DETERMINANTS OF EFFECTIVE UTILIZATION OF HEALTH MANAGEMENT INFORMATION FOR DECISION MAKING AMONG HEALTH PROGRAM MANAGERS: A CASE OF MALINDI SUB COUNTY, KILIFI COUNTY, KENYA.

BY
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A Research Project Report Submitted in Partial Fulfilment for the Requirements of the Award of the Degree of Master of Arts in Project Planning and Management of the University of Nairobi

2016

DECLARATION

This research report is my original work and has not been presented for any academic award in any university**.**

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Signedé é é é é é é é é é é é Date é é é é é é é é é é é é é é é é é

Declaration by the supervisor

This research report has been submitted for examination with my approval as the University Supervisor.

Signed é é é é é é é é ..... Dateé é é .....

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DEDICATION

This research report is dedicated to my lovely husband and our children for their tireless encouragement, patience and supports both morally, emotionally and physically during the entire period of study**.**

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ABBREVIATIONS AND ACRONYMS

DHMT	District Health Management Teams
DHMIS	District Health Management Information Systems
KDHS	Kenya Demographic and Health Survey
GOK	Government of Kenya
DHIS	District Health Information Software
HIS	Health Information System(s)
HMIS	Health Management Information System(s)
MDGs	Millennium development goals
MOH	Ministry of Health
M&E	Monitoring and Evaluation
MOPHS	Ministry of Public Health and Sanitation
NGO	Non-governmental organization
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization
CDC	Centres for Disease Control
GAVI	Global Alliance of Vaccines and Immunisation
HMN	Health Metrics Network
HR&I	Health Records and Information
Http	Hypertext Transfer Protocol
RHIS	Routine Health Information Systems
RHINO	Routine Health Information Network
SCHMTs	Sub county Health Management Teams
HMTs	Hospital Management Teams

ABSTRACT

The Kenyaôs Ministry of Health established the District Health Management Information Systems (DHMISs) in 1978 to strengthen the routine health information so that information can be available for the purpose of being utilised to make decisions in all the levels that health care is provided. These systems are available and in use in Malindi sub County of Kilifi County however, there was need to find out what determines the utilization of information in decision making so as to improve on them and enhance information use. These factors studied were categorized into behavioural, technical and organizational factors and classified as independent variables. The study was delimited to the health program managers and to the study variables in the conceptual frame work. Empirical literature of the works of widely published scholars was reviewed in the study and the gaps in literature documented. The study was grounded on performance of routine health information system management framework by Aqil, Lippeveld & Hozumi and used an evidence based health information system theory and HIS design theory as the key theoretical models. The study adopted a cross sectional research design and employed a mixed method paradigm. Stratified and purposive sampling methods were used to select the sample of the respondents from the target population of 280 health workers. Using the statistical formula by Fisher et al, a sample size of 162 individuals was determined to constitute the sample size for the study. A four level data collection questionnaire of semi structured questions was used in data collection. Reliability, content and validity of the questionnaire were tested through pilot tests and pre-tests by the researcher. Qualitative data was cleaned, coded and analyzed using inferential statistics. SPSS software version 20 and Microsoft excel were used to clean and analyze the quantitative data. Appropriate descriptive statistics were done using absolute numbers, percentages and tables. It was found out that all the three factors studied had a positive correlation and thus had an influence in the utilization of data for decision making among health program managers. It was also established that there was a substantial relationship between all the three variables termed as independent with information utilization as dependent variable. On behavioural factors roles and responsibilities (nature of work) affected data collection and use with a p value of $0.0007<0.05$ and Pearson coefficient correlation of 0.694, also staff competence/skills and positive attitude had a relationship to the use of information at a Pearson value of 0.305 and lack of incentives to use information and nature of work related to information use at Pearson value of 0.239. On technical factors, availability of information for use was seen to be affected negatively by knowledge on IT (rho -0.726), system complexity (rho -0.711) and lack of documentation tools (rho -0.719). Organizational factors especially support for data review and sharing forums were seen to affect information use at p value of $0.017 <0.05$ and rho 0.376. All the three hypotheses tested in the study were therefore not rejected. The study established that utilization of health management information for decision making among health program managers in Malindi Sub County is ongoing (97.4%) however it is determined by behavioral, technical and organizational factors and that organizational factors played a key role in enhancing the behavioral and technical factors. It is therefore recommended that these three factors should be enhanced and strengthened so as to maximize the use of information to make decisions in Malindi Sub County. It is also recommended that the same research be conducted in other sub counties of the county to correlate this information. Also, it is recommended that another research to assess the knowledge, attitude and perception of the health workers on data collection tools should be conducted.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The World Health Organization (WHO) gives a definition of health as a "state of complete physical, mental, and social wellbeing, and not merely the absence of disease or infirmity."

Public health is ñthe science and art of preventing disease, prolonging life, and promoting physical health and efficiency through organized community effortsò. The main objective of public health is to enhance the health of people at the community level which can be achieved by means of collective actions through authorities of public health within the government context. The three main functions of public health interventions have been classifiedd as assessment of health needs and health status, policy development to serve the public interest and assurance that necessary service is provided. ñData, information and knowledge support these three functions thus high quality data is required for better information, better decision-making and better population healthò (CDC fact sheet, 2014).

According to Murray et al, (2000), ñthere is a broad consensus that a strong health management information system is an integral part of the health system, the operational boundaries of which include all resources, organizations and actors that are involved in the regulation, financing and provision of actions whose primary intent is to protect, promote or improve health ò Effective management of todayôs health systems depends on critical use of data and information for the effective policy-making, planning, monitoring of services and making decisions ñ (Stansfield, 2005).

According to WHO, the health system is a construction in which people, institutions, and organizations work together to assemble and allocate resources for treating diseases and injuries and preventing and not just a mix of facilities and medical consultations. It rests on certain pillars which are termed as vital elements that make the health care system to work and function. They comprise of an extensive communications system apart from a well-managed civil service. These pillars are service delivery, HMIS, human resources, medical products (vaccines and technologies), governance and financing.

Health information management is one of the six pillars which is very important for health systems escalation. It is aòdata collection system specifically designed to support planning, management and decision making in health facilities and organizationsò (WHO, 2004). It is a

òprocess whereby health data are recorded, stored and processed for policy-making, planning, implementation and evaluation of health programsò (WHO, 2010). Health management information has been in most cases expressed as òthe foundation for better health and as an essential component of appropriate decision-makingò (Lippeveld, 2001). In support of the same, Plianbangchang S, (2008), in his inaugural address during a regional consultation workshop, asserted that information is the core pillar in strengthening the health systems and that information availability enables managers of health to utilize the information for better implementation, planning, policy-making, monitoring and evaluation of programmes in health.

Reliable and timely information on service delivery and other key indicators is very valuable for health managers at all levels. Recently, increased attention has been given to data utilization in the international community of public health with more contributions from numerous groups like the Health Metrics Network (HMN) at the World Health Organization, Measure Evaluation Project (www.cpc.unc.edu/measure), and the World Bankôs Global AIDS M&E Team (GAMET). More investments have continued to be channelled in the collection of data for health programs but a concern has been raised that such data is not being used to its full potential (Moreland, 2009). More often many decision makers have based their decisions on political opportunism, expediency or donor demand and at times on infrequently repeated national studies like Demographic Health Survey (DHS) which are not sensitive to changes occurring over shorter time scale (Gething, 2007).

Following the decentralization of health, the policies made were to respond to the òpast failures and inadequacies of centralized bureaucracies to effectively provide health for all and redress the marginalization of rural communitiesò (Brosio,2000). The district health management information systems (DHMIS) were established in 1997 to support the districts in utilizing the generated data for the decisions made in health facilities internationally especially for those countries contributing to the millennium development goals. Registers of births and deaths were set up by many countries in Europe before they even became economically powerful and a number of low income and middle income developing countries have successfully improved on their vital registration systems. (Cuba, the Islamic Republic of Iran, Malaysia and Sri Lanka). Lippeveld et al. (2000) in the 1990s supported the developing countries to build up a routine health management information systems whose main components were illustrated as indicator development based on the

management information needs in collecting data, transmitting data, processing and analysis of data which guided the utilization of information.

According to a research done in Sri Lanka on information use, most of the factors highlighted are that;òmost of information systems are paper-based; information systems of various vertical programmes are not integrated; flow of information is mostly in the upward direction; and there is a very limited feedback system. Finally, they highlighted the need for clear policy framework on information systems; need of comprehensive support of ICT; need to increase the sharing between public and private sectors and the need for an increase of trained human resources ò (Samansiri B.A.D, 2014).

Loevinsohn (1994) noted that less than 50% of the mid-level health managerôs in some developing countries had the ability to analyse and use data obtained from a new HMIS while some of the managers were able to do some word-processing and others statistical tasks using micro-computers. About 50% were able to evaluate their programmes for the previous year using the new information system, while most of them were unable to identify their best and poorest performing districts. Mengistie (2010) summarized the HMIS in Amhara regional state in Ethiopia which had features of routine paper -based as ñfragmentation of data collection tools and reports, inconsistency and redundancy of reports and no feedback mechanismò.

Musoke (2000) noted that the limits to valuable use of information were the quality and application of the information and also sometimes the difficulties of putting ideas into practice. Gibson et al revealed that hindrances to affective utilization and management of information system were; lack of strong information system at medical store department, ministry of health and social welfare to manage the organization, suppliers and clients needs; lack of compliance to the national ordering and deliveries guideline and procedures; inadequate funds; low capacity in implementing integrated logistic system; lack of national representative data during annual budgeting and forecasting of essential medicines requirements; and political interests.

In 2004 Ministry of health officials and healthcare stakeholders conducted an assessment of the state of the HMIS in Zanzibar as a team. The assessment revealed that the system wasòfragmented and did not support data-driven decision-makingò. To be specific, too much data was being collected which was not linked to indicators and there were inconsistencies and overlaps in data reporting. The Kenyaôs Ministry of Health established the District Health Management Information Systems (DHMISs) in 1978 to strengthen the routine health

information by putting data directly in the hands of decision makers at various levels of health system for them to plan strategically, set their priorities right, Monitor and Evaluate programs, conduct research, make policies and improve patientôs quality of care (MOH, 2009). Reviews continued until 2011 when Kenya adopted a web based district health information system software version 2 (DHIS2) to date. Data can easily be accessible to all levels through this system

According to the assessment done by the Kenya ministry of health and Health Metric network (2008), data utilization was very weak especially for data that is routinely collected. It indicated that only 51% of health workers use data. The factors highlighted were, lack and varied human capacity to collect, analyze and standardized database and printing resources, most reports are not printed in time and reports generated are a few years back (HMN,2008).

The main aim of health information is to make effective the health service performance at the various levels where it is administered through providing vital and adequate information needed by the managers of health to monitor, evaluate and plan their activities. Thus the need to conduct this study to find out the determinants of the utilisation of health information for the implementers to put interventions in place to enhance utilisation of information to make decisions in an effort to improve service delivery in Malindi Sub County which is one of the seven sub counties in Kilifi County in the Coastal region. Since there is a fully functioning HMIS department and the researcher hails from the sub county, it was convenient to conduct the research in this area to assess the overall picture of HMIS utilisation in the Sub County.

1.2 Statement of the problem

Health information is a powerful vehicle for improving the health of a community and it highlights both the existence of problems and opportunities for improvement. It assists in guiding action in support of policy changes and improvement of programsô effectiveness. In spite of the heavy investment in the District Health Management Information Systems (DHMISs currently DHIS2) since 1978 to strengthen the routine information by putting data directly in the hands of decision makers at various levels of health system, Health Metric network (2008), indicated that only 51% of health workers use data. The factors highlighted wereòlack and varied human capacity to collect analyze and standardized database and printing resourcesò (HMN, 2008). There has also been numerous efforts to improve health information system and literature indicates that there is a growing foundation on the functions being played by data and information in making decisions about health and social care, which generally confirms to us that information fights for predominance among other influences and

drivers (Hensher and Fulop, 1999; Bovaird et al, 2012; Miller et al, 2014). Most of the literature studied appears to capture information use as not being problematic; however, this study is concerned mostly with the issues that create the need for information, those that affect the choice of information use and also information use and the factors that influence it. This is an under-researched area in that there is little or no documented evidence and literature to show how this data is being utilized.

Theo Lippeveld (2013) observed that, health care providers need to have access to relevant patient information (patient medical history and record) to match their needs with available programs and treatments while program managers need to have access to information in order to guide routine operations, monitor performance, learn from past results and improve liability. This means resources can be directed to areas where they are needed the most if information is utilized to make decisions however, according to WHO (2014), the providers of health care in various levels of the health system cannot detect problems and prioritize their needs neither can they monitor progress and estimate the effect of interventions because of not utilizing data. This has brought about increased running costs of health facilities due to recurrence of diseases, inconsistence in patientôs management, increased workload on health care providers and data collectors hence a compromised quality of health care and limited ability to obtain the overall picture of the community health status thus slow attaining of health goals (Mogere, 2010). This study therefore seeks to identify the issues, challenges, constraints and success stories of information use, both positive and negative, in Malindi Sub County in order to address them to enhance utilization of information for decision making.

1.3 Purpose of the Study

The purpose of this study was to find out the determinants of the utilization of health management information for decision making among health program managers in Malindi sub county, Kilifi County, Kenya.

1.4 Research Objectives

This study was guided by the following objectives:

i. To assess the factors related to behaviour which influences health information utilization to make decisions among public health managers.

ii. To establish the technical factors that influences the utilization of health information in decision making among public health managers.

iii. To ascertain the organizational factors that influences the utilization of health information in decision making among public health managers.

1.5 Research Questions

The study sought to answer the following questions:

i. What are the factors related to behaviour which influences health information utilization to make decisions among public health managers?

ii. What are the technical and operational factors that influence the utilization of health information in decision making among public health managers?

iii. What are the organizational factors that influence the utilization of health information in decision making among public health managers?

1.6 Research Hypothesis

The study was guided by the following hypothesis tested at 95% significance level:

$H_1$1: Factors related to behaviour significantly influence the utilization of health information in decision making among public health managers.

$H_1$2: Technical factors significantly influence the utilization of health information in decision making among public health managers.

$H_1$3: Organizational factors significantly influence the utilization of health information in decision making among public health managers.

1.7 Significance of the Study

According to WHO (1998), those who manage health at different levels of the health system cannot identify problems and prioritize their needs neither can they monitor progress and evaluate the impact of interventions which has brought about increased running costs of health facilities due to recurrence of diseases, and inconsistences in patientôs management. Generally this has also led to an increased workload on health care providers and data collectors hence a compromised quality of health care and limited ability to obtain the overall picture of the community health status thus slow attaining of health goals (Mogere, 2010). WHO (2008) recommends that despite significant achievements made in building national health information systems, some issues and challenges related to the use of

health information for policy debate, decision-making and appropriate use of tools for transforming data into information needs to be addressed.

At the health center, dispensary and hospital levels, managers need information to make decisions on patient progress, mode of patients being admitted and discharged from hospitals, how long the patients stay in the hospital, how medical supplies and equipments are used, how different categories of health care workers and ancillary staff are deployment and expenditure and income incurred. At the level of Sub County, managers and those who plan use this information and data to come up with relevant population situational analysis and risk factors for them to make decisions regarding allocation of resources to different health facilities. Such information is forwarded upwards through sub county and county levels to the national level within the public health sector through DHIS2 where decisions are made essentially on resource allocation. (WHO, 2005).

It is hoped that the study recommendations will give the best ways to achieve information utilization for decision making to facilitate proper prioritization of health needs, interventions and proper resource allocation to prevent unnecessary disease outbreaks and workloads as indicated by WHO (2014) in the attempt to realize the goals of decentralization in health sector by improving health services. The study was expected to establish areas of the health information system, which needs to be strengthened and supported for routine data to be utilized in decision making by the health managers at all levels to improve service delivery as far as effectiveness and efficiency is concerned. It is hoped that the study will contribute to the knowledge and literature that would help to strengthen the routine data utilization for decision making (D4D) in Malindi sub county as well as all the other Sub counties of Kilifi County government in Kenya.

1.8 Delimitations of the Study

The study was delimited to the study variables only considering that all the health program managers at all levels are targeted. One might see some form of bias since the sample were people at managerial level only and all health workers should use information during service delivery. However, as Flyvbjerg (2006: 237) suggests, the case study contains no greater bias toward verification than other methods of inquiry, and that ñon the contrary, experience indicates that the case study contains a greater bias toward falsification of preconceived notions than toward verificationò. It is believed the perspective of a health care provider regarding information use was well represented in the sub heads of departments.

1.9 Limitations of the Study

The study was limited to health program managers at various levels who are always very busy and the limitation here was getting them which the researcher overcame by constant communication to book appointments to reach them in good time and have them fill the questionnaire. Another limitation was that some were too busy to fill the questionnaire and so the researcher had to be patient and aggressive enough to reach all of them through research assistants who helped fill the questionnaires.

1.10 Assumptions of the Study

It was assumed that the researcher will receive support and cooperation from all the heads of the health programs at all levels , would find all the required respondents of the study during the study period and that they will be willing to give honest and relevant answers to the study and that they will be objective not subjective. The study established that the heads of the health programs at all levels had busy schedules however, despite that, they were very supportive and cooperative and almost all the required respondents of the study during the study period were found all willing to give honest and relevant answers to the study and actually the responses were objective and not subjective.

1.11 Definition of Significant Terms

Health management information system: A well organised structure/procedure of collecting, collating, analysing and evaluating strategy, disseminating and use of information about individual patients, population, resources used and health outcomes of interventions and the state and nature of systems through which the interventions are applied. It is a process where health data are recorded, stored and processed for policy-making, planning, implementation and evaluation of health programs.

Decision making: The process of selecting the logical choice or a course of action from the available options or alternatives. It is done to achieve a specific objective or to solve a specific problem.

Technical factors are issues concerning with the special knowledge, skills and expertise to build up, run, handle, and increase the performance and processes of RHIS.

Behavioural factors are ones belief, values and attitudes towards health information.

Organizational Factors are those issues that are concerned with the structure of the organization, support services, procedures, resources, and culture to manage, develop and improve the performance and processes of RHIS.

1.12 Organization of the Study

The study is organised into five chapters.

Chapter one discusses the background of the study in which the contextual and conceptual issues are explored including factors influencing the utilization of health management information for decision making among health program managers. The chapter gives direction for the study through stating of objectives, the significance of the study, its delimitation and limitations.

Chapter two covers empirical and theoretical literature on factors influencing the utilization of health management information for decision making among health program managers. The chapter provides a foundation upon which the findings of the study are discussed and conclusions drawn. The chapter finally identifies the knowledge gap from the literature studied.

Chapter three covers research methodology which was used in the study, research design, sample frame, target population, sampling procedures, description of research instruments, content validity and reliability of research instruments, methods of data collection, procedures for data analysis, operational definition of variables and ethical considerations.

Chapter four covers the analysis of data, presentation of data and interpretation of study findings while chapter five summarises the study findings, discusses the research findings, draw conclusions and recommendations and suggests areas of further research.

CHAPTER TWO

LITERATURE REVIEW

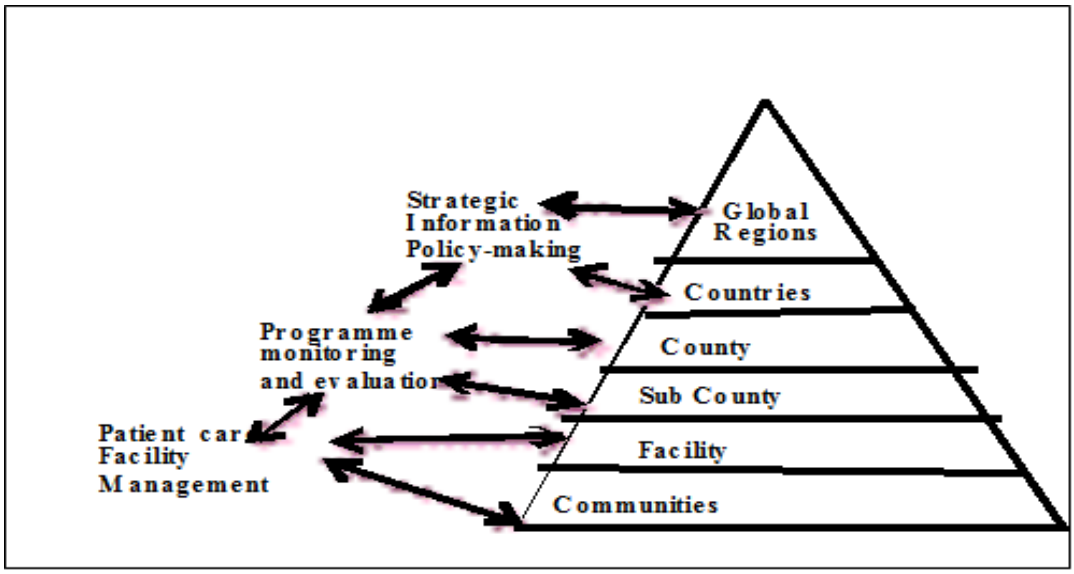
2.1 Introduction

This chapter provides an outline of Health Management information system and the factors that influence the utilization of the same for decision making. The theoretical framework of Health Management information System in relation to this study will be discussed. It will specifically discuss behavioural factors (the perception, attitudes, values, motivation, roles and responsibilities) of the data collectors and users, the technical factors (the knowledge, skills on information technology and computers, data collection processes and indicator understanding, systems, forms, and methods) associated with bad recording and reporting, mistakes and delays in data processing and in disseminating of information which lead to availability and accessibility of data/ information for use and organizational factors (Information culture, structure, policies/guidelines, resources, supervision and feedback) sometimes referred to as supportive environment.

2.2 Overview of Health Management Information System

As depicted by Brosio (2000), the system of healthcare is comprised of complicated set of organizations which creates an environment with strict needs for data to generate information for decision making. Gething (2007) noted that the main data sources which are associated with health facilities are those that come from public health surveillance and health services data also sometimes known as health management information system or routine health information system. An appropriate health information system generates information that is used by different users and actors in different systems of health. Some of these users operate at the top management level like in strategic planning, resource allocation, and assessment of the overall goals whereas others work at mid-level and bottom level like in management of cases, programme management, handling of resources, and human resource deployment) as revealed in figure 1 below.

Figure 1- Levels where health information is produced and how it is used



Source: Carla AbouZahr & Ties Boerma (2005)

The types of information mandatory to each type of actor in the health system differ in such a degree of reliability, levels of detail, levels of aggregation, and diversity of topics. According to the worldwide structure of District health information systems, which Kenya adopted, at the health centre, dispensary and hospital levels, managers need information to make decisions on patient progress, mode of patients being admitted and discharged from hospitals, how long the patients stay in the hospital, how medical supplies and equipments are used, how different groups of health care workers and support staff are deployment and expenditure and income incurred. At the point of Sub County, those who manage and plan use this information and data to come up with relevant population situational analysis and risk factors in order to make decisions regarding allocation of resources to different health facilities. This information is forwarded up through sub county and county offices to the national offices through DHIS2 within the public health sector where decisions are made essentially on resource allocation (WHO, 2005)

At a Workshop, Campbell (2003) presenting on ò enhancing the quality and use of health information at the district levelò explained that of all the levels of institutions, it is at the sub county level and the lower levels that health information system may be utilised fully and where the potentials of distinct staff and members of the community can actually be drawn and this is where denominators and numerators begin to have a meaning. Reliable policy, routine management decisions and resource allocation in the sector of health need appropriate

information from routine health information systems (RHIS) for it to track whether health care and services related to support systems that include equipment, infrastructure and supplies, finance, and human resources being delivered are of good quality (WHO, 2005). However, assessments done previously in developing countries pointed out that the routine health information system is regularly in disarray (Aquil et el 2009). Problems limiting the country-level performance include: ñpoor data quality, limited use of available information, and weaknesses in how data are analyzed and poor management practicesò.

In addition, managers in health systems of developing countries are likely to miss the actual purpose of the routine health information system which is to provide data meant to track the performance of the overall health system including programs since the data are not normally used to appraise the performance of staff at the facility or to assess the achievement of facility and sub county targets (Loevinsohn, 1994).

According to WHO director in Asia (2008), ñmaking decisions without using information is like painting in the darkò. ñChange is hard because people overestimate the value of what they have, and underestimate the value of what they may gain by giving that up.ò The benefits to a health program that can be gained from better use of health data have been documented and include; Improved health strategies that lead to improved health programs, Improved management of programs by an increased focus on measurable results, Improved programs by using data and information to make service delivery, programmatic and management decisions at the health facility, program site, and program management levels, Increased awareness of emerging or existing health problems by key decision-makers and opinion leaders, Awareness of successful interventions among policymakers and donors leading to increased support including increased funding, Improved transparency of health programs leading to improved confidence by funding agencies that health funding is accomplishing results, and Improved data quality when those who generate data use the data, because they have a vested interest in collecting data regularly and maintaining data quality (Stansfield et al, 2006; De et al, 2003).

2.3 The use of Health Management Information in decision making among health Managers

An international concern for evidence base is growing on what influences coverage and what commissions decisions in the systems of health care which have outlined the importance of

information and knowledge levels, and of recent they have begun to investigate what factors influence political and institutional decisions (Williams 2013; Landwehr and Böhm, 2011).

Factors related to background have been found to affect the levels of engagement of the public in decision making as noted by Abelson (2001), ñ hospital pharmacist drug adoption decisions have been found to be influenced by: attributes of the medicine, professional opinion, resources and expertise, ethics and values, and patient opinionñ (Paudyal et al, 2012), and ñcase manager resource allocation decisions have been found to be shaped by a combination of system-related, home care program-related, family-related, and client-related factorsñ (Fraser et al, 2009). In a study conducted by Measure Evaluation (2007) on data use in Kenya and Nigeria, barriers observed to play a role to poor data quality and inadequate utilization included ñlack of high quality information, weak human resource capacity and support systems, delays in releasing information, and a lack of organizational support to analyze, disseminate, interpret, and utilize informationñ (Measure Evaluation, 2007).

The centres for disease control and preventionsô data for decision making (DDM) project assessed access to and use of information in five countries at multiple levels of the health system. The primary factors limiting decision makersô access to data were related to the design of the health surveillance system, ongoing training of personnel, and dissemination of data from the system (Wilkins et al, 2008). Overall, the findings from the studies mentioned provide support for the idea that the factors that constrain the use of data and information are common to various situations.

A number of factors have been associated with poor quality Health Management Information System in Tanzania like in many other developing countries. These factors included failure of health workers to appreciate the importance of information; lack of knowledge and skills for data analysis; inadequate staff to record medical information; and lack of feedback from health managers after receiving data. The collection of enormous amounts of data tends to put an unnecessary burden on data collectors (Simba & Mwangu, 2006; Nyamtema, 2010; WHO, 1997; Mshana, 2004).In Kenya, the national government made data and information from a study on contraceptive prevalence and fertility issues publicly available in a format that was understandable and useful to the user. This strategy drew attention from the public and politicians resulting in evidence-based advocacy for additional funding.

A conceptual framework known as Performance of Routine Information System Management (PRISM) developed by Measure Evaluation and John Snow, provides the analysis of routine health information systems broadly to include three key factors for success: Behavioural

factors - the knowledge, attitudes, skills, motivation, values and the roles and responsibilities of the people who collect and use data, Technical factors ï to include data collection, systems, forms, processes and methods and organizational/environmental factors ï including information culture, resources, structure, roles and responsibilities and key contributors at each level of the health system.

2.4 Behavioural Factors that influence health information use for decision making among health managers

Behavioural effects on information demand and utilization always require indefinable views like attitudes, the values that are held by people regarding health information, responsibilities, motivation, how one performs a job, and the chain of command. To determining some of these factors related to behaviour requires interventions beyond simple training to improve skills and knowledge in analyzing data and using information (Aqil, Lippeveld , Hozumi, 2009).

According to Chaled, (2013), routine information users demand, motivation, confidence, and competence to perform their chores which affect the system performance and processes directly and also an individual feels about the utility or outcomes of a task Chas well as the complexity of the task (Jutand , 2000), all are more likely to affect task to be performed. Sauer born (2000) demonstrates that people not aware of a difference between their actual and perceived competence in executing a task.

Behavioural factors give an insight which is crucial in the way into which policymakers, managers, and health workers utilise information (or failure to utilise). For instance the main task of the provider of service in health which rotates around their daily/clinical job as technical worker or health service manager. They perceive their extra duties such as surveillance of diseases, keeping of stock, budgeting and evidence-based planning as not important compared to health care provision. Just as one district medical officer of health in East African reported, ñStaff refuses to use data; they do not appreciate the importance of data, hence never refer to it in making decisions.ò This corresponds with Dumont et al, (2012) that health facility managers are collecting data without understanding completely why they are collecting that data and its utility has not been explored and thus probably create little appreciation for collecting it.

According to Aqil et el, (2009), Routine Health information System ñperformance was hindered by complicated data collection registers and forms, lack of motivation of staff to

collect data, and their lack of understanding of the utility of that data. Senior managers were not interested in using the information that was collectedò. Sauerborn (2000) also showed that organizational values have a positive influence on membersô behaviour. It is therefore, important to understand collective values associated to the processes of RHIS and the tasks related in order to discover opportunities to promote values which encourage RHIS tasks in order to improve performance on utilization of information. A study conducted in Uganda to ñinvestigate the accessibility and use of information by health workersò showed that there was a positive attitude regarding the system amongst 91% of the health workers though there were challenges with indicator definitions due to lack of trainings.

2.5 Technical factors that influence information use for decision making among health managers

Boone, (2013), outlined technical factors as ñall those that are related to the specialized know-how and technology to develop, manage and improve RHIS processes and performanceò. Widespread use is promoted by extensive dissemination and accountability (Stansfield et al, 2000) while knowledge gap about the usefulness of RHIS data is a major factor on low quality of data and utilization of information (Rotich et al, 2003).

Regardless of major achievements which were made to build ñnational health information systems, there is need to address some challenges and issues that relate to health information use for decision-making, policy debate and appropriate use of tools for transforming data into informationò (WHO, 2008). Mutale et al, (2013 noted ñthat weak health information systems (HIS) are a critical challenge to reaching the health-related Millennium Development Goals because health systems performance can not be adequately assessed or monitored where HIS data are incomplete, inaccurate, or untimelyò. According to Sauerborn (2000), ñthe complexity of the system design used in entry and recording of data is the most important technical factor affecting utilization of routine health information by health facilitiesò. In relation to the above, Boone, (2013), also argues that the complexity of these systems makes it hard for health workers to utilize the system and end up using manual paper files recording which makes information spoilt and poorly managed. In addition to the discussion of the technical factors limiting utilization of routine health information, Rhoda(2010), discovered that some of the software for running the system of data entry and computation are also scarce, expensive and complex. Gopalan (2013), argues that IT use and applications are a new concept in modern institutions in developing countries particularly those in Africa. African institutions right from the top district level are fond of

using manual systems of data recording; that is through writing on papers and keeping in cupboards.

Arguments according to Gopalan. (2013) says that ñevery country requires good indicators that meet multiple needs, but should maintain a manageable numberñ. The evaluation also illustrated the hindrance caused by systems which do not function and also having too many indicators to handle. In Australia, directors of sexually transmitted infection programs were surveyed regarding their utility of surveillance data (Pope & Counahan, 2005). Few respondents reported that they did not read annual and quarterly reports and they also did not find the indicators useful. The authors concluded that addressing technical determinants, such as making the indicators significant, could increase the utilization of the information produced by the surveillance system. Dumont, et. al, (2012), puts it that all stakeholdersÓ involvement in indicator development of data use is a strong factor in determining the level of regular use of health information in health facilities especially in sub-Saharan countriesò.

A research by Suartini Bambang in Indonesia on utilization of information showed that information was inadequate especially the baseline information on population (WHO, 2008). This agrees with Davies et al, (2011) that, development of information systems are done so that the needs of the multiple users of data can be met throughout a health system. According to Mavimbe, Braa, & Bjune, (2005), Ófor consistent data use to occur, data need to be of high quality so that data users are confident that the data they are consulting are accurate, complete, and timely. Without quality data, data-informed decision making will not occur and program efficiency and effectiveness will sufferÓ

A study conducted among middle level health managers in an unidentified developing country to assess their competency with analyzing and using data from a health information system showed that there was a significant need to train managers in data analysis and use, and to integrate data utilization activities when information systems are installed (Loevinsohn, 1994). The factors highlighted were, Ólack and varied human capacity to collect, analyze and standardized database and printing resources, most reports are not printed in time and reports generated are few years backÓ (HMN, 2008). Dumont et al, 2012 noted that, Óthere were problems being experienced for technical information to be conveyed effectively and this was associated with limited skills on numeracy which minimised the degree to which rates, ratios and percentages, were used; literacy levels were also low which limited the understanding, acceptance, and usage of information; messages were also misunderstood if not tailored

to suitable language and culture; they were not effective if they donôt suggest an action; and they said ¢it is difficult to craft compelling messages on routine, ñboringò subjectsò.

Garrib et al (2008) who conducted an assessment in the rural South African district health information systems found out that the health facilities could not use data gathering tools as expected because they had knowledge gap on data analysis, interpretation and utilization of information and in the 10 clinics evaluated, some data values were not found (2.5%), and data outside the expected ranges were found to be at 25% with no explanation given.

A study on data use assessment conducted among a small sample of health professionals working in the Tanzanian health system found that staff in health organizations/agencies primarily lacks technical and analytical skills creating a barrier to producing high-quality, reliable data and information (Harrison & Bakari, 2008). A study conducted by Measure Evaluation on situational analysis in Uganda showed that they lacked the technical capacity to analyze, interpret and use data. These findings are consistent with the results of similar assessments in China, Mexico, Pakistan, and South Africa (Aqil, 2008).

Measure Evaluation conducted a situational analysis in Uganda using the Performance of Routine Information System Management (PRISM) framework tools to determine how data was being utilized by health facilities and sub county health departments, what factors hampered information utilization, and to provide suggestions to strengthen the health information system. The findings revealed that information use was limited. Data dissemination (poor access) and utilization was poorest particularly for data that is regularly collected. According to Adeya et al, (2006), appropriate system for health information should give and distribute data in suitable forms that all audience can understand i.e. the users and the managers.

The Centres for Disease Control and Preventionsô Data for Decision Making (DDM) project assessed access to and use of information in five countries at multiple levels of the health system. The primary factors limiting decision makersô access to data were related to the design of the health surveillance system, ongoing training of personnel, and dissemination of data from the system (Wilkins et al, 2008). Overall, the findings from the studies mentioned provide support for the idea that the factors that constrain the use of data and information are common to various situations hindering availability and access for use. In many assessments done, information collection was done however printing was either not done or done late and only few copies which could not be distributed widely. (HMN, 2008).

The Kenya national policy on the attainment of ñhealth for all by the year 2000ò through theòprimary health careò strategy has not been very successful despite the continued effort made by the government. It is argued here that one of the major issues which contribute to this situation is lack of appropriate and timely provision of health information required by primary health care workers to enable them plan and implement programmes at the community level (Amoth, 2000). The study established that primary healthcare workers require timely and accurate health information resources not only to enable them solve clinical problems but also for preventive and promotive campaigns at the community level (Amoth, 2000).

Kenya Ministry of Health in collaboration with key stakeholders sought to design a nursing workforce database system to inform policies and strategic planning with evidence-based information (Riley et al, 2007). This database provided national coordination among stakeholders and has improved the Kenya Ministry of Healthôs capability to assess its nursing workforce and document important trends. In support of Amoth, Abisai James (2008) in his study in Eldoret on information availability & use found out that provision of information services in both public and private sector firms in the municipality is not efficient and that the information is not accessible because it was hampered by poor repackaging. The primary factors limiting decision makersô access to data were related to the design of the health surveillance system, ongoing training of personnel, and dissemination of data from the system (Wilkins et al, 2008). It recommended and emphasized the need for trained manpower that will be able to appreciate the use and value of information. It also recommended recruitment of qualified personnel to ensure effective provision of information, establishment of information departments and formulation of information policies in house to guide in the management of information resources which is in agreement with Dumont, et al, (2012), that communication amongst M&E, HIS, and management functions is essential. This ties with Aqil et al, (2009) that making data available through the development of targeted information products that respond to specific data usersق information needs is important.

2.6 Organizational factors that influence information use for decision making among health managers

A system of health information (HIS) can be illustrated by how it utilises the resources it gets as inputs, how it processes the resources in the indicator selection and sources of data (data gathering and organization procedures) and how it produces its products which are information outputs and dissemination of information and utilization. Factors related to

organization like inadequate human resource and funding, low support from management, inadequate support supervision and inadequate leadership affect the performance of RHIS as illustrated by the literature on information system by Nsubuga et al (2002). The framework of PRISM consider organizational factors important in that they affect performance and describes this category as those factors that relate to the structure of the organization, procedures, resources, culture to develop, support services, and manage and improve RHIS performance and processes. To make it correct, people recognize what the organization value and would like to share and act on what is important and not on what they may be told to do which is not valued by the top management. Arguments according to Gopalan, (2013) says that guidelines and policies are necessary for selection of indicators, collection of data , analysis and utilization of information and also in order to select indicators and in relating indicators to problems, priorities, objectives, and goals that are crucial for effective boosting on utilization of routine information regarding health.

Auster and Choo (1993) confirmed that "managersô function as an information-processing system in which information is received, its flow is directed, and action is taken based on this information". At organization and management levels, the significance of information originates from the need to deal with uncertainties, which comes from regarding an organization as a social system which is open. Thompson argued that "uncertainty is the 'fundamental problem of complex organization and coping with uncertainty is the essence of administrative process'"(Thompson 1967: 159). He identified technology and environment as the major two sources of uncertainty in the organization and that for organizations to survive and thrive in uncertainties of such degree; they need to increase their capacity to process information. An example is to improve on the managers' skills on information management (to collect, analyse, and transmit information). According to HMN (2005) donors tend to take advantage of the government policies which are perceived sometimes as weak by taking lead to demand for extra and enhanced data to serve their own purposes of reporting because at the national level such data is considered not relevant. Because of such constraints found in the national government systems, some donors organize their own systems for monitoring their activities.

WHO (2005) noted that "even within ministries of health; there is poor sharing and coordination of data and information from and between different departments, and duplication of data-generation efforts often due to external pressures". The efforts of different units involved in the production of health information are uncoordinated and unlinked and

mandates are weak or non-existent. Inevitably, as a consequence, there is little attention given to meeting the human-resource needs in the form of suitably skilled and motivated health information officers". Gopalan, (2013) argues that the systems used to produce health information, financial resources, and human resources also has an influence on the utilization of routine health information by the health facilities. Jutand (2000), further asserts that health information system and information policies also has an influence towards the utilization of routine health information.

The findings from a Population Council study (Baldwin & Population Council, 2009) which assessed demand for data in Ghana, Ethiopia, Senegal, and Uganda found there to be a need for information to be presented in user-friendly formats developed for a variety of audiences. A study conducted in 2007 in several countries, including India, by the Overseas Development Institute on the linkages between research and policy also found a need for greater dissemination of research findings and communication formats targeting specific audiences (Jones & Walsh, 2008). A study conducted in Uganda to "investigate the accessibility and use of information by health workers" showed that the limitations to effective use of information were the value and significance of the information and also the problems in occasionally putting the ideologies into practice (Musoke, 2000). This corresponds with Rotich et al, (2003) that knowledge gap on the importance of RHIS data is seen as a major factor in poor quality of data and information utilization. The gaps were associated to inadequate training, dormant supervision, workload pressures amongst the staff and the laborious and lengthy nature of the system which agrees with Nsubuga et al that inadequate in human resources and funding, less management support, inactive supervision and leadership affect performance of RHIS.

In a study conducted by Measure Evaluation (2007) on information use in Kenya and Nigeria, barriers seen to contribute to poor quality of information and inadequate use included availability of quality data, inadequate capacity of human resource and systems support, delayed release of information, and lack of support from the organization to analyse, interpret, disseminate, and utilize information. This study is in agreement with a research done by Cindy Carlson for WHO (2005) which indicated that in terms of data use, countries (Kenya, Tanzania and Uganda) have been consistently poor at supporting health workers who are collecting data to use it locally for planning and management purposes.

Sauerborn (2000) and Boone (2013) argues that some members of the health management teams have been supported to receive training on supervision, leadership and

management to enhance their capacity to effectively manage health services. Thus they are expected to capacity build lower health facilities through supervision which leads to effective utilization of routine health information. At the sub-county and county health authorities there is facilitation to offer systematic supportive supervision to the Primary Level Centres to ensure that guidelines are adhered to, skills are reinforced and ultimately high quality services are offered. Kamadjeu et al, (2005) emphasizes that the senior managers leadership on shared values related to information systems are alluded to as a pre-existing culture of data collection otherwise culture of information According to Chaled et al, (2013), the availability and access to timely reporting and feedback has potential to determine the level of utilization of routine health information by health facilities. According to Scott (2005), it is crucial that managers are aware of the information they require, how to acquire it and to maximize the use in order to survive and prosper in today's information-intensive environment. MOH (2009) points out that guidelines and policy documents lack in health facilities, HMIS staff have inadequate capacities on information use and that there are many parallel data collection systems with poor coordination among other information challenges.

The USAID/Kenya, (2010) noted that there is little allocation of resources for publications and dissemination of periodic reports, let alone investment in information generation, analysis and creation of knowledge management that would facilitate learning and sharing of experiences and best practices. According to Gopalan (2013), ensuring that data is stored properly and accessible easily over the mid and long term will make easy its validation (accuracy, completeness timeliness, and reliability); assessment of quality of care; analysis of disease trends; comparison of different service performance; and ultimately the equitable distribution of resources. The level of culture of information use of a health facility also influences the utilization of health information by the health facility (Jutand, 2000). People working within an organization perform tasks and behaviours which they believe are valued and promoted by the organization.

2.7 Theoretical framework

This research was grounded on the Evidence Based Health Information System Theory by Carbone (2008) and The Health Information System design theory by Richardson Sandra_M. These models were found ideal since they support the influence of the independent variables on the dependent variable under study.

2.7.1 The Evidence Based Health Information System Theory by Carbone (2008).

This theory was selected because it holds that there is a need for evidence based information regarding the organization of daily routine information to make planning and policy formulation for any developmental organization (Carbone, 2008). Researchers, suggested that what was needed was a fit between the technical subsystems and the social subsystems which together made up an organization (Schneberger & Wade, 2006). The technical subsystem/factors comprises of the devices, tools and techniques needed to transform inputs into outputs in a way which enhances the economic performance of the organization. While the social system (behavioural factors) comprises the employees (at all levels) and the knowledge, skills, attitudes, values and needs they bring to the work environment as well as the reward system and authority structures that exist in the organization (C legg, 2000). WHO (2005) stated that the proper collection, management and use of information within healthcare systems ñwill determine the systemôs effectiveness in detecting health problems, defining priorities, identifying innovative solutions and allocating resources to improve health outcomes. The theory further argued that health settings are owned and run by health workers who at the same time are key personnel for decision making (Carbone, 2008) thus clinicians need a motivation in order to influence behavioural change in clinical practice to use the local (electronic) health records for decision making.

2.7.2 The HIS design theory

This theory has been selected because it is based on the principles which direct the practice of medicine and those which guide the design of information systems and requires a common understanding from the two disciplines to provide a suitable moral basis for information use (Richardson, 2006). From history, healthcare information systems in organizations were addressing issues like admissions and discharges, billing, payroll, insurance, and related tasks. The healthcare organizations were assisted by these systems to improve efficacy in their operations and succeed in cost reduction thus sustainability of change and further change depends on the evidence success (Carbone, 2008) through the adoption of information system/technology in any health setting. The technology (operating system) will work as a catalyst to enable the overall ñclinical careò task (input) driven by the expectation of improving the health of an individual or population is satisfactorily carried out (output) known in the health field as a clinical outcome (Jutand, 2000). This means it must allow members of the clinical team (Doctors, Nurses, Staff etc) to communicate with each other, it also must make sure that risk management system exist to follow up on patients that

might miss out on clinical care; it must ensure that there is a sound financial systems underpinning the work being carried out. Another principal role is to measure the success in achieving that original task (improvement in health outcomes) (Aqil A, et. al, 2009).

A key aspect of this theory is the relationship between catalyst(technical) and the human / workforce (behavioural) factors which needs to be built around principles of mutual trust and purposeful action between individuals that appear to share a common goal (health outcomes improvements). This connection between the catalyst and health setting is not always evident as sometimes individualôs short term goals might not be the same; for example the Information System (IS) practitioner (catalyst) might be more compelled to financially and workforce information system. This explains the construct relationship between the organization structure and information use (Jutand, 2000)

2.8 The conceptual framework

The interrelationships between the study variables are conceptualized as shown in Figure 2

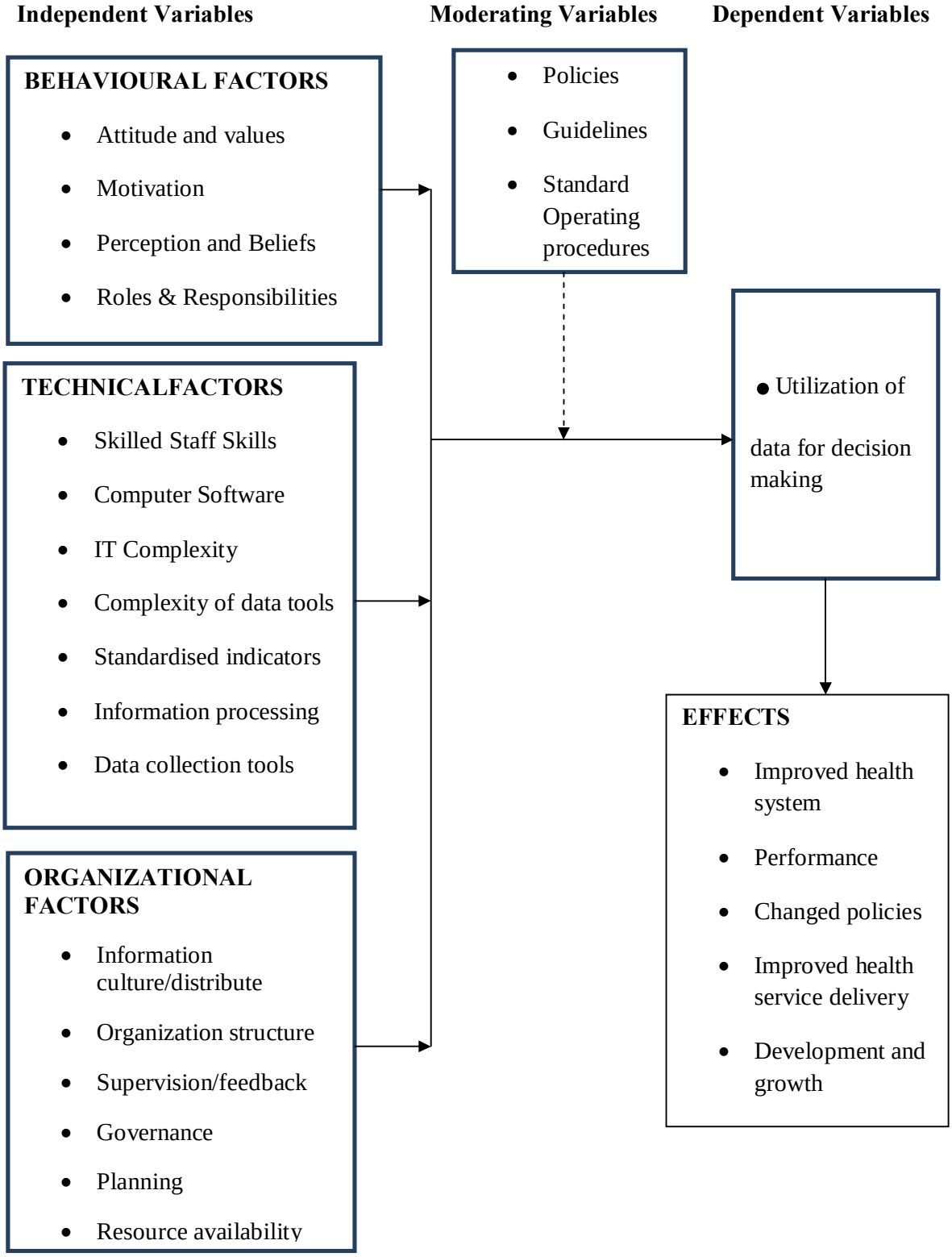


Figure 2 Conceptual framework

The framework above depicts an effect that in order to effectively utilize routine health information, several factors must be considered. These are technical, organizational as well as behavioural as far as this study is concerned. Technically, the skills by the health facility staff, data management tools among others affect the utilization of routine health information system. More so, several organizational factors like information distribution, supervision as well as resource availability have an effect on the effective utilization of routine health information among program managers. Lastly but not least, behavioural factors like ones belief, values and attitudes towards health information also affect its effective utilization among health managers. Policies, standard operating procedures and guidelines will enhance the utilization of data (moderating variables).

2.9 Research gaps

Much has been written and documented by earlier authors and scholars relating to factors influencing effective utilization of routine health information but the following gaps were found existing within the above literature.

A great deal of the reviewed literature has been done but little has been documented on how data has been effectively utilized and this remains a big concern of this study. This research therefore is expected to act as source of future reference to all studies related to factors related to effective utilization of routine health information among health program managers. Since models regarding data utilization in health institutions has been compiled for a couple of years, there is need for a model that works in relation to the current ICT model system that regards current data compilation and usage using modern information technologies.

Literature reviewed in earlier studies do not relate the impact of effective utilization of routine health information towards the development or success of a health program. This gap remains a big challenge since most of the health facilities will not be motivated to understand the reasons for routine health information compilation and utilization if there is no documented success story. Literature reviewed in earlier studies negatively relates the earlier intervention or current government and health institutions intervention towards data utilization by lower health facilities. Literature and documentation is needed to emphasize the necessary policies towards the improvement of data recording and information utilization in all health care facilities. Literature reviewed by earlier authors and studies does not make use of understanding how effective utilization does not only help in decision making but also how it is importance to other development variables

such as training and human resource management area. This study will also make use of the existing findings to relate to the importance of information utilization towards other development factors such as effective human resource recruitment and training.

A lot of literature has been published on factors influencing routine utilization of health information ranging from the historical perception which provides a valuable input to the researcher especially in bringing out variables and factors which will assist in designing the instruments to use in data collection. However, the reviewed literature does not explain the extent to which factors of utilization actually influences routine utilization of health information.

2.10 Summary of chapter

As portrayed in Figure 2.2 above, the conceptual framework puts forward that behavioural, technical, and organizational factors (independent variables) influence the collection of data, processing, transmission, and presentation which also influences the quality of data and use (dependent variable). Policies, standard operating procedures and guidelines will enhance the utilization of data (moderating variables). The framework defines good Routine Health Information System performance as the production of quality data as well as documented use of information for decision making. It hypothesizes that poor quality of data and limited use of information for evidence-based decision making is not only due to technical issues but also a result of organizational and behavioural barriers that hinder the effective use of information (Aqil, Lippeveld & Hozumi, 2009).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology which the study will use. It comprises of the research design, study area, target population, sample and sample procedures, data collection procedures, research instruments, reliability and validity of research instruments and data analysis.

3.2 Research Design

The research design was based on the mixed method paradigm. In this inquiry, both quantitative and qualitative data collection methods were employed to gather data from respondents by use of a semi structured questionnaire and one focused group discussion . This provided in-depth information of data utilization among health program managers for decision making. A cross sectional research design was used by the researcher since it was expected to provide a quick snapshot of whatôs going on with the variables of interest for the research problem.

3.3 Target Population

Mugenda & Mugenda (2003) define population as an entire group of individuals, events or objects with some observable characteristic. The research targeted all health workers working in Malindi Sub county who were heading/manning GOK health facilities e.g. a Health centre or a dispensary in charge, hospital departmental heads (Hospital Management Teams) and hospital sections heads, health program managers (Sub County Health Management Teams) and CHEWS. In this study they were termed as health program managers. A total of 280 health workers were expected to be in the sub county

Table 3.1 Target Population

Respondents	Target Population
Sub County program Managers	28
Hospital heads of departments	38
Health centre and dispensary in charges	42
CHEWs	16
Section Heads	156
Total	280

3.4 Sample size and Sampling Procedure

A Statistical formula (fisherôs formulae) was used to calculate the size of the sample with 95% confidence interval.

$$n = \frac{z^2 p q}{d^2}$$

Where n = Minimum sample size required

P = Probability of success (proportion of target pop. estimated to have particular characteristic-51. %).

q = probability of failure.

d = degree of accuracy desired.

But because the population of health workers is less than 10,000, this formula will be applied .i.e.

$$nf = \frac{n}{1 + \frac{n}{N}}$$

Where nf is desired sample size for population less than 10,000

n is desired sample size for more than 10,000

N is Total Population = 280 health workers

P = 51 % is Data use (HNM, 2008)

Q = 1 ï 51%

Z = 5% =0.05^2 = 0.025. Check Z value from the table = 1.956

d = 0.05^2

$$n = \frac{z^2 p q}{d^2} = \frac{1.96^2 \text{ X } 0.510(0.490)}{0.05^2}$$

= 384

nf = n / 1 + n / N

= 384 / (1 + (384/280))

= 161.9297 = 162

Sample size was **162** health workers.

3.4.1 Sampling Procedure

A stratified method of sampling was used in the study. The total population of 280 health workers was categorised into five homogenous stratums mainly: Sub County program Managers, Hospital heads of departments, head of Health centre or Dispensary termed as facility in charge in charges, Community Health Extension Workers (CHEWs) and Hospital section Heads. A convenience method was employed to select the head of the strata as the study subject. The hospital section heads that comprised of the deputy heads and sub section heads among departments were selected using the simple random method.

Table 3.2 Sampling of Respondents

Respondents	Target Population	Sample	Proportion of population	
Sub County program Managers	28	28	100%	Purposive
Hospital heads of departments	38	38	100%	
Health centre and Dispensary In charges	42	42	100%	
CHEWs	16	16	100%	
Section Heads	156	38	24.4%	Simple random
Total	280	162	57.9%	

3.5 Data Collection Methods

Data was collected from the identified 162 respondents using semi structured questionnaires that were distributed by the research assistants. The research assistants were inducted so that they could guide the respondents in case of enquiries. The questionnaire utilized had four sections. Section I of the questionnaire had questions on the background information of respondents, section II on behavioral factors (health workers knowledge, attitude and perception on health information), section III on technical factors and section IV on the organizational factors that influence the analysis and utilization of health information as independent variables while the dependent variables were captured in relation to the independent variable. The questionnaire had both closed and open ended questions.

3.6 Validity and Reliability of Research Instrument

The researcher ensured that the research instrument was valid and reliable by use of content validity, criterion-related validity, face validity, constructs validity and reliability criteria as documented below.

3.6.1 Validity of Research Instruments

Creswell (2002) defines validity as the extent to which an instrument measures what it is intended to measure. Content validity was established through adequate coverage of the topic under study by the questionnaires and ensuring the instruments contained a representative sample of the universe. Criterion-related validity was determined by making certain that the

information specified by the criterion was collected. Face validity was verified by ensuring that the questionnaire measured the trait of interest while construct validity was the degree to which the instrument measured the trait or theoretical construct that it was intended to measure. Dooley (1995), advocates that validity can be increased through the construction of questions ôby balancing wordings so that items are not always scored in the YES or in the NO directionô and the use of items that do not provoke defensiveness. This was addressed in the preparation of the questionnaire.

3.6.2 Reliability of Research Instruments

Reliability was established using a pilot test by collecting data from 20 subjects not included in the sample. Data collected from pilot test was analyzed using Statistical Package for Social Sciences reliability test. A two -way mixed model was used to correlate at 95% confidence interval. The reliability through Cronbach's Alpha was 0.832 and Cronbach's Alpha Based on Standardized Items was at 0.853. According to Fraenkel and Wallen (1996) regarding reliability, a coefficient (alpha) of 0.70 or higher is considered acceptable reliability.

3.6.3 Pilot study

The questionnaire was filled before the exercise to see the flow of questions and ease of filling. As recommended by Baker (1994) the sample size which was used to pilot was within the range of 10% to 20% (20 questionnaires). After the filled pilot questionnaires were received together with the suggestions and comments by the respondents, the questionnaires were reviewed to improve on the comprehension and suitability of the wordings, sequencing of the questions and the time to be taken to complete each questionnaire.

3.7 Data Collection Procedures

After obtaining the permit, the selected research assistants were trained and thereafter they proceeded to distribute the questionnaires to the respondents. The purpose of the survey was explained to each of the respondents and their consent obtained before data collection. The self-administered questionnaire was more preferred in this study because it collected data in a relatively short time (Oso & Onen, 2009). Furthermore, feedback was to be anonymous which encouraged openness in giving views, opinions and feelings. The researcher used semi structured questionnaires to enhance on the quantity and quality of the data collected.

3.8 Data Analysis

Orodho (2002) defines data analysis as an assessment of what has been collected in a survey or experiment and making conclusions and assumptions from this data thorough organizing the data, breaking it into manageable units, synthesizing it as well as searching for patterns. The use of open ended questions generated qualitative data which was categorical in nature. The responses were coded and analyzed using inferential statistics. SPSS and Microsoft Excel were used to clean and analyze data. Appropriate descriptive statistics was done using absolute numbers, tables, and simple percentages.

3.9 Operational definitions of variables

Objectives	Type of Variable	Indicators	Measurement Scale	Methods of data collection	Data collection tools	Data analysis technique
-To assess the factors related to behavior which influences health information utilization to make decisions.	-Perception -Attitude Values -Motivation -Beliefs -Roles & Responsibilities	-No. of respondents whose views, values and opinions favors/agrees with information use standards -No. of respondents whose role and responsibilities agree with HMIS standards	Nominal Interval	Administering questionnaire	Questionnaire	Percentage Tables Pearson coefficient Correlation
-To establish the technical and operational factors that influences the utilization of health information in decision making.	-Skilled Staff -Computer Software Complexity -Complexity of data management -Standardized indicators -Information processing -Data collection tools	-No. of respondents reporting having been trained on health information -No. of respondents reporting proper availability of data when required -No. of respondents reporting to have proper and adequate data collection tools and forms -No. of respondents with analysis skills -No. of respondents reporting proper Indicator understanding and relevance	Nominal Interval	Administering questionnaire	Questionnaire	Percentage Tables Spearman Rank Correlation
-To establish the organizational factors that influences the utilization of health information in decision making.	-Information culture, -Organization structure, Supervision Guidelines -SOPs -Resource availability	-No. of respondents reporting as conducting review meeting forums -No. of respondents reporting to have feed back on reports -No. of respondents using guidelines and SOPs to manage data -No. of respondents receiving support supervision and data quality audits from senior level	Nominal Interval	Administering questionnaire	Questionnaire	Tables Graphs Spearman Rank Correlation

3.10 Ethical considerations

The researcher obtained authority to carry out the study from the University of Nairobi. She then sought ethical clearance to conduct the research from Pwani university ethical review board through the Kilifi county research committee through the permission of the Medical officer of Health Malindi Sub County. She was then given authority to collect data by the county research committee. Each respondent was given a chance to either consent or refuse after being told the purpose and procedures of the study. All responses were kept confidential and anonymous.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter analyses the data collected, presents it in tables and undertakes data interpretation. The chapter provides the major findings and results of the study as obtained from the questionnaire.

4.2 Questionnaire Response Rate as per the Stratum

Questionnaire response rate indicates the percentages of the questionnaires that were filled and returned by the respondents as per the positions held. The returned questionnaires were the ones analyzed. Table 4.1 shows the response rate from the sample size.

Table 4.1: Questionnaire Response Rate

Stratum	Sample size	Return Rate
Hosp section head	38	37
Hospital departmental head	38	38
Sub county manager/ program head	28	26
I/C of facility (Dispensary/H/C)	42	41
CHEW (Community)	16	11
Total	162	153

Out of the 162 respondents targeted in the study, 153 completed and returned the questionnaire which constitutes a response rate of 94.4%. This response rate is excellent and representative of the target population as noted by Mugenda and Mugenda (2003) who suggested that a response rate above 70% is excellent while a rate of 60% is good and 50% is adequate for analysis and reporting

4.3 Demographic Characteristics of the Respondents

As part of their demographic information, the study sought to establish the background information of respondents. This included age, gender, position held, level of training, profession, working experience and area of work.

4.3.1 Distribution of Respondents by Age

The study wanted to establish the ages of the respondents who were at the managerial positions. This was categorised as the youth in age bracket of 18 to 25 years, the middle aged from 26 to 40 years and those aged 40 years and above. There was need for inclusion of all the age groups above 18 years so that it became holistic and everyone was involved and engaged (Lederach, 1997). The results obtained were as shown in table 4.2

Table 4.2: Distribution of Respondents by Age

Age group	Frequency	Valid Percent	Cumulative Percent
8-25 Years	9	5.9	5.9
26-40 Years	76	49.7	55.6
41Years and above	68	44.4	100.0
Total	153	100.0	

As shown in table 4.2 above, 49.7% of the respondents were middle aged, 44.4% were aged 40 years and above while 5.9 % of the respondents were below 25 years. It therefore implies that most of the managers in the sub county are either middle aged or above 40 years and very few less than 10% attained managerial roles by age 25.

4.3.2 Distribution of Respondents by Gender

The study required to assess the gender of the respondents. This was important to find out the gender representation of the managers in Malindi sub county. The results were as shown below in table 4.3

Table 4.3: Distribution of Respondents by Gender

Gender	Frequency	Valid Percent	Cumulative Percent
Male	79	51.6	51.6
Female	74	48.4	100.0
Total	153	100.0	

The distribution shown in table 4.3 above is very representative of gender almost 50:50 however males had slightly higher representation (51.6%) than females (48.4%)

4.3.3 Distribution of Respondents by Profession

This was necessary to ensure that all professions were included in the study in order to reach the various departments as per the professions of the managers working in Malindi Sub County. The distribution is as shown in table 4.4 below

Table 4.4: Distribution of Respondents by Profession

	Frequency	Valid Percent	Cumulative Percent
Doctor	6	3.9	3.9
Nurse	53	34.6	38.6
Health Records	16	10.5	49.0
Clinical medicine	22	14.4	63.4
Public Health	17	11.1	74.5
Laboratory	6	3.9	78.4
CHEW	6	3.9	82.4
Nutrition	6	3.9	86.3
Others	21	13.7	100.0
Total	153	100.0	

According to the findings, most of the respondents engaged in the managerial positions were nurses at 34.6% followed by the clinical medicine staff at 14.4% then the public health officers at 11.1%. The health records and information officers at 10.5%, doctors, laboratory staff, CHEWs and nutrition were at 3.9% respectively while the rest of the professions who included medical engineering, VCT counsellors, radiographers, orthopaedic technicians physio therapists, social workers and occupational therapists combined as others were at 13.7% due to the limited numbers therefore all were represented in the study.

4.3.4 Distribution of Respondents by Level of Training

The researcher found it necessary to collect this data in order to assess the level of training of managers in the sub county and the findings are as in table 4.4 below

Table 4.5: Distribution of Respondents by level of Training

Training Level	Frequency	Valid Percent	Cumulative Percent
Certificate	14	9.2	9.2
Diploma	104	68.0	77.1
Degree	28	18.3	95.4
Masters	7	4.6	100.0
Total	153	100.0	

From the findings 68.0% of the managers had diploma level training 18.3% degree, 9.2% certificate and 4.6% had mastersô level training

4.3.5 Distribution of Respondents by Work Experience

The researcher assessed whether the years of experience in the current position contributed to utilisation of information. Table 4.6 below gives us an overview.

Table 4.6: Distribution of Respondents by Work Experience

Classified Years	Frequency	Valid Percent	Cumulative Percent
0-5 Years	69	45.1	45.1
6-10 Years	33	21.6	66.7
11-15 Years	12	7.8	74.5
Above 15 Years	39	25.5	100.0
Total	153	100.0	

Most of the respondents had stayed in their current area of work for 5years or less (45.1%), followed by those who had stayed for 15 years and above (25.5%), 6-10 years at 21.6 while those who stayed for 11 ï 15 were only 7.8%.

4.4 Descriptive Statistics on the Influence of Behavioural Factors on the Use of Health Information to Make Decisions

In an effort to determine the influence of behavioural factors on the utilization of information for decision making, respondents in this study were asked to tick what was appropriate for them on some of the behavioural factors.

4.4.1 Distribution of Respondents by Type of Data They Collect

Table 4.7 shows the statistics on some of the findings from the question on which type of data the managers collected as they operate their programs or in the course of their duties. This was a multiple response question because some collected more than two types of data.

Table 4.7: Distribution of Respondents by Type of Data They Collect

Type of data	Frequency	Percent
Out patient service data	72	47.1
In patient service data	41	26.8
Clinical service data	44	28.8
Diagnostic service data	46	30.1
Program service data	96	62.7
Health System service data	39	25.5

As shown above, most of the respondents collect program service data (62.7%), 47.1% collect outpatient service data 30.1% collect diagnostic service data, 28.8% clinical service data, 26.8% in patient service data while 25.5% collect health system service data.

4.4.2 Distribution of Respondents Necessity of Data Collection

The study assessed whether the attitude of the program managers was positive on data collection and whether it was necessary for them to collect data as shown in table 4.8.

Table 4.8: Distribution of Respondents Necessity of Data Collection

Response	Frequency	Valid Percent	Cumulative Percent
Yes	151	98.7	98.7
No	2	1.3	100.0
Total	153	100.0	

Table 4.8 above shows 98.7% reported that it was necessary to collect data while only 1.3% reported that it was not necessary. The reasons for not collecting data were lack of data collection tools 1.3%, very tedious 1.3%, not my work 0.7% and not necessary 0.7%.

4.4.3 Distribution of Respondents on Reasons for Data Collection

This was a multiple response question which was meant to assess the opinions and views of the respondents on data collection and so respondents were allowed to tick more than one response.

Table 4.9: Distribution of Respondents on Reasons for Collecting Data

Reason	Frequency	Percent
As a requirement	64	41.8
To keep track of disease trend	92	60.1
As a routine exercise	27	17.6
To use it for decision making	128	83.7

Majority of the respondents (83.7%) collected data for use in decision making and 60.1% collected it to keep track of disease which is still use of information. On the negative side 41.8% collected as a requirement and 17.6% as a routine exercise.

4.4.4 Distribution of Respondents on the Importance of Information Use in Their Areas of Work

This question sought to determine the views, values and opinions of the managers on the importance of utilization of information in their areas of work. Table 4.10 shows what was found.

Table 4.10: Distribution of Respondents on Importance of Information Use in Their Area of Work

Response	Frequency	Valid Percent	Cumulative Percent
Yes	149	97.4	97.4
No	4	2.6	100.0
Total	153	100.0	

97.4% of the managers felt that information use was important in their area of work while 2.6% felt it was not important and that they use approximates (0.7%), their own opinions (2%), just decide1.3%.

4.4.5 Distribution of Respondents on Reasons for Importance of Information in Their Work

This was a multiple response question which was meant to determine how the respondents used information in their areas of work. They were allowed to tick more than one response.

Table 4.11: Distribution of Respondents on the Reason for Information Use in Their Area of Work

Reason	Frequency	Percent
Monitor my work	109	71.2
Monitor others Work	46	30.1
Monitoring Program Output	92	60.1
Planning	119	77.8
Evaluation	94	61.4
Budgeting	76	49.7
Medico-legal	31	20.3

Table 4.11 above shows that 77.8% used information for planning, 71.2% to monitor their work, 61.4% to evaluate their programs, 60.1% to monitor program out put 49.7% use it for budgeting, 30.1% use it monitor others work while 20.3% used the information for medico legal issues. This is evidence that information is in use in Malindi Sub County.

4.4.6 Distribution of Respondents Feelings on What Motivates People to Use Information

This was a multiple response question that assessed motivation to use information. Most of the respondents (96.7%) felt that information is key in decision making also to be noted is that staff competence and skills (73.9%), positive attitude (66.7%), management guidance and leadership (53.6), proper resources (50.3%) and confidence to use information 51.0% are major motivators of information use according to the respondents.

Table 4.12: Distribution of Respondents Feelings on What Motivates People to Use Information

Respondent feelings on what motivates people to use information	Frequency	Percent
Information is key in decision making	148	96.7
Confidence to use Information motivates	78	51.0
Staff competence and skills motivates	113	73.9
Positive attitude motivates	102	66.7
Belief that information is useless de motivates	19	12.4
Lack of incentives de motivates	33	21.6
Nature of work motivates (e.g clinician and HRIO)	13	8.5
Information which adds no value de motivates	20	13.1
Proper resources Motivates	77	50.3
Management guidance and leadership motivates	82	53.6

The major de motivators of information use were seen as nature of work for example where someone works like the clinician versus HRIO or managers of program or facility (this came from deputies and section heads) at 8.5%, belief that information is useless 12.4%, information which adds no value 13.1% and lack of incentives 21.6%.

4.4.7 Distribution of Respondents on View or Opinion on Information Use

The researcher wanted to assess the views and opinions of the managers on information use. The view or opinion given was coded as positive if it was according to the HMIS guidelines or negative if not in line with the guidelines. The findings were as shown in table 4.13 below.

Table 4.13: Distribution of Respondents Feelings on What Motivates People to Use Information

Opinion	Frequency	Valid Percent	Cumulative Percent
Positive	74	48.4	48.4
Negative	2	1.3	49.7
None	77	50.3	100.0
Total	153	100.0	

Most of the respondents (50.3%) either concealed their feelings or were too busy to write their opinions or they felt itôs automatic however 48.4% of the respondents had a positive opinion towards information use and only 2% had a negative opinion in that indicators collected were not relevant in their areas of work.

4.5 Inferential Statistics on Behavioural Factors

A correlation analysis using Pearson coefficient correlation was conducted at 95% and 99% confidence intervals and 5% and 1% significance level with a 2-tailed test. Table 4.14 indicates the correlation between some of the behavioural factors and information use.

Table 4.14: Inferential Statistics on Behavioural Factors

		Staff competence and skills	**Positive attitude on use**	**Lack of incentives**	**Nature of work**
Staff competence and skills	Pearson Correlation	1	.305**	.131	-.032
	Sig. (2-tailed)		.000	.106	.694
	N	153	153	153	153
Positive attitude on information use	Pearson Correlation	.305**	1	.169*	.166*
	Sig. (2-tailed)	.000		.037	.041
	N	153	153	153	153
Lack of incentives	Pearson Correlation	.131	.169*	1	.239**
	Sig. (2-tailed)	.106	.037		.003
	N	153	153	153	153
Nature of work motivates	Pearson Correlation	-.032	.166*	.239**	1
	Sig. (2-tailed)	.694	.041	.003	
	N	153	153	153	153

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.14 shows a weak positive correlation between staff competence/ skills and positive attitude to use information indicated by a Pearson value of 0.305 and lack of incentives to use information and nature of work at 0.239 values. This finding shows that the behavioral

factors positively correlate with information use for decision making. Additionally, the value of 0.305 and 0.239 for a sample size of 153 at a significance level of 0.01 is statistically significant. From these analyses, the hypothesis that; **$H_1$1**: Behavioural factors significantly influence the utilization of health information in decision making among public health managers cannot be rejected.

4.6 Descriptive Statistics on the Influence of Technical Factors on the Utilization of Information for Decision Making

In an effort to determine the influence of technical factors on the utilization of information for decision making, respondents in this study were asked to tick what was appropriate for them on some of the technical factors.

4.6.1 Respondents Training on Data Management

The respondents were required to give a yes or no answer if they had been trained on data management. The findings were as shown in table 4.15 below.

Table 4.15: Distribution of Respondents by Whether Trained on Data Management

Trained	Frequency	Valid Percent	Cumulative Percent
Yes	94	61.4	61.4
No	59	38.6	100.0
Total	153	100.0	

61.4% responded that they had been trained on data management and 38.6% had not been trained. When asked where they had trained some said they had trained in college 31.4%, others on seminars and workshops 34.6%, 27.5 % on job training and 0.7% during continuous medical education. The respondents gave more than one training site.

4.6.2 Distribution of Respondents on the Availability of Data When Required

The respondents were required to give a yes or no answer on whether data was available when required. As shown in table 4.16 below 79.7% of the respondents said data was available when required while 20.3% said data was not available in time. When asked the main source of information, 52.9% of them said it was available from monthly summaries, 49.0% from registers, 32.7% from DHIS and 19.6% from Records/HMIS office. Some gave more than two sources.

Table 4.16: Distribution of Respondents on the Availability of Data When Required

Availability of data	Frequency	Valid Percent	Cumulative Percent
Yes	122	79.7	79.7
No	31	20.3	100.0
Total	153	100.0	

For those who said that data was unavailable when required the main reasons for data not available were poor documentation 11%, Lack of documentation tools 6.5%, inadequate information technology knowledge on the DHIS software 5.9%, system complexity 6.5%, inadequate knowledge on data extraction, analysis and processing 10.5%.

4.6.3 Distribution of Respondents on the Relevance and Simplicity of Indicators.

The respondents were required to give a yes or no answer on whether the indicators collected were relevant and understandable. As shown in table 4.17 below 89.5% of the respondents reported that the indicators collected were relevant and understandable.

Table 4.17: Distribution of Respondents on the Relevance and Simplicity of Indicators

Relevance	Frequency	Valid Percent	Cumulative Percent
Yes	137	89.5	89.5
No	16	10.5	100
Total	153	100	

Respondents who reported that the indicators were not relevant and understandable in table 4.17 above gave their recommendations on how to improve the indicators and the responses were; training on indicator understanding 11.1%, availability of standard documentation tools 6.5% and few but quality standardised indicators to be collected 7.2%.

4.6.4 Distribution of Respondents Who Carry Out Any Data Analysis on the Data They Collect

The researcher assessed whether the program officers carried out any data analysis on the data they collect and the results are as shown in table 4.18 below.

Table 4.18: Distribution of Respondents Who Carry Out Any Data Analysis on the Data They Collect

Analysis	Frequency	Valid Percent	Cumulative Percent
Yes	127	83.0	83.0
No	26	17.0	100.0
Total	153	100.0	

83% respondents carry out data analysis on the data they collect while17 % did not. Analysis was done manually by 33.3%, through DHIS2 by 13.7%, by use of computer programs 22.2% and 49% used reports. For those who did not carry out analysis, this was due to; lack of knowledge on data analysis 8.5%, lack of equipment for data analysis 5.9%, not required to analyze 3.3% and others said there was no need for data analysis 28.1%.

4.6.5 Distribution of Respondents on Problems Encountered When Using Health Information

The researcher assessed what the program officers encountered as major problems when they were using health information. Most of them had more than one response as shown in table 4.19 below.

Table 4.19: Distribution of Respondents on Problems Encountered When Using Health Information

Problem encountered	Frequency	Percent
Inaccuracy of information	79	51.6
Unavailability of information	34	22.2
Data not complete	82	53.6
Data not timely	66	43.1
Indicators irrelevant	25	16.3

Data incompleteness 53.6%, inaccuracy 51.6% and untimeliness 43.1% seemed to have been the common problems encountered while data unavailability 22.2% and irrelevancy of indicators 16.3% were also noted.

4.6.6 Distribution of Respondents Skills on Data Analysis and Use

Respondents were required to report on data analysis skills, as indicated in table 4.20 below.

Table 4.20: Distribution of Respondents on Problems Encountered When Using Health Information

Skills	Frequency	Valid Percent	Cumulative Percent
Yes	77	50.3	50.3
No	76	49.7	100.0
Total	153	100.0	

50.3% of the respondents reported that they had skills for data analysis while 49.7% had no skills. Those with no skills reported that they required the following skills in data analysis and use; 16.3% required HMIS skills, 13.7% required survey/research skills, and 31.4% required data analysis skills, 15.7% data utilization skills, 9.8% planning skills while 28.1% required computer software skills.

4.7 Inferential Statistics on Technical Factors

A correlation analysis using Spearman rank coefficient of correlation was conducted at 95% and 99% confidence intervals and 5% and 1% significance levels respectively with a 2-tailed test. Table 4.21 below indicates the correlation between the technical factors and availability of data for use. A strong negative correlation was noted between availability of data and inadequate IT knowledge -0.726, lack of documentation tools -0.719, system complexity -0.711 at 0.01 level of confidence and lack of knowledge to analyse -0.187 at 0.05 confidence levels. There was also a strong positive relationship between lack of documentation tools and inadequate IT knowledge 0.979, system complexity 0.957 and lack of knowledge to analyse 0.446 at 0.01 confidence levels. System complexity was also found to have a relationship with lack of knowledge to analyse 0.428 at 0.01 confidence levels.

Table 4.21: Inferential Statistics on Technical Factors

Spearman's rho		Availability of data	Inadequate IT Knowledge	Lack of documentation tools	System complexity	Lack of knowledge to analyse
Availability of data	Correlation Coefficient	1.000	-.726**	-.719**	-.711**	-.187*
	Sig. (2-tailed)		.000	.000	.000	.020
	N	153	153	153	153	153
Inadequate IT Knowledge	Correlation Coefficient	-.726**	1.000	.979**	.961**	.463**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	153	153	153	153	153
Lack of documentation tools	Correlation Coefficient	-.719**	.979**	1.000	.957**	.446**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	153	153	153	153	153
System complexity	Correlation Coefficient	-.711**	.961**	.957**	1.000	.428**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	153	153	153	153	153
Lack of knowledge to analyse	Correlation Coefficient	-.187*	.463**	.446**	.428**	1.000
	Sig. (2-tailed)	.020	.000	.000	.000	
	N	153	153	153	153	153

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.21 above shows a relationship between the technical factors and the availability of data/information for use thus we cannot reject the hypothesis **$H_1$2**: Technical factors significantly influence the health information utilization in decision making among public health managers.

4.8 Descriptive Statistics on the Influence of Organizational Factors in the Utilization of Information to Make Decisions

The researcher wanted to determine whether organizational factors influence the utilization of information for decision making

4.8.1 Distribution of Respondents on Whether They Conducted Data Review Meetings

The study assessed whether the respondents conducted data review meetings to share information which is a way of utilizing information to make decisions by the organization.

Table 4.22 Distribution of Respondents on Whether They Conducted Data Review Meetings

Reviews	Frequency	Valid Percent	Cumulative Percent
Yes	97	63.4	63.4
No	56	36.6	100.0
Total	153	100.0	

63.4% reported that they conducted review meetings while 36.6% did not. It was reported by those who conducted review meetings that they normally discussed; management of routine data like quality, reporting or timeliness 51%, findings of routine data like disease trends 43.1%, service coverage in terms of quantity and quality 45.1%, medicine stock out in terms of workload and quantification 25.5% and patient utilization of services in relation to population assigned 34.0%. Respondents confirmed that they discussed more than two items.

4.8.2 Distribution of Respondents on Availability of HMIS Policy Documents

The respondents here were required to report whether they have the important documents which support information use and rate how important these documents were to them. As indicated in table 4.23 below all these documents availability was below average yet their usefulness was rated above average thus there is need for these guidelines to be printed and be distributed to all managers. Policies and guidelines to be specific were rated as very useful 96% by the respondents yet the availability was only at 39.9%.

Table 4.23 Distribution of Respondents on Availability of HMIS Documents

HMIS Document	% reported available	Very useful	Somewhat useful	not useful
Policies and guidelines	39.9	96%	6.5	5.9
Annual planned targets	45.1	59.5	12.4	3.9
National HMIS policy	20.9	45.8	11.8	5.9
Standard operating procedures	46.4	60	4.6	3.3
Success stories of HMI use	20.3	49.7	13.7	3.9

Standard Operating procedures 60%, annual planned targets 59.5%, National HMIS policy 45.8% and **s**uccess stories of HMI use 49.7% were rated very useful however their availability was only at 46.4%, 45.1% 20.9% and20.3% respectively.

4.8.3 Distribution of Respondents on Submission of Reports to the Next Level

The study purposed to find out whether the managers submitted reports to the higher level as a way of soliciting support from the seniors.

Table 4.24 Distribution of Respondents on Submission of Reports to the Higher Level

	Frequency	Valid Percent	Cumulative Percent
Yes	128	83.7	83.7
No	25	16.3	100.0
Total	153	100.0	

83.7% said they submitted reports to the higher level while 16.3% did not.

4.8.4 Distribution of Respondents on Feed Back After Submission of Reports

The study sought to find out whether the managers received feedback after they submitted reports to the higher level as a way of support on data quality and use from their seniors (for those who submitted).

Table 4.25 Distribution of Respondents on Feedback after Submission of Reports

Feedback	Frequency	Valid Percent	Cumulative Percent
Yes	85	55.9	55.9
No	67	44.1	100.0
Total	152	100.0	

As shown in table 4.25 above, 55.9% were given feedback while 44.1% were not.

4.8.5 Distribution of Respondents on the Type of Feed Back Received After Submission of Reports

The study sought to understand the type of feedback given being a way of support from the management in the organization. As shown in table 4.26 below 37.3% received a documented feedback on data quality issues, 34.0% received verbal corrections of reports and 30.1% received documented performance reports for the facility. Some of the respondents gave more than two responses. This is quite low compared to the support expected.

Table 4.26 Distribution of Respondents on Feedback after Submission of Reports

Type of feed back	Frequency	Percent
Data quality issues documented	57	37.3
Verbal corrections on the reports	52	34.0
Performance of health facility based on routine HIS	46	30.1

4.8.6 Distribution of Respondents on the Support for Information Use

The study sought to find out if there was support from the higher level management structures to mobilize funds and resources to enhance the utilization of information for decision making.

Table 4.27 Distribution of Respondents on the Support for Information Use

Support	Frequency	Valid Percent	Cumulative Percent
Yes	106	69.3	69.3
No	47	30.7	100.0
Total	153	100.0	

69.3% of the respondents said they received some form of support while 30.7% said they did not receive any form of support.

4.8.7 Distribution of Respondents on the Form of Support Received

The study wanted to find out what sort of support was received by those who said they received some form of support. Most of them received support in form of data tools (58.2%), support supervision (44.4%) and data quality assessments at 36.6%.

Table 4.28 Distribution of Respondents on the Form of Support Received

Form of support	Frequency	Percent
Data quality assessments	56	36.6
Data tools support	89	58.2
Data review meeting support	30	19.6
Funding for HMIS activities support	11	7.2
Support supervision and OJT	68	44.4
Performance review support	35	22.9

HMIS activities received the least support at 7.2% followed by data review meetings at 19.6% and finally Performance review support 22.9%. Some of the managers had more than two responses

4.8.8 Distribution of Respondents' Suggestions and Recommendations on How to Improve the Utilization of Health Information

The study sought to get the suggestions and recommendations of respondents on how to improve the utilization of health information in decision making. Table 4.29 gives the major suggestions for improvement as coded from the respondents.

Table 4.29 Distribution of Respondents' Suggestions and Recommendations on How to Improve the Use/Utilization of Health Information

Suggestions and recommendations	Frequency	Percent
Trainings and OJT	49	32.0
Quality data with all the dimensions	14	9.2
Data reviews and sharing forums	11	7.2
Avail resources like computers	16	10.5
Incentives and lunches in the sharing forums	2	1.3

Most of the respondents 32.0% suggested trainings and on the job trainings 10.5% suggested resources like computers, and 9.2% recommended collection of quality data, 7.2% data reviews and sharing forums while 1.3% recommended incentives and lunches in the sharing forums. Other suggestions all at1.3% respectively were analysis at source & feedback, attitude Change, use of EMR and computers at facility level, use few but standardised indicators, give support supervision, mentorship and OJT from the top management (county), simplify, avail, harmonise and provide data collection tools on time, holding CMEs and provide guidelines and tools.

4.8.9 Distribution of Respondents by Lessons Learnt and HMIS Use Success Stories

The statement sought to find out the lessons learnt (both positive and negative) and success stories of the respondents as they utilized data to make their decisions. Some of the major lessons were coded and analyzed as per table 4.30 below. 16. 3% used data to improve on their services, 10.5% used information to plan successfully, and 6.5% used information to lobby for resources, 3.9% used information for budgetary allocations, 3.3% to monitor disease trends and actually called for national immunization days and 1.3% used information to lobby for support by writing a proposal and it was supported.

Table 4.30 Distribution of Respondents' By Lessons Learnt and HMIS Use Success Stories

Success stories/Lesson learnt	Frequency	Percent
Planning	16	10.5
Lobbying/share for resources	10	6.5
Funded by use of data to write proposal	2	1.3
Improve quality of services	25	16.3
Monitor ;disease trends, NIDs, service progress	5	3.3
Budgetary allocations	6	3.9

Some of the successful stories were less than one percent thus not included in table 4.30 above however their inputs were: Used data to make annual work plan, available information makes my work easier, conducted defaulter tracing using accurate information, made consumption and budget for patient food using information, disease control, disease surveillance and response, early detection of diseases, feedback helped me in correcting errors, got more staff due to high workload, lack of confidentiality causes stigma, used lessons learnt from data to improve service delivery, networking is made easier, quantification of commodities which could not be easy without information, wrong decisions due to missed data during collection, used data to improve deliveries through sensitization of community and incomplete information hinders information use.

4.9 Inferential Statistics on the Organizational Factors

A correlation analysis by spearman rank was conducted at 99% confidence interval and % significance level with a 2-tailed test. Table 4.31 indicates the correlation between getting some form of support and conducting data review meetings/forums rho0.376 to share information which enhances utilization of data to make decisions on planning and service delivery.

Table 4.31 Inferential Statistics on the Organizational Factors

			Get some form of support	**Conduct data review meetings**
Spearman's rho	Get some form of support	Correlation Coefficient	1.000	.376**
		Sig. (2-tailed)	.	.000
		N	153	153
	Conduct data review meetings	Correlation Coefficient	.376**	1.000
		Sig. (2-tailed)	.000	.
		N	153	153

**. Correlation is significant at the 0.01 level (2-tailed).

There was also a relationship between availability of data for use and support from senior managers using chi square (p-value 0.017 (1df, 5.702[a])) which shows significant relationships between organizational factors and information use thus the hypothesis **$H_1$3:** Organizational factors significantly influence the utilization of health information in decision making among public health managers cannot be rejected.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter entails a summing up of the findings, discussions, conclusions and recommendations. The findings of the study are summarized in accordance with objectives of the study which are behavioural, technical and organizational factors influence on health information utilization to make decisions. The independent variables were studied against dependent variable which is utilization of health management and information.

5.2 Summary of the Findings

This section represents findings of the study on the factors influencing utilization of health management and information in Malindi sub county, Kilifi County.

5.2.1 Findings on influence of behavioural factors on utilization of health information

Most of the respondents 98.7% reported that it was necessary to collect data. Their opinions and views towards information use were that; 96.7% of the respondents felt that information is key in decision making, 73.9% of them felt that staff competence and skills was key in information use, others felt that positive attitude towards information motivates information use (66.7%). Management guidance and leadership (53.6), Proper resources (50.3%) and confidence to use information 51.0% were also found to be major motivators of information use. This indicated a positive attitude among the sub county managers towards information use. The study also found out that 97.4% of the managers felt that information use was important in their area of work and that 77.8% used information for planning, 71.2% to monitor their work, 61.4% to evaluate their programs, 60.1% to monitor program output. This implies that utilization of information for decision making among program managers in Malindi Sub County is on-going though there is still room for improvement. A correlation analysis using Pearson coefficient correlation was conducted at 95% and 99% confidence intervals and 5% and 1% significance level and with a 2-tailed test. A significant positive correlation between staff competence/skills, positive attitude and management leadership and guidance to use information was noted by a Pearson value of r0.371 and r0.287 and lack of incentives to use information and nature of work at r0.239 values. The

study established that there was increased utilization of information with positive attitude r0.333. This finding shows that the behavioral factors positively correlate with information use for decision making and thus can influence decision making.

5.2.2 Findings on Influence of technical factors on Utilization of health information

The study showed that 61.4% of the respondents had been trained on data management. When asked whether information was available when needed for use, 79.7% of the respondents reported that it was available and that the main source of information was from monthly summaries (52.9%), 49.0% from registers, 32.7% from DHIS and 19.6% from Records/HMIS office. For those who reported that data was unavailable when required the main reasons were poor documentation 11%, lack of documentation tools 6.5%, inadequate IT knowledge on the DHIS software 5.9%, system complexity 6.5%, inadequate knowledge on data extraction, analysis and processing 10.5%. The study found out that the indicators collected were relevant and understandable 89.5%. Those who reported that the indicators were not relevant and understandable recommended that trainings on indicator understanding should be conducted 11.1%, standard documentation tools should be availed 6.5%, few but quality standardised indicators to be collected 7.2%. 83% reported that they carry out data analysis on the data they collect and17 % did not. When asked how they did the analysis, their report was: 33.3% did it manually, 13.7% used DHIS, 22.2% used computer programs and 49% used reports. Lack of knowledge on data analysis 8.5%, lack of equipment for data analysis 5.9%, not required to analyse 3.3% and no need for data analysis 28.1% were the main reasons for not analyzing data. According to the findings there seems to be knowledge gap in analysis of data for use. Similar results were identified in a study conducted in Kenya by measure evaluation (2007) whereby staffôs capacity to analyze, interpret and use data was limited.

Data incompleteness 53.6%, inaccuracy 51.6%, data unavailability 22.2 and irrelevancy of indicators 16.3% and untimeliness 43.1% seemed to have been the common problems encountered while using health information. 50.3% of the respondents had skills for data analysis while 49.7% had no skills. Those who had no skills required HMIS skills 16.3%, survey/research skills 13.7%, data analysis skills 31.4%, data utilization skills 15.7%, planning skills 9.8% while 28.1% required computer software skills. A strong negative correlation was noted between availability of data and inadequate IT knowledge -0.726, lack of documentation tools -0.719, system complexity -0.711 at 0.01 level of confidence and

lack of knowledge to analyse -0.187 at 0.05 confidence levels. A strong positive relationship between lack of documentation tools and inadequate IT knowledge 0.979, system complexity 0.957 and lack of knowledge to analyse data 0.446 at 0.01 confidence levels was also found. System complexity was also found to have a relationship with lack of knowledge to analyse 0.428 at 0.01 confidence levels. This correlates with measure evaluation (2007) who identified different challenges such as general lack of analysis and use skills, lack of performance based and culture and no incentives for data utilization determine information use.

5.2.3 Findings on influence of organizational factors on utilization of health information

The study found out that 63.4% conducted data review meetings while 36.6% did not. The study established that 51% discussed management of routine data like quality, reporting or timeliness, 43.1% discussed findings of routine data like disease trends, 45.1% discussed about service coverage in terms of quantity and quality, 25.5% discussed about medicine stock out in terms of workload and quantification and 34.0% discussed about patient utilization of services in relation to population assigned. It was found out that policies and guidelines were rated as very useful 96% by the respondents yet the availability was only at 39.9%, national HMIS policy 45.8% useful and only 20% available, standard operating procedures 60% very useful and 46.4% available. Submission of reports to the higher level was found at 83.7% and that only 55.9% were given feedback. 37.3% received a documented feedback on data quality issues, 34.0% received verbal corrections of reports and 30.1% received documented performance reports for the facility. The study found out that most of the respondents received some form of support from the sub county or county 69.3% and the type of support was in form of data tools (58.2%), support supervision (44.4%), funding for HMIS activities at 7.2%, data review meeting support 19.6% and data quality assessments at 36.6%.

Most of the respondents suggested improvements of information use by conducting trainings and on the job trainings 32.0%, provision of resources like computers 10.5%, 9.2% recommended that people should collect quality data, 7.2% data reviews and sharing forums while 1.3% recommended incentives and lunches in the sharing forums. Other suggestions which were at 1.3% respectively were analysis at source & feedback, attitude change, use of EMR and computers at facility level, use few but standardised indicators, give support

supervision, mentorship and OJT from the top management, simplify, avail and harmonise data collection tools on time, holding CMEs and provide guidelines and tools. The study also found out success stories from the managers who used information. Most important was planning 10.5%, lobbying and sharing of resources for resources 6.5%, funded by use of data to write proposals 1.3%, improve quality of services 16.3%, budgetary allocations 3.9% and monitor disease trends, national immunisation days and service progress 3.3%.

The study found a relationship between availability of data for use and support from senior managers using chi square p-value 0.017 (1df, 5.702[a)] and also there was correlation between getting some form of support and conducting data review meetings/forums to share information which enhances utilization of data to make decisions on planning and service delivery. This finding is in line with Thompson (1967: 159) who identified technology and environment as major sources of uncertainty and recommended that organizations need to increase their information-processing capacity for instance, to increase managers' information management skills (collecting, analysing, and transmission of data).

5.3 Discussion of Findings

The findings showed positive significant correlation between all the three factors that influence information use. The discussion of findings from this study is presented as follows;

5.3.1 Behavioural factors and utilization of information to make decisions

The study established that behavioural factors influenced utilization of information to make decisions in Malindi Sub County. It was determined that there was increased utilization of information with positive attitude, views and opinions. Management guidance and leadership was also found to influence staff competence/skills and positive attitude towards information use. Additionally lack of incentives was found to negatively influence use of information especially in the nature of work the manager did which is in line with Carbone (2008) that clinicians need a motivation in order to influence behavioural change in clinical practice to use the local health records for decision making. Also according to WHO (2005), little attention has been set to address the staffing needs as concerns trainings to give them skills in order to have motivated health information officers. Thus the need for the organization to address the challenge.

The study findings are in agreement with Aqil et al, (2009), that most of the behavioural factors will require interventions that go beyond simple training that improves knowledge and skills in understanding data and using information. The findings emphasize the work of Chaled (2013) and Jutand (2000) that routine information users demand, confidence, motivation and competence to perform their tasks which affect the system processes and performance directly and that how an individual feels about the utility or outcomes of a task as well as the complexity of the task affect the likelihood of that task being performed. Lack of incentives to use information and nature of work corresponds with Dumont et al, (2012) that health facility managers are collecting data without understanding completely why they are collecting that data and its utility has not been explored and thus probably create little appreciation for collecting it.

5.3.2 Technical factors and utilization of information to make decisions

The study established that inadequate IT knowledge, lack of documentation tools, system complexity and lack of knowledge to analyse influenced information availability for use in Malindi Sub County. This is in line with Sauerborn (2000) who indicated that the complexity of the system design used in entry and recording of data is the most important technical factor affecting utilization of routine health information by health facilities. In relation to the above, Boone (2013), also argued that the complexity of these systems makes it hard for health workers to utilize the system and end up using manual paper files recording which makes information spoilt and poorly managed. In addition to the discussion of the technical factors limiting utilization of routine health information, Rhoda (2010), discovered that some of the software for running the system of data entry and computation are also scarce, expensive and complex. Gopalan (2013), argues that IT use and applications are a new concept in modern institutions in developing countries particularly those in Africa. System complexity was also found to be influenced by lack of knowledge to analyse. This is in agreement with Garrib et al (2008) who assessed the rural South African district health information system found out that health facilities were not utilizing data aggregation tools as expected because they had limited skills to analyse, interpret and utilize the data and also agrees with the world health organisation who emphasizes that correct use of data transforming tools into information needs to be dealt with (WHO, 2008).

5.3.3 Organizational factors and utilization of information to make decisions

Support from senior managers and the organization were found to influence data review meetings/forums to share information which enhances utilization of data to make decisions. Also support from senior managers was also found to influence availability of data for use. The findings matches with Kamadjeu et al, (2005) emphasis that the senior managers leadership on shared values associated to information systems are alluded to as a pre-existing culture of data collection otherwise ج culture of information ج The findings also collude with Chaled, et al, (2013) that, the availability and access to timely reporting and feedback has potential to determine the level of utilization of routine health information by health facilities and also with Scott (2005) that, it is crucial that managers are aware of the information they require, how to acquire it and to maximize the use in order to survive and prosper in today's information-intensive environment. MOH, (2009) points out that there is lack of guidelines and policy which was noted in the study yet most of the managers felt it was very important in their areas of work. The study found out that support mostly was in form of supervision concurring with Sauerborn (2000) and Boone,(2013) argument that some members of the health management teams have been supported to receive training on supervision, leadership and management to enhance their capacity to effectively manage health services. Thus they are expected to capacity build lower health facilities through supervision which leads to effective utilization of routine health information.

5.4 Conclusion

Based on the findings of the study, the following conclusions are made on the influence of utilization of information for decision making among health managers in Malindi Sub County. All the three factors studied influenced utilization of information for decision making among health managers in Malindi Sub County to almost similar extents. As demonstrated by the correlation coefficients for behavioural factors, we can say that attitude; values, motivation, perception, beliefs roles and responsibilities (nature of work) were found to be major factors in low data quality and information use and that they influence the utilization of information for decision making.

Technical factors like staff competence and skills, computer software, IT complexity, complexity of data management and data collection tools demonstrated as effective

instruments for data availability, analysis and use to make decisions. There was evidence that lack of technical and analytical skills created a barrier to producing high-quality, reliable data and information. This agrees with Harrison & Bakari (2008) that lack of technical and analytical skills creates a barrier to producing high-quality, reliable data and information and also with Rotich et al (2003) that limited knowledge of the usefulness of RHIS data is found to be a major factor in low data quality and information use.

Organizational and management structures in the areas of support of review meetings, feedbacks and supervision were found to be a very effective strategy of enhancing information utilization to make decisions and also the level of culture of information use in a health facility also influenced the utilization of health information by the health facility. Just as it is depicted by Schneberger & Wade (2006) in the EBHIS theory, it was evident that there has to be a fit in between the behavioural and technical factors which must be supported by the organization in order for information to be effectively utilized. Also, it was noted that support from the higher level was very important to provide a mutual agreement between the behavioural and the technical factors to achieve a common ground for information use.

5.5 Recommendations

Based on the findings from the study, it is recommended that:

1. On behavioral factors, the management structures should lay emphasis on information values and create leadership on information use in order to boost positive attitude, values, motivation and perception to use information for decision making despite the roles and responsibilities. This is supported by Aqil et al (2009) who noted that influencing many of these behavioural factors will require interventions that go beyond simple training that improves knowledge and skills in understanding data and using information.

2. On the technical factors, it is emphasized that there should be trained manpower that will be able to appreciate the use and value of information and it is recommended that those not trained on data collection and information use should be trained through OJT, seminars and workshops. Same recommendation was done by Loevinsohn (1994) and Wilkins et al (2008) that there was a significant need to train managers in data analysis and use, and to integrate data utilization activities when information systems are installed.

3. Qualified personnel e.g. HRIOs should be recruited to ensure effective provision of information, establishment of information departments and formulation of information policies in house to guide in the management of information resources. This was also a recommendation by Dumont et al, (2012).

4. Data collection tools e.g. registers and summaries should be standardized, harmonized and reduced to enhance quality and relevance of indicators and that available data should be packaged through the development of targeted information products and tools that respond to specific data users and information needs at various levels and departments to suit each user.

5. On the organizational factors it is recommended that the county and sub county should play a key role in the management support through support supervision, feedbacks on reports and information sharing and review forums in order to boost information sharing at the health facility level. It is also recommended that the health settings provide an enabling environment and that special skills that support the acceptance of information technology in health settings should be put in place which is in line with Jutand (2000).

6. Ensure the resources to strengthen data utilization are developed and distributed to every facility in the sub county for example manuals, standard operating procedures, research results and equipment like computers.

5.6 Suggestions for further research

On the basis of what has been found out from this study, the researcher recommends that similar studies be conducted in other sub counties in the county to correlate these findings so as to improve the information culture in the county.

The researcher also recommends that a study to find out the knowledge, attitude and perception of the health workers on data collection tools should be conducted.

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APPENDICES

APPENDIX I: LETTER OF TRANSMITTAL

Dorah Wavua Chorongo
University of Nairobi,
Extra Mural Studies, Malindi.
P.o. box 1995, Malindi
E-mail chorongodorah@gmail.com.

Dear respondent,

RE: <u>COLLECTION OF DATA FOR ACADEMIC RESEARCH</u>

I am a post graduate student of registration number L/76396/2014 at the School of Continuing and Distance Education in the University of Nairobi and pursuing Masters of Arts Degree in Project Planning and Management. I intend to carry out a research on the factors influencing the utilization of health management information system for decision making among health program managers in Malindi sub county, Kilifi County, Kenya. This study is part of the fulfilment of the course that I am undertaking.

This study entails collection and analysis of data and thereafter a report written. Findings and recommendations from this study will help generate data that will be of benefit to health planners and health institutions in improving and strengthening the quality of health information for decision making in health care delivery.

You have been selected to participate in the study by filling the attached questionnaire. You will be required to fill the attached informed consent form. The information provided will be used for academic purpose only and will be held at the highest level of confidentiality.

Thanks in advance for cooperating,

Yours Sincerely,

Dorah Wavua Chorongo
L50/76396/2014

APPENDIX II: INFORMED CONSENT FORM

The factors influencing the utilization of health management information system for decision making among health program managers in Malindi sub county, Kilifi County, Kenya.

Researcher

Name: Dorah Wavua Chorongo.

Organization: Malindi Health Manager

Background: You have been identified as one of the key persons for this study on the factors influencing the utilization of health management information system for decision making among health program managers in Malindi sub county, Kilifi County, Kenya and therefore you are requested to give information as per the questionnaire. This study is being carried out with permission from the University of Nairobi. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to read the following information carefully. You are free to ask the researcher if there is anything that is not clear to you. This study is part of the fulfilment for the attainment of a masterôs degree in Project Planning and Management.

Risks: The information gathered from the field during this research is solely for academic purposes and will not be shared with any unauthorized person.

Confidentiality: All participants involved in this study will not be identified and their anonymity will be maintained.

Consent: By signing this consent form, you confirm that you have read and understood the information and have had the opportunity to ask questions. You understand that your participation is voluntary and that you are free to withdraw at any time, without giving a reason and without cost. You understand that you will be given a copy of this consent form. You voluntarily agree to take part in this study.

Participant.....Sign.....Date __/___/2015

APPENDIX III: RESPONDENTS QUESTIONNAIRE

Questionnaire Identification Information

Respondent Code /__ / __ / __

Date of Interview __ __/__ __ /2015

Introduction

I am a student from University of Nairobi, and I am carrying out a research on the factors influencing the utilization of health management information system for decision making among health program managers in Malindi sub county, Kilifi County, Kenya. You have been identified as one of the key persons for this study and therefore you are requested to give information on health information as per the questionnaire. The information captured in this questionnaire is important in that it will generate data that will be of benefit to health planners and health institutions in improving and strengthening the quality of health information for decision making in health care delivery.

All information provided shall be treated with strict confidentiality and shall only be used for the purpose of this study.

INSTRUCTIONS

Please tick in the box provided, circle or write the correct answers in the blank spaces provided.

SECTION I: BACKGROUND INFORMATION

1. Ageé é é
   a) 18 ï 25 ☐
   b) 26 ï 40 ☐
   c) 40 and above ☐

2. Gender of the Respondent
   a) Male ☐
   b) Female ☐

3. Professional training of the respondent.

a) Doctor ☐
b) Nurse ☐
c) Health Records ☐
d) Clinical Medicine ☐
e) Public health ☐
f) Laboratory ☐
g) CHEW ☐
h) Others (specify).....

4. Level of training

a) Certificate ☐
b) Diploma ☐
c) Degree ☐
d) Masters ☐

5. The years of working experience in the current office. é .. é é é é .

6. Where do you work?

a) Sub county Hospital ☐ b) Health Centre ☐ c) Dispensary ☐
d) Sub county ☐

7. Position held by the respondent.

a) Hospital Sectional head ☐
b) Departmental head (HMT Member) ☐
c) Program head (SCHMT Member) ☐
d) Head of a health facility (Dispensary/ Health Centre) ☐
e) Community health extension worker ☐

SECTION I1: BEHAVIOURAL FACTORS AND INFORMATION USE INDEPENDENT VARIABLE).

8. What type of data do you generate in the course of your daily activities? **(Multiple responses allowed Tick)**

a) Outpatient data ☐
b) Inpatient data ☐
c) Clinical ☐
d) Diagnostic data ☐
e) Program data (HIV, IMMUNZATION, FP, and ANC) ☐
f) Health systems data (finances, infrastructure, Human resource) ☐
g) Others (specify)é é é é é é é é

9. According to you, is it necessary to collect this data?

a) Yes ☐ (b) No ☐

10. If yes in question 9 above, what reason do you have for collecting data? (Tick)

a) As a requirement ☐
b) To keep track of disease trend ☐
c) As a routine exercise ☐
d) To use it for decision making ☐
d) Others (specify)é é é é é é é é é ..

11. If no in question 9 above, what reason do you have for not collecting data?

a) No tools for collection ☐
b) Not necessary ☐
c) Very tedious ☐
d) Boring ☐
d) Not my work ☐
d) Others (specify)é é é é é é é é é

12. Is information use important to you or your area of work? Yes ☐ No ☐

13. If yes in12 above how do you use the health information? (Tick what is applicable)

a) Monitor my work ☐
b) Monitor others work ☐
c) Monitoring programme output ☐
d) Planning ☐
e) Evaluation ☐
f) Research ☐
g) Budgeting ☐
h) Medico - legal ☐
i) Others

(specify)é é é é é é é é é é .....

14. If no in Q12 above, how do you make your decisions as you run your services? Tick)

a) Use approximates ☐
b) Use my opinion ☐
c) Just decide ☐
d) Ask others opinions ☐
e) Other specify ☐

15. Kindly tick all what you feel/think motivates or drives people to use information.

a) Information is power/key in decision making ☐
b) Confidence to use the generated information ☐
c) Staff competence and skills to perform health information tasks is essential for data collection, analysis and use ☐
d) Positive attitude towards data collection and use ☐
e) Belief that Routine Health Information System data is useless hinders data usage ☐
f) Lack of motivating incentives hinders information use ☐
g) Nature of work e.g. Customized to patients treatment not collecting data ☐
h) Collecting information that adds no value irritates me ☐
i) Proper resources e.g. computers, laptops etc. ☐
j) Management guidance and leadership ☐

16. What is your view or opinion on information use?.....

.....

SECTION I1I: TECHNICAL FACTORS AND INFORMATION USE (INDEPENDENT VARIABLE).

17. Have you ever been trained on data management?

a) Yes ☐

b) No ☐

18. If yes, (above), where did you train?

a) College training ☐

b) Seminars or Workshops ☐

c) On job training ☐

d) Others (specify)é é é é é é é é é é é

19. Are the data/ information available on time when you require it for decision making?

Yes ☐ No ☐

20. If Yes in question 19 above, what is the source of this information?

a) District Health Information System Soft ware(DHIS) ☐

b) Registers ☐

c) Copies of monthly Summaries ☐

d) Records /HMIS office ☐

21. If NO in question 19 above, what are the reasons of unavailability? (**Multiple responses allowed Tick)**

a) Poor documentation ☐

b) Inadequate IT knowledge on the DHIS software ☐

c) Lack of documentation tools ☐

d) System complexity ☐

e) Inadequate knowledge on data extraction, analysis and processing ☐

f) (Specify)é ..

22. Do you think that the indicators collected are relevant and understandable?

a) Yes ☐
b) No ☐

23. If No in Q22 above, what are your recommendations (Tick)

a) Training on indicator understanding ☐
b) Availability of standard documentation tools ☐
c) Few but quality standardised indicators to be collected ☐
d) Others specify.....

24. Do you carry out any data analysis on the data you collect?

a) Yes ☐
b) No ☐

25. If yes in Q 24 above, how do you analyze your data?

a) Manually ☐
b) Using DHIS ☐
c) Using computer programs ☐
d) Using reports ☐

26. If no, in Question 24 above, why donôt you analyze?

a) Lack of knowledge on data analysis ☐
b) Lack of equipment for data analysis ☐
c) Not required to analyze ☐
d) No need for data analysis ☐
e) Others (specify)é ..

27. What problems do you encounter when using health information? (Tick appropriately)

a) Data not accurate ☐
b) Data not available ☐
c) Data not complete ☐
d) Data not timely ☐
e) Indicators nor relevant ☐

28. In general, do you feel you have the skills necessary to analyze and use data and information in order to help with the kinds of decisions that you are involved in?

a) Yes ☐
b) No ☐

29. If No in question 28 above, which skills do you require?

i. HMIS ☐
ii. Survey /Research ☐
iii. Data analysis ☐
iv. Data utilization ☐
v. Planning ☐
vi. Computer softwareôs ☐
vii. Other data related areas. Specifyé é é é é é é é é é é

SECTION V: ORGANIZATIONAL FACTORS THAT INFLUENCE THE ANALYSIS AND UTILIZATION OF HEALTH INFORMATION (INDEPENDENT VARIABLE).

30. Do you conduct data review meetings Yes ☐ No ☐

31. If yes in Q30 above, what do you normally discuss? (Kindly tick what is discussed)

a. Management of routine data like quality, reporting or timeliness ☐
b. Findings of routine data like disease trends ☐
c. Service coverage in terms of quantity and quality ☐
d. Medicine stock out in terms of workload and quantification ☐
e. Patient utilization of services in relation to population assigned ☐
f. Others (please specify)é .

32. Do you have any of these documents? Please circle Yes or No and rate their usefulness to you as: 1= not useful, 2 = somewhat useful, 3 = very useful (Whether you have them or not)

a) Guidelines/ recommendation for action (a). Yes (b). No. Rate ☐
b) Annual planned targets from the district office (a). Yes (b). No Rate ☐
c) County/National HMIS Policy (a). Yes (b). No é .. Rate ☐
d) Standard Operating procedures manual? (a). Yes (b). No Rateé .. ☐
e) Reports showing success stories of data use. (a). Yes (b). No Rateé .. ☐

33. Do you submit Monthly reports to the Sub County Offices? Yes ☐ No ☐

34. If yes, in question 33 above, do you get any sort of feedback? Yes ☐ No ☐

35. If Yes in question 34 above, what sort of feedback? (Tick those relevant)

a. Data quality issues (documented) ☐
b. Verbal corrections on the reports ☐
c. Performance of health facility based on routine HIS (documented) ☐
d. Others
(Specify)é ..

36. Do you get any form of support from the County/or senior managers to enhance data analysis and utilization for decision making? Yes ☐ No ☐

37. If yes in question 36 above, what form of support do you get? (Tick those relevant)

a. Data quality Audits (DQAs) ☐
b. Data collection tools ☐
c. Resources for conducting data review meetings ☐
d. Performance of health facility based on routine HIS ☐
e. Funding for HMIS activities ☐
f. Support supervision and on job training on data tools ☐
g. Others (Specify)é .

38. Give your own suggestions and recommendations on how to improve the use/utilization of health information to make decisions in our health facilitiesé é é é é é é é é é é é é é é é é ..
39. Kindly share any brief experiences on the utilization of information whether positive or negativeé é é é é é é é é é é é é é é é é

APPENDIX IV: LETTER FROM UNIVERISTY OF NAIROBI FOR DATA COLLETION

UNIVERSITY OF NAIROBI
COLLEGE OF EDUCATION AND EXTERNAL STUDIES
SCHOOL OF CONTINUING AND DISTANCE EDUCATION
DEPARTMENT OF EXTRA- MURAL STUDIES

MALINDI SUB CENTRE

MALINDI EXTRAMURAL CENTRE
P.O.BOX 5309-80200 MALINDI

25th July 25, 2016.

TO WHOM IT MAY CONCERN

Dear Sir/Madam

RE: DATA COLLECTION-

Dorah Wavua Chorongo of student ID Number L50/76396/2014 is undertaking *Master of Arts in Project Planning and Management* at the University of Nairobi in Malindi. As part of the requirement for her program, she is required to undertake a research on ***"factors influencing the utilization of health management information for decision making among health program managers in Malindi sub county, Kilifi County, Kenya.***". Therefore the purpose of this letter is to request you to kindly grant her permission to collect data for her research.

This research is purely for academic purposes, any assistance accorded to her will be highly appreciated.

UNIVERSITY OF NAIROBI
MALINDI EXTRA MURAL CENTER
P. O. Box 5309-80200, MALINDI
CENTRE ADMINISTRATOR
Date: 20/07/2016 Sign:

STEPHEN FANAKA NDURYA
CENTRE ADMINISTRATOR
DEPARTMENT OF EXTRAMURAL STUDIES

APPENDIX V: KILIFI COUNTY AUTHORIZATION LETTER

COUNTY GOVERNMENT OF KILIFI
DEPARTMENT OF HEALTH RESEARCH COMMITTEE

Email:researchcommitteekilifi@gmail.com
When Replying/Telephoning quote
REF: DOH/RESEARCH/2016/17/2

P. O. Box 9-80108
Kilifi
Date 28 September 2016

Mrs Dorah W. Chirongo
Health Records and Information Officer,
Malindi Sub-County

Dear Madam,

RE: AUTHORIZATION TO CARRY OUT A STUDY IN MALINDI SUB-COUNTY, KILIFI.

The Kilifi County Department of Health research committee is in receipt of your application for permission to conduct a study, **"Factors influencing the utilization of health management information for decision making among health program managers in Malindi Sub County, Kilifi County, Kenya"** that received ethical approval from Pwani University ERC ***Ref:ERC/MA/008/2016***.

The committee is glad to grant you authorization to conduct your study in Malindi Sub-County upon which after completion of you research, you are **REQUIRED** to submit a written report to the Kilifi County Department of Health research committee detailing the findings, conclusion and recommendations emanating from your study.

NB: The Principal Investigator **MUST** ensure that the study is conducted in full accordance to the human subject's considerations.

We wish you the very best as you conduct your research.

Sincerely,

COUNTY DIRECTOR OF HEALTH
KILIFI COUNTY
27 SEP 2016
P. O. Box 9 - 80108, KILIFI

Evaline Lang'at
Research Coordinator
KILIFI COUNTY HEALTH RESEARCH COMMITTEE

APPENDIX VI: CERTIFICATE OF ETHICAL APPROVAL

NACOSTI ACCREDITED

ERC/MA/008/2016

ETHICS REVIEW COMMITTEE

ACCREDITTED BY THE NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION (NACOSTI, KENYA)

CERT IFICATE OF ETHICAL APPROVAL

THIS IS TO CERTIFY THAT THE PROPOSAL SUBMITTED BY:

DORAH W. CHORONGO

REFERENCE NO:
ERC/MA/008/2016

ENTITLED:
Factors influencing the utilization of health management information for decision making among health program managers in Malindi Sub County, Kilifi County, Kenya

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TO BE UNDERTAKEN AT:
KILIFI COUNTY, KENYA

FOR THE PROPOSED PERIOD OF RESEARCH

HAS BEEN **APPROVED** BY THE ETHICS REVIEW COMMITTEE

AT ITS SITTING HELD AT PWANI UNIVERSITY, KENYA

ON THE **13th DAY OF AUGUST 2016**

CHAIRMAN SECRETARY LAY MEMBER