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SCHOOL OF THE ARTS AND DESIGN

COMMUNICATION FOR IMPROVED MATERNAL HEALTHCARE FOR WOMEN IN INFORMAL URBAN SETTLEMENTS OF KENYA

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DECLARATION

I, MAUREEN MONICA ATIENO OCHOLA hereby declare that, this study is my own original work and not a duplication of similar published work of any scholar for academic purpose. This research has not been submitted to this or any other institution of higher learning for the award of a Certificate, diploma or degree in any field of study. The research provides my own opinions and not necessarily that of the University of Nairobi.

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Signed: ..... Date: ……

Supervisor's Declaration

Signed:..... Date: ……

MRS FRANCISCA ODUNDO, School of the Arts and Design, University of Nairobi

DEDICATION

This research is dedicated to my loving parents Mr Dalmas Ochola Owino and Mrs Millicent Akinyi Ochola for their love and support throughout this journey.

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DEFINITION OF TERMS

IDEO - An award winning global design firm that takes human centred design based approach in helping organizations innovate and grow

IDE - Product design and development firm in the Silicon Valley dealing in human centred industrial design.

Heifer international - Non-profit organization that works to eradicate hunger and poverty using sustainable ideals based on complete community development.

Eclampsia - a condition in which one or more convulsions occur in a pregnant woman suffering from high blood pressure, often followed by coma and posing a threat to the health of mother and baby.

Haemorrhage - Escape of blood from a raptured vessel

SUMATA - means auspicious mother in Sanskrit.

ACRONYMS

ANC	Antenatal care
CARE	Cooperative for Assistance and Relief Everywhere
CDC	Centers for Disease Control and Prevention
CHW	Community health worker
DFID CRD	Department for International Development Central Research Department
GOtv	Digital terrestrial TV service
HIV	Human Immunodeficiency Virus
ICRW	International Centre for Research on women
IEC	Information Education and Communication
ITHs	International Health Technologies
KTN	Kenya Television Network
MAMA	Mobile Alliance for Maternal Action
NGO	Non-Governmental Organization
NICE	National Institute for Health and Care Excellence
NTA	National Television Network
PNC	postnatal care
QTV	Quick Time Television
RFID	Radio Frequency Identification
SMS	Short Message Service
TBA	Traditional Birth Attendants
TV	Television
WHO	World Health Organization

ABSTRACT

According to the African Population and Health Research Centre, Nairobi, Kenya's capital informal settlements have a higher maternal mortality rate (706 deaths per 100,000 live births) compared to the countries capital, which is at 510 per 100,000 live births. This research borrows a leaf from countries like Sweden that managed to reduce their maternal mortality due to increase in knowledge on maternal health issues. Therefore, the study looks at human centred communication as a strategy to reduce maternal deaths in the informal urban settlements in Kenya. Human centred design takes into account the realities of women's lives thus when incorporated into the communication strategies will empower, inform and motivate women to use the services available in the health care sector.

Qualitative research methods were employed in this study. In-depth face-to-face interviews and focus group discussions were used to establish the current sources of maternal health information used by women in the informal urban settlements and the efficiency of these sources. The study also sought to determine the social networks used by the women, when and how they are used and how best they can be used to effectively design maternal health information for women in the informal urban settlement.

The study revealed that women in informal urban settlements sought maternal health information from health workers, informal and mass media sources. The efficiency of the sources of maternal health information was affected by age difference and level of education of the mothers. Additionally, cultural and language barriers were further identified as bottlenecks of information dissemination and seeking. The study further revealed that social networks such as mobile phones, radios and televisions could be used to disseminate maternal health information to women in the informal urban settlement.

CHAPTER ONE

1.1 BACKGROUND INFORMATION

This study looks at human centred design as viewed at by Victor Papanek in his book "Design for the real world". Victor Papanek saw design as a way of solving real problems for real people. He advocated for design addressing the needs of the poor, disabled, elderly and other underserved communities. In his book, Papanek argues that design needs to be innovative, extremely creative, multi- disciplinary and most of all research oriented (Papanek, 1972).

Treatment and care in maternal health should be considerate of women's needs and preferences. In partnership with their healthcare providers, expectant women should be given the chance to make informed decisions regarding their treatment and care. Good communication between health workers and women is important; and should incorporate information tailored to the women's needs (NICE guideline DRAFT, 2010).

Communication is important in maternal healthcare because for the formal health care systems to work effectively, the women must be informed, empowered and motivated to use the services available in the healthcare sector. Literature review examining the social, cultural, economic and political factors that affect maternal health indicates that women need to understand their needs, access services confidently without delay and make informed decisions about their health (Roth & Mbivzo, 2001).

Human centred design takes into account the reality of a woman's life within the context of her family and the community. This as suggested by Roth and Mbivzo, (2001) is because a woman's decision-making power regarding her health is very limited due to cultural and social reasons. Therefore, human centred design involves tailoring the information to include the social contexts in which health choices are made; this may include the husband, the in-laws and brothers. Alternatives to the normal communication strategies are used in human centred design to relay maternal health information in order to achieve more

sustainable results. To achieve an efficient communication strategy, the needs of the users are put at the core of the design process (Roth & Mbivzo, 2001).

Direct maternal mortality causes are eclampsia, haemorrhage, infection, obstructed labour and unsafe abortion (Figure 1 shows the causes in percentage). High fertility rates because of lack of access to contraceptives and other reproductive healthcare services, under nutrition, adolescent pregnancies and lack of proper care during pregnancy are other causes of maternal deaths. These causes are preventable or treatable by use of drugs for postpartum haemorrhage and sepsis and this is possible through strengthening of primary healthcare systems and encouraging women to deliver in healthcare facilities (Moss, Valentine, & Kates, 2010). This calls for new and innovative models that increase access to quality health services (Kristensen, et al., 2012).

Understanding the mentioned causes of maternal mortality has led to different strategies on improving maternal health. Some of these strategies such as communication create awareness to address some of the aspects of maternal mortality before, during and after pregnancy and childbirth. Some of these strategies include improving access to family planning, encouraging antenatal and prenatal visits and ensuring good nutrition for mother and child after childbirth (Roth & Mbivzo, 2001).

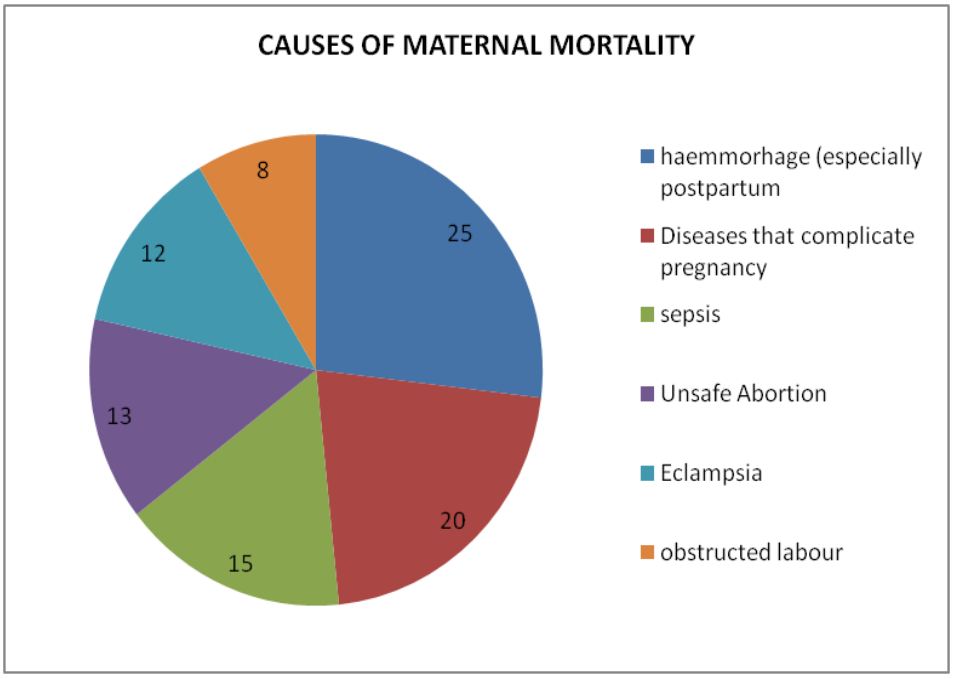

Figure 1: Causes of maternal mortality (in percentage)

Source: https://kaiserfamilyfoundation.files.wordpress.com/2013/01/8074.pdf

Roth and Mbivzo, (2001) conclude that maternal mortality is caused by a variety of factors that delay the access of women to maternal healthcare facilities as a result of social, cultural or economic factors within the family or the community. The delays are categorized as follows:

1. Delay in the first choice to seek care.
2. Delay in a woman's arrival in a health facility.
3. Delays occurring when a woman has arrived within the health care facility.

The healthcare provider-client interactions and the availability of medicines and supplies in the hospital cause delays at the health care facility. This may affect a woman's perception on the benefits of using maternal health care services or contribute to delays when she gets to the hospital. This delay within the health care facility has been improved through strengthening communication within the health facility (Roth & Mbivzo, 2001).

There is no single intervention for improving maternal health. This study therefore focuses on communication as a human centred strategy to improve maternal health. In this regard, a report on the United States government's determination to address worldwide maternal, new-born and child health in 2010 indicated that maternal health outcomes are significantly improved through counselling, information and outreach that aim at the woman, her husband and other key decision makers in the family. Additionally, World Health Organization states that regions like South- East Asia, Latin America, East Asia and North Africa have reported declines in maternal mortality since the 1990s due to increased education on the use of contraceptives to delay and postpone childbearing (Moss, Valentine, & Kates, 2010).

Similarly, maternal mortality in the developed countries stands at nine deaths per 100,000 live births according to the World Health Organization, (2007). In Sweden, the progress in maternal health began after 1870 due to increase in knowledge on maternal health. This

gives evidence on the efficiency of communication as an intervention to improve maternal health.

According to African Population and Health Research Centre, (2009) there is a need to deliver sustainable focused health education that aims at encouraging the use of contraceptives to alleviate unwanted pregnancy and to promote the use of antenatal care and obstetric services is necessary in the informal urban settlements of Nairobi, Kenya.
Since mobile phones are a preferred mode of communication to many people across the globe, Nicaragua is using mobile technology to target the youth who enjoy texting with information to improve maternal health. ChatSalud, a project run by a collaboration of local organizations took advantage of the influence and anonymity of mobile phones to connect the youth to reliable and fast sexual and reproductive health information through SMS. At the core of this initiative (ChatSalud) is the belief in human-centred design that puts individuals at the core of a design process (Mobile Alliance for Maternal Action (MAMA), n.d).

Discussed below are case studies from different parts of the world on human centred maternal health communication interventions:

1.1.1 ART FOR POSTNATAL EDUCATION IN HAITI

The child malnutrition unit at Hospital Albert Schweitzer in Haiti adorns colourfully designed murals painted over the beds to aid in keeping the new-borns healthy and well fed. This is because in Haiti, one in every five new-borns suffers from chronic malnutrition. The mural in the hospital shows mothers the importance of breastfeeding their new-borns as well as the importance of taking their babies to the health centre for check-up. The fact that Haiti has a 53% literacy rate makes it important for health messaging at the hospital to be done through art as well as through color-coded words. Figure 2 shows the mural at Hospital Albert Schweitzer (James, 2015).

At the same time, social services at Hospital Albert Schweitzer are labelled in red so those who cannot read can easily find the department and those who can read can find the signs written in French and in Creole because of the language politics in Haiti. This intervention

in Haiti improved maternal health through ensuring good nutrition and way finding through communication without discrimination to women who cannot read (James, 2015).

Figure 2: Mural at the Albert Schweitzer hospital

Source: http://mombloggersforsocialgood.com/2015/05/09/newborn-and-child-health-education-through-haitian-art/

1.1.2 REINFORCING POSITIVE REPRODUCTIVE HEALTH MESSAGING THROUGH BRANDING AND EDUTAINMENT

Population Services International (PSI) a non-profit organization that improves the health of individuals in the developing world came up with Orange Familia brand, which is the acknowledged colour of family planning and reproductive healthcare services in Tanzania. Familia's brand is a Logo that bearing the shape of a heart at the start of its name. The logo is used in the clinics signage, health workers clothing, condoms and education booklets (See figure 3 below) (James, 2015).

Branded dancers and drummers entertain community members at the health facilities with health messages about family planning using dance and short skits as shown in figure 4. This is an awareness strategy known as edutainment, which aims at shifting cultural attitudes about health. Edutainment educates women and their husbands on family planning thus preventing unwanted pregnancies that may lead to abortions. This communication tool has seen Tanzania's maternal mortality reduce from 483 to 398 deaths per 100,000 live births (James, 2014).

Figure 3: Familia branding

Source:http://mombloggersforsocialgood.com/2014/10/13/how-psi-reinforces-positive-reproductive-health-messaging-through-branding-edutainment/

Figure 4: Familia branded edutainment

Source:http://mombloggersforsocialgood.com/2014/10/13/how-psi-reinforces-positive-reproductive-health-messaging-through-branding-edutainment/

1.1.3 INITIATING COMMUNITY COMMUNICATION TO REDUCE MATERNAL MORTALITY IN NIGERIA

MamaYe, a campaign initiated by Evidence for Action (a multi-year programme that aims at improving mother and child survival in sub-Saharan Africa) used Community Communication to overcome two causes of maternal death, which are the delays in deciding to seek care and delays in reaching skilled care. Trainers trained volunteers who

then used the community communication tools in discussions with small groups through memorable songs and actions to make the information fun and easy to remember. The small group discussions made participants aware of what their peers thought thus making the actions more socially acceptable (Aradeon, 2014).

Due to this intervention in three northern Nigerian states, delays were overcome for 5,643 women with maternal emergencies and 8,438 facility deliveries within two and a half years of the inception of the interventions. Maternal mortality ratio in the states where the interventions were initiated reduced from 1,271 per 100,000 births to 1,057 per 100,000 births. In the control sites with similar training but without the Community Communication interventions, there was almost no change in maternal health (Aradeon, 2014).

1.1.4 SUMATA INITIATIVE IN NEPAL (Care, share and support)

SUMATA is a Nepali abbreviation that means care, share and prepare. The initiative launched in 2002 as a Safe Motherhood behaviour change strategy to encourage the adoption of suitable maternal and new-born health behaviours. SUMATA identified Safe Motherhood as a social issue that highlighted health service provision and social behaviours. This involved development of communication strategies with standardized messages incorporated on posters, lampshades, billboards, banners, television dramas, radio and street theatre (Sood, Chandra, Mishra, & Neupane, 2004).

This initiative targeted women, husbands, families, community leaders and community health workers. SUMATA was initiated in Baglung and Lalitpur districts in Nepal. A study done showed that the SUMATA initiative had a positive impact on the mothers, husbands, families and community health workers. The target population reported comprehending the specific messages and they were more willing to attend health facilities for skilled attendance (Sood, Chandra, Mishra, & Neupane, 2004).

This program resulted into more women seeking care in hospitals thus reducing the number of maternal deaths. The women were also more aware of dangerous signs such as vaginal bleeding during pregnancy, severe bleeding during childbirth, high fever during postpartum

period and difficulty in breathing in the new-borns (Sood, Chandra, Mishra, & Neupane, 2004).

1.1.5 JACARANDA HEALTH REDESIGNED MEDICAL RECORDS

Jacaranda Health is a chain of maternity clinics in Kenya that aim at providing reasonably priced, high quality mother and child health services to underprivileged peri-urban women. Jacaranda health redesigned their medical records to document every consultation and for the clients to carry home. The medical records are updated at every visit to encourage continuity of care and to improve communication (Karnad, 2014).

The redesigned medical records also meet specific needs of the low-income clients such as giving the patients control over their health as the records hold basic information on the consultations and vital healthy pregnancy tips and advice. The forms are easier to understand, as there is no use of ambiguous medical terminologies and since women in low-income areas seek care at multiple facilities, the new records provided a guide to the flow of consultation from one health facility to the other (Karnad, 2014).

The new forms are a success because clinicians were engaged in the design process to get the best output. These new medical records improved maternal healthcare because women are able to mind their health with the help of the healthy pregnancy tips given in the medical records. There is also avoidance of misdiagnosis during consultation and the women are encouraged to go for antenatal and postnatal clinics because they are free to move from one clinic to another. Figure 5 shows the redesigned medical records (Karnad, 2014)

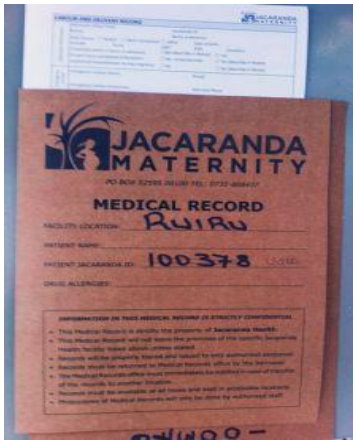

Figure 5: Jacaranda medical file and insert

Source: http://jacarandahealth.org/you-spin-me-right-round-like-a-medical-record-baby/

1.1.6 SUMMARY

The background information discusses innovative ways in which different countries have used communication as a strategy to meet the maternal healthcare needs of women. Communication in this context is a Human centred design strategy to improve on maternal healthcare by accessing to women medical knowledge that could diminish their risk of suffering a pregnancy-related death.

As much as Kenya is initiating human centred design interventions in communication to improve maternal healthcare, the documented interventions are in the rural areas and therefore there is a gap in the involvement of these communication strategies to improve maternal health in the informal urban settlements. This study will therefore investigate clinics in the informal urban settlement of Kibera to find out to what extent they are using human centred communication strategies to improve on maternal health.

This study aims at addressing the communication challenges in maternal healthcare in the informal urban settlements in Kenya. The approach guided by human centred design principles will result in communication strategies that meet the needs of women in the informal urban settlements in Kenya.

1.2 PROBLEM STATEMENT

Women in the informal urban settlement of Kibera do not get the proper maternal health information thus leading to the high mortality rate in the informal urban settlements of Nairobi, Kenya. They do not make proper use of the health materials given them during antenatal/postnatal clinical visits and thus end up getting information from unreliable sources regarding maternal health.

Despite the fact that the access to essential obstetric care is the most effective clinical intervention for reducing maternal mortality, only a handful of women in the informal settlements make the recommended number of four antenatal care visits to access care or initiate the first visit at the right time. Unmarried women below 25 years of age are also prone to abortion due to unwanted pregnancies. This shows that women who live in the informal settlements either lack information about maternal health or may have the information but choose to ignore.

Although other parts of the world have incorporated maternal health communication strategies based on the needs of the end users, there is little or no research showing the same has been done in the informal urban settlements in Kenya.

This research therefore will address the use of communication to improve maternal health communication in the informal urban settlements in Kenya. According to the African population and Health Research Centre (APHRC) in Kenya, informal settlements in Nairobi, Kenya's capital have 706 deaths per 100,000 live births. This is high compared to the country's capital that estimates the number of maternal deaths at 510 per 100,000 live births. The number of deaths in urban areas is expected to be less due to the number of well-resourced health facilities (Oronje, 2009).

1.3 OBJECTIVES OF THE STUDY

1.3.1 MAIN OBJECTIVES

- To establish a maternal health communication strategy framework based on human centred design principles that facilitate effective dissemination of information about

and adoption of improved maternal health practices in the informal urban settlements in Kenya.

1.3.2 SPECIFIC OBJECTIVES:

1. To identify currently used and preferred information sources on antenatal and postnatal care in the informal urban settlements in Kenya

2. To investigate the efficacy of the communication strategies in the healthcare sector as perceived by women in the informal urban settlements in Kenya.

3. To investigate the efficacy of the communication strategies in the healthcare sector as perceived by health care providers in the informal urban settlements in Kenya.

4. To determine the communication tools used by women and how best they may be used to effectively design information on maternal healthcare in the informal urban settlements.

1.3.3 RESEARCH QUESTIONS:

1. What are the currently used and preferred information sources on antenatal and postnatal care in the informal urban settings in Kenya?

2. How efficient are the communication strategies in the healthcare sector as perceived by women in the informal urban settlements in Kenya?

3. How efficient are the communication strategies in the healthcare sector as perceived by health care providers in the informal urban settlements in Kenya?

4. What are the communication tools used by women and how best can they be used to effectively design information on maternal healthcare in the informal urban settlements?

1.4 JUSTIFICATION OF THE STUDY

- This research will provide academic literature on the use of communication as a human centred design strategy to improve on maternal healthcare in informal urban Kenyan settlements.
- The research findings will give academic literature findings to guide communication designers to gain the “creative confidence” to make change happen in the healthcare sector.
- This research will give literature much needed in achieving vision 2030 and in realizing the Sustainable Development Goals (SDGs), which aim at reducing the global mortality ration to less than 70 per 100,000 live births by 2030 (UNDP, 2015).

1.5 SCOPE OF RESEARCH

The research is about maternal healthcare communication in informal urban settlements in Kenya. As much as there are so many informal urban settlements in Kenya, the research was carried out in Kibera informal settlement to narrow the scope of the study.

The research will only dwell on the extent to which the communication strategies used in the informal settlements are human centred. To fulfil the objectives of the study, the research will include women attending antenatal and postnatal clinics and the healthcare providers in health facilities in Kibera.

1.6 ASSUMPTIONS OF THE STUDY

- Human centred communication can improve maternal health care in the informal urban settlements.
- There is no communication framework based on human centred design principles that facilitates the effective dissemination of information on improved maternal health in the informal settlements in Kenya.

1.7 CONCEPTUAL FRAMEWORK

The conceptual framework of the study is based on the relationship between the variables in the study topic. This framework is heavily influenced by the social cognitive theory. This communication theory explains how personal factors, the environment and behaviour are constantly influencing each other. According to the theory, better understanding of maternal health needs influences the maternal health communication strategies put in place for the women. This in turn influences the maternal health seeking behaviour of women, as more women will access skilled health care. Pregnant women accessing maternal health facilities will lead to an improvement in the maternal health care and a decrease in maternal mortality.

This conceptual framework outlines the relationship between the environmental factors, personal factors and behaviour change. Maternal health communication integrated with human centred design principles governed by the social cognitive theory will lead to more women accessing skilled maternal healthcare and this will improve maternal healthcare. Figure 6 shows the conceptual framework.

When research about the lifestyle of women informs a communication intervention, the women will be more receptive to the proposed intervention and thus understand the information provided better. This will lead to a reduction in unwanted pregnancies and an understanding of the importance of antenatal and postnatal clinical visits. Understanding of the information leads to change in maternal health seeking behaviour in the mothers, as they will have understood the importance of skilled assistance during pregnancy. More women accessing skilled maternal healthcare will lead to access of the right information at the health facilities leading to improved maternal health.

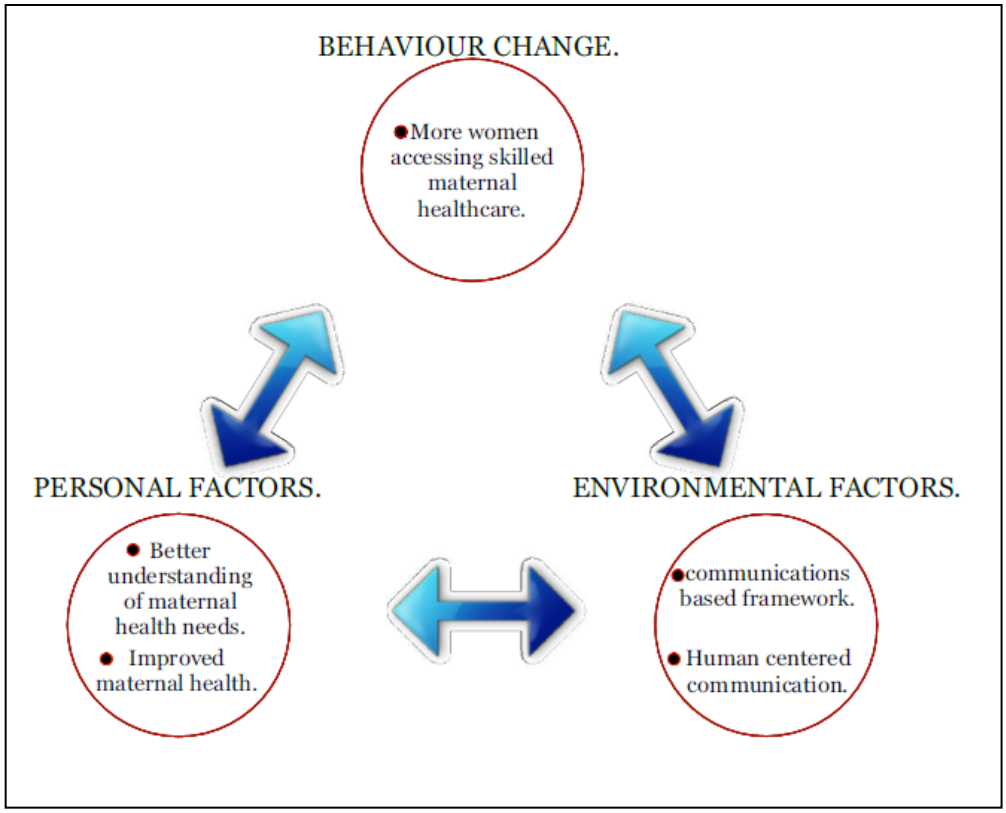

Figure 6: Conceptual framework

Source: Author

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

The study reviews literature on the relationship between human centred design and communication in maternal healthcare. It will also discuss the evolvement of communication in maternal healthcare in different geographical and historical settings. The literature review focuses on communication as a social aspect of maternal healthcare.

2.1 HISTORY OF COMMUNICATION IN HEALTHCARE

Health communication was poorly developed during the early days of medicine in America. Communication in health was informal and was viewed as “common sense “to everyone. It was limited to messages on quarantine and communication on communicable diseases (Thomas & Richard, 2006).

Knowledge about delivery and child-care was traditionally obtained from fellow women and through personal experience from rearing children in extended families. However, this has changed due to increased medicalization of childbirth and formal education among the women. These changes have seen women depending more on formally organised antenatal education as a source of maternal health information (Renkert & Nutbeam, 2001).

Early family planning interventions involved interpersonal communication through family planning providers, content users and opinion leaders. The key element in the communication strategies was the creation of demand. In interventions targeting populaces with high fertility, social support for practicing family planning was created to facilitate a demand for contraceptives. Likewise, larger families were targeted with information on reducing the unmet need for family planning through supporting the use of contraceptive techniques and addressing the health concerns about contraceptives (Department for international development, 2010).

In the 1950s and 1960s, doctors withheld critical information about certain conditions, Kernahan reports that a married woman diagnosed with a serious condition such as cancer would not be informed of her condition but instead her husband would be informed. This was because some doctors felt that knowing one's condition would worsen the patient's psychological health. On the contrary, now health providers are very open with their patients about their diagnostic information, risks and treatment to make the patient a part of the decision making process (Leonard, 2014).

The 1960s and 1970,s saw patients wanting to know more about their health. This was the trend with some hospitals using vans for mammography and providing patients with electronic health information (Leonard, 2014). Additionally, digital inventions have made it possible for clients to use portable gadgets to access their health information and cell phones are used to display peoples' vital signs in real time (Topol, 2013).

In the United States, social media has transformed the pattern of health related communication by increasing individuals' connectivity and enabling the users' direct participation. This has been made possible by the fact that participation in social networking sites increased four times between 2005 and 2009. This realization resulted into efforts to ascertain new prospects by means of social media to improve on population healthcare. Social networking has proved to attract the most users compared to the other forms of social media. This makes social networking sites the bull's eye for capitalizing on the impact of healthcare communication (Chou et al, 2009).

According to Chou et al, (2009) the potential for impelling the healthcare and health behaviour of the American populace through social media is remarkable. This is because in the United States, social media penetrates the inhabitants regardless of ethnicity, education, or access to health care and it has an opportunity for reducing the health difference gap and reaches a wider audience compared to the conventional media.

2.2 HEALTH COMMUNICATION

When planning a communication intervention it is important to know the people who will benefit directly from the information. They are referred to as the primary audience and this

is the group whose behaviour is to be changed by the information. It is important to carry out research in order to find out the primary audience and their behaviour determined (Kreps & Maibach, 2008).

According to Suggs et al, (2015) the right messenger for a communication affects how the communication is received. People respond best to communications from people they trust. Case in point, results from a study done to test the relationship between parents confidence on information on vaccines and the source of information showed that 76% of parents trusted advice from their children's paediatrician compared to 23% trusting advice from the government.

Suggs et al, (2015) also note that education and health literacy go hand in hand. Health literacy is defined as the ability of an individual to attain, process and comprehend basic health decisions. Worldwide evidence show that health literacy is quite low and health communicators should have this in mind when designing and delivering messages.

Additionally, choices of communication sources are influenced by the ages of the audience. Older adults have more trust in a person with whom they can discuss their health face to face as opposed to a non-living source, which they have to operate, such as the television or radio (Chaudhuri, Le, White, Thompson, & Demiris, 2013). On the other hand, a study done in two countries that have one common language, share cultural practises and icons showed that adolescents use the internet for personal health information sources. This study showed that the adolescents would check information obtained from personal sources from the internet for credibility. This is because Hardey, (1999) branded the internet as a technology that allows its users to test health information and enables individuals to search for information irrespective of the place and time. Additionally, fear of confidentiality breaches and the medical office settings are some of the barriers faced by adolescents in seeking effective service use. The internet therefore, gives the adolescents a well-timed and convenient service as well as reducing embarrassments and providing privacy. The data from the study done in the two countries also suggested that adolescents use other media like radios and televisions to access health information. The study concludes that the internet has the ability to pool the best features of current medical information sources. It

can bring together empathy related to unprofessional individual sources, credibility associated with qualified sources, and reactions from personal sources (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005).

Mukong and Burns, (2015) state that most people in developing countries acquire information through informal sources like relatives and friends. Cultural values and norms also inform the health seeking behaviour of people in developing countries (Mukong & Burns, 2015).

Healthy people magazine (2010) states that health communication uses communication strategies to enlighten and influence persons or community choices that improve healthcare. Most people need to have information in a language they can understand. Basic facts should be presented in ways that people who need the information can understand (Kreps & Maibach, 2008).

According to a report by Suggs et al (2015) on the World Innovation Summit for Health (WISH) there are five Ws of message design and they include the following:

1. Why are you communicating? - knowing whether the communication is to change behaviour, to inform, to invoke an action or to change social norms.
2. Whom do you need to communicate with? – The target audience who the message is meant for should be identified in the message.
3. Where will you access the target of your communication? – understand all channels of communication including technology used and the setting. This is where the communication will be set up; either in a school, clinic or at home.
4. What strategies will you use to communicate? - The language, visuals and ideas that are used should be easy to understand. Consider how the framing of the message will affect the audience.
5. What time will you communicate to whom? - Each audience should be targeted with the right communication at the correct time. It is also important to know when the audience will be more receptive to the message.

This study focuses on learning the lifestyles of the target audience by focussing on the second and fifth Ws of message design. It looks at the target audience to whom health messages are directed and the timing of the communication to the audience. Design of most health messages neglect conducting research on the target audience so as to tailor the messages to suit them. In this regard, this research looks to fill this gap.

2.3 MATERNAL HEALTH AND COMMUNICATION

Health literacy is the ability of an individual to access healthcare information and his/her capacity to use it efficiently. Maternal health literacy on the other hand is improved by antenatal care education focused on pregnancy, labour and child rearing skills (Renkert & Nutbeam, 2001). Health communication is very important in maternal healthcare. Fannie Fonseca-Becke and Catherine Schenck-Yglesias mention that one way of objectively measuring the clinical and overall service quality in a maternal healthcare facility is through including the information, education and communication as an indicator of improvement in attitudes and behaviour change (Becker & Yglesias, 2004). Access or uptake of skilled health attendance at birth is a way of monitoring programs as a set benchmark for the improvement of maternal health care (Liljestrand, 2000).

Effective healthcare communication means transmission of messages in a way that improves the mothers' ability to maintain their own health, to recognize the dangers they face and how to control them and to react to treatment as necessary (Suggs, et al, 2015).

Women in developing countries have higher chances of dying in pregnancy and in childbirth compared to their counterparts in the developed countries. Herz and Measham state that for an effective primary maternal health service in developing countries, the health system should include effective communication strategies (Fraser & Meli, 1990). Additionally, studies show a strong relationship between use of antenatal health services and place of birth; women who make more than four antenatal care appointments are more likely to give birth in a skilled healthcare facility than those who make less than the recommended four antenatal visits. This therefore calls for effective communication strategies in maternal health targeted towards antenatal and postnatal clinical visits (African Population and Health Research Centre, 2009).

However, the delivery of antenatal care education lacks grounding in the field of education because antenatal care teachers are trained as midwives or nurses. These healthcare workers therefore lack competence in teaching (Renkert & Nutbeam, 2001). As explained by Newton, (2000) medical practitioners do not understand and are not sensitive to adolescents' needs; they do not know how to talk to them. This has been a major obstacle to the use of existing healthcare services by the adolescents (Barker, 2007). Therefore, people who work with the youth should understand the needs and strengths of the adolescents when designing their programmes (Mc Neely & Blanchard, 2010).

In the United States, it was noted that the typical antenatal tutelage was deficient of respect and scheduling of lessons, length of lesson, the number of people in the classes and content of classes (Renkert & Nutbeam, 2001). How long adolescents have to wait for a service is also a factor affecting their help seeking behaviour. This is affirmed by a study in Zambia where young people preferred seeking Sexually Transmitted Infection treatment from traditional healers and private health practitioners as opposed to public clinics. They preferred these sources because they were faster and more private. Similarly, a study done in the United States, which revealed that Hispanic young women sought information on sensitive issues such as sexual reproductive health from informal sources (Barker, 2007).

On the other hand, a study done in South Nyanza, Kenya revealed that adolescents mainly seek reproductive health information from their mothers due to gender-based socialization; this explains why they prefer to seek information from their mothers and not from their brothers or fathers (Obare, Agwanda, & Magadi , 2006). Researchers have also noted that adolescents' help seeking behaviour is observed from adults around them; they tend to adopt the way their parents cope with situations and learn from them. Additionally, adolescents who have had negative experiences such as betrayal of trust, offering advice instead of listening or rejection when seeking help from certain sources will tend to avoid such sources of help because of mistrust.

2.3.1 MOBILE-HEALTH COMUNICATION

In Uganda, Mali, Malawi, Ghana and Sierra Leone, there was a wider use of radio systems as a way to improve the access to emergency obstetric care. The use of the radio calls addressed the delay in arrival at a health facility. The traditional birth attendants were armed with walkie-talkies to communicate with ambulances and supervisors when faced with difficulties. As a result, these countries reported a notable increase in supervised births compared to before the interventions were put in place (Noordam, et al, 2011). Due to cost implications in Uganda, this initiative was later replaced with use of mobile phones, which was considered more practical and cheaper to maintain (UNFPA, 2007).

Chib et al. (2008) mentions the use of mobile phones to connect the lay healthcare workers to skilled health workers in order to lessen the delay in receiving and accessing suitable and sufficient care at the health facility. The mobile phones aided in the contact of patients, supervisors and midwives. It was also reported that there was time efficiency due to coordination of visits and assistance was made easier through phone call thus minimising maternal deaths. Some of the constraints experienced in this intervention included cost of the mobile phone and network coverage in the rural areas.

Additionally, Suggs et al, (2015) report about the wired mothers' mobile app that is an intervention of the department of internal health, university of Copenhagen in Denmark and the Ministry of Health, Zanzibar, Tanzania. The application aims at empowering women to make informed choices about going for regular antenatal care and about giving birth in health facilities with help of skilled health workers.

On the other hand, growth in mobile phone ownership especially in the low-resource settings offers a chance to deliver timely information on antenatal and postnatal care. Providing mothers with antenatal information directly on their palms is an innovative way to empower women especially in low-resource settings (kioko, 2012). Access to maternal healthcare information via mobile phone brings about timely access to information on antenatal and postnatal care. Kioko, (2012) confirmed that maternal health information can be accessed by individuals in rural and urban areas. The information can be accessed in any

language preferred by the mother. Kioko further recommends partnerships with doctors, hospitals and NGOs in slums to ensure a smooth transfer of information through mobile phones (kioko, 2012). Likewise, pregnant women in Zanzibar are asked for their consent to receive mobile health information and personal information to tailor the text messages. The women then receive educational text messages on pregnancy including the importance of having skilled attendants deliver their baby. The midwives phone number is to the women with a small voucher of an equivalent 25 Kenyan shillings to use for making calls to the midwife. This intervention has reduced maternal mortality in the 24 primary health facilities that participated in the intervention (Suggs et al, 2015). Atoll free hotline has been implemented in Malawi to give information on maternal and child health issues from skilled health workers. The program also gives tips and reminders as text messages on mobile phones (Mendoza, Okoko, Morgan, & Konopka, 2013)**.**

Interactive Research and Development Pakistan came up with a mhealth vaccine registry with interactive alerts linked to radio frequency identification (RFID) tags on vaccination cards that are issued by the government. This effort was combined with text message reminders for the mothers (Mendoza, Okoko, Morgan, & Konopka, 2013)**.**

MAMA in South Africa is also using mobile phones to inform and empower mothers to adopt healthy behaviours during pregnancy and to access skilled maternal and child health services. The programme launched in 2013 offers free SMS through two clinics in the city and an interactive quiz service. The SMS text messages are sent twice a week from the fifth week of pregnancy until the baby is 12 months old. Pre-recorded voicemail messages are also pushed to the registered mothers phones. MAMA provides a web-based community portal that shares real life stories from mothers, articles and life guides. The mother registers her due date and the information is tailored to her and her baby. Figure 7 shows the community portal on mobile phone. Evidential data from the programme shows that the mothers feel informed, validated and empowered. The convenient and discreet nature of the service also makes the women comfortable (Mendoza, Okoko, Morgan, & Konopka, 2013)**.**

Furthermore, young people feel more comfortable asking questions in an anonymous way through a familiar medium such as a mobile phone. They simply type a question and immediately receive a response. Clinic appointment reminders can also be sent to patients via text messages. Additionally a survey by Kegg et al. revealed that SMS was the preferred way for patients to be reminded of appointments (Lim, Hocking, & Aitken, 2008). Similarly, a study done to investigate the impact of text messaging for promotion of sexual health among the youth in Victoria South Africa concluded that mobile phones, especially SMS create a unique chance for health workers to reach a large populace of patients at a lower cost (Gold, Lim, Hellard, Hocking, & Keogh, What's in a message? Delivering sexual health promotion to young people in Australia via text messaging, 2010).

Figure 7: Community portal on mobile phone

Source:http://www.jhsph.edu/departments/international-health/_documents/USAIDmHealthCompendiumVol2FINAL.pdf

2.3.2 EDUTAINMENT COMMUNICATION

Entertainment education method is a communication strategy that can be used to address a number of development problems, maternal health being one of them. An example is given

of soul city institute for health and development communication, an NGO with headquarters in Houghton in Johannesburg South Africa that uses mass media for health education in South Africa. Strategies used by Soul city include having multimedia vehicles to address high priority national health issues, television drama series known as soul city that broadcasts on South Africa's most popular television channel. The health issues are also addressed by radio drama series aired on all 9 South African Broadcasting Corporation regional language radio stations namely: (Ligwalagwala; Umhlobo Wenene; Thala Phala; Lesedi; Thobela Fm; Motswideng; Ukhozi Fm; Munghana Lonene FM; Ikwekwezi;). Additionally, the national health issues were addressed by designing health education booklets around the popularity of the TV series characters, which are published in major newspapers. Analysis of data from the TV series audience members showed that they identified with role models in the TV series and thus learned strategies on health matters such as maternal health (Mendoza, Okoko, Morgan, & Konopka, 2013).

In Nepal, in order to attract men and their families, the community and the family level support network (network of international and locally based NGOs in Nepal) designed activities in form of education as well as entertainment to increase awareness on safe motherhood. This was done through mass media campaigns, local dance troops, roving health educators and plays at public festivals (Roth & Mbivzo, 2001).

Additionally, Makutano Junction is a Kenyan TV drama that mixes education and entertainment successfully. The purpose of this TV drama is to enhance poor people's livelihoods through access to research information through educational television drama. Research has shown that the educational content of the TV drama is most welcome by its viewers. The report in 2008 by Steadman showed that 85% of the viewer's value the TV drama for its educational content. The programme is a partnership between UK and African based research partners and the information providers (Department for International Development Central Research Department). At the end of each episode, the viewer's send text messages requesting for additional information on the topic aired in the particular episode. The information sent to the viewers is in form of a leaflet (comic strip) which is mailed to

them. Makutano Junction has an audience estimated at six million by 2008 (Social Development Direct, 2008).

Research shows that adolescents (11 to 19 years) seek health information from sources such as television and radio because of the anonymity associated with the sources and because they can access this information, wherever they are and thus do not have to visit a doctor (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005). Other researchers have hypothesized that media may function as a 'super-peer' for adolescents to emulate in sexual situations and for this reason adolescents frequently cite media as a major source of information (Scull, Malik, & Kupersmidt, 2014). Contrary to this, research also reveals that individuals over 35 years of age, have a higher amount of confidence in person(s) with whom they are able to deeply talk over their health issues face to face as opposed to a non-living source, which they have to operate, such as the television or radio (Chaudhuri, Le, White, Thompson, & Demiris, 2013).

2.3.3 MULTIMEDIA COMMUNICATION

The use of the internet as a source for health information has led managers and designers to develop new service ideas that address the needs of the service users. The benefits of online health information include the fact that the services are not bound to specific opening and closing hours and designated place. Research shows that websites have a role in de-professionalization of medicine and they strengthen self-help social movements. The use of online health information not only shapes personal information seeking but also the understanding of the information (Palmen & Kouri, 2012).

The use of social media is altering the methods of health communication and changing the way healthcare workers and people relate. The ease with which people stay connected through technology influences the techniques health and wellbeing are managed both by persons and by the healthcare sector (PALMÉN, 2013)**.**

In Finland, preventive and counselling maternal services are playing a potential role in backing up the role of social support and health communication. A web service owned by a local primary maternity clinic offers health information for parental support. A study

conducted on this mode of communication showed that the women are happy to be in a group that fosters social support of parents (Palmen & Kouri, 2012). The same study indicated the significance of researching on the users' lives in their daily context. This study looked at factors that affected the mothers' use of the diverse functions of web services and concluded that the use of the web services were affected by availability of time, presence of other social networks, conventional information seeking practices and confidence in the mothers capability to judge credibility in the health information. The findings of the study also brought to light that the efficacy from the web service reacted more to their desires of social support rather than their need of healthcare information. Therefore with the help of social media, the mothers built some kind of a real life support group. This is compared to a simillar study by Novick et al in the USA where the main finding was that women preffered getting care in a group rather than one on one. The study concluded that the group provided the women with companionship, reduced their stress and loneliness (Palmen & Kouri, 2012).

In Finland, the mothers deemed the concept of trust very important in the online group. The trust grew from the fact that the nurse in charge of maternity care was handling the group enthusiastically by inviting mothers to join and by ensuring the group was active at all times. The interviews also revealed that the women trusted healthcare information delivered by experts but this was not a sufficient condition for the information to be considered useful (Palmen & Kouri, 2012).

2.4 HUMAN CENTERED DESIGN

Human Centred Design is the adequate understanding of users and their needs and preferences in design. Human centred design brings about constructive cooperation between researchers, designers and users (Steen, 2008) and views the poor as individuals who should voice their concerns as well as participate in decisions that concern them (Narayan,2000).

According to Tim Brown, (2009) the CEO and president of IDEO, a prominent United States design and innovation firm a successful human centred innovation must address a user's experience and emotional response by getting to know the user's needs. This ensures that the end users feel the desired emotions when using the proposed design. He adds that human centred design requires empathy because it allows the designer to view the end users as much more than just subjects (Tim Brown, 2011).

Victor Margolin on the other hand, believes that the design discipline has a big potential in solving big problems and should incorporate the creation of culture and not just creation of the newest products. He sees system design as key to innovation and argues that the systems only work well when encompassed with other different behaviours and user cases (Sisson, 2015). Margolin emphasizes that for the system designs to work efficiently, the designer should collaborate with other stakeholders as part of the intervention. As much as Victor Papanek and Victor Margolin agree that designers should work to solve real problems, they disagree when Papanek talks about designers not engaging in mainstream market. However, Margolin feels that not engaging in the mainstream market restricts the possibilities for a social designer and recommends that designers and helping professionals find ways of working together (Margolin, 2002).

According to Norman, (2005) human centred design guarantees clear improvements of bad products or systems; it can avoid failures and will make sure that products work and people can use them. He further argues that human centred design does not meet the goal of design, which is to produce great designs by breaking the rules and ignoring the generally accepted practice. He mentions that human centred design will only achieve good designs and not great designs (Norman, 2005). Literature proposes that involving users in the design process will improve a systems worth because of the precise valuation of the user desires and the greater level of user approval (Dabbs, et al., 2009).

The philosophy of design as problem solving pushes designers to think about how design can contribute to helping the developing societies. Victor Papanek echoes this in his book "design for the real world" where he urges designers to use design to help the less fortunate in the society. Papanek argues that design must become a creative, multi-disciplinary tool that responds to the needs of men. (Papanek, 1972)

Norman, (2005) feels that the focus on humans is misguided and a focus on activities rather than the people may bring more benefits. He continues to argue that focusing on activity does not mean discarding human centred factors. He argues that events involve people and thus any structure that supports activities must support the individuals who perform them.

The role of human centred design is to bring multiple talents to the solutions of complex issues by incorporating empathy and the needs of the people who must work within the system, the people who will approve it and those who will benefit from the outcome. The end users must be part of the solution to ensure that their understanding, trust and comfort are essential to the overall achievement of the enterprise (Norman, 2014).

2.4.1 HUMAN CENTERED DESIGN AND MATERNAL HEALTH COMMUNICATION

Reducing maternal mortality ratios requires that maternal health services be more responsive to mothers' needs. Involving mothers' in decision-making ensures a better chance that the maternal healthcare services are modified to their needs (Dieleman, 2012).

Communication between health workers and women is important and should be supported by evidence-based information custom-made to the woman's, needs. This will ensure that treatment care and information the women receive are ethnically appropriate and available to all women including those with extra needs such as sensory, physical and those with learning incapacities (NICE guideline DRAFT, 2010).

According to the women's and children's health network, (2009) Woman centred care focuses on the woman's desires and expectations. It encapsulates the need of the baby, the woman's family, her husband and those affiliated with her as identified by the woman. Woman centred care involves the woman's life across institutions and the community and involves partnership with other healthcare professionals when required. It holistically looks into the woman's emotional, social, psychological, physical, cultural and spiritual needs.

Doctors use human centred systems to help individual patients manage their conditions by giving information about the healthcare professional who completely understands their condition in order to get advice or answer questions from the discharged patient. The doctors can also give suggestions about wellness programs that are suitable for the discharged patient (White, 2009).

When health communication is based on the information needed by the end user, the choices seem more favourable to the potential user. When this is incorporated into the communication marketing strategy, a change in behaviour occurs in the end user (Kreps & Maibach, 2008).

Human centred design involves the end users all through the development so that technology support tasks are stress-free to control and bring significance to the users. The use of interactive health technologies supports the exchange of health information amongst patients and between patients and health workers, enabling the making of medical decisions and promoting self-care among patients (Dabbs, et al., 2009).

As much as interactive health technologies (IHTs) are designed to improve health behaviour, human centred design allows the end users to guide how the design process in order to increase usability. Human centred design involves these methods (Dabbs, et al., 2009):

- Making an assessment of the intended users
- Making an observation and analysis of the tasks and requirements
- Developing and testing of the prototypes
- Making an evaluation of the design options
- Analysing and determining usability glitches
- Testing of the features using the users

Incorporating human centred design principles in the communication systems keeps the focus on meeting the user's needs. Involving the users during the design process are known to lessen development time because usability glitches are recognized and solved before the systems are put in use (Dabbs, et al., 2009).

Functionality and usability chances of any health system are increased when human centred design principles are applied to the development of communication systems thus increasing the probability of encouraging the anticipated health behaviours and health results (Dabbs, et al., 2009).

Literature reviewed by King and Hope, (2013) showed that patients desire a patient centred approach during communication with their doctors. The literature suggested that patients desire to be told what is wrong in plain languge, they strive for an enhanced physisian-patient relationship in terms of friendliness, decision making and respect. The review of literature done showed a positive relationship between patient understanding, recall of information and adherence to therapy and the physician/doctor communication behaviour. Adequate physician communication was agreed to be when the doctor fosters the relationship and gathers information between him and the patient, when the physician provides information and makes decisions and when he responds to the emotional needs of the patients. The review suggested that for patients to understand and recall information from doctors, the communication between the patient and doctor should be uncomplicated, specific, minimize jargon, be repetitive and check patient understanding (King & Hoppe, 2013).

Patients need to have information in a language they can understand. Presentation of basic facts should be in ways that people who need the information can understand (Kreps & Maibach, 2008). To avoid poor doctor- patient communication, a trusting doctor-patient relationship should be established during history taking or during discussions about managing the condition and this in turn leads to proper information exchange thus leading to minimized complaints against the doctors by the patients (Narenjiha, Haghighat , Bahaddor , Shajari , & Jameie, 2012).

Cultural preferences and practices of diverse communities should also be reflected in the health messages. Culture affects how individuals communicate, comprehend and react to health information (CDC, nd). An individual's culture also affects his/her perception of the world thus interfering with the effectiveness of health communication (Schyve, 2007).

Newton, (2000) states that medical practitioners do not understand and are not sensitive to adolescents' needs; they do not know how to talk to them. This has been a major obstacle to the use of existing healthcare services (Barker, 2007). Therefore, people who work with the youth should understand the needs and strengths of the adolescents when designing their programmes (Mc Neely & Blanchard, 2010).

Norman, (2014) states that the end user should be part of the design to ensure that their understanding, trust and comfort are catered for in the design. A gender guide to reproductive health publications also states that it is important to identify the audience by finding out details such as the kind of work they do, their location, education level, social and gender roles they have (Kols, 2007). Inquiring these details will help the designer to know the user needs and design an intervention that has these needs in mind.

A study done in South Nyanza, Kenya showed that traditional gender constructions and social norms impede the discussion about reproductive health issues among the adolescents and their educators. The discussions of the study continue to explain that this could be the issue especially for the adolescents in much of sub-Sahara Africa because they are socialised to discuss sexual matters with particular members of their social contact (Obare, Agwanda, & Magadi , 2006). Furthermore, according to Mullick et al., (2005) in most African countries maternal healthcare issues such as family planning, pregnancy and delivery have always been considered as women's affairs (Adenike I, Esther O, Adefisoye O, Adeleye A., & Sunday O., 2013).

A study in Australia examining the impact of text messages in promoting sexual and reproductive health in young people revealed that young people were likely to pay attention when a message had some humour. The humour also made them remember the messages and its contents (Gold, Lim, Hellard, Hocking, & Keogh, What's in a message? Delivering sexual health promotion to young people in Australia via text messaging, 2010). Likewise, in this study the younger respondent was bored because there was no humour in the health talks. All these studies show the importance of conducting research about users before design. This helps to find out and clarify the kind of audience going to use a proposed communication intervention.

When the intended users of the design participate in the designing and testing of the communication intervention, the outcome is more successful. The audience should participate by chosing the right words, colours and visuals in a brochure (Centers for Disease Control and Prevention (CDC), 2009).

Additionally, healthcare workers should also take part in the design of health communication materials. Healthcare workers should play a major role of explaining the inteded message and the desired outcomes to the artists. This is because the artists do not fully understand the health messages and thus cannot work without guidance from the professionals (Houts, Doak, Doak, & Loscalzo, 2006). Likewise, is important to pre-test the communication intervention/materials to understand the consumers' wants and preferences. This will ensure the patients' needs and culture are incorporated into the communication strategy (Brown, Lindenberger, & Bryant, 2008).

2.4.2 HUMAN CENTERED DESIGN TOOL KIT

The human centred design toolkit second edition was an outcome of a project funded by Bill and Melinda Gates Foundation, in which four organizations: IDEO, IDE, Heifer International and ICRW collaborated. These four organizations collaborated to create a method for guiding innovation and design for individuals living under 200 Kenyan shillings a day.

This toolkit offers techniques and worksheets to direct through a process that empowers communities allowing their desires/needs to guide the design of solutions. According to the human centred design toolkit, human centred design is a guideline used to create innovative solutions for the world. These solutions include services, environments products, methods of interaction and organizations.

The process of human centred design begins by examining the lifestyles of the people being designed for. This is done by listening to and understanding what the people want through research. This is called the desirability lens. Once the desirable range is identified, the solutions are viewed through a lens of feasibility and viability. At the end of a human centred design process, the solution should be desirable, feasible and viable. (See figure 8)

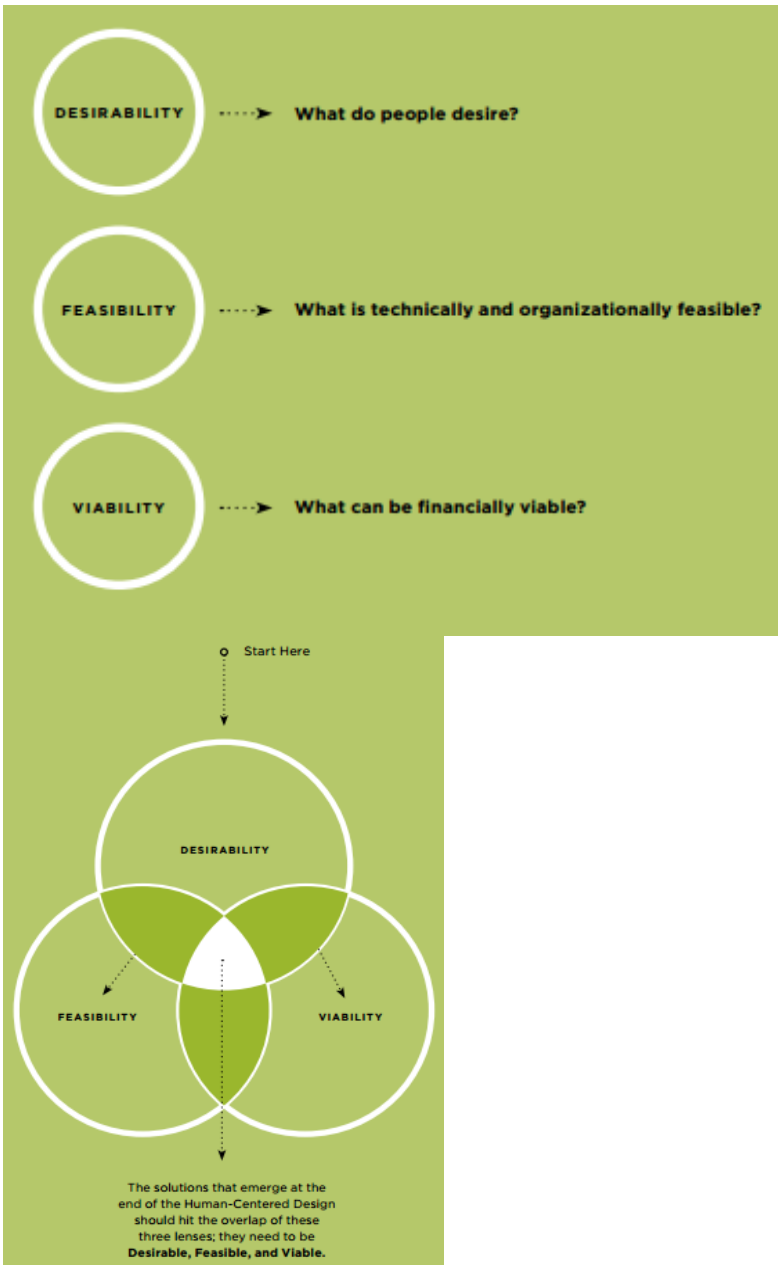

Figure 8: Three lenses of human centred design

Source: human centred design toolkit

2.4.3 HUMAN CENTERED DESIGN PROCESS

According to the IDEO human centred design toolkit, the human centred design process undergoes three phases:

1. HEAR: conducting field research to collect stories and inspirations from the people.
2. CREATE: creation of frameworks, solutions and prototypes by translating the collected information.
3. DELIVER: the deliver phase gathers solutions through cost modelling, competence assessment and operation planning. This helps in the creation of new innovative solutions.

Hear phase

The IDEO design toolkit points out that during the hear phase of the human centred design process, qualitative research techniques allow the design team to develop empathy for users. This is because without empathy, one cannot anticipate the user experience. Qualitative methods of research reveal individual's social, political, financial and ethnic opportunities and obstacles in their own specific words. It is outlined that at the beginning of the process, the research is used to inspire resourcefulness and form insight about new prospects and concepts. Later, the qualitative research methods can be used to learn about people's feedback to proposed ideas.

The first step is to identify a challenge in order to guide the questions asked in the field. The second step is to recognise what is already known so that the design team can freely focus on what they do not know in the field. The third step is to identify the people to speak with by including both ends of the range as well as people in the middle will help cover a wide range of behaviour, beliefs and perspectives. This is important in the construction of frameworks and for brainstorming. The fourth step involves choosing the research methods that are appropriate for the study. The fifth step is to develop an interview approach that will enable you get the relevant information from the customer as well as engage with them as an empathetic friend. Last step is to develop a mind-set that puts aside all that is known during the research to avoid bias conclusions.

Create phase

The create phase has four goals: making sense of data, recognizing patterns, defining prospects and generating solutions. The first step of the create phase is developing the approach through deep empathetic thinking and transforming that empathy into innovations. This can be done by Co-designing with people from the community and through empathy, which is a way of blending the design team's expertise with the needs of the people on the ground. The second step is sharing stories by transforming the stories into data that can be used for inspiration, ideas and solutions. The third step is identification of patterns that make larger relationships within the information by linking similar thoughts to form one big insight and editing out information that is not important. The fourth step is creation of opportunity areas by envisioning future possibilities. Suggesting more than one solution to the problem does this. The fifth step is brainstorming new solutions by thinking without any organizational or operational constraints. The sixth step is making ideas real through prototyping. This enables the ideas to be tested and evaluated by others. After prototyping, gather feedback by taking several executions out to people.

Deliver phase

During this phase, the feasibility and viability of all the solutions are checked. During this phase, the design team will create the components needed to make the innovation successful. The first step is to develop a sustainable revenue model. The value provided to the customer should be the priority as the support systems around the solution are designed. The second step is identifying capabilities required for delivering solutions by identifying the range of solutions for making it real. The third step is to plan a pipeline of solutions and check whether the solution is directed at the current consumer group or whether it increases the group of consumers served. The fourth step is to create an operation timeline by mapping the solutions to a timeline. Planning mini-plots and iteration for all the solutions in the pipeline follows this. This is done by identifying simple low investment subsequent steps to keep the concepts alive. The sixth step is to create a learning plan to keep abreast about how the innovations are working to keep improving the designs. This is done by frequently collecting feedback from users.

2.5 EFFECTIVE DISSEMINATION OF HEALTH MESSAGES

Communication skills of public health professionals are very important. How well they explain important health messages to the public and check to make sure the messages are understood is essential in health communication. The public health professionals need to be trained in health literacy, plain language and cultural competency (CDC, nd).

The health message needs to consider how familiar the target group is to the information that is being communicated. The information should not contain unnecessary statistics and medical terminology (CDC, nd).

The health messages needs to be issued in multiple languages and formats. Cultural preferences and practices of diverse communities should also be reflected in the health messages. Culture has an emotional impact on how people communicate, comprehend and react to health information. Since the health professionals have adapted to the language of their specialty, it may affect how they communicate to the public (CDC, nd).

Public health workers need to utilize recognised dissemination channels that are trustworthy in the community. The messages should be disseminated in form of print and other media. This can also be done through community leaders, shelters or places where people gather (CDC, nd).

In the United States, health messages are politicized as is seen in long standing debates on issues such as abortion. Thousands of shillings are spent on advertisements criticizing new policies (Suggs et al, 2015).The same has been witnessed in Kenya where use of polio vaccines have been debated in the parliament with religious, medical and political sides all having conflicting opinions. Therefore, for effective dissemination of health messages, such politicization of the messages should not be encouraged.

2.6 HEALTH LITERACY

According to Kohan, Ghasemi and Dodangesh, (2007) maternal health literacy is the ability to make a diagnosis of dangerous symptoms of the pregnancy period, suitable nutrition and a healthy life during pregnancy. Maternal health literacy is therefore necessary for a

healthy maternity period and pregnancy outcome. Renkert and Nutbeam, (2001) emphasize that this is enhanced by antenatal care education that focuses on evidences surrounding pregnancy, labour and child rearing skills (Mojoyinola, 2011).

Health literacy is a patient's ability to attain, process and comprehend basic healthcare information and services needed to make suitable health decisions (williams, Davis, Parker, & Weiss, 2002). Communication is a major skill in health care. Many patients have a difficulty in understanding what their physicians tell them. This is evident in the fact that most patients are able to recall less than 50% of the information given to them by their doctors once they leave the hospital. This is particularly evident in patients that lack an understanding of the common health terms and written health materials. The use of medical jargon combined with patient's inadequate health terminology has resulted in insufficient and unclear communication in healthcare (williams, Davis, Parker, & Weiss, 2002).

Poor health literacy or lack of understanding of the oral or written health communication may result in the following:

- Difficulties in traversing the healthcare structure
- Incorrect or unfinished histories
- Missed medics' appointments
- Medication taken at the wrong times
- Wrong prescriptions
- Lack of knowledgeable approval

In addition, patients with low health literacy are most likely to misunderstand treatment recommendations, have lower health status and poorer health outcomes. Health literacy is particularly challenging among older adults of average financial means, individuals with limited schooling or those with limited English adeptness (Mojoyinola, 2011).

Written patient education pamphlets are rendered useless by the ignorance of medical terms by the patients who use them. Studies show that most customary patient teaching materials are written at levels over and above the patients' literacy skills. Inadequate comprehension of medical terminology, inadequate medical knowledge and reduced ability to embrace

new information also affects low literate patients when communicating with healthcare providers (williams, Davis, Parker, & Weiss, 2002).

The Internet has proved to be a source for patients to get particular health information. However, some of the formats used are not appropriate for audiences with low literacy levels. A study conducted in the US by Rand revealed that 100% of the English-language web sites assessed in the study presented health information at a ninth-grade level or higher and 86% of Spanish language sites presented information at a high-school level. This proved that although more people are using the internet for medical information, most users could not find the health information they sought (williams, Davis, Parker, & Weiss, 2002).

Additionally, doctors may find it hard to recognize patients with limited health literacy because such patients may not recognize they have a problem and some of them may hide it due to shame. Such patients are revealed to compensate on their reading skills by relying on their listening skills (Schloman, 2004). Therefore such patients may not recognise communication materials like the health booklets, pamphlets and flip charts where they have to utilize their reading skills. Healthcare workers should therefore be on the lookout for such patients and thoroughly examine their health literacy levels according to Schloman, (2004) by taking note of a surrogate reader accompanying the patient, watching out for vision or hearing problems, looking at incompletely filled out forms with only the name of patient provided

On the other hand, a review of literature done by King and Hope showed relationships between patient understanding, recall and adherence to therapy and the physician/doctor communication behaviour. Adequate physician communication nurtures the relationship and gathers information between the doctor and the patient, it enables the physician to provide information, make decisions and respond to the emotional needs of the patients. The review suggested that for patients to understand and recall information from doctors, the communication between the patient and doctor should be uncomplicated, specific, minimize jargon, be repetitive and check patient understanding (King & Hoppe, 2013). This could also be attributed to health illiteracy; according to Kickbusch and Maag, (2006) health literacy is the ability to make sound health choices in everyday life- at the

workplace, at home. He describes this as the ability to seek out information and take charge (Pleasant & Kuruvilla, 2008).

Presentation of basic health facts should be in ways that people who need the information can understand (Kreps & Maibach, 2008). Similarly, a study done in the United States indicated that 22.3 million American have limited English proficiency, 49.6 million Americans speak different languages from English. The journal goes on to discuss how a Spanish-speaking individual was misdiagnosed because of language barrier leading to the patient suffering a raptured artery (Flores, 2006). This shows how language barrier has detrimental effects in healthcare communication in both developed and developing countries.

Patients with low functional literacy can have health information relayed to them in form of pictures (Schloman, 2004). Michielutte et al researched on the effects of pictures on women's comprehension of health information, his study showed that low literacy adults would benefit more than high literacy adults would from the use of images in health information materials. Use of animated cartoons and pictures can help patients recall spoken information from doctors. Use of the simplest drawing and photographs will help viewers with low literacy skills to comprehend the envisioned messages without being distracted by unconnected details. This can be done by the use of realistic pictures using complete body images as reference for body parts as opposed to using abstract symbols (Houts, Doak, Doak, & Loscalzo, 2006).

2.7 INTERVENTIONS TO ENHANCE COMMUNICATION

The benefit of written health communication materials depend on how they are organised and used. Studies in medical practice reveal that it makes a difference when the physicians give the materials directly. This is because physicians are most probable to use written material when they take responsibility for selecting and maintaining a small collection of the materials. This allows the physicians to tailor the messages to suit the patient's needs. (williams, Davis, Parker, & Weiss, 2002)

These materials should be written following references from specialists in the design of brochures. The patients are more accepting towards the written material if the material includes reviews by focus group discussions consisting of patients from the target audience (williams, Davis, Parker, & Weiss, 2002). This only emphasizes the power of involving patients into the design of the communication materials.

Visual aids have been long known to help with communication with non-literate persons. A study showed that use of pictographs enhanced the recollection of spoken medical information by 71% among literate persons and similar results were noted with low-literate persons. Cartoon illustrations have also been proved to improve understanding of and compliance with health care directives in most studies. Interactive computer based multimedia is another effective way of teaching patients with insufficient health literacy (williams, Davis, Parker, & Weiss, 2002).

A major challenge of the entertainment education strategy is the ethical problems. This can be mitigated by using local writers and creative teams to ensure the edutainment initiative is culturally sensitive and uses local language. The programme should use subject matter specialists to ensure technical information given is accurate (Mendoza, Okoko, Morgan, & Konopka, 2013)**.**

Williams, Davis, Parker, & Weiss (2002) outlined six steps to improve understanding of health information among patients with low health literacy. The mentioned steps are:

1. Take time to asses patients' health literacy skills by assessing the patient's ability to read and their inability to fill out intake forms accurately and incompletely.
2. Use commonly used language instead of medical jargon.
3. Use pictures to improve understanding and recollection of health information.
4. Limit information given at every single interaction and repeat directives.
5. Ask the patients to teach back or demonstrate what they have understood to check understanding.
6. Be caring, courteous and thoughtful by investing in patients to take part in their own healthcare.

2.7.1 VISUAL COMMUNICATION

Visual intelligence is critical in understanding the world around us especially with the increase in the role of images in communication. In order for visual intelligence to manifest, it is necessary that a populace is visually literate. Unfortunately, most education syllabus both in the West and in Africa does not favour the teaching of visual literacy. As such, the general population are unable to understand all forms of visual images created to communicate to them and are left at the mercy of what they have been socialised to comprehend in their micro community. Communication Psychologist J.J.Gibson makes a distinction between the images that appears on the retina called the "visual field" which he says interprets patterns of light as reality and the mental creation that is our "visual world" which is an interpretation of reality (Barry, 1997).Each individual interprets images as they choose perceive them. The intentions of an image encoder does not matter, a person will process and perceive an image in a manner individual to them. Their demographic background influences their perception of the image. Age, gender, social class, character, temperament is all long-term variables that contribute to perception. Immediate factors such as mood and situation among others also contribute.

According to Alfred Korzybski, when we watch television our understanding of what is shown to us is dependent on our emotional state, our mind-set at the time and our prior experience. These factors result in us misunderstanding what we see by approximately 30% (Barry, 1997).

We are biologically tuned to overestimate some aspects of perception such as height compared to width .Therefore, our image of the world is controlled by evolutionary principles that is to a great extent shared by those with the same cultural background and is unique to every individual (Barry, 1997).

2.7.2 PERCEPTUAL ILLUSIONS

Barry, (1997) defines Perception as a dynamic system that uses the feedback from the body's sensory systems, amalgamates this with recollection and comprehension and builds from both an integrated sense of self and mind. Perceptual illusions are a result of a number of distortions; an example is the way a straight stick seems to bend under water (Barry, 1997).Perceptual illusions are important in that they can be manipulated to influence the message that an encoder wishes to convey. However, it is important that the encoder be knowledgeable in how to manipulate the elements and principles of design found in an image to construct an image that transmits a message as envisaged.

The first data that the brain perceives is the boundary contours which allows the distinction between one object and another. Once the brain has perceived the edges, it fills in the missing detail between them by averaging the colour and brightness and smearing the details. The images formed consciously and unconsciously give the perceptual borders and the characteristics implied with the whole image. Figure 9 shows an example of an "impossible" figure, Devils turning fork. The figure is impossible because it has three prongs but a base that can only support two. The parts of the figure make sense but not the figure as a whole (Barry, 1997).

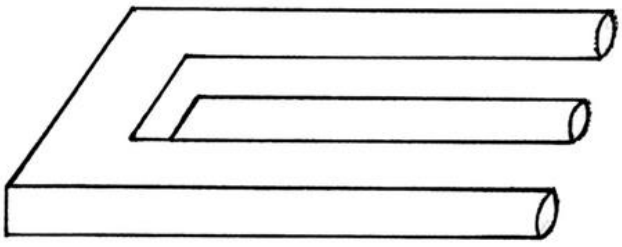

Figure 9: Devils turning fork

Source: Visual Intelligence: Perception, Image, and Manipulation in Visual Communication (Page 29)

The visual image differs from a photograph because unlike the camera, the eye is not an instrument for capturing images but it is a complex unit to identify change, form and features and it prepares the data for the brain to deduce. Contour, texture and regularity in a three dimensional ambient optical array of the environment make it possible to differentiate objects and to see them as constant and external to us (Barry, 1997).

Visual illusions can also be in the form of systematic distortions of size or shape. This distortion can be in many simple figures. The explanations accorded to these visual illusions can present a challenge to the human brain. This is because distortions occurring in several directions at the same time can be hardly due to eye movements. (Gregory, 1968)

The photograph is a favoured method of capturing images for communication in illustration for development. However, it must be considered that it is not always ideal. It may be difficult for a person to read two-dimensional information such as in a photograph. This is because one cannot move about in it both to observe invariant shapes, textures and patterns and to filter out irrelevant information (Barry, 1997).This becomes an issue for a target audience who are not socialised to decipher photographs.

2.8 SOCIAL COGNITIVE THEORY

This study is mainly guided by the social cognitive theory; this theory explains how individuals acquire and retain certain behavioural patterns. According to the Social Cognitive theory the environment, people and behaviour are continually influencing each other (Glanz et al, 2002). Figure10 shows the conceptual model of the theory.

Lapinski, (2009) states that barriers to global public health are rooted in human behaviour, which necessitates the use of communication, based on theory to understand communication processes. Adopting theoretical approaches gives health communication a chance to offer significant input in enhancing and saving lives.

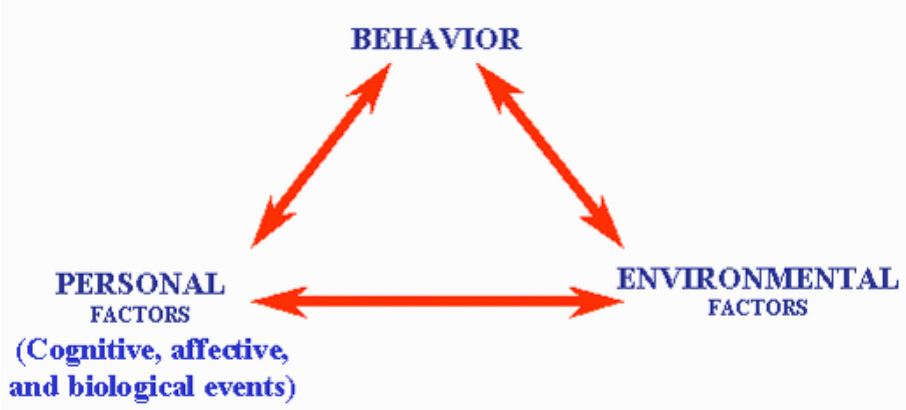

Figure 10: Conceptual social cognitive theory model

Source:https://www.utwente.nl/cw/theorieenoverzicht/Theory%20Clusters/Health%20Communication/Social_cognitive_theory/

Communication, as discussed by James Carey serves two roles: an instrumental role that helps one acquire knowledge and a ritual role that sees persons as members of a social community. Health communication has significance to all aspects of health including disease prevention and quality of life. This relevance in health communication focuses on the environmental, psychological and social influences of behaviour and health (Lapinski, 2009).

Information received and processed through individual and social circles determines what people encounter and the meaning derived from communication depending on the individual experience, belief and knowledge, the cultural patterns, interpersonal relationships and social norms. Secondly, it is only natural to expect discrepancies between the disseminated message and the received message due to the difference in interpretation and the decoding of the information. This is avoided by carefully studying the correspondence of the messages as they are sent and received. Thirdly, in communication, the receivers and sources of information are constantly changing roles therefore its essential to conduct audience assessment and message pretesting in health communication (Lapinski, 2009).

2.9 SOCIALLY ORIENTED APPROACHES TO HEALTH

Healthcare quality is a social matter, as it requires altering the social systems' practices that damage health rather than just altering the habits of persons. The approaches used seek to raise public responsiveness to health hazards through education. People work together to improve the worth of their lives to change and accomplish social change as recognized by the social cognitive theory (Bandura, 2004).

Beliefs of personal value play a core role in personal transformation. Unless people have faith in producing desired outcomes by their actions, they have little motivation to act or to endure faced by challenges. The other factors that serve as directors and influences are embedded in the foundation that one has the authority to produce the desired actions by their actions (Bandura, 2004).

Bandura, (2004) explains that behaviour is partly regulated by the social feedbacks it evokes. People are influenced by the social approval or disapproval of the outcomes of behaviour change. The motivations for behaviour change is enhanced by assisting individuals understand how habit change is in their best interest and the bigger objectives they hold. When personal goals are embedded in a system, self-motivations and guides for health behaviours are achieved.

2.9.1 SOCIAL NETWORKS AND HEALTH BEHAVIOUR

Social networks are associated with health and wellbeing in different ways; it is argued that social systems and social relations affect a person's behaviour beyond the impact of his/ her individual qualities according to Smith and Christakis, 2008 and Valante 2010. It has also been argued that social networks help to promote multidisciplinary work in mother and child health services. Social networks are based on describing who knows whom or whom talks to whom within a communal setting or an organization and can also influence the type of health services utilised by patients (PALMÉN, 2013)**.**

Most people in developing countries acquire information through informal sources and cultural values and norms. In regards to information, the awareness of an individual

depends on the behaviour or how knowledgeable his or her friends or neighbours are (Mukong & Burns, 2015).

The level of education of a woman and her understanding about the significance of pregnancy and delivery care and cognizance of where to get them plays a role in the acceptance to use services according to Simkhada et al., 2008. The relationship between education and use of maternal health services is partly attributed to the fact that formal education exposes women to information about sexual and reproductive health. Schooling enhances self-efficacy in women and it enhances their decisions on safe motherhood and use of contraception (UNDP, 2011)

The use of outreach services to reach women in their home environment reduces the physical barriers but also plays a role in promoting greater maternal health awareness among households that have not been exposed to this information. This intervention employs the use of trained community health workers CHWs who are recruited from their own communities (UNDP, 2011).

Communication strategies targeting populaces with high levels of fertility talk about the socio cultural norms that support large families. Persons and couples not able to control their own fertility are directed at by communicating messages encouraging smaller families or birth spacing through use of contraceptive methods or natural family planning. On the other hand, communication strategies targeting populations in which smaller families are desired but still have unwanted fertility due to unintended pregnancies call for communication interventions that provide information about family planning services and how to get them. It also advocates for the use of effective contraceptive methods and the dismissal of rumours and mythologies about contraception to reduce obstacles to use (Department for international development, 2010).

The provision of Family planning education and contraceptive methods immediately after delivery is effective in providing postpartum family planning use. This can be done through outreach or community based visits to reach underserved populations (Mulligan, et al., 2010).

CHAPTER THREE

METHODOLOGY

3.0 INTRODUCTION

This chapter specifically addresses itself to methodological procedures of the study. This involves the research study area, study population, sampling procedure, methods of data collection and sources of data, reliability and validity of study instruments, data analysis and ethical issues in the research.

3.1 RESEARCH DESIGN

This study applied Qualitative research methods as suggested by C Pope, (2002). He argues that the quality of healthcare is multidimensional and complex and some questions may not be open to quantitative measurement. Majority of barriers to health-related goals are quality-related; as quality improvement, approaches may be able to tackle some of them. Quality improvement means any process aimed at decreasing the quality gap in systemic and structural utilities according to the dimensions of quality. (Schneider, 2006). Schneider, (2006) mentions involvement of people as one of the basic principles of quality improvement in healthcare in developing countries.

The research employed qualitative techniques of data collection, analysis and presentation. These included in-depth face-to-face interviews and focus group discussions with women attending antenatal and postnatal clinic and in-depth interviews with healthcare providers to collect in-depth information through probing. This is because the issues under study are varied and have many dimensions thus the need to portray them in their multifaceted form (Leedy & Ormrod, 2005). The study also reviewed secondary data such as maternal health brochures, pamphlets and booklets from healthcare facilities.

Different methods of data collection were used in the research to allow for triangulation of data. According to Denzin and Lincoln, (2005) triangulation is used to cross- data from multiple sources and to verify the quality of data collected and to compare and contrast the

emerging themes from different sources. This research triangulates the data from the interviews and the focus group discussions.

3.2 STUDY AREA

The study area is in Kibera, which is located 5km south of Nairobi, Kenya. Kibera is the largest informal settlement in Nairobi, Kenya and is the second largest in Africa. It has a population of 170,070 according to the Kenya population and Housing census in 2009.

As is the case with most of informal settlements in Africa, the pace of population growth has exceeded the economic growth making it difficult for urban authorities to provide quality social services in Kibera. Emerging evidence shows that health disparities between the poor and the middle class are widening in the urban settings of the developing world and in informal settlements the urban poor exhibit poorer health results than those in the rural areas (CARE for Kenya, 2013).

Most of Kibera informal settlement residents live in extreme poverty, earning less than $1.00 per day. Unemployment rates are high. There are few schools, and most people cannot afford an education for their children. Clean water is scarce and therefore diseases caused by related poor hygiene are prevalent. Majority of Kibera residents lack access to healthcare (Ruwa, 2015).

Kibera is appropriate for this study because a study done in 2009 by Oronje showed that the informal settlements in Nairobi, Kenya's capital is 706 deaths per 100,000 live births, which is higher than the country's capital. Kibera being the largest informal settlement in Nairobi deemed appropriate to represent the informal settlements in Nairobi. A report by CARE for Kenya highlights that little attention is paid to the maternal health problems of women in Kibera. Women in Kibera are less likely to attend antenatal and postnatal care and even far much less likely to deliver in a health facility (Oronje, 2009).

According to the French Institute for Research in Africa (IFRA) Nairobi and Keyobs, a Belgian company, using Geographical Information Systems (GIS) methodology and ground survey, Kibera is divided into the following villages: Kianda, Soweto West, Soweto

East, Kisumu Ndogo, Lindi, LainiSaba,Raila,Silanga, Makina, Gatwekera and Mashimoni. (See Figure 11) (Desgroppes & Taupin, 2012).

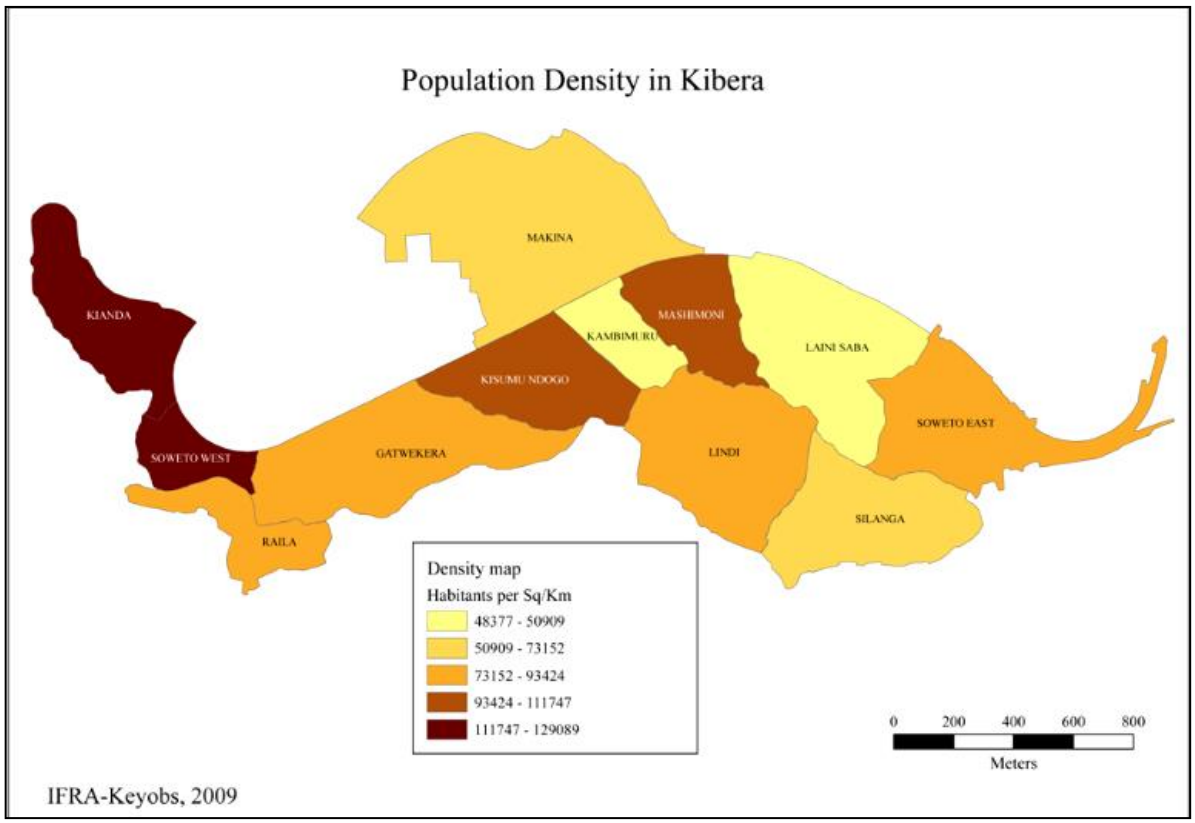

Figure 11: Population density in Kibera

Source: IFRA- Keyobs Field Survey, 2009

In urban informal settlements, the understanding of maternal mortality as indicated by Ziraba et al (2009) is indicated by low use of health services and increase in child mortality. This shows that the urban poor are a highly vulnerable and marginalized group. The situation has been worsened by high levels of rural-to-urban migration which has led to the growth of urban informal settlements in Kenya. The informal settlements are characterised with low availability and utilization of formal services including maternity care. Figure 12 shows the housing in the informal settlement.

Figure 12: Kibera informal settlement housing

Source: http://www.kenyamercyministries.org/kibera

3.3 STUDY POPULATION

The study population is comprised of women of childbearing age attending antenatal and postnatal clinics in three healthcare facilities in the informal settlement of Kibera. The population also includes all the health professionals in the three healthcare facilities.

3.4 SAMPLING METHODS

3.4.1 Purposive Sampling

The three health facilities in the study were purposively chosen. This is because Kibera has quite a number of health facilities but very few of these health facilities have comprehensive maternal health services. The study therefore selected three health facilities that have comprehensive maternal health services and are frequented by the women of Kibera informal settlement. The selected facilities were Beyond zero health clinic, AMREF health clinic and Ushirika health clinic.

Purposive method of sampling was used to draw out study participants that were relevant to the topic under study. This method of sampling involves the deliberate choice of an informant due to the qualities the informant possesses. In this study, women of

childbearing age attending antenatal and postnatal clinic were selected for interviews at the health clinics. Five (5) women-attending antenatal and five (5) women attending postnatal clinic were interviewed at each of the three (3) health clinics, making 30 interviews in the study.

The key informants, who were health care workers, were also purposively selected in each health facility. The selection process involved selection of healthcare workers who communicate directly with the women during antenatal and postnatal care. Two healthcare workers who interact directly with the women in regards to maternal health were interviewed in each health facility making six (6) health care workers for the study.

Sample sizes for interviews can be justified using different methods in qualitative research. The first method is through citation of recommendations by qualitative methodologists; the second is to act on precedent by citation of sample sizes used in studies with similar research problems and designs and third is by involving statistical demonstration of saturation within a data set. (Marshal et al, 2013). This research therefore goes by the first method of sample size justification, which is through citation of recommendations by qualitative methodologists. According to Denzin and Lincoln who are qualitative methodologists, 30-50 is a recommended number of interviews for a qualitative study to have a solid understanding of the given phenomenon. A minimum sample size of 36 interviews was therefore used for this study.

Additionally, a homogeneous group of women attending antenatal and post-natal clinic were purposively drawn out and invited for focus group discussions. The selected women were those attending antenatal care and those attending postnatal care. Two Focus group discussions were conducted at each health facility, one with the women attending antenatal clinic and the other with women attending postnatal clinic. The study therefore had six focus group discussions, which is good enough to reach saturation of the topics under discussion (Millward, Focus Groups, 2012). Morgan, (1996) also states that most projects consist of four to six focus groups.

The sample reflected the segments of the population who will provide the most meaningful information in relation to the study objectives. The groups were homogenously divided to facilitate disclosure because of the rapport created among people who have common

characteristics. Therefore, women attending antenatal clinic formed one focus group discussion and women attending postnatal clinic formed another focus group discussion in each health facility (Millward, Focus Groups, 2012).

Each focus group discussion had between 6-8 women as suggested by Wilkinson, (2003). This is because larger groups are more difficult to manage as they are liable to form subgroups and it is hard to obtain a clear recording of the session because people talk at different volumes at different distances making the discussion difficult to track (Millward, Focus Groups, 2012).

3.5 DATA COLLECTION AND INSTRUMENTS

The study employed two methods of data collection. This was to allow for triangulation of data from the two sources to ensure accuracy and reliance. The two methods are face-to-face interviews and focus group discussions.

3.5.1 Face-to-Face interviews

The intensity and length of the interview affected the decision of the sample size (Wilmot, n.d). Since the sample size for the interviews was 36 participants, the length of the interviews were 30 minutes each as suggested by Dicico Bloom and Crabtree, (2006).

The interviews were conducted in a quiet, comfortable and private area within the vicinity of the health facility. Voice recorders and note taking were used to collect data from the interviews; this allowed the interviewer to interact more with the participants.

Open-ended interview guides was used to conduct exit face-to-face interviews. The women were interviewed after their doctor's visit. The interviews commenced with general conversation to yield a more relaxed atmosphere and then the participants were probed to gain clarity of the topics under study (Whiting LS, 2008).

3.5.2 Focus Group Discussions

The focus group discussions aimed at building conversation among the participants and not between the interviewer and individual participants. According to Wilkinson, (2003) focus group discussions produce broader and more in-depth understanding of the topic because

the interaction process among participants stimulate memories, debate and discussion in a way that is less likely in a one on one interview.

Apart from the advantages mentioned above, focus group discussions also have disadvantages such as the researcher having less control over the data generated and it takes effort to assemble the group for the discussion. Additionally, it is not possible to know whether the respondents are influenced by the interaction in the group and this may affect the quality of data (Freitas, Oliveira, Jenkins, & Popjoy, 1998). This is because the group may influence the nature of data produced from the focus group discussions and some participants may withhold things they would say in private (Morgan, 1996).

The participants were chosen purposively with each focus group discussion having homogenous characteristics: women attending antenatal clinic formed one focus group discussion while those attending postnatal clinic formed the other. This was to facilitate the free flow of discussion because each group had homogenous characteristics (Khan, Anker, Patel, Barge, Sadhwani, & Kohle, 1991). This ensured creation of rapport among the participants who are unknown to each other (Millward, Focus Groups, 2012).

The focus group discussions were held on the designated clinic days with the help of the health care providers. The same venue used for the antenatal and postnatal clinic education was used for the focus group discussions for convenience and comfort of the participants due to the familiarity of the venue in each focus group and to set the tone of the research as professional. According to Millward, (2012) most focus group researchers agree that the recommended time for a focus group discussion session involving adults is between 1 and 2 hours. Following this recommendation, the focus group discussions each lasted one hour.

Before the commencement of the focus group discussions informed consent was obtained from the participants and assurance of confidentiality was given. Interview guides were used to ensure the discussions stayed on topic and to aim at recording as many individual utterances as possible guided the discussions. The data was collected using a voice recorder and supplemented by field notes to minimize the burden of having to listen, observe and facilitate.

3.6 DATA ANALYSIS

A thematic method of data analysis was used in this study. This method of analysis identifies, analyses and reports patterns within the collected data. It organises the data in detail and goes further by interpreting the various aspects about the data in relation to the research questions thus representing meaning within the data set (Braun & Clarke, 2006).

3.6.1 Face-to-Face interviews

The data from the interviews was transcribed verbatim by playing the recorder back and forth for accuracy (Whiting LS, 2008).The data collected in Kiswahili was translated to English as the data was being transcribed. Data analysis began immediately after the first data was collected and modified throughout the study. According to Burnard, (2008) this initial analysis of data may further inform the following data collection; for example the interview guides were slighly modified because of emerging findings which needed further clarification. During this phase the researcher began to produce initial codes from the data by identifying features from the data set that were assesed in the most meaningful way regarding the phenomenon. The coding was done manually by writing notes.

The data was thematically arranged according to the relationships between the key variables as per the research questions and the emerging issues. Analysis of the interview data proceeded with broad categories/ themes in mind. Morse (2008) describes a 'category' as a collection of similar data sorted into the same place, which enables the researcher to identify and describe the characteristics of that category.

The researcher then went through all the formed themes and considered whether they appear to form a comprehensible pattern. At the end of this phase, the researcher had an idea of all the different themes and the overall story they told about the data.

The researcher then analysed the different themes to identify what each theme was about and the story told by each theme and how it fit into the complete overall story. This helped identify if there were some sub-themes within the themes.

3.6.2 Focus Group Discussions

Data collected in other languages was translated to English. The data from the focus group discussions was transcribed and the entire atmosphere of the discussion captured. The content analysis was comprised of both mechanical and an interpretive component. The mechanical aspect involved physical organization and subdivision of the date into categories while the interpretive aspect involved determining the importance of the categories according to the research questions. Linking the mechanical and interpretive aspects developed meaningful coding schemes.

The recordings were listened to and a list of key ideas for each topic under discussion was put down. Quotations and ideas were placed under the appropriate categories, which were then divided into subcategories or combined into larger themes (Khan, Anker, Patel, Barge, Sadhwani, & Kohle, 1991). Content analysis was mainly used for the focus group discussions; the most meaningful categories were determined about the research questions (Millward, Focus Groups, 2012).

Additionally, opinions from the focus groups were addressed as being constructed collectively. However, this approach may reflect individuals' held opinions and it may not represent the views of all the participants within the group discussion. The 'collective voice' in this context was dealt with by considering the discourses constructed within the focus group discussions (Smithson, 2000).

However, focus group discussions have limitations such as the tendency of certain group members dominating the discussions and the tendency of certain socially acceptable opinions to emerge during discussions. During analysis of data, these limitations were not ignored. Moreover, Myers, (1998) states that these limitations make the findings interpretable and practicable (Smithson, 2000).

The emanating data from the focus group discussions was triangulated with the data from the in-depth interviews. The data was also crosschecked with the information from the literature review for consistency.

3.7 DATA PRESENTATION

According to Braun and Clarke (2006), data presentation should provide evidence of the themes within the data. Therefore, the data presentation from the interviews and focus group discussions were in form of narratives and verbatim quotations. Some of the narratives and quotable quotes from the interviews and Focus group discussions were pieced together from several sources into the report to explain the emerging trends exhaustively. This enabled a comprehensive and compact form of exhibiting the information.

The table 2 shows a summary of the sampling methods, data collection methods, data collection instruments, data analysis and data presentation methods.

Table 1: summary of methodology

Source: Author

Sampling method	**Data collection**	**Instruments**	**Data analysis**	**Data presentation**
Purposive (30 women)	Interviews	Open ended interview guides	Thematic analysis	Narratives
Purposive (6 FGDs)	Focus Group Discussions	Open ended interview guides	Thematic analysis	Narratives
Purposive (6Healthcare providers)	In-depth interviews	Open ended interview guides.	Thematic analysis	narratives

3.8 RELIABILITY AND VALIDITY OF THE STUDY INSTRUMENTS

Before embarking on the study, the research instruments once developed were extensively discussed with the researcher's supervisor from the school of the arts and design and her input was incorporated into the tools. Validity issues were considered in this study through the careful and diligent collection of data. The study employed multiple data collection

methods. This was done using interviews and focus group discussions to triangulate data from the interviews in order to minimise errors in the research findings.

The reliability was ensured by confirming that the data collection procedures can be repeated to attain the same results. This was done through the documentation of the procedures and data collection processes used in the study. Professionals in the medical field were also interviewed for further insight on the research topic and affirmation of the study findings.

A pre-test was then carried out in a different area (Kayole informal settlement) from the study site and the issues arising from the pre-test were addressed by correcting the instruments accordingly. The corrected instruments were eventually used for the final data collection.

3.9 ETHICAL CONSIDERATIONS

Approval to conduct the research was obtained from the University of Nairobi. Additionally, consent letters were obtained from the health facilities and from the county health services, (Appendix E shows all the authorization letters used to conduct the research). This being a qualitative study, the researcher interacted profoundly with the participants of the study by entering their personal space to collect data. Creswell, (2003) states that the researcher must respect the needs, rights, values and desires of the research informants. This study therefore adhered to the recommendations of Miles and Huberman, (1994) when conducting the research.

1. Informed consent – the researcher informed the informants of the purpose, nature and extent of the research before commencing. A written consent was obtained from each participant to ensure the consent is voluntary and without any pressure.
2. Privacy, confidentiality and anonymity – the researcher assured the informants of their privacy and that their names would not be used for any other purpose and that no information will be shared that reveal their identity.

3. Voluntary participation – the informants were informed that their participation is voluntary and they are under no obligation to give information during the data collection.

4. The researcher maintained the highest professional research standards and competencies, emphasizing the importance of the research to the respondents.

3.10 LIMITATIONS OF THE STUDY

A number of issues arose during the study that undermined the essence of purposeful sampling. As mentioned earlier in the chapter, the study participants were interviewed after the doctors' visit. The healthcare workers asked the mothers (study participants) to come for the interviews after the regular check-up. This meant that the healthcare workers had a role in the initial choice of the mothers to be sampled. This means the healthcare workers acted as gatekeepers to the health facilities thereby creating a 'gate keepers bias' as mentioned by Groger & Mayberry, (1999) and Yates et al. (1995) (Tuckett , 2004).

Opinions from the focus group discussions were reported as being constructed collectively ('collective voice'). This may not have reflected the views of all the participants within the group thereby creating a bias in the findings.

The results of this study may not be generalised to the broader women population of Kibera informal settlement. This is because most of the respondents who signed the consent forms were mothers in the age group 24 to 28. This is because this age group was the majority at the clinic and they were more willing to participate in the interviews.

CHAPTER FOUR

FINDINGS

4.0 INTRODUCTION

This chapter reports the findings from the interviews and focus group discussions as per the methodology. The study was carried out in three health facilities in Kibera (AMREF, Beyond Zero and Ushirika health facilities).

The chapter reports the respondents' personal information like age group, marital status, level of education, occupation and the number of children the respondents have. It further reports the data from the field as categorised by the research questions. The chapter ends with a summary of the study findings.

4.1 PERSONAL INFORMATION

The study interviewed 6 healthcare workers and 30 mothers attending antenatal and postnatal clinics in AMREF, Ushirika and Beyond Zero health facilities in Kibera. It further held total of 6 focus group discussions across the 3 healthcare facilities with mothers attending antenatal and postnatal clinics. The data collection involved collecting personal information from the respondents as discussed below:

4.1.1 Marital status and Age group of respondents

The in-depth interviews with the mothers comprised of 25 married women and 5 single women(See Figure 14). The interviewed mothers were between the ages of 18 and 37. The respondents' ages were grouped as shown in table 2 and Figure 13 below. The researcher interviewed 4 mothers who were below the age of 18, 8 mothers were between the ages of 19 and 23, 12 mothers were in age group 24 to 28, 2 mothers were in age group 29 to 33 and 4 mothers were in age group 34 to 38.

The focus group discussions on the other hand comprised of 25 married mothers, 2 separated mothers, 9 single mothers and 1 widow (See Figure 14). The age group in the focus group discussions was as follows: 21 respondents were below the age of 24, 10

respondents were between 25 to 30 years, 4 respondents were between 31 to 37 and 2 respondents were above 37 years of age.

Additionally, of the 6 healthcare workers interviewed 3 were married, 2 were single and 1 was a widow (See Figure 14). The oldest healthcare worker was categorised in the age group 39 and above, 4 out of the 6 were in the age group 34 to 38 and 1 healthcare worker was in the age group 24 to 28. (See Figure 13 below)

Table 2: Marital status and Age group of respondents

	In-depth interviews		Focus group discussions		Health care workers	
Marital status	Number	Percentage	Number	Percentage	Number	Percentage
Married	25	83.3	25	67.6	3	50.0
Single	5	16.7	9	24.3	2	33.3
Separated	-		2	5.4	1	16.7
Widow	-		1	2.7	-	-
Total	30	100	37	100	6	100
Age Group						
18 and below	4	13.3	3	8.1		
19 To 23	8	26.7	18	48.6		
24 To 28	12	40	7	18.9	1	16.7
29 To 33	2	6.7	4	10.8		
34 To 38	4	13.3	5	13.5	4	66.7
39 and above					1	16.7
Total	30	100	37	100	6	100

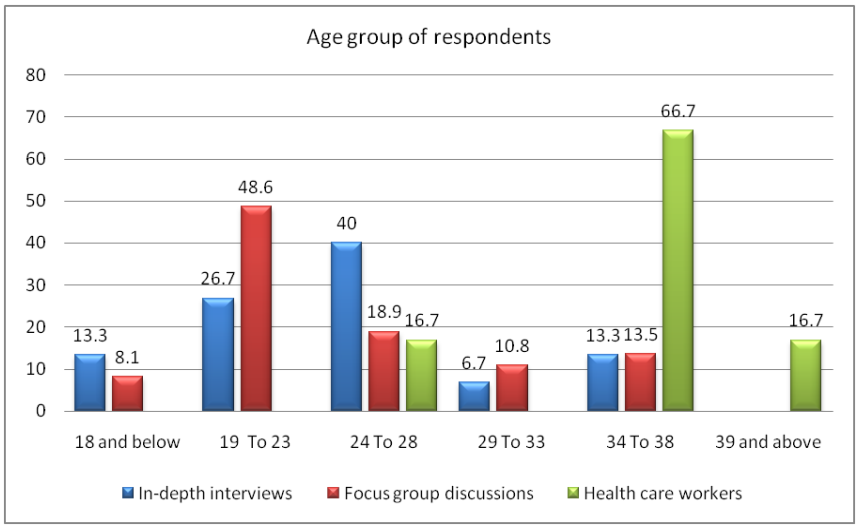

Figure 13: Age group of respondents

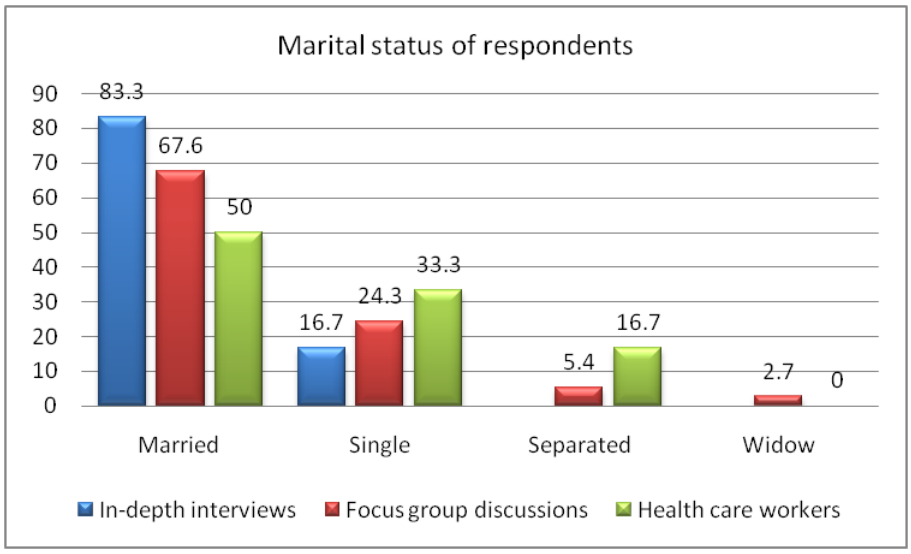

Figure 14: Marital status of respondents

4.1.2 Level of education

Education level of the in-depth interview respondents were categorised as follows: 3.3% of the 30 respondents did not have any formal education and 3.3% went to lower primary (for purposes of this study lower primary is class 4 and below). Majority (60.0%) of the respondents went to upper primary (for purposes of this study upper primary means from class 5 to class 8), 16.7% did not complete their secondary education and 16.7% completed secondary education. Among the 37 respondents in the focus group discussions, 2.7% went to lower primary, 62.2% went to upper primary, 13.5% did not complete secondary education, 18.9% completed secondary education and 2.7% went to the tertiary/ college level of education. The 6 healthcare workers who were interviewed had different levels of education: 33.3% of the 6 healthcare workers completed secondary education while the remaining 66.7% went through college education. See table 3 below.

Table 3: education level of respondents

	In-depth interviews		Focus group discussions		Health care workers	
Education level	Number	Percentage	Number	Percentage	Number	Percentage
None	1	3.3				
Lower Primary	1	3.3	1	2.7		

Upper primary	18	60.0	13	62.2		
Incomplete secondary	5	16.7	5	13.5		
Completed secondary	5	16.7	7	18.9	2	33.3
Tertiary/college			1	2.7	4	66.7
Total	30	100	37	100	6	100

4.1.3 Occupation of respondents

Majority (54%) of the interview respondents were housewives (for the purposes of this study these were married women who were unemployed), 20% of the respondents were casual workers. These respondents washed clothes for payment, freelance hairdressers, food handlers and construction workers. Additionally,13% of the respondents owned small businesses (these were mothers who owned kiosks selling vegetable, mandazi, chips and those with M-Pesa kiosks), 3% were unemployed (for the purposes of this study these were single mothers who were unemployed), 3% were salaried employees which was a security guard, and 7% of the respondents were tailors. The focus group discussions consisted of 37 respondents, 3% of whom were casual workers, 46% were housewives, 8% were unemployed, 3% were salaried employees (this included one employee in real estate) and 11% owned small business. See Figure 15 below. On the other hand, 1 of the healthcare workers was a clinician (clinical officer), 3 were mentor mothers and the remaining 2 were nurses. See Figure 16 below.

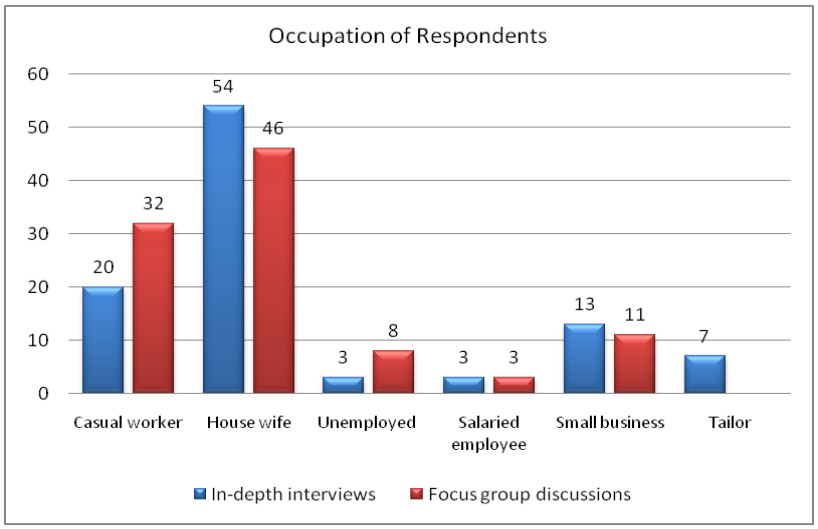

Figure 15: Occupation of respondents

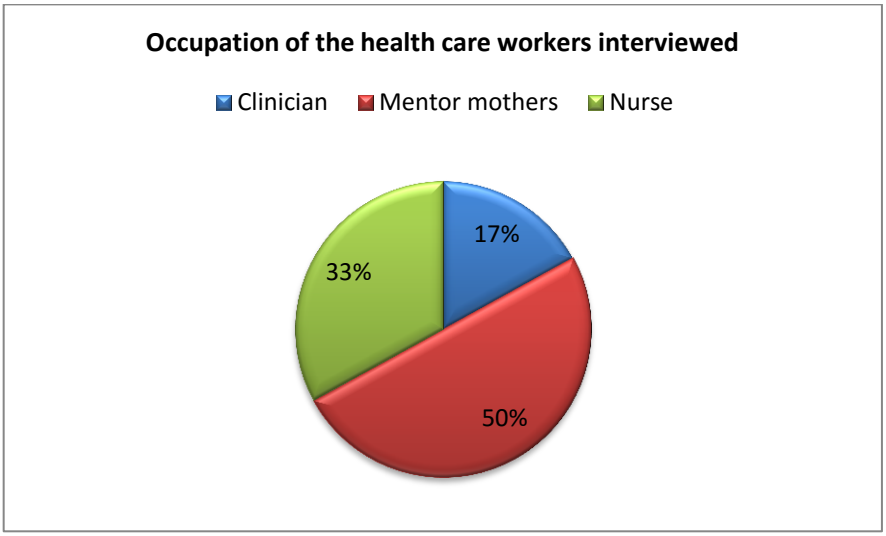

Figure 16: Occupation of health care workers

4.1.4 Number of children respondents have

The study sought to know the number of children the respondents have. From the 30 interviews, 50% of the respondents had only 1 child, 10% had 2 children and further 10% had 3 children. Additionally, 6.7% of the respondents' had 4 children and 23.3% of those interviewed had no other children. However, of the 23.3% respondents who were expecting their first child, one respondent had had a child who died immediately after birth. See table 4 below.

Table 4: The number of children respondents have

	In-depth interviews	
Number of children	Number	Percentage
0	7	23.3
1	15	50.0
2	3	10.0
3	3	10.0
4	2	6.7
Total	30	100

4.2 SOURCES OF INFORMATION

The study sought to know the sources of information regarding maternal health in the informal settlement of Kibera. To do this the researcher asked questions as per the interview guides as shown in appendix D. The data from the field was analysed and categorised into major themes that were emanating from the findings. For the purposes of this study, the major categories were friends (neighbours and colleagues), healthcare workers (community health workers (CHWs), doctors, mentor mothers, nurses and peer educators), mass media (Television and radio), relatives (sisters, husbands, mothers, aunties) and school. Additionally, mothers who have had children, health prints and traditional birth attendants were major categories arising from the findings.

4.2.1 Source of information for antenatal / postnatal care

The main sources of information emanating from the in-depth interviews were through friends and relatives; 43.3% of the interview respondents mentioned friends as their source of information while 43.3% of the respondents mentioned relatives as their source of information. Additionally, 30.0% of the respondents got information from healthcare workers, 13.3% of the respondents got information from mass media sources, 6.7% got information from women who have had children and 3.3% got this information from school. See Figure17 below.

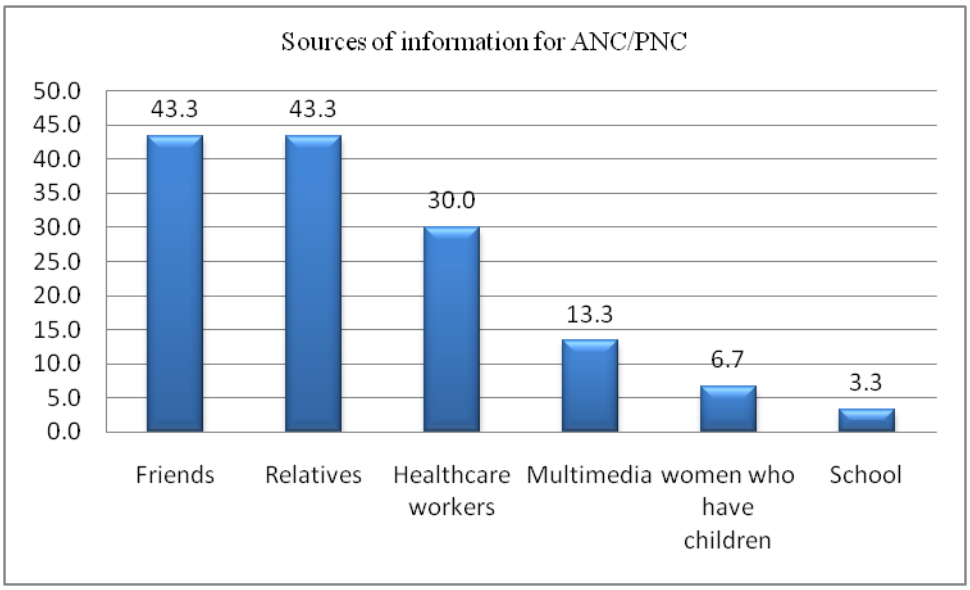

Figure 17: sources of information for ANC/PNC

The respondents who mentioned friends as their source of information were 25% of the respondents in the age group 18 years and below and 25% of the respondents in the age group 19 to 23. Additionally, 75% of the respondents in the age group 18 years and below and 50% of respondents in age group 19 to 23 mentioned relatives as their source of information for ANC/PNC. On the other hand, 25% (18 years and below) and 25% (age group 19 to 23) mentioned mass media sources like televisions.

However, 58.3% of the respondents in the age group 24 to 28 mainly mentioned friends (neighbours) as their source of information. Respondents in age group 29 to 33 (50%) said they got information from other women who have had children. Only one respondent (3.3%) mentioned school as a source of information. This respondent was in the age group 24 to 28 and had upper primary school level of education. On the other hand, 50% of respondents in the age group 34 to 38 mentioned community health workers as the source of information.

On the other hand, 20% of the respondents expecting their first child got antenatal care/postnatal care information from health care workers whereas 60% of these respondents got information from friends and 60% got information from relatives. However, 50% of the women who had 4 children got information from women who have had children and 50% got information from healthcare workers. Of the respondents who

had one child, 33.3% got information from friends, 33.3% got information from healthcare workers and 13.3% got information from women who have had children. Additionally, 20% of the women who had one child got ANC/PNC information from mass media sources. No significant relationship was realised between the sources of information and the number of children the respondents had

Additionally, 48% of the married respondents got ANC/PNC information from friends, 40% got this information from relatives, 28% got this information from healthcare workers, 12% from mass media sources and 8% got this information from women who have children. In the converse, 20% of the single mothers got ANC/PNC information from friends, 60% got information from relatives, 40% got information from healthcare workers and 20% got information from mass media sources. In conclusion, the data shows no relationship between the marital status and the sources of maternal health information as both the married and single respondents mentioned similar sources. See Figure 18.

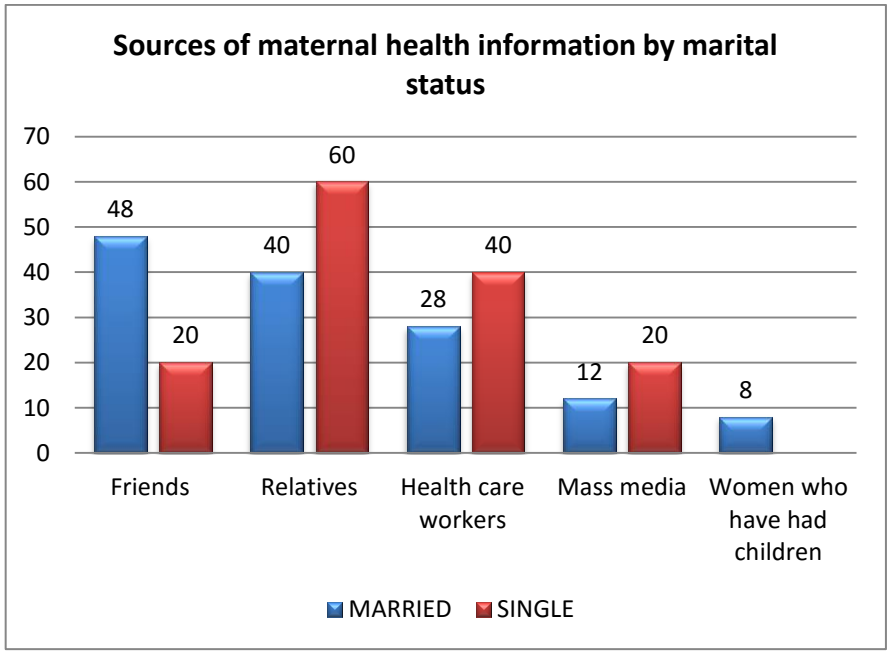

Figure 18: sources of maternal health information by marital status

4.2.2 Sources of information for community members on maternal health

According to the findings from the interviews, 53.4% of the respondents did not know where other community members got information on maternal health, 20% of the respondents said, other community members got information from healthcare workers and 20% mentioned friends. Additionally, 3.3% of the respondents mentioned health prints and 3.3% said other community members got information from relatives. Figure 19 shows the sources of information for community members on maternal health in percentage.

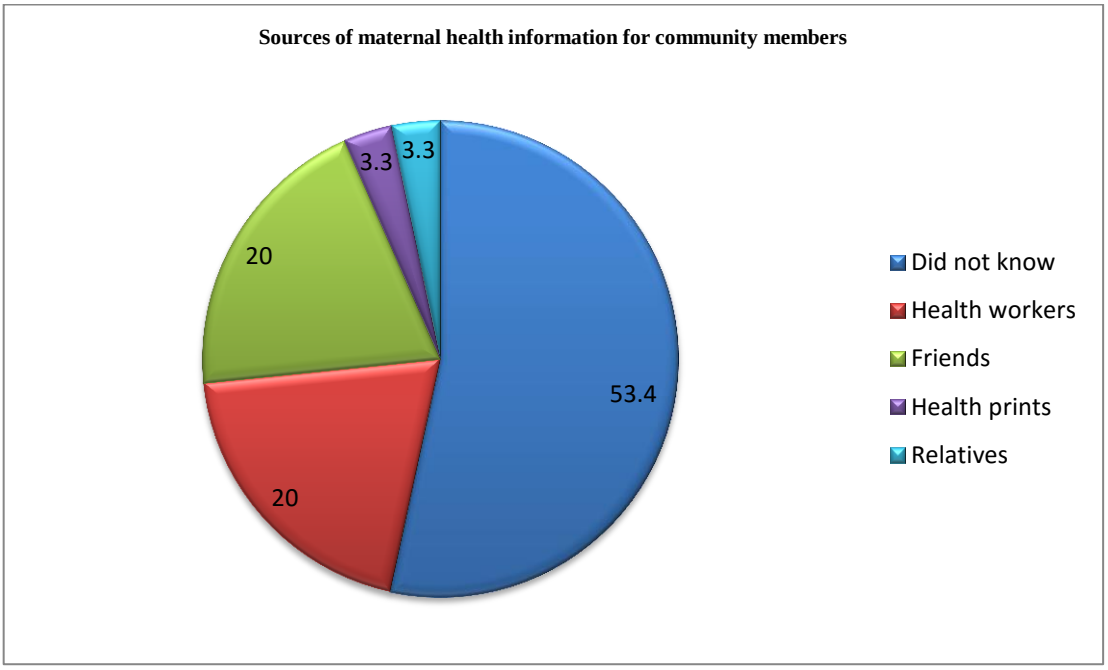

Figure 19: Sources of maternal health information (in percentage) for community members

The focus group respondents stated that community members access information on maternal health from friends, posters, relatives, healthcare workers and women who have had children. They further stated that other sources of maternal health information included online information, mass media sources like Television and radio and traditional birth attends.

On the other hand, 4 out of 6 healthcare workers mentioned friends, healthcare workers, relatives and 2 out of 6 healthcare workers mentioned mass media sources as sources of

maternal health information for the community members in the informal settlement of Kibera. Additionally, one healthcare worker said there is a rising use of women support groups in Kibera as a source of information on maternal health. However, he cautioned that medical providers first assessed the information shared before being shared in the women support groups. Mothers who have had children (2 healthcare workers) also came out as a source of information on maternal health by the community members.

4.2.3 Respondents' reasons for attending antenatal/postnatal care

The respondents in the age group 18 years and below (25%) mainly went for ANC (antenatal care) and PNC (postnatal care) because a relative asked them to go. This age group (25%) also went to the hospital to get the mother and child health booklet since they would need it when they went back to the hospital for delivery and 50% went for child vaccinations and to check on their babies' weight. However, 37.5% of respondents in the age group 19 to 23 went to the health facility because they were unwell and in the course of treatment found out, they were pregnant. Henceforth, these respondents continued with their ANC visits as directed by the doctors at the health facility. One of these respondents said, "I did not know I was pregnant I just went to hospital then they found out I was pregnant. I went back for clinic because I was told by the doctor to go back for check-up". Relatives and health care workers were some of the sources of maternal health information that influenced the respondents' decisions to seeking antenatal and postnatal care.

Additionally, 12.5% of the respondents in the age group 19 to 23, 50% of respondents in age group 29 to 33 and 33.3% of respondents in age group 24 to 28 went for ANC visits to know their HIV status and to know the health condition of their unborn baby. On the other hand, 50% of respondents in age group 19 to 23, 75% of respondents in age group 34 to 38 and 50% of respondents in age group 29 to33 went for PNC visits to check on their babies' weight and to get advice on how to care for their babies. However, 12.5% of respondents in age group 19 to23 and 25% of respondents in age group 34 to 38 went to the healthcare facilities for vaccinations. See Figure 20.

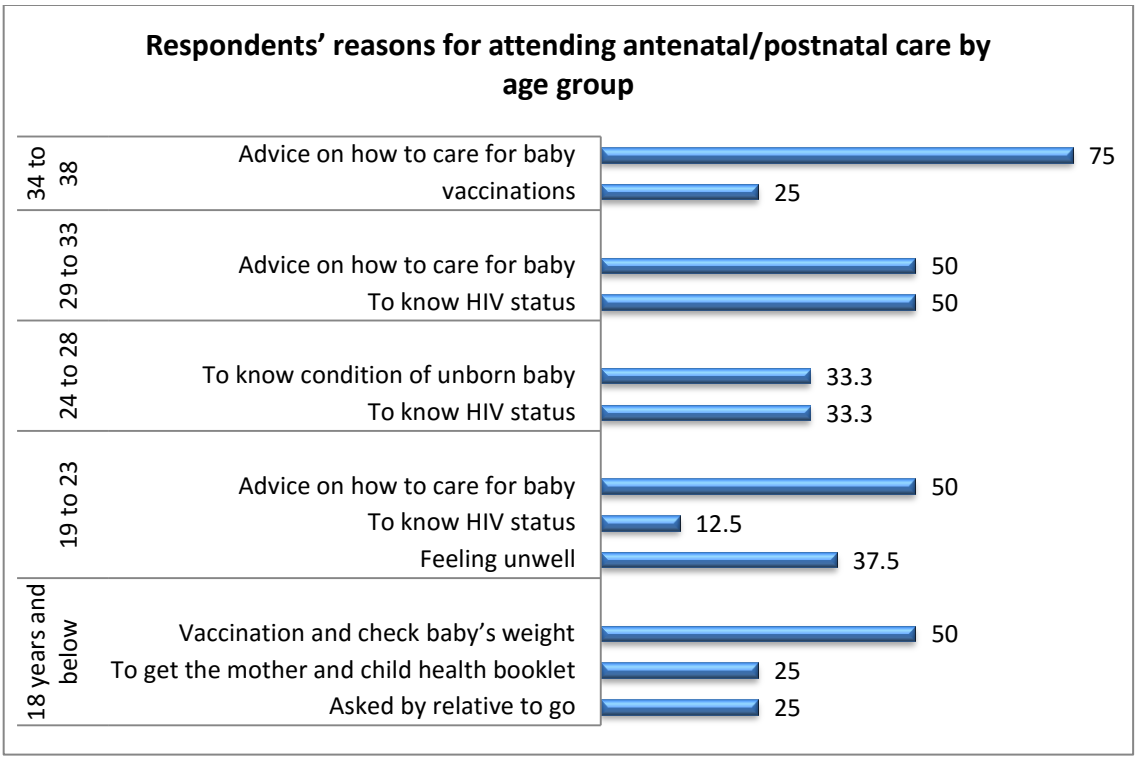

Figure 20: reasons for attending ANC/PNC by age group

The respondents who were expecting their first babies went to the hospital for the following reasons: 20% were asked by their husbands to go. One of them said, "I came to check if the baby is okay and to find out if the baby has any problem and to check weight. My husband also asked me to come". Additionally, 40% did not know they were pregnant and went to the hospital and found out they were pregnant after that and 20% went to the clinic because it was getting too late for antenatal care. Majority (53.3%) of the respondents who had one child went to the hospital to check on the baby's weight and 26.6% went to the hospital to know their HIV status. Of the respondents who had two children, 33.3% went to the hospital to check on their babies' weight. Relatives as a source of maternal health information was realised from the findings.

However, 8% of the married respondents were asked to go for antenatal/ postnatal check up by their husbands, 20% went for antenatal care to now their HIV status and 16% of the married respondents did not know they were pregnant and only found out during the course of treatment at the hospital. Additionally, 32% of the married respondents went for

antenatal/ postnatal care to check on their babies' weight and to monitor their health while 8% felt like it was time they started going for antenatal care at 6 months. On the other hand, 60% of single mothers went for ANC/PNC to check on the babies' weight while 40% went to know their HIV status. Relatives (husbands) are a source of maternal health information for the married women in Kibera.

4.2.4 Main sources of information on maternal health

The main sources of maternal health information as mentioned by the interviewees were health care workers, friends, women who have had children, traditional birth attendants, relatives and mass media sources. Out of the 30 respondents, 50% said their main source of maternal health information was through healthcare workers, 20% of the respondents mentioned relatives and 16.7% of the respondents mentioned women who have had children as their main source of maternal health information. A further 12.3% of the respondents said their main source was from friends, 12.3% mentioned mass media sources such as Television and radio and 3.3% of respondents cited traditional birth attendants as their main source of information on maternal health needs.

Healthcare workers were mentioned by 50% of respondents and older women who have had children were mentioned by 50% of respondents in the age group 34 to 38 as their main sources of maternal health information. On the contrary, 75% of the respondents in the age group 18 years and below mentioned mass media sources such as television and radio and relatives (50%) as their main sources of maternal health information. Women who have had children were mentioned by 100% of the women in the age group 29 to 33 whereas 41.7% of the women in age group 24 to 28 healthcare workers as their main source of maternal health information. This finding showed a significant relationship between age and the sources of maternal health information. Figure 21 shows the sources of maternal health information by age group.

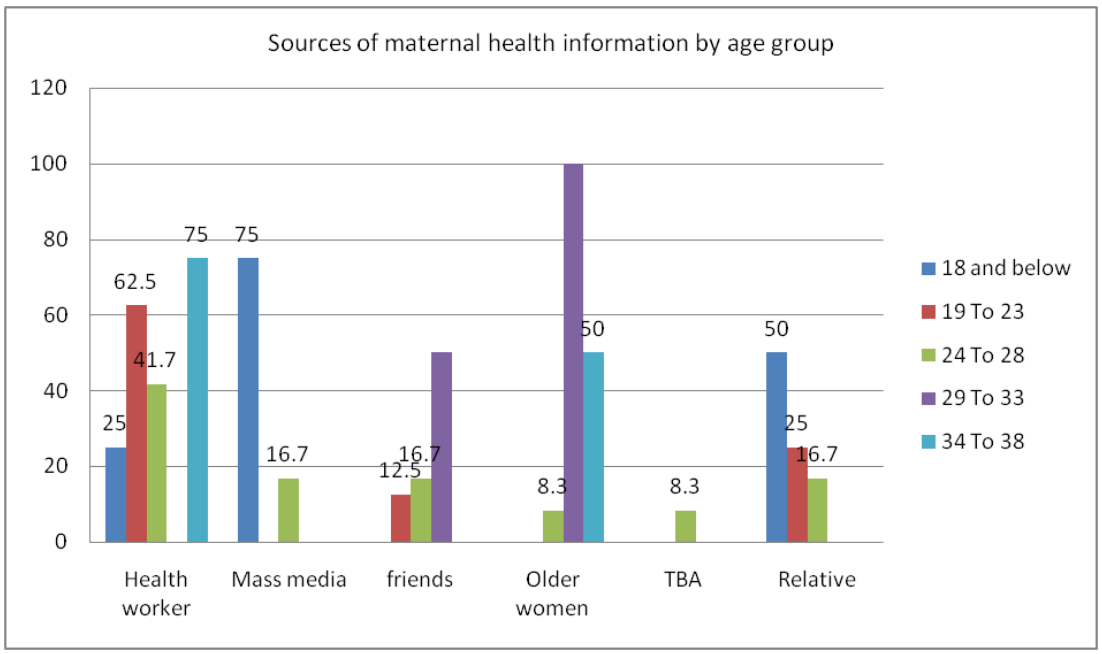

Figure 21: sources of maternal health information by age group

The respondents in the focus group discussions also discussed their main sources of information on maternal health. The respondents agreed that women who have had children were their main source of information on maternal health. However, the respondents also mentioned relatives and friends. They further mentioned healthcare workers; citing doctors and hospital visits. The focus group discussion also brought out traditional birth attendants, health prints and online information as main sources of information on maternal health.

Additionally, 4 out of 6 healthcare workers mentioned flipcharts, 5 healthcare workers stated pamphlets and 1 healthcare worker mentioned visual aids as some of the materials they use to communicate with patients. One of the healthcare providers who mentioned flipcharts said the flipcharts used in the health facility had both graphical images and texts (See Figure 23). He said the images help patients get a clearer picture of what the healthcare workers teach the patients. Additionally, 2 out of the 6 healthcare workers said they used patient teachers to demonstrate to the rest of the patients as a way of passing information. The healthcare workers said they use this for topics such as breastfeeding to show the other mothers exactly how to hold a baby and position the breast when breastfeeding and to ensure the mothers understand. Figure 24 shows a poster used in one

of the health facilities. Out of the 6 health workers, 5 mentioned the mother and child health booklet shown in Figure 25 as one of the materials they use to help pass maternal health information to the mothers. Figure 22 shows the materials used by health workers to communicate maternal health information to the mothers.

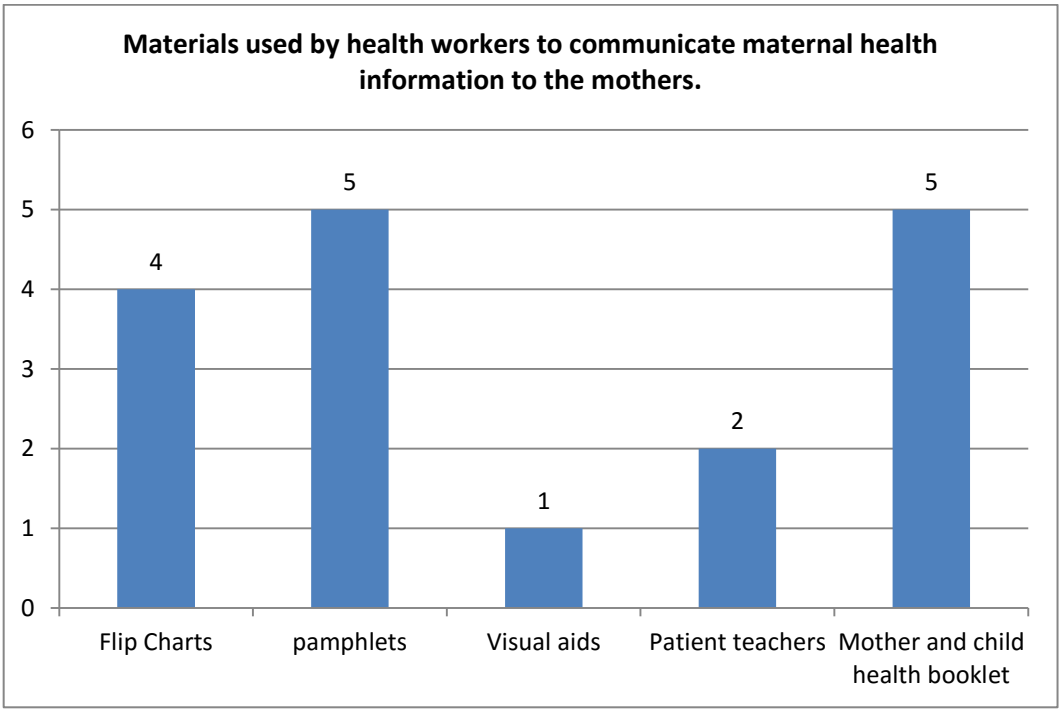

Figure 22: Materials used by health workers for maternal health communication

From the study findings, it was evident that the number of children the respondents had, had no relationship with the sources of maternal health information sought by the respondents. This is revealed from the fact that 66.7% of the respondents who had one child mentioned healthcare workers as their main source of information and 26.7% mentioned relatives. Additionally, 40% of respondents who were expecting their first child mentioned relatives as the main source of information and 50% of respondents who had 4 children mentioned healthcare workers as the main source of maternal health information.

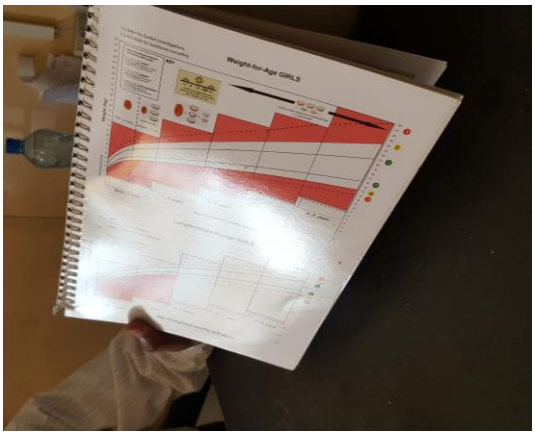

Figure 23: flipcharts used by healthcare workers

Source: Author

Figure 24: health poster atUshirika health facility

Source: Author

4.3 EFFICACY OF COMMUNICATION MATERIALS

The efficacy of the materials used to communicate maternal health information to the mothers in Kibera was one of the research questions. To do this the study sought to know the respondents' understanding of the maternal health materials available at the health facilities in Kibera.

4.3.1 Maternal health information materials given to mothers

The study also sought to know the kind of maternal health information materials the respondents take home. Most of the respondents took home the mother and child health booklet shown below (see Figure 25). These were 70% of the respondents, 6.7% of the respondents had been given brochures and pamphlets, and 6.7% of the respondents said they had been given clinic cards (see Figure 26). However, 16.7% of the respondents had never been given any communication material on maternal health to take home.

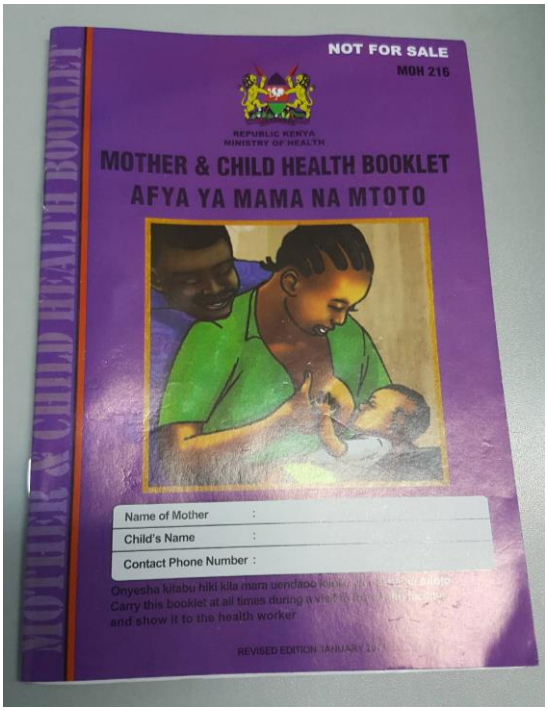

Figure 25: mother and child health booklet

Source: Author

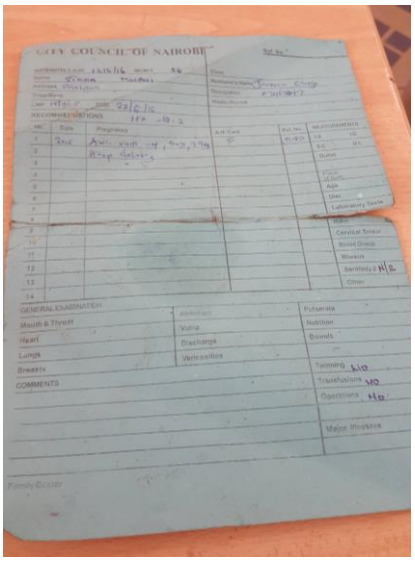

Figure 26: Clinic card

Source: Author

4.3.2 Understanding of the health materials

The respondents were asked about their understanding of the mother and child health booklet (shown in Figure 25), a breastfeeding pamphlet (shown in Figure 27) and a breast milk expression pamphlet (shown in figure 28). The respondents had a look at each of the health materials mentioned above and explained what they understood from the materials. The respondents who had not seen these information materials before were asked to comment on the images on the cover page of the health materials. This was to check on how the respondents interpreted the messages on the front cover of the booklet and pamphlets. The findings were as follows:

Figure 27: breastfeeding pamphlet

Source: Author

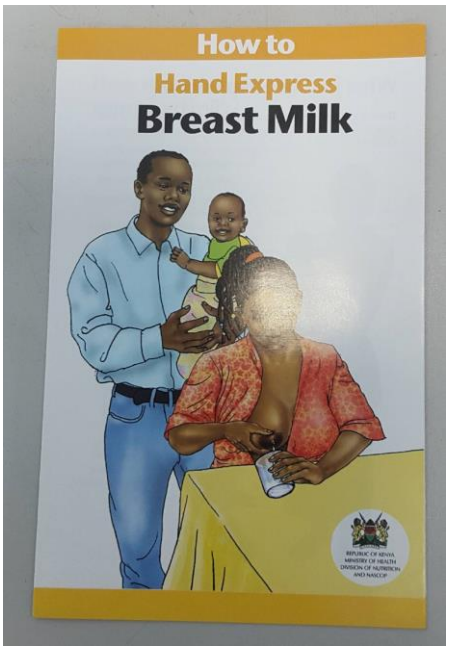

Figure 28: breast milk expression pamphlet

Source: Author

Mother and child health booklet

The respondents who had read the booklet had some knowledge of the information in the mother and child health booklet. Out of the 30 respondents, 10% said the health booklet outlines the kinds of foods an expectant mother should eat; they said mothers should eat well balanced diets for the baby to get enough milk. One respondent among the 10% said, "A healthy mother who eats what is recommended in the booklet will have more milk for the baby". Additionally, 3.3% of the respondents said the booklet was meant for keeping the baby's health records and it shows mothers how to breastfeed. Out of the 30 respondents, 33.3% said the booklet was about mother and child. They outlined that it showed mothers how to take care of themselves and their babies during pregnancy and after birth and 36.7% said the booklet was about how a mother should breastfeed her baby. Although, these respondents read the booklet 3.3% could not understand some of the information especially, the medical terms used in the booklet.

The respondents (20%), who had not read the booklet before, talked about the image on the cover page of the health booklet. They said the image was about a mother feeding her baby and the father in the image appeared happy. A respondent also said that the image was about a father helping to take care of the baby.

Some respondents (50%) in the age group 18 years and below did not read the booklet because they did not know they were supposed to obtain maternal health information from the booklet and others could not read the booklet because of their level of education. These respondents said, "I use the book to go to the clinic; the book is for the doctors to record. I am usually very busy so I don't read it because I have no time". Another respondent said, "I don't read it my husband reads and so he tells me what is written. I only went up to class 8". This respondent cited her level of education as the reason why she did not read the health booklet. She went up to the upper primary level of education. The respondents (50%) who had 4 children did not have time to read the mother and child health booklet.

The focus group discussions also discussed the mother and child health booklet and the respondents gave their view on what they thought about the booklet. The respondents mainly agreed that the booklet was about taking care of a baby and that it was about how a

mother can take care of her baby and herself. Some respondents also felt that the booklet was about breastfeeding; how long to breastfeed a baby and the kinds of food a breastfeeding mother should eat. It was also mentioned during the discussion that the booklet was about pregnancy and after pregnancy; during pregnancy, the booklet taught a mother the kinds of food to eat, to visit a health facility for check-up and to go for ANC (antenatal care) after delivery

During the focus group discussions, it was evident that some respondents did not understand some information in the booklet. This was from a statement made by one of the respondents; she said that the booklet was meant to be used for one and a half years after which she would be given another card. This was a misconception because the booklet should be used continuously for five years. In addition, another respondent said, "I have read the book but some parts are not clear; like the part showing a woman who has delivered but is still bleeding. I wonder why the woman is still bleeding". This respondent did not understand this part of the booklet because it was about danger signs of pregnancy and the said woman in the booklet had not delivered. Moreover, some respondents said that they could not understand some medical terms and graphs used in the booklet. They said, "There are some graphs in the book that I don't understand otherwise the rest have pictures so it's easy to understand".

However, the discussions also brought to light that some respondents did not read the booklet because they do not have time to read and some respondents did not know the book was meant to be read. One of the respondents said, "*kwani ni yetu ya kusoma tena*?" to mean "you mean we are supposed to read this booklet!" Additionally, during the discussions the respondents who did not read the booklet said, "I thought the booklet was just for the doctor to write on. I keep it until my next clinic day. I do not even know what is written in it. I need to start reading it".

The breastfeeding pamphlet

The respondents had not seen the breastfeeding pamphlet before. Therefore, they responded to the question by looking at the image shown in Figure 19. From the interviews, 63.3% of the respondents said the image was about breastfeeding. Among

them, one respondent in the age group 19 to 23 who was among the 63.3% said, “The mother in the picture is breastfeeding the baby but it’s like the baby’s ears are swollen”. This respondent got the message from the pamphlet but she misunderstood the image. This respondent did not have any formal education.

Additionally, 16.7% of the respondents explained that the image shows how to carry a baby when breastfeeding. Of the 16.7%, one respondent added that the image shows the kind of love a mother should accord her baby. However, 25% of the respondents in the age group 18 years and below and 8.3% of respondents in age group 24 to 28 said that the pamphlet is about malnutrition. They said, “The pamphlet shows a child with a big head and small body so it means it’s about malnutrition in babies” and “the baby has a problem because of the big head and small body”. This also shows how the respondents lacked the skills to filter out the irrelevant information in the image thus they ended up misinterpreting the image. Additionally, 3.3% of the respondents were not sure whether the image showed a mother breastfeeding or whether she was just seated. The respondent who was expecting her first child could not make up her mind. The respondents who misinterpreted the image on the cover of the pamphlet had upper primary as their highest level of education.

The focus group discussion respondents discussed the breastfeeding pamphlet and it was clear that they understood the pamphlet. Majority of the respondents said the pamphlet was about breastfeeding, how to sit while breastfeeding and how breastfeeding the baby showed love because of the love symbol. The respondents talked about breastfeeding and its importance to the baby.

On the contrary, during the focus group discussion some respondents said the pamphlet was about malnutrition and they said that the mother and baby did not look very healthy. A respondent said, “Pamphlet shows the mother does not eat well balanced diets and that is why the baby has a big head. The baby lacks some nutrients from the breast milk”. Some respondents also said that the baby in the image was not held properly; they said, “The baby has not been carried very well. The mother is just holding the baby’s head. The mother should also look at the baby while breastfeeding”. This shows how the respondents concentrated on the irrelevant information from the shown image.

Milk expression pamphlet

The breast milk expression booklet was given to the respondents to test their interpretation of the image on the cover page. Out of the 30 respondents, 30% said the pamphlet was about how breast milk is made safe for the baby, 63.3% of the respondents said the image showed mother expressing milk for her baby and 3.3% said it was about how to handle breast milk; by either expressing it in a glass or feeding the baby directly. However, 13.3% of the respondents said they did not understand why the mother was expressing her breast milk in a glass with one of the respondents stating that it is not a good practice. One of these respondents wondered whether the woman in the image would pour out the milk after expressing it in the glass. Additionally, 6.7% of the respondents reacted to the image with questions; one of them wondered, "Why is the mother expressing breast milk? Is it bad? The baby should be breastfeeding" and the other said, "The image is about a family, I see a mother, father and a baby but I don't know whether the mother's breast has a problem". Finally, 3.3% of the respondents said they have never seen anyone express breast milk in a glass. Misinterpretation of images is common in health messages. Most of the respondents did not understand why the mother was expressing her milk and thought that it was wrong. This shows these women had not seen or heard about breast milk expression. They thought it was wrong hence their reaction. Culture as a theme emerged from this finding.

The respondents in the focus group discussions understood the breast milk expression pamphlet. The majority of the respondents agreed that the pamphlet was about expressing breast milk for a baby. The respondents added that the milk expressed was for a baby who could not breastfeed and that mothers who cannot breastfeed because of painful breasts can express the milk for the baby instead.

4.3.3 The last time respondents acted on information received about maternal health

Data from the in-depth interviews suggested that respondents had acted on maternal health information from healthcare workers: 13.3% of the respondents got information on eating healthy during pregnancy, 23.3% got information on breastfeeding, 3.3% got information on avoiding self-medication during pregnancy but seeing a doctor when not feeling well and 3.3% got information on keeping fit through exercise during pregnancy. Respondents

in the age group 18 years and below mainly mentioned health workers as the source of information they have acted on during pregnancy and after delivery.

The maternal health booklet was also a source of information that some of the respondents had acted on. Out of the 30 respondents, 13.3% got information on feeding their babies, 6.7% got information on not self-medicating during pregnancy, 3.3% got information on keeping fit during pregnancy and 3.3% got information on handling the baby like how to hold the baby during breastfeeding and how to give the baby a bath.

Information on taking iron supplements during pregnancy was mentioned by 3.3% of the respondents as emanating from mass media sources like the radio. Additionally, 10% of the mothers said they got information about handling their babies from their relatives, 6.7% got information to avoid carrying heavy loads when pregnant and to avoid eating certain types of foods from friends. One of the respondents who talked about getting information from friends said, “A colleague told me not to eat bananas because they will make my baby extremely big and I will have difficulty giving birth”. This shows how information from the wrong sources can be misguided.

However, 16.7% of the respondents could not remember ever getting information from any source. One of these respondents said, “I don’t read any booklet because I already have a timetable of what I eat at home so I don’t need the booklet to guide me”.

4.3.4 Health talks

Health talks are educational sessions held at health facilities to educate the mothers on different maternal health issues; they are held at 8 a.m. on Wednesdays at the health facilities. Of the respondents interviewed, 53.3% had attended the health talks and 46.7% of the interviewed mothers had not attended the health talks.

The interview respondents gave different reasons for not attending the health talks. The reasons were wrong timing due to the talks being too early, lack of time to attend the talks and lack of knowledge about the talks. One of the respondents said,” the talks are held too early and I come to the clinic at ten o’clock; so there is, no way I can make it in time to attend the health talks”. Another respondent said, “I have never attended the health talks

because of time. I don't have anyone to leave in the house so I rush to the clinic and back home, I don't have time". Additionally, one respondent said she did not know about the health talks and was hearing about it for the first time.

The respondents who had attended the health talks (53.3%) said they were taught about preparation for child birth; this was about buying baby clothes and getting them ready for the baby's arrival, how to save money for any emergencies during baby's delivery and getting someone reliable to take them to hospital during labour. Additionally, the mothers were taught about caring for the baby; how to give the baby a bath, how to hold a new-born baby and the kinds of food to feed the baby and about breast feeding. The health talks also entailed talks on how sexually transmitted infections (STIs) are acquired and how to avoid the infections. The different Family planning methods and when to take the baby for vaccination was also taught during the health talks.

Among the respondents who had attended the health talks 53.3% understood and were satisfied with the information they received while 46.7% of the respondents who attended health talks did not understand and were not satisfied with the information; one of them said," I was not concentrating and the doctor was too serious and boring. Moreover, it just felt funny because there were men in the audience too and the doctor was explaining about the use of condoms". This respondent experienced discomfort and embarrassment due to the set-up of the health talks. It also shows lack of consideration of gender and social norms appreciated by the respondent. She also needed some humour in the talk. The respondent was in the age group 18 years and below.

However, one of the 46.7% respondents who had not attended the health talks because she gets to the clinic when the talks are done said, "the last time I delivered a baby, I did not know I had labour pains because I was not told how it feels. I stayed home for a whole week not knowing it was time to go to the hospital. A neighbour came to my house and told me to go to the hospital by which it was too late. I delivered but the baby died after 2 days". This respondent explained that a neighbour told her that during labour she would experience some lower back pains and when she did not she opted to stay at home even though she had some pain on her lower abdomen. This respondent got the wrong

information from her neighbour resulting into her losing her baby. Of the respondents who had 4 children, 50% did not attend health talks due to lack of time and 60% of the respondents who were expecting their first child did not attend citing lack of time as the reason.

Another respondent who had not attended health talks said, "The doctor told me to get ready for delivery and look for someone to bring me to hospital as I will be due on the 20th of May. Then he told me to come back on 10th, so I don't know whether am coming to deliver or for another clinical visit on 10th of May". This patient had forgotten what the doctor had told her and on questioning why she did ask for clarification she said the doctor was in a hurry because there were other patients waiting in line. This is a clear case of how unsatisfied some of the mothers are with the information received from their doctors. This also shows poor doctor patient communication.

Additionally, the respondents in the focus group discussions said that they had attended the health talks and some said they had not attended the health talks. Some respondents said that they had attended the health talks but the sessions were very boring. These respondents were in the age group 18 years and below. They recommended for the sessions to be made livelier. However, a respondent in the age group 34 to 38 said, " the talks are not boring but perceived as boring by mothers who do not have time to sit and listen". This also shows how age group influenced the sources of information preferred by mothers in the informal settlement of Kibera. Humour is revealed as one of the qualities that respondents in age group 18 years and below look for in a communication strategy.

Majority of the respondents in the age groups 18 years and below, 19 to 23 and 24 to 29 had not attended the health talks. The respondents agreed that the health talks were held too early for most mothers to attend and the healthcare workers needed to inform the mothers about the health talks in advance. However, one respondent in age group 29 to 33 thought the health talks were just a way of passing time before the nurses got ready for work, she was shocked to hear the health talks are held weekly. Additionally, some respondents who do not come for the health talks prefer getting maternal health information from other sources. They said, "I ask my TBA all the questions I have because she is more

experienced but during delivery I will go to a hospital because I know I can get infections and the TBA cannot help me in case of emergency". This respondent cannot rely on information from any other source because she believes her traditional birth attendant is more experienced. This respondent was in the age group 19 to 23 and she did not complete her primary level of education. The literacy level of this respondent influences her preferred source of maternal health information.

Respondents in the focus group discussions were not satisfied with the information they got from the health talks but they could not ask questions because of the presence of so many people. One respondent said, "I wish they would have elaborated more. I had questions but I could not ask because we were too many people".

4.3.5 Respondents' preferences for receiving maternal health information

Out of the 30 interview respondents, 13.3% were satisfied with the way the healthcare workers were passing information to them. These respondents did not give any recommendations. However, the other respondents mentioned the following as their preferred sources of information:

1. Health talks:

When asked to recommend the best way of receiving maternal health information from healthcare workers, 40% of the respondents recommended the use of health talks. Among them the respondents who were in the age group 18 and below said, "The doctors teaching, should be lively and even tell jokes to the mothers as they teach". They need to demonstrate to us what they mean". The other respondent in the same age group suggested that the healthcare workers should demonstrate so that the mothers can understand better.

Respondents in the age group 19 to 23 (62.5%) said that during the health talks the health care workers should stick to using one language and not mixing languages as it got very confusing for them during health talks and that most mothers prefer health talks, as they are too busy to read pamphlets. The respondent who talked about using one language to give information had upper primary level of education. This respondent said, "The doctors need to use one language and not mix languages. It's very confusing". On the other hand, 60%

of the respondents, who were expecting their first child, also suggested the use of health talks.

The use of health talks to communicate maternal health information came out strongly during the focus group discussions as well. The respondents in the discussions suggested that the health talks should be humorous/lively with the teachers/healthcare workers telling jokes and being friendly. They said, “The doctors teaching, should be lively and even tell jokes to the mothers as they teach”. A respondent also said that these health talks could only work when the mothers are reminded before the talks are held because most of them forget about the talks. They also complained that the talks are held too early for most women who have to do house chores in the morning before going to the hospital. However, some respondents disagreed and felt that it was a matter of sacrifice. They said that the mothers should make a sacrifice and attend the health talks however early they are held.

2. One on one teaching with a health care worker:

Out of the 30 respondents, 23.3% suggested one on one discussion with a healthcare worker as the best way of receiving maternal information; out of the 23.3%, one respondent was in the age group 34 to 38. Only one respondent in the age group 19 to 23 suggested this method of passing information, she said, “The doctors should teach mothers one on one especially those who don’t have time like me”.

Most of the interview respondents (41.7%) who suggested one on one discussion with health workers were in the age group 24 to 28. The respondents said that this would enable them ask the doctor questions which they would not ask in a group and that one on one discussions with the doctor would save them time unlike health talks.

The focus group discussions also mentioned healthcare workers such as community health workers, nurses and doctors as sources of maternal health information. The respondents said it is easier to talk to the community health workers at home, as they would be able to ask all the questions they can without any embarrassment and this will also help mothers who miss the health talks. They said the community members feel closer to the community health workers, as they are part of the community unlike the nurses.

However, some respondents in the focus group discussions did not agree with the idea of community health workers visiting mothers at home. They said, “I don’t support CHWs coming to the houses because some of them could even be thieves or people with funny behaviours, this is Nairobi you cannot trust everyone and invite them in your home. They should call us for barazas and teach us in a group”.

3. Health prints and posters:

The use of communication materials such as posters, health prints and billboards were suggested by 10% of the interview respondents. Out of the 10%, a respondent in the age group 29 to 33 suggested the use of posters with pictures and writings in both Kiswahili and English.

In the age group 24 to 28, two respondents preferred the use of communication materials, with one respondent saying, “I prefer use of books instead of talks so that I can easily refer when am home”. The other respondent suggested the use of billboards for advertisements and the use of charts and pictures. The respondent mainly wanted a source she can refer to when at home.

Respondents in the focus group discussions also recommended the use of health prints and posters. One respondent said, “They should give us pamphlets like the one you showed us. The pamphlets can be explained in the hospital and given to the mothers to go home with as reminders of what they have been taught, in this case they don’t have to know how to read, each time they see the pictures it will remind them of what they were taught”. Additionally, the respondents said the idea of health prints would help mothers who sent other women to take their children to clinic to get maternal health information. “It would help teach the mothers who don’t have time what they miss from the hospital teachings”, they said. On the other hand, some respondents were against the use of health prints; they said use of health prints and posters would not help the mothers who do not like reading. These respondents suggested use of health prints to give information away from the hospital and to aid the mothers who do not have time to take their children for postnatal care.

4. Meetings/ seminars in the village:

Holding meetings in the villages was recommended as one way of passing maternal health information by 10% of the interview respondents. They said this would be a good way to reach young girls, as most of them do not have ways of receiving maternal health information. This was recommended by a respondent in the age group 34 to 38. Additionally, a respondent in the age group 19 to 23 said that most mothers could be targeted by holding meetings/ seminars in the villages to teach them and during these meetings women can also have talks among themselves.

The focus group discussions also concluded that the mothers would appreciate being called for meetings/seminars in the village. It came out clearly from the discussions that the mothers in Kibera would prefer a central office located within the village where they could access maternal health information anytime they need information. They said, “I suggest that a central office where women can seek maternal information any time they are in need be opened in the villages”.

4.3.6 Influence on choice of health facility to deliver

The study sought to know what influences the choice of health facilities the mothers in Kibera choose for deliver. As a whole, 36.7% of the respondents chose the health facility because of the level of respect and care they would receive at that health facility. One respondent said, “My friends say the doctors talk to mothers respectfully at AMREF” whereas 13.3% of the respondents had no control over the healthcare facility they went to for delivery. One of these respondents said, “My delivery was abrupt and I couldn’t make it to the hospital so I gave birth in a toilet”. Another respondent mentioned that she had no control because she was transfer to another facility due to emergency procedures such as caesarean section.

Additionally, relatives influenced the respondents, who were in the age group 18 years and below (50%). They said, “My mother told me I would be treated respectfully at AMREF health facility”, they were also influenced by distance to the place of residence (25%) and the level of care and respect they would receive at a health facility (50%).

Age group 19 to 23 were influenced by the health facilities ability to handle emergencies like caesarean section deliveries (12.5%), distance from home (25%), free delivery services

and their familiarity with the hospital as they were already going for antenatal clinic at the same health facility (25%). These respondents said, “AMREF is free and they treat people with respect”, and “I have had all my children in AMREF”. However, one respondent (12.5%) in this age group said she did not have control over where she delivered, as she could not make it to the hospital; she delivered in a toilet.

Respondents’ in the age group 24 to 28 choice of health facility was dependent on the level of respect and care they got from the staff of the health facility(33.3%) and 16.7% did not have control of the health facility as they were referred to other hospitals. However, 50% of respondents in the age group 34 to 38 said the choice of the health facility was because the staff were respectful and friendly and 25% of respondent went ahead to say that they will go to the same health facility they had all their children. This respondent has had 4 children. On the contrary, 40% of the respondents who were expecting their first child chose to go to a health facility because of the level of respect they would get at that facility and 20% chose a clinic due to familiarity because they were already going for antenatal care at the same facility.

The main influencing factors mentioned by respondents from the focus group discussions were factors like distance from the health facilities; the respondents mainly went to health facilities that were closer to their residential homes. The respondents also preferred delivering in hospitals they were familiar with either because they had delivered a baby at the health facility before or because they had been attending antenatal clinic at the same facility. The level of respect and care received at a health facility also played a major role when the mothers were choosing which hospital to deliver a baby. However, some respondents said they did not have a choice, as they could not tell where the labour pains would find them. They said they would go to the nearest hospital at that time. Additionally, some respondents also said they did not have a choice of their place of birth because they were referred to other hospitals due to complications that could not be handled at the hospitals they attended.

4.4 Interviews from healthcare workers:

4.4.1 Challenges experienced by healthcare workers when communicating maternal health information

The healthcare workers mentioned language barrier as a major challenge when communicating with the mothers. Out of the 6 healthcare workers interviewed, 5 of them said language barrier was a major challenge. One health worker said, “Language barrier is a major challenge, it is difficult to translate some medical terminologies without losing meaning”. Rudeness from the mothers was another challenge mentioned by 2 of the healthcare workers and 2 healthcare workers also complained of the patients not having the patience and time to sit and listen to any explanations. One healthcare worker said, “some are in a hurry and don’t have the time for any explanations or teachings and therefore it becomes challenging to start having a talk about anything”. The other challenges mentioned by the healthcare workers included education level of the patients (4 out of 6) and some patients did not like young healthcare workers (1 out of 6). Additionally, some of the mothers do not get support from their spouses 91 out of 6) and dealing with disabled mothers like deaf mothers who require an interpreter (2 out of 6).

4.4.2 Challenges faced by healthcare workers when using maternal health communication materials

Majority of the mothers do not read the mother and child health booklet. One out of the 3 health care workers who said the mothers don’t read the booklet said, “The women view the ANC booklet as a booklet meant to be used by the health care providers and not them. The say the booklet is for the doctors. Majority of the women do not read the booklet. They just open it when they come to the clinic”. This shows low health literacy from the mothers in Kibera. They do not know how to use the materials given them.

Additionally, some mothers do not know why they are given materials like pamphlets. One health care worker said, “Sometimes I give them pamphlets to take home but at the end of the session the mother folds the pamphlet and gives it back or leaves it in the office”.

A health care worker complained that the education level of the mothers was another challenge they faced when using the mother and child health booklet. She said, “Education

level of the patient is a challenge, some have gone up to class 3 and therefore they have difficulty in understanding information which may be considered basic to others". Figure 29 shows the challenges faced by health workers when communicating maternal health information to the mothers.

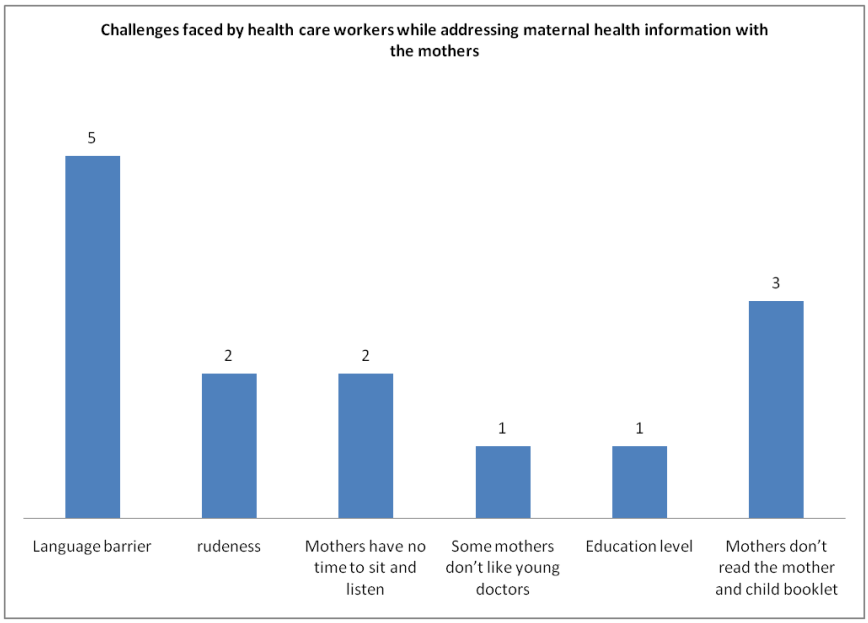

Figure 29: Challenges faced by health workers

4.4.3 How healthcare workers tell whether patients understand the information given to them

The healthcare workers said they confirm whether the mothers understand the information passed to them by asking questions and asking them to demonstrate what they understood to the other mothers. This was mentioned by 2 of the healthcare workers.

One healthcare worker said, "Their understanding is shown when the mothers stop coming to the child welfare clinic after 9 months while it is clearly stated in the booklet that they need to attend child welfare clinic until the age of 5 years". This shows that the mothers do not understand the health booklets given them.

"When the mothers ask questions then it means they understand what they are taught". This is how one healthcare worker could tell how much the patients understood. One way was also by making the patients participate by giving their opinions during the health talk. One

healthcare worker said that when the patients feel like their opinions matter to the teacher they participate and understand more.

Out of the 6 healthcare workers, 3 of them felt that the mothers understood information during health talks because the mothers asked them questions. It was also mentioned that the mothers were given pamphlets in different languages like Kiswahili and English to ensure they understood. This was mentioned by 2 healthcare workers.

4.4.4 Design of maternal health material

The study sought to know whether the health care workers were involved in the design of the communication materials they use when giving maternal health information to the mothers. Out of the 6 healthcare workers, 5 had not been contacted to give any input on the design of any maternal health communication material. However, one healthcare worker was contacted and she said, “I was contacted 4 years ago. They asked for suggestions and I told them they should write the book in Kiswahili for the mothers who don’t understand English but have never heard from them again”. This healthcare worker was not sure whether the people who contacted her about this information were from the ministry of health. This shows inadequacy in the design of the materials. Feedback from the users is not used in the design of the maternal health communication materials used in Kibera.

4.4.5 Satisfaction of the healthcare workers with the maternal health communication materials

Some of the healthcare workers were satisfied with the content on the mother and child health booklet while others were not. Out of the 6 healthcare workers, 4 health care workers felt the content in the booklet was satisfactory while 2 felt that the content was not satisfactory. The 4 healthcare workers were satisfied with the content but felt that the health materials were not enough to reach the target population; most of the mothers did not have the mother and child health booklet because they were not in circulation. The healthcare workers also complained that they were overwhelmed with work and did not have time to explain to the mothers the importance of the booklet and how it should be used. Additionally, one healthcare worker suggested that the records department be trained on how to sensitize the mothers on the use of the mother and child health booklet as they

give them the booklet. She said, “The women don’t own the booklets. The records department should be trained to reach the mothers on how to use the health booklets and how useful it is for them before giving out the booklets”. On the other hand, one health worker who was satisfied with the health booklet said, “This book is better than the card and it can be used for up to 2 kids unlike the card. It does not require the mother to walk with different cards all the time”.

The 2 healthcare workers who were not satisfied with the content of the booklet said that family planning bit of the booklet was not very clear and therefore needed more information, the words in the booklet should be reduced to major points and a Kiswahili version of the booklet be made available.

4.5 SOCIAL NETWORKS OF THE WOMEN

4.5.1 Mobile phones

Mobile phone is one medium of passing information. The respondents were asked whether they owned mobile phones. Out of the 30 respondents, 93.3% owned mobile phones, which they used to make and receive calls, chat, receive and send money and surf the internet. However, 6.7% of the respondents did not own mobile phones.

Among the respondents who owned mobile phones, 100% of the respondents in the age group 18 years and below all had mobile phones and they all loved using their mobile phones for chatting. The respondents in age group 19 to 23 (87.5%) used their mobile phones for calls and texts mostly; 25% of the respondents in this age group used their phones to access social media sites such as Facebook. A respondent (8.3%) in the age group 24 to 28 said that she used her phone mostly for calling and did not like texting at all. Age group 34 to 38 respondents (100%) mainly used their phones for calls. Only one respondent (25%) in this age group said she used her phone for texting.

The healthcare workers were asked about their thought on transmitting maternal health information through mobile phones to the mothers in Kibera informal settlement. Out of the 6 healthcare workers, 4 felt that the use of mobile phones to transmit information would work in Kibera. One healthcare worker said that mobile phones would transmit information

successfully as they were already doing that at Beyond Zero health facility; texts are sent to mothers to call them for outreaches and in return, they come out in large numbers for these outreaches. She said the information passed through the phones would remind mothers about the immunization dates, when they are due for check-up and update the mothers who do not come for antenatal clinic about their health and the unborn baby's health. A healthcare worker said, "Some mothers come for the ANC booklet because it's needed when they come for delivery and they don't come back to the hospital again until delivery time. Text messages can be very useful to such women; to give them updates about their health and the baby's health". She added that most of the mothers in Kibera could access a mobile phone at least once a day making this intervention very viable.

However, 2 out of the 6 healthcare workers said the use of mobile phones would not work in Kibera. They said this intervention would not work because some women cannot text and most of them would ignore the messages. One healthcare worker said the phone messages would not make a difference because she calls the women to come to the hospital but they do not show up. Moreover, this health worker said that one on one interaction with the mothers make them feel more at ease.

From the focus group discussions, the respondents said they used mobile phone to make and receive phone calls, send and receive texts, to listen to the radio and to access information from the internet. From the discussions, the respondents who were 18 years and below mainly used their mobile phones to chat with friends and family. The respondents also said their phones were on throughout the day unless when the phone was charging.

4.5.2 Televisions

The respondents who could access a television either owned one or watched from the neighbours' houses; of the interviewed respondents, 73.3% owned television sets in their houses and 6.7% watched from the neighbours' house. However, 20% of the respondents did not own televisions.

The respondents who could access TV liked to watch programmes between 2pm and 10pm; these were 33.3% of the respondents whereas, 20% watched TV anytime they were free.

Additionally, 10% of the respondents watched TV during morning hours; from 10 am and 6.7% of the respondents rarely watched TV. A respondent who rarely watched TV said that it was because she has an eye problem.

One respondent who has TV but rarely watches was in the age group 34 to 38. The respondents (25%) in this age group mainly watched television in the evenings as from 7pm. These respondents preferred to watch news and local Kenyan programmes like papa Shirandula.

Respondents who were 18 years and below all had access to a television despite the fact that 50% of them did not own televisions; they watched from the neighbours' houses. This age group also watched television anytime they were free. They love watching channels like citizen, KTN, K24 and Zee world. Their favourite programmes were Mexican soap operas and African/Nigerian movies.

In the age group 19 to 23, only one respondent (14.3%) watched television anytime she was free the rest (85.7%) watched TV in the evenings. The respondents in this age group preferred watching channels like citizen TV, N.C.A and U.T.V. Their favourite programmes were Mexican soap operas, African /Nigerian movies and news.

Additionally, 66.7% of the respondents in the age group 24 to 28 mainly watch TV in the evenings from 7pm. However, 8.3% of the respondents watch TV in the morning and 8.3% watches TV anytime of the day. One respondent in this age group said she loves watching a channel on GO TV known as health channel. This is where she gets most of her information on health matters. The respondents in this age group mainly love watching Mexican soap operas and African/Nigerian movies. On the other hand, 50% of the respondents in the age group 29 to 33 own televisions and 50% of the respondents who own television in this age group said they watch TV in the evenings from 7pm and love watching Mexican soap operas and African/Nigerian movies. Of the respondents expecting their first baby, 75% watched TV in the evenings and 25% watched TV anytime and 50% of the respondents who had 2 children watched TV in the evenings and all the respondents who had 4 children did not like watching TV. The other respondent who had 4 children did

not own a TV. Additionally, all (100%) of the respondents who had 3 children did not like watching TV because of eye problems.

Respondents in the focus group discussions discussed about television; they talked about the television programmes they watched and about the times of the day, they would watch television. The respondents who did not have television said they had not bought a digital TV decoder and the others said they did not have television but watched at the mother in-laws house. However, the respondents who had television watched TV in the evenings (from 6pm). Other respondents said they watched TV in the morning and evening (from 10am and from 6pm) and other respondents watched television anytime they were free. Most respondents who watched TV anytime were free and were in the age groups 18 years and below and 19 to 23. The respondents in the focus group discussion watched Citizen TV, KTN and QTV. They mainly watched local Kenyan programmes, Nigerian movies, Mexican soap operas and news.

Additionally, healthcare workers were asked about their take on the use of televisions to transmit maternal health information. The 4 healthcare workers who said this mode of transmitting information would work in Kibera said the mothers could be enlightened on the use of the mother and child health booklet using this method. Additionally, they said that most households in Kibera own a television set and thus the information would reach most of the mothers. On the contrary, 2 healthcare workers thought that this mode of transmitting maternal health information would not work because the households that do not own televisions in Kibera would not be reached.

4.5.3 Radios

Majority of the respondents (80%) owned radios, with 10% of them using their mobile phone radios. However, 20% did not own radios at all. The respondents who owned radios listened to these radio stations: Radio Jambo, Radio Maisha, Classic FM, Milele FM, vernacular radio stations (Ramogi and adhiani FM) and Pamoja FM). The most popular radio stations were Radio Jambo with 26.7% of the respondents listening to it and the vernacular radio stations with 10% of the respondents listening to the channels.

The respondents (50%) in the age group 18 and below mostly listened to their mobile phone radios mainly preferring radio programmes in the morning. They preferred listening to music on classic FM. The respondents in age group 19 to 23 (37.5%) mainly listened to Radio Jambo; a programme called Patanisho. This radio programme is about fixing marital relationships. The programme is aired early morning from around 6am.

Age group 24 to 28 mainly listened to radio Jambo (33.3%) and Milele FM radio stations (16.7%). They listen to these programmes early morning and some respondents (33.3%) listen to the radio the whole day. The respondents in the age group 29 to 33 (50%) mainly listen to Radio Jambo from around 6am. One of the respondents (25%) in the age group 34 to 38 listens to health talks on Pamoja Radio. However, a majority of respondents in this age group listen to Radio Jambo- Patanisho.

Additionally, of the women who had 4 children 50% listened to the radio anytime and 50% listened to the radio in the morning and 60% of the women who were expecting their first child listened to radio in the morning. Additionally, 46.7% of the women who had one child listened to radio in the morning and 33.3 % of women who had 2 children listed to radio in the morning. No relationship existed between the number of children and the time the respondents listened to the radio.

The healthcare workers gave their opinion on the use of Radios to transmit maternal health information. Out of the 6 healthcare workers, 5 felt that radios would transmit maternal health information successfully in Kibera. They said use of radios would transmit information in different languages. One healthcare worker felt that this method of communication would not work especially for the families who do not own radios. She went ahead and suggested door-to-door outreaches and health talks in hospitals to reach the mothers.

The respondents in the focus group discussions who owned radios said that they listened to Radio Jambo; their favourite was a radio programme known as Patanisho. These respondents listened to the radio early in the morning (from 6am). However, it was noted that respondents in the age groups 18 years and below and 19 to 23 said they rarely listened

to radio. These respondents said that they listened to radio only when bored; they mostly listen to music through their phone radios.

4.6 SUMMARY OF KEY FINDINGS

This section summarises the key findings from the study. The section is divided into three major categories: sources of maternal health information, efficacy of the available maternal health communication materials and the social networks of the mothers in Kibera informal settlement.

Sources of maternal health information

The sources of information from the in-depth interviews were friends, relatives, healthcare workers, multimedia sources, women who have had children and from school. These sources were further confirmed from the focus group discussions. Additionally, the respondents in the focus group discussions mentioned traditional birth attendants, health prints, health posters and online information as other sources of information. However, healthcare workers added that women support groups were a rising source of information for women in Kibera informal settlement. Healthcare workers also mentioned flip charts, pamphlet and visual aids as the sources of materials they used to communicate maternal health information to mothers. Other healthcare workers also used "patient-teachers" during health talks to demonstrate to the other mothers.

Mothers in the age group 34 to 38 preferred getting maternal health information from older women who have children and from healthcare workers. This was a complete contrast from respondents in the age group 18 years and below who got information from friends, relatives and multimedia sources like television and radio. Additionally, 75% of respondents from this age group (18 years and below) did not attend health talks because they thought the talks were boring and the hosting healthcare workers were too serious whereas 75% of the respondents in the age group 34 to 38 attended health talks. The respondents in the age group 34 to 38 felt that mothers should create time and attend health talks because they are important.

There was no significant relationship between the sources of maternal health information and number of children the women had. The occupation of the women also had no impact on the sources of maternal health information sought by the mothers.

Efficacy of maternal health communication materials

The respondents who read the mother and child health booklet complained about the medical jargon in the booklet. Most of them found the medical jargon to be an impediment to understanding the information in the booklet. They also complained about the graphs in the booklet saying they could not understand them.

Moreover, the healthcare workers felt that the mother and child booklet should be shortened to include major points only and a Kiswahili version of the book be made available for mothers who do not understand English. Since most mothers did not know how to use the booklet, the healthcare workers suggested that the records department where the booklets originate from be trained on how to sensitize the mothers on the use of the mother and child booklet. There is a shortage of information materials such as the mother and child health booklet and so some mothers are given cards (see figure 18). The cards as shown in figure 18 are not durable and tear a part in a short time. These cards also do not give any information that can aid the mother during her pregnancy, for example unlike the mother and child health booklet; the cards do not show the kinds of food the mother should eat during pregnancy.

Some of the respondents misinterpreted the images on the cover of the provided health materials. These respondents concluded that the breastfeeding pamphlet was about malnutrition in children. This was because of misinterpreting the graphical presentations. They said the baby in the image had a bigger head compared to the rest of the body, this therefore meant that the baby was suffering from malnutrition.

The mother and child health booklet replaced the numerous maternity health cards that were given to women before. The health booklet is therefore used throughout antenatal and postnatal care but some of the respondents thought they would get other cards after pregnancy. This shows that the mothers did not know how to use the booklet.

The findings also show that the mothers did not attend health talks, which are major source of information regarding maternal health. The main reason given for this was that the health talks are held too early for most women to attend. The respondents mainly in the age group 18 years and below complained that the health talks are boring and the healthcare workers who host the talks are too serious. For this reason, these respondents avoided attending these health talks. Some respondents also complained of the talks being embarrassing especially when there are men in the audience; during discussions like family planning. Some of the respondents with questions during the health talk also tended to shy away from asking because of the large audience.

Healthcare workers complained about the level of education of the mothers being a challenge when using the health materials like the mother and child health booklet. Additionally, most mothers did not understand why they are given mother and child health booklet; most of them thought the book is meant for the doctor's records and not for them to obtain maternal health information.

The sources of information used by mothers in Kibera informal settlement are not efficient and because of this one respondent lost a baby immediately after delivery. This respondent relied on information from a wrong source (friend). As a result, she went to the hospital when it was too late.

Social networks of women in Kibera

The women in Kibera own mobile phones, which are on throughout the day. Those who do not own mobile phones can access a phone at least once a day. The mobile phones are used to make and receive calls, receive and send money, send and receive text messages and surf the internet. The respondents in the age group 18 years and below used their mobile phones mainly to chat with friends and relatives.

Health care workers gave suggestions on the use of mobile phones to reach women and send them reminders to come to the health facility for health talks, immunizations and

check-up. On the contrary, some health workers felt that use of mobile phones would not work as most of the mothers would ignore the text messages.

Televisions and radios are a major source of entertainment for the mothers in Kibera informal settlement. The respondents in Kibera own televisions and the ones who do not own televisions watch from their neighbours houses. Favourite TV programmes mentioned by the respondents are African movies (Nigerian movies), Kenyan local programmes, Mexican soap operas and news. The favourite radio channel was Radio Jambo where most mothers love listening to a radio programme called Patanisho every morning.

Additionally, healthcare workers felt that most of the residents in Kibera who owned televisions would benefit from maternal health information transmitted via television. They also said that use of radios to transmit maternal health information would enable the information to reach the mothers in different languages.

CHAPTER FIVE

DISCUSSIONS

5.0 INTRODUCTION

The following chapter discusses the research findings in regards to the literature review. The findings are also discussed as per the research questions. The study investigated the maternal health information sources of the women in the informal settlement of Kibera. The chapter further discusses the efficiency of the available information materials on maternal health and the social networks of the women in Kibera.

5.1 SOURCES OF INFORMATION

When planning a communication intervention it is important to know the people who will benefit directly from the information. These are the primary audience and this is the group whose behaviour is to be changed by the information. It is important to carry out research in order to find out the primary audience and their behaviour determined (Kreps & Maibach, 2008). To this regard, the study sought to know the ages of the respondents and their level of education. The respondents were grouped into age groups as shown in table 3. The ages of the respondents directly affected the choice of maternal information sources as discussed below:

The findings show that majority of the women who were interviewed were in the age group 24 to 28 (40%), women in the age group 19 to 23 followed this by 26.7%. Literature from Kenya Demographic and Health Survey (2014), states that postnatal care and antenatal care from a skilled provider is highest among women younger than age 35. (Kenya Demographic and Health Survey, 2014). This explains why women below the age of 35 were the majority participants in the study. They are most likely to be found at a healthcare facility, seeking antenatal and postnatal care because they are of peak childbearing age.

Most of the respondent's mentioned friends and relatives as their sources of information regarding maternal health; 43.3% of the respondents mentioned friends and 43.3%

mentioned relatives (see figure 14). Mukong and Burns, (2015) state that most people in developing countries acquire information through informal sources like relatives and friends. Informal sources of information are revealed as a theme in the information seeking behaviour of the women in the informal urban settlement of Kibera. Cultural values and norms also inform the health seeking behaviour of people in developing countries; this is evident from the sources such as traditional birth attendants mentioned by the respondents in the focus group discussions. They further state that the awareness of a person depends on the behaviour or knowledge his or her friends have; this shows that most of the mothers in the informal settlement of Kibera are influenced by their surroundings, which include friends and relatives (Mukong & Burns, 2015).

The findings indicate a significant association between age and the sources of maternal health information. For instance, mothers in the age group 34 to 38 (50%) preferred getting maternal health information from older women who have children and (75%) from healthcare workers. In the converse, 75% of mothers in the age group 18 years and below mainly got maternal health information from mass media sources like television and radio and 50% got information from relatives mainly mothers. Anonymity, privacy and gender-based socialization are themes seen from this finding. The adolescents (11 to 19 years) seek health information from sources such as television and radio because of the anonymity associated with the sources and because they can access this information, wherever they are and thus do not have to visit a doctor (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005). Other researchers have hypothesized that media may function as a 'super-peer' for adolescents to emulate in sexual situations and for this reason adolescents frequently cite media as a primary source of information (Scull, Malik, & Kupersmidt, 2014). Similarly, a study done in South Nyanza, Kenya revealed that adolescents mainly seek reproductive health information from their mothers due to gender-based socialization; this explains why they prefer to seek information from their mothers and not from their brothers or fathers (Obare, Agwanda, & Magadi , 2006). Researchers have also noted that adolescents' help seeking behaviour is observed from adults around them; they tend to adopt the way their parents cope with situations and learn from them. Additionally, adolescents who have had negative experiences such as betrayal of trust, offering advice instead of listening or rejection when seeking help from certain sources will tend to avoid such sources of help

because of mistrust. How long adolescents have to wait for a service is also a factor affecting their help seeking behaviour. This is affirmed by a study in Zambia where young people preferred seeking Sexually Transmitted Infection treatment from traditional healers and private health practitioners as opposed to public clinics. They preferred these sources because they were faster and more private. The results of this study are also similar to a study done in the United States, which revealed that Hispanic young women sought information on sensitive issues such as sexual reproductive health from informal sources (Barker, 2007).

Additionally, the findings indicate that 75% of the respondents in the age group 18 years and below did not attend the health talks held at the health facilities; they said the talks were boring and the healthcare workers were too serious. The themes realised from this finding were humour and sensitivity to adolescents needs. As explained by Newton, (2000) medical practitioners do not understand and are not sensitive to adolescents' needs; they do not know how to talk to them. This has been a major barrier to the use of existing health services by the adolescents (Barker, 2007). Therefore, people who work with the youth should understand the needs and strengths of the adolescents when designing their programmes (Mc Neely & Blanchard, 2010). On the contrary, majority (75%) of the older respondents in this study (age group 34 to 38) attended health talks and felt they were very informative. This could be explained by the fact that individuals over 35 years of age, have a better amount of confidence in person(s) with whom they are able to deeply discuss their health face to face as opposed to a non-living source, which they have to manipulate, such as the television or radio (Chaudhuri, Le, White, Thompson, & Demiris, 2013).

According to Simkhada et al, (2008) the level of education of a woman and her knowledge about the significance of pregnancy care and awareness of where to obtain them plays a role in the uptake of maternal health services. The relationship between education and use of maternal healthcare services is partially attributable to the fact that formal schooling exposes women to information about reproductive health and pregnancy care. Additionally, education enhances self-efficacy in women and it enhances their decisions on safe motherhood and use of contraception (UNDP, 2011). Majority (60%) of the respondents had the highest level of education attained in this study as upper primary school. These

respondents mostly received maternal health information from friends, relatives, traditional birth attendants and from older women who had had children. This clearly shows how the level of education plays a role in their health information seeking behaviour. Additionally, these respondents had health booklets given at the hospital but could not read them citing their level of education as the reason. One of the respondents said, "I have never read it. My husband is the one who reads it because he can understand what is written. I leave it on the table for him to read. Then he tells me whether I have added weight or not and what I need to eat. I only went up to class 8". Barker, (2007) states that persons with higher levels of education are more prone to use formal health services as opposed to persons with lower levels of education; 80% of the respondents who had completed the secondary level of education acted on information received from healthcare workers.

The findings also indicated that 8% of the married women went for antenatal/postnatal care because they were asked to by their husbands. This is proven by the fact that the role of husbands in decision making concerning women's use of prenatal and delivery services has been identified to influence women's health seeking behaviour. Therefore, when the husband believes that antenatal care is important he will encourage/ influence the wife's utilization of care (Lubbock & Stephenson, 2008). Marriage therefore plays a role in the information seeking behaviour of women in the informal urban settlements.

Health care workers use visual aids, flipcharts and booklets that have pictorial representations when communicating with the mothers on maternal health. Visual aids help with communication with non-literate persons. A study showed that use of pictographs improved the recollection of spoken health information by 71% among literate persons and related results were realised with low-literate persons. Cartoon graphics also improve the understanding and agreement with health communication in most studies (williams, Davis, Parker, & Weiss, 2002).

5.2 EFFICACY OF MATERNAL HEALTH COMMUNICATION MATERIALS

Effective health communication means transmitting messages in a way that enhances the mothers' ability to maintain their own health, to comprehend the threats they face and how to control them and to react to treatment as necessary (Suggs, et al, 2015).

From the findings, the sources of information mainly used by the mothers in Kibera informal settlement are from informal sources such as friends, relatives, traditional birth attendants and from women who have had children. However, healthcare workers stated that the sources of information they use to communicate to mothers in Kibera include flipcharts, mother and child booklet, pamphlets and visual aids. The discord between the sources of information mentioned by the healthcare workers and the patients (mothers in Kibera/respondents) show that the information sources used by the healthcare workers are neither preferred nor understood by the patients. This also showed poor use of communication materials by the healthcare workers. An explanation to this could be because doctors may find it hard to identify patients with limited health literacy because such patients may not recognize they have a problem and some of them may hide it due to shame. Such patients are revealed to compensate on their reading skills by relying on their listening skills (Schloman, 2004). Therefore such patients may not recognise communication materials like the health booklets, pamphlets and flip charts where they have to utilize their reading skills. Healthcare workers should therefore be on the lookout for such patients and thoroughly examine their health literacy levels according to Schloman, (2004) by taking note of a surrogate reader accompanying the patient, watching out for vision or hearing problems, looking at incompletely filled out forms with only the name of patient provided. This will enable the doctor know how to communicate to the patient effectively.

Furthermore, 3.3% of the respondents complained about the medical jargon and the graphical representations in the maternal health booklet. These respondents said that they could not understand some of the information in the mother and child health booklet because of the medical terms used in the booklet. The respondents had incomplete secondary level of education. The medical jargon was an impediment to the understanding of the maternal health information relayed to the mothers. This can be explained by the fact that written patient education pamphlets are rendered useless by the lack of knowledge of medical terms by the patients who use them. Studies show that majority of ordinary patient education materials are written at levels surpassing the patients' literacy levels. Insufficient comprehension of health vocabulary, limited health knowledge and impaired ability to

assimilate new information also affects low literate patients when communicating with healthcare providers (williams, Davis, Parker, & Weiss, 2002).

Many patients have a difficulty in understanding what their physicians tell them. This is evident in the fact that most patients are able to recall 50% or less of the information given to them by their physicians once they leave the hospital. This manifestation is popular with patients that lack an understanding of the common medical terms and written health materials. The use of medical terms combined with patient's limited health vocabulary has resulted in inadequate and confusing communication in healthcare (williams, Davis, Parker, & Weiss, 2002). One of the respondents said, "The doctor told me to get ready for delivery and look for someone to bring me to hospital as I will be due on the 20th of May. Then he told me to come back on 10th, so I don't know whether am coming to deliver or for another clinical visit on 10th". This patient had forgotten what the doctor had told her and on questioning why she did not ask for clarification she said the doctor was in a hurry because there were other patients waiting in line. This is a clear case of how unsatisfied some of the mothers are with the information received from their doctors. This is a case of poor doctor- patient communication. A trusting doctor-patient relationship is established during history taking or during discussions about management plan and this in turn leads to appropriate information exchange thus leading to minimized complaints against the doctors by the patients (Narenjiha, Haghighat , Bahaddor , Shajari , & Jameie, 2012). Furthermore, patients report that many of their informational and emotional needs are not met during doctor visits; King and Hoppe, (2013) result this to lack of patient centred communication. A review of literature done by King and Hope showed relationships between patient understanding, recall and adherence to therapy and the physician/doctor communication behaviour. Adequate physician communication nurtures the relationship and gathers information between the doctor and the patient, it enables the physician to provide information, make decisions and respond to the emotional needs of the patients. The review suggested that for patients to understand and recall information from doctors, the communication between the patient and doctor should be uncomplicated, specific, minimize jargon, be repetitive and check patient understanding (King & Hoppe, 2013). This could also be attributed to health illiteracy; according to Kickbusch and Maag, (2006)

health literacy is the ability to make sound health decisions in everyday life- at the workplace, at home. He describes this as the ability to seek out information and take responsibility (Pleasant & Kuruvilla, 2008).

The healthcare workers suggested that a Kiswahili version of the mother and child booklet be availed to mothers who do not understand English. The (5 out of 6) health workers considered language as a major barrier to health communication with the patients. The suggestion by the health workers is supported by literature, which states that health messages should be issued in multiple languages and formats (CDC, nd). In agreement with this, healthy people magazine (2010) states that people need to have information in a language they can understand. Presentation of basic health facts should be in ways that people who need the information can understand (Kreps & Maibach, 2008). Similarly, a study done in the United States indicated that 22.3 million American have limited English proficiency, 49.6 million Americans speak a language other than English. The journal goes on to discuss how a Spanish-speaking individual was misdiagnosed because of language barrier leading to the patient suffering a raptured artery (Flores, 2006). This shows how language barrier has detrimental effects in healthcare communication in both developed and developing countries.

One respondent said, “They should give us pamphlets like the one you showed us. The pamphlets can be explained in the hospital and given to the mothers to go home with as reminders of what they have been taught. In this case they don’t have to know how to read, each time they see the pictures it will remind them of what they were taught at the hospital”. The pamphlets showed to the women had pictures as shown in figure 19 and 20. Michielutte et al researched on the effects of pictures on women’s understanding of health information, his study showed that low literacy adults would benefit more than high literacy adults would from the use of pictures in health education materials. Use of animated cartoons and pictures can help patients recall spoken information from doctors (Houts, Doak, Doak, & Loscalzo, 2006).

A photograph is not always ideal. It may be difficult for a person to read two-dimensional information such as in a photograph. This is because one cannot move about in it both to

observe invariant shapes, textures and patterns and to filter out irrelevant information (Barry, 1997).This becomes an issue for a target audience who are not socialised to decipher photographs. Use of the simplest drawing and photographs will help viewers with low literacy skills to understand the intended messages without being distracted by irrelevant details. This can be done by the use of photorealistic pictures using whole body images as reference for body parts as opposed to using abstract symbols (Houts, Doak, Doak, & Loscalzo, 2006). For this reason, some of the respondents misinterpreted the images shown on the cover of the health materials presented to them during the interviews. Some of the respondents said the breastfeeding pamphlet shown in figure 19 was about malnutrition, "The pamphlet shows a child with a big head and small body so it means it's about malnutrition in babies" and "the baby has a problem because of the big head and small body". These respondents lacked the skill to filter out the irrelevant information from the shown image. They therefore concentrated on the irrelevant information on the image thus missing the communication that was being passed by the pamphlet.

Cultural preferences and practices of diverse communities should also be reflected in the health messages. Culture affects how people communicate, understand and respond to health information (CDC, nd). An individual's culture also affects his/her perception of the world thus interfering with the effectiveness of health communication (Schyve, 2007). When the respondents were shown the milk expression pamphlet, most of them (26.7%) were in shock because they had neither seen nor heard about breast milk expression before. One respondent wondered whether the woman in the image would pour out the milk after expressing it in the glass. Additionally, another respondent said, "Why is the mother expressing breast milk? Is it bad? The baby should be breastfeeding!" With the reaction, the respondents had about the breastfeeding pamphlet, it would only mean they did not understand about breast milk expression and therefore giving them such a pamphlet would be rendered ineffective due to cultural preferences. The respondents felt it was a strange practice because they could not relate to it. Since pictures can be interpreted in a number of ways it is recommended that, a caption should accompany the picture for guidance on explaining the intended meaning of the picture. Without guidance, viewers may develop

their own interpretations of the pictures, which may be different from those intended by the authors (Houts, Doak, Doak, & Loscalzo, 2006).

The respondents did not know how to use the mother and child health booklets given them. Some of them did not know the booklet was for their use as well as the doctors' use. These respondents said they thought the book was meant for the doctors' records and not for them to obtain maternal health information. This shows that the mothers in Kibera are not health literate and therefore they cannot understand basic health information. Health literacy is a patient's ability to attain, process and comprehend basic health information and services needed to make appropriate health decisions (williams, Davis, Parker, & Weiss, 2002). Additionally, one of the healthcare workers stated that the fact that the mothers stop attending postnatal care at the 9^{th} month showed their lack of understanding of the mother and child health booklet. They said that it is clearly stated in the booklet that postnatal care should continue until the age of 5 years.

However, 20% of the respondents who were expecting their first babies went for antenatal care because they thought time was running out and thus it was too late to go for antenatal care. These respondents started their antenatal care late. The results from a WHO randomised trial showed that there should be at least four antenatal care visits during pregnancy with the first visit during the first trimester (Finlayson & Downe, 2013). This shows that these respondents were too late to start their antenatal care visits. A study done in Uganda at Mulago hospital also showed that women did not know the right time to start antenatal care (Kisuule, et al., 2013). This shows lack of health literacy from the women in Kibera.

One respondent who lost a baby due to inefficient information also shows lack of efficiency in the sources of maternal health information used by women in Kibera. This respondent relied on information from a wrong source (friend). As a result, she went to the hospital when it was too late. "The last time I delivered a baby, I did not know I had labour pains because I was not told how it feels. I stayed home for a whole week not knowing it was time to go to the hospital. A neighbour came to my house and told me to go to the hospital immediately but it was too late. I delivered but the baby died after 2 days". Communication between physicians and patients can be problematic due to lack of

understanding from the patients. Lack of understanding may be because of the physicians urge to communicate clearly and as a result using technical terminology because of precision, familiarity and due to lack of equivalent non-technical terms. The physicians also give too much information for the patients to process. Additionally, patients with well-developed language skills may also find it difficult to understand some medical information because they are unfamiliar with medical terminology (Houts, Doak, Doak, & Loscalzo, 2006).

Feelings of discomfort and embarrassment when using a source of information, shows lack of empathy in the design of that communication intervention. Furthermore, designing a communication intervention that does not factor in the needs of the users such as their availability of time to use the proposed design makes the design lack empathy for its users. Norman, (2014) states that the end user should be part of the design to ensure that their understanding, trust and comfort are catered for in the design. A gender guide to reproductive health publications also states that it is important to identify the audience by finding out details such as the kind of work they do, their location, education level, social and gender roles they have (Kols, 2007). Inquiring these details will help the designer to know the user needs and design an intervention that has these needs in mind. The respondents complained about the health talks being too early for them to attend; for this reason, some of the respondents (46.7%) did not attend the health talks. Additionally, one respondent who attended the health talk said," I was not concentrating and the doctor was too serious and boring. Moreover, it just felt funny because there were men in the audience too and the doctor was explaining about the use of condoms". The respondent who felt the health talks were boring was in the age group 18 years and below. Her feelings could be explained by the fact that adolescents prefer anonymity when seeking or receiving information on sexuality/ reproductive health (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005). One of the healthcare workers said, "We encourage husbands to accompany their wives to the hospital especially for family planning". However, this study shows that having men in the audience makes the women uncomfortable especially during reproductive health talks as mentioned by the respondent. Embarrassment during sexual reproductive talks could be because of gender and social norms within a community. This

finding is similar to findings from a study done in South Nyanza, Kenya where the findings showed that traditional gender constructions and social norms hinder the discussion of sexual and reproductive health issues among the adolescents and their teachers. The discussions of the study continue to explain that this could be the issue especially for the adolescents in much of sub-Sahara Africa because they are socialised to discuss sexual matters with specific members of their social contact (Obare, Agwanda, & Magadi , 2006). Furthermore, according to Mullick et al., (2005) in most African countries maternal health issues such as family planning, pregnancy and childbirth have always been considered as women's affairs (Adenike I, Esther O, Adefisoye O, Adeleye A., & Sunday O., 2013). A study in Australia examining the impact of text messages in promoting sexual and reproductive health in young people revealed that young people were likely to pay attention when a message had some humour. The humour also made them remember the messages and its contents (Gold, Lim, Hellard, Hocking, & Keogh, What's in a message? Delivering sexual health promotion to young people in Australia via text messaging, 2010). Likewise, in this study the younger respondent was bored because there was no humour in the health talks.

The role of human centred design is to bring multiple talents to the solutions of complex issues by incorporating empathy and the needs of the people who must work within the system, the people who will approve it and those who will benefit from the outcome. The end users must be part of the solution because their understanding, trust and comfort are essential to the overall achievement of the system (Norman, 2014). When the intended users of the design participate in the designing and testing of the communication intervention, the outcome is more successful. The audience should participate by chosing the right words, colours and visuals in a brochure (Centers for Disease Control and Prevention (CDC), 2009). The health care workers (5 out of 6) stated that they have never been approached to take part in the design of the maternal health materials they use. The healthcare worker who had taken part in the design of information materials said that she gave recommendations which have not been implemented; she recommended that a Kiswahili version of the mother and child health booklet be availed to the mothers but this has not been done. Healthcare workers should play a major role of explaining the inteded message and the desired outcomes to the artists. This is because the artists do not fully

understand the health messages and thus cannot work without guidance from the professionals (Houts, Doak, Doak, & Loscalzo, 2006). Likewise, is important to pre-test the communication intervention/materials to understand the consumers' wants and preferences. This will ensure the patients' needs and culture are incorporated into the communication strategy (Brown, Lindenberger, & Bryant, 2008).

The mother and child health booklet is effective and has advantage over the clinic cards that were given to mothers before. The booklet does not require the mothers to walk with different cards all the time they attend clinic. The booklet has all the information from antenatal care to postnatal care and is durable unlike the clinic card which tears over time as shown in Figure 18. The design change in the booklet had the user needs in mind and therefore it was human centered. It considered how cumbersome it was for the women to carry different clinic cards which were not durable and would tear apart over time. According to Norman, (2005) human centred design guarantees clear improvements of bad products or systems; it can avoid failures and will make sure that products work and people can use them. Literature suggests that involving users in the design process will improve a systems quality because of the precise valuation of the user requirements and the higher level of user acceptance (Dabbs, et al., 2009).

5.3 CONCLUSIONS AND RECOMMENDATIONS

The respondents (93.3%) owned mobile phones which they used to make and receive phone calls.The growth in mobile phone ownership especially in the low-resource settings offers a chance to deliver timely information on antenatal and postnatal care. Providing mothers with antenatal information directly on their palms is an innovative way to empower women especially in low-resource settings (kioko, 2012).

The healthcare workers agreed that mobile phones could transmit maternal health information to mothers in Kibera. Mobile phones have also worked in transmiting maternal health information in Zanzibar; mothers receive text messages on pregnancy including the importance of having skilled atendance assistance during delivery (Suggs et al, 2015). Young people feel more comfortable asking questions in an anonymous way through a

familiar medium such as a mobile phone. They simply type a question and immediately receive a response. Clinic appointment reminders can also be sent to patients via text messages. Additionally a survey by Kegg et el., revealed that SMS was the preferred way for patients to be reminded of appointments (Lim, Hocking, & Aitken, 2008). Similarly, a study done to examine the impact of text messaging for promotion of sexual health among the youth in Victoria South Africa concluded that mobile phones, especially SMS create a unique chance for health workers to reach a large number of patients at a lower cost (Gold, Lim, Hellard, Hocking, & Keogh, What's in a message? Delivering sexual health promotion to young people in Australia via text messaging, 2010)

Televisions and radios were mentioned as major sources of entertainment for the respondents. The respondents who do not own television watch from their neighbours houses. The study revealed that 73.3% of the respondents owned television sets. Health care workers said that televisions and radios could be used to transmit maternal health information to the mothers in Kibera informal settlement.

Countries like South Africa are using innovative ways to transmit health information; Soul City Institute for Health and Development Communication is a non-governmental organization with headquarters in Johannesburg South Africa (Houghton) that uses mass media for health education in South Africa. Television drama series broadcasting on South Africa's most popular television channel, radio drama series broadcasting in nine local languages, designing health education booklets around the popularity of the TV series characters, which are published in major newspapers are strategies used by Soul City to transmit health messages to the public. Analysis of data from the TV series audience members showed that they identified with role models in the TV series and thus learned strategies on health matters such as maternal health (Mendoza, Okoko, Morgan, & Konopka, 2013). The same strategy could be used to transmit maternal health information in Kibera because the respondents also mentioned their love for particular local TV series and radio programmes. Additionally, N.G.O clinics in Bangladesh have introduced short films on waiting room televisions about reproductive health subjects (Kozara, 2008).
In Kenya, programmes like Makutano Junction have been used to enhance the lower class livelihoods through research information via educational TV drama. The Kenyan TV

drama or a similar TV drama set up can be used to target the mothers in Kibera with maternal health messages. This show ends with an invitation asking the viewers to text questions they have about the episode aired. The questions can then later be passed on to experts for answers (Social Development Direct, 2008). Makutano Junction combines education and entertainment. This would especially be suitable to target the adolescents as well as their mothers. The adolescents can afterwards text the questions they need answers to.

5.4 CONCLUSIONS AND RECOMMENDATIONS

This research was set out to establish a communication framework based on human centred design principles that facilitate effective dissemination of information about and adoption of improved maternal health practices in the informal urban settlements in Kenya. To do this the study sought to answer the following research questions:

1. What are the currently used and preferred information sources on birth, antenatal and postnatal care in the informal urban settings in Kenya?
2. How efficient are the communication strategies in the healthcare sector as perceived by women in the informal urban settlements in Kenya?
3. How efficient are the communication strategies in the healthcare sector as perceived by health care providers in the informal urban settlements in Kenya?
4. What are the communication tools used by women and how best can they be used to effectively design information on maternal healthcare in the informal urban settlements?

Incorporating human centred design in communication strategies keeps the focus on meeting the user's needs. Human centred design being the core of this study, dictates that user is involved in the design process from the beginning to reduce any problems associated with the use of the communication system later. The study therefore proposes a framework (see Figure 20) that guides the design of communication interventions that

facilitate effective dissemination of information about improved maternal health practices in the informal urban settlements in Kenya. According to the framework, the design process begins by empathising with the users through conducting research. The research is conducted to find out the needs and preferences of the users. After the research, the collected information is put together and different stakeholders come on board to ideate and come up with creative communication interventions (prototype). The prototype is then taken back to the users for feedback on its usability. During this stage the users can either reject or accept the proposed solution. This stage is also done by conducting qualitative research. The feedback from the users is then used to re-design the prototype and come up with a human centred communication intervention.

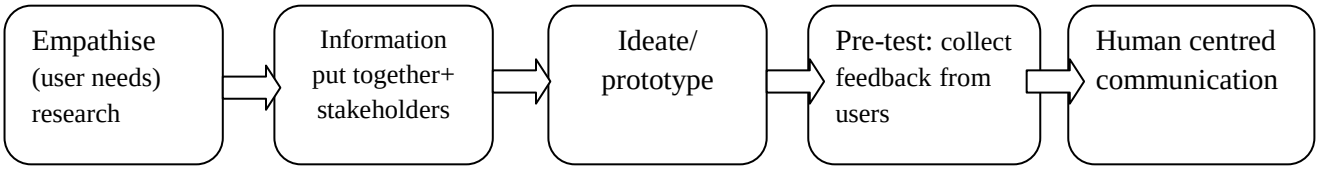

Figure: 30 (maternal health communication framework)

Source: Author

Research by Mukong and Burns, (2015) reveals that most people in developing countries seek health information from informal sources. Likewise, informal sources of information such as friends and relatives are still preferred by women in the informal settlement of Kibera. The study also revealed a significant relationship between age and the sources of maternal health information sought by women in Kibera. Adolescents (18 years and below) preferred seeking information from mass media sources and from relatives (mothers). This was due to adolescents' quest for sources of information that are private and timely. Additionally, adolescents also seek information by emulating their mothers; they do what they saw their mothers do or ask them for help. In the converse women in the age group 34 to 38 sought information from health care workers and from women who have had children due to their desire to discuss their health face to face.

The study clearly shows that the same sources of information targeting adolescent mothers (18 years and below) will not be preferred by older women (in this case age group 34 to 38). Therefore, different communication strategies should be designed to target audiences in different age groups. Not only can the age group 34 to 38 receive maternal health through face-to-face discussions with the doctors but the information can also be delivered to them by having TV screens in the health facility waiting areas. The screens can transmit maternal health information through short skits by local TV programme actors and the skits can end by asking the audience to ask the doctor any questions they may have for clarification. This will also help unburden the doctors work by him only clarifying on points the patients have not understood Young audience (18 years and below) should be targeted by maternal health information that have some humour. Humour enables them remember the health messages. The research revealed that the mothers in Kibera had access to mobile phones. As suggested by the health workers, the mobile phones should be used to transfer maternal health information to the mothers in the informal urban settlements. The adolescents who like anonymity when accessing maternal health information can be targeted using mobile phones. The ministry of health should collaborate with mobile phone network providers to facilitate the delivery of maternal health information via mobile phones.

Audiences in the age group 18 years and below should be targeted with sources of information that do not require them to wait for the services and sources of information that accord them some level of secrecy; the adolescents should be able to access the maternal health information in private. On the other hand, relatives like mothers of the adolescents should also be target audience for maternal health information in informal urban settlements in Kenya. This calls for a two-pronged approach targeting the adolescents and the mothers of the adolescents. This can be through introduction of TV programmes such as Makutano junction. The TV programme can be used to relay maternal health information to families thereby targeting both the adolescents and the mothers. The TV series can be tailored to handle information on maternal health sensitively to make it appropriate for family viewing. The programme can be aired at 7.30 after the 7 o'clock news to attract as much family viewing as possible. Clips from the Makutano Junction TV drama can be used to relay maternal health information at the hospital waiting areas.

However, the study concludes that there is no association between the number of children mothers in the informal settlements of Kibera have and the sources of maternal health information they seek. The mothers can be targeted using age and the level of education.

Understanding the literacy levels of the target audience is important when designing maternal communication strategies for women in informal urban settlements. Education has proven to enhance self-efficacy in women through their decisions in safe motherhood and use of contraception. The study shows that women in Kibera informal settlement with low formal education (upper primary) are unable to comprehend printed health information. Therefore, to reach this target audience, their literacy levels should be understood by conducting research. This will help by clarifying what the patients can and cannot understand. Introduction of TV and radio programmes that promote health literacy will also help in raising the health literacy of the patients.

Maternal health information needs to be conveyed in ways that will improve the ability of the women in the informal urban settlements to maintain their own health during and after pregnancy. However, the sources of information used in the informal settlement of Kibera were established to be ineffective. This was due to the use of medical jargon in the maternal health materials issued to the mothers at the health clinics, lack of understanding between the mothers and the doctors when exchanging maternal health information, cultural preferences of the women causing embarrassments and misunderstanding, lack of health literacy and boredom from the audience.

The study recommends that when designing maternal health information for the women in informal urban settlements, the communication strategy should use as simple words as possible in order to communicate to the mothers effectively. This will enable the low literate patients and patients who do not understand medical terminology understand the health information. Therefore, maternal health messages should be precise and more readable by avoiding the use of medical jargon. Additionally, communication between the doctor and patient should be uncomplicated and specific. The doctor should also check the patient understanding by asking whether the patient has understood and by asking questions to confirm patient understanding.

Cultural preferences saw patients misinterpreting visual communication in the study. Maternal health communication strategies should avoid this by having small captions to explain the intended meaning of the pictures used for communication. This can only be done by conducting research to gain some knowledge about the users. After the captions are introduced the communication strategy should be pre-tested by the users to get feedback to redesign the health material accordingly. This will avoid viewers having their own interpretations of the pictures in maternal health prints.

Feelings of discomfort when using a communication method can be avoided by incorporating the users in the design process. Finding out as much as possible about the users through research will enlighten the designer about the cultural preferences and consequently avoid putting the users in embarrassing situations. The women in Kibera should not be put together with men during reproductive health discussions as suggested by the conducted research.

The healthcare workers also gave a recommendation to ensure the women in Kibera informal settlement know how to use the mother and child health booklet. They recommended that the women should be sensitized on how to use the booklets by the records department as they are given the booklets.

Healthcare workers should also be involved in the design of health materials used by women in the informal urban settlements to give their professional advice to the designers. Furthermore, they should also participate in the testing of the maternal health communication materials. Additionally, the users should also participate in the design as earlier mentioned and in the testing of the communication materials.

The Ministry of Health should collaborate with the television and radio stations to communicate maternal health information. Since the study revealed that the mothers in Kibera own televisions and radio, the transmission of maternal health information can be done through television and radio programmes that are most popular with the women in Kibera. The women enjoyed watching African/ Nigerian movies on television. During such programmes, commercial breaks should be introduced to deliver maternal health information. Likewise, the radio stations should use the popular radio programme hosts to

give information about maternal health. This can be done during the radio programme known as Patanisho, which is so popular with the women in Kibera. Furthermore, the characters from the popular television and radio programmes can be used to deliver maternal health messages in humorous cartoon messages for the adolescents.

Timely targeted counselling should be given to the expectant mothers to avoid mishaps due to lack of information. This should be done at 8 months when the mothers are due in a month to sensitize them on issues like labour signs and before pregnancy on when to start antenatal care visits. The sensitization can be through health talks or design of an Information Education and Communication (IEC) print materials targeting the labour signs/symptoms and when to start ANC. The IEC material should be designed in guideline with human centred design principles like involving the users and stakeholders in the design process. After the design, the IEC materials should be pre-tested with the users and health care workers. The material should also be designed incorporating humour and using simple words.

The study findings also indicated that the mothers in Kibera would prefer getting information from a centrally located office in the village where they can access information on maternal health anytime. They recommended that the office would be especially useful for working mothers who do not have time to go to the clinic. These mothers can access information from these offices when they are in need of maternal health information.

The study further recommends that the proposed framework can also be used to improve on maternal health in the rural areas of Kenya. This will significantly bring down the mortality rate in the country as a whole.

5.5 RECOMMENDATIONS FOR FURTHER RESEARCH

The study recommends that similar studies be done in the rural areas as well as in the urban settlement of Kenya in order to compare the maternal health communication needs of women. As shown in the study findings, different age groups prefer different sources of

maternal health information; conducting the study in the rural areas and in other urban settlements will unearth any similarities or differences from this study.

Additionally, this study could not determine a significant relationship between the occupation of the mothers and their maternal health information seeking behaviour because the interviewed mothers were all in informal employment. Therefore, further investigation determining whether the occupations of the mothers affect their information seeking behaviour should be carried out.

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APPENDICES

APPENDIX A: RESEACH BUDGET

	Details	Ksh.
1	Printing and stationery	20,000
2	Internet	10,000
3	Digital Voice recorder	20,000
4	Transport allowance	20,000
5	Meals	5,000
6	Data collection	10,000
6	Miscellaneous	20,000
	GRAND TOTAL	**105,000**

APPENDIX B: RESEARCH SCHEDULE

N0	DATE	ITEM	MODE
1.	7th September 2015- 30TH September 2015	Title and Concept Paper Development	Document &Power Point presentation
2.	5th October 2015- 2nd December 2015	Proposal Development, Reconnaissance & Overview of Research Methodology	Desk critics, Expert Advice, Seminar Presentation and Class Presentations
3.	8th December 2015	Preliminary Proposal Presentation	Document &Power Point presentation
	20th January 2016	Final Proposal Presentation	Document &Power Point presentation
4.	28thJanuary 2016-	Field Work	As in Research Methodology
5.	30thMarch 2016	Presentation of Research Findings	Document &Power Point presentation
6.	30thMarch 2016- 12thApril 2016	Review, Editing	Desk critics
7.	8thJune 2016	Final Presentation of preliminary Report	Document &Power Point presentation
8.	15thJune 2016	Handing in of Project report	Document to University Regulations

APPENDIX C: INFORMED CONSENT FORM

UNIVERSITY OF NAIROBI

COLLEGE OF ARCHITECTURE & ENGINEERING

School of The Arts And Design

P.O. Box 30197, GPO 00100 Nairobi, Kenya

Informed Consent Form

This study intends to establish a communication framework based on human centered design principles that facilitate effective dissemination of information about adoption of improved maternal health practices in the informal urban settlements in Kenya. The primary research question that will guide this study is: ***to what extent has communication as a human centered design strategy been integrated in the maternal healthcare sector in informal urban settlements in Kenya*?**The data collected in this study will be used to draw conclusions to help design professionals and design researchers better understand the impact of human centered design in communication design strategies.

Participant's Understanding

- I agree to participate in this study that I understand will be submitted in partial fulfilment of the requirements for the MA degree in Design at University of Nairobi.
- I understand that my participation is voluntary.

- I understand that all data collected will be limited to this use or other research-related usage as authorized by University of Nairobi.
- I understand that I will not be identified by name in the final product.
- I am aware that all records will be kept confidential in the secure possession of the researcher.
- I acknowledge that the contact information of the researcher and his advisor have been made available to me along with a duplicate copy of this consent form.
- I understand that I may withdraw from the study at any time with no adverse repercussions.

Participant's Full Name: _____

Participant's Signature: _____ Date signed: _____

Researcher: MAUREEN M.A. OCHOLA PHONE: 0724125089

Advisor: MRS. FRANCISCA ODUNDO PHONE: 0722784618

APPENDIX D: INTERVIEW GUIDES

PERSONAL INFORMATION FORM

1. **Name: ……..**
2. **Marital status: ……**
3. **Occupation:……..**
4. **Level of education:……..**
5. **Age:……..**

INTERVIEW GUIDE

FOCUS GROUP DISCUSSIONS WITH MOTHERS ATTENDING ANTENATAL CLINICS

Sources of information:

1. Where do community members access information on maternal health?
2. What are some of the reasons that made you come to the health facility?
3. Who or what influenced your coming to the health facility?
4. When you have, a problem related to maternal health, whom do you go to for a solution?

Efficacy of communication materials:

5. What stories do these booklet/ brochure/ flipcharts tell you?
6. Have you ever attended a health talk with a health worker? What were you told? Did you understand? Were you satisfied with the information?
7. What do you recommend as the best way of receiving information from the healthcare workers?
8. Do you intend to deliver in a health facility? Why? Which one and what has informed this decision?

Social networks of the women

9. Do you own a mobile phone? What do you use your mobile phone for? Do you have it on throughout the day
10. Do you have a TV? How many times do you watch it? What programs do you watch?
11. Do you have a radio? How many times do you listen to it? What programs do you listen to?

FOCUS GROUP DISCUSSIONS WITH MOTHERS ATTENDING POSTNATAL CLINICS

Sources of information:

1. Where do community members access information on maternal health?
2. What are some of the reasons that made you come to the health facility?
3. Who or what influenced your coming to the health facility?
4. When you have, a problem related to maternal health, whom do you go to for a solution?

Efficacy of communication materials:

5. Do you understand the booklet/ brochure/ flipcharts? What is your understanding of the information?
6. Have you ever attended a health talk with a health worker? What were you told? Did you understand? Were you satisfied with the information?
7. What do you recommend as the best way of receiving information from the healthcare workers?
8. Did you deliver in a health facility? Which one?Why?

Social networks of the women

9. Do you own a mobile phone? What do you use your mobile phone for? Do you have it on throughout the day
10. Do you have a TV? How many times do you watch it? What programs do you watch?
11. Do you have a radio? How many times do you listen to it? What programs do you listen to?

IN-DEPTH INTERVIEWS WITH HEALTH PRACTITIONERS

Personal information:

1. What is your name:
2. What is your profession?
3. For how long have you worked in your current position?

Sources of information:

1. What material do you use to communicate with the patients?
2. What is your main source of information regarding maternal healthcare needs?
3. Where do community members access information on maternal health?

Efficacy of communication materials:

4. What are some of the challenges you experience when communicating with the patients?
5. What are some of the challenges you experience when using this material?
6. Do you think the patients understand? How do you know they understand the information?
7. Are you involved in the design of these materials? How?
8. Are you satisfied with the content? if not what do you think should be changed in the content?

Social networks of the women

9. Do you think transmitting maternal information through mobile phones would work for the women of Kibera?
10. Do you think the women of Kibera would benefit from maternal health information transmitted via TV/ Radio? Why?

IN-DEPTH INTERVIEWS WITH MOTHERS ATTENDING PRENATAL CLINICS

Sources of information:

1. Where did you get information to come for antenatal clinics?
2. Where do community members access information on maternal health?

3. What are some of the reasons that made you come to the health facility?
4. When you have a problem, whom do you go to for a solution?

Efficacy of communication materials:

5. Have you ever been given any maternal health information material to go home with? what was it about? What kind of material was it?
6. What story do you get from this booklet/ pamphlets?
7. When was the last time you acted on the information received regarding maternal health? Where did you get this information?
8. Have you ever attended a health talk with a health worker? What were you told? Did you understand? Were you satisfied with the information?
9. What do you recommend as the best way of receiving information from the healthcare workers?
10. What has informed the choice of the health facility you intend to deliver in? Which one is it?

Social networks of the women

11. Do you own a mobile phone? What do you use your mobile phone for? Do you have it on throughout the day
12. Do you have a TV? How many times do you watch it? What programs do you watch?
13. Do you have a radio? How many times do you listen to it? What programs do you listen to?

IN-DEPTH INTERVIEWS WITH MOTHERS ATTENDING POSTNATAL CLINICS

Sources of information:

1. Where did you get information to come for antenatal clinics?
2. Where do other women access information on maternal health?
3. What are some of the reasons that made you come to the health facility?
4. When you have a problem, whom do you go to for a solution?

Efficacy of communication materials:

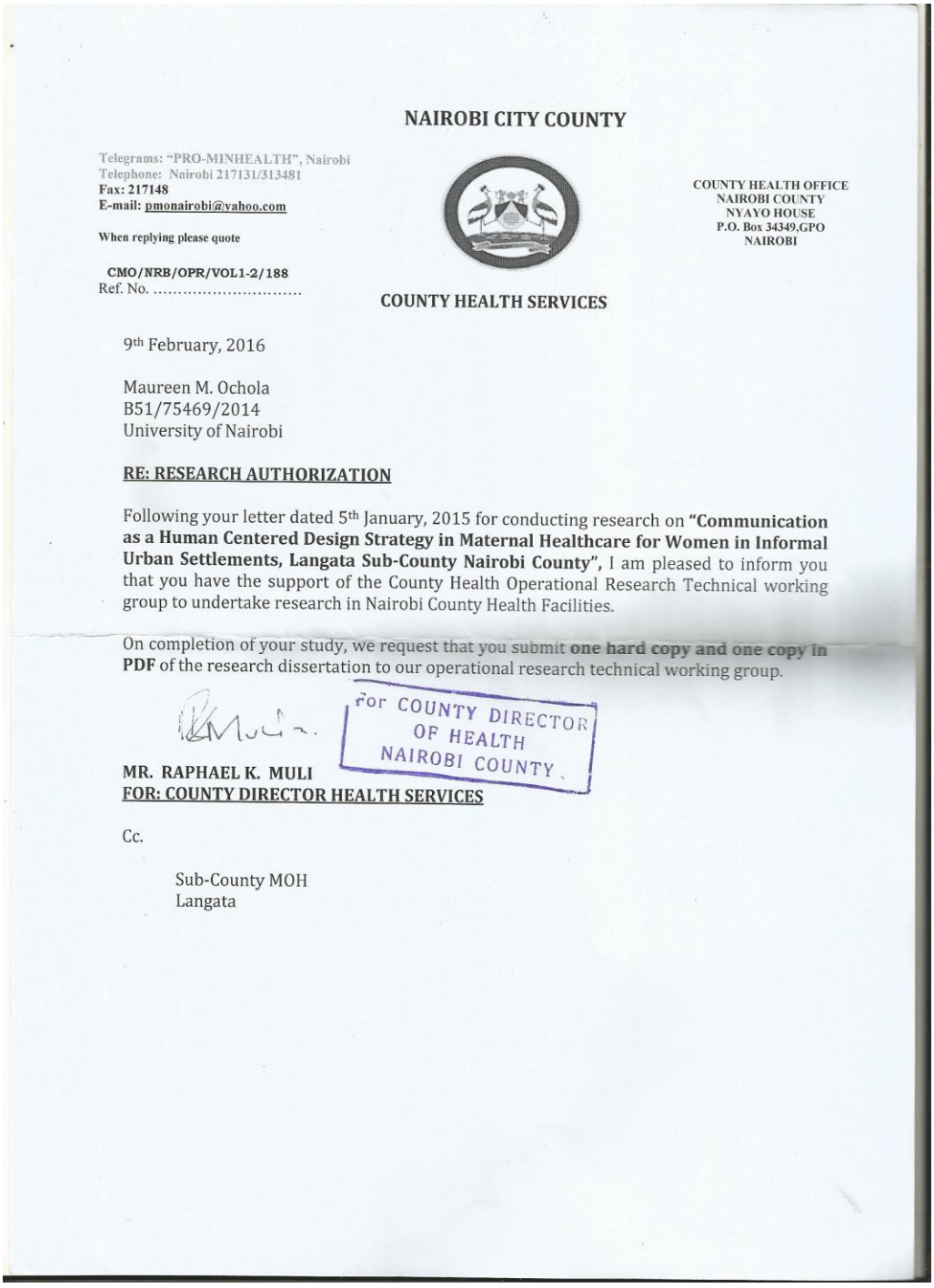
1. Have you ever been given any maternal health information material to go home with? what was it about? What kind of material was it?
2. What story do you get from booklet/ pamphlets?
3. When was the last time you acted on the information received regarding maternal health? Where did you get this information?
4. Have you ever attended a health talk with a health worker? What were you told? Did you understand? Were you satisfied with the information?
5. What do you recommend as the best way of receiving information from the healthcare workers?
6. Did you deliver in a health facility? Which one?Why?

Social networks of the women

1. Do you own a mobile phone? What do you use your mobile phone for? Do you have it on throughout the day
2. Do you have a TV? How many times do you watch it? What programs do you watch?
3. Do you have a radio? How many times do you listen to it? What programs do you listen to?

APPENDIX E: AUTHORIZATION LETTERS

COUNTY HEALTH SERVICES AUTHORIZATION LETTER



NAIROBI CITY COUNTY

Telegrams: "PRO-MINHEALTH", Nairobi
Telephone: Nairobi 217131/313481
Fax: 217148
E-mail: pmonairobi@yahoo.com

When replying please quote

CMO/NRB/OPR/VOL1-2/188
Ref. No. .....

COUNTY HEALTH OFFICE
NAIROBI COUNTY
NYAYO HOUSE
P.O. Box 34349,GPO
NAIROBI

COUNTY HEALTH SERVICES

9th February, 2016

Maureen M. Ochola
B51/75469/2014
University of Nairobi

RE: RESEARCH AUTHORIZATION

Following your letter dated 5th January, 2015 for conducting research on **"Communication as a Human Centered Design Strategy in Maternal Healthcare for Women in Informal Urban Settlements, Langata Sub-County Nairobi County"**, I am pleased to inform you that you have the support of the County Health Operational Research Technical working group to undertake research in Nairobi County Health Facilities.

On completion of your study, we request that you submit **one hard copy and one copy in PDF** of the research dissertation to our operational research technical working group.

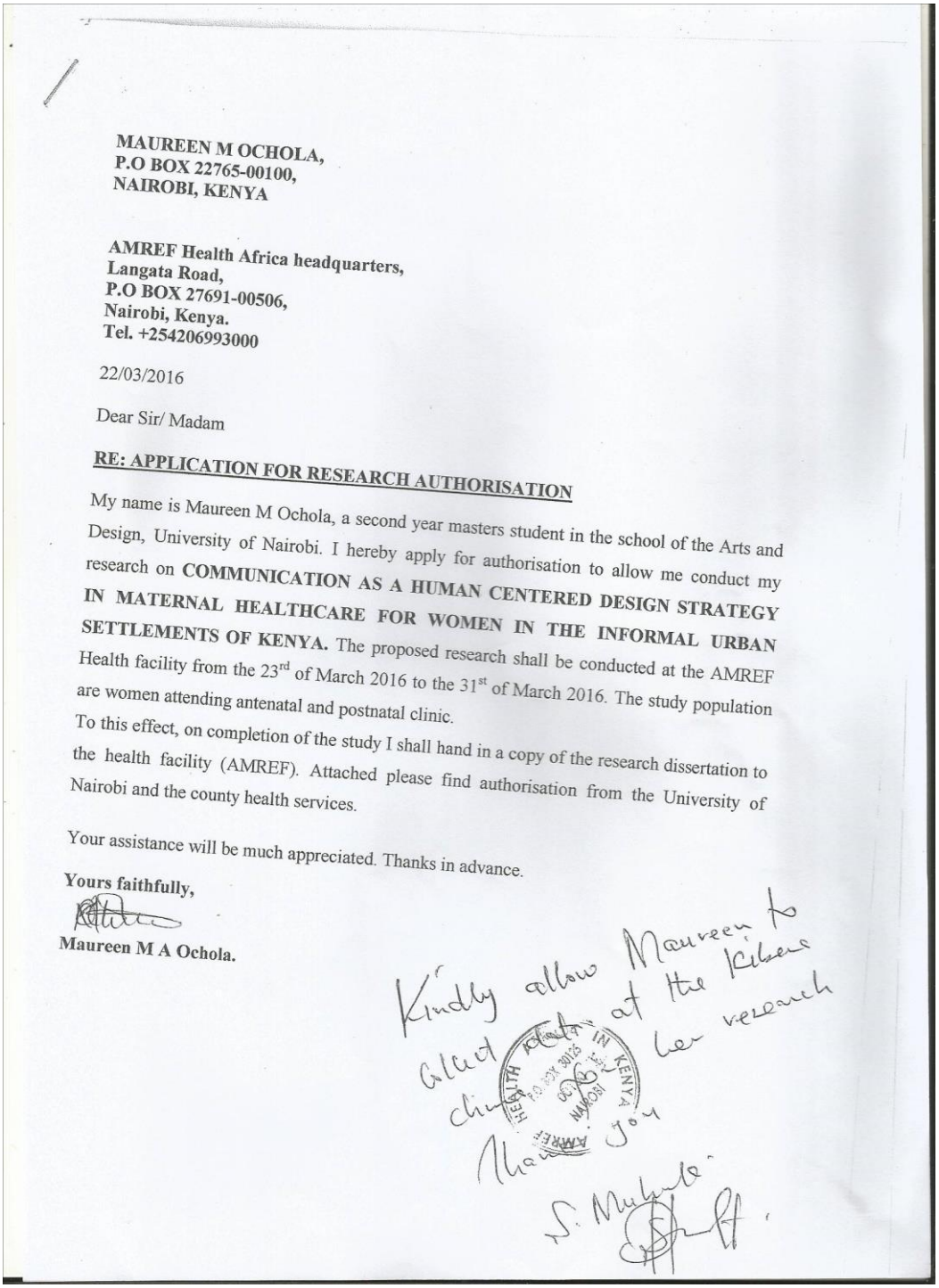
for COUNTY DIRECTOR OF HEALTH NAIROBI COUNTY

MR. RAPHAEL K. MULI
FOR: COUNTY DIRECTOR HEALTH SERVICES

Cc.

Sub-County MOH
Langata

AMREF HEALTH FACILITY CONSENT LETTER



MAUREEN M OCHOLA,
P.O BOX 22765-00100,
NAIROBI, KENYA

AMREF Health Africa headquarters,
Langata Road,
P.O BOX 27691-00506,
Nairobi, Kenya.
Tel. +254206993000

22/03/2016

Dear Sir/ Madam

RE: APPLICATION FOR RESEARCH AUTHORISATION

My name is Maureen M Ochola, a second year masters student in the school of the Arts and Design, University of Nairobi. I hereby apply for authorisation to allow me conduct my research on **COMMUNICATION AS A HUMAN CENTERED DESIGN STRATEGY IN MATERNAL HEALTHCARE FOR WOMEN IN THE INFORMAL URBAN SETTLEMENTS OF KENYA.** The proposed research shall be conducted at the AMREF Health facility from the 23rd of March 2016 to the 31st of March 2016. The study population are women attending antenatal and postnatal clinic.

To this effect, on completion of the study I shall hand in a copy of the research dissertation to the health facility (AMREF). Attached please find authorisation from the University of Nairobi and the county health services.

Your assistance will be much appreciated. Thanks in advance.

Yours faithfully,

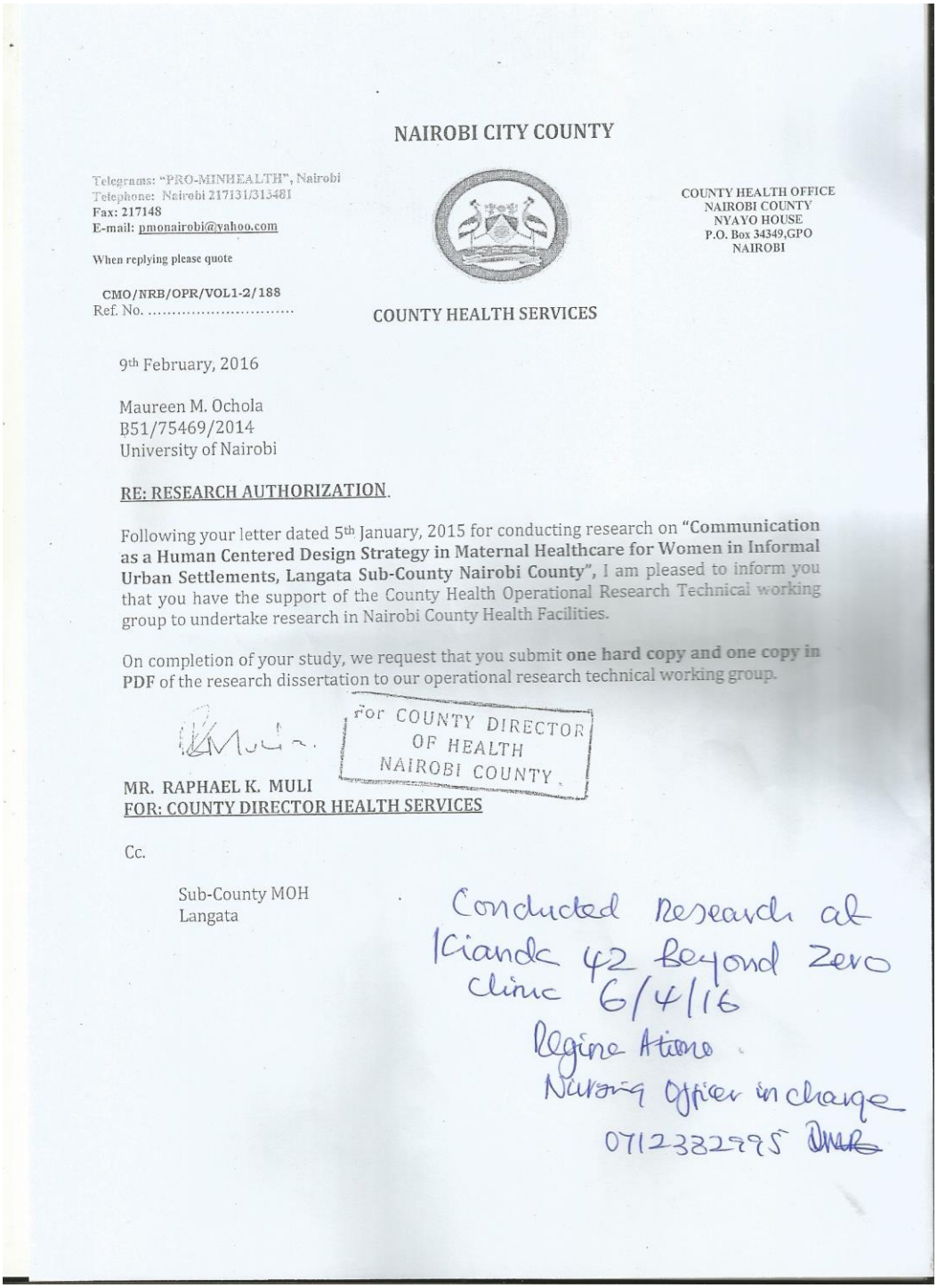
Maureen M A Ochola.

Kindly allow Maureen to collect data at the Kibera clinic for her research

Thank you

S. Mukuria

BEYOND ZERO HEALTH FACILITY CONSENT LETTER



NAIROBI CITY COUNTY

Telegrams: "PRO-MINHEALTH", Nairobi
Telephone: Nairobi 217131/315481
Fax: 217148
E-mail: pmonairobi@yahoo.com

When replying please quote

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COUNTY HEALTH OFFICE
NAIROBI COUNTY
NYAYO HOUSE
P.O. Box 34349,GPO
NAIROBI

COUNTY HEALTH SERVICES

9th February, 2016

Maureen M. Ochola
B51/75469/2014
University of Nairobi

RE: RESEARCH AUTHORIZATION.

Following your letter dated 5th January, 2015 for conducting research on **"Communication as a Human Centered Design Strategy in Maternal Healthcare for Women in Informal Urban Settlements, Langata Sub-County Nairobi County"**, I am pleased to inform you that you have the support of the County Health Operational Research Technical working group to undertake research in Nairobi County Health Facilities.

On completion of your study, we request that you submit **one hard copy and one copy in PDF** of the research dissertation to our operational research technical working group.

for COUNTY DIRECTOR
OF HEALTH
NAIROBI COUNTY

MR. RAPHAEL K. MULI
FOR: COUNTY DIRECTOR HEALTH SERVICES

Cc.

Sub-County MOH
Langata

Conducted Research at Kiandk 42 Beyond Zero clinic 6/4/16
Regine Atieno
Nursing Officer in charge
0712382795

USHIRIKA HEALTH FACILITY CONSENT LETTER

NAIROBI CITY COUNTY

Telegrams: "PRO-MINHEALTH", Nairobi
Telephone: Nairobi 217131/313481
Fax: 217148
E-mail: pmonairobi@yahoo.com

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9th February, 2016

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B51/75469/2014
University of Nairobi

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for COUNTY DIRECTOR OF HEALTH NAIROBI COUNTY

MR. RAPHAEL K. MULI
FOR: COUNTY DIRECTOR HEALTH SERVICES

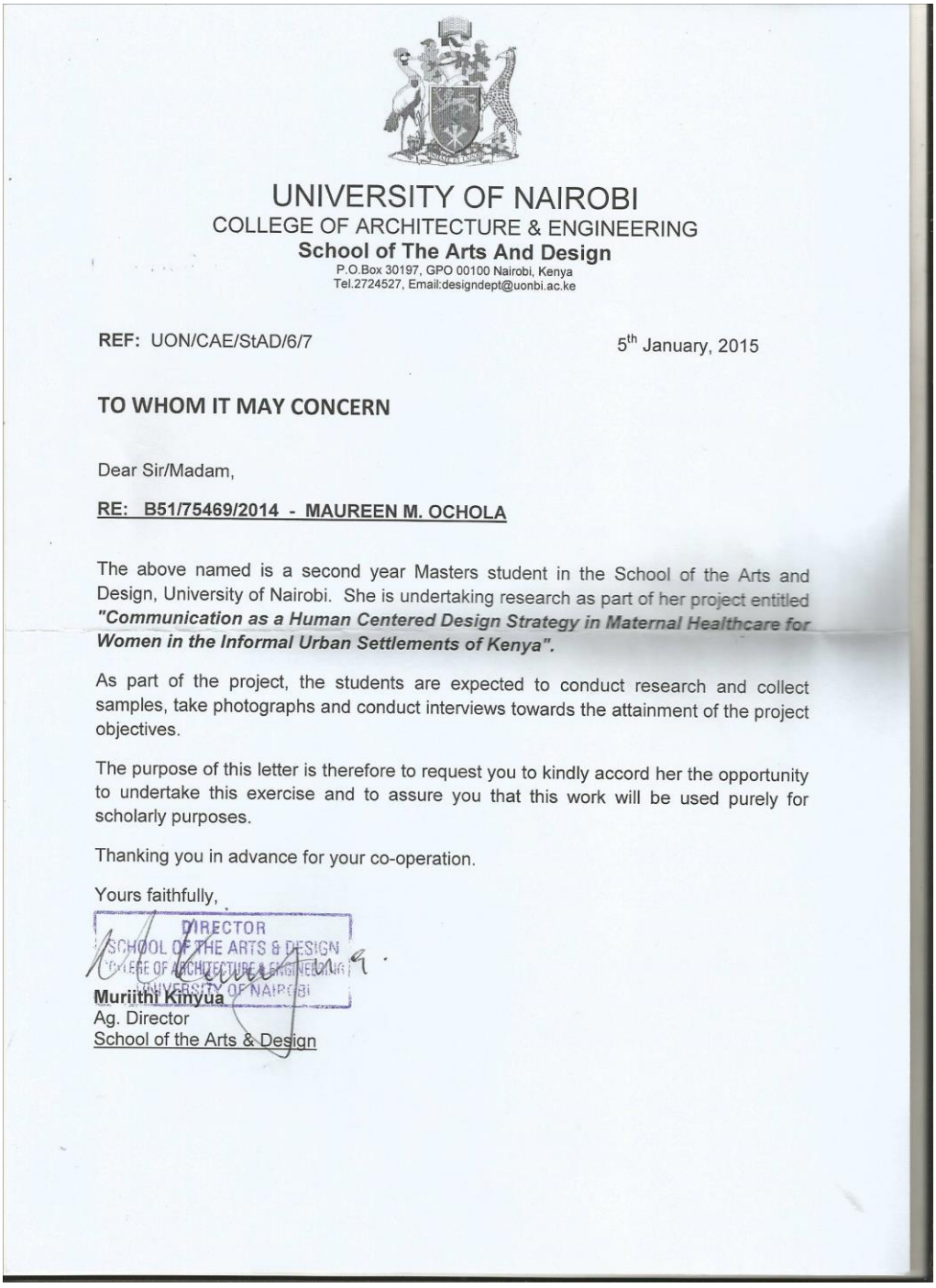
Cc.

Sub-County MOH
Langata

Accepted to conduct in Ushirika HC
Kinyanjui F
Clinician

USHIRIKA MEDICAL CLINIC AND MATERNITY SERVICES
P.O. Box 3260-00506 KIBERA NAIROBI
Date 28/3/2016

UNIVERSITY OF NAIROBI RESEARCH AUTHORIZATION LETTER



UNIVERSITY OF NAIROBI
COLLEGE OF ARCHITECTURE & ENGINEERING
School of The Arts And Design
P.O.Box 30197, GPO 00100 Nairobi, Kenya
Tel.2724527, Email:designdept@uonbi.ac.ke

REF: UON/CAE/StAD/6/7

5th January, 2015

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: B51/75469/2014 - MAUREEN M. OCHOLA

The above named is a second year Masters student in the School of the Arts and Design, University of Nairobi. She is undertaking research as part of her project entitled ***"Communication as a Human Centered Design Strategy in Maternal Healthcare for Women in the Informal Urban Settlements of Kenya".***

As part of the project, the students are expected to conduct research and collect samples, take photographs and conduct interviews towards the attainment of the project objectives.

The purpose of this letter is therefore to request you to kindly accord her the opportunity to undertake this exercise and to assure you that this work will be used purely for scholarly purposes.

Thanking you in advance for your co-operation.

Yours faithfully,

DIRECTOR
SCHOOL OF THE ARTS & DESIGN
COLLEGE OF ARCHITECTURE & ENGINEERING
UNIVERSITY OF NAIROBI

Muriithi Kinyua
Ag. Director
School of the Arts & Design