 11-15years while 19% and 7% had had the infection for between 0-5 years and 21 years above, respectively. The fact that over 50% of respondents had lived with HIV infection for more than ten years could be a pointer to the efficacy of preventive and supportive measures put in place by the government and its development partners. Those who had lived longer with HIV infection were also likely to have better communication outcomes at p=0.001, as shown in Table 4.7 above. However, these findings were contrary to those of Kar et al. (2019), which suggested that patients who had an illness for a longer duration (greater than seven years) were more likely to have a poorer outcome. The positive findings in this study may be attributed to strong and numerous networks of civil societies and HIV/AIDS patients support groups in the study area.

4.4.2 Functional Health Literacy (FHL)

Table 4.8: Distribution of respondents by responses to FHL items

	Functional HealthLiteracy Items (N=362)	Never	Rarely	Occasionally	Regularly	Always	Mean	SD
1	How often are appointment cards written in a way that is easy to read and understand?	25.1%	17.1%	22.4%	13.5%	21.8%	**2.90**	**1.548**
2	How often are medical forms difficult to understandand fill out?	9.7%	16.0%	31.5%	24.0%	18.8%	**3.26**	**1.231**
3	How often do you have difficulty understanding written information your health care providergives you?	10.8%	21.3%	24.3%	24.3%	19.3%	**3.20**	**1.274**
4	How often do you have problems learning about your medical condition because of difficulty in understanding written information?	6.9%	14.4%	25.7%	29.8%	23.2%	**3.48**	**1.119**
5	How often do you have someone (like a family member, friend, hospital/clinic worker, or caregiver) help you read hospitalmaterials?	13.5%	17.7%	26.7%	24.3%	18.0%	**3.15**	**1.288**
6	How often are you confident filling out medical forms byyourself?	13.3%	17.4%	24.3%	21.5%	23.5%	**3.25**	**1.343**
7	How often are you confident following the instructions on the label of a medicationbottle/packet?	9.4%	22.9%	18.8%	19.1%	29.8%	**3.37**	**1.363**
	Cumulative Mean						**3.23**	**1.31**

As illustrated in Table 4.8 above, Functional Health Literacy (FHL) among HIV/AIDS patients was measured using the seven (7) items scale developed by Chew et al. and adopted by An & Muturi (2011). The respondents were asked to respond to the seven items using a Likert scale ranging from never (1) to always (5), always denoting higher literacy levels. The coding for items serial numbers 2-5 on whether medical forms were difficult to understand and fill out, difficulty understanding written information given by health care provider, problems learning about respondent's medical condition because of difficulty in understanding written information and frequency of someone helping with reading hospital materials were revised so that "always" denoted low health literacy and "never" for higher literacy levels. The scores for the items on a scale were summed anddivided by the number of

items in the scale, giving a weighted mean score ranging from 1–5. FHL was subsequently categorized into either inadequate or adequate for scores between 1 to 3.4 and 3.5 to 5, respectively.

On average, FHL among the respondents in this study was inadequate, with a mean of 3.23 and standard 1.31, as shown in Table 4.8 above. FHL can be depicted as the cognitive capacity to comprehend, interpret and apply written or oral health information so that someone with adequate literacy level would have a better health condition than one with limited literacy level (Rademakers & Heijmans, 2018). Unfortunately, inadequate FHL appears to be a widespread problem among patients with chronic health conditions. As previously mentioned, studies conducted by Bradley (2013) show that in the UK, the USA, Australia, and in Canada, 20% to 50% of the population have low FHL, which can have negative effects on an individual's health status (Bradley, 2013; Ishikawa, 2008). A recent study by Rademakers and Hejimans (2018) further revealed that 4 out of 10 Dutch men and women with chronic disease had inadequate FHL.

Regarding the various items of FHL, respondents scored poorest, mean of 2.90 when asked to state how often appointment cards were written in a way that is easy to read and understand, with 25% stating that it had never been easy to read and understand appointment cards. Additionally, about 19% and 24% of the respondents believed that medical forms were either always or regularly difficult to understand and fill out. When asked to state how often they had difficulty understanding written information given by their health care providers, a mean of 3.20 was posted, with 43% of respondents stating they regularly or always had difficulties.

Writing and reading abilities are increasingly becoming very important in today's healthcare environment where a lot of emphasis is put on self-care and home-based care due to the fragile healthcare infrastructure. According to Geboers (2017), people with inadequate FHL often lack the ability to read well and the knowledge about the body, its functioning and nature, as well as causes of different types of disease conditions. This compromises their ability to manage their disease (Paasche-Orlow & Wolf, 2016). Beyond reading and other communication skills, knowledge of relevant

health topics, making sense of health information as well as the healthcare system also requires numerical skills, such as disease risk or the normal range of values such as blood pressureor cholesterol levels (Griffey et al., 2016).

In this study, 42% of the respondents reported that they either regularly or always required someone (like a family member, friend, hospital/clinic worker, or caregiver) to help them read hospital materials. Only 14% were able to read independently, meaning that most of the respondents were forced to rely on someone else for assistance with their sensitive medical information. Concerning how often the respondents were confident filling out medical forms by themselves, 14% and 17 % were either 'never' or 'rarely' confident in filling out hospital forms. This, coupled with the fact that only about 30% of these respondents were 'always' confident following the instructions on the label of amedication bottle/packet, could present a big challenge, especially in a condition like HIV/AIDS that is surrounded with a lot of stigma and discrimination.

Gokengin et al. (2017), in their analysis of HIV/AIDS-related stigma and discrimination in Turkey, found out that HIV-related stigma was widespread, originated from close associates of the patient and had undesired effects. Being gossiped about, being subjected to verbal abuse, threats and injury were the most common forms of stigma. Overall, 30%of the participants had lost their jobs due to HIV-related stigma, while 20% were denied healthcare services because of HIV positivity. Hence, perceived HIV-related stigma maymake people living with HIV to internalize stigma and anticipate stigmatizing experiences, causing undesired health as well as psychosocial outcomes (Ibrahim et al.,2019).

4.4.3 Communicative Health Literacy (CHL)

Table 4.9: Distribution of respondents by responses to CHL items

	Communicative Health Literacy Items N=362	Never	Rarely	Occasionally	Regularly	Always.	Mean	SD
1	Since being diagnosed with HIV, how often do you collect HIV/AIDS related information from various sources?	7.5%	17.4%	36.2%	21.3%	17.7%	**3.24**	**1.156**
2	Since being diagnosed with HIV, how often have you obtained HIV/AIDS related information that you wanted?	5.5%	17.4%	29.0%	25.1%	22.9%	**3.43**	**1.177**
3	Since being diagnosed with HIV, how often have you understood the obtained HIV/AIDS related information?	5.0%	7.5%	25.1%	24.9%	37.6%	**3.83**	**1.160**
4	Since being diagnosed with HIV, how often have you applied the obtained information to your daily life?	9.4%	16.9%	32.6%	21.8%	19.3%	**3.25**	**1.343**
5	Since being diagnosed with HIV,how often have you communicated your thoughts about your illness to someone else?	5.8%	18.0%	37.6%	26.8%	11.9%	**3.21**	**1.363**
	Cumulativemean/SD						**3.392**	**1.152**

Communicative Health Literacy (CHL) is defined as superior capabilities that enable someone to extract information, derive meaning from various forms of communication and apply new information to changing situations (Nutbean, 2009). In this study, CHL was measured using five items Likert scales adopted from Ishikawa, Takeuchi & Yano (2008). Each item was rated on a 5-point scale, ranging from 1, 'never' to 5, 'always,' with 5 denoting higher level CHL. The scores for the items on a scale were summed up and divided by the number of items in the scale, giving a weighted mean score ranging from 1–5. Subsequently, CHL was then

categorized into either inadequate or adequate for scores between 1 to 3.4 and 3.5 to 5, respectively

Generally, the respondents in this study had inadequate CHL with an overall mean of 3.392 and standard deviation of 1.152 as illustrated in Table 4.9 above. This was lower than 3.61 (standard deviation S.D., 0.64) obtained in a similar study by Goto et al. (2019). Notably, inadequate CHL is a precursor to poor health outcomes. Talan (2020) observed that since CHL increases a person's capacity to ask questions and recognize one's very own information gaps, an individual with poor CHL may encounter difficulties in explaining health problems or discussing them with health experts.

Mehzabin et al. (2019) further suggest that a person having adequate CHL can communicate his/her health issue without any difficulty and discuss it, asking questionsto gain more understanding. Thus patients having chronic health conditions like HIV/AIDS could be left with nowhere to turn to if they cannot discuss or ask questions to gain more understanding about their illness in the consultation room while facing equal measure of stigma and discrimination in the community. This could explain why only 12% of the respondents reported that they were comfortable communicating their thoughts about an illness to someone else in this study in comparison to, most (62%) who had either never or rarely shared their feelings with a third party.

This study's findings further revealed that most respondents hardly looked for HIV/AIDS-related information from various sources, as only 18% of respondents did so regularly. When asked to state how often they had obtained HIV/AIDS-related information they wanted, only 48% reported that they either regularly or always obtain such desired information while 23% never or rarely obtained such information. This clearly illustrates how challenging it could for HIV/AIDS patients with limited CHL to navigate their ways in the ever-changing healthcare environment.

Griffey et al. (2016) concurred with this study's finding when they observed that patients with inadequate CHL were 'lost' within the healthcare environment. To such

a person, most of the things were new and to be discovered. They perceived interaction with medical experts as hierarchical and unequal. Additionally, they are hesitant to ask questions since they would prefer not to "waste health workers time." This study also revealed that patients with limited CHL not only have difficulties accessing information, but they also struggle to understand and apply the obtained information about their healthin real life situations. For example, only 52% reported that they understood the obtainedHIV/AIDS related information and only 40% of the respondents were able to apply such new knowledge in their daily lives. These findings mirror those of Maleki Chollou et al. (2020), who found out that patients with limited communicative health literacy may forget quickly or fail to completely understand the information that was discussed with their healthcare providers.

4.5 Critical Health Literacy (CHL)

Table 4.10: Distribution of respondents by responses to CHL items

Critical Health Literacy Items N=362		Never	Rarely	Occasionally	Regularly	Always.	Mean	SD
1	Since being diagnosed with HIV, how often have you considered whether the information given to by healthcare provider is applicable to yoursituation?	7.2%	17.1%	35.1%	22.1%	18.5%	**3.28**	**1.161**
2	Since being diagnosed with HIV, how often have you considered the credibility of the information givento you by your doctor?	5.2%	12.4%	22.4%	30.7%	29.3%	**3.66**	**1.173**
3	Since being diagnosed with HIV, how often have you checkedwhether the information givenby your doctor was valid and/or reliable?	5.2%	16.6%	28.5%	25.7%	24.0%	**3.47**	**1.175**
4	Since being diagnosed with HIV, how often have you collectedinformation to make health-related decisions	7.2%	12.2%	20.4%	29.0%	31.2%	**3.65**	**1.237**
			Cumulative Mean				**3.515**	**1.186**

Nutbean (2009) described critical health literacy as more advanced cognitive skills that, combined with social abilities, can be applied to critically examine health data and use this information to have better control of one's situations. Critical health literacy was similarly measured using the scale adopted from Ishikawa, Takeuchi, & Yano (2008). Each item was rated on a 5-point scale, ranging from 1, 'never' to 5, 'always,' with always denoting a higher degree of health literacy. Critical health literacy was then categorizedinto either inadequate or adequate for scores between 1 to 3.4 and 3.5 to 5, respectively.As shown in Table 4.10 above, critical health literacy among HIV/AIDS patients in Homa Bay county was adequate, with a mean score of 3.515 and a standard deviation of

1.186. Liu et al. (2018) noted that critical health literacy implies acting as a person or ina group to improve health through social activism or political framework. Therefore, thisdomain of health literacy focuses on community capacity to take action on social and economic determinants of health (Rademakers & Heijmans, 2018). The adequate level of health literacy in Homa Bay county might be due to numerous non-governmental organizations (NGOs) and civil society organizations conducting health promotion activities in the country. According to the NACC (2018), Homa Bay county has about 24 implementing partners fighting the HIV/AIDS pandemic. Through implementation of Community Health Strategy, the partners have reached households with health information through community health workers and other community-based interventions with much success (NACC, 2018).

This study's results further show that over 40% of respondents regularly considered the applicability of healthcare providers' information to their disease situation. A further 51% had considered the credibility of such information given to them by their doctors.

Additionally, over half of the respondents reported that they always went a step further to check the validity/reliability of the information given by doctors. Since being diagnosed with HIV, for example, most of the respondents (64%) in this study had tried to collect information to make health-related decisions, which could be a pointer to the level of social empowerment that these respondents have.

To a large extent, our findings have contradicted findings from other previous studies conducted in the area of critical health literacy. For instance, in the European Health Literacy Survey (Pelikan, 2018), respondents reported that items denoting critical healthliteracy, including judging health information's credibility, were most difficult to comprehend. Similarly, Heijmans et al. (2015) and Harris et al. (2019) found respondents in their studies scoring poorly in the critical health literacy items. These studies, however, focused mainly on other chronic conditions like diabetes and not on HIV/AIDS as was the case with this study.

4.6 Doctor-Patient communication

Table 4.11: Distribution of respondents by perception of doctor-patient communication

Doctor-Patient Communication (DPC) Items N=362	Never	Rarely	Occasionally	Regularly	Always.	Mean	SD
How often does your doctor listen carefully to you?	6.1%	11.3%	35.1%	19.9%	27.6%	**3.52**	**1.182**
How often does your doctor explain your health concerns in a way that is easy to understand?	2.8%	14.6%	24.9%	24.6%	33.1%	**3.71**	**1.154**
How often does your doctor give you easy to understand instructions about taking care of your healthproblems?	4.1%	11.6%	21.8%	32.0%	30.4%	**3.73**	**1.136**
How often does your doctor seem to know the important information about your health problems?	3.3%	9.7%	23.5%	30.1%	33.4%	**3.81**	**1.105**
How often does your doctor show respect for what you tell him/her?	2.2%	10.8%	23.8%	24.6%	38.7%	**3.87**	**1.114**
How often does your doctor spend enough time with you?	3.9%	7.5%	19.6%	29.3%	39.8%	**3.94**	**1.113**
How often does your doctor use medical words that youdo not understand?	16.9%	20.4%	35.6%	18.8%	8.3%	**3.19**	**1.169**
How often does your doctor talk too fast when talkingwith you?	16.3%	22.4%	26.8%	22.1%	12.4%	**3.08**	**1.262**
How often does your doctor use pictures or drawings or models to explain issues to you?	11.6%	18.0%	28.7%	24.6%	17.1%	**3.18**	**1.244**
How often does your doctor give you easy to understand instructions about how to take your medicines?	2.5%	11.0%	24.6%	25.4%	36.5%	**3.82**	**1.117**
How often does your doctor explain the possible side effects of your medicines?	2.5%	12.4%	31.2%	20.2%	33.7%	**3.7**	**1.133**
How often does your doctor explain medication side effects in a way that is easy to understand?	4.7%	8.8%	32.3%	24.9%	29.3%	**3.65**	**1.129**

How often does your doctor suggest ways to help you remember to take your medicines?	4.7%	8.8%	32.3%	24.9%	29.3%	**3.6**	**1.169**
How often does your doctor explain the results of your blood test, X-ray, or other laboratory tests in a way that is easy to understand?	5.8%	16.6%	31.5%	21.8%	24.3%	**3.42**	**1.189**
How often do you feel that your doctor cares about you as a person?	5.0%	11.9%	19.3%	20.7%	43.1%	**3.85**	**1.237**
			Cumulative Mean ±SD			3.60	1.164

To measure the quality of doctor-patient communication, fifteen questions adapted fromthe Consumer Assessment of Healthcare Providers and Systems (CAHPS) health literacy item set were used. A five-response category comprising 'Never,' 'Rarely,' 'Occasionally,''Regularly' and 'Always' was utilized. For all but two of the CAHPS items, "always" represented the most positive response, but for the questions asking about health providers using medical jargon and speaking too fast, the "Never" response representedthe highest approval from the patients. Consequently, the coding for these questions wasreversed to be consistent with the other CAHPS items. A total weighted mean score wascalculated for each CAHPS survey collected, with possible mean scores ranging from 1- 5, representing the lowest rating provider communication and the highest possible provider communication rating, respectively. As a result, mean scores below 3.5 were graded as non-effective, while scores ranging between 3.5 to 5 were graded as effective.Table 4.11 above illustrates that the patients surveyed rated the quality of their provider's communication as effective with a mean score of 3.60 and a standard deviation of 1.164. Effective communication from healthcare providers may compensate for lack of understanding among patients with inadequate health literacy in clinical settings. Burch& Jackson (2019) noted that in the recent past, the average number of clinical items, ranging from diagnoses, medications to diagnostic tests addressed at adult primary carevisits, had increased from 5 to 7, while the time spent on each item had decreased from 4.4 to 3.8 minutes. This underscores how effective communication can be an importanttool, especially in resource constraint settings.

This study's results are in support of the finding of Madula et al. (2018), where half

of the participants indicated that healthcare providers were not only very good but also treated them with warmth, sympathy and were impressed with the way healthcare providers were communicating with them. However, several other studies conducted on doctor-patient communication have established that patients disapproved of communication between them and their doctors, contradicting the findings of this study(Kumbani et al., 2013; Mamo et al., 2019; Seshadri, 2020). The positive approval of doctor-patient communication in this study might have been contributed partly becausemost of the patients interviewed had had HIV infection for a longer duration, making them conversant with most healthcare providers and the healthcare environment.

Concerning the specific questions on the 15 item doctor-patient communication scale used to measure doctor-patient communication, the majority of the respondents were concerned that their doctor was talking too fast, seldom used pictures or drawings or models to explain issues and that doctor's use of medical words that were difficult to understand. These items received the least approval scores with mean scores of 3.08, 3.18, and 3.19, respectively, as shown in Table 4.11 above. For instance, 12% and 22%of respondents were of the opinion that their healthcare providers either 'always' or 'regularly' speak too fast during the clinical consultation process while a further 30% reported that their doctors rarely used pictures or drawings or models to explain health issues to them. Still, 8% and 19% of surveyed patients reported that their doctors used medical words that they could not understand ‘always’ and ‘regularly’ respectively. Additionally, 23% of respondents stated that their doctor rarely or never explained the results of the blood test, X-ray, or other laboratory tests in a way that was easy to understand. Even though witnessed to a lesser magnitude compared to other studies, all these are concerns known to negatively impact health outcomes (Parekh et al.,2018; Slater et al., 2017).

Conversely, the surveyed patients had positive ratings of communication with their healthcare providers in respect to the adequacy of time the healthcare providers spent with them (mean of 3.94), doctor showing respect for what patients shared with them (mean score of 3.87), and doctors issuing easy to understand instructions about how to take medicine (mean of 3.82). A doctor's knowledge of important information

about respondents' health problems was also rated positively with a mean score of 3.81 out of5, as shown in Table 4.11 above. These findings are inconsistent with other studies whichfound that some health workers are impolite, rude and shout at patients, which as a result,dissuades them from access to services offered at health facilities and could have seriousconsequences, especially in the context of chronic conditions like HIV/AIDS (Kang et al., 2016, Murigi, Mogale, & Moagi, 2020).

4.7 Logistic Regression Analysis of the study variables

Simple logistic regression was carried out for all the variables in the study to determine the degree to which independent variables namely; functional health literacy, communicative health literacy and critical health literacy, influenced the dependent variable, which was the doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya. The obtained findings were interpreted based on two major logistic regression outputs: block 0 and block one models. Block 0 was used to evaluate the usefulness of having a null model, which is a model with no explanatory variables, while Block 1 showed the results after the inclusion of the explanatory variables. Block0 and block one models were also compared to establish any substantial improvement after the inclusion of explanatory variables.

Before conducting logistic regression analysis, the dependent variable was transformed into binary form assuming 0 and 1 values to mean non- effective and effective respectively. The overall effectiveness of the dependent variable was measured using the fifteen items on the questionnaire. To classify the dependent variable (Doctor-Patient communication, DCP) as effective or non-effective, the weighted scale of the indicator variables forming the dependent variables was computed as follows:

$$Y = \frac{DCP1(1) + DCP2(2) + \cdots + DCP15(15)}{1 + 2 + \cdots + 15}$$

Y (doctor-patient communication among HIV/AIDS patients) was a continuous random variable with values lying between 0-5. The Y values were further

transformed into two categories with values lying between 1-3.4 categorized as non-effective, while any value of Y lying between 3.5-5.0 was categorized as effective. From the above description, new Y values were coded as effective (1) and non-effective (0), respectively, before conducting logistic regression.

4.7.1 Functional health literacy and doctor-patient communication among HIV/AIDS patients

The study's first objective was to establish the extent to which Functional Health Literacy (FHL) influences doctor-patient communication among HIV/AIDS patients in Homa Bay county. Consequently, logistic regression was conducted to show the relationship between FHL and doctor-patient communication. As displayed in Block 0 in Table 4.12 below, the output as per classification Table 1 in the absence of predictor variable (functional health literacy), suggests that 74.3 % of the respondents held the opinion that doctor-patient communication among HIV/AIDS patients in Homa Bay county was effective. Variables in the equation Table also illustrate the predicted odds of [Exp(B)]

=2.892, as shown below.

Block 0: Beginning Block

Table 4.12: Classification Table 1 for FHL

	Observed		**Predicted doctor Patiant communication among HIV/Aids Patients**		**Percentage correct**
			Not effective	Effective	
Step 0	Doctor Patiant communication among HIV/Aids Patients	Not effective	0	93	.0
		Effective	0	269	100
	Overall percentage				**74.3**

a. Constant is included in the model.
b. The cut value is .500

Table 4.13: Variables in the Equation for FHL

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	1.06194	.117	82.149	1	.000	2.892

To obtain a detailed Block 1 output, the explanatory variable (functional health literacy) was included in the model under two main categories, initially in a model without a moderator and then with a moderator, in this case, patients' demographic factors. P values of less than 0.05 were used to assess the presence of significant improvement from Block0 results.

The results as presented in the omnibus test output (Table 4.14) for both model 1 and 2 without a moderator and with a moderator respectively demonstrate that models were significant since both recorded p-values of 0.000 <0.05, indicating that FHL had a significant positive influence on doctor-patient communication among HIV/AIDS patients in Homa Bay county both in circumstances where moderator was included andwhere the moderator was not included. Cox & Snell and Nagelkerke R-square values further demonstrated that between 25.0% and 31.8% of the variation in doctor-patient communication among HIV/AIDS patients in Homa Bay county was explained by FHL for the model in Block 1 in the absence of moderator and in the presence of moderator (demographic factors) respectively.

Classification table 2 (Table 4.15) for FHL further underscores the importance of patients' demographic factors (moderator) in doctor-patient communication as there was a superior increase in classification rate. The table indicates an improvement of both models in block one as the classification rate increased by 2.2% to 76.5%, up from 74.3in Block 0 for model 1(absent of moderator), and by 4.2% to 78.5% in the presence of the moderator.

Similarly, based on variables in the Equation Table 2 after inclusion of FHL in the block, the relationship between the explanatory variable and doctor-patient communication among HIV/AIDS patients given by logistic regression equations can be expressed as $Y= -6.234+ 1.981X_1$ for the model without moderator and $Y = -9.846+0.991X_1+2.294X_1$

*Z for the model with the moderator. This can be interpreted that for every unit of FHL, the value of doctor-patient communication among HIV/AIDS patients in Homa Bay County changed by 1.981 in the absence of moderator and 2.294 when demographic factors were included as a moderator.

Finally, to ascertain the goodness of fit based on the logistic regression model, the Hosmer and Lemeshow test, which is a Chi-square test statistic used to check if the logistic regression model is suitable for a given data set, was applied. As indicated in Table 4.17 below, the models were good since the p-values established were much greater than the conventional p-value of 0.05, at 0.931, and 0.983 for models 1 and 2, respectively. This further illustrated that FHL had a significant positive influence on doctor-patient communication among HIV/AIDS patients in Homa Bay County, Kenya.

Block 1: Method = Enter (FHL)

Table 4.14: Omnibus Test of Model Coefficients for FHL

Model 1 (Absence of Moderator)				
		Chi-square	**df**	**Sig.**
Step 1	Step	71.784	1	.000
	Block	71.784	1	.000
	Model	71.784	1	.000
	(Presence of Moderator)			
Model 2				
		Chi-square	**df**	**Sig.**
Step 1	Step	93.695	2	.000
	Block	93.695	2	.000
	Model	93.695	2	.000

Model Summary for Functional health literacy			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	366.557[a]	.171	.250
2	344.646[a]	.217	.318

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 4.15: Classification Table 2 for FHL

Model 1 without moderator					
	Observed		**Predicted doctor Patiant communication among HIV/Aids Patients**		**Percentage correct**
			Not effective	**Effective**	
Step 0	doctor Patiant communication among HIV/Aids Patients	Not effective	22	71	23.6
		Effective	**14**	**255**	**94.8**
	Overall percentage				**76.5**
Model 2 with moderator					
	Observed		**Predicted doctor Patiant communication among HIV/Aids Patients**		**Percentage correct**
			Not effective	**Effective**	
Step 0	doctor Patiant communication among HIV/Aids Patients	Not effective	36	57	38.7
		Effective	**22**	**248**	**92.2**
	Overall percentage				**78.5**

a. Constant is included in the model.
b. The cut value is .500

Table 4.16: Variable Equation Table for FHL

Model 2 Without moderator

		B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
Step 1[a]	Functional health literacy	1.981	.288	47.377	1	.000	7.253
	Constant	-6.234	1.032	36.450	1	.000	.002

a. Variable(s) entered on step 1: X_4.

Model 1 With moderator

		B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
Step 1[a]	Functional health literacy	.991	.344	8.278	1	.004	2.694
	Functional health literacy Z	2.294	.512	20.047	1	.000	9.919
	Constant	-9.846	1.388	50.332	1	.000	.000

a. Variable(s) entered on step 1: Functional health literacy, Functional health literacy *Z.

Table 4.17: Hosmer and Lemeshow Test

Model 1 Without moderator	Step 1	**Chi-square**	**df**	**Sig.**
		3.054	8	.931
Model 2 With moderator	Step 1	**Chi-square**	**df**	**Sig.**
		1.931	8	.983

As narrated above, FHL was found to positively influence doctor-patient's communication in this study. Indeed, every unit of FHL increased the value of doctor- patient communication among HIV/AIDS patients in Homa Bay county by up to 2.294. This finding is in line with previous studies, which have also found an association between FHL and health outcomes (Smith et al., 2014; Muscat et al., 2015; Tolan, 2020). In contrast however, a study by Brabers et al. (2017) on the role of health literacy in patients' involvement in medical decision-making did not find a relationship between most aspects of health literacy and involvement in medical decision-making. This study was conducted among the general population and also used five scales of the Health Literacy Questionnaire (HLQ) developed by Osborne et al. (2013) as opposed to the seven (7) items scale developed by Chew et al. (2004) used in our study. The variation in the findings of various studies may also be due to many tools currently being used tomeasure functional health literacy.

4.7.2 Communicative health literacy and doctor-patient communication among HIV/AIDS patients

The second objective of the study was to determine the relationship between Communicative Health Literacy (CHL) and doctor-patient communication among HIV/AIDS patients in Homa Bay county, and the objective was tested against the hypothesis that there was no significant influence of CHL on doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya.

Logistic regression analysis was done, and based on the logistic model, the output between CHL and doctor-patient communication was categorized into Block 0 and

Block 1. Without the inclusion of the predictor variable in the model, Block 0 classification Table demonstrated that 74.4% of the respondents believed that doctor-patient communication among HIV/AIDS patients in Homa Bay county was effective, as shown in Table 4.18 below. The equation Table output variables further predicted theodds value of [Exp(B)] =2.892, as illustrated below.

Block 0: Beginning Block

Table 4.18: Classification Table 1 for CHL

	Observed		**Predicted doctor Patiant communication among HIV/Aids Patients**		**Percentage correct**
			Not effective	Effective	
Step 0	Doctor Patient communication among HIV/Aids Patients	Not effective	0	93	.0
		Effective	0	269	100
	Overall percentage				**74.3**

a. Constant is included in the model.

b. The cut value is .500

Table 4.19: Variables on the Equation for CHL

Variables in the Equation for Communicative health literacy

		B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
Step 0	Constant	1.06194	.117	82.149	1	.000	2.892

When the predictor variable, CHL was included in the model, Block 1, which consists of the Omnibus test table, model summery, classification Table 2, and a new variable equation, Table 2 was obtained. The omnibus tests of model coefficients for the CHL Table displayed the outcome of the Likelihood Ratio (L.R.) test to ascertain if the inclusion of the variables in the block contributes significantly to model fit.

As displayed in Table 4.20 below, the results indicate that CHL had a significant influence on doctor-patient communication among HIV/AIDS patients in Homa Bay

county, both in the absence of moderator and in the presence of moderator as p-values were less than 0.05 in both scenarios. Summary model Table further indicated that 24.7% to 36.3% and 27.8% to 40.8% of the variation in doctor-patient communication among HIV/AIDS patients in Homa Bay county was explained by CHL for the model in block 1 in the absence of moderator and in the presence of moderator (demographic factors) respectively with pseudo R2 (Cox & Snell R-Square and Nagelkerke R-square) values of .247to 0.363 for model 1 and 0. .278 to 0.408 for model 2, respectively.

The model classification table output (Table 4.21) shows significant improvement of both models with the explanatory variable, CHL. The classification rate for the two models increased by 5.3% to 79.6% for model 1 without a moderator and 6.6% to 80.9% in model 2 in the presence of a moderator. Results of this study**,** as displayed in Table 4.22, further shows that for every unit of CHL, the value of doctor-patient communication among HIV/AIDS patients in Homa Bay county changed by up to 1.798, underscoring the important role of CHL in doctor-patient communication. Hosmer and Lemeshow test confirmed that communicative health literacy had had a significant positive influence on doctor-patient communication among HIV/AIDS patients in HomaBay county, p-values of 0.103 and 0.24 without a moderator in the presence of a moderator, respectively.

Table 4.20: Omnibus Tests of Model Coefficients for CHL

Model 1 (Absence of Moderator)				
		Chi-square	**df**	**Sig.**
Step 1	Step	108.975	1	.000
	Block	108.975	1	.000
	Model	108.975	1	.000

Model 2 (Presence of Moderator)				
		Chi-square	**df**	**Sig.**
Step 1	Step	125.071	2	.000
	Block	125.071	2	.000
	Model	125.071	2	.000

Model Summary for Communicative health literacy

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	329.365[a]	.247	.363
2	313.270[a]	.278	.408

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 4.21: Classification Table 2 for CHL

Model 1 without moderator					
	Observed		Predicted doctor Patiant communication among HIV/Aids Patients		Percentage correct
			Not effective	Effective	
Step 0	doctor Patient communication among HIV/Aids Patients	Not effective	42	51	45.5
		Effective	23	246	91.1
	Overall percentage				79.6
Model 2 with moderator					
	Observed		Predicted doctor Patiant communication among HIV/Aids Patients		Percentage correct
			Not effective	Effective	
Step 0	doctor Patiant communication among HIV/Aids Patients	Not effective	46	47	49.5
		Effective	22	247	91.9
	Overall percentage				**80.9**

a. Constant is included in the model.

b. The cut value is .500

Table 4.22: Variables Equation Table for CHL

Model 2 Without moderator

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Communicative health literacy	1.798	.214	70.930	1	.000	6.040
	Constant	-5.709	.780	53.501	1	.000	.003

a. Variable(s) entered on step 1: X_4.

Model 1 With moderator

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Communicative health literacy	1.126	.261	18.591	1	.000	3.082
	Communicative health literacy Z	1.661	.428	15.047	1	.000	5.263
	Constant	-8.514	1.122	57.579	1	.000	.000

a. Variable(s) entered on step 1: Critical health literacy , Critical health literacy

Table 4.23: Hosmer and Lemeshow Test

Model 1 Without moderator	Step 1	**Chi-square**	**df**	**Sig.**
		13.271	8	.103
Model 2 With moderator	Step 1	**Chi-square**	**df**	**Sig.**
		10.374	8	.240

The finding of this study clearly illustrates that CHL had a significant and positive influence on doctor-patient communication among HIV/AIDS patients in Homa Bay County. Indeed, for every unit of CHL, the value of doctor-patient communication among HIV/AIDS patients in Homa Bay county changed by up to 1.798. CHL consists of superior level communicative and social skills necessary for the extraction and utilization of information in health environment, making patients self-confident in taking actions independently on advice given and interacting with ease within the health care system. It's therefore not surprising that many studies, just like this study, have found a significant association between CHL and health outcomes, especially in the context of chronic health conditions like HIV/AIDS (Shonna Yin, 2017; Heijmans et al., 2015; Couture et al., 2017).

4.7.3 Critical health literacy and doctor-patient communication among HIV/AIDS patients

The study then investigated the influence of Critical Health Literacy (CRHL) on doctor- patient communication with a null hypothesis that there was no significant influence of CRHL on doctor- patient communication among HIV/AIDS patients in Homa Bay county, Kenya. The logistic regression between CRHL and doctor-patient communication was performed. Table 4.24 below illustrates the findings for Block 0, which again demonstrated that majority of the respondents were in the opinion that doctor-patient communication among HIV/AIDS patients in Homa Bay county was effective.

Block 0: Beginning Block

Table 4.24: Classification Table 1 for CRHL

	Observed		**Predicted doctor Patiant communication among HIV/Aids Patients**		**Percentage correct**
			Not effective	Effective	
Step 0	Doctor Patiant communication among HIV/Aids Patients	Not effective	0	93	.0
		Effective	0	269	100
	Overall percentage				**74.3**

Constant is included in the model.
The cut value is .500

Table 4.25: Variables in the equation for CRHL

Variables in the Equation for Critical health literacy

		B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
Step 0	Constant	1.06194	.117	82.149	1	.000	2.892

Further results shown in Block 1 Table 4.26 below illustrate that there was a

significant relationship between the dependent variable (doctor-patient communication among HIV/AIDS patients) and the independent variable, CRHL with p = 0.000. The two pseudo R^2 (Cox & Snell R-Square and Nagelkerke R-square) values of 0.270 to 0.397 for model 1 and 0.314 to 0.461 for model 2 further suggested that 27.0% to 39.7% and 31.4% to 46.1% of the variation in doctor-patient communication among HIV/AIDS patients in Homa Bay county was explained by CRHL for the model in block 1 in the absence of moderator and in the presence of moderator respectively as illustrated in Table 4.26 below.

Compared to the block 0 results, the inclusion of predictor variable in Block 1 increasedthe classification rate by 1.7% to 75.8% for model 1 (absent of moderator) and 6.9% to 81.2% that 81.2 in the presence of a moderator. The model with the moderator (demographic factors) again proved to be a better model than the model without a moderator (model 1), as was the case with the other two previous objectives.

Block 1: Method = Enter

Table 4.26: Omnibus Tests of Model Coefficients for CRHL

Model 1 (Absence of Moderator)				
		Chi-square	**df**	**Sig.**
Step 1	Step	120.720	1	.000
	Block	120.720	1	.000
	Model	120.720	1	.000
Model 2 (Presence of Moderator)				
		Chi-square	**df**	**Sig.**
Step 1	Step	144.239	2	.000
	Block	144.239	2	.000
	Model	144.239	2	.000

Model Summary for Critical health literacy

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	317.024[a]	.270	.397
2	293.505[a]	.314	.461

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 4.27: Classification Table 2 for CRHL

Model 1 without moderator					
	Observed		Predicted doctor Patient communication among HIV/Aids Patients		Percentage correct
			Not effective	Effective	
Step 0	Doctor Patient communication among HIV/Aids Patients	Not effective	21	72	22.5
		Effective	15	254	94.4
	Overall percentage				**76.0**
Model 2 with moderator					
	Observed		Predicted doctor Patient communication among HIV/Aids Patients		Percentage correct
			Not effective	Effective	
Step 0	Doctor Patient communication among HIV/Aids Patients	Not effective	48	45	51.5
		Effective	23	246	91.5
	Overall percentage				**81.2**

a. Constant is included in the model.

b. The cut value is .500

Table 4.28: Variables in the Equation for CRHL

Model 2 Without moderator

		B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
Step 1[a]	Critical health literacy	2.501	.366	46.642	1	.000	12.198
	Constant	-6.254	1.042	36.062	1	.000	.002

a. Variable(s) entered on step 1: X_4.

Model 1 With moderator

		B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
	Critical health literacy	1.306	.464	20.436	1	.005	1.358
Step 1[a]	Critical health literacy Z	2.707	.581	21.678	1	.000	14.987
	Constant	-7.982	1.009	62.602	1	.000	.000

a. Variable(s) entered on step 1: Critical health literacy, Critical health literacy *Z.

Table 4.29: Hosmer and Lemeshow Test

Model 1 Without moderator	Step 1	**Chi-square**	**df**	**Sig.**
		8.164	8	.418
Model 2 With moderator	Step 1	**Chi-square**	**df**	**Sig.**
		3.348	8	.911

Nutbean (2009) described CRHL as very advanced cognitive abilities that, in combination with social skills, can be utilized to analyze information in a critical way and to apply this information to attain bigger control over life occasions and circumstances. Patients with adequate CRHL skills are characterized by self-confidence to act independently on advice and interact successfully with the health care system and providers. This could explain why this study found a significant positive relationship between CRHL and doctor-patient communication, similar to other studies comparing health literacy to various health outcomes (Heijmans et al., 2015; Shonna Yin, 2017; Couture et al., 2017).

Nonetheless, previous studies have found varied results concerning which health literacydomain has the greatest influence on health outcomes. The study by Heijmans et al. (2015), for example, concluded that communicative had the strongest correlations with all health outcome measures, followed by critical health literacy and functional health literacy. However, this study found critical health literacy as, by far, superior to the twoother domains of health literacy. The variation could partly be due to different health literacy measurement scales currently in use, coupled with the fact that most of these other studies involved mainly hypertensive and diabetic patients, not HIV/AIDS as in our case. Further, well organized HIV/AIDS support group networks and high concentration of civil societies and NGOs operating in Homa Bay county may be credited with empowering the patients to advocate for their health.

4.8 Multivariate Regression Analysis

Multiple regression analysis is a statistical method used to predict the value of a dependent variable based on the values of two or more independent variables. Multiple logistic regression model was performed to determine the influence of all

the independent variables in this study namely FHL, CHL and critical health literacy on thedependent variable which was doctor-patient communication among HIV/AIDS patients in Homa Bay County, Kenya. The overall models without moderator and with moderator for the study were:-

$$Y = \ln\left(\frac{1}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e \qquad \text{and}$$

$$Y = \ln\left(\frac{1}{1-p}\right) = \beta_0 + \beta_1 X_1 * Z + \beta_2 X_2 * Z + \beta_3 X_3 * Z + e$$

where:

Y = Doctor patient communication among HIV/AIDS patients

X_1 = Functional health literacy

X_2 = Communicative health literacy

X_3 = Critical health literacy

Z = Demographic factors (ModeratorX)

Just like simple logistic regression discussed in the previous sections, the omnibus tests model coefficients in Table 4.30 gives the results of the overall model after inclusion of independent variables in Block 1. The findings show that there was significant contribution of the independent variables both in the absence and in the presence of moderating factors. This was supported by goodness of fit values which indicated that all the p-values (sig) were smaller than 0.05 (0.00<0.05) suggesting that there was a significant improvement to the Block 0 model. Because of these facts, it was concluded that functional health literacy, communicative health literacy and critical health literacy had a significant effect on doctor patient communication among HIV/AIDS patients in Homa Bay County, Kenya more so when moderating factors were included.

The model Summary table suggest that Cox & Snell R-Square and Nagelkerke R-Square values were .375 and 0.549 respectively in the absence of moderators suggesting that 37.5% to 54.9% of Doctor patient communication among HIV/AIDS patients in Homa Bay county, Kenya was explained by the independent variables. Similarly, Cox & Snell R-Square and Nagelkerke R-Square values in the presence of moderators (demographic factors) were: 0.428 to 0.603 for age, 0.503 to 0.739 for

gender and 0.518 to 0.762 for marital status as moderators. All these values were reflecting significance improvement in the models when the moderators were included. Table 4.30 illustrate these findings.

In the classification table 4.31 for explanatory variables, it was also noted that the correct percentage values for functional health literacy, Communicative health literacy, and critical health literacy rate had increased from 74.2 % in block 0 to 86.2% in block 1 when moderating factors were not present and 74.2% to 87.6%, 74.2% to 90.3% and 74.2% to 91.2% when moderating factors age, gender and marital status were included as moderating factors. The output also suggest that there was significant improvement on Block 0 in instances where there was no moderator and even more improvement in the presence of moderators (demographic factors)

The findings based on Variables in the Equation for all Explanatory Variables table 4.32, suggest that there was positive and significant influence of the independent variables Functional health literacy, communicative health literacy, critical health literacy on doctor patient communication among HIV/AIDS patients. The model was expressed as $Y=-14.222+2.238X_1+ 1.297X_2+1.603X_3$ .The regression coefficient of 2.238, 1.297, 1.603, indicates that an increase in Functional health literacy, communicative health literacy and critical health literacy by 1unit leads to an increase in doctor patient communication among HIV/AIDS patients by 2.238, 1.297, 1.603, units respectively. In the presence of moderating factors age, gender and marital status, the models obtained were: - $Y= 16.912+5.414\ X_1$*Age+ $7.609X_2$*Age+ $4.502X_3$*Age, $Y= 13.60+4.541X_1$*Gender+ $1.687X_2$*Gender+ $0.660X_3$*Gender and $Y= 12.01+3.224\ X_1$*Marital Status+ $5.212X_2$*Marital Status+ $4.842X_3$*Marital status respectively. The estimates of the coefficients in the presence of moderators also indicated that there was positive influence of independent variables on the dependent variable dependent variable (Doctor patient communication among HIV/AIDS patients in Homa Bay County, Kenya).

Hosmer and Lemeshow test statistics employed to assess the goodness of fit for the overall logistic regression model clearly indicated that the overall regression models

were good. This was for both models where moderator was absent and where the moderator was present. These finding were supported by p-values of 0.204 for model 1 (without moderator) and 0.464, 0.411 and 0.321 for model 2 where age, gender and marital status were included as moderating factors. Clearly all the p-values were greater than the conventional p-value of 0.05 thus, based on this Hosmer and Lemeshow test statistics values it was concluded that all the models were fit. Besides that, the wald-statistics based on these models also indicated that every predictor variable had a significant influence dependent variable (Doctor patient communication among HIV/AIDS patients in Homa Bay County, Kenya). The table 4.33 gives the details of the findings.

Table 4.30: Omnibus Tests of Model Coefficients for Explanatory Variables

Model 1	**Absence of Moderator**	**Chi-square**	**Degree of freedom**	**Sig.**
	Step	176.501	3	.000
Step 1	Block	176.501	3	.000
	Model	176.501	3	.000
Model 2	**Presence of Moderator (age)**			
	Step	190.729	3	.000
Step 1	Block	190.729	3	.000
	Model	190.729	3	.000
Model 2	**Presence of Moderator (gender)**			
	Step	252.934	3	.000
	Block	252.934	3	.000
	Model	252.934	3	.000
Model 2	**Presence of Moderator (Marital Status)**			
	Step	264.423	3	.000
	Block	264.423	3	.000
	Model	264.423	3	.000

Model Summary for Explanatory Variables

Step	-2 LogCox & Snell R Square	Nagelkerke R Square
	likelihood	
1. Model with No moderator	254.940[a]	.375	.549
2. Model with moderator (Age)	240.711[a]	.428	.603
3. Model with moderator (Gender)	159.598[a]	.503	.739
4. Model with moderator (Marital Status)	148.109[a]	.518	.762

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 4.31: Classification Table 2 for Explanatory Variables

Block 0: Beginning Block					
	Observed		Predicted doctor Patient communication among HIV/Aids Patients		Percentage correct
			Not effective	Effective	
Step 0	Doctor Patient communication among HIV/Aids Patients	Not effective	0	93	.0
		Effective	0	269	100.0
	Overall percentage				**74.2**
Model 1 without moderator					
	Observed		Predicted doctor Patient communication among HIV/Aids Patients		Percentage correct
			Not effective	Effective	
Step 0	Doctor Patient communication among HIV/Aids Patients	Not effective	62	31	66.7
		Effective	19	250	92.9
	Overall percentage				**86.2**
Model 2 with moderator(age)					
			Not effective	Effective	
Step 0	Doctor Patient communication among HIV/Aids Patients	Not effective	67	26	72.0
		Effective	19	250	92.9
	Overall percentage				**87.6**
Model 2 with moderator(Gender)					
			Not effective	Effective	
Step 0	Doctor Patient communication among HIV/Aids Patients	Not effective	76	17	81.7
		Effective	18	251	93.3
	Overall percentage				**90.3**
Model 2 with moderator(Marital Status)					
			Not effective	Effective	
Step 0	Doctor Patient communication among HIV/Aids Patients	Not effective	76	17	81.7
		Effective	15	254	94.4
	Overall percentage				**91.2**

a. Constant is included in the model.
b. The cut value is .500

Table 4.32: Variables in the Equation for Predictor Variables

		B	S.E.	Wald	df	Sig.	Exp (B)
Model 2 Without moderator							
Step 1[a]	Functional health literacy	2.238	.445	25.279	1	.000	9.374
	Communicative health literacy	1.297	.341	14.435	1	.000	3.659
	Critical health literacy	1.603	.321	25.011	1	.000	4.970
	Constant	-14.22	1.778	63.954	1	.000	.000

Variable(s) entered on step 1: Functional health literacy, Communicative health literacy, and critical health literacy

		B	S.E.	Wald	df	Sig.	Exp(B)
Model 1 With moderator(age)							
Step 1[a]	Functional health literacy*age	5.414	1.129	22.985	1	.000	224.51
	Communicative health literacy *age	7.609	2.106	13.058	1	.000	201.77
	Critical health literacy *age	4.502	2.239	11.702	1	.001	198.67
	Constant	16.912	2.096	65.099	1	.000	.000

Variable(s) entered on step 1: Functional health literacy * age, Communicative health literacy* age and Critical health literacy * age

		B	S.E.	Wald	df	Sig.	Exp(B)
Model With moderator(Gender)							
Step 1[a]	Functional health literacy*Gender	4.541	.591	59.050	1	.000	93.805
	Communicative health literacy *Gender	1.687	.482	12.267	1	.000	5.4040
	Critical health literacy*Gender	.660	.317	4.324	1	.038	1.9350
	Constant	13.60	1.828	55.359	1	.000	0.0000

Variable(s) entered on step 1: Functional health literacy * Gender, Communicative health literacy* Gender and Critical health literacy * Gender

		B	S.E.	Wald	df	Sig.	Exp(B)
Model 1 With moderator(Marital Status)							
Step 1[a]	Functional health literacy*Marital Status	3.224	.934	11.919	1	.001	00.0400
	Communicative health literacy * Marital Status	5.212	1.005	26.868	1	.000	183.370
	Critical health literacy * Marital Status	4.842	.675	51.388	1	.000	126.755
	Constant	12.010	1.709	49.391	1	.000	.000

Variable(s) entered on step 1:Functional health literacy*Marital Status, Communicative health literacy* Marital Status and Critical health literacy*Marital Status

Table 4.33: Hosmer and Lemeshow Test

Model 1 Without moderator	Step 1	**Chi-square**	**df**	**Sig.**
		10.955	8	.204
Model 2 With moderator(age)	Step 1	**Chi-square**	**df**	**Sig.**
		9.762	8	.464
Model 1 With moderator(Gender)	Step 1	**Chi-square**	**df**	**Sig.**
		9.622	8	.411
Model 2 With moderator(Marital Status)	Step 1	**Chi-square**	**df**	**Sig.**
		9.255	8	.321

From the above finding, it can be concluded that even though both functional health literacy, communicative health literacy and critical health literacy all had positive significant influence on doctor-patient communication, the most preferred models was when moderating factors were included in the model. The finding of this study contradicts those by Reisi et al. (2016), which found that communicative health literacy showed the strongest correlations with outcome measures, followed by critical health literacy. Additionally, Passamai, Sampaio,Iorio Dias, & Cabra (2012) in their cross-sectional study on association of health literacyand health outcomes, found out that critical health literacy made a significant contribution to perceived knowledge, active role in treatment, general self-management and confidence in medical consultations as compared to other domains of health literacyamong patients with chronic illness.

Given that critical health literacy is defined as the cutting edge intellectual capabilities which, combined with social abilities, can be applied to critically analyze health information, and utilize this data to exert greater control over different circumstances (Nutbean, 2009), it is not surprising that this study found the strongest relationships between critical communicative health literacy and doctor patient communication in Homa Bay county.

The health literacy scale adopted from Ishikawa, Takeuchi, & Yano (2008) and used in this study includes many items about social and life skills that creates an all-round patient able to match the dynamics of our healthcare system. According to Sykes, Wills, Rowlands, & Popple (2013) critical health literacy includes advanced personal

and socialskills, (health) knowledge, information skills, effective interaction between service providers and users, informed decision making and empowerment including political actions. In that way, the broad definition of Sykes may better fit the reality of daily livingwith a chronic disease like HIV/AIDS.

Finally, confidence to demand what is right in the healthcare environment which could partly be due to high concentration of health NGOs in Homa Bay country and which waslikely to be enhanced most from critical health literacy skills, was useful in improving doctor-patient communication as was released by the findings of this study.

4.9 Hypothesis testing

Based on the three null hypotheses which were proposed by the study, the results of study demonstrated that all the predictor variables; functional health literacy, communicative health literacy and critical health literacy had significant positive influence on doctor-patient communication among HIV/AIDS patients in Homa Bay County as shown on Tables 4.34 and 4.35 below. Therefore, all the null hypotheses were rejected.

Table 4.34: Regression Coefficient in the absence of moderator

No	Hypotheses	W-value	P- value	Decision
1.H_0	Functional health literacy has no influence on Doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya.	25.279	.000	Reject **H_0**
2. H_0	Communicative health literacy has no influence on Doctor patient communication among HIV/AIDS patients in Homa Bay county, Kenya.	14.435	.000	Reject **H_0**
3.H_0	Critical health literacy has no influence onDoctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya.	25.011	.000	Reject **H_0**

Table 4.35: Regression Coefficient in the presence of moderator

No	Hypotheses	w- value	P- value	Decision
1.H_0	Functional health literacy has no influence on Doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya.	4.494	.034	Reject **H_0**
2. H_0	Communicative health literacy has no influence on Doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya	9.887	.002	Reject **H_0**
3.H_0	Critical health literacy has no influence on Doctor-patient communication among HIV/AIDS patients in Homa Bay ounty, Kenya	42.396	.000	Reject **H_0**

4.10 Optimal Model

This study had the main objective of establishing how functional health literacy, communicative health literacy and critical health literacy influence doctor-patient communication among HIV/AIDS patients in Homa Bay County, Kenya. It looked at the moderating role of patients demographic factors in doctor-patient communication in the context of HIV/AIDS patients. Several tests done and described in the previous sections of this thesis have all but confirmed that independent variables and the moderator (demographic factors) all had an influence on the dependent variable. This was further confirmed by two pseudo R2 square values, Cox & Snell and Nagelkerke which were higher in the presence of the moderator compared to an inferior situation when the moderator was omitted. Consequently, the existing model as presented in the conceptual framework, is hereby retained as the optimal model, shown on figure 4.1

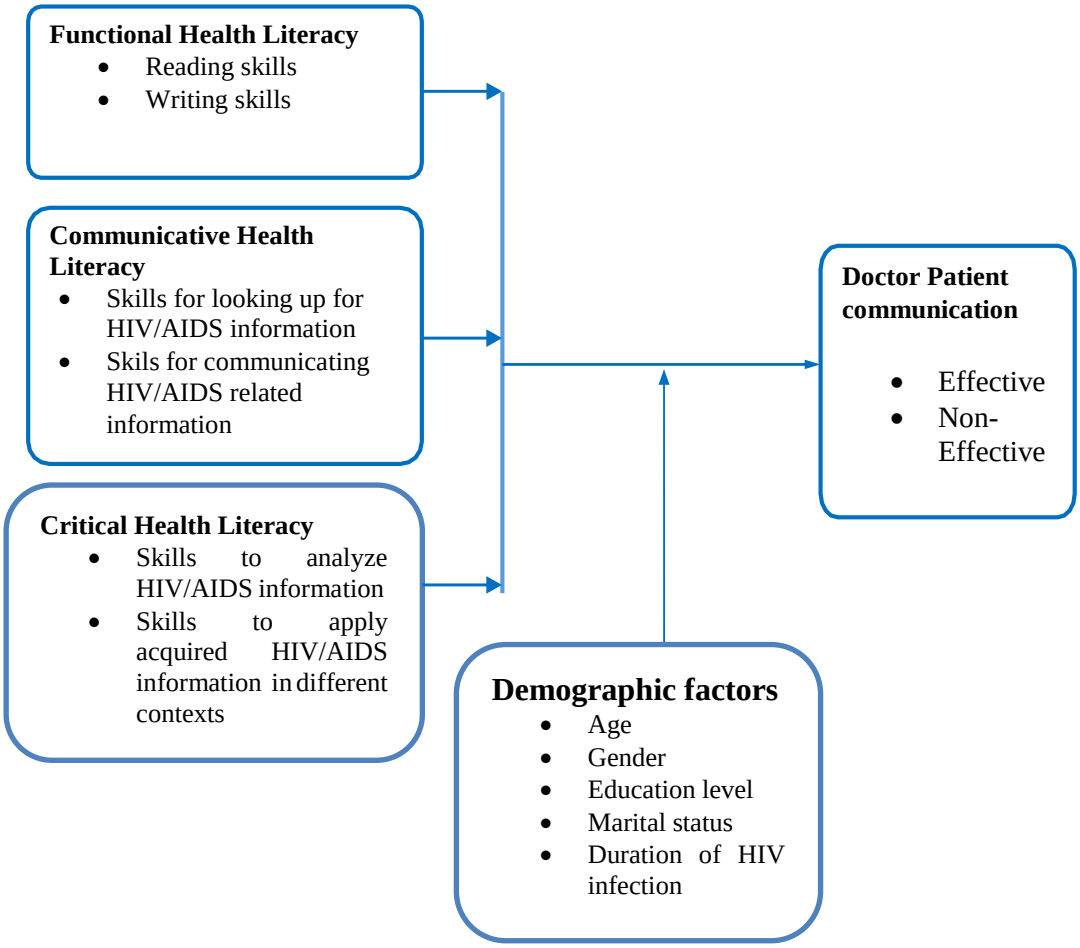

Figure 4.1: The optimal model

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This Chapter summarizes the key findings of the study, conclusions and recommendations for various stakeholders. The main objective of this study was to determine the influence of health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay County, Kenya. The following are the breakdown of the major findings guided by the specific research objectives.

5.2 Summary of the major findings

5.2.1 The influence of functional health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya.

The study's first objective was to determine the influence of functional health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay county. Both descriptive and inferential statistics were used to arrive at the findings. Descriptive statistics showed that the level of functional health literacy among the study respondents was inadequate and the least significant in its effect on doctor-patient communication compared to other domains of health literacy. Further, most of the respondents found thegreatest challenge in reading and understanding appointment cards and filling in medicalforms. These findings were consistent with the majority of studies previously conductedin the field of health literacy, most of which also found inadequate level of functional health literacy among study respondents.

Although inferential statistics showed that functional health literacy had a significant positive influence on doctor-patient communication, it had the least Nagelkerke R

Square value compared to communicative and critical health literacy. The literature review showed that most studies found a significant relationship between functional

health literacy and doctor-patient communication and other health outcomes. Similarly, most studies that have compared the influence of the three domains of health literacy on various health outcomes also found functional health literacy as having the least influence.

5.2.2 The influence of communicative health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya.

The second objective of the study was to determine the influence of communicative health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay county. The descriptive statistics results showed that the level of communicative health literacy, just like functional health literacy described above, was inadequate. Thestudy also found out that only a few respondents took time to look for HIV/AIDS-relatedinformation, and even when they did so, only a handful obtained such desired information. This study's findings are largely in agreement with several similar studies that have consistently found communicative health literacy to be inadequate.

This study also revealed that communicative health literacy had a significant positive influence on doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya. This influence was, however, slightly subordinate to critical health literacy in this study. The literature review shows that previous studies are almost unanimously in support of this study's findings regarding the positive influence of communicative health literacy on health outcomes, including doctor-patients' communication.

5.2.3 The influence of critical health literacy on doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya.

Another objective of the study was to establish the influence of critical health literacy on doctor patient communication among HIV/AIDS patients in Homa Bay county, Kenya. Descriptive statistics revealed that unlike the other two domains of health literacy described above, the level of critical health literacy was found to be adequate among the respondents in this study. In general, respondents scored highly in most critical health literacy items. To a large extent, our findings have contradicted

findings from other studies conducted in the area of health literacy that found out that respondents experienced most difficultly in items reflecting critical health literacy, including judgingthe credibility of health information.

Inferential statistics revealed that critical health literacy had a significant positive influence on doctor-patient communication among HIV/AIDS patients in Homa Bay county. Compared to other health literacy domains, critical health literacy had the greatest influence on doctor-patient communication in this study as it posted the highest Cox & Snell and Nagelkerke R square values. A good number of previous studies foundcommunicative health literacy to have the strongest correlations with all outcome measures, followed by critical health literacy. This was contrary to our study which found communicative health literacy as subordinate to critical health literacy. The difference could be because most of these studies were conducted among diabetic and hypertensive patients compared to our study where the respondents were people living with HIV/AIDS.

5.2.4 The moderating influence of patients' demographic factors on doctor-patient communication among HIV/AIDS patients in Homa Baycounty, Kenya

In this study, the patients surveyed rated the quality of doctor-patients' communication as effective. This was in agreement with other previous studies where most of the participants indicated that healthcare providers were very good and treated them with warmth, sympathy and were impressed with the way healthcare providers were communicating with them. Several other studies conducted on doctor-patient communication have, however, established that patients disapproved of communication between them and their doctors, contradicting this study's findings.

The positive approval of doctor-patient communication in this study might have been contributed partly by the fact that most of the patients interviewed had been living withHIV infection for a longer duration, making them conversant with most of their healthcare providers. This is also consistent with social penetration theory, which proposes that as relationships grow, communication between two individuals moves from relatively shallow, non-intimate tiers to deeper, greater intimate ones. The

demographic factors were found to have a significant positive moderating influence on doctor patient communication as their inclusion in model 2 of Block 1 in logistic regression proved to be a superior model compared to a model without the moderating variables. Males, older patients, patients with higher education levels, and those who hadhad HIV/AIDS infection for a longer duration enjoyed a better doctor-patient's communication experience in this study.

5.3 Conclusions

The finding showed that the level of functional health literacy among the study respondents was inadequate and the least compared to other domains of health literacy. Further, most of the respondents found the greatest challenge in reading and understanding appointment cards and filling in medical forms. Additionally, the study revealed that functional health literacy had a significant positive influence on doctor- patient communication, albeit inferior compared to both communicative and critical health literacy. Therefore, when patients' functional health literacy is improved, doctor- patient communication, which is a precursor for positive health outcomes, also improves. Positive patients experience can be improved by writing medical information in easy toread and understand format.

This study's findings demonstrated inadequate levels of communicative health literacy among HIV/AIDS patients in Homa Bay county. The study also found out that only a few respondents took time to look for HIV/AIDS-related information, and even when they did so, only a handful obtained such desired information. Further, this study revealed that communicative health literacy had a significant positive influence on doctor-patient communication among HIV/AIDS patients in Homa Bay county, Kenya. This influence was, however, slightly subordinate to critical health literacy in this study. Communicative health literacy contains superior level communicative and social skills that are necessary for the extraction and utilization of information in the health environment, making patients self-confident in taking actions independently on advice given and interact with ease within the health care system. Increase in communicative health literacy among patients would go a long way in enhancing the capacity of patients to operate effectively in an ever dynamic

healthcare environment.

This study's findings revealed that unlike the other two domains of health literacy, the level of critical health literacy was found to be adequate among the respondents in this study. In general, respondents scored highly in most critical health literacy items. Inferential statistics further illustrated that critical health literacy had a significant positive influence on doctor-patient communication among HIV/AIDS patients in Homa Bay county. Compared to other domains of health literacy, critical health literacy had the greatest influence on doctor-patient communication in this study. Critical health literacy is more advanced cognitive skills that, together with social skills, can be applied to critically analyze health information and use this information to exert greater controlover life events and situations. It implies acting as a person or a group to improve health through the political framework or social activism. The adequate level of critical healthliteracy in Homa Bay county might be due to many NGOs and civil society organizations conducting health promotion activities in the country. Therefore, their actions should besustained.

In this study, the patients surveyed rated the quality of doctor-patients' communication as effective. Doctor-patient communication's positive approval is thought to be contributed to by deeper, greater intimate relationships developed during the long interaction period as majority of respondents had had HIV infection for many years. Male patients, older patients, patients with higher education levels, and those who had had HIV/AIDS infection for a longer duration enjoyed a better doctor-patient's communication in this study. The demographic factors were found to have a significantpositive moderating influence on doctor- patient communication.

5.4 Recommendations of the study

This study gives several recommendations to various stakeholders involved in day to dayprovision of healthcare to patients, people living with HIV/AIDS, policymakers, and researchers.

5.4.1 Recommendations to People Living with HIV/AIDS

This study has concluded that critical health literacy, in particular, is a major prerequisite for effective doctor-patient communication in HIV/AIDS. Critical health literacy is acquired mainly through empowerment-based capabilities, where members become enlightened on issues, take part in important dialogue and take an interest in decision making for the sake of their health. Therefore, encouraging people living with HIV/AIDS to form or join existing networks and support groups is highly recommended. This will create more avenue for patients, acting as an individual or in a group to improve health.

5.4.2 Recommendations to Health professionals

The result of this study has clearly illustrated that the majority of HIV/AIDS patients have inadequate functional and communicative health literacy. Poor health literacy among patients is a major barrier to effective patient healthcare provider communication. Effective health provider patient communication can bridge this gap and provide meaningful consultation experience to low-health literate patients. Even though in general, doctor-patient communication was described as effective in this study, majority of the respondents were concerned that their doctor was taking too fast, seldom used pictures or drawings or models to explain issues and doctor's use of medical words that were difficult to understand, all of which complicate matters especially to a low health literate patient. This study, therefore, recommends reequipping healthcare providers with effective doctor-patients' communication skills. Such training should also focus on providers' skills to identify patients with inadequate health literacy who may require special consideration, including taking more time with them and avoiding medical jargons.

5.4.3 Recommendations to Policymakers

In this study, young people were more likely to describe doctor-patient interaction as non-effective compared to their older counterparts. Youth-friendly HIV/AIDS services, which are tailored to suit young people's unique demands, should, as a policy issue, be availed at every facility that is offering HIV/AIDS services.

Secondly, posters used to convey health messages, medical forms and appointment cards used in the hospital should be designed and written in a language that is easy to read and understand.

5.4.4 Recommendations for scholars and academicians

First, this research was a correlational study, and as such, causation could not be established. The study, therefore, recommends an experiment be conducted with different groups, one with adequate health literacy and another group with inadequate health literacy, for a causal-effect relationship to be established between health literacy and doctor-patient communication.

Second, the study concluded that the level of functional and communicative health literacy was inadequate. In doing so, the study relied on health literacy scales developed elsewhere. Future research is recommended to develop and validate a health literacy measurement scale that considers the local context.

The study revealed that most of the respondents were concerned that their doctor was taking too fast, seldom used pictures or drawings or models to explain issues, and doctor's use of medical words that were difficult to understand. Further, respondents found the greatest challenge in reading, understanding appointment cards and filling in medical forms. In some parts of the world, these medical forms, appointment cards andhealth messages are generally designed at fifth-grade literacy levels. A study on appropriate literacy levels to design our health messages, considering the local health literacy levels and context, is therefore of high priority

Finally, study considered five factors as demographic variable which were combined as a single moderating variable ignoring the individual influence of each of them on the model. So, the study recommends that further insights to be conducted on how each of the demographic factors acts as moderating variable on health literacy and doctor patient communication among HIV/AIDS patients in Homabay County Kenya.

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APPENDICES

Appendix I: Questionnaire

STUDY TOPIC: HEALTH LITERACY AND DOCTOR-PATIENT COMMUNICATION

Instruction

The following are statements about how people express their concerns on communication with their doctors and utilization of healthcare services in general. There are no right or wrong responses. Some of the items may sound similar, but they pertain to slightly different issues.

Please respond to all items.

SECTION A: FUNCTIONAL HEALTH LITERACY						
Considering how your experience while seeking healthcare services has been, indicate your degree of agreement with each statement by placing tick ( ) in the spaces to the right of each item		**Never**	**Rarely**	**Occasionally**	**Regularly**	**Always**
1.	How often are appointment cards written in a waythat is easy to read and understand?					
2.	How often are medical forms difficult to understand and fill out?					
3.	How often do you have difficulty understanding written information your health care provider givesyou?					
4.	How often do you have problems learning about your medical condition because of difficulty in understanding written information?					
5.	How often do you have someone (like a family member, friend, hospital/clinic worker, or caregiver)help you read hospital materials?					
6.	How often are you confident filling out medical forms by yourself?					
7.	How often are you confident following the instructions on the label of a medication bottle/packet?					

SECTION B: COMMUNICATIVE HEALTH LITERACY						
Considering how your experience in managing your condition has been, kindly indicate your degree of agreement with each statement by placing tick ( )inthe spaces to the right of each item		**Never**	**Rarely**	**Occasionally**	**Regularly**	**Always**
8	Since being diagnosed with HIV, how often do youcollect HIV/AIDS related information from various sources?					
9	Since being diagnosed with HIV, how often have you obtained HIV/AIDS related information that youwanted?					
10	Since being diagnosed with HIV, how often haveyou understood the obtained HIV/AIDS related information?					
11	Since being diagnosed with HIV, how often have you applied the obtained information to your daily life?					
12	Since being diagnosed with HIV, how often have you communicated your thoughts about your illnessto someone else?					
SECTION C: CRITICAL HEALTH LITERACY						
Considering how your interaction with your doctor has been, indicate your degree of agreement with each statement by placing tick ( )in the blank to the right of each item		**Never**	**Rarely**	**Occasionally**	**Regularly**	**Always**
13	Since being diagnosed with HIV, how often have you considered whether the information given to byhealthcare provider is applicable to your situation?					
14	Since being diagnosed with HIV, how often have you considered the credibility of the informationgiven to you by your doctor?					

15	Since being diagnosed with HIV, how often have you checked whether the information given by your doctor was valid and/or reliable?					
16	Since being diagnosed with HIV, how often haveyou collected information to make health-related decisions					
SECTION D: DOCTOR- PATIENT COMMUNICATION						
Considering how your interaction with your doctorhas been, indicate level of frequency by which youexperience the different aspects of communicationdenoted by each statement below by placing tick ( ) in the spaces to the right of each item		**Never**	**Rarely**	**Occasionally**	**Regularly**	**Always**
17	How often does your doctor listen carefully to you?					
18	How often does your doctor explain your health concerns in a way that is easy to understand?					
19	How often does your doctor give you easy to understand instructions about taking care of your health problems?					
20	How often does your doctor seem to know the important information about your health problems?					
21	How often does your doctor show respect for what you tell him/her?					
22	How often does your doctor spend enough time with you?					
23	How often does your doctor use medical words that you do not understand?					
24	How often does your doctor talk too fast when talking with you?					
25	How often does your doctor use pictures or drawings or models to explain issues to you?					
26	How often does your doctor give you easy to understand instructions about how to take your medicines?					
27	How often does your doctor explain the possible side effects of your medicines?					

28	How often does your doctor explain medication side effects in a way that is easy to understand?					
29	How often does your doctor suggest ways to help you remember to take your medicines?					
30	How often does your doctor explain the results of your blood test, X-ray, or other laboratory tests in a way that is easy to understand?					
31	How often do you feel that your doctor cares about you as a person?					

SECTION E: DEMOGRAPHIC CHARACTERISTICS					
32	With what gender do you identify?	Male	Female	Others	
33	How old are you? (Indicate your age as at the last birth day)				
34	What is your marital Status?	Married	Divorced	Widowed	Single
35	What is the highest grade or level of school that youhave completed?	Class 8 or less	Some high school	High school completed	College/ University
36	Which year were you first diagnosed with HIV?				

Appendix II: Informed Consent

TO PARTICIPATE IN A RESEARCH STUDY

You are being asked to volunteer for a research study. Please read this form and ask any questions that you may have before agreeing to take part in this study.

Study Title: "Health Literacy and Doctor Patient Communication among HIV/AIDS patients in Homa Bay County, Kenya."

Principal Investigator: Dennis BUTTO

Contact Information: Jomo Kenyatta University of Agriculture and Technology, P.O Box 62000 – 00200 NAIROBI. Tel Number- 0724 352450

Purpose of the Research Study

The purpose of this study is to determine the influence of health literacy on doctor - patient communicationamong HIV/AIDS patients in Homa Bay county, Kenya.

Procedures

If you agree to be involved in this study, you will be asked to complete a 3-page survey questionnaire that examines how you have been handling your disease condition and your interaction with your health providers. This survey should take you approximately 20-30 minutes.

Risks and Benefits of Being in the Study

There are no foreseeable risks to participating in this study. The benefits to participation are: that you will be able to voice your opinion(s) anonymously on this subject, which can help tailor health services to people at various health literacy levels. Also, this study is important because it examines the communication skills of the health providers from the patient perspective.

Anonymity

Because you have not signed a sign-up sheet, or any other form that includes your name, your participation in this study is completely anonymous. Furthermore, because your survey will be combined with other surveys (approximately 384), your responses will be virtually impossible to separate from the other responses.

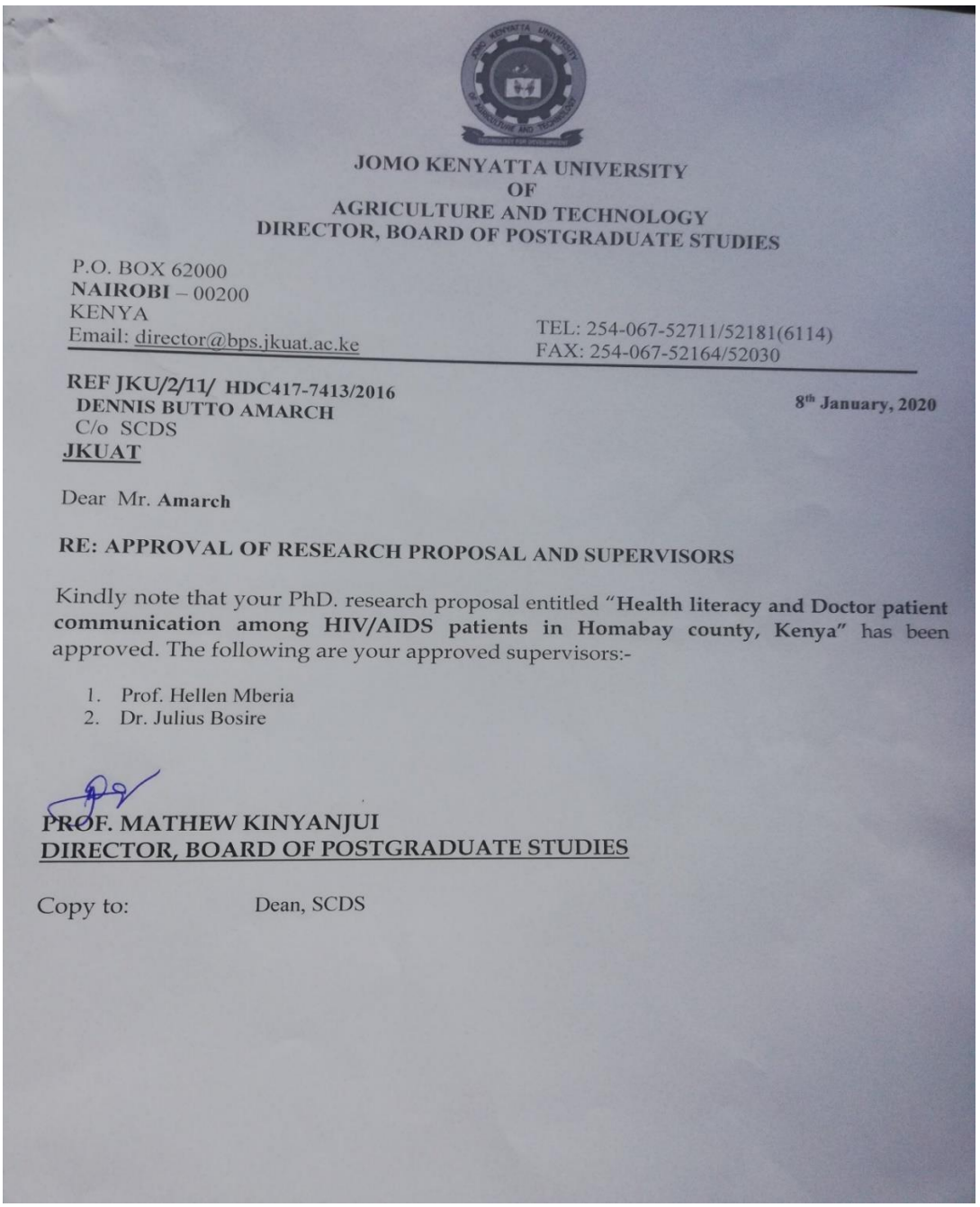
Voluntary Nature of the Study

Participation in this study is voluntary. Your decision whether or not to participate will not result in penalty or loss of benefits to which you are otherwise entitled. If you decide to participate, you are free to not answerany question or withdraw at any time.

Contacts and Questions

The researcher conducting this study can be contacted at buttoamach2010@gmail.com. You are encouraged to contact the researcher if you have any questions.

Appendix III: JKUAT BPS Approval



JOMO KENYATTA UNIVERSITY
OF
AGRICULTURE AND TECHNOLOGY
DIRECTOR, BOARD OF POSTGRADUATE STUDIES

P.O. BOX 62000
NAIROBI – 00200
KENYA
Email: director@bps.jkuat.ac.ke

TEL: 254-067-52711/52181(6114)
FAX: 254-067-52164/52030

REF JKU/2/11/ HDC417-7413/2016
DENNIS BUTTO AMARCH
C/o SCDS
JKUAT

8th January, 2020

Dear Mr. **Amarch**

RE: APPROVAL OF RESEARCH PROPOSAL AND SUPERVISORS

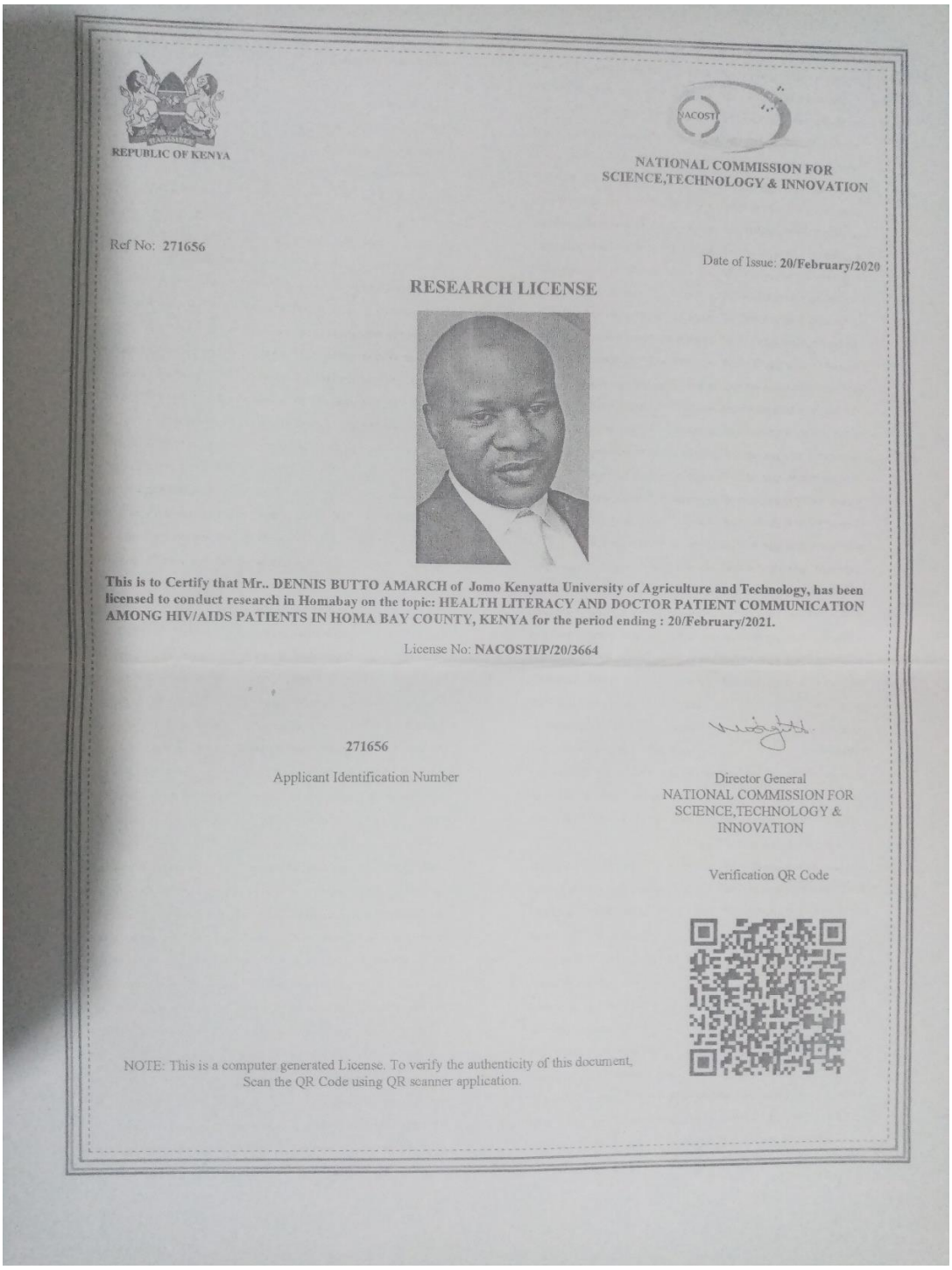
Kindly note that your PhD. research proposal entitled "**Health literacy and Doctor patient communication among HIV/AIDS patients in Homabay county, Kenya**" has been approved. The following are your approved supervisors:-

1. Prof. Hellen Mberia
2. Dr. Julius Bosire

PROF. MATHEW KINYANJUI
DIRECTOR, BOARD OF POSTGRADUATE STUDIES

Copy to: Dean, SCDS

Appendix III: NACOSTI Research Permit



REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 271656

Date of Issue: 20/February/2020

RESEARCH LICENSE

This is to Certify that Mr.. DENNIS BUTTO AMARCH of Jomo Kenyatta University of Agriculture and Technology, has been licensed to conduct research in Homabay on the topic: HEALTH LITERACY AND DOCTOR PATIENT COMMUNICATION AMONG HIV/AIDS PATIENTS IN HOMA BAY COUNTY, KENYA for the period ending : 20/February/2021.

License No: NACOSTI/P/20/3664

271656

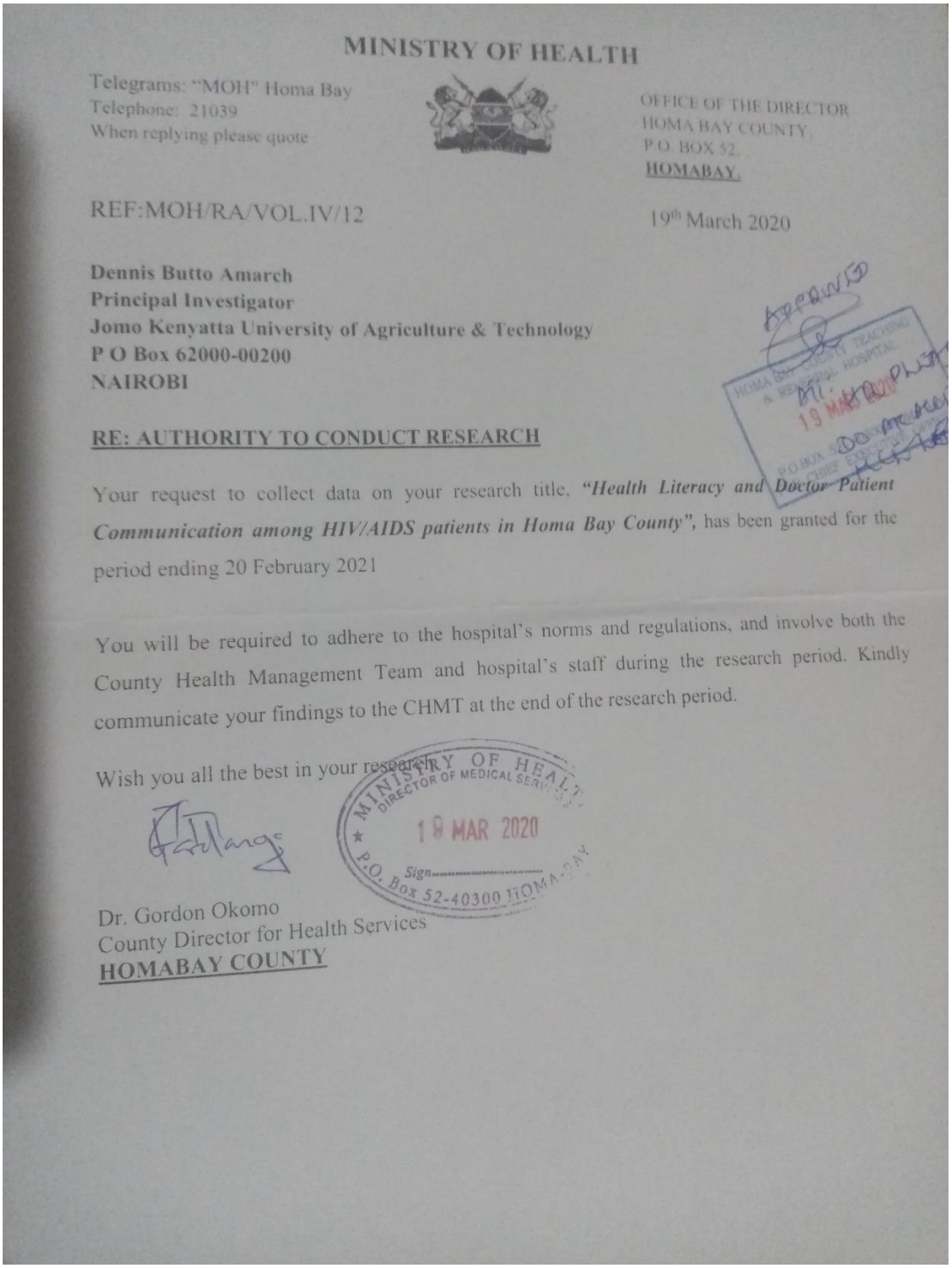
Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE,TECHNOLOGY &
INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

Appendix IV: Authority to Conduct Study at Homa Bay



MINISTRY OF HEALTH

Telegrams: "MOH" Homa Bay
Telephone: 21039
When replying please quote

OFFICE OF THE DIRECTOR
HOMA BAY COUNTY,
P.O. BOX 52,
HOMABAY.

REF:MOH/RA/VOL.IV/12

19th March 2020

Dennis Butto Amarch
Principal Investigator
Jomo Kenyatta University of Agriculture & Technology
P O Box 62000-00200
NAIROBI

APPROVED
19 MAR 2020

RE: AUTHORITY TO CONDUCT RESEARCH

Your request to collect data on your research title, ***"Health Literacy and Doctor Patient Communication among HIV/AIDS patients in Homa Bay County"***, has been granted for the period ending 20 February 2021

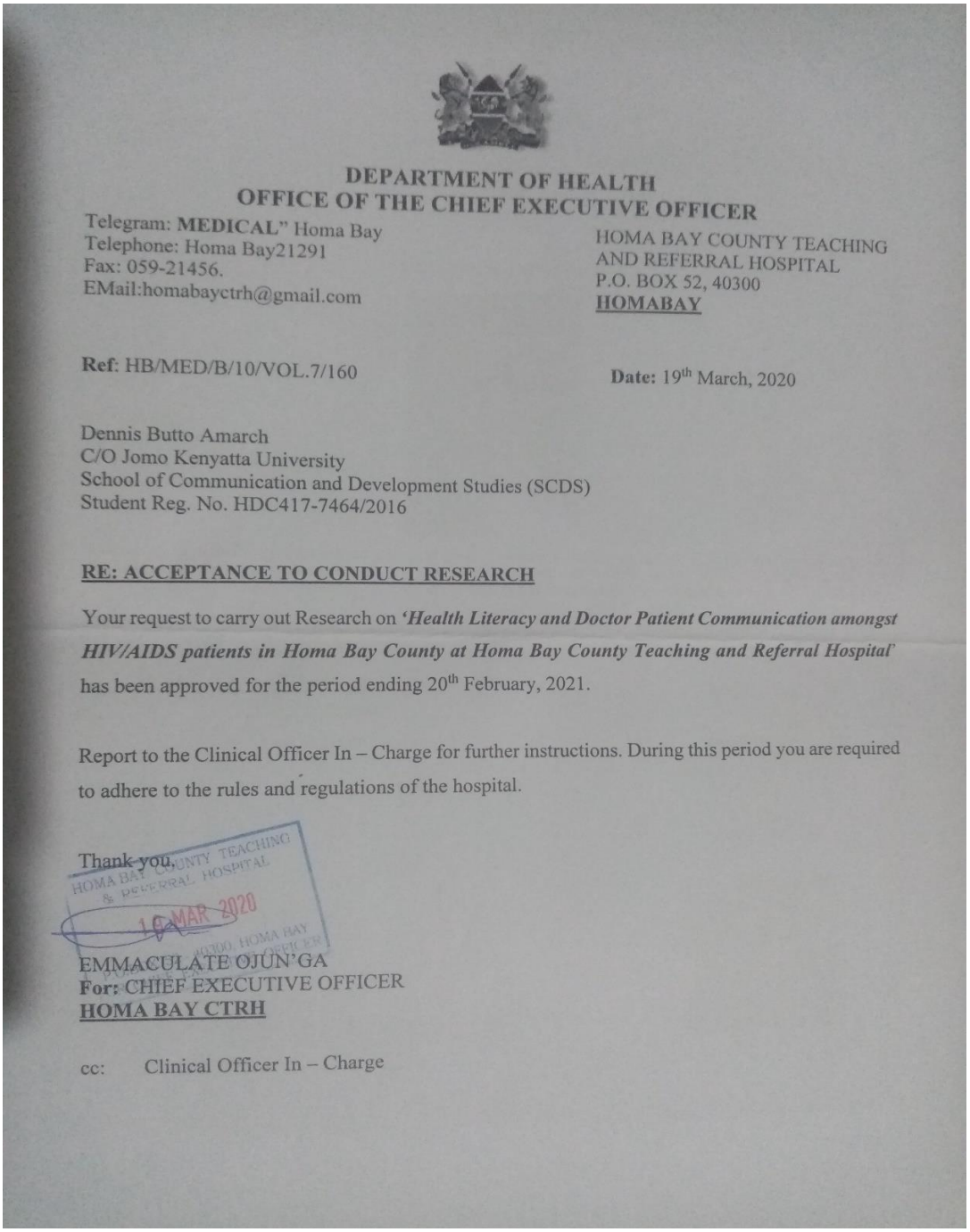
You will be required to adhere to the hospital's norms and regulations, and involve both the County Health Management Team and hospital's staff during the research period. Kindly communicate your findings to the CHMT at the end of the research period.

Wish you all the best in your research.

MINISTRY OF HEALTH
DIRECTOR OF MEDICAL SERVICES
19 MAR 2020
Sign.....
P.O. Box 52-40300 HOMA BAY

Dr. Gordon Okomo
County Director for Health Services
HOMABAY COUNTY

Appendix V: Acceptance at Homa Bay County Hospital



DEPARTMENT OF HEALTH
OFFICE OF THE CHIEF EXECUTIVE OFFICER

Telegram: **MEDICAL"** Homa Bay
Telephone: Homa Bay21291
Fax: 059-21456.
EMail:homabayctrh@gmail.com

HOMA BAY COUNTY TEACHING
AND REFERRAL HOSPITAL
P.O. BOX 52, 40300
HOMABAY

Ref: HB/MED/B/10/VOL.7/160

Date: 19th March, 2020

Dennis Butto Amarch
C/O Jomo Kenyatta University
School of Communication and Development Studies (SCDS)
Student Reg. No. HDC417-7464/2016

RE: ACCEPTANCE TO CONDUCT RESEARCH

Your request to carry out Research on ***'Health Literacy and Doctor Patient Communication amongst HIV/AIDS patients in Homa Bay County at Homa Bay County Teaching and Referral Hospital'*** has been approved for the period ending 20th February, 2021.

Report to the Clinical Officer In – Charge for further instructions. During this period you are required to adhere to the rules and regulations of the hospital.

Thank you.

HOMA BAY COUNTY TEACHING & REFERRAL HOSPITAL
10 MAR 2020
P.O. BOX 52-40300 HOMA BAY
PUBLIC HEALTH OFFICER

EMMACULATE OJUN'GA
For: CHIEF EXECUTIVE OFFICER
HOMA BAY CTRH

cc: Clinical Officer In – Charge