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INVESTIGATING HEALTH AND NUTRITION MESSAGES GIVEN TO PREGNANT WOMEN AT BWAILA HOSPITAL IN LILONGWE

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DEDICATION

I would like to dedicate this report to my dear husband Chaonaine for your unwavering support, love and care and my son Ntchane-Harris for your love and your inner strength against all odds and inspiring me to be a better mother.

CONTENTS

ABBREVIATIONS

ANC	Antenatal care
DD	Dietary Diversity
DHO	District Health Officer
FAO	Food Agriculture Organisation
HAZ	Height for Age Z-score
HDDS	Household Dietary Diversity Score
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
IDDS	Individual Dietary Diversity Score
MDHS	Malawi Demographic Health Survey
NSO	National Statistical Office
OPC	Office of the President and Cabinet – Department of Nutrition and HIV/AIDS
PMTCT	Prevention of Mother to Child Transmission of HIV
TBA	Traditional Birth Attendant
UNESCO	United Nations Educational Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
VCT	Voluntary Counselling and Testing
WHO	World Health Organisation

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ABSTRACT

OBJECTIVE: This study was designed to investigate if health and nutrition messages given to pregnant women at Bwaila hospital in Lilongwe, Malawi were understood and used and if the messages made the women health and nutrition literate.

STUDY DESIGN: A cross sectional study where data was collected using two structured questionnaires. Purposive sampling was used to recruit the study participants and these were 60 first time pregnant women (Primigravida) who were in their third trimester and 10 nurses who attend to these women during antenatal sessions. Data on demographics, obstetric situation, antenatal services accessed, nutrition knowledge and practices and information provided and used, were collected from the pregnant women. Non parametric statistical analyses performed on data included Chi square (χ^2), Kruskal-Wallis (H), Mann-Whitney (U) and Spearman's rho (ρ).

RESULTS: The findings show that distance to the hospital was a significant factor on when to make the first antenatal visit ($p=0.014$). Age was related with the number of routine visits ($p=0.002$), knowledge of the six food groups ($p=0.025$), knowing dietary sources of iodine ($p=0.03$) and correlated with making lifestyle changes ($p<0.009$). Education influenced the pregnant women's perception of adequacy of time with the nurses during antenatal visits ($p=0.002$), and it was correlated with searching for other health information ($p<0.03$). The nurses/midwives faced a number of challenges in their work and were aware of the government policy. The nurses were aware that they had influence on the quality of service that they proved and they suggested training more nurses, giving health talks as ways to lower maternal mortality and that government should build more health facilities.

CONCLUSION

The pregnant women in this study had limited health and nutrition knowledge either due to the limited content of the information that the nurses provided or due to their own limited health and nutrition literacy skills.

1.0 INTRODUCTION

Malawi is a country located in the Sub Saharan region of Africa with a population of 13.1 million of which 2.9 million are women of reproductive age defined as women within 15 to 49 years (National Statistical Office, 2009). Lilongwe city is the administrative capital of Malawi and this is where this study was conducted. Figure 1 shows the geographical location of Malawi and the location of Lilongwe district within the central region of the country. Lilongwe city is within the central region of the country.

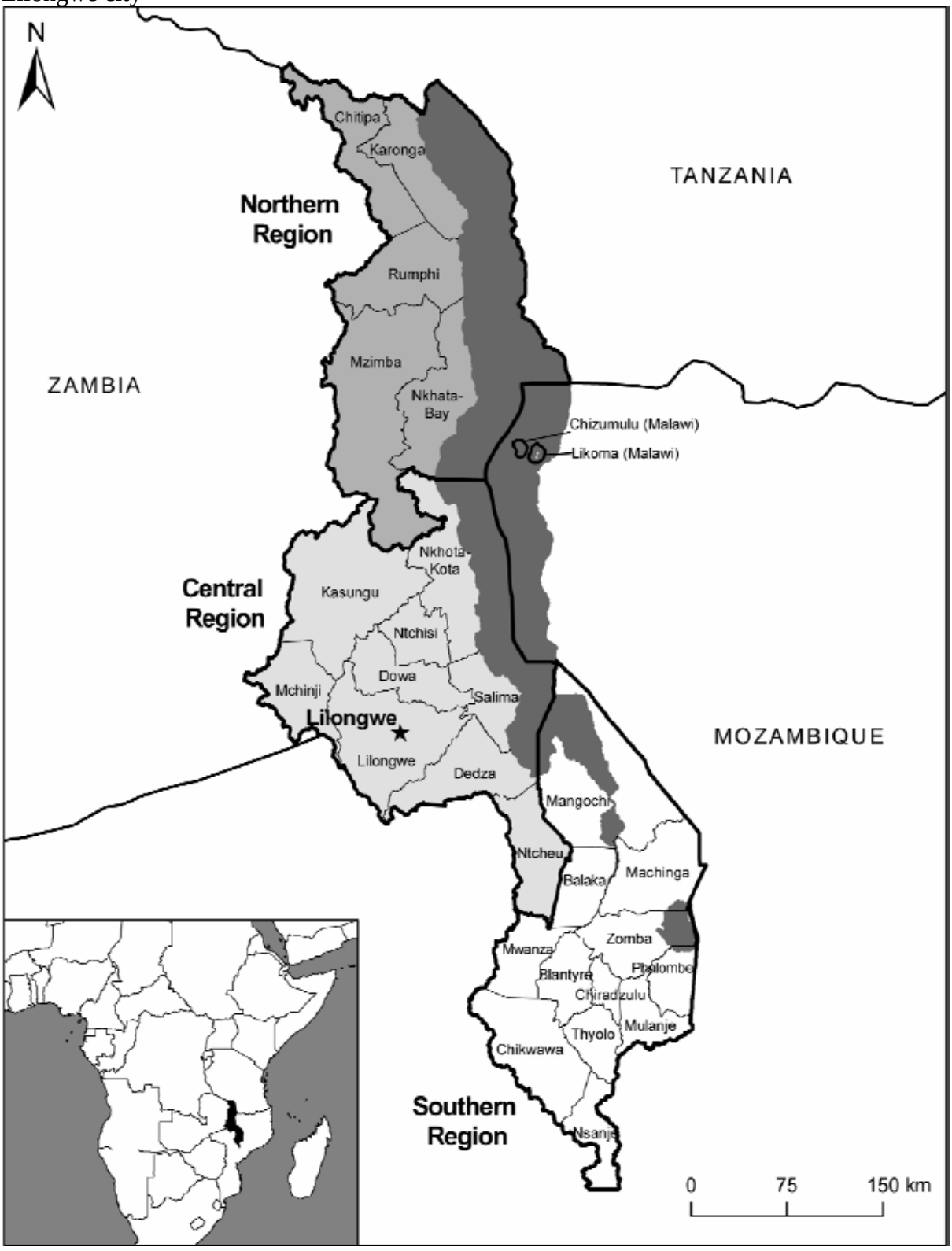
1.1 Maternal mortality problem in Malawi

Malawi's maternal mortality rate was reported as 1120 per 100 000 live births in 2000 and had since then fallen to 984 per 100 000 live births in 2004 (Ministry of Health, 2004). Recent estimates indicate that maternal mortality has decreased further to 807 per 100 000 live births which is still high (Khunga, 2010). High maternal mortality rate may have an effect on the infants that may survive. In Malawi, infant mortality rate is at 76 per 1000 live births (OPC, 2009a).

The government of Malawi made maternal and child health a priority and instituted a number of programs whose goal is to reduce the maternal and infant mortality rates. An example of such a programme is the Safe Motherhood Initiatives programme which was started in 1995 with the aim of reducing maternal and infant mortality. Through this initiative the government had hoped to achieve improved access to quality obstetric and neonatal care through provision of transport facilities, for example bicycle ambulances, for local communities to facilitate transportation of pregnant women to the nearest health centre. Another component of the same program dealt with improving attitudes of health care providers and sharpening their technical skills in service delivery (Ashwood-Smith, 2000).

In Malawi, maternal mortality is caused by haemorrhage (25%), hypertension (12%), sepsis (15%), unsafe abortions (13%), obstructed labour (8%) and other causes (28%) which include anaemia, HIV/AIDS and heart disease. Other related factors that can also contribute towards maternal mortality include limited access to health care, long distances to health care facilities, limited number of qualified and skilled birth attendants, low literacy and education levels and poverty (Geubbels, 2006).

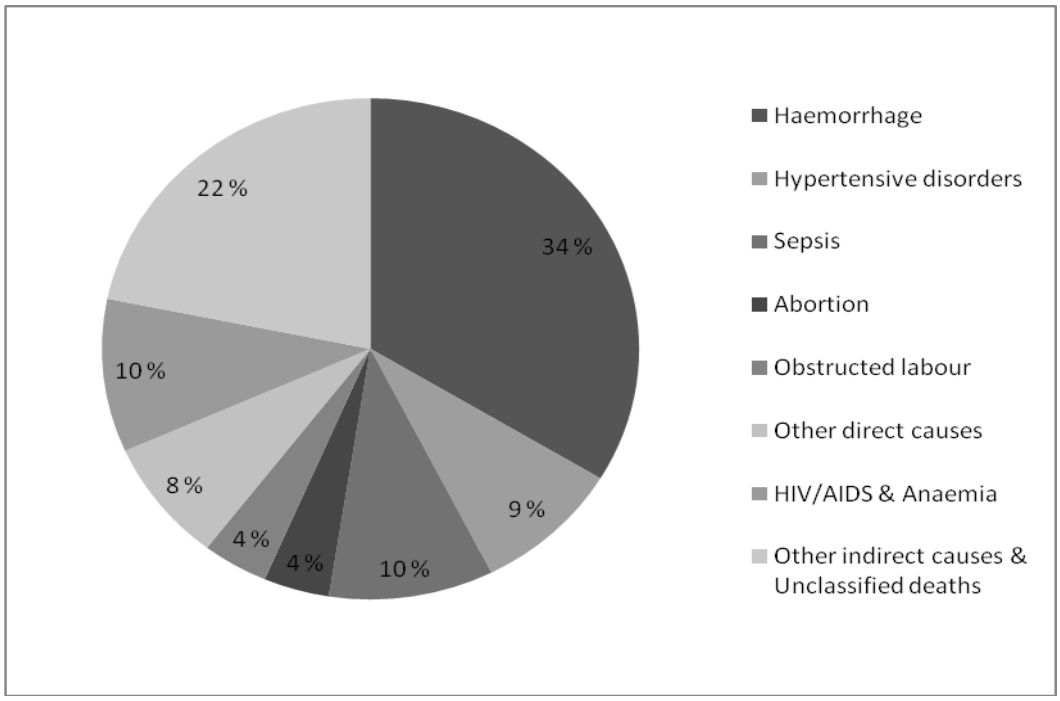
Map of Malawi showing the three administrative regions of the country and location of Lilongwe city



Source: Malawi Demographic and Health Survey Report (2005)
Figure 1 Map of Malawi and **Malawi's** location in Sub Saharan Africa

United Nations Children's Fund (UNICEF) defines maternal mortality rate as the number of maternal deaths per 100 000 live births. Sub Saharan Africa has the highest number of maternal mortality rates in the world which is 920 per 100 000 live births (UNICEF, 2008). Malawi is among the countries with the highest number of women who die due to pregnancy and its associated causes.

Maternal health is defined by the WHO as the health of women during pregnancy, childbirth and the postpartum period. This period is characterised with ill-health, suffering and death. The direct causes of maternal morbidity and mortality include haemorrhage, infection, high blood pressure, unsafe abortion, and obstructed labour (WHO, 2009).



Source: Adopted from Lancet 2006, 367: 1066-74

Figure 2 Causes of Maternal mortality in Africa

WHO also defines maternal death as the death of a woman while pregnant or within 42 days of termination of pregnancy, regardless of the site or duration of the pregnancy, from any cause related to or aggravated by the pregnancy or its management. Current global estimates show that haemorrhage and hypertension are the leading causes of maternal deaths and these account for more than half (53%) of all maternal deaths. Figure 2 shows the causes of maternal deaths in Africa and these include haemorrhage (34%), hypertension (9%) and sepsis (10%). In Sub Saharan Africa, haemorrhage and hypertension are estimated to be among the leading causes of maternal deaths (WHO & UNICEF, 2010).

Health literacy has been defined by the United States Department of Health and Human Services as the degree to which individuals have the capacity to obtain, process and understand basic health information and services so that they make appropriate health decisions (United States Department of Health and Human Services, 2000). The context of this definition is further explained by the National Library of Medicine which states that health literacy in the context of the definition suggests that an individual uses a more complex level of thinking or understanding to make informed decisions about their health (National Library of Medicine, 2000).

The World Health Organisation (WHO) defines health literacy as the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use the health information in ways which will promote and maintain good health. It further explains that health literacy means more than being able to read pamphlets and successfully make appointments. It also states that in improving people's access to health information and their capacity to use it effectively, health literacy is essential for empowerment (WHO, 1998).

Nutrition literacy can be defined as the degree to which individuals have the capacity to obtain, process and understand basic nutrition information and services needed to make appropriate dietary choices.

Maternal health literacy can be defined as the cognitive and social skills which determine the motivation and ability of women to gain access to, understand, and use information in ways that promote and maintain their own health and that of their children (Renkert & Nutbeam, 2001).

United Nations Educational Scientific and Cultural Organisation (UNESCO) define literacy as the ability to read and write as well as understanding a simple statement related to one's daily life. This involves a continuum of reading and writing skills and also includes basic arithmetic skills (UNESCO, 2000). Literacy has also been defined as the ability to read and write in any language (National Statistical Office, 2009). Malawi's literacy rate is at 64% with 69% of males and 59% of the females being classified as literate. Lilongwe district has a literacy rate of 62% with 67% of males and 58% of females being literate (National Statistical

Office., 2005). The official age for entry into primary school in Malawi is 6 years. Primary school education is 8 years with the first 4 years classified as junior primary and the next 4 years as senior primary and secondary school is 4 years. In Lilongwe district 28 to 30% of women have never been to school (National Statistical Office, 2009).

Health literacy focuses on an individual's capacity to obtain, interpret, understand and to use health information to promote and maintain health (Nutbeam, 1999). This is an important concept as it has the ability to empower individuals to navigate health systems as well as understand and use health information that they may be provided with. In applying this concept to maternal health, making pregnant women health literate could help them obtain, interpret, understand and use the health information to maintain satisfactory health status. This could have a contributory effect of lowering maternal mortality rates if women are provided with information in a manner that they could use.

There have been few studies on the concept of health literacy in Malawi and limited literature exists on the links between health literacy and maternal health in Malawi (Malata, Hauck, Monterosso, & McCaul, 2007). This study was designed to explore if the concept of health literacy can be applied to the maternal health sector in Malawi.

This research was conducted at Bwaila hospital which is in Lilongwe district. Lilongwe has two referral hospitals and these are Bwaila and Kamuzu Central Hospitals. Lilongwe has a population of 1 230 834 people and out of this, 630 508 are female and also out of this 365 376 are women of reproductive age defined as women in the age range between 15 and 49 (National Statistical Office, 2009). Bwaila hospital's antenatal care facility caters for a population of about 3000 pregnant women in a month. Bwaila Hospital is a referral hospital for all health centres in the district and the central region of the country (Refer to figure 1).

Bwaila was chosen as the study site because of its location in the city. It is located about 500 metres from the city's main bus and minibus terminal. The hospital also offers free antenatal services so women from various socioeconomic backgrounds and communities access the antenatal care facilities there. The hospital has undergone refurbishment and extension where more buildings were constructed increasing its capacity (bed space). This has made even more women access the antenatal care (ANC) facilities.

1.2 General objective

To evaluate if the health and nutrition messages given to first time pregnant women attending antenatal sessions at Bwaila Hospital are understood and thus lead to better health and nutrition literacy

1.3 Specific Objectives

- To investigate views of pregnant women towards antenatal care services
- To explore challenges first time pregnant women face in seeking health services
- To investigate levels of knowledge about health and nutrition among pregnant women
- To investigate the nutritional quality of the pregnant women's diets
- To find out challenges nurses face in delivering antenatal care
- To find out perspectives of nurses and midwives on the causes of maternal mortality and what can be done to improve the situation

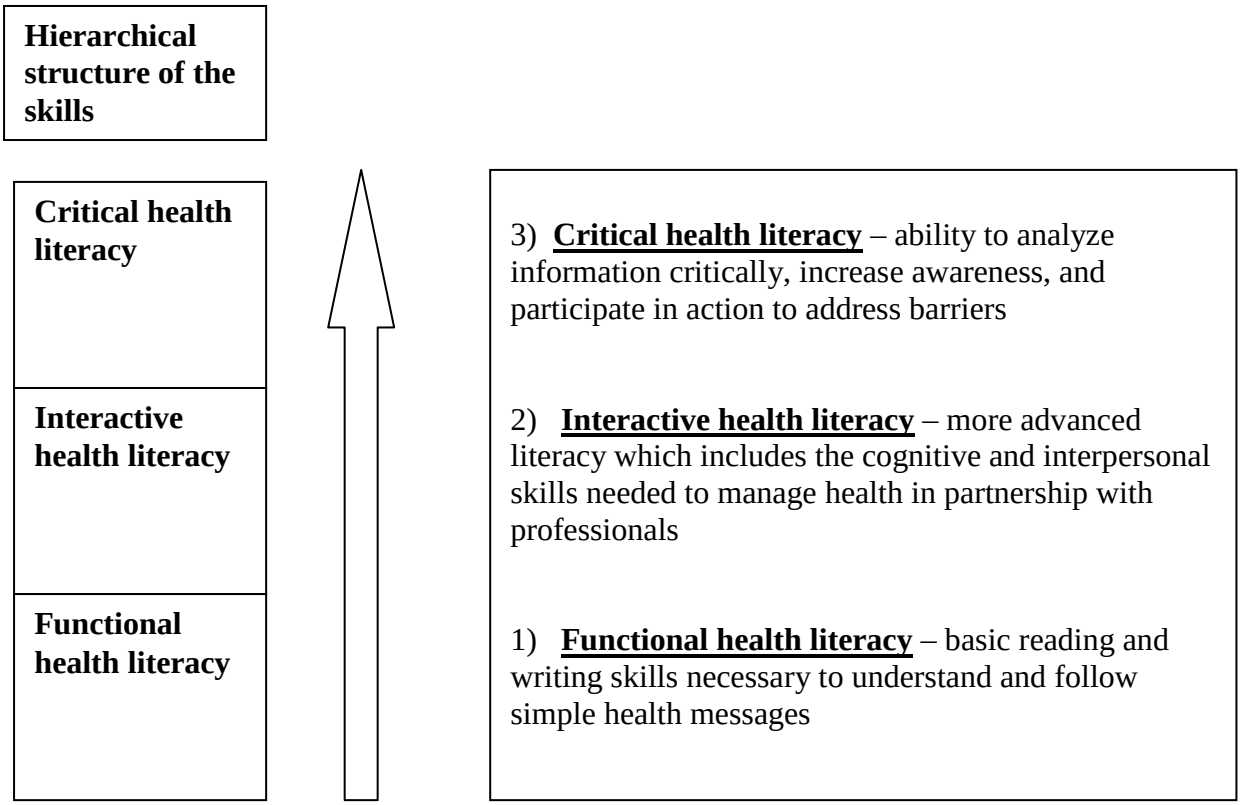
1.4 About the researcher

This study was designed and developed by myself and I was supervised by Dr. Ingrid Barikmo of Akershus University College here in Norway and Dr. Alexander A. Kalimbira of Bunda College in Malawi. I was inspired to conduct this study after taking a course about health literacy and health communication. During this course, it was discussed that health communication has the ability to empower individuals to take control of their health. In Malawi there are numerous projects on empowerment in decision making, gender and human rights issues but I had not come across it in the field of health so explicitly.

2.0 THEORY

Several studies have been conducted to investigate various aspects of health literacy and linking them to general health as well as maternal health (Mayumi, Keiko, & Takehito, 2005; Renkert & Nutbeam, 2001; Smith, 2008; Zanconato, Msolomba, Guarenti, & Franchi, 2006). Other studies have also looked at antenatal care service delivery and the challenges encountered (Mathole, Lindmark, Majoko, & Ahlberg, 2004; Mrisho, et al., 2009). These studies have concluded that if people have low health literacy levels, their quality of life is poor and it is associated with chronic illnesses but if steps are made towards improving health literacy in individuals, their quality of life significantly improves. These studies also illustrate that poor service delivery in ANC services can affect the perceptions of the pregnant women towards the service (Malata, et al., 2007; Mathole, et al., 2004; Mayumi, et al., 2005; Mrisho, et al., 2009; Renkert & Nutbeam, 2001; Smith, 2008).

2.1 Health Promotion Model



Source: Developed by Petterson (2008) from Nutbeam (1999)

Figure 3 Health Promotion Model

The model in figure 3 categorises health literacy in three levels and these are the functional, interactive and critical levels. At the functional level, health literacy is associated with the simplest reading and writing skills and these should help the individual to understand and use simple health messages. The interactive level is more advanced as it is associated with how an individual processes their thoughts as well as their personal experiences and uses them to make sense of their health situations in consultation with health personnel. The highest level is the critical level where an individual is able to comprehend, evaluate and make use of health information and its associated concepts to make decisions concerning their health. These decisions should be those that promote better quality of life and health.

It is reported that health literacy is dependent upon levels of fundamental literacy and cognitive development. In such a case, an individual who does not have developed skills in reading and writing will be exposed to less health education and will poses less developed skills with which they can act on information that they may receive. It is also important to note that ability to read and write are not a guarantee that an individual will respond in a desirable way when presented with health education and communication activities (Nutbeam, 1999). It has also been reported that if one works towards raising critical consciousness of individuals with little or no reading skills, these individuals can undertake activities and achieve similar outcomes to what is described as the critical level of health literacy (Wallerstein & Bernstein, 1988).

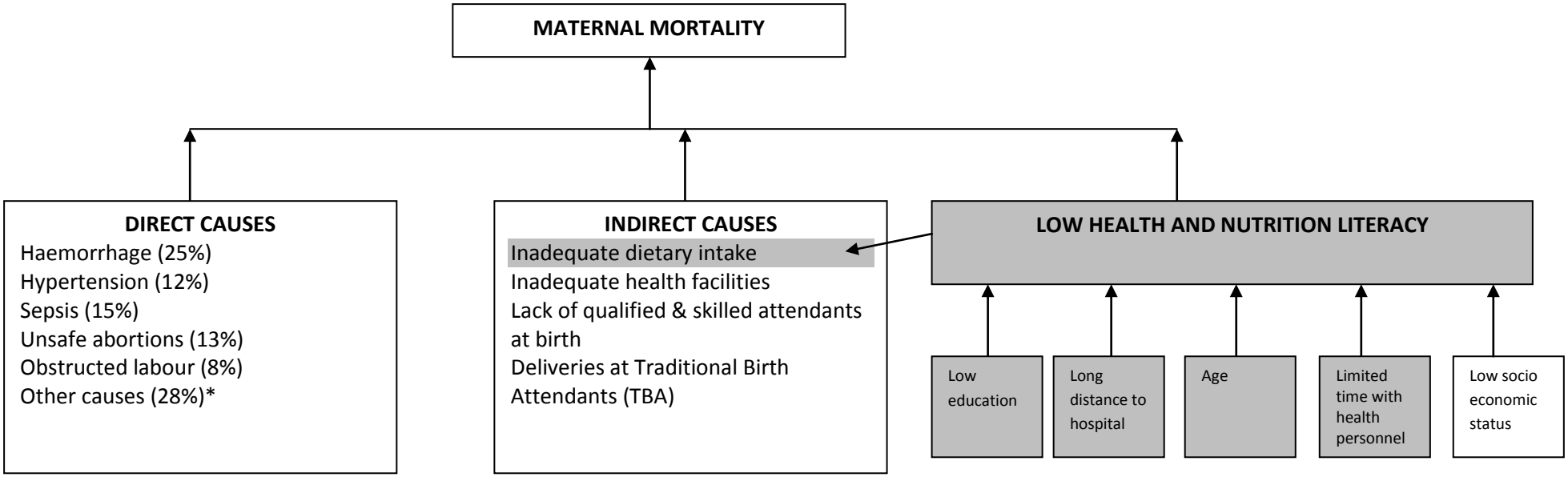
Nutrition literacy can be defined as the degree to which individuals can obtain, process and understand basic nutrition information and services needed to make appropriate dietary decisions (Silk, et al., 2008). Individuals with lower incomes and less education are also more likely to have poorer diets than those individuals with more income and education (Silk, et al., 2008). With reference to the health promotion model (Figure 3), nutrition literacy can be categorised into three levels and these include functional, interactive and critical levels. At the functional level, the focus is on reading and understanding basic nutrition information. At the interactive level, the focus is on gaining access to nutrition information, how to communicate with nutrition experts (nutritionists) and using this information in their day to day life. The critical level is characterised with evaluating nutrition messages and taking personal as well as community actions regarding food and nutrition issues (Pettersen, 2008).

Dietary diversity (DD) is defined as the number of unique foods consumed over a given period of time (Hoddinot & Yohannes, 2002). Individual dietary diversity (IDD) is used to assess nutrient adequacy of diets (FAO, 2007). Dietary diversity is measured by summing the number of foods or food groups consumed over a reference period (Hoddinot & Yohannes, 2002). Other studies have highlighted the link between dietary diversity and nutrient adequacy (Arimond, Torheim, Weismann, Joseph, & Carriquiry, 2008; Torheim, et al., 2004). A statistically significant association was found between level of maternal education and dietary diversity in Malawi with a stronger association between dietary diversity and height for age z-score (HAZ) of children from women with no education and women with secondary education as compared to women with some primary education (Arimond & Ruel, 2004).

2.2 Model Development

A model (figure 4) was developed to explore if health and nutrition literacy can contribute towards a reduction in maternal mortality. This model briefly outlines the direct and related causes of maternal mortality in Malawi (Geubbels, 2006). Focusing on the related causes, low levels of education and low health and nutrition literacy levels have been highlighted as some of the factors that could influence maternal mortality. This study tried to investigate if health communication is done using the health promotion approach during antenatal sessions. This could result into health literacy which could have the following characteristics; ability to read and write so that the woman can read health and nutrition information. The other attribute focuses on the ability to interact with health personnel so that the women can properly manage their health. Another attribute focuses on the ability to analyse information provided so as to take actions and make decisions that promote their health and nutrition status.

MODEL DEVELOPED FOR THIS RESEARCH STUDY



*Other direct causes include anaemia, malaria, HIV/AIDS, heart disease

KEY: Areas of focus for the study

Figure 4 Model developed to understand research assumptions

3.0 METHODOLOGY

This research was conducted in order to find out which health and nutrition messages were given to pregnant women and how these messages were received. The study also wanted to find out if the messages that were received were being used and if the messages resulted into any behaviour changes among the pregnant women.

3.1 Study Design

The study was designed as cross sectional and a descriptive approach was used to investigate the characteristics of the study population and how these characteristics were influencing behaviour.

3.2 Study Questionnaires

Two structured questionnaires (appendix I and II) had been developed for the data collection, one for pregnant women and the other one was for the nurses. The questionnaire for the pregnant women was translated into the local language (Chichewa) to ensure consistency in the way the questions were asked to the women. This made the questionnaire more suited to the local context (See appendix III). To ensure that the questionnaire had been properly translated two different individuals were used to translate it; one translated it from English to Chichewa and another from Chichewa to English to check for inconsistencies. The other questionnaire was administered to the nurses that attended to these pregnant women when they came for their routine check up. The questionnaires were pretested at Likuni Mission Hospital to check that the questions were understood by the targeted respondents. This was a beneficial exercise as it allowed for some modifications to be made to the questionnaires before they were finally administered to the pregnant women and nurses at Bwaila Hospital.

3.3 Variables Measured

The Chichewa translated questionnaire (appendix III) was used to interview the pregnant women. Below are the variables that were measured using this questionnaire.

3.3.1 Demographic characteristics

All the pregnant women were asked about their age, marital status, occupation as well as that of their spouse if they were married. The women were asked about their family situation including other individuals in their households and number of dependants. These were not

their biological children. The women were asked about the number of individuals in their homes who were engaged in some form of economic activity. The women were also asked about their religion, education level and the places where they stayed.

3.3.2 Personal Medical History

The women were asked about their general health before becoming pregnant and while they were pregnant. They were also asked if they had any of the following illnesses: tuberculosis, asthma, hypertension, diabetes, epilepsy, renal diseases, fistula repair or any other illness in the year before the study. The women were also asked if they had any major operation and for those responded yes they were asked to explain why they were operated. The pregnant women were also asked about any major illness that runs in their family and for those that responded yes they were asked to mention what kind of illness.

3.3.3 Current Obstetric History

The women were asked about some of their vital statistics such as weight, blood pressure and their height. They were also asked about their reproductive health and these included recalling their last monthly period, expected day of delivery and how far along they were. They were also asked about when they had made their first antenatal visit and the reason why they came at the mentioned time.

The women were asked about tetanus immunisation, if they had received it or not and those who had not received had to explain further. The women were also asked if they knew their blood group or not and to state what it was if they knew. The women were asked about receiving iron and folate tablets and how many they were taking and for those not taking had to explain why.

The women were also asked about contraceptive use before becoming pregnant, method used, challenges with the method. The women were asked if they had an HIV test or not and to give a response for having test or not.

3.3.4 Nutrition Knowledge

The women were assessed on their eating patterns and nutrition knowledge. The women were asked about their general eating patterns and a detailed 24 hour dietary recall without amounts

was done to assess food intake and this was used to determine dietary diversity following the FAO guidelines (FAO, 2007). The foods were categorised into 14 food groups and the groups were as follows: cereals; vitamin A rich vegetables and tubers; white tubers; dark green leafy vegetables; other vegetables; vitamin A rich fruits; other fruits; organ meats; flesh meat; eggs; fish; legumes, nuts and seeds; milk; oils and fats. The women were assessed on their knowledge of the six food groups which are promoted in Malawi and these include staples, animal foods, legumes, vegetables, fruits, fats and oils and the benefits of eating from all six food groups. The women were also asked if they knew the micronutrients iron, vitamin A and iodine and their dietary sources.

The women were asked about other foods that they heard that pregnant women should not eat and the reasons. The women were also asked if they had any cravings and for which foods. They were also asked if they had problems with food intake and what those problems were.

The women were asked about any new health problems due to the pregnancy and if they had brought it to the attention of the health personnel during their routine check-up and why they did so or did not do so. The women were asked about other routine antenatal visits made and other hospital visits made if ill. The women were asked to recall routine services accessed during antenatal sessions.

3.3.5 Information provision and use

The women were asked to recall information received during antenatal sessions and if it had been beneficial or had helped them understand what their bodies were going through or had made them change their lifestyle and their reasons for each response. The women were asked about adequacy of the time spent with the nurses and to give a reason for their response. The women were asked about any unaddressed issues they might have and to give a reason for their response.

The women were asked about what other information they would like to have from the hospital during antenatal sessions. They were also asked if coming to the health facility had helped to cope with any anxieties they might have had and to give a reason for their answer.

The women were asked if they had looked for other health information, from where they got the information and if it had been beneficial or not.
The women were asked their opinion as to why other pregnant women do not attend antenatal sessions and about what health personnel and government could do to encourage pregnant women to attend antenatal sessions and reduce maternal mortality.

3.4 Nurses perspectives

The second questionnaire (appendix II) was given to the nurses that attended to the women. This questionnaire mostly had closed questions with precategorised responses for the nurses to tick the response that best answered a particular question. This was done to save them time and to not disturb their work schedule.

3.4.1 Demographics

The nurses were asked about their age, marital status, religion, education level and place where they stayed.

3.4.2 Service delivery

The nurses were asked about when they became nurses and then qualified as midwives.

3.4.2.1 Challenges faced with work

They were asked challenges they faced in their work and about what could be done to improve them. They were asked about the number of women they attended to in a day, week and month.

3.4.2.2 Routine antenatal care service

They were asked about their opinion on why women attend antenatal sessions and how many sessions a pregnant woman is supposed to attend before delivery. The nurses were asked about what routine things they did during the antenatal sessions and what they would do if a woman was not progressing well, or was anaemic, or was malnourished. The nurses were also asked to rate a range of statements on scale of importance of 1 to 5 with 1 being not at all in agreement up to 5 being extremely agree. The nurses were asked about information provided to women post delivery. The nurses were also asked what they and government could do to reduce maternal mortality.

3.5 Sample Inclusion Criteria

In this study, purposive sampling was used. Purposive sampling allows a researcher to choose participants to be included in the study based on knowledge of specific characteristics of the sample that would best represent the population (Berg, 2004). This method of sampling also enables a researcher to use their own judgement to select cases that will assist in answering the research question and meet the objectives. The sample selected is usually small but informative in relation to the cases in the study (Neuman, 2000).

In this study, a total of 60 first time pregnant women who were in their third trimester were sampled. These women were chosen based on the assumption that since they would be giving birth for the first time they would be paying more attention to the information that they were given during the antenatal sessions as they came for their routine visits and that this would facilitate assessing what effect these health talks were having on their lives.

A total of 10 nurses who attend to the women during the antenatal visits were also interviewed. Their inclusion was based on the fact that they are the ones imparting health and nutrition information to the pregnant women and are therefore responsible for making the women health and nutrition literate. Their views on the maternal health situation were therefore regarded as important.

3.6 Data Collection

Bwaila hospital's antenatal clinic conducts health talks for an hour every morning focusing on HIV infection and prevention, family planning, hygiene and sanitation, communicable and non communicable diseases and nutrition. There is no specific structure on when a specific topic is presented but it depends on the plan of the nurse delivering the talk. Only women who attend these health talks are allowed to proceed for further health assessment.

After the health talks, the pregnant women proceeded to undergo their routine check-up focusing on their weight, blood pressure and physical examination. For those making their first visit, before any health assessment is done, they were supposed to undergo mandatory HIV test and related counselling. After the test, they proceeded with the routine health checks and assessment. Then all the women were entered into a register and given a date on which to

make a subsequent visit. It was at this point I recruited the women to participate in the research and each interview lasted on average about thirty minutes.

3.7 Project plan

ACTIVITY/MONTH	Aug 2009	Sept 2009	Oct 2009	Nov 2009	Dec 2009	Jan 2010	Feb 2010	Mar 2010	April 2010	May 2010	June 2010	July 2010	Aug 2010	COMMENTS
Corrections to proposal														
Translating questionnaires														
Ethical clearance from the Ministry of Health														Seeking authorisation from Ministry of Health and District Health Officer (DHO)
Arranging for pre test														Meeting Hospital Administrator & Matron for Likuni Mission hospital
Pre test/Pilot														Likuni Mission hospital
Correcting questionnaire after pre test														
Setting up data collection schedule														Meeting with DHO and Matron for Bwaila hospital
Printing questionnaires														
Developed data entry sheet														
Data collection														
Data cleaning and data entry														
Data analysis														
Report writing														

Note: The data for this research was collected in two phases: November 2009 and March 2010. This was due to illness of my son who needed extensive medical attention and care.

3.8 Linking research objectives to the variables that were measured

The table below shows how the objectives of the study were related to the questions which the women were asked.

Table 1 Research objectives linked to the questions

Objective	Question number in Appendix I or III
• To investigate views of pregnant women towards antenatal care services	50 to 64
• To explore challenges first time pregnant women face in seeking health services	44 to 49
• To investigate levels of knowledge about health and nutrition among pregnant women	10 to 31 tackled health issues and 32 to 43 tackled nutrition issues
• To investigate the nutritional quality of the pregnant women's diets	33 on 24 Hour dietary recall
• To find out challenges nurses face in delivering quality antenatal care	Questions number 9, 10 and 11 (**appendix II**)
• To find out perspectives of nurses and midwives on the causes of maternal mortality	All questions in questionnaire marked as **appendix II**

3.9 Data Analysis

Each day after data collection, the questionnaires were checked, cleaned and entered into a data base that was created in excel. The data base was exported to SPSS version 18 where the analysis was done. Simple descriptive analysis was done and the following non-parametric tests were used for further analysis: Chi square (χ^2), correlation tests using Spearman rho (ρ), Mann-Whitney **U** and Kruskal-Wallis **H** Tests. Non-parametric tests were chosen because they have less strict requirements on adequacy of sample size and the scale of measurement can be either categorical or ordinal (Pett, 1997). Nonparametric tests also use the median and not the mean in the analysis especially when the data is skewed (Gibbons, 1993). The χ^2 was used to test for significant differences between categorical variables. The correlation was used to describe strength and direction of linear relationship between two variables. The Mann-Whitney Test was used to test for differences between two groups of variables. Kruskal-Wallis Test was used to test for differences on more than two groups of independent variables.

3.10 Ethical Considerations

The study was cleared and approved by the Ministry of Health's ethical clearance committee and the District Health Officer for Lilongwe district. Before each interview, every woman was told about the aims of the research and asked for her consent to participate. Each woman was taken to a separate spot where she would be comfortably interviewed. On the questionnaires, no names were recorded and the information that was collected would not be traced back to the participants thus ensuring them of remaining anonymous.

NB: Ethical clearance can take a few weeks or months depending on the nature of the study.

4.0 RESULTS

This chapter will describe the findings from the study starting with the pregnant women where focus will be on their demographic characteristics, obstetric situation, accessing and utilisation of antenatal care services, nutrition knowledge and information provided. The latter part of the results section focuses on the nurses' perspective where their demographic characteristics, challenges faced in their work, perspectives on causes of maternal mortality and their suggestions on what could be done to improve quality of service that is provided.

4.1 DEMOGRAPHICS

Table 2 Demographic characteristics of the pregnant women

Demographic characteristic		n	%
AGE:	15-19	32	53
	20-24	22	37
	25-29	6	10
MARITAL STATUS:	Single	7	12
	Married	53	88
OCCUPATION:	Business lady	4	7
	Unemployed	56	93
FAMILY SITUATION (Adults):	1 Adult	2	3
	2 Adults	47	78
	3 Adults	6	10
	4 Adults	5	8
(Other children):	No children	34	57
	1-4 children	22	37
	5-8 children	4	7
RELIGION:	Christian	49	82
	Muslim	11	18
EDUCATION:	Never been to school	1	2
	Junior primary (1 – 4 years)	7	12
	Senior primary (5 – 8 years)	20	33
	Junior secondary (9 – 10 years	17	28
	Senior secondary(11 – 12 years)	14	23
	Tertiary	1	2
DISTANCE TO HOSPITAL(km):	1-5	18	30
	6-10	23	38
	11-15	6	10
	16-20	12	20
	21-25	1	2
OCCUPATION (SPOUSE):	No spouse	7	12
	Businessman	21	35
	Other forms of employment	32	53
ECONOMIC ACTIVITY:	1 Adult	51	85
	2 Adults	8	18
	3 Adults	1	2

From table 2, it can be observed that 53% of the women were in the 15 to 19 years age category and 88% of the women were married. Most of the women (93%) were unemployed but had a spouse who was employed (88%). It can also be observed that 78% of the women

came from households that had two adults managing the home and 57% were staying without other children in the household. Most of the households (85%) where these women were coming from had only one individual engaged in some form of economic activity. Most of the women (82%) were of the Christian faith. Half of the women (53%) had junior secondary education or higher. The study showed that the hospital is serving women that are within 1 to 25 km radius, but more than half (68%) of the women were living within 1 to 10 km radius from the hospital. Four pregnant women were business women and they lived further away from the hospital

The relationships between the demographic variables were investigated using Spearman's rho. There was a significant correlation between age of the pregnant woman and her education level with $\rho = 0.46$, $p = 0.000$. The older pregnant women had been more years in school than the young ones. Age was also correlated with the occupation of the pregnant woman's spouse with $\rho = 0.28$, $p = 0.03$ with more of the older pregnant women having a spouse who was employed than the younger ones.

There was a negative but significant correlation between a pregnant woman's occupation and the distance to the hospital ($\rho = -0.30$, $p = 0.018$). Those pregnant women who were employed lived further from the hospital than the others. There was also a negative significant correlation between a pregnant woman's occupation and having other adults engaged in some economic activity ($\rho = -0.44$, $p = 0.000$). The pregnant women that were employed came from households that had other adults who were engaged in some economic activity.

The occupation of the spouse of the pregnant woman was negatively correlated to the number of kids in the household ($\rho = -0.43$, $p = 0.001$). The households where the spouses worked had less number of other children.

4.2 OBSTETRIC SITUATION

Table 3 Indicators on current obstetric situation for the pregnant women

Indicator		n	%
Weight before pregnancy (kg):	Less than 44	1	2
	45 – 49	2	3
	60 – 64	3	5
	65 – 69	2	3
	Above 70	1	2
	Don't know	51	85
Current weight (kg):	less than 44	1	2
	45 – 49	9	15
	50 – 54	12	20
	55 – 59	15	25
	60 – 64	13	22
	65 – 69	5	8
	70 – 75	2	3
	Above 76	3	5
Blood pressure before pregnancy : (Self reported)	Normal	2	3
	Varied	1	2
	Don't know	57	95
Current blood pressure: (Self reported)	Normal	58	96
	Varied	1	2
	Don't know	1	2
Knows blood group	Yes	3	5
	No	57	95
Height:	Don't know	60	100
Stage of pregnancy (months):	7	41	68
	8	13	22
	9	6	10

Table 3 shows the situation surrounding the period before and during the pregnancy. It can be seen that 85% of the women did not know their weight before becoming pregnant but most of them (82%) were within 45 to 64kg of weight during their third trimester. Most of the women (95%) did not know their blood pressure before becoming pregnant and 96% of them had normal blood pressure in their third trimester. The majority of the women (95%) did not know their blood group. Only 5% knew their blood group and these were O- (n=2) and AB (n=1). None of the women knew their height.

A Kruskal-Wallis test revealed a significant difference in knowing their blood group across the ages (Gp 1, n=32: 15 – 19 years, Gp 2, n=22: 20 – 24 years, Gp 3, n=6: 25 – 29 years), $\chi^2(2, n=60) = 11.64$, $p = 0.003$. The older women had a higher mean rank than the others meaning that the older women were more likely to know their blood group than the younger women.

A Mann-Whitney test revealed a significant difference in knowledge of the blood group between those aged 15 – 19 years and 25 – 29 years, $U = 64$, $z = -3.31$, $p = 0.001$, $r = 0.4$.

A Kruskal-Wallis test revealed no significant difference between knowing their weight before being pregnant or their current weight or knowing their blood pressure before being pregnant or current pressure and their age, education level or distance to the hospital.

4.2.1 Other reported illness

The women were asked if they had been ill during the previous year before they became pregnant. Most of the women (85%) said that they had not been sick while 15% had been sick and the illnesses included malaria (10%), stomach (3%) and heart problems (2%). Kruskal-Wallis test revealed no significant differences between other reported illness and age, education level or distance to the hospital.

The women were asked if they had gone to the hospital other times than their routine visits due to illness. The majority of the women (85%) had not gone to the hospital for other illnesses while 15% had been to the hospital and the illnesses reported were malaria (5%), headache (3%), high blood pressure (2%), stomach pain (2%), thrush (2%) and cough (2%). A Kruskal-Wallis test revealed no significant difference between other hospital visits due to illness and age, education level, number of other antenatal visits or distance to the hospital.

The women were also asked if they were facing new health problems when they were pregnant. About half of the women (52%) said that they had new health problems related to their pregnancy. Some of the illnesses mentioned included body pains (19%), stomach aches (19%), heart palpitations (10%), headaches (16%), legs swelling (7%), backache (3%), heartburn (3%), and weight gain (3%). A Kruskal-Wallis test revealed no significant difference between reporting to have had new health problems and age, education level, number of other antenatal visits or distance to the hospital.

The women were asked if they had brought these problems that they had mentioned to the attention of the health personnel during their routine check-up. Slightly more than half (55%) of the women that said that they had health problems did not mention them to the health personnel that were attending to them. The table 4 shows the reasons why the women said they did not mention their problem to health personnel.

A Kruskal-Wallis test revealed no significant difference between mentioning the new health problem to the health personnel during routine visits and age, education level, number of other antenatal visits or distance to the hospital.

Table 4 Reasons provided for not mentioning problem to health personnel

Reason for not mentioning problem	n	%
Forgot	5	29
Nurses were busy	4	24
Was not asked	3	18
Knows it is related to pregnancy	2	12
Was advised by friends to rest	1	6
Thought it would be covered in health talks	1	6
Don't know	1	6
TOTAL	17	100

Table 4 above shows that some of the pregnant women (29%) said that they forgot to mention the health problem to the health personnel. Other pregnant women said the nurses were busy (24%) and they were not asked (18%). A Kruskal-Wallis test revealed no significant difference between not mentioning the new health problem to the health personnel during routine visits with age, education level, number of other antenatal visits or distance to the hospital.

Less than half (48%) of the pregnant women said that they had new health problems and they had mentioned them to the health personnel. Table 5 below shows that some of the women were referred for further treatment (36%) and others were given antimalarials (21%). Some women (14%) also said that they were not given any advice despite mentioning the health problem while others were reassured that situation would improve with time (14%).

Table 5 What happened after reporting health problem to health personnel

What happened after mentioning problem	n	%
Referred for further treatment	5	36
Was given antimalarials	3	21
Was told it would improve	2	14
Was not given any advice	2	14
Advised on the signs of labour	1	7
Was given prescription to buy medication	1	7

A Kruskal-Wallis test revealed no significant difference between what happened after mentioning the new health problem to the health personnel during routine visits and age, education level, number of other antenatal visits or distance to the hospital.

4.3 ANTENATAL SERVICES ACCESSED

Bwaila hospital has an antenatal clinic that offers a number of services that every pregnant woman accessing their services should be provided with. The women were asked which month of their pregnancy they made their first antenatal visit.

4.3.1 First Antenatal visit

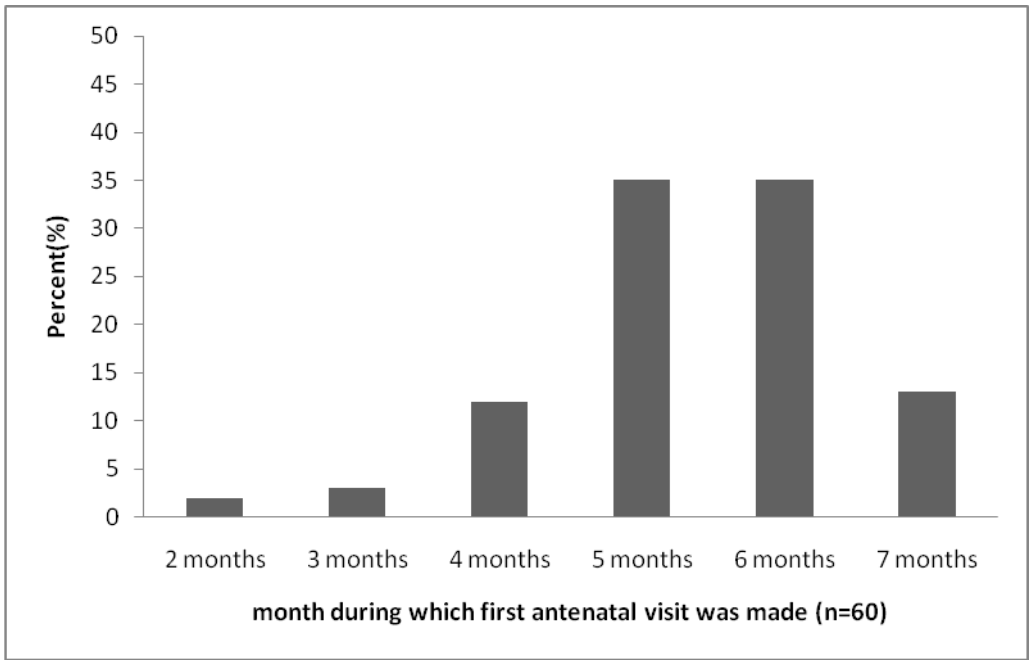


Figure 5 Illustrating the month of the women's pregnancy when she first had her antenatal visit

From figure 5 it can be seen that 70% of the women said that they had made their first visit during their fifth and sixth months of pregnancy and 13% said they came in the seventh month. Kruskal-Wallis tests showed that there were no significant differences between when first visit was made and age, education level, distance to the hospital or occupation of the woman or the spouse.

The women were asked about the reasons why they came at the mentioned time. Table 6 shows some of the reasons that were given to explain why they came at the time they had mentioned.

Table 6 Reasons explaining why first visit was made at the mentioned time

Reason for first visit	n	%
Wanted to know how she is	7	12
Wanted to start early	4	7
Wanted to make sure she was pregnant	7	12
It was right time to come	5	8
Was frequently ill	1	2
To get tested (HIV)	1	2
Was told by friends	5	8
Stays very far	1	2
Had no one to come with	1	2
Afraid to tell parents	1	2
Felt baby move	1	2
Did not know appropriate time	3	5
No reason given	23	38
Total	60	100

From table 6, it can be seen that 38% of the women said they had no reason to justify why they came at the time they mentioned. However, 12% of the women said that they wanted to know how she was and another 12% wanted to make sure she was pregnant. Another 8% said it was the right time to come and these women came between their fourth and sixth month of the pregnancy. Another 8% said they were told by their friends to go for antenatal.

A Kruskal-Wallis test revealed a significant difference in reason why first visit was made and the various distances to the hospital which are (Gp 1, n=18:1-5 km, Gp 2, n=23: 6-10 km, Gp 3, n=6: 11-15 km, Gp 4, n=12: 16-20 km, Gp 5, n=1: 21-25), $\chi^2(4, n=60)= 9.59$, p=0.048.

A Mann-Whitney test revealed a significant difference in reason why first visit was made among pregnant women living between distances 1 to 5 km (Md=4.5, n=18) and 16 to 20 km (Md=6, n=12), U=49, z = -2.61, p=0.009, r=0.34. This test also revealed a significant difference among pregnant women living between distances 6 to 10 km (Md=5, n=23) and 16 to 20 km (Md=6, n=12), U=69.5, z = -2.47, p=0.014, r=0.42.

4.3.2 Other routine antenatal visits

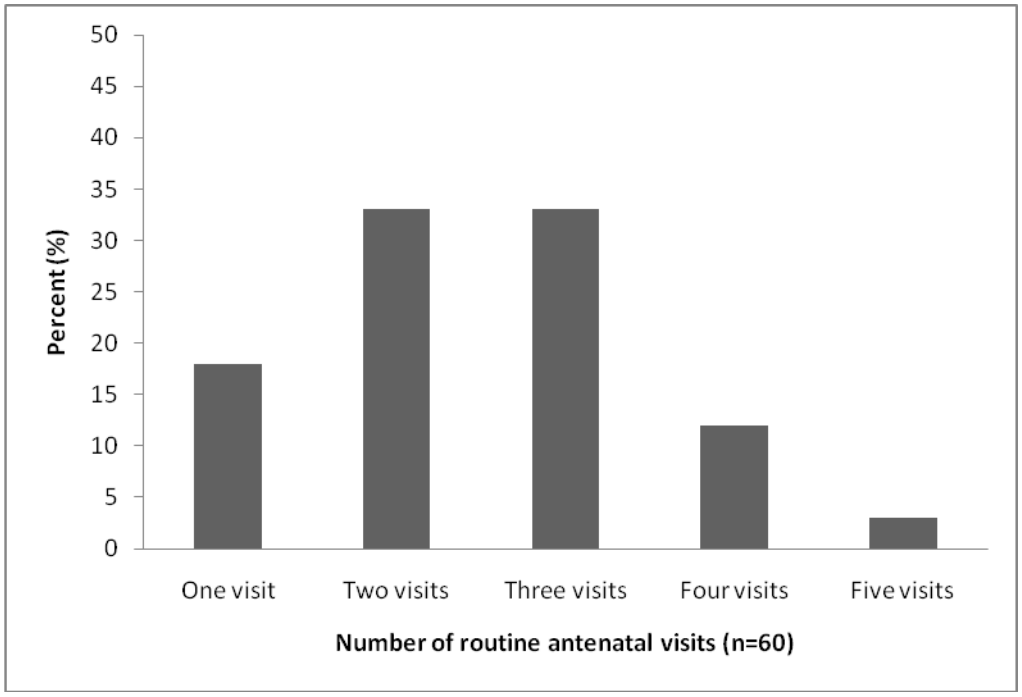


Figure 6 Showing number of other routine antenatal visits that were made

The figure 6 above shows that 66% of the women had made two to three routine visits. Another 18% of the women said they had made only one visit.

A Kruskal-Wallis test revealed a significant difference in number of other routine visits made across the three age groups (Gp 1, n= 32: 15-19 years, Gp 2, n= 22: 20-24 years and Gp 3, n=6: 25-29 years), $\chi^2(2, n=60) = 8.61$, $p = 0.013$. The older age group (25-29 years) had a higher median score (Md = 3.5) than the other two groups which both had median values of 2. A Mann-Whitney test revealed a significant difference in number of other routine visits between the women aged 15-19 years (Md = 2, n = 32) and 25-29 years (Md = 3.5, n=6), $U = 36.50$, $z = -2.47$, $p = 0.014$, $r=0.40$. This test was also significant between women aged 20 to 24 years (Md = 2, n=22) and 25 to 29 years (Md = 3.5, n=6), $U = 14.5$, $z = -3.03$, $p = 0.002$, $r=0.57$. This shows that the older pregnant women (25 to 29 years) made more antenatal visits as compared to the other younger pregnant women.

Tetanus

All the women in the study had received tetanus vaccinations.

Iron and Folate supplements

Most of the women (93%) said they were taking iron and folate supplements and those that did not (7%) said it was because they had not received the supplements. Those who did not receive the supplements were aged 20 to 24 (n=3) and 25 to 29 (n=1) and had been through senior primary (n=1) and senior secondary school (n=3) and lived with 1 to 10 km from the hospital and had made two (n=1) and three (n=3) routine antenatal visits.

HIV testing (Prevention of Mother To Child Transmission of HIV-PMTCT)

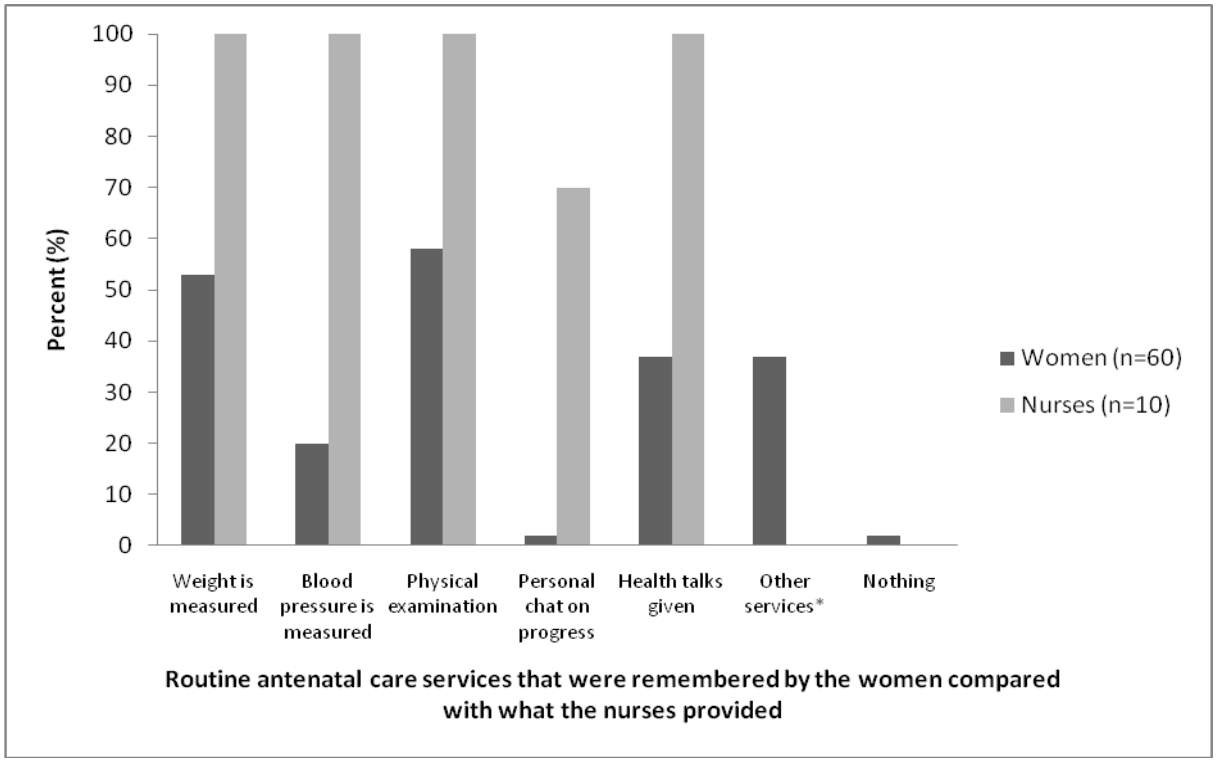
It is government policy that all pregnant women accessing antenatal service from its hospitals should be tested for HIV. All the women in this study said they had been tested for HIV.

Family planning before becoming pregnant

All the women in this study said they had never used any family planning methods.

4.3.3 Routine ANC services accessed (remembered)

The women were asked about the routine things that they accessed every time they came for antenatal visits.



*Other services provided included HIV testing and immunisations

Figure 7 Showing the things that women recalled compared with what the nurses said they provided

Figure 7 shows that all the nurses (100%) said that they measured weight and blood pressure as well as physically examining the women and conducting health talks. The nurses also said that they had personal chats with the women. In comparison, 58% of the women said they were physically examined on the belly and another 53% said they had their weight measured. The women also mentioned other services that were provided and these included HIV testing and immunizations. Some women (37%) also said that they had attended health talks. Despite the fact that 93% of the pregnant women received iron supplements, only 7% mentioned it as part of routine service provided. These were pregnant women who were between 15 to 19 years of age and were living within 1 to 5 km from the hospital.

A Kruskal-Wallis test revealed no significant difference between routine ANC services remembered by the pregnant women and age, or number of routine visits made, or education level of the pregnant women or the woman's employment status.

4.3.4 Quality of ANC visits

The women were asked if they had adequate time with the nurses or midwives when they come for their routine visits. The majority of the women (73%) said that they had adequate time with the nurses or midwives and 27% said they did not have adequate time. The women were asked to explain why they said they had adequate time or not with the nurses or midwives.

A Kruskal-Wallis test revealed a significant difference in having adequate time with the nurses and the women's education levels (Gp 1, n = 1: Never been to school, Gp 2, n = 7: Junior primary school, Gp 3, n = 20: Senior primary school, Gp 4, n = 17: Junior Secondary school, Gp 5, n = 14: Senior secondary school, Gp 6, n = 1: Tertiary education level, $\chi^2(5, n=60) = 13.17$, $p = 0.022$. Those who had never been to school and those who had been to senior primary, junior secondary and senior secondary had a higher median score (Md = 1) than those who had been through junior primary and tertiary levels of education (Md=0). This means that the women that viewed the time as adequate were more likely to have been through senior primary, junior secondary, senior secondary or had never been to school.

A Mann-Whitney test revealed significant difference in adequacy of time with the women and nurses/midwives among the women who had been through junior primary school (Md = 0, n = 7) and senior primary school (Md = 1, n = 20), $U = 27$, $z = -3.13$, $p = 0.002$. This shows that

those women who had been through senior primary school were more likely to view the time as adequate as compared to those who had been through junior primary school.

Table 7 Reasons mentioned for having adequate time or not

Adequate time	Reason for answer	n	%
Yes (n = 44)	Given appropriate advice	1	2
	Knows what she is going through	4	9
	There is time for questions	10	23
	Women are examined properly	2	4
	Nurses are busy	2	4
	No reason given	25	57
	Total	44	100
No (n = 16)	Nurses are busy	7	44
	Waiting time is too long	2	13
	Knows what she is going through	5	33
	Has been here only once	1	6
	No reason given	1	6
	Total	16	100

From table 7, it can be seen that the women that said they had adequate time with the nurses mentioned having time for questions (23%) and that they knew what they were going through (9%). Above half (57%) of the women that said yes gave no reason for their response and these were aged between 15 to 19 years and lived within 1 to 10 km radius from the hospital. The women that said they did not have adequate time said the nurses were busy (44%) and others said they knew what they were going through (33%). Only one woman gave no reason for not having adequate time and she was in the age range of 15 to 19, had been through junior primary school and lived within 1 to 10 km radius from the hospital.

A Mann-Whitney test revealed a significant difference in reasons pregnant women provided for saying that they had adequate time with the nurses among the single (Md = 7, n = 7) and married women (Md = 5, n = 53), $U = 100$, z = -2.07, p = 0.039, r = 0.3. This means those women that were married were more likely to view the time with the nurses as adequate as compared to those who were not married.

The women were also asked if they had unaddressed health issues relating to their pregnancy. Very few (7%) women said they had unaddressed issues while most of them (93%) did not have unaddressed issues. Table 8 shows the reasons that were provided for having unaddressed issues or not. Some of the reasons for having unaddressed issues included not being asked how she was feeling and wanting to know more about labour and delivery. The

reasons for not having unaddressed issues included having no problem in the body (20%) and 78% of the women gave no reason.

Table 8 Reasons why the women said they had unaddressed issues or not

Unaddressed issues		n	%
Yes (n = 4)	Was not asked how she was feeling	1	25
	Wants to know more about labour and delivery	1	25
	Does not know much as its first visit	1	25
	No reason given	1	25
	Total	4	100
No (n = 56)	She has no problem in her body	11	20
	Does not know much as its first visit	1	2
	No reason given	44	78
	Total	56	100

The women that had unaddressed issues had been through primary school (n=3) and secondary school (n=1) and they lived within 1 to 10 km (n=3) and 16 to 20km (n=1) radius from the hospital. The women that did not have unaddressed issues had also been through primary school (n=25) and secondary school (n=31) and they lived within 1 to 10 km (n=38) and 11 to 25 km (n=17) radius from the hospital.

A Kruskal-Wallis test revealed no significant differences in reasons for having or not having unaddressed health issues among the pregnant women and age, education level, marital status or distance to the hospital.

The women were asked about their opinion on why other pregnant women do not access antenatal services.

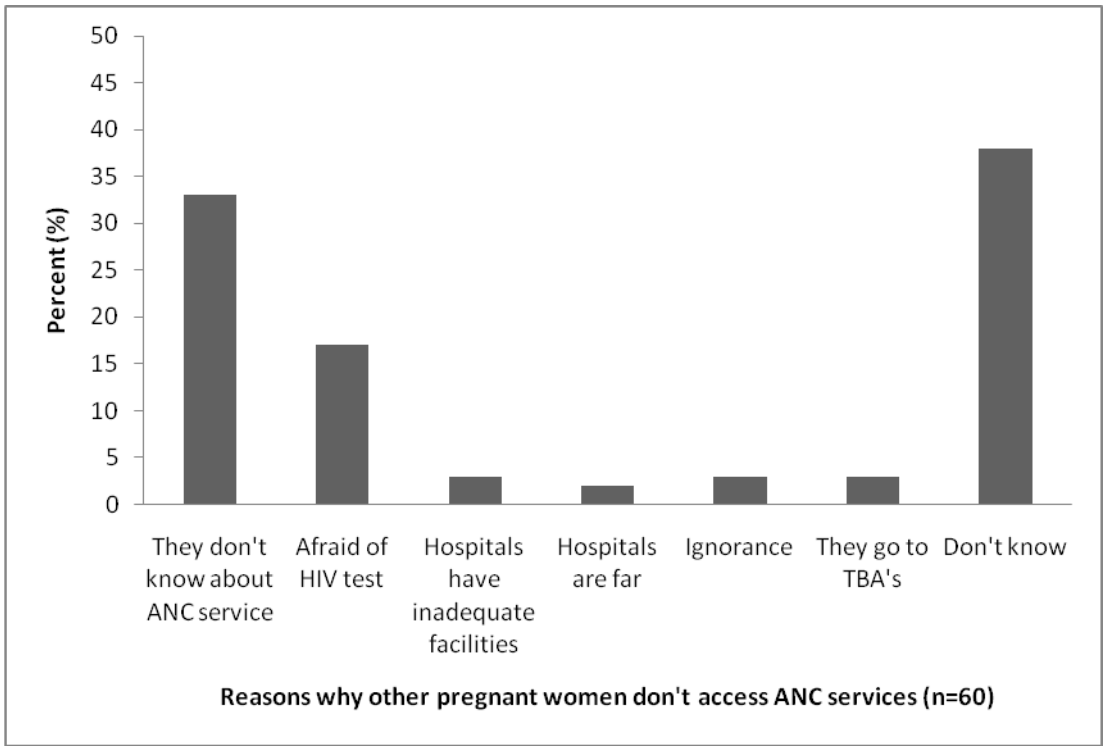


Figure 8 Showing reasons why some pregnant women do not access ANC services

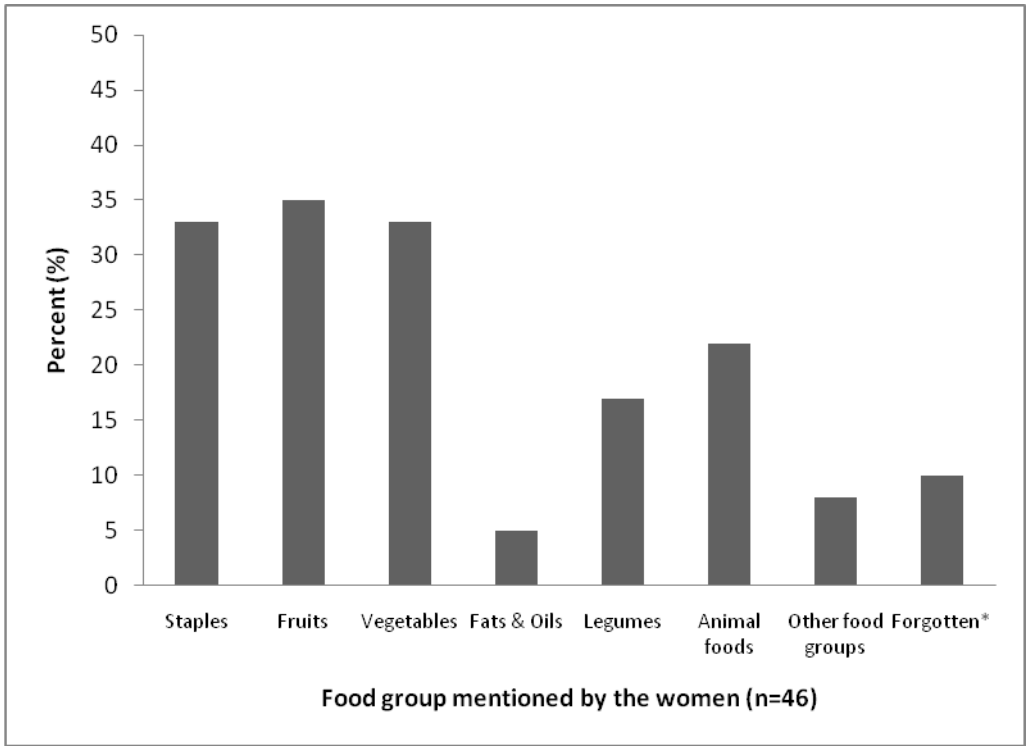
Figure 8 shows that some of the women (38%) said that they did not know why other pregnant women do not come for antenatal care services. It can also be seen that 33% of the women said that other pregnant women do not know about ANC services and another 17% said other pregnant women were afraid of HIV test.

A Kruskal-Wallis test revealed no significant difference in reasons why other pregnant women do not access ANC services and education level, age, distance to hospital or marital status.

4.4 NUTRITION KNOWLEDGE AND PRACTICES

4.4.1 The Six food Groups

The Malawi Government promotes six food groups as part of nutrition education at the ANC centres. The six food groups include staples, fruits, vegetables, fats and oils, animal foods and legumes. The women were asked if they had ever heard about the six food groups. Most of the women (70%) had heard about them.



*Some of the women said that they had heard about the six food groups but said that they could not remember what they were.

Figure 9 Illustrating food groups that the women mentioned as belonging within the six food groups

Figure 9 shows that fruits (35%), vegetables (33%), staples (33%) and animal food group (22%) were mentioned by most of the women that had ever heard about the six food groups. A Kruskal-Wallis test revealed no significant differences between knowledge of the food groups and age, education level, number of antenatal visits or the pregnant woman's occupation.

Further analysis was done to look at the number of groups that were remembered by the women. From figure 10, it can be observed that 30% of the women remembered 3 groups, 23% remembered 2 food groups and 17% remembered 1 food group. None of the women knew all the six food groups.

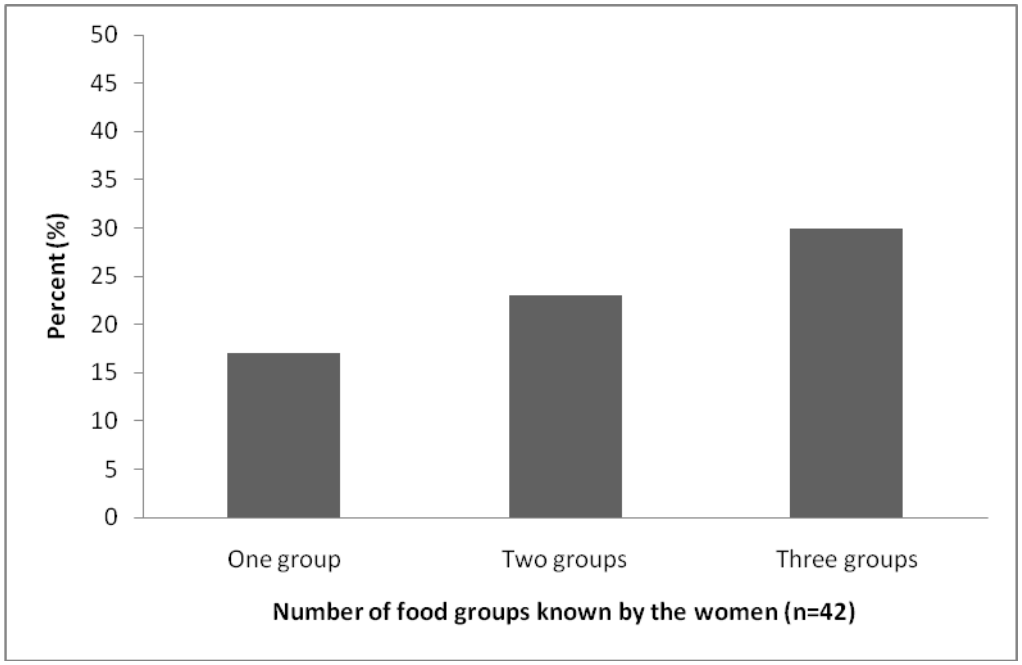


Figure 10 Number of known food groups

A Kruskal-Wallis test revealed a significant difference in number of food groups known across the three different age groups (Gp 1, n = 20: 15 -19 years, Gp 2, n = 17: 20 -24 years, Gp 3, n = 6: 25-29 years), χ^2 (2, n = 42) = 6.4, p = 0.042. The youngest pregnant women had the lowest median score (Md = 2) than the other two age groups which both recorded a higher median score (Md = 3). This shows that the younger women knew less number of food groups than the older women.

A Mann-Whitney test revealed a significant difference in number of food groups known among the pregnant women aged 15 – 19 years (Md = 2, n = 20) and 25 – 29 years (Md = 3, n = 6), U = 19, z = -2.24, p = 0.025, r = 0.35.

The women were told the six food groups and were asked if it is important for pregnant women to eat from all the mentioned groups. All the women agreed that it was important for pregnant women to eat from all the food groups and the reasons are presented in the figure below.

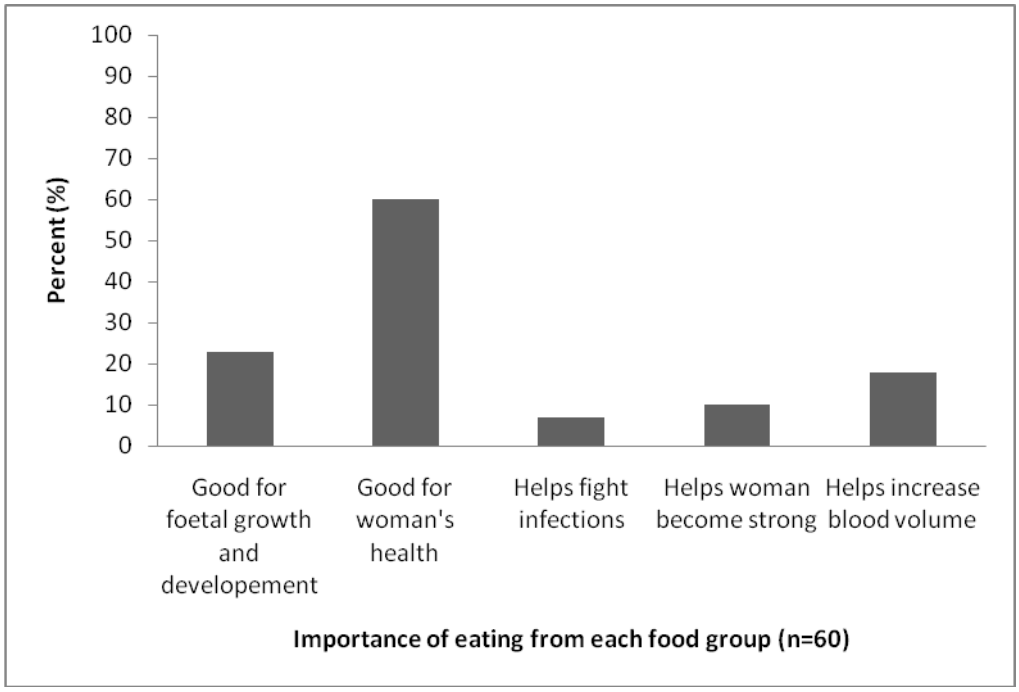


Figure 11 Illustrates importance of eating from each food group

From figure 11, it can be observed that most of the women (60%) said that eating from all food groups is good for a woman's health and for foetal growth and development (23%).

A Kruskal-Wallis test revealed no significant differences between knowledge of the food groups and age, education level, or the pregnant woman's occupation.

4.4.2 Micronutrients of Public Health Concern in Malawi

The Ministry of Health has identified iron, vitamin A and iodine as micronutrients of public health concern. A number of strategies have been put in place to improve intake of these nutrients and one of such strategies is nutrition education in schools and ANC centres. The women were asked if they had heard about iron, vitamin A and iodine and their dietary sources.

The findings in table 9 indicate that iron was known by most of the women (75%) followed by vitamin A (63%) and iodine (28%). The women who said they knew the micronutrients were asked to mention the dietary sources.

Table 9 Micronutrients of public health concern known by the pregnant women

Micronutrient	%	Correct dietary sources
Iron Yes (n=45)	75	Avocado leaves (13%), Meat (2%), Beans (15%), Sweet potato leaves (3%), and Pumpkin leaves (2%)
Vitamin A Yes (n=38)	63	Meat (13%), Milk (5%), Eggs (5%), Oily fish (3%), Pawpaw (3%)
Iodine Yes (n=17)	28	Iodised salt (59%) and fish (12%)

Table 9 also contains the dietary sources for each micronutrient that were correct. Other dietary sources for iron mentioned included vegetables (69%) and fruits (15%) but no specific examples were provided. Other incorrect sources of iron mentioned were orange squash (9%) and fish (2%). Although fish enhance absorption of iron they do not contain iron themselves. Other dietary sources of vitamin A included vegetables (34%), fruits (21%), vegetable relish with groundnut flour (2%) and the incorrect sources mentioned were avocado (5%), beans (3%), glucose (3%) and forgotten (3%). The incorrect dietary sources for iodine included beef (12%), orange squash (12%), liver (6%), vegetables (6%), and beans (6%).

A Kruskal-Wallis test revealed a significant difference in knowledge of dietary sources of iodine with occupation status of the pregnant women among employed pregnant women (n=4) and unemployed pregnant women (n=56), $\chi^2(1, n=60) = 4.52$, $p = 0.034$. All the pregnant women that were employed knew about iodine.

A Kruskal-Wallis test also revealed a statistically significant difference between knowledge of the dietary sources of iodine across the age groups (Gp 1, n = 8: 15-19 years, Gp 2, n = 8: 20-24 years, Gp 3, n = 1: 20 – 24years), $\chi^2(2, n=17) = 7.05$, $p = 0.03$.
A Mann-Whitney test revealed a significant difference in the knowledge of dietary sources of iodine with age 15 – 19 years (Md = 2.5, n = 8) and 20 – 24years (Md = 1, n = 8), $U = 14$, $z = -2.17$, $p = 0.03$, $r = 0.5$. The younger women knew more correct dietary sources of iodine than the older ones.

4.4.3 Food myths and Challenges with food intake

The women were asked about any food items they might have heard that a pregnant woman must not eat. About 32% of the women had heard about foods that a pregnant woman was not supposed to eat. The women said that leftovers (12%), eggs (10%), sugarcane (3%), beer,

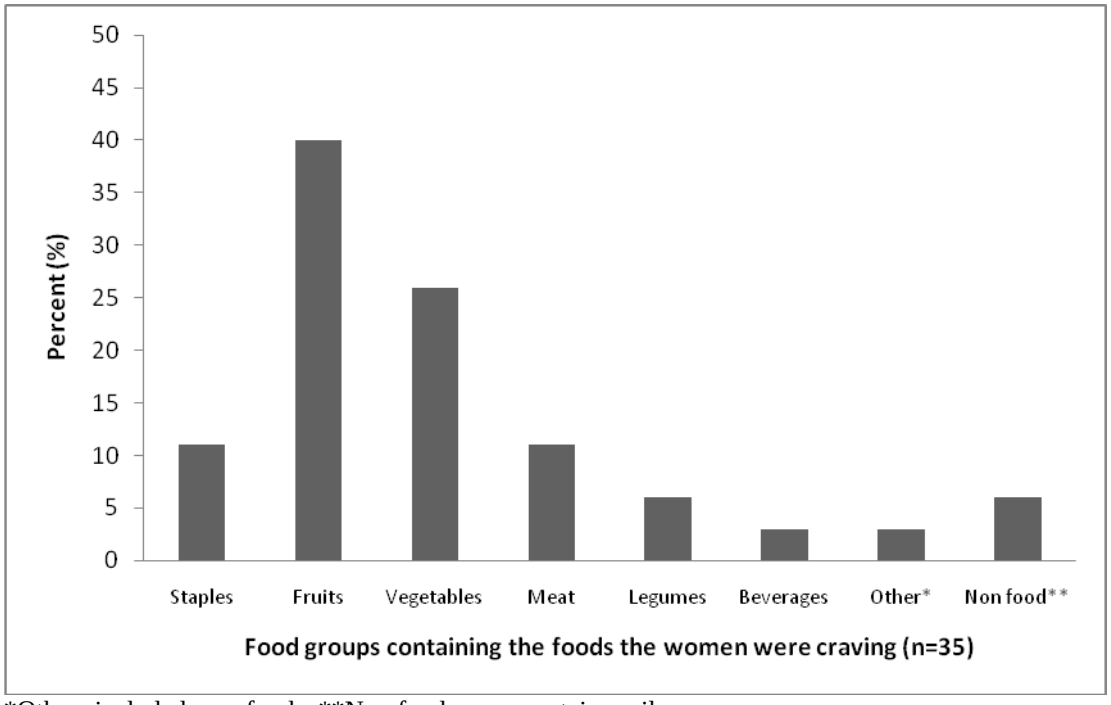
carbonated drinks, guavas, okra, foods with pepper, were some of the foods that were mentioned. The women were asked reasons why they were not to eat the mentioned foods. The women who mentioned eggs said they were told baby would be born with no hair (5%) and others said they were just told not to eat (5%). The women who mentioned leftovers said they were told leftovers were bad for the unborn baby's eyes (7%), or they might contain harmful organisms (2%) and others said they were just told not eat them (2%).

Challenges with Food Intake

The women in this study were asked if they were experiencing any challenges with their food intake. Only 13% of the women said they were experiencing challenges with their food intake. The challenges mentioned by these women were heartburn (7%), nausea (3%) and loss of appetite (3%).

Craving for specific foods

The women were also asked if they had cravings for specific foods. More than half (58%) said that they were craving for specific foods and these are presented in the figure below, categorised according to the six food groups.



*Others included sour foods. **Non food group contains soil

Figure 12 Food groups that contain the foods the women had mentioned that they were craving

From figure 12 it can be observed that 40% of the women had cravings for fruits and these included avocadoes, guavas, bananas, and mangoes. Some of the women (20%) also said that they had cravings for vegetables which included mustard leaves, pumpkins and cucumber.

4.4.4 General Food habits and practices

The women were asked about their general eating patterns now that they were pregnant. The figure below shows some of the foods that the women said that they ate on a general basis. From figure 13, it can be observed that most (60%) of the women ate staples which included nsima[1], irish potatoes and rice. A quarter of the women (25%) also said that they ate animal foods and these included eggs and flesh meat, fruits (25%) and vegetables (17%).

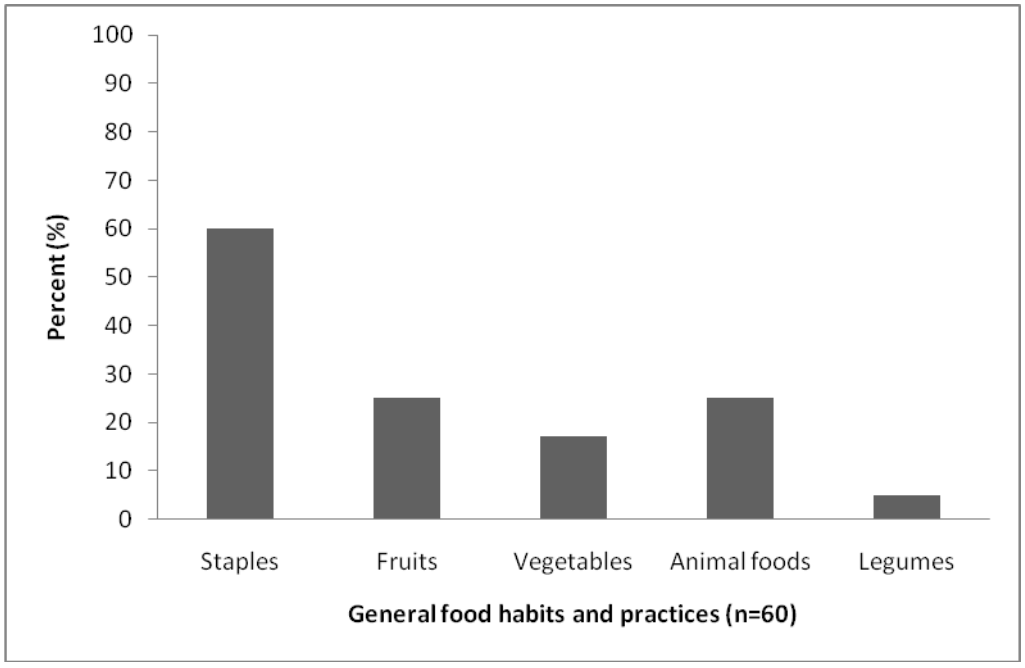


Figure 13 Foods that the women said were part of their general food habits and practices

The women that ate most of the staples were aged 15 to 19 years (n=16) and 20 to 24 years (n=15) and had been to secondary school (n=20). The women that said they ate fruits were aged 15 to 19 years (n=7) and 20 to 24 years (n=6) and had been to secondary school (n=11). The women that ate meats were aged 20 to 24 years (n=7) and 15 to 19 years (n=6) and had been to secondary school (n=13).

[1] Nsima is a thick porridge served in a lump form and it is made from maize flour. The whole maize seeds are milled to make whole grain flour. The maize seeds can also be partly milled and soaked in water for 1 to 2 days then sun dried and then milled into a fine powder. The more refined maize flour is quoted as 65% extraction.

A Kruskal-Wallis test revealed no significant difference in general eating patterns and the ages, different education levels, number of antenatal visits, distance to the hospital or the woman's occupation.

4.4.5 Dietary Diversity

Nutrition adequacy of the women's diets was assessed using Individual Dietary Diversity Scores (IDDS) and this was based on 14 food groups.

The following is a list of the food groups and the foods consumed within each group:

1. Cereals: Nsima rice, white bread, and small doughnuts (*mandazi*), roasted green maize
2. Vitamin A rich vegetables and tubers: Yellow sweet potatoes and pumpkins
3. White tubers: Irish potatoes and cassava
4. Dark green leafy vegetables: Pumpkin leaves (*nkhwani*), bean leaves (*khwanya*), black jack (c*hisoso*), sweet potato leaves (*kholowa*), amaranthus leaves (*bonongwe*)
5. Other vegetables: Cabbage, mustard leaves (*mpiru*), rape, Chinese cabbage, tender green bean pods (*zitheba*), okra (*thelele lobala*), gourds (*mphonda*) and cucumber (*nkhaka*)
6. Vitamin A rich fruits: Mangoes and papaya
7. Other fruits: Guava, avocado (*peyala*), banana (*nthochi*)
8. Flesh meat: Beef and chicken meat
9. Eggs
10. Fish: Small fish (*kapenta, matemba, utaka, usipa*)
11. Legumes, nuts and seeds: Soya, beans, ground nuts
12. Milk (This was taken together with tea so only a small amount was added)
13. Oils and fats (This was used during cooking of some dishes)
14. Organ meats[2]

[2] No one consumed from the organ meats groups because they are usually expensive

The figure below illustrates the number of food groups that were consumed.

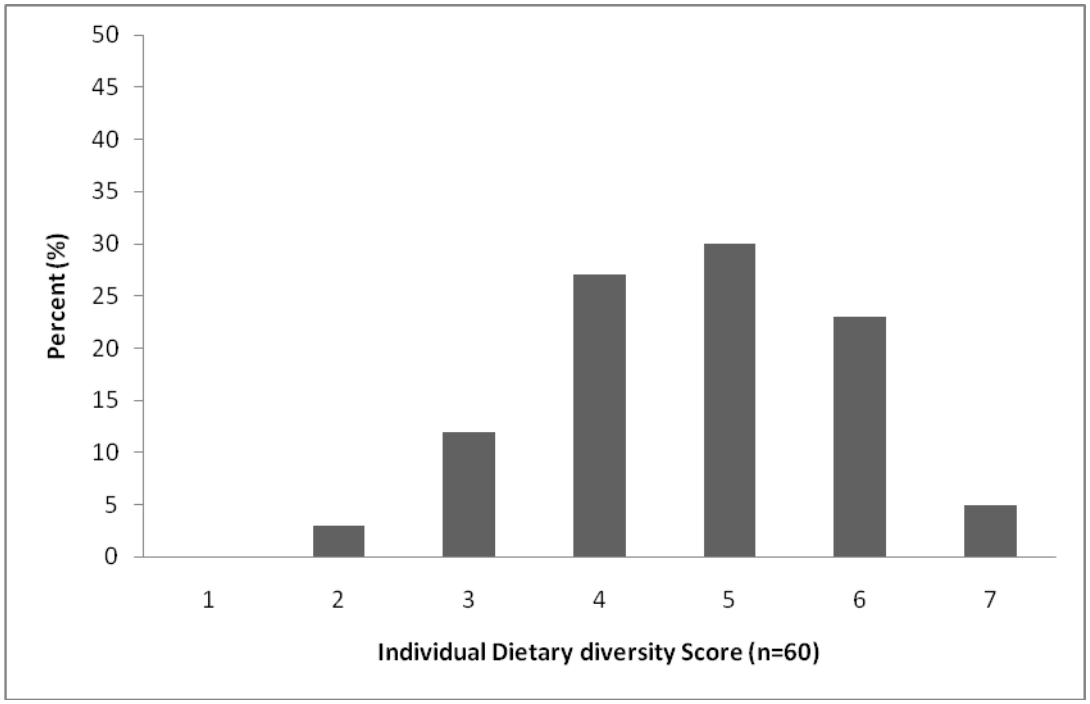


Figure 14 Number of groups consumed the previous day before the study

Figure 14 shows that the lowest IDDS was 2 and the highest was 7. The mean IDDS was 4.7. The women's IDDS was categorised into three groups of low, medium and high, with low representing 3 groups or less, medium representing 4 and 5 groups and high representing 6 or more groups. From the figure it can also be seen that 15% of the women had eaten from 3 or less of the food groups, while 57% had eaten from 4 and 5 groups and 28% of the women had eaten from 6 groups or more.

A Kruskal-Wallis revealed no significant difference between the IDD scores and age, education level, occupation, distance to the hospital or number of ANC visits.

Figure 15 shows that the women in the high IDDS category mostly ate cereals, other fruits, legumes, nuts and seeds and oils and fats. The women in the medium IDDS category mostly ate cereals and half of them also ate fish. The women in the low IDDS category mostly ate cereals but ate very little fish and other fruits.

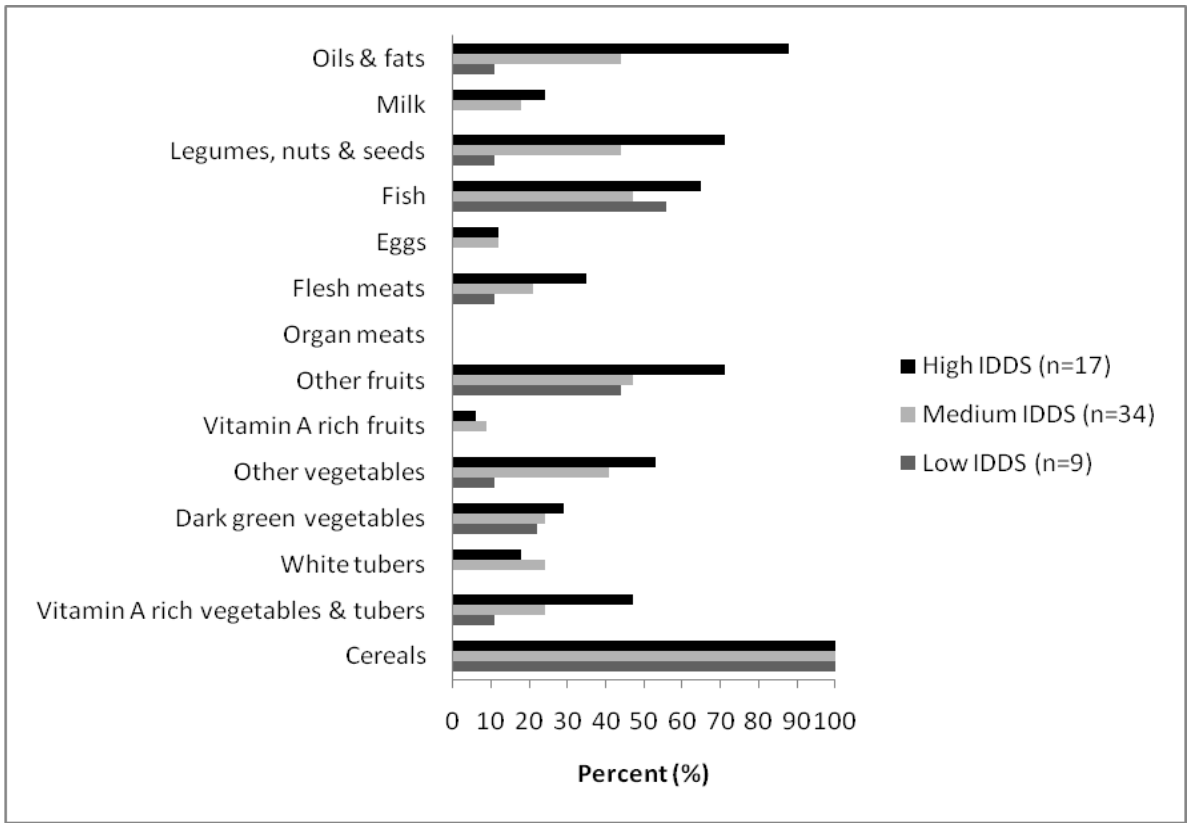


Figure 15 Number of women that ate from each food group based on the IDDS

4.5 INFORMATION PROVISION AND UTILISATION

The figure below shows information that was remembered by the women and information that was rated as extremely important by the nurses.

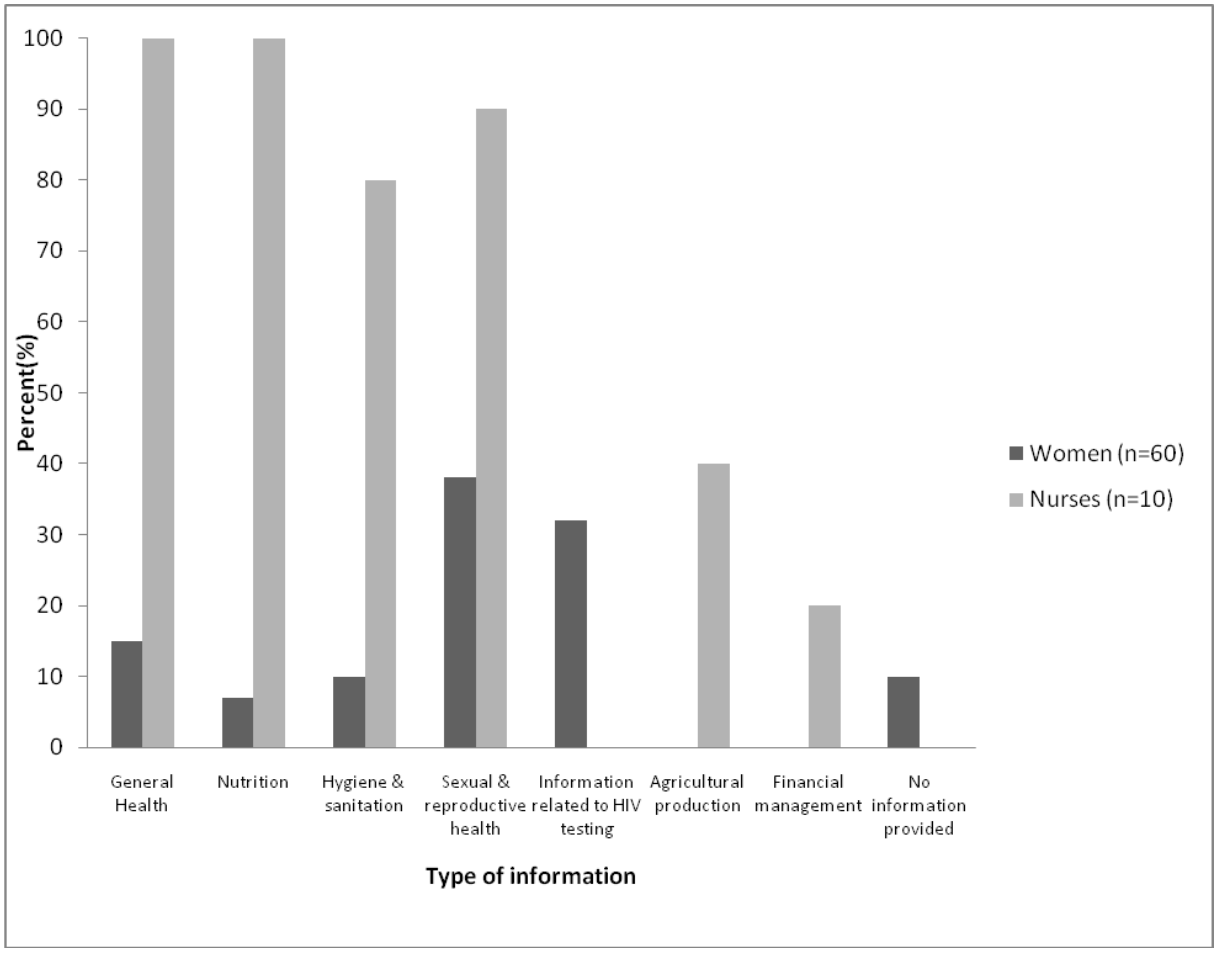


Figure 16 Information that was remembered by the women compared with information that was rated as extremely important by the nurses

From figure 16 it can be observed that the pregnant women said they remembered receiving information about sexual and reproductive health (38%) and information related to HIV testing (32%). The nurses were rating general health, nutrition, sexual and reproductive health and hygiene and sanitation information as extremely important. However, this was not being remembered by most of the women. Another 10% of the women said that they had not received any information during their routine visits.

There were no correlations between remembering information that was provided and age, education level, distance to hospital or the pregnant woman's occupation or that of their spouse.

The women were also asked in what way the information that they had been provided with became beneficial in their lives.

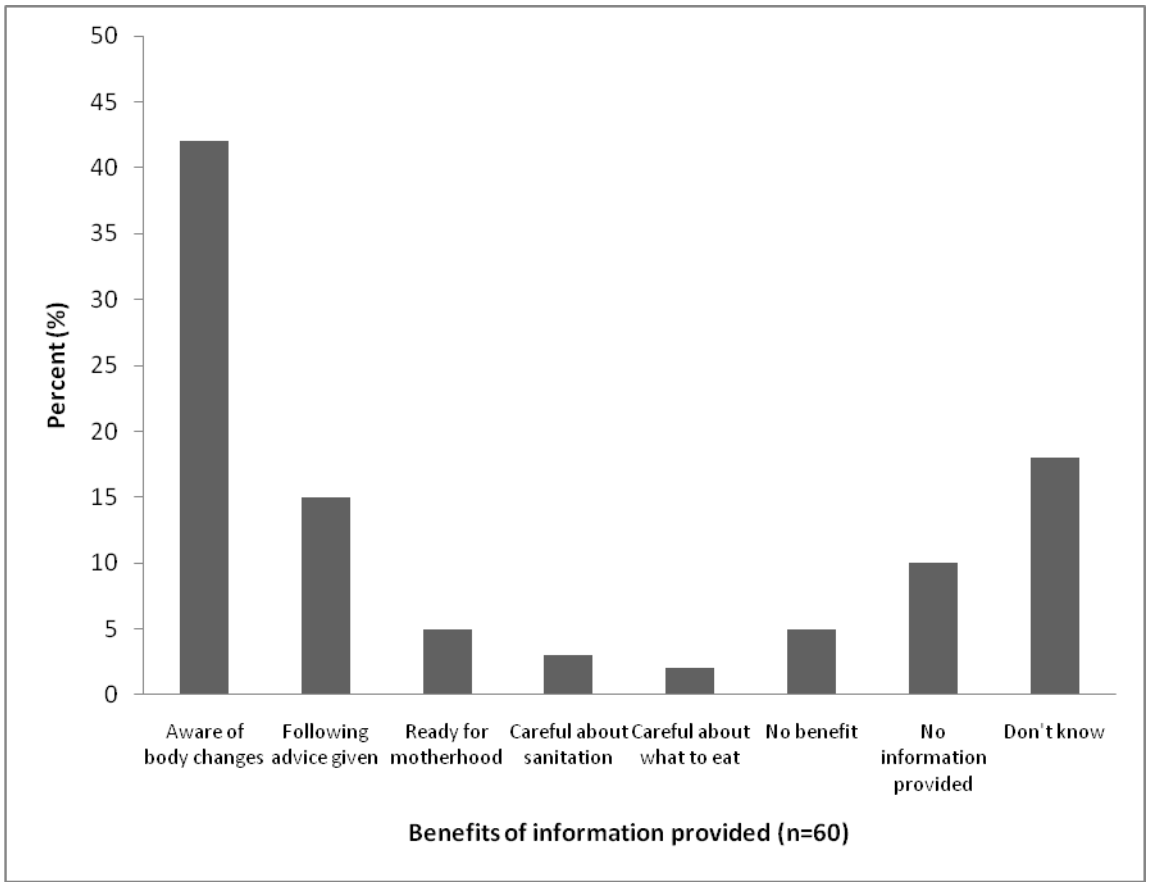


Figure 17 Benefits of information that was provided to the pregnant women

Figure 17 shows that 42% of the women said that the information which they were provided with made them aware of the changes their bodies were going through and 15% said that they were following advice which they were given. Another 18% said that they did not know whether the information had any benefit to them or not and these were aged 15 to 19 years (n=7) and 20 to 24 years (n=4) and had been through primary school (n=9) and secondary school (n=2).

A Kruskal-Wallis test revealed no significant differences between benefits of information that was provided and education level, age, or the pregnant woman's occupation or that of their spouse.

Lifestyle changes

The women were asked if the information they had been provided with made them change their lifestyle. Most of the women (68%) said that they had changed their lifestyle based on

the information that they were given. The women were asked to give reasons why they had changed or not changed their lifestyle.

Figure 18 shows the reasons that were provided for changing or not changing their lifestyle after receiving health information from the health personnel.

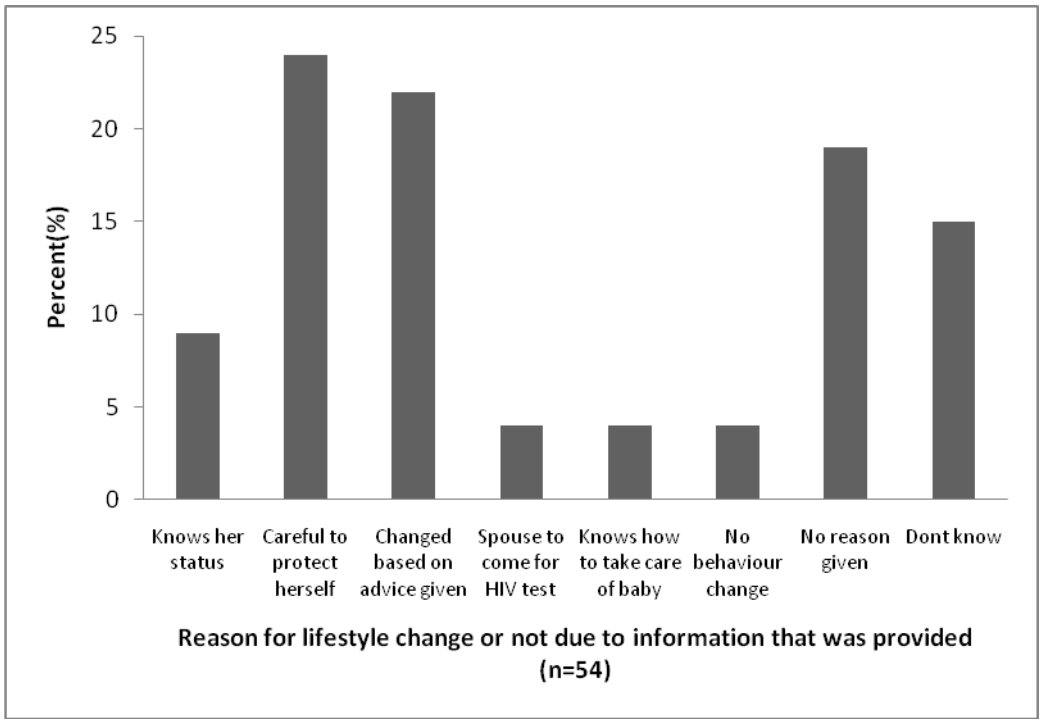


Figure 18 Reasons for lifestyle change or not due to information that was provided

Figure 18 shows what some women said about the information they had received and the lifestyle changes which they had made. The women that said they were being careful about protecting themselves (24%) were older women aged 20 to 24 years (n=7). Other women said they changed based on advice that they were given (22%). Some of the women (19%) gave no reason to justify why they had made lifestyle changes or not and these were mostly young women aged 15 to 19 years (n=6). Some of the women (15%) said they did not know whether they had made any lifestyle changes and most of these were aged 15 to 19 years (n=6).

The relationship between lifestyle changes due to information that was provided and age was investigated using Spearman's rho. There was a positive correlation between the variables $\rho=0.33$, $n=60$ and $P<0.009$. This meant that the older women made lifestyle changes due to the information that was provided.

Searching for information

The women were asked if they had searched for information from other sources other than the hospital. Only 23% of the women said they had searched for information from other sources and the sources mentioned were family members (64%), friends (29%) and neighbour (7%) The women were also asked if they found the information they had searched useful. About two thirds (64%) of those women who had searched for information from other sources said the information made them more aware of what their bodies were going through and the other third (36%) said they felt more ready for motherhood.

Further correlation analysis using Spearman's rho shows searching for information was positively correlated with education with $\rho=0.28$, $n=60$ and $P<0.03$, and high levels of education was associated with ability to search for information.

Other information to be provided

The women were also asked about what other information should be provided to pregnant women.

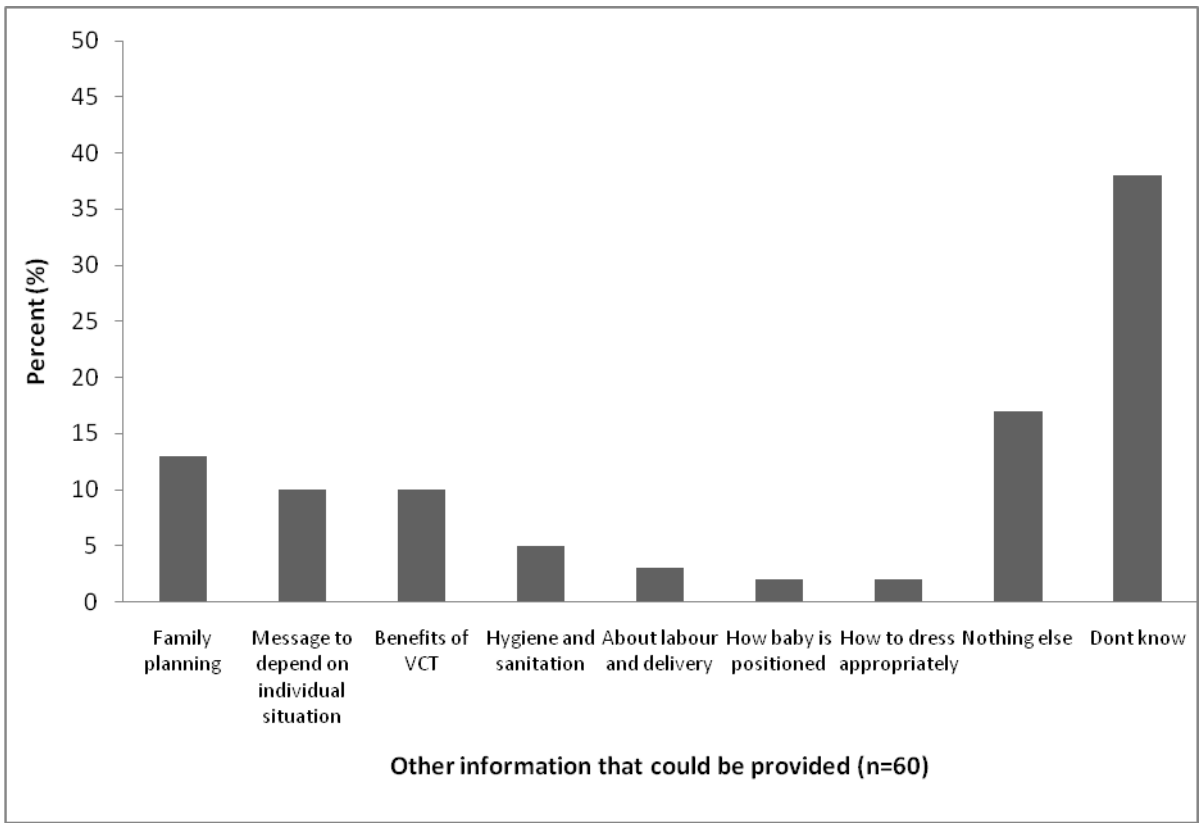


Figure 19 Other information that could be provided to pregnant women

From figure 19, it can be observed that 38% of the women said that they did not know what other information could be provided and another 17% said nothing else should be provided. However, 10% of the women said they that the message should depend on individual assessment and also information on benefits of voluntary counselling and testing (VCT). Another 13% said that family planning information should be provided.

There was no significant correlation between age, education level, number of antenatal visits or occupation and suggesting other topics for information that could be provided during antenatal sessions.

Policy advice

The women were asked about what the health personnel could do to make hospital environment more supportive towards pregnant women.

Table 10 Responses on what health personnel could do to improve hospital environment

What health personnel can do	n	%
Health personnel should be more friendly	1	2
They should allocate more time for personal consultations	1	2
Attend to the women in good time	2	3
Tell them benefits of ANC	8	13
Encourage women to visit ANC	1	2
Counselling	1	2
Women visiting ANC to encourage other women	2	3
It's their own responsibility	4	7
Don't know	40	67
TOTAL	60	100

From table 10 above, it can be observed that 67% of the women said that they did not know what health personnel could do to improve hospital environment. These were mostly younger women aged 15 to 19 years (n=24) and had been through primary school (n=21). Other women said that the hospital personnel should tell women about benefits of ANC (13%) and these were mostly younger women aged 15 to 19 years (n=5) and had been to secondary school (n=6). Some women also said that it is the responsibility of the hospital personnel to improve the hospital environment (7%) and these were aged 20 to 29 years (n=4) and had been to secondary school (n=4).

There was no significant correlation between age, education level, number of antenatal visits or occupation and suggesting what health personnel could do to improve the hospital environment.

The women were also asked about what government could do to minimise the number of women who are dying in child birth and pregnancy related conditions.

Table 11 Responses on what government could do to minimise maternal mortality

What health personnel can do	n	%
Make hospitals more protected	2	3
Mobile clinics to go into communities	7	12
Put radio announcements	2	3
Encourage women to go to ANC	7	12
Arrest all TBA's and all women found there	3	5
Provide transport for women to go to ANC	1	2
Give them appropriate assistance	2	3
Put in place nurses/midwives that respect their jobs	1	2
Don't know	35	58
TOTAL	60	100

Table 11 shows that 58% of the women said did not know what government could do to minimise the number of women who are dying in child birth and related conditions. These were mostly the younger women aged 15 to 19 years (n=22) and had been to primary school (n=17). However, some of the women who had been to secondary school (n=18) also did not know. Some few women (12%) said that government should encourage women to go to ANC and these were aged 15 to 24 (n=6) and had been to secondary school (n=5). Other women (12%) also said that mobile clinics should go into the communities and these were women aged 20 to 24 (n=4) and had been to secondary school (n=5).

There was no significant correlation between age, education level, number of antenatal visits or occupation and suggesting what government could do to minimise maternal mortality.

4.6 NURSES PERSPECTIVE

This section of the study was deemed necessary to understand the challenges nurses or midwives face in the delivery of antenatal care and also to find out their views on the cause of maternal mortality in Malawi.

4.6.1 Demographics

Table 12 Demographic characteristics of the nurses/midwives that participated in the study

		n	%
AGE (Years):	25 – 29	2	20
	30 – 34	2	20
	35 – 39	1	10
	Above 40	5	50
MARITAL STATUS:	Single	2	20
	Married	6	60
	Divorced	1	10
	Widowed	1	10
DISTANCE TO HOSPITAL (km):	1 – 5	3	30
	6 – 10	4	40
	11 – 15	1	10
	21 – 25	1	10
	Above 26 km	1	10

The table 12 above shows that 50% of the nurses were above 40 years of age and 60% of them were married. All the nurses interviewed were also midwives and they had attended various training institutions. Most of the nurses (40%) were also living within 6 to 10 km from the hospital.

4.6.2 Service Delivery

4.6.2.1 Challenges faced in their work and suggestions for improvement

The nurses were asked about the challenges they faced in their work. Most of the nurses (90%) said that there are a lot of patients and a few nurses. The nurses said that on average they attended to 132 pregnant women per day, 586 per week and 2880 per month. The nurses also felt that they were getting inadequate pay (90%).

The nurses were asked suggestions on what improvements could be made on their working conditions. Most of the nurses said that increasing their pay (90%) and sending them for refresher courses (80%) would improve their work. Half of the nurses also said that more nurses should be hired to reduce their work load and others (20%) felt that they should be provided with accommodation as they resided far from the hospital.

4.6.2.2 Accessing antenatal care

The nurses were asked about their opinion on why pregnant women access antenatal services. All the nurses said that the pregnant women seek antenatal to get checked up on their

progress. Most of the nurses (90%) also said that the pregnant women seek antenatal services to get advice on their health.

Frequency of ANC visits

All the nurses said that pregnant women need to make a minimum of four visits during the course of the pregnancy. In this study, only 12% of the pregnant women said they had made the recommended minimum number of visits (see figure 6).

Advice on progress

The nurses were asked about what they did if they saw that a pregnant woman was not progressing well. All the nurses said that they provided advice based on the problem identified. Some of the nurses (90%) also said that they would give general health advice when they observed that some of the women were not progressing well. The nurses were also asked what they would do if they saw that a pregnant woman was anaemic. All the nurses said that they would give iron supplements and nutrition advice about iron rich foods. The nurses were also asked what they would do if they observed that a pregnant woman was malnourished. All the nurses said that they would provide advice on appropriate dietary intake.

Advice on post delivery care provided

The nurses were asked about the type of advice that they provide to women after they deliver.

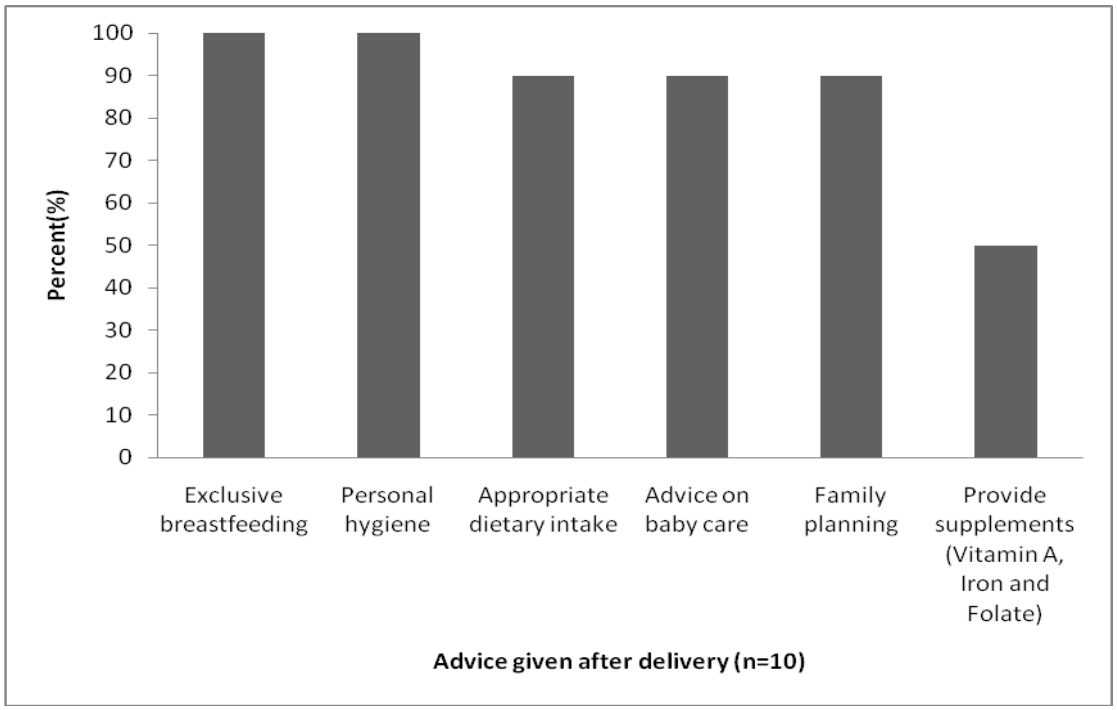


Figure 20 Advice given to women after they deliver

From figure 20, it can be observed that all the nurses said they gave advice on exclusive breastfeeding and personal hygiene. The nurses (90%) also said they gave advice on appropriate dietary intake (such as the six food groups) for the mother, advice on baby care and advice on family planning.

4.6.2.3 Causes of high maternal mortality in Malawi

The nurses were also asked about their opinion on causes of high maternal mortality in Malawi.

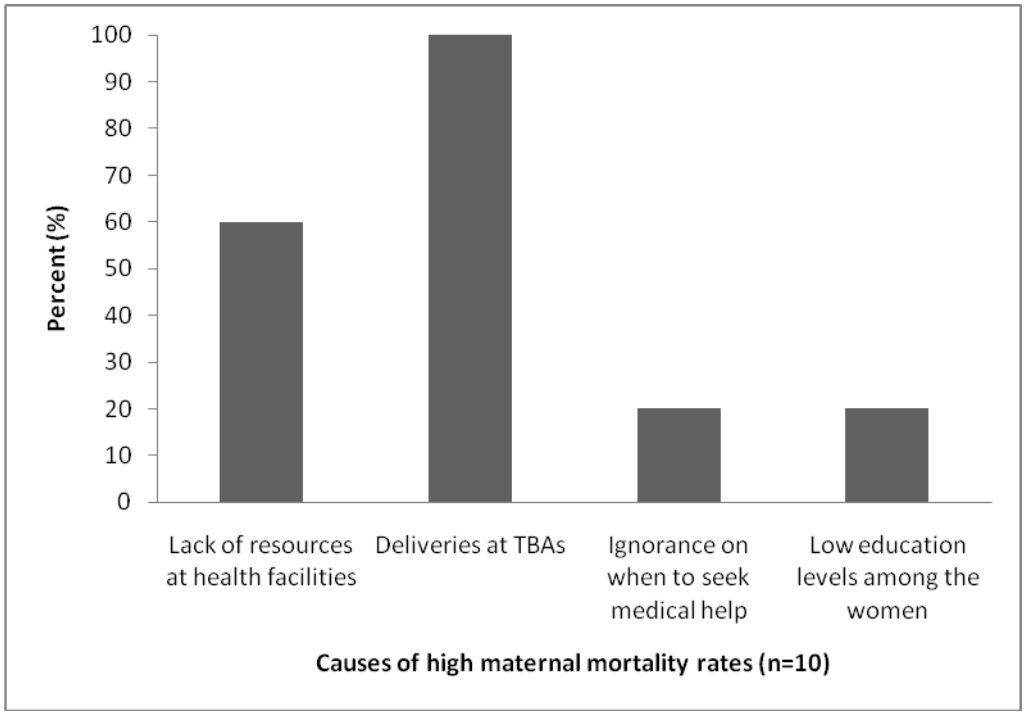


Figure 21 Nurses opinion on causes of high maternal mortality rates in Malawi

From figure 21 it can be seen that all the nurses said that high maternal mortality rates are caused by using traditional birth attendants (TBA's). Another 60% also said that lack of resources in health facilities, both in personnel and equipment, was contributing towards maternal mortality. Not many nurses (20%) mentioned education as a related cause for maternal mortality.

Ensuring health during pregnancy

The nurses were asked about what the pregnant women could do to ensure good health during pregnancy. The majority of the nurses (90%) said that pregnant women would ensure their health by attending antenatal visits as prescribed. Some of the nurses (30%) also said that adhering to medical advice provided to the pregnant women would help ensure their health during pregnancy.

Nurses contribution towards lowering maternal mortality

Figure 22 shows that the majority of the nurses (70%) said that government should train and employ more midwives. The nurses (60%) also said that nutrition talks with the women would help lower maternal mortality.

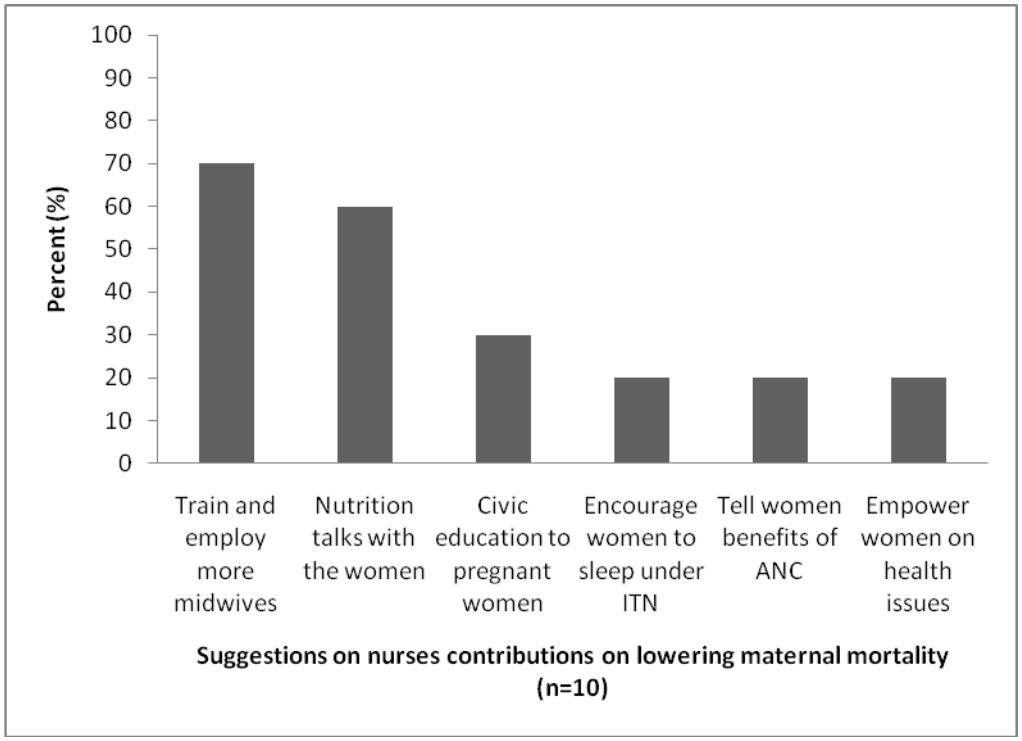


Figure 22 Suggestions from nurses on what they could do to reduce maternal mortality

The nurses were also asked about their opinion on what government could do to lower maternal mortality. Figure 23 shows that half of the nurses (50%) said that government should build more health centres. Some of the nurses (30%) said that government should give free food supplements and drugs to pregnant women.

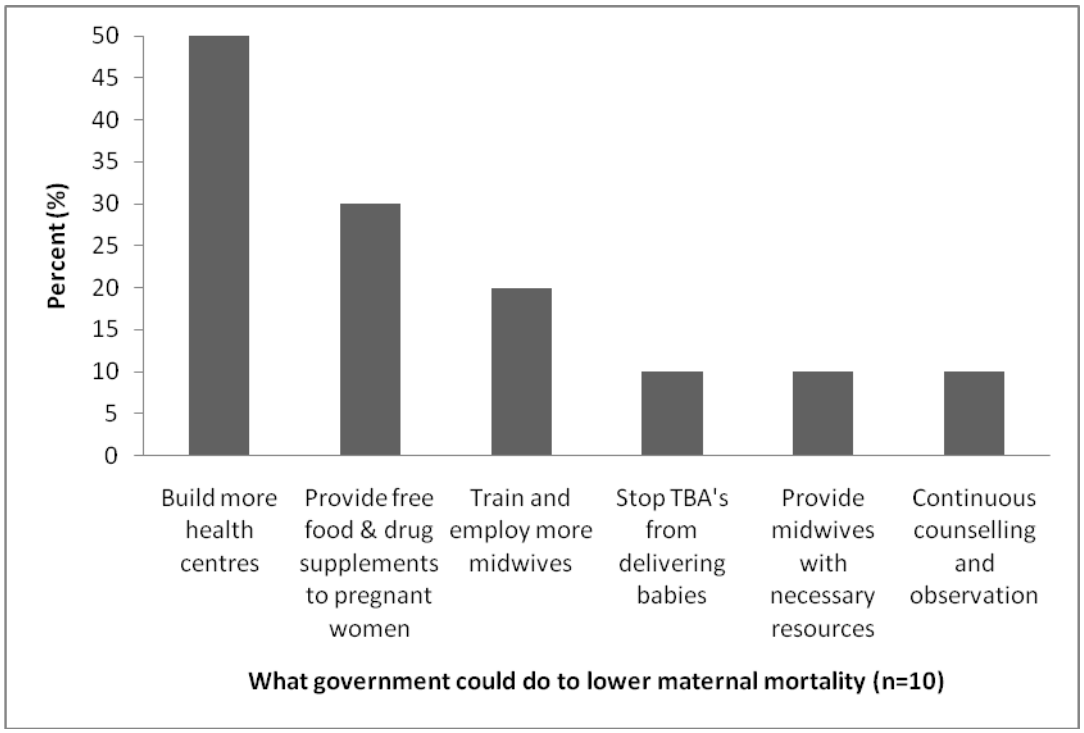


Figure 23 Nurses suggestions on what government could do to lower maternal mortality

5.0 DISCUSSION

In this section I will first discuss the methodology and then the results.

5.1 Methodology

The study has some limitations which should be considered when using the findings from this research. The study design being cross sectional only allowed for comparisons to be made between the variables. The limitation of the design is that direct causality cannot be made among the variables. The selection of the study participants may also limit the generalisations from the findings because the study was conducted in one location only, the centre of the city, and has therefore limited cross comparisons to be made in other locations. The pregnant women who participated in the study were purposively sampled which helped to capture the women that would provide the information that assisted in understanding the issues of interest through responses to questions. However, purposive sampling limits the likelihood of all potential study participants to be included in the study. The cross sectional design allowed for only one interview with the respondents and the relationships between variables that were collected were determined. This design helped to identify associations between the variables that were collected and generated ideas for further follow up studies with other designs. The research design was more of a quantitative approach and therefore no follow up questions could be asked to the respondents outside those within the questionnaire that was designed.

The questionnaires that had been developed by the researcher were pre tested to check if they would be understood by the target audience. This exercise allowed for evaluation of the data collection procedure. Data was collected through face to face interviews with the pregnant women and this allowed the researcher to have control over the information that was collected and uniformity in the approach. The nurses filled in the responses themselves which saved time. The limitation with face to face interviews is the possibility of respondent bias where the respondent may tell researcher what needs to be said but may not be what they practice as the results have shown the differences between what the nurses said what they provided and what the women remembered. Interviews also only accommodate questions in the designed questionnaire so this limits ability to ask further probing question. The study design should have allowed for triangulating with other data collection methods like focus group discussions where further information would have been sourced from the respondents. Translating the pregnant women's questionnaire into the local language allowed for use of terms which the

women were familiar with but this was also a challenge as some English words do not have exact words in the local language. The other limitation with the questionnaire was that some questions could have been time specific. For example, the women were asked to recall activities that are routinely done when they came for antenatal visits. This question should have focused on the activities of the day the interview was done and then a follow up question would have tried to capture differences in the activities for this day and other days when other visits had been made. The questionnaire should have been developed to collect the actual age without the precategorised responses before the data collection. A question on the actual income for the household was not included in the questionnaire and this challenged the researcher in trying to establish the socio economic situation of the respondents and it limited the analysis. Another question on the eating habits of the household was constructed using a vague word without time qualification to it.

The researcher made the data collection atmosphere comfortable by asking the women to go and sit at a private spot for the interview. The researcher also made sure to arrive early at the antenatal clinic to attend the health talks. She was dressed moderately with a wrap (*chitenje*) and the hair tied back and the face with no makeup. The data was collected within the hospital premises and this may have affected the way the women responded to some questions. As it can be observed from the results, at times the women responded as not knowing the answers to questions asked or could not justify some of their responses. The hospital setting may not have been ideal for the data collection and maybe if the women were interviewed from their homes they could have been more comfortable and answered more openly. The women were interviewed after they had been attended to by the nurses and this was usually after they had been waiting at the hospital for more than three hours. Even though most of the women did not complain about the time factor in the service that they got from the hospital, it might have affected the way they responded to the questions.

5.2 Demographics

The discussion focused on the following demographic variables: age, marital status, woman's occupation, education level, and distance to the hospital because they were found to be statistically significant with other variables. The other demographic characteristics (family situation, religion, occupation of the spouse and economic activity) were not statistically

significant with any of the results. The other variable that was mostly used was the number of routine visits.

More than half (53%) of the pregnant women in this study were within the age group 15 to 19 years. Teenage pregnancies are associated with increased risk of poor social, economic and health outcomes for both the mother and the child (Dickinson, Fullerton, Eastwood, & Sheldon, 1997). It has been reported in several studies that teenage pregnancies are associated with increased medical risks during pregnancy and poorer birth outcomes for their babies (Gupta, Kinan, & Bhal, 2008). Teenage pregnancies are also associated with an increased risk of complications which include preterm labour, small for gestational age babies, prematurity and perinatal mortality, antepartum and postpartum haemorrhage, preeclampsia, prolonged rapture of membranes and prolonged labour (Kondamudi, Bhattacharyya, Noah, & Noel, 1993). This means that more than half of the investigated pregnant women could be at risk from some of these conditions. These women should be encouraged to keep attending antenatal sessions so that any potential risks could be dealt with as soon as they occur. The pregnant women who were not married lived with their parents and were also the youngest. This puts them at risk of future economic insecurity as they had to drop out of school. The results also show that none of the pregnant women had used family planning methods before becoming pregnant. This highlights the need for improving availability of family planning services so that young women can delay pregnancy and avoid the associated health risks.

Age of the women was correlated with education and their occupation. The older women (25-29 years) had been through secondary school and had a job. Young girls need to be encouraged to delay marriage so that they minimise the associated risks that they are putting themselves in. When the girls delay marriage, they are more likely to be educated. Since in this study it is the older women who were employed, it means they have more economic stability and will be able to provide a better environment for their children.

5.3 Obstetric situation

Age, education and distance to the hospital did not influence the women's ability to know their weight, height or blood pressure before becoming pregnant. These are vital statistics which every health conscious person has to be aware of. Maternal height has a direct influence on gestational length (Chan & Lao, 2009). The women should know their heights

and also the risks associated with short maternal stature as these can affect the pregnant woman and her unborn child.

Most of the pregnant women were in self reported good health the year before they became pregnant and during their pregnancy. However, nothing can be said about those that do not deliver at hospitals. The MDHS (2004) reported that 57% of births took place at a health facility and 29% took place at home, and another 12% took place at a TBA's place and 1% took place in other places (National Statistical Office & ORC Macro, 2005). This means there are some women who are at risk as they are not attending antenatal sessions and not delivering at a health facility. This might contribute towards the high maternal mortality rate. There is a need for approaches of increasing access to antenatal services so that as many women as possible get the help they deserve.

Half of the women indicated having new health problems during their pregnancy. Slightly less than half of them brought their problems to the attention of the health personnel. The women were waiting to be asked by the health personnel about their health and this may put the women at risk of ill health as the nurses were already time constrained and might have overlooked to inquire about how they were feeling. Although the women noticed that the nurses were busy, they should have brought their health issues to the nurses. Firstly, this incident highlighted the limited skills which the women had in interacting with the health personnel and this is an attribute of interactive health literacy (see figure 3). Secondly, this incident also points for the need for government to recruit more nurses so that a better quality health service is provided. The findings also indicate that the women who had brought their health issues to the attention of the nurses got help. This shows that this group of women had better skills at interacting with the nurses and getting the right assistance that promoted their health. Most of the women in this group had been through secondary school and they lived within 1 to 10 km radius from the hospital. This characteristic can be linked to properties of the interactive level of health literacy (refer to figure 3) although there were no significant differences among these women. The nurses also need to consider scheduling their time properly so that they make time for one to one chats with the women on their progress as some women indicated that they had un-addressed issues.

5.4 Antenatal services accessed

Antenatal care (ANC) is essential in the screening, primary or secondary prevention and treatment of pregnancy complications. When a pregnant woman starts to attend ANC early, it helps in early detection and treatment of adverse pregnancy related outcomes (Khatun & Rahman, 2008). WHO and its technical working group recommend that pregnant women from developing countries should seek antenatal care within the first four months of pregnancy (WHO, 2002).

In this study, 70% of the women had made their first visit during their fifth and sixth months of pregnancy (see figure 5). This was not satisfactory because they missed having the initial health risk assessment that should be done early. The women also missed the antimalarials and deworming drugs which they would have received in the first trimester. It is important for pregnant women to start attending antenatal sessions as early as possible so that any risks on their health should be identified in good time. This can allow planning for the spacing out of subsequent visits based on this initial risk assessment. There were no statistical differences between age, education level, occupation of the woman or spouse or the distance to hospital and when first antenatal visit was made. However, a study in Equatorial Guinea found that higher levels of education improved ANC attendance especially early registration for ANC sessions (Jimoh, 2003).

There were statistically significant differences ($p=0.014$) on reasons why first visit was made at the mentioned time between women that lived within 1 to 10 km compared to those living 16 to 20 km from the hospital. The women that lived closer to the hospital made the initial antenatal visit early. This means that distance to the antenatal clinic may have influenced their health and nutrition literacy in a positive way. Those women staying further from the hospital may attend a few antenatal sessions thereby missing relevant information that could help promote positive maternal health and so limiting their health and nutrition literacy. Government of Malawi needs to consider investing more into building health centres to reduce the distances pregnant women have to cover to access antenatal care services. This corresponds with what was reported in another study that found that uptake of antenatal care was related to availability of the service along with other factors such as maternal education, marital status, household income and women's employment (Simkhanda, Teijlingen, Porter, & Simkhanda, 2008).

The MDHS for 2004 also reports on the benefits of antenatal care and its influence on pregnancy outcomes. It states that this depends on the timing of the antenatal care as well as the content and quality of the services provided. In Malawi, women are advised to have a minimum of four visits spread throughout the pregnancy with the first visit in the first trimester which is the same as what the WHO promotes. In Malawi, only 57% of the reported births had met the recommended number of four or more visits (National Statistical Office & ORC Macro, 2005). In this study, 66% of the pregnant women had made two to three antenatal visits. Since the women were in their third trimester, they would be on target to meet the minimum number of four visits that are prescribed. There were statistically significant differences on the number of other routine visits made ($p=0.002$) within the ages with the older women (25 to 29 years) making more routine antenatal visits than the younger women (15 to 19 years). This could be due to the fact that the older women were employed and had more resources to use for transport. Increased numbers of antenatal visits have the potential of increasing a woman's exposure to health and nutrition information and thus making her more health literate.

All the women had received tetanus vaccines, got tested for HIV and most of them (93%) had received the iron supplements. This is commendable because it means that the women were getting the service that they were supposed to be provided with. However, not much can be said about the messages that were provided to the women.

Basic antenatal care components are described as an effective means for the prevention of a range of pregnancy complications and reducing maternal mortality (Pallikadavath, Foss, & Stones, 2004). There were no significant differences among the pregnant women on the services they remembered and the different ages, levels of education, number of other antenatal visits or distances to the hospital. Most of the women remembered having been physically examined and having their weight measured. However blood pressure was not remembered by most of the pregnant women and yet most of them were in their teenage years where pregnancy is associated with risk of preeclampsia and eclampsia (Kondamudi, et al., 1993) and preterm birth and low birth weight (Khashan, Barker, & Kenny, 2010). Another study found that women of low sociodemographic status were at high risk of having inadequate care. This was because of barriers of a financial nature as well as inadequate

system capacity, distance, long waiting time, and knowledge (Beukens, 1990). The nurses in our study reported all the activities that they do during routine visits. However, there were differences between what the nurses reported and what the women remembered. On one hand, the nurses were overburdened with work and so may not have provided a consistent service. On the other hand, the pregnant women were not very health literate as some of the services which they did not mention were actually recorded in their health passport. With figure 3 as the reference, it means that the women did not have functional health literacy as they could not follow what was provided and written down. There is need for proper scheduling of the other routine visits after the initial risk assessment so that there is adherence to standards that have been set by the government. This will ensure that consistent services are provided to all pregnant women during antenatal sessions. The nurses need to explain to the pregnant women the information that is recorded in health passports so that the pregnant women are able to follow their health progress.

There were statistically significant differences in judging adequacy of time spent with the nurses between pregnant women that had been through senior primary school and those who had been through junior primary school ($p=0.002$). This means that those that had been through lower levels of education thought the time was sufficient for the service they got compared to those who had been through higher levels of education. This finding supports the need for women to be encouraged to remain in school so that they can learn to recognise the quality of service that they are supposed to get. The health service providers should make pregnant women more aware of the service that they are supposed to get during their routine visits. This will assist the women in demanding services that they are supposed to get and improve their health literacy skills. There was a statistically significant difference on the reasons provided for judging the adequacy of the service among married and unmarried pregnant women ($p=0.04$). The unmarried women had a higher median score than the married ones and regarded the time with the nurses as adequate. It can be beneficial to assume that the women in this study were not very health literate as 43% of the women did not give a specific reason why they felt the time was adequate or not.

Most of the pregnant women (93%) had no unaddressed health issues relating to their pregnancy. If this was truthfully reported, this is good because it means the pregnancy poses minimum risk on their health. This can help the nurses in planning follow up visits so that

they are more spaced out to minimise their work load. As it has been said before elsewhere in this report, this group of women were taken from one location and therefore not much can be said about those that do not attend antenatal care sessions.

The pregnant women were asked about why other women do not access ANC services. There were no statistically significant differences in the responses provided and age, education level, number of antenatal visits, women's occupation or distance to the hospital. However, another study conducted to review how economic status, education and empowerment of the women affect utilisation maternal health services in developing countries found that women with higher education, incomes and those that were empowered were more likely to use modern contraceptives, attend more than 4 antenatal visits and had a skilled attendant at birth (Ahmed, Creanga, Gillespie, & Tsui, 2010). The study also reports that efforts to lower maternal mortality rates will fail if basic maternal health services are not improved with policies that target women that are poor. It states that expanding the already existing services and making it of better quality will motivate women to use the service as they will have the ability to interact with health personnel and request services which could promote their health (Ahmed, et al., 2010). Women in Malawi need to be encouraged to remain in school so that they acquire the necessary skills which can help them get better jobs as well as become aware of the services that they require to promote their health and nutrition status.

5.5 Nutrition knowledge and practices

The government of Malawi through the Department of Nutrition and HIV/AIDS are promoting the consumption of the six food groups for pregnant women as well as the whole population. The six food groups include staples, legumes and nuts, fruits, vegetables, animal foods and fats. All health and nutrition messages promote the consumption of a variety of foods in every meal so that the diet is diverse. Health care providers are the ones mandated with the task of passing on the information to pregnant women seeking health care. The health service providers should be knowledgeable so that they are able to pass on accurate and relevant information therefore the need for refresher courses and continuous learning opportunities for health personnel is necessary. The nurses nutrition knowledge was not evaluated, however, they answered correctly on what messages to give in specific situations. Since most of the pregnant women could not remember the specific dietary sources, the limitation in nutrition knowledge could also be present in the nurses.

Bandura's social learning theory describes knowledge as one of several factors that are required for behavioural change (Bandura, 1986). Nutrition knowledge was investigated among the pregnant women in the present study. Above two thirds (70%) of the pregnant women had heard about the six food groups. There were no significant differences among the women and age, education levels, number of antenatal visits or distance to the hospital. None of the women knew all the six food groups. This is different to what was found in another study that explored nutrition knowledge levels and how it varied in a community. Their findings showed that nutrition knowledge varied with age, education levels, marital status, employment and socioeconomic status. Those women who were older and had higher levels of education had more knowledge. Those women who were married or were employed or were from households with high socioeconomic indicators had higher levels of nutrition knowledge (Hendrie, Coveney, & Cox, 2008). Most of the women in the present study remembered staples, fruits and vegetables. There were significant differences in number of food groups known ($p=0.025$) and the age groups with the older pregnant women (25-29 years) knowing more food groups than the younger ones (15-19years). This agrees with what was reported by Hendrie et al (2008) that nutrition knowledge was associated with age in their study.

Iron, vitamin A and iodine were identified as micronutrients of public health concern in Malawi. According to the nutrition fact sheet (OPC, 2009b), 44% of the women were anaemic, 57% had Vitamin A deficiency and 3% had goitres. The National reproductive health guideline (Ministry of Health, 2004) indicates that government is encouraging health service providers to encourage all women accessing antenatal services to take iron/folate supplements on a daily basis. The guideline also encourages service providers to promote production, preparation and consumption of a wide variety of foods to minimise micronutrient deficiencies.

Iron and vitamin A were known by the majority of the pregnant women and iodine was the least known micronutrient. There were statistically significant differences on the knowledge of dietary sources of iodine across the age groups ($p=0.03$) with the younger women (15 to 19 years) mentioning more correct dietary sources. This could be due to the fact that since health education has been incorporated into the mainstream school systems the younger pregnant women knew about it from there. Some older women that knew correct dietary sources of

iodine were employed in their own small business and might have heard about it from the market where they traded. There is need for continued efforts in raising awareness about these micronutrients and the good dietary sources and how to prepare those foods to enhance their bioavailability. Other studies have reported that health promotion and nutrition counselling as related to the diet have reduced neural tubal defects (folate) if public awareness is encouraged (Gregory, 2006).

Food myths or taboos are described as having a long history and the expectation is that any society should have reasons why these exist in their culture (Meyer-Rochow, 2009). The women in the present study were familiar with food myths and the reasons for not consuming the specific food mentioned. This also means that the pregnant women are living in a society where food myths exist and if the women have limited nutrition information they face challenges in deciding which food items to have on their diet. Antenatal sessions need to cover these during health talks so that pregnant women made aware of myths that exist in their society.

Studies have showed that nausea and vomiting during pregnancy are experienced by 80% of pregnant women (Nguyen & Einarson, 2006). They start around the fourth and ninth week of pregnancy until the twelfth and sixteenth weeks of pregnancy (Miller, 2002). It has also been reported that nausea and vomiting can persist throughout pregnancy and so the pregnant woman's life can be severely affected (Attard, et al., 2002). Very few pregnant women (13%) had challenges with food intake probably because they were in their third trimester. But those that are affected need reassurance from health personnel and information on possible remedies that can help in coping with the situation to improve their quality of life.

Food cravings as well as other aversions and pica are common during pregnancy and can have a significant impact on pregnancy progress and outcome (Nyaruhucha, 2009). Although more than half of the pregnant women said they had cravings for some foods, there were no statistically significant differences among them. The foods that the women craved included the following groups: fruits, vegetables, meats and staples. Most of the specific foods mentioned as being craved for were in season during the time of the study, so maybe this was not a craving or the question was not clear to them.

Looking at general food habits and practices, the findings show that the women generally ate staples, fruits and animal foods. Comparing this with their knowledge of the six food groups, the women were familiar with staples, fruits, vegetables and animal foods. Comparing general food practices with dietary diversity, it can be observed that cereals were consumed by everyone, but only half of the women ate other fruits, fish, legumes and oils and fats. Consumption of legumes, nuts and seeds was also high especially foods like porridge and vegetables that incorporated soya bean flour and ground nuts flour in the preparation. Intake of milk was low and this was taken together with tea as part of breakfast.

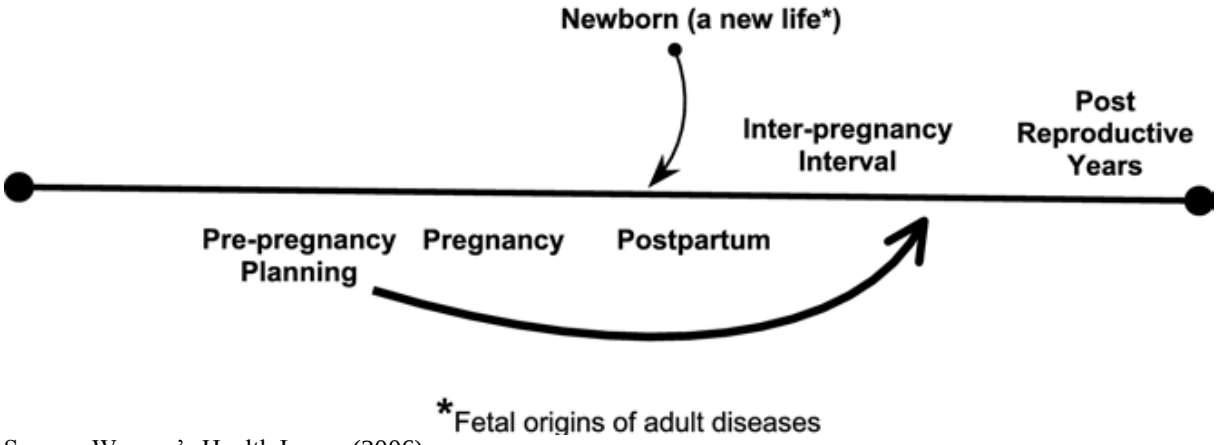
Dietary diversity has been defined as the number of individual foods or groups consumed over a reference period (Hoddinot & Yohannes, 2002). A more varied diet is associated with a number of positive outcomes such as birth weight (Rao, et al., 2001), child anthropometric status (Hatløy, Hallund, Diarra, & Oshaug, 2000) as well as improved haemoglobin concentrations (Bhargava, Bouis, & Scrimshaw, 2001). Dietary diversity can be assessed at household and individual levels. Household dietary diversity score (HDDS) reflects economic ability for the household to consume a variety of food. Other studies have demonstrated that an increase in dietary diversity is associated with socio-economic status and household food security (Hatløy, et al., 2000; Hoddinot & Yohannes, 2002). Individual dietary diversity score (IDDS) reflects nutrient adequacy of the diet and this has been shown in several studies with non breast feeding children (Kennedy, Pedro, Seghieri, Nantel, & Brouwer, 2007; Ruel, Graham, Murphy, & Allen, 2004), adolescents (Mirmiran, Azadbakht, Esmaillzadeh, & Azizi, 2004) and adults (Foote, Murphy, Wilkens, Basiotis, & Carlson, 2004). IDDS was positively correlated with increased mean micronutrient density of complementary foods (FANTA, 2006). FAO recommends the use of 12 food groups when analysing HDDS and 14 food groups when analysing IDDS (FAO, 2007). In the present study, IDDS was investigated using 14 groups and the mean was 4.7 which were very low. Those women in the highest IDDS consumed from 7 food groups and those with the lowest IDDS ate from 2 groups. Those with the highest IDDS ate cereals, other fruits, legumes, nuts and seeds and oils and fats. Intake of foods rich in micronutrients such as vitamin A and iron was low among all the IDDS categories. In our study, IDDS was not significantly related to age, education, pregnant woman's occupation, or distance to the hospital or number of routine antenatal visits. A study in Burkina Faso found that dietary diversity based on 22 food groups (DDS-22) was associated with socio demographic and economic variables. In that study, the women that

were more educated or wealthier had higher DDS-22 (Savy, et al., 2007). Another study in Mali found that DDS was associated with education and socio economic score among other factors (Torheim, et al., 2004). Since intake of micronutrient rich foods was low in our study, which could be a reflection of the women's limited nutrition knowledge and this could also signify their limited nutrition literacy.

5.6 Information provision and utilisation

Antenatal education has a very clear agenda whose aim is to build confidence and self esteem so as to enable individuals to ask questions and seek information so that they can make informed choices and communicate more effectively with health professionals and also taking responsibility for their health (Nolan, 1997).

The National Reproductive Health Guidelines (Ministry of Health, 2004) tasks health service providers with the duty of providing health and nutrition information to pregnant women as they seek antenatal services. There were no statistically significant differences on the information that was remembered by the women. Very few women remembered the information that they had from the hospital during health talks. The nurses rated general health, nutrition, sexual and reproductive health information and sanitation and hygiene as extremely important. The nurses were quite aware of the policy line but the challenge lies with implementation as they have too many women to attend to. The women were more familiar with information related to HIV testing and sexual reproductive health information. Since the introduction of the comprehensive PMTCT program by the government of Malawi, most of the health talks centred on HIV testing and prevention of infection. Nutrition information was among the least remembered information. This can be as a consequence of limited information that they are provided with as well as the way the information is provided to them. It is reported that health as well as nutrition education have potential to promote health beyond the pregnancy period (Gregory, 2006).



Source: Women's Health Issues (2006)

Figure 24 The lifespan approach to health promotion

Figure 24 highlights the reproductive continuum where each phase is an opportunity for health promotion and to improve the health and well being of the woman and that of her family (Gregory, 2006). This means health and nutrition education have the potential to impact the health and nutrition status of the whole household if it targets the women before they become pregnant and they continue with it until after they have the children.

There were no statistically significant differences on the benefits on their lives based on the information that was received by the pregnant women. Some of the women were able to relate the information they were provided with to their health as they said that the information helped them understand what their bodies were going through and that they were following advice which they were given. Some of the pregnant women said that they did not know whether the information which they received was beneficial or not. This could also point towards limitations with the nurses ability in delivering the information as well as the women might not have been very health literate. The pregnant women need to be encouraged to pay attention when information is being provided during health talks so that they can learn about its benefits on their lives.

Most of the pregnant women (68%) said that they made lifestyle changes based on the information they were provided. There was a statistically significant positive correlation with age and lifestyle changes ($p<0.009$). This meant that with increasing age, there was also an increase in likelihood of having lifestyle changes among the pregnant women. Women need to be encouraged to wait until they are a bit older before they become pregnant so that they are more mature and can use the information they receive at the antenatal sessions properly.

This also points the need for using the lifespan approach discussed earlier so that women are targeted with health information before they become pregnant as this has potential to influence their lives even beyond the current pregnancy.

There was a positive correlation between searching for other information and the education level ($p<0.003$). This means that the more educated a woman is, the more likely it is that she would look for other information that could improve her life. Again, it is important for the young girls to be encouraged to stay in school so that they can use the skills that they get through formal education to improve their own health and that of their household by looking for health promoting information.

There was no statistically significant difference regarding what other information that could be provided during antenatal sessions. Some of the pregnant said they needed family planning information and that the information should depend on individual situation. Most of the women (55%), however, said they did not know what else could be provided or that nothing else should be provided.

The pregnant women were of the opinion that if health personnel told about the benefits from the antenatal sessions, other pregnant women would be coming to the hospital. The majority of the pregnant women had no suggestion on what health personnel could do to make hospital environment friendlier towards pregnant women. The pregnant women said that government should send out mobile clinics in rural areas to assess pregnant women as well as encouraging other pregnant women to attend antenatal clinics. The majority of the women did not give any suggestions on what government could do to minimise maternal mortality. These statements highlight the fact that most of these women were not health literate even though some of them provided some suggestions.

5.7 Nurses perspectives

Half of the nurses were above 40 years of age and two thirds were married and lived within 1 to 10 km radius from the hospital. The nurses faced a number of challenges that have an impact on the quality of the antenatal care that they offered. It appeared that the nurses were doing well in their work looking at the services which they mentioned that they offered. There are differences in what the women recalled and what the nurses provided. The women

were may not have been very health literate and the nurses might also have been inconsistent in the services that they offered and the way the information was provided. The women also show that they lack adequate health and nutrition information. This might be due to inadequate skills among the nurses as to how to deliver information to women with inadequate skills. Since the nurses indicated that refresher courses could help in their service delivery, they need to be reoriented in their client handling skills so that they are able to give appropriate information to the women in a manner that they can understand and use it.

The nurses did not highlight the lack of education as a factor that can lead to maternal mortality. The present study, however, has found that education influenced health and nutrition knowledge which also influence health and nutrition literacy. Even though most of the pregnant women were not health literate, some of them had some knowledge so if it is enforced, the quality of their diets and their lives could be improved. The nurses also mentioned that training and employing more midwives could help reduce maternal mortality. The nurses also mention civic education to pregnant women as another way of lowering maternal mortality. This is a good suggestion considering that some women do not attend antenatal sessions and so this could be the only way to reach them in their communities and make them aware of the benefits of antenatal care to their health. Since the recommendation for building more health centres is long term in nature, there is a need for innovative ways of getting health and nutrition information to the women now.

6.0 CONCLUSION

Even though the pregnant women in this study were able to read and write, the women had limited health and nutrition knowledge either because the midwives attending to them did not provide adequate information or that the women themselves were not health and nutrition literate. The women in this study did not articulate themselves very well as they mostly said yes or no but could not give appropriate responses to justify their responses. The pregnant women were also not looking for other information that might help them, even though some of them had various anxieties. The women need to take the health talks seriously as they contain valuable information which they need to incorporate in their daily lives. The women showed difficulties in relating and incorporating information from the health talks into their lives. This could be observed in the limited number of food groups they were having at a given meal time and the way they answered.

This study has also highlighted that distance to the hospital was a crucial factor in maternal health service delivery and government should plan to construct more health facilities so that women have health services closer to where they stay. Age of the woman is another important factor as the findings showed that older women were more likely to make more antenatal visits and know more about food groups. Government needs to put in place programmes that promote young girl education so that they stay in school. Knowledge about iodine and its dietary sources was very low despite the various government efforts to promote it. Low education was another factor that negatively influenced the pregnant women's ability to assess the quality of the service that they got and the general eating patterns in the pregnant women's homes. Higher education was correlated with looking for other information apart from the hospital.

The study has also highlighted that using the health promotion approach has the potential to influence pregnant women's behaviour to make them more health literate. However, the study had highlighted that education level and age of the women are key in promoting health and nutrition literacy. Therefore, health service providers should develop health promoting initiatives knowing the different education levels among the women. This should also be done bearing in mind that the nurses that are expected to implement this are faced with challenges which should also be considered. The health promotion initiatives can have a lasting impact on a woman's life if the lifespan approach is incorporated.

7.0 RECOMMENDATIONS

The following are the recommendations being made based on the findings from the study:

1. The government needs to consider to deploy nutritionists in hospitals so that they work in conjunction with health service providers in the provision of appropriate nutrition information
2. Government needs to continue raising awareness about benefits of antenatal care and point out when first antenatal visit should be made
3. Nurses should be reoriented in their client handling skills so that they are able to interact with them considering their status
4. The nurses need to come up with ways of spreading their work during the day such as scheduling subsequent visits based on the initial risk assessment after first visit
5. Pregnant women need to pay attention during health talks and ask relevant questions so that any misconceptions they have should be cleared
6. Women need to be encouraged to stay in school and delay marriage so that they minimise the risks associated with early pregnancies and also so they will be able to get more knowledge that can help promote their health.

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Don't know = 99
Have not asked = 88
Will not answer = 77

APPENDICES

APPENDIX I

EVALUATION OF HEALTH AND NUTRITION MESSAGES GIVEN TO PREGNANT WOMEN
QUESTIONNAIRE FOR FIRST TIME MOTHERS (Primigravida)

My Name is Naomi Mvula currently pursuing a Masters in Food, Nutrition and health with Akershus University College in Norway. I am conducting research on how health and nutrition messages that are given to pregnant women affect their health. I would like to ask you a few questions regarding your health during the current pregnancy. I would like to assure you that information you will share with me will only be used for research purposes and will not be traced back to you. You are also free not to participate or discontinue with the interview at any time. However, your input will be greatly appreciated as it will impact on the health of other women and make their pregnancy a better experience.

A) DEMOGRAPHIC CHARACTERISTICS

1. AGE 1) 15 – 19 2) 20 – 24 3) 25 – 29 4) 30 – 34 ☐☐
   5) 35 – 39 6) Don't know 7) Other specify _____
2. Place of residence _____ Distance_____ km ☐☐
3. Number of people in your household: Adults _____ Children _____
4. How many of the adults (18 – 59 years) are engaged in some type of economic activity?
   _____ ☐☐
5. Religion 1) Christian 2) Muslim 3) Orthodox 4)Pagan ☐☐
   5) Hindu 6) Baha'i 7) other specify_____
6. Occupation 1) Teacher 2) secretary 3) Maid 4) Business lady ☐☐
   5) Nurse 6) Unemployed 7) other specify _____
7. Marital status 1) single 2) Married 3) Divorced 4) Widowed ☐☐
   5) Other specify _____
8. Occupation of your spouse 1) Teacher 2)Businessman 3)Civil servant ☐☐
   4) Doctor 5) Unemployed
   6) Other specify _____
9. Education level 1) Junior primary school 2) Senior primary school ☐☐
   3) Junior secondary school 4) Senior secondary school
   5) Tertiary/ University 6) never been to school
   7) Other specify _____

Don't know = 99
Have not asked = 88
Will not answer = 77

B) PERSONAL MEDICAL HISTORY

10. Have you had any of the following illnesses in the past year? (*Not reading the responses*)

1. Tuberculosis ☐
2. Asthma ☐
3. Hypertension ☐
4. Diabetes ☐
5. Epilepsy ☐
6. Renal diseases ☐
7. Fistula repair ☐
8. Other specify _____

11. Have you had a major operation recently? ☐☐
    1)Yes 0) No

If yes, why were you operated on?

_____

_____

_____

FAMILY MEDICAL HISTORY

12. Do you know of any major illness that runs in your family line? ☐☐
    1)Yes 0) No

If yes, what is it? _____

CURRENT OBSTETRIC HISTORY

13. What was your weight before becoming pregnant? ☐☐
    1)45 – 49kg 2) 50 – 54kg 3) 55 – 59kg 4) 60 – 64kg 5) 65 – 69kg
    6) 70 – 74kg 7) Other specify _____kg

14. What is your current weight now? ☐☐
    1)45 – 49kg 2) 50 – 54kg 3) 55 – 59kg 4) 60 – 64kg 5) 65 – 69kg
    6) 70 – 74kg 7) Other specify _____kg

15. What was your blood pressure like before becoming pregnant? ☐☐
    1) Normal 2) varied 3) high

16. What is your current blood pressure like? ☐☐
    1) Normal 2) varied 3) high

17. What is your current height? _____cm ☐☐

18. When was the date of the last period? _____

19. What is your expected date of delivery? _____ ☐☐

Don't know = 99
Have not asked = 88
Will not answer = 77

20. Currently, how far along are you? _____ months ☐☐

21. During which month of your pregnancy did you first come to the antenatal clinic?
_____ Month/Date

22. Why did you come at the above mentioned time?
_____
_____

23. Have you had tetanus toxoid vaccination? 1) Yes 0) No ☐☐
If no, why not?
_____
_____
_____

24. Do you know your blood group? 1) Yes 0) No ☐☐

If yes, what is it? 1) A+ 2) A- 3) AB+ 4) A B- 5) O- ☐☐
6) O+ 7) B+ 8) B-

25. Are you taking any iron supplements now? ☐☐
1) Yes 0) No
If yes, how many are you taking per day?
_____

26. If no, why are you not taking any iron supplements? (*Not reading the responses*)
1) The pills made me nauseous ☐
2) The pills made me constipated ☐
3) The pills made my faeces very dark ☐
4) The pills made me lose my appetite for food ☐
5) The pills caused me to have heartburn ☐
6) Other specify _____

27. Have you used any family planning methods before becoming pregnant? ☐☐
1) Yes 0) No (*continue with question number 30*)

28. If yes, what method were you using? (*Not reading the responses*)
1) Pills ☐
2) Injectables ☐
3) Norplant ☐
4) IUD/ Loop ☐
5) Natural methods ☐
6) Other specify _____

Don't know = 99
Have not asked = 88
Will not answer = 77

29. Did you experience any challenges with your method?

1) Yes 0) No ☐☐

If yes, what challenges did you face? (*Not reading the responses*)

1) Heavy bleeding ☐
2) Prolonged bleeding ☐
3) Nausea ☐
4) Headaches ☐
5) Amenorrhea ☐
6) Other specify _____

30. Have you had an HIV test? 1) Yes 0) No ☐☐

31. What is the reason for having had or not having had the test?

Reason for having HIV test

_____

_____

Reason for not having HIV test

_____

_____

C) NUTRITION AND HEALTH KNOWLEDGE

32. What do your meals consist of these days? (*Not reading the responses*)

1) Nsima ☐
2) Fruits ☐
3) Vegetables ☐
4) Fats and oils ☐
5) Beans ☐
6) Meats ☐
7) Other specify _____

Don't know = 99
Have not asked = 88
Will not answer = 77

33. **24 HOUR DIETARY RECALL**

Please describe all the foods (meals and snacks) you ate yesterday during the day and night, whether at home or outside the home. Start with foods first eaten in the morning

Meal type	Food eaten	Details of the food eaten	Place where food was eaten
Break fast			
Lunch			
Dinner			
Snacks in between meals			

Don't know = 99
Have not asked = 88
Will not answer = 77

34. Do you know about the main food groups? 1) Yes 0) No ☐☐
    If yes, what are they? (*Not reading the responses*)
    1. Staples ☐
    2. Fruits ☐
    3. Vegetables ☐
    4. Fats and oils ☐
    5. Legumes ☐
    6. Animal foods ☐
    7. Other specify _____

35. Out of the groups I will mention, which ones should a pregnant woman eat? (*Reading the responses*)

	Yes	No
1. Staples	☐	☐
2. Fruits	☐	☐
3. Vegetables	☐	☐
4. Fats and oils	☐	☐
5. Legumes	☐	☐
6. Animal foods	☐	☐
7. Other specify _____		

36. Why are these foods important? (*Not reading responses*)
    1. They are good for foetal growth and development ☐
    2. They are good for the woman's health ☐
    3. They help fight infections ☐
    4. They help the woman become strong to support the foetus ☐
    5. Other specify _____

37. Have you heard about any foods that a pregnant woman must avoid?

_____

_____

38. Why do you think a pregnant woman must avoid the foods you have mentioned above?

_____

_____

_____

39. Do you know any foods that are rich in iron? 1)Yes 0) No ☐☐
    If yes, what are they?

_____

_____

Don't know = 99
Have not asked = 88
Will not answer = 77

40. Do you know of any foods rich in vitamin A? 1) Yes 0) No ☐☐
    If yes, what are they?

_____

_____

41. Do you know of any foods rich in iodine? 1) yes 0) No ☐☐
    If yes, what are they?

_____

_____

42. Are you facing any cravings for items that you would normally not consume?
    1)Yes 0) No ☐☐
    If yes, what are you craving for?

_____

_____

43. Are you experiencing any problems that are interfering with your day to day food intake?
    1)Yes 0) No ☐☐
    If yes, what are they? (*Not reading responses*)
    1. Nausea ☐
    2. Excessive salivation ☐
    3. Loss of appetite ☐
    4. Vomiting after meals ☐
    5. Other specify _____

44. Are you having any new health problems because of your pregnancy?
    1)Yes 0) No *(If no, go to question 47)* ☐☐
    If yes, what problems do you have?

_____

_____

_____

45. The health problem that you have just mentioned, have you brought it to the attention of the midwife/nurse during your routine check up?
    1) Yes 0) No *(If yes, go to question 46)* ☐☐
    If No, why not?

_____

_____

_____

46. If yes, what happened when you brought up your health problem to the medical personnel?

_____

_____

_____

Don't know = 99
Have not asked = 88
Will not answer = 77

47. How many times other than today, have you come for routine check up?(*Not reading responses*)

1. This is the first time ☐
2. Once ☐
3. Two times ☐
4. Three times ☐
5. Four times ☐
6. Five times ☐
7. other specify _____

48. Have you had to come to the hospital for other ailments related to the pregnancy apart from your routine check up? 1) Yes 0) No ☐☐
If yes, what problem did you have?

_____
_____
_____

49. When you come to the antenatal clinics for your routine check up, what happens? (*Not reading responses*)

1. Weight is measured ☐
2. Blood pressure is measured ☐
3. Physical examination of the belly ☐
4. Personal chat with the midwife about pregnancy progress ☐
5. Health talks are given ☐
6. Receiving supplements ☐
7. Other specify _____

50. What kind of information is given to you during your visits? (*Not reading responses*)

1. Health information ☐
2. Nutrition information ☐
3. Hygiene & Sanitation ☐
4. Sexual and reproductive health information ☐
5. Others specify _____

51. In what way has the information you have been provided with been beneficial to you? (*Not reading responses*)

i. I am more aware about the changes my body is going through ☐
ii. I am careful about the foods I eat ☐
iii. I am more careful about the sanitation around my home ☐
iv. I am now ready for motherhood ☐
v. It has not been beneficial to me ☐
vi. Others specify _____

Don't know = 99
Have not asked = 88
Will not answer = 77

52. Has the information that you have been provided with helped in understanding what your body is going through? 1) Yes 0) No ☐☐

Give a reason for your answer!

_____

_____

_____

53. Has the information you have been provided with led to any changes in your life style?
1)Yes 0) No ☐☐

Give a reason for your answer!

_____

_____

_____

54. Is there adequate time between you and the midwife when you come for your routine check up? 1)Yes 0) No ☐☐

Give a reason for your answer!

_____

_____

_____

55. Are there issues that you are concerned about related to your pregnancy that have not been addressed during your routine visits? 1)Yes 0) No ☐☐

Give a reason for your answer!

_____

_____

_____

56. What else, do you think needs to be included in the information that is provided to you?

_____

_____

_____

57. This being your first pregnancy, would you say coming to a health facility has helped you in coping with the anxieties you have? 1)Yes 0) No ☐☐

Give a reason for your answer!

_____

_____

_____

58. Have you tried to search for information to help you in your pregnancy from other sources other than hospital personnel?
1)Yes 0) No (*If no continue to question 62)* ☐☐

Don't know = 99
Have not asked = 88
Will not answer = 77

59. If yes, where did you get the additional information? (*Not reading responses*)
    1. Family members ☐
    2. Friends ☐
    3. Newspapers, Magazines, Brochures, other print media ☐
    4. Television ☐
    5. Radio ☐
    6. Internet ☐
    7. Other specify _____

60. If yes, in what way was the information in anyway useful? (*Not reading responses*)
    1. I am more aware about the changes my body is going through ☐
    2. I am careful about the foods I eat ☐
    3. I am more careful about the sanitation around my home ☐
    4. I am now ready for motherhood ☐
    5. It has not been beneficial to me ☐
    6. Others specify _____

61. If yes, why has the information not been beneficial to you? (*Not reading responses*)
    1. I am still not clear about the changes my body is going through ☐
    2. I still have unanswered questions ☐
    3. I am still experiencing challenges with my health ☐
    4. I don't know ☐
    5. Others specify _____

62. In your opinion, why do you think women do not come to access antenatal services? (*Not reading responses*)
    1. The health staff are not friendly ☐
    2. The hospital is very far from where they stay ☐
    3. The TBAs are more friendly ☐
    4. The hospitals do not have adequate facilities ☐
    5. The women do not know about the ANC service ☐
    6. Others specify _____

63. What should health personnel do to make the environment more supportive/welcoming towards pregnant women? (*Not reading responses*)
    1. They should be more friendly ☐
    2. They should give relevant information ☐
    3. They should allocate more time for personal consultations ☐
    4. They should attend to the pregnant women in good time ☐
    5. I don't know ☐
    6. Others specify _____

Don't know = 99
Have not asked = 88
Will not answer = 77

64. What should the government do to minimize the number of women that are dying in childbirth and pregnancy related conditions?(*Not reading responses*)
    1. It should train more nurses /midwives ☐
    2. It should put in place nurses/midwives that respect their jobs ☐
    3. It should fire all non performing nurses/midwives ☐
    4. It should put in place health supportive strategies ☐
    5. I don't know ☐
    6. Others specify _____

Acknowledgement:
I would like to thank you for your time and responses that you have provided. I would like to assure you that the information you have given me is confidential and will not in any way be traced back to you. The information you have provided will be vital for improvements in maternal health delivery services. Thank you!!

Don't know = 99
Have not asked = 88
Will not answer = 77

APPENDIX II

EVALUATION OF HEALTH AND NUTRITION MESSAGES GIVEN TO PREGNANT WOMEN QUESTIONNAIRE FOR INTERVIEWS WITH MIDWIVES AND NURSES

My Name is Naomi Mvula currently pursuing a Masters in Food, Nutrition and Health with Akershus University College in Norway. I am conducting research on how health and nutrition messages that are given to pregnant women affect their health. This questionnaire has questions regarding the services that are provided to pregnant women. I would like to assure you that information you will share with me will only be used for research purposes. This information will not be traced back to you. You are also free not to participate. However, your input will be greatly appreciated as it will impact on the health service delivery towards pregnant women.

SECTION A

DEMOGRAPHIC CHARACTERISTICS

(*Please tick the one that applies*)

1. AGE
   - 1) 15 – 19 ☐
   - 2) 20 – 24 ☐
   - 3) 25 – 29 ☐
   - 4) 30 – 34 ☐
   - 5) 35 – 39 ☐
   - 6) Don't know ☐
   - 7) Other specify _____

2. SEX (*Tick one that applies*) Male ☐ Female ☐
3. Place of residence _____ Distance _____km

4. Religion (*Tick the one that applies*)
   - 1) Christian ☐
   - 2) Muslim ☐
   - 3) Pagan ☐
   - 4) Baha'i ☐
   - 5) Hindu ☐
   - 6) Other specify _____

5. Marital status (*Tick one that applies*)
   - 1) Single ☐
   - 2) Married ☐
   - 3) Divorced ☐
   - 4) Widowed ☐
   - 5) Other specify _____

Don't know = 99
Have not asked = 88
Will not answer = 77

6. Education level/ Tertiary institution attended (*Tick one that applies*)
    1. Kamuzu College of Nursing ☐
    2. Nkhoma School of Nursing ☐
    3. Nguludi Mission Nursing School ☐
    4. St John of God Nursing School ☐
    5. Others specify _____

SECTION B

SERVICE DELIVERY

7. When did you start practicing as a nurse?
   Year _____
8. When did you become a midwife?
   Year _____

9. What are some of the challenges you face in your work? (*Tick all those that apply*)
    1. There are a lot patients and few nurses ☐
    2. I reside far from the work place ☐
    3. Inadequate pay ☐
    4. I don't have any challenges ☐
    5. Others specify _____

10. What do you think would help improve your work? (*Tick all those that apply*)
    1. More nurses should be hired ☐
    2. Nurses should be sent for refresher courses ☐
    3. Nurses pay should be increased ☐
    4. I don't know ☐
    5. Others specify _____

11. How many pregnant women do you attend to in:
    A day _____
    A week _____
    A month _____

12. In your opinion, why do these pregnant women come to the antenatal clinic? (*Tick all those that apply*)
    1. To get checked up on the progress of their pregnancy ☐
    2. To get advice on their health ☐
    3. To receive supplements ☐
    4. I don't know ☐
    5. Others specify _____

Don't know = 99
Have not asked = 88
Will not answer = 77

13. How often must the women come for these visits?(*Tick all those that apply*)
    1. Once a month ☐
    2. Once in 2 months ☐
    3. Once in 3 months ☐
    4. A minimum of 4 times during their whole pregnancy ☐
    5. They should come only when they have a problem ☐
    6. I don't know ☐
    7. Others specify _____

14. What happens during routine check up when these women have come to you? (*Tick all those that apply*)
    1. Weight and blood pressure are measured ☐
    2. Physical examination of the belly ☐
    3. Personal chat with woman about progress of the pregnancy ☐
    4. Health talks are given ☐
    5. Providing them with supplements ☐
    6. Others specify _____

15. What do you do when you notice that a woman is not progressing well with her pregnancy? (*Tick all those that apply*)
    1. Give them advice according to the problem identified ☐
    2. Give them health advice ☐
    3. Admit them for observation ☐
    4. Wait for situation to improve ☐
    5. Providing them with supplements ☐
    6. Others specify _____

16. For the statements below, indicate on a scale of 1 to 5 (with 1 being not at all to 5 being extremely important), how you rate the importance of the following types of information being provided to pregnant women

Importance sheet

Type of information	**Scale of importance**				
	Not at all in agreement	**Not very in agreement**	**Neither agree nor disagree**	**Somewhat agree**	**Extremely agree**
General health information is important					
Agricultural production information is important					
Sexual and reproductive health information is important					
Nutrition information is important					
Sanitation and hygiene information is important					
Financial management information is important					

Don't know = 99
Have not asked = 88
Will not answer = 77

17. What do you do when you notice that a pregnant woman is anaemic?(*Tick all those that apply*)
    1. Give them iron supplements ☐
    2. Give them nutrition advice about iron rich foods ☐
    3. Admit them for observation ☐
    4. Wait for situation to improve ☐
    5. Others specify _____

18. What do you do when you notice that a pregnant woman is malnourished?(*Tick all those that apply*)
    1. Give them food supplements ☐
    2. Give them advice about appropriate dietary intake ☐
    3. Admit them for observation ☐
    4. Wait for situation to improve ☐
    5. Others specify _____

19. What kind of advice do you give the women after delivery? (*Tick all those that apply*)
    1. Give them advice about exclusive breast feeding ☐
    2. Give them advice about appropriate dietary intake ☐
    3. Give them advice about personal hygiene ☐
    4. Give them advice about baby care ☐
    5. Give them information on family planning ☐
    6. Give them supplements (Iron & Vit. A) ☐
    7. Others specify _____ ☐

20. In your opinion, why are there high rates of maternal death in Malawi?

    _____
    _____
    _____

21. What do you think the women need to do to ensure their health and well being during pregnancy to have a successful pregnancy?

    _____
    _____
    _____
    _____

22. What do you think you can do to contribute towards reducing maternal deaths?

    _____
    _____
    _____
    _____

Don't know = 99
Have not asked = 88
Will not answer = 77

23. What must the government do to make a significant reduction in maternal deaths in Malawi?

_____
_____
_____
_____

Acknowledgement:
I would like to thank you for your time and responses that you have provided. I would like to assure you that the information you have given me is confidential and will not in any way be traced back to you. The information you have provided will be vital for improvements in maternal health delivery services. Thank you!!

Don't know = 99
Have not asked = 88
Will not answer = 77

APPENDIX III

EVALUATION OF HEALTH AND NUTRITION MESSAGES GIVEN TO PREGNANT WOMEN QUESTIONNAIRE FOR FIRST TIME MOTHERS (Primigravida) CHICHEWA VERSION

My Name is Naomi Mvula currently pursuing a Masters in Food, Nutrition and health with Akershus University College in Norway. I am conducting research on how health and nutrition messages that are given to pregnant women affect their health. I would like to ask you a few questions regarding your health during the current pregnancy. I would like to assure you that information you will share with me will only be used for research purposes and will not be traced back to you. You are also free not to participate or discontinue with the interview at any time. However, your input will be greatly appreciated as it will impact on the health of other women and make their pregnancy a better experience.

Dzina langa ndine Naomi Mvula ndipo pakali pano ndikupanga maphunzilo aukachenjede wa zakudya ndi za umoyo ku Akershus University College ku Norway. Ndikupanga kafukufu pa mauthenga okhudzana ndi umoyo ndi chakudya womwe amaperekedwa kwa amayi oyembekezera. Ndimafuna nditapezako mwayi ndikukufunsani mafunso angapo okhudzana ndi umoyo wanu pa nthawi yomwe mukuyembekezelayi. Ndikufuna ndikutsimikizileni kuti zomwe titakambilane apa ndi za chinsinsi ndipo sadzakulondolozani inu ndi mayankho anu. Muli omasuka kusatenga nawo mbali kapena kusiya kayankha mafunso nthawi ina iliyonse. Koma nzeru zanu zithandiza kupeza njira zamakono zotukulila moyo wa amayi oyembekezera.

A) DEMOGRAPHIC CHARACTERISTICS

1. AGE 1) 15 – 19 2) 20 – 24 3) 25 – 29 4) 30 – 34 ☐☐
   Zaka 5) 35 – 39 6) Don't know 7) Other specify _____

2. Place of residence _____ Distance_____ km ☐☐
   Malo omwe mumakhala *Mtunda*

3. Number of people in your household: Adults _____ Children _____
   Anthu omwe mukukhala nawo pakhomo lanu *Akulu* *Ana*

4. How many of the adults (18 – 59 years) are engaged in some type of economic activity? ☐☐
   _____
   Pa anthu akulu omwe mukukhala nawo ndi angati omwe amagwira ntchito?

5. Religion 1) Christian 2) Muslim 3) Orthodox 4)Pagan ☐☐
   Chipembedzo 5) Hindu 6) Baha'i 7) other specify_____

6. Occupation 1) Teacher 2) secretary 3) Maid 4) Business lady ☐☐
   Ntchito yomwe mumagwira 5) Nurse 6) Unemployed 7) other specify _____

Don't know = 99
Have not asked = 88
Will not answer = 77

7. Marital status 1) single 2) Married 3) Divorced 4) Widowed ☐☐
   Moyo wanu wa banja 5) Other specify _____

8. Occupation of your spouse 1) Teacher 2)Businessman 3)Civil servant ☐☐
   Ntchito yomwe amagwira amuna anu 4) Doctor 5) Unemployed
   6) Other specify _____

9. Education level 1) Junior primary school 2) Senior primary school ☐☐
   Maphunzilo 3) Junior secondary school 4) Senior secondary school
   5) Tertiary/ University 6) never been to school
   7) Other specify _____

B) PERSONAL MEDICAL HISTORY

10. Have you had any of the following illnesses in the past year? (*Not reading the responses*)
    Kodi munadwala ena mwa matenda awa mchaka chathachi?

1.	Tuberculosis	*Chifuwa chachikulu*	☐
2.	Asthma	*mphumu*	☐
3.	Hypertension	*Befu*	☐
4.	Diabetes *Shuga*		☐
5.	Epilepsy	*Khunyu*	☐
6.	Renal diseases	*Matenda a muchikhodzodzo*	☐
7.	Fistula repair		☐
8.	Other specify _____		

11. Have you had a major operation recently? *Kodi munapangidwako opaleshoni posachedwapa?*
    1) Yes *Eya* 0) No *Ayi*
    If yes, why were you operated on? *Ngati eya, chifukwa chani munapangidwa opales* ☐☐
    _____
    _____
    _____

FAMILY MEDICAL HISTORY

12. Do you know of any major illness that runs in your family line? *Kodi m'banja mwanu muli ndi matenda ena alionse a ku mtundu wanu?*
    1)Yes *Eya* 0) No *Ayi* ☐☐
    If yes, what is it? _____
    Ngati alipo, ndi matenda anji?

CURRENT OBSTETRIC HISTORY

13. What was your weight before becoming pregnant?
    Kodi mumalemera bwanji pasikelo musanakhale oyembekezera?
    1)45 – 49kg 2) 50 – 54kg 3) 55 – 59kg 4) 60 – 64kg 5) 65 – 69kg ☐☐
    6) 70 – 74kg 7) Other specify _____kg

Don't know = 99
Have not asked = 88
Will not answer = 77

14. What is your current weight now?
    Nanga pakali pano sikelo yanu ndi chani?
    1)45 – 49kg 2) 50 – 54kg 3) 55 – 59kg 4) 60 – 64kg 5) 65 – 69kg
    6) 70 – 74kg 7) Other specify _____kg

15. What was your blood pressure like before becoming pregnant?
    Kodi BP yanu inali bwanji musanatenge pakati pamenepa?
    1) Normal *Bwinobwino* 2) varied *Imasinthasintha* 3) high *yokwera*

16. What is your current blood pressure like?
    Nanga pakali pano BP yanu ili bwanji?
    1) Normal *Bwinobwino* 2) varied *Imasinthasintha* 3) high *Yokwera*

17. What is your current height? _____cm
    Kodi msinkhu wanu ndiwautali bwanji?
18. When was the date of the last period? _____
    Kodi munasamba liti komaliza?
19. What is your expected date of delivery? _____
    Mukuyembekeza kudzachila liti?
20. Currently, how far along are you? _____ months
    Pakadali pano mukuyembekezera mwezi wachingati?
21. During which month of your pregnancy did you first come to the antenatal clinic? *Munayamba kubwera ku sikelo mukuyembekezera miyezi ingati?*
    _____ Month/Date

22. Why did you come at the above mentioned time? *Ndichifukwa chani munayamba kubwera pa nthawi yomwe matchulayo?*
    _____
    _____

23. Have you had tetanus toxoid vaccination? 1) Yes *Eya* 0) No *Ayi*
    Kodi munalandira katemela wa kafumbata?
    If no, why not? *Ngati ayi chifukwa ninji?*
    _____
    _____
    _____

24. Do you know your blood group? 1) Yes *Eya* 0) No *Ayi*
    Kodi mumadziwa gulu la magazi lanu?
    If yes, what is it? *Ngati eya, ndi chani?*
    1) A+ 2) A- 3) AB+ 4) A B-
    5) O- 6) O+ 7) B+ 8) B-

Don't know = 99
Have not asked = 88
Will not answer = 77

25. Are you taking any iron supplements now? *Kodi mukumwa ma pilisi a mchere wa ayironi?*
    1)Yes *Eya* 0) No *Ayi* ☐☐
    If yes, how many are you taking per day? *Ngati eya, mukumwa angati pa tsiku?*
    _____

26. If no, why are you not taking any iron supplements? (*Not reading the responses*)
    Ngati ayi, nchifukwa chani simukumwa mapilisi a ayironi?
    1) The pills made me nauseous *amandipatsa nseru* ☐
    2) The pills made me constipated *amandilepheretsa chimbudzi* ☐
    3) The pills made my faeces very dark *amapangitsa chimbudzi chakuda* ☐
    4) The pills made me lose my appetite for food *amandichotsa khumbo la chakudya* ☐
    5) The pills caused me to have heartburn amandiotcha pa mtima ☐
    6) Other specify _____

27. Have you used any family planning methods before becoming pregnant? *Munagwiritsako njira za kulela musanakhale oyembekezera?*
    1) Yes *Eya* 0) No *Ayi* (*continue with question number 30*) ☐☐

28. If yes, what method were you using? (*Not reading the responses*)
    Ngati eya, mumagwiritsa njira yanji?
    1) Pills *Mapilisi* ☐
    2) Injectables *Jakiseni* ☐
    3) Norplant *Noplanti* ☐
    4) IUD/ Loop *Lupu* ☐
    5) Natural methods *Njira za makolo* ☐
    6) Other specify _____

29. Did you experience any challenges with your method? *Munakumana ndi vuto lina lililonse pa njira yomwe munasankhayo?*
    1) Yes *Eya* 0) No *Ayi* ☐☐
    If yes, what challenges did you face? *Ngati eya, ndimavuto anji?* (*Not reading the responses*)
    1) Heavy bleeding *Kutaya magazi kwambili* ☐
    2) Prolonged bleeding *Kutaya magazi mopitiliza masiku* ☐
    3) Nausea *Nseru* ☐
    4) Headaches *Mutu umapweteka* ☐
    5) Amenorrhea *Ndinaleka kusamba* ☐
    6) Other specify _____

30. Have you had an HIV test? *Munayamba mwakayezetsapo HIV?*
    1) Yes *Eya* 0) No *Ayi* ☐☐

Don't know = 99
Have not asked = 88
Will not answer = 77

31. What is the reason for having had or not having had the test?
Chifukwa chani munakayezetsa kapena simunakayezetse HIV?

Reason for having HIV test *Chifukwa choyezetsera*

_____

_____

Reason for not having HIV test *Chifukwa chosakayezetsera*

_____

_____

C) NUTRITION AND HEALTH KNOWLEDGE

32. What do your meals consist of these days? *Masiku ano mukumadya chani?* (*Not reading the responses*)

1) Nsima ☐
2) Fruits *Zipatso* ☐
3) Vegetables *Masamba* ☐
4) Fats and oils *Zamafuta* ☐
5) Beans *Nyemba* ☐
6) Meats *Nyama* ☐
7) Other specify _____

Don't know = 99
Have not asked = 88
Will not answer = 77

33. **24 HOUR DIETARY RECALL**

Please describe all the foods (meals and snacks) you ate yesterday during the day and night, whether at home or outside the home. Start with foods first eaten in the morning *Chonde fotokozani zakudya zonse zomwe munadya dzulo masana ndi usiku, kaya kunyumba kapena koyenda. Muyambe kufotokoza chakudya cha m'mawa*

Meal type	**Food eaten**	**Details of the food eaten**	**Place where food was eaten**
Break fast ***Kadzutsa***			
Lunch ***Nkhomalilo***			
Dinner ***Mgonelo***			
Snacks in between meals ***Zakudya zina***			

Don't know = 99
Have not asked = 88
Will not answer = 77

34. Do you know about the main food groups? *Kodi munamvako za magulu a zakudya?*

1) Yes *Eya* 0) No *Ayi* ☐☐

If yes, what are they? (*Not reading the responses*)

1. Staples *Zopatsa mphamvu* ☐
2. Fruits *Zipatso* ☐
3. Vegetables *Zamasamba* ☐
4. Fats and oils *Zamafuta* ☐
5. Legumes Zanyemba ☐
6. Animal foods *Zanyama* ☐
7. Other specify _____

35. Out of the groups I will mention, which ones should a pregnant woman eat? (*Reading the responses*)*Pamagulu omwe nditatchule, ndi ati omwe mayi woyembekezeraayenera kudya?*

		Yes	No
1. Staples	*Zopatsa mphamvu*	☐	☐
2. Fruits	*Zipatso*	☐	☐
3. Vegetables	*Zamasamba*	☐	☐
4. Fats and oils	*Zamafuta*	☐	☐
5. Legumes	*Zanyemba*	☐	☐
6. Animal foods	*Zanyama*	☐	☐
7. Other specify _____			

36. Why are these foods important? *Ubwino wa zakudya zimenezi ndi chani?*(*Not reading responses*)

1. They are good for foetal growth and development ☐
   Zimathandiza kuti mwana akule bwino mumimba
2. They are good for the woman's health ☐
   Zimathandiza pa moyo wa mayi
3. They help fight infections ☐
   Zimathandiza kupewa matenda
4. They help the woman become strong to support the foetus ☐
   Zimathandiza mayi kukhala ndi mphamvu pamene ali woyembekezera
5. Other specify _____

37. Have you heard about any foods that a pregnant woman must avoid? *Munamvako za zakudya zomwe mayi woyembekezera sayenera kudya?*

_____
_____

38. Why do you think a pregnant woman must avoid the foods you have mentioned above? *Mukuona ngati ndichifukwa chani mayi woyembekezera sayenera kudya zakudya zimenezo?*

_____
_____
_____

Don't know = 99
Have not asked = 88
Will not answer = 77

39. Do you know any foods that are rich in iron? *Mukudziwako zakudya zomwe zili ndi ayironi?*
    1)Yes *Eya* 0) No *Ayi* ☐☐
    If yes, what are they? *Ngati eya, ndi ziti?*

    _____

    _____

40. Do you know of any foods rich in vitamin A? *Mukudziwako zakudya zanji zomwe zili ndi Vitamin A?* 1) Yes *Eya* 0) No *Ayi* ☐☐
    If yes, what are they? *Ngati eya, ndi ziti?*

    _____

    _____

41. Do you know of any foods rich in iodine? *Mukudziwako zakudya zanji zomwe zili ndi ayodini?*
    1) Yes *Eya* 0) No *Ayi* ☐☐
    If yes, what are they? *Ngati eya, ndi ziti?*

    _____

    _____

42. Are you facing any cravings for items that you would normally not consume? *Mukumakhala ndi chilakolako cha zakudya zomwe simumadya kawirikawiri?*
    1)Yes *Eya* 0) No Ayi ☐☐
    If yes, what are you craving for? *Ngati eya, ndi zakudya zanji?*

    _____

    _____

43. Are you experiencing any problems that are interfering with your day to day food intake? *Mukukumana ndi vuto lina lililonse lomwe likusokoneza madyedwe anu a chakudya?*
    1)Yes Eya 0) No *Ayi* ☐☐
    If yes, what are they? Ngati eya, ndimavuto anji? (*Not reading responses*)
    1. Nausea *Nseru* ☐
    2. Excessive salivation *malovu amadzadza mkamwa* ☐
    3. Loss of appetite *Kusafuna kudya* ☐
    4. Vomiting after meals *Kusanza ndikatha kudya* ☐
    5. Other specify _____

44. Are you having any new health problems because of your pregnancy? *Pali vuto lina lililonse pa moyo wanu lomwe labwera chifukwa cha pakatipa?*
    1)Yes *Eya* 0) No *Ayi* ☐☐
    If yes, what problems do you have? *Ngati eya, ndi vuto lanji?*

    _____

    _____

    _____

Don't know = 99
Have not asked = 88
Will not answer = 77

45. The health problem that you have just mentioned, have you brought it to the attention of the midwife/nurse during your routine check up? *Vuto mwalitchulali, munayamba mwawauzako a namwino mutabwera ku sikelo?*

    1) Yes *Eya* 0) No *Ayi* ☐☐

    If No, why not? *Ngati ayi, ndi chifukwa chani simunanene?*

_____
_____
_____

46. If yes, what happened when you brought up your health problem to the medical personnel? *Ngati eya, chinachitika ndi chani mutawawuza a namwino za vuto lanu?*

_____
_____
_____

47. How many times other than today, have you come for routine check up? *Mwabwerako kusikelo kangati kupatula lero?*(*Not reading responses*)

    1. This is the first time *kano ndikoyamba* ☐
    2. Once *Kamodzi* ☐
    3. Two times *Kawiri* ☐
    4. Three times *Katatu* ☐
    5. Four times *Kanayi* ☐
    6. Five times *Kasanu* ☐
    7. other specify _____

48. Have you had to come to the hospital for other ailments related to the pregnancy apart from your routine check up? *Munabwerako ku chipatala kaamba ka vuto lina lililonse lokhudzana ndi pakati panu?* 1) Yes *Eya* 2) No *Ayi* ☐☐

    If yes, what problem did you have? *Ngati eya, ndi vuto lanji?*

_____
_____
_____

49. When you come to the antenatal clinics for your routine check up, what happens? *Mukabwera kusikero ya amayi oyembekezera, chimachitika ndi chani?*

    (*Not reading responses*)

    1. Weight is measured *Amatiyeza sikelo* ☐
    2. Blood pressure is measured Amatiyeza BP ☐
    3. Physical examination of the belly *Amatiyeza pakati* ☐
    4. Personal chat with the midwife about pregnancy progress ☐
       Timacheza mwachinsinsi ndi a namwino za momwe pakati pakuyendera
    5. Health talks are given ☐
       Amatiyankhula za umoyo
    6. Receiving supplements *Timalandira mapilisi* ☐
    7. Other specify _____

Don't know = 99
Have not asked = 88
Will not answer = 77

50. What kind of information is given to you during your visits? *Mumalandira uphungu wanji mukabwera kusikelo?*(*Not reading responses*)

    1. Health information *Uphungu wa zaumoyo* ☐
    2. Nutrition information *Uphungu wa madyedwe abwino* ☐
    3. Hygiene & Sanitation *Uphungu wa za ukhondo* ☐
    4. Sexual and reproductive health information ☐
       Uphungu wa chikhalidwe cha pa banja
    5. Others specify _____

51. In what way has the information you have been provided with been beneficial to you? *Uphungu womwe mumalandila umakuthandizani bwanji?* (*Not reading responses*)

    1. I am more aware about the changes my body is going through ☐
       Ndikutha kuzindikila zomwe thupi langa likukumana nazo
    2. I am careful about the foods I eat ☐
       Ndimasamala zakudya zomwe ndimadya
    3. I am more careful about the sanitation around my home ☐
       Ndimasamala ukhondo pakhomo langa
    4. I am now ready for motherhood ☐
       Ndine okonzekera kukhala mayi
    5. It has not been beneficial to me ☐
       Sizinandithandize kalikonse
    6. Others specify _____

52. Has the information that you have been provided with helped in understanding what your body is going through? *Uphungu womwe mukulandira ukukuthandizani zomwe thupi lanu likudutsamo?* 1) Yes *Eya* 0) No *ayi* ☐☐
    Give a reason for your answer! *Perekani chifukwa cha yankho lanu?*
    _____
    _____
    _____

53. Has the information you have been provided with led to any changes in your life style? *Nanga uphungu womwe mwalandila wakupangitsani kusintha makhalidwe anu?*
    1)Yes *Eya* 0) No *Ayi* ☐☐
    Give a reason for your answer! *Perekani chifukwa cha yankho lanu?*
    _____
    _____
    _____

Don't know = 99
Have not asked = 88
Will not answer = 77

54. Is there adequate time between you and the midwife when you come for your routine check up? *Kodi mumakhala ndi nthawi yokwanila ndi anamwino mukabwera kusikelo?*

    1)Yes *Eya* 0) No *Ayi* ☐☐

    Give a reason for your answer! *Perekani chifukwa cha yankho lanu?*

    _____
    _____
    _____

55. Are there issues that you are concerned about related to your pregnancy that have not been addressed during your routine visits? *Pali zina zili zonse zomwe simudathandizike zokhudzana ndi pakati panu chiyambireni kubwera kusikelo*

    1)Yes *Eya* 0) No *Ayi* ☐☐

    Give a reason for your answer! *Perekani chifukwa cha yankho lanu?*

    _____
    _____
    _____

56. What else, do you think needs to be included in the information that is provided to you? *Ndi zinthu zanji zomwe mukadakonda atawonjezera pa malangizo omwe mumalandila?*

    _____
    _____
    _____

57. This being your first pregnancy, would you say coming to a health facility has helped you in coping with the anxieties you have? *Iyi pokhala mimba yanu yoyamba, kodi kubwera kusikelo zathandiza kuchotsa khawa pamoyo wanu*

    1)Yes *Eya* 0) No *Ayi* ☐☐

    Give a reason for your answer! *Perekani chifukwa cha yankho lanu?*

    _____
    _____
    _____

58. Have you tried to search for information to help you in your pregnancy from other sources other than hospital personnel? *Palinso kwina komwe mwakhala mukutenga uphungu kupatula ku sikelo?*

    1)Yes *Eya* 0) No *Ayi* (*If no continue to question62)* ☐☐

Don't know = 99
Have not asked = 88
Will not answer = 77

59. If yes, where did you get the additional information? (*Not reading responses*)
    1. Family members *Abale anga* ☐
    2. Friends *Anzanga* ☐
    3. Newspapers, Magazines, Brochures, other print media *Zolemba* ☐
    4. Television *Wayilesi ya kanema* ☐
    5. Radio *Wayilesi* ☐
    6. Internet ☐
    7. Other specify _____

60. If yes, in what way was the information in anyway useful? *Ngati eya uthenga umenewo wakuthandizani bwanji?* (*Not reading responses*)
    1. I am more aware about the changes my body is going through ☐
       Ndikuzindikila momwe thupi langa likusinthila
    2. I am careful about the foods I eat ☐
       Ndikusamala zakudya zomwe ndimadya
    3. I am more careful about the sanitation around my home ☐
       Ndikusamala ukhondo pa khomo langa
    4. I am now ready for motherhood ☐
       Ndili okonzeka kukhala mayi
    5. It has not been beneficial to me ☐
       Sizinandipindulile kalikonse
    6. Others specify _____

61. If yes, why has the information not been beneficial to you? *Ngati ayi, inu mukuona ngati uphunguwu siunakupindulileni chifukwa chani?* (*Not reading responses*)
    1. I am still not clear about the changes my body is going through ☐
       Sindikumvetsetsa zomwe thupi langa likudutsamo
    2. I still have unanswered questions ☐
       Ndili ndi mafunso omwe ndikusowa mayankho ake
    3. I am still experiencing challenges with my health ☐
       Ndikukumana ndi mavuto pa umoyo wanga
    4. I don't know *Sindikudziwa* ☐
    5. Others specify _____

62. In your opinion, why do you think women do not come to access antenatal services?
    Mumaganizo anu, ndichifukwa chani azimayi samabwera kusikelo?(Not reading responses)
    1. The health staff are not friendly ☐
       Ogwira ntchito kuchipatala samawalandira ndi nsangala
    2. The hospital is very far from where they stay ☐
       Chipatala chilli kutali ndi komwe amakhala
    3. The TBAs are more friendly ☐
       Azamba amawalandira mwa nsangala
    4. The hospitals do not have adequate facilities ☐
       Zipatala zilibe zipangizo zokwanila
    5. The women do not know about the ANC service ☐
       Azimayiwo sadziwa kuti kuli sikelo ya amayi apakati
    6. Others specify _____

Don't know = 99
Have not asked = 88
Will not answer = 77

63. What should health personnel do to make the environment more supportive/welcoming towards pregnant women? *Anthu akuchipatala adzipanga chani kuti azimayi oyembekezera azibwera momasuka kusikelo?* (*Not reading responses*)
    1. They should be more friendly ☐
       Adzikhala a nsangala
    2. They should give relevant information ☐
       Azipeleka uphungu oyenera
    3. They should allocate more time for personal consultations ☐
       Azipeleka nthawi yokwanila pocheza mwachinsinsi ndi amayi
    4. They should attend to the pregnant women in good time ☐
       Adziwathandiza amayi mwachangu
    5. I don't know *Sindikudziwa* ☐
    6. Others specify _____

64. What should the government do to minimize the number of women that are dying in childbirth and pregnancy related conditions? *Kodi boma lichite chani pothandiza kuchepetsa imfa za amayi oyembekezera?* (*Not reading responses*)
    1. It should train more nurses /midwives ☐
       Aphunzitse anthu ambili kukhala anamwino
    2. It should put in place nurses/midwives that respect their jobs ☐
       Alembe ntchito anamwino olemekeza ntchito yawo
    3. It should fire all non performing nurses/midwives ☐
       Achotse ntchito anamwino onse omwe sakutha ntchito yawo
    4. It should put in place health supportive strategies ☐
       Liyike m'malo njira zopititsa patsogolo umoyo wa amayi
    5. I don't know *Sindikudziwa* ☐
    6. Others specify _____

Acknowledgement:
I would like to thank you for your time and responses that you have provided. I would like to assure you that the information you have given me is confidential and will not in any way be traced back to you. The information you have provided will be vital for improvements in maternal health delivery services. Thank you!!

Ndikufuna ndikuthokozeni mayi chifukwa cha nthawi yanu ndi mayankho omwe mwandipatsa. Ndikufuna ndikutsimikizileni kuti nkhani zomwe takambilanazi ndi zachinsinsi ndipo sadzakulondolozani inu chifukwa cha mayankho omwe mwapereka. Mayankhowa athandiza kukhonza mfundo zopititsila patsogolo ntchito zotukula uchembere wabwino. Zikomo!!