ASSESSMENT OF KNOWLEDGE OF OBSTETRIC DANGER SIGNS AND ITS ASSOCIATED FACTORS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC AT PUMWANI MATERNITY HOSPITAL.

BY

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H57/11828/2018

A RESEARCH DISSERTATION SUBMITTED TO DEPARTMENT OF PUBLIC AND GLOBAL HEALTH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF PUBLIC HEALTH OF THE UNIVERSITY OF NAIROBI.

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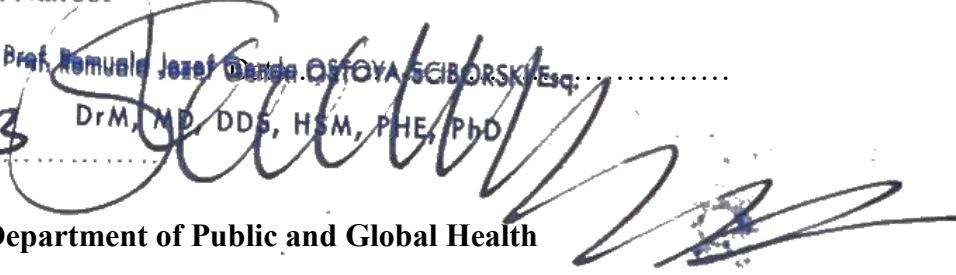
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ABSTRACT

Study Background

High death rate of pregnant women especially in developing countries has created the need for the improvement of the process of pregnancy danger signs' awareness as a method to enhance uptake of skilled maternal care. In Kenya, the outcome of the awareness has been the reduction of maternal mortality to 362 deaths. However, this is still not close to the SDG target 3.1 of reducing global maternal mortality ratio to less than 70 per 100,000 live births. Despite the emphasis on increased awareness of pregnancy warning signals as is required to reach the national goal, less information is present concerning the true level of knowledge in Kenya today.

Broad Objective

To discern the level of awareness on danger inferring obstetric signs and its related factors in pregnant mothers getting antenatal clinic services at Pumwani Maternity Hospital.

Methods

A cross-sectional study was conducted from 1st September 202 to 30th September 2022 on randomly selected sample of 375 pregnant women who were attending ANC clinic at Pumwani maternity Hospital. Pre-tested structured questionnaire was used to collect data on the women who and consented. Chi-squares and logistic regression analysis were performed using STATA version 11.2 and results were presented using tables and graphs.

Results

Total of 371 pregnant women accurately filled the questionnaire making a response rate of 97.87%. The most common mentioned danger sign during pregnancy was severe headache by 269(71.7%) Women who could mention atleast 3 danger signs during childbirth and postpartum period were 174(46%) and 168(45%) respectively.Occupation (Chi Square = 16.182   df= 4, $\chi2$= 0.0.003) and access to cost of ANC care (Chi Square = 6.6017 df= 2 , $\chi2$= 0.037)were factors found to be significantly associated with knowledge of danger signs during pregnancy. The study findings also indicated significance association in marital status (.Chi Square = 8.9735 df= 2, $\chi2$= 0.011), occupation (Chi Square = 20.970 df= 4, $\chi2$= 0.0.000) and income and access to cost of reading/listening materials (Chi Square = 33.8285 df= 20, $\chi2$= 0.027) with knowledge in labor. Cost of antenatal care (Chi Square = 9.5098 df= 2, $\chi2$= 0.009) and access to cost of

reading/listening materials (Chi Square = 34.1152 df= 20, χ2= 0.025) were found to be significantly associated with knowledge during postpartum. Pregnant women in Week 28 -42 have 0.872 chance of having knowledge in pregnancy danger signs, 2.054 chance of having knowledge of labour danger signs and 2.340 chance of knowledge of post-partum danger signs compared to those in week 1-13 of gestation. women with gravidity of 4 and above, they are 3.214 times more likely to have knowledge of pregnancy danger signs, 1.345 times more likely to have knowledge of labour danger signs and 3.098 times more likely to have knowledge of post-partum danger signs compared to those of gravidity of 1.

Conclusion

The study concluded that the overall knowledge on obstetric danger signs is fair because most of the respondents were aware of three or more signs, with exposure to reading materials a key factor in the knowledge of danger signs in all three obstetric phases. However, the level of knowledge about postpartum danger signs was found lower compared to knowledge of danger signs during pregnancy and delivery indicating that women in the post-partum phase are likely to delay in seeking healthcare.

LIST OF ABBREVIATIONS AND ACRONYMS

ANC –Antenatal Clinic

SDG – Sustainable Development Goals

WHO – World Health Organization

KDHS-Kenya Demographic and Health Survey

PMH-Pumwani Maternity Hospital

DEFINITIONS OF SIGNIFICANT TERMS USED IN THE STUDY.

Obstetric danger signs

Problems that pregnant women experience during pregnancy, labour and following pregnancy.

Health Care

The maintenance and improvement of physical and mental impairment in human beings, especially through the provision of medical services. (Prevention, diagnosis and treatment of diseases)

Health care systems

The organization of people, institutions, and resources that deliver health care services to meet the health needs of target populations.

Maternal mortality ratio

Number of maternal deaths per 100,000 live births.

Maternal death

Death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of duration of the pregnancy from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Knowledge

Is defined as information, skills and understanding that person has acquired through learning or experience ("Longman dictionary of contemporary english," 2003).In this study knowledge will be defined as being aware of and mentioning danger signs seen during pregnancy ,childbirth and after delivery

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

The pregnancy process is natural, and should averagely last 40 weeks on full term. However, most if not all pregnant women face the risk that problems can sprout at any time during their pregnancy, labour, and immediately after child bearing. This often leads to complications of obstetric nature that need to be managed early.

As per (Say *et al.*, 2014a), the World Health Organization denoted that global pregnancy and intrapartum complications cater for the deaths of an estimated 830 mothers every day. This gave a yearly summation of 287,000 women. Of these, 99% occur in countries that are still developing with the burden being greater in poor communities and rural areas.

Knowledge of pregnancy danger signs and childbirth related complications enhanced timely acknowledgment of their signs. Thus making an essential step forward in addressing delays in seeking healthcare services and getting to health facilities.(Alkema *et al.*, 2016)

Through the provision of antenatal care, antenatal mothers had an opportunity to be informed on the dangers associated with antepartum, intrapartum and postpartum periods. According to (Bogale & Markos, 2015), there was a statistical significance between antenatal follow up and pregnancy danger signs awareness during pregnancy and childbearing.

The World Health Organization affirmed that 75% of maternal deaths is due to major pregnancy issues. These included:-severe haemorrhage, complications of abortions that are not safe, high blood pressure, infections and other complications from delivery. One key recommendation to controlling this situation is providing awareness of these danger signs. This awareness is crucial in the motivation of pregnant women to seek the services of skilled birth attendants and request referral if there arises any complications detrimental to the well-being of both mother and her new born (soubeiga, Dieudonne, Lise Gauvin, 2014).

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One of the key factors that is associated with lack of knowledge yet can lead to maternal deaths is delay in seeking care. Pregnancy complications should be addressed in time and any delay will mean further complication or even death. Pregnancy warning signs have been identified to include swollen hands/face, vaginal bleeding and poor vision. In labour, complications that may be experienced are prolonged labour, retained placenta, severe vaginal bleeding and convulsions. After birth, the possible warning signs are high fever, vaginal odour and severe bleeding.

(UN/UNICEF, 2018) acknowledged that with improvement in pregnancy complication awareness, there will be early detection and hence timely decision to access the required healthcare. With knowledge, warning signs will be noticed easily even by unspecialized health practitioners who are the true back bone of primary healthcare provision. This hence assist in optimization of the few childbirth attendants in Kenya, and the provision of emergency pregnancy-related services. Sensitizing mothers to recognize pregnancy-related warning signs served to not only save them and their baby's life, but also to strengthen primary health care.(Hoque and Hoque, 2011)

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviewed the theoretical and empirical literature of the key variables in our study with an aim of identifying existing research gaps. Specifically, this chapter reviewed literature on pregnancy danger signs' awareness of antenatal mothers during the pregnancy process, childbearing and the period after childbearing. The review also addressed other factors cognizant with access to information on obstetric danger signs.

2.1.1 Knowledge of Pregnancy danger signs and associated factors

Pregnancy danger signs are experienced by pregnant women on their bodies or foetuses and require instant medical intervention. The danger signs mostly experienced during the antenatal period, are severe bleeding of vagina, swollen hands, and distorted vision (Wassihun *et al.*, 2020)

As per (Mwilike *et al.*, 2018), complications during pregnancy can be unpredictable and therefore every pregnant woman should be informed of the antenatal danger signs. This danger signs are among others vaginal bleeding, severe headache, swollen hands, reduced fetal movement, high fever and reduced vision.

Studies carried out in different countries indicate that during antenatal visits, health education provides appropriate information and advice to mothers for a healthy pregnancy as a result enhances utilization of skilled health professionals.(Pembe *et al.*, 2009)(Mugo, Dibley and Agho, 2015)

With availability of so many pregnancy educational materials, many pregnant women are informed on pregnancy changes and expectations, All the same, nurses are still tasked with the responsibility of equipping mothers with certain information even though sources caution them about need for medical care and supervision.

During ANC visits and any other encounter with pregnant women, mothers should be encouraged to prepare adequately for complications by raising their cognisance of pregnancy related warning signs through the provided education about their health.(Mbalinda *et al.*, 2014)

When women have better care during their pre-partum period, they tend to have low risk of maternal complications and mortality. This better care for women increases their chances of choosing to utilize professional care during child birth.

2.1.1.1 Global

According to UNICEF, 800 million women die globally due to antepartum and intrapartum related causes; 20% of which occur in India whereby around 44,000 women lose their lives due to pregnancy and childbirth related complications. (Say *et al.*, 2014b)

(Kumar *et al.*, 2019) conducted research where 354 women attending ANC at Vardhman Mahavir medical college and Safdarjung Hospital were interviewed, only 170 (48%) could mention a minimum of one pregnancy danger sign. Of the 170 study participants, 147 pregnant women mentioned pain of the abdomen as key danger sign during antenatal period.141 recognized severe fatigue as a danger sign while only 10(5.8%) knew convulsions as a danger sign during antepartum period.(J. and Cuddapah, 2017) agree that there was llittle information on pregnancy danger signs with only 147 pregnant women out of the 200(73.5%) being able to mention at least one pregnancy warning sign. However, vaginal bleeding (39%) and convulsions (39%) were the most mentioned danger signs with abdominal pain being the least mentioned pregnancy danger sign (18%)

Findings of (Kumar *et al.*, 2019)indicated that education status of mothers, socio-economic status, and ANC visits of study participants directly influenced their cognisance of pregnancy danger signs.(Vijay, Kumare and Yerlekar, 2015) agrees in their study that education status was a major factor to the level of cognisance on pregnancy danger signs.(Bhumi and Chajhlana, 2018)acknowledged a connection between mothers' age and education with literacy on pregnancy danger sign. This is however contradicted by findings of (Kumar *et al.*, 2019) that knowledge on pregnancy danger signs has no association with religion, locality, age and parity.W

Findings of (Wulandari and Laksono, 2020) reported that in Indonesia as many as 56.7% of antenatal women are aware of pregnancy warning signs. Women in more developed areas appeared more informed compared to those in rural areas. Age groups 15-19 years were less informed versus older age groups. They conclude by confirming that for Indonesia, all variables in the study were inferences of cognisance on obstetric warning signs. This study intends that similar research be conducted by government in order to use the findings to determine the policy target.

2.1.1.2 Africa

Sub Saharan Africa experiences 66% of all maternal deaths per year worldwide. This is because of a very high maternal death rate with roughly 523 deaths experienced for 100,000 live births. An amount totalling a staggering 196,000 deaths each year. South Sudan, Chad and Sierra Leon record a yearly maternal death count of more than 1000 deaths for 100, 000 live births.(World Health Organisation, 2019)

Ethiopia indicated that 31.9% of mothers are aware of danger signs in pregnancy (Bogale and Markos, 2015). Findings of (Hailu, Gebremariam and Alemseged, 2010)whereby 30.9% of the respondents mentioned at-least 2 danger signs of pregnancy in Aleta Wondo comply with the study in Goba. However, this findings are lower compared to the one in Rural Tanzania (Pembe *et al.*, 2009)whereby only 6.9% of the respondents were aware of at least 3 pregnancy related danger signs.(Hailu and Berhe, 2014)agrees and affirms that a substantial percentage of women are unaware of obstetric danger signs thus an indication of likelihood to delay in seeking health care services by pregnant women.

Severe vaginal bleeding was the most instantly mentioned common danger sign of pregnancy (Hailu and Berhe, 2014).(Mwilike *et al.*, 2018)agrees that the most common instantly identified pregnancy danger sign in Urban Tanzania was vaginal bleeding(81.2%).This is consistent with Goba district Ethiopia(Bogale and Markos, 2015),Chamwino district Tanzania(Bintabara, Mpembeni and Mohamed, 2017) and rural Uganda (Kabakyenga *et al.*, 2011)where most respondents instantly mentioned vaginal bleeding as a warning sign. However,(Pembe *et al.*, 2009) showed a contrasting finding whereby only 9.6% informed of vaginal bleeding as a pregnancy warning sign.

(Mwilike *et al.*, 2018) identified a substantial connection in the age of participants and having cognisance about danger signs. Similar findings were reported in rural Tanzania (Pembe *et al.*, 2009) and South Africa (Hoque and Hoque, 2011), with older and multiparous women being more informed.

As per findings of (Hailu and Berhe, 2014), the place of delivery, education level of the mother and having a functional Radio was independently connected to awareness on antepartum and intrapartum danger signs.(Bintabara, Mpembeni and Mohamed, 2017)agrees and further states that Maternal education, spouse occupation, and counselling on danger inferring pregnancy signs in the duration of antenatal care were crucial to knowledge on these signs. This trend was also present in research on rural women in south-western Uganda (Kabakyenga *et al.*, 2011) where the education level, mothers' age, and ownership of household assets were connected to cognisance of danger inferring pregnancy signs.

2.1.1.3 Kenya

Of all deaths of women aged 15-49 years, 14% is attributable to maternal deaths (KDHS, 2014).This gives a maternal mortality ration of 362 deaths even after 96%of women with live births receiving antenatal care.

In (KDHS, 2014),only 58% of the recipients of antenatal care for their most recent birth within 5 years before the survey reported to be cognisant of signs of pregnancy complications. This is higher compared to findings of (Phanice and Zachary, 2018) whereby only 34.2% of 149 participants were informed of warning signs during pregnancy.

Findings of (KDHS, 2022)affirm that women having a first birth, those in urban areas, the more educated, and wealthier women were more aware of indicators of pregnancy complications.(Phanice and Zachary, 2018)disagree as their findings suggest that mothers age,education level,number of pregnancies that resulted to live births and marital status did not influence awareness of obstetric complications.

2.1.2 Knowledge of Intrapartum obstetric danger signs and associated factors

(Hailu and Berhe, 2014) state that bleeding of vagina, an overly long labour, convulsions and retained placenta are risk factors in labour. This is confirmed by results from Shashamane Ethiopia, (Wassihun *et al.*, 2020) who indicate that the danger signs during childbearing and childbirth include severe bleeding of vagina, overly long labour in women, and convulsions.

(Kumar *et al.*, 2019) stated that out of 354 pregnant women selected to take part in their study, only 126(35.6%) were cognisant of danger signs during labour. This was inconsistent with findings of (J. and Cuddapah, 2017)and (Agarwal *et al.*, 2010) who stated that 67.5% and 78.5% respectively of respondents had cognisance of one or more than one danger sign in labour and childbirth. In sub–Saharan Africa, (Kumar et al., 2019) findingsare slightly higher in comparison to studies done in Goba where cognisance of danger signs during labour was 27% (Bogale and Markos, 2015) . In Tanzania, (Pembe *et al.*, 2009)indicated only 1.3% of the respondents were cognisant of danger signs related to labour.

Findings of (Bogale and Markos, 2015)suggest that the most identified warning sign during labour is vaginal bleeding 167 (63.5%) . Findings from these studies are coherent with others from different countries (Hailu and Berhe, 2014),(Mwilike *et al.*, 2018),(Pembe *et al.*, 2009),(Kabakyenga *et al.*, 2011),and(Mbalinda *et al.*, 2014). This could serve as an indication that women acknowledge vaginal bleeding as a major and quickest cause of maternal deaths. However, the finding are higher compared to (Kaso and Addisse, 2014) where (55%), (42.4%), (26.6%) and 11.5%of the women instantly identified overly long labour, retained placenta, severe bleeding of vagina and convulsions as warning signs in labour and childbearing.

(Bogale and Markos, 2015) further states that retained placenta, (48.7%) and prolonged labour, (57%) were commonly and highly stated by the study participants when childbearing. These are coherent with findings in a research in Aleta Wondo where cognisance of retained placenta was (51.4%) and having a labour period of over 12 hours was identified to (43.2%) (Hailu, Gebremariam and Alemseged, 2010). However, it was higher in comparison to a similar study conducted in Uganda where these factors were at (35.1%) and (18.3%) respectively. (Kabakyenga *et al.*, 2011).Somewhat, this is lower in Nepal whereby (79%) knew that longer than the norm labour hours represent a danger sign when childbearing. (Thapa and Manandhar, 2017).

2.1.3 Knowledge of Post-partum obstetric danger signs and associated factors

(Mbalinda *et al.*, 2014), identified several risk factors during the postnatal period which included foul smell, discharge form caesarean section discharge , abdominal pain, visual disturbance, severe headache, frequent nausea, breathing challenges and signs of post-partum depression. Others

included foul vaginal smell, high fever and severe bleeding soaking pad every 2 hours. (Wassihun *et al.*, 2020) emphasized that danger signs during the postpartum period included loss of consciousness, fever at birth and severe bleeding following child birth.

(Dangura, 2020), stated that 213 (29.1%) of mothers knew about post-partum danger signs and were able to identify at least two post-partum period danger signs. The trend was a bit higher compared to (Phanice and Zachary, 2018)and (Bogale and Markos, 2015)since 15(10.1%) and 124(22.1%) of the responders had the awareness of danger signs during post-partum period respectively. However, this findings were lower compared to a study by(Hailu, Gebremariam and Alemseged, 2010)and (Yinager Workineh, Desta Hailu, Teklemariam Gultie, Nega Degefu, Minale Mihrete, Melese Shimeles, Melkamu Mahino, Mekides Guesh, 2014) where 37.7%and 73% respectively of pregnant women were cognisant of post-partum danger signs.

Findings of a study conducted in Chamwino district,Tanzania(Bintabara, Mpembeni and Mohamed, 2017) indicate that a significant percentage of participants did not mention warning signs related to pre-eclampsia and pre-eclampsia. These findings are consistent with (Kaso and Addisse, 2014)in Robe Wareda, Ethiopia and (Mbalinda *et al.*, 2014) in Mulago Hospital, Uganda.

Findings of (Bililign et al., 2017)where only 26.4% of participants were aware of danger signs during post-partum period. Other complications which were well known were vaginal bleeding (89.2%), severe headache (23.1%), and vaginal odour (23.2%). This findings are different compared to (Hailu, Gebremariam and Alemseged, 2010)whereby danger signs commonly experienced in the post-partum period were severe vaginal bleeding (59%), breathing difficulties (17.9%), unconsciousness (14.4%), and extreme body weakness (13.9%) .(Dangura, 2020)finding were lower compared to the earlier mentioned since Severe vaginal bleeding by (16%), malodorous vaginal discharge (8.9%),Severe headache (8.6%), convulsion (7%), severe weakness (7%) , high fever (6.8%), difficult of breathing (6.6%), loss of consciousness by (6.2%), and swollen hand or face (5.3%)were commonly mentioned. Further to this findings,(Kaso and Addisse, 2014)found that only (34.1%), (10.3%) and (8.5%) of the study participants instantly identified severe bleeding in vagina, high fever and vaginal odour as post-partum danger signs, respectively.

Findings of (Yinager et al., 2014) revealed that high level of education, younger age, having a monthly income, and the mothers' choices were related to their knowledge on post-partum complications. (Dangura, 2020)Agreed with these findings and stated that participants with high school level education and above were about twice as cognisant of postpartum danger signs in comparison to the uneducated. Mothers' age also improved the chances of being aware of warning signs of post-partum. Further, Place of residence had statistical inference to cognisance of danger inferring obstetric signs of post-partum. Women who reside in developed areas were likelier to be cognisant of danger inferring signs of post-partum. These findings were consistent with (Bogale and Markos, 2015)whereby urban residents had more chances to be cognisant of danger inferring obstetric signs against the chances of their rural counterparts. As a result, they were more aware of postpartum complications.

2.1.4 Overall knowledge of obstetric danger signs and associated factors

According to (Phanice and Zachary, 2018)'s research in Kenya, a respondent was termed to be cognisant of danger inferring obstetric signs when they could instantly identify a minimum of two inference signs at each stage(pregnancy, delivery and post-partum).This was consistent in (Hailu and Berhe, 2014) and,(Wassihun *et al.*, 2020).This was not inherent in studies in Raya Kobo district of Ethiopia(Bililign and Mulatu, 2017), Goba district of Ethiopia (Bogale and Markos, 2015)and Rural Uganda(Kabakyenga *et al.*, 2011)whereby a participant was acknowledged aware if she could indicate 3 key danger inferring obstetric signs of the three phases i.e. antepartum, childbirth and post-partum.

The findings of a study in Kericho county Kenya identified only 4.7% of pregnant women in the research were aware of danger inferring obstetric signs (Phanice and Zachary, 2018). These findings are in contrast with earlier studies in Egypt which revealed 25% (Rashad and Essa, 2010) , Tanzania (Bintabara, Mpembeni and Mohamed, 2017) and Nepal (66.0%) (Thapa and Manandhar, 2017). (Amenu *et al.*, 2016)study determined only 55.1% of women who had just given birth under study were aware of danger inferring obstetric signs. The study is consistent with research evidence from rural Tanzania (51.1%) (Pembe *et al.*, 2009) but higher than studies conducted in Egypt (25%) and Uganda (19%)(Kabakyenga *et al.*, 2011).

(Bogale and Markos, 2015) ascertains that women were aware that the main cause of maternal mortality is bleeding. Vaginal bleeding was also the fastest cause of maternal mortality. Most of the participants recognized vaginal bleeding as highly mentioned danger inferring obstetric signs in the study. This was consistent with studies by (Hailu, Gebremariam and Alemseged, 2010),(Pembe *et al.*, 2009)and (Kabakyenga *et al.*, 2011).Somewhat, this was not the case with findings by (Kaso and Addisse, 2014) which indicated that almost half of the participants were unaware of vaginal bleeding as an obstetric danger sign.

(Thapa and Manandhar, 2017) concluded that age of the mother, educational level and gravida were not related to the general awareness of danger inferring obstetric signs but work status and term of pregnancy were identified to be related to the awareness.(Phanice and Zachary, 2018)agrees with this findings since they discovered that in their study, mothers age, level of education, parity and marital status were statistically significant with mothers awareness of pregnancy danger signs. A study in Egypt (Rashad and Essa, 2010)disagrees with this findings as they found out that lack of cognisance on danger inferring obstetric signs was related to younger age, lack of antenatal care, low level of education, gravidity and parity and previous experiences with any obstetric complications.

(Amenu *et al.*, 2016)findings point out a substantial relationship between cognisance of danger inferring obstetric signs and gravidity. They argue that multi-porous women were more cognisant of health problems related to pregnancy, delivery, and post delivery period than primiparous. These findings were similar with research done in Ethiopia, Tanzania, and Egypt [(Hailu, Gebremariam and Alemseged, 2010),(Pembe *et al.*, 2009)and (Rashad and Essa, 2010).

(Amenu *et al.*, 2016)further states that antenatal clinic follow-up has a major relation to the mother's cognisance of danger inferring obstetric signs. According to the study, mothers who had antenatal clinic follow-up in their previous pregnancy were about twice as likely to be cognisant. This trend is in relation to research done in Uganda, Egypt, Ethiopia and Tanzania(Kabakyenga *et al.*, 2011),(Rashad and Essa, 2010),(Hailu and Berhe, 2014)and (Pembe *et al.*, 2009).They claim that antenatal clinic is an ideal site for the women to be informed of obstetric danger sign they may

experience in the pregnancy process. This therefore is an essential chance for communication, information and education.

2.2 Statement of the Research Problem

Maternal mortality remains dangerously high in developing countries like Kenya. An estimated 295,000 women succumbed to avoidable circumstances associated with childbearing. Of these deaths, 86% occurred in the sub-Saharan region of Africa and the southern part of Asia. The common feature in these regions is a lack of cognisance on pregnancy and childbearing related dangers and signs of these dangers. Appropriate awareness on danger signs will inherently lead to better anticipation and preparedness for inferable factors of the three stages of pregnancy delay, with a birth plan availed for each pregnancy(Agarwal *et al.*, 2010).According to WHO, pregnancies that will require rapid and skilled care to prevent death is estimated at 15% of in all countries .(Nieburg, 2012) .

('KENYA DEMOGRAPHIC AND HEALTH SURVEY', 2023) affirms that 75 % of mothers' deaths are as a result of antepartum, intrapartum and post-partum related complications while indirect obstetric death (25%) is caused by preexisting states that are made worsened by the process of childbearing. Nevertheless, only 58% of women in Kenya are reported to have received some teaching on signs of childbearing complications. Primigravida and urban women were more cognisant on signs of pregnancy complications and socio-demographic characteristics that are involved in obtaining information on danger inferring obstetric signs include wealth, level of education and place of residence(KDHS, 2014).Pumwani Maternity Hospital is an obstetric and referral maternity hospital for childbearing of expectant mothers in Nairobi and adjacent counties. It is one of the largest maternity hospitals in the county and sub-Saharan Africa and majority of its clients are from poor economic background.

Every mother needs education on pregnancy danger signs since complications can be unpredictable. Awareness of these signs will assist in making the right choices and take necessary required health care seeking actions. Ultimately seeking the appropriate healthcare action means acquiring instant and appropriate care, which in turn brings down the rate of death and morbidity of pregnant women.

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2.3 Conceptual Framework

The study assumed that socio-demographic factors and obstetric characteristics directly affect the cognisance of danger inferring obstetric signs among pregnant women. Socio-demographic factors (independent variable) included age, marital status, income, access to cost of antenatal care, education level, occupation, access to cost of reading materials and cultural issues. Obstetric characteristics (independent variable) included gestation age, parity, gravidity and number of visits to antenatal clinics. Overall cognisance of danger inferring obstetric signs (dependent variable) was characterized by mention of two or more danger signs in the 3 stages i.e. pregnancy, childbearing and post-partum.

SOCIO-DEMOGRAPHIC FACTORS	KNOWLEDGE OF OBSTETRIC DANGER SIGNS	OBSTETRIC CHARACTERISTICS
Age Marital status Income Medical cover Education level Occupation Ownership of pregnancy journals/newspaper, cellphone,radio or TV. Cultural issues		Gestational age (weeks) Parity Gravidity Number of ANC visits Complications during pregnancy
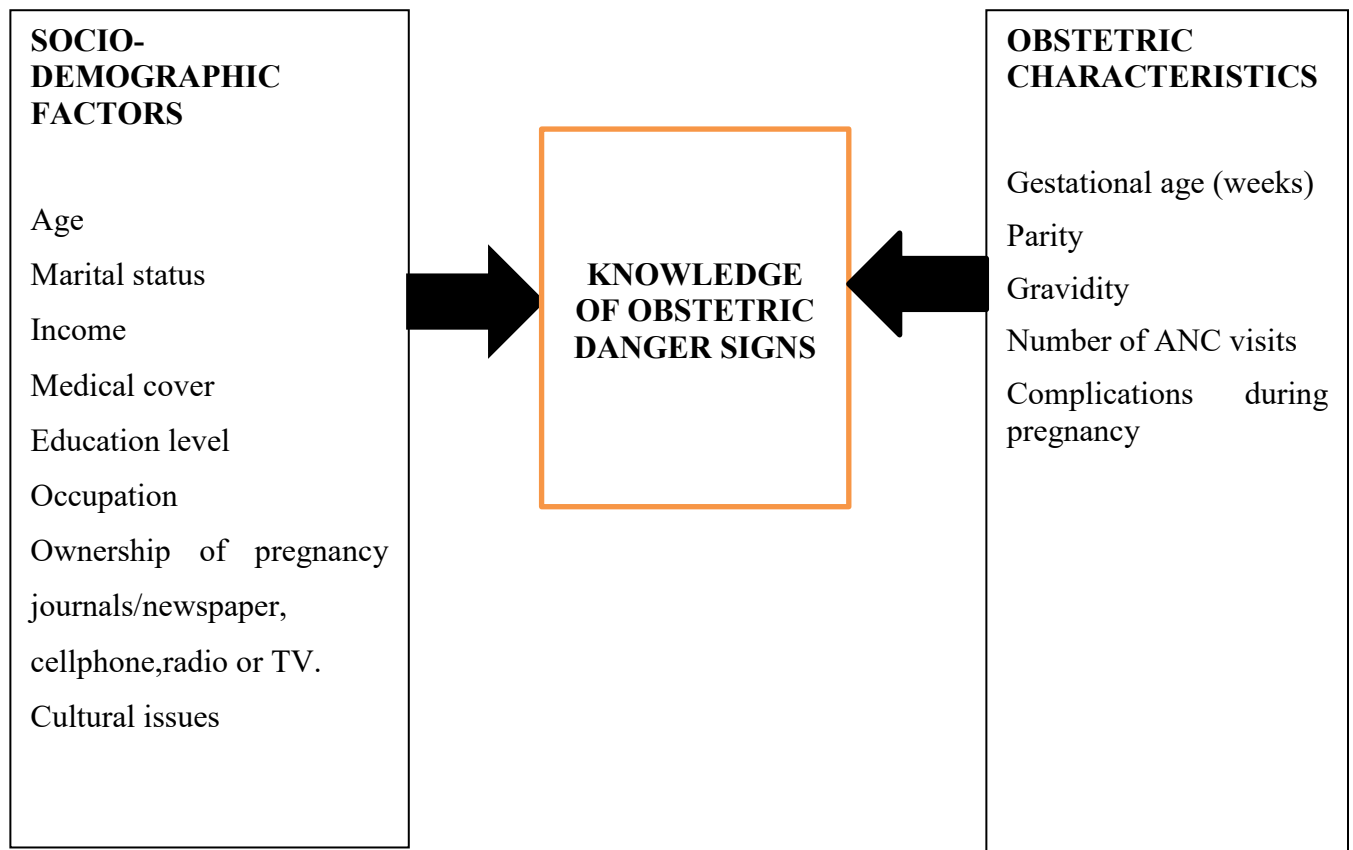
Figure 2.1 Conceptual framework on knowledge of obstetric danger signs and its associated factors   *Source : Researcher, (self), 2021*

2.4 Justification

The (KDHS, 2014) report indicates that poor women of between 15-49 years have low cognition on danger inferring obstetric signs. Over the past decade, one key method to decreasing maternal deaths in Kenya is providing information to women, their families and communities so as to sensitize them on danger inferring obstetric signs. Regardless of the emphasis provided by the national strategy to improve awareness about danger inferring obstetric signs, there is little information regarding the level of knowledge in Kenya today where minimal studies or researches on the area are done(Phanice and Zachary, 2018).Previous studies such as (Mwilike *et al.*, 2018),(Wassihun *et al.*, 2020),(Bogale and Markos, 2015) and (Hailu, Gebremariam and Alemseged, 2010) were conducted in other countries in Africa whose findings may not be generalizable to Kenya due to the differences in social, cultural and economic factors.
(Phanice and Zachary, 2018) failed to assess the relation of social-demographic factors and awareness on pregnancy danger signs. Women of reproductive age below 18 years and above 43 years were excluded in their study, but they were included in this study.

These factors justify this study which looks to assess the level of awareness of obstetric danger signs in pregnant women attending Pumwani Maternity Hospital. The findings of this study will influence data driven decision making by policy makers in public health in designing, planning, organizing and implementation of suitable approaches and interventions to increase overall cognisance of obstetric danger signs.

2.5 Research questions

The study answered the following questions: -

i   What is the overall knowledge of obstetric danger signs among pregnant women attending antenatal clinic at Pumwani Maternity Hospital?

ii   What is the level of knowledge of antepartum, intrapartum and postpartum obstetric danger signs in childbearing women attending ANC at Pumwani Maternity Hospital?

iii   Do socio-demographic factors affect pregnant women in their access to information on pregnancy danger signs?

iv   Do obstetric characteristics affect awareness on obstetric danger signs among pregnant women attending PMH?

2.6 Objectives

The study was guided by the following objectives: -

2.6.1 Broad objective

To discern the level of awareness on danger inferring obstetric signs and its related factors in pregnant mothers getting antenatal clinic services at Pumwani Maternity Hospital.

2.6.2 Specific objectives

i   To identify the general level of cognisance on danger inferring obstetric signs in pregnant women attending ANC at PMH.

ii To discern level of knowledge on antepartum, intrapartum and postpartum danger signals in pregnant women attending ANC at PMH.

iii To discover the connection between socio-demographic factors and cognisance on danger inferring obstetric signs in pregnant women attending ANC at PMH.

iv To identify the relation of obstetric characteristics and cognisance on danger inferring obstetric signs in pregnant women attending ANC at PMH

2.7 Research gap

In spite of the accentuation provided by the national strategy to increase awareness on danger inferring obstetric signs, very little information has been discovered concerning the present state of awareness especially in Kenya where very minimal studies or research in this area have been conducted.

CHAPTER THREE: RESEARCH METHODOLOGY

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3.1 Introduction

This chapter provided a description of the study technique and processes that were utilized. The research design, the study region, the target population, the inclusion and exclusion criteria, the sample size, the sampling method, the data collection methods, the validity and reliability of the research instrument, the techniques for data wrangling, data analysis and presentation, and ethics are all discussed in this chapter.

3.2 Research Design

A cross-sectional study design was employed. Data was collected using questionnaire administration to 375 pregnant women attending ANC at PMH who had been selected and gave consent. The questionnaire was applied to collection of data regarding general views of populace, opinions and habits on myriad of educational or social issues; The issues included access to information regarding obstetric danger signals by childbearing women, and how socio-demographic factors and obstetric characteristics affects their access to knowledge.

3.3 Study area

The study was conducted in Pumwani Maternity Hospital. PMH is situated in the Eastern region of Nairobi County. It is a first of its kind facility in availing of maternity services in sub-Saharan Africa. Our focus was specifically involved in PMH's antenatal care department. The department's daily normal deliveries range from 50-100 deliveries and the caesarean sections are between 10-15.

The choice of Pumwani Maternity Hospital as the area to conduct the study was motivated by the fact that majority of its clients are from poor socio-economic background. The 2014 KDHS report indicated than women had average information about obstetric danger signs (58%). This hospital was selected because it serves as an obstetric and referral maternity hospital for childbearing in Nairobi and adjoining counties. This means it serves a population with a variety of characteristics. The hospital has expanded maternity friendly health services and is well equipped to provide both normal and caesarean services for Nairobi County and beyond. Previous studies such as (Haleema *et al.*, 2019),(Hailu, Gebremariam and Alemseged, 2010) and (Wassihun *et al.*, 2020) were

conducted in other countries in Africa whose findings may not be generalizable to Kenya due to differences in socio, cultural and economic factors.

A study by (Phanice and Zachary, 2018) failed to assess the relation of social-demographic factors and awareness on pregnancy danger signs. Women of reproductive age below 18 years and above 43 years were excluded in the study but they were included in this study.

3.4 Target population

The population for this study was pregnant women attending ANC at Pumwani Maternity and aged between 15-49 years. The researcher targeted these participants since they are women of reproductive age and therefore possess the information which was necessary to provide answer to the study's research questions.

3.5 Inclusion Criteria

The features or aspects that the potential participants had for them to be incorporated in the study were;

- Those pregnant women aged between 15-49 years having their antenatal clinic at Pumwani Maternity Hospital during the research period.
- Pregnant women who gave informed consent

3.6 Exclusion Criteria

Exclusion criteria were any characteristics that potential participants had which disqualified them from taking part in the study. The exclusion criteria in this study were;

- Pregnant woman attending ANC at PMH aged lower than 15 years or more than 49 years. This is because getting consent for women below 15 years from parents/guardians was expensive and time consuming. On the other hand, those above 49 years are not on the reproductive age therefore were not included as representatives in this study.
- Those who did not give informed consent.
- Pregnant women who were mentally challenged

3.7 Sampling method

In this study, systematic random sampling method was used to recruit study units. It involved review of the hospital patient records to identify pregnant women attending the facility. Using the

hospital patient records, pregnant women attending ANC at PMH were ordered according to their OP number and sampling interval was calculated. A random start was selected between start and sampling interval of 3. Subsequent pregnant mothers were then selected after repeatedly adding sampling interval using the OP numbers. Women with the selected OP numbers were issued consent forms for filling. Those who had consented received a pretested questionnaire for filling. A distance of one metre was maintained between the interviewer and interviewee to ensure they conform to the Covid-19 guideline. The principal investigator also provided hand sanitizers which ensured that cross-infection was controlled.

3.8 The sample size

Sample size determination was adoption of Fischer's et al (1988) model for a population less than ten thousand.

$$n=\frac{Z^2PQ}{d^2}$$

Where;

n=Desired sample size

Z=Standard deviation of the required confidence level (I.96)

P=Proportion of pregnant women will be estimated to be 58%(Survey, 2014)

d=Level of statistic set at (0.05)

Q=1-p

n=1.96

Therefore   n= $(1.96)^2 \times 0.58 \times 0.42 / (0.05)^2 = 375$

Adjusting for non-response ;-(d*n)

$$=0.05*375$$

$$=18$$

Therefore, n=375$\pm$ 18

3.9 Study Variables

This study had both independent variables and dependent variables. The independent variables consisted of variables that were manipulated in the study to see the effect on dependent variables. In this study, socio-demographic factors and obstetric complications were the independent variables. Examples of Socio-demographic factors included age, Income, marital status, Access to cost of antenatal care (medical cover), Education level, Occupation, Access to cost of reading materials (ownership of pregnancy journal/newspaper, radio, TV and cell phone) and Cultural issues. Obstetric characteristics included gestational age in weeks, parity, gravidity, number of ANC visits and complications during pregnancy.

Dependent variables were variables in which changes were a result of level of independent variables. Cognisance of danger inferring obstetric signs was our dependent variable and was measured by mention of a minimum of three danger signals in pregnancy, childbirth and post-partum.

The study was developed using 6 indicators to detect women's awareness about antepartum danger signs, 6 indicators to detect women awareness about intrapartum care and complications and 5 indicators to assess women awareness about post-partum care and complication. To show the connection between socio-demographic characteristics and cognisance of danger inferring obstetric signs, 8 indicators were also used. Lastly, 5 indicators were used to show a connection between cognisance of danger inferring obstetric signs and obstetric characteristics.

These study variables are defined in Table 3.1;

Table 3.1: Measures operationalizing the study variables.

Study variable	Variable indicator	Assessment scale
Antepartum danger signs	Vaginal bleeding Severe headache Blurring of vision Swollen hands/face/feet. No/Reduced foetal movement. Pain in the abdomen.	Mentioning of at least three danger signs
Intrapartum danger signs	Premature rapture of membrane Meconium-stained fluid (green fluid) High Fever Prolonged labour >12hrs Convulsions Retained placenta. Baby's hand/feet come first	Mentioning of at least three danger signs
Post-partum danger signs	Swollen hands/face/feet. Severe headache Convulsions Loss of consciousness Excess vaginal bleeding (soaks a pad every hour for 2 hours) Severe abdominal pain Breathing difficulty	Mentioning of at least three danger signs

Socio-demographic factors	Age Marital status Income Access to cost of antenatal care. Education level Occupation Access to cost of reading materials. Cultural issues	Linkage to any of two danger signs
Obstetric characteristics	Gestational age(weeks) Parity Gravidity Number of ANC visits Complications during pregnancy	Linkage to any of two danger signs

source: Researcher, (self) 2021

3.10 Data Collection method

The data collection instrument for the research was a structured survey questionnaire written in English. This instrument was considered because of its simplicity, flexibility, scalability and its cost efficiency as a method of collecting data. It was essential since it enabled the researcher to be available in administrating the questionnaire and this resulted to a greater response rate.

To gather information on knowledge on obstetric danger signs among pregnant women of age 15-49 years getting antenatal clinic services at Pumwani Maternity hospital, the questionnaires were designed with 6 sections covering all the study variables, that is obstetric danger signs, socioeconomic factors and knowledge of obstetric danger signs. The questionnaire which included both qualitative and quantitative questions was designed to be as concise as possible while collecting the necessary data thus increasing the response rate and also was self-administered to the respondents who pregnant women were.

3.11. Reliability and validity of instrument

Reliability in this study was defined as a measure of the degree to which the research instrument yields consistent results on repeated trait (Mugenda and Mugenda 1999). It is the accuracy and precision of a measurement procedure (Kothari, 2010). Validity in this study sought important proof that confirmed the answers found demonstrating the nature of the problem. The validity of the instrument was ensured through constructive criticism from the proposal supervisors who have had an extensive proficiency and expertise in the questionnaire construction. The instrument was later revised and upgraded according to the supervisors' advice and suggestions. In addition, pilot and pre-testing was employed to improve validity.

3.12 Pre-testing of the data collection tools

The questionnaire was tested by test- retest method whereby the same instrument was given more than once to five different people who used it under identical conditions and performance was thereafter compared.

3.13. Data processing, analysis and presentation

 A Microsoft excel data sheet was used for data entry of the responses from all the questionnaires. Data processing and cleaning was done using frequency tables and cross tabulation. Clean data was fed to Stata version 11.2 software for analysis. The data analysis was classified into descriptive statistics and inferential statistics. Descriptive statistics comprises of central tendency and measures of dispersion were used where mean and standard deviation were used to describe the study population. Inferential statistics allowed us to generalize our findings to the whole of PMH population using data from the sample.

3.14. Ethical Considerations

Approval for this study proposal was sought from the School of Public Health (see Appendix E). Ethical approval to conduct the study was pursued from the Kenyatta National Hospital and University of Nairobi Ethics and Research committee, Nairobi County Health Department and from Pumwani Maternity Hospital. The participants were informed about the study and they were required to give a signed informed consent. For participants below 18 years, consent was sought from the guardians. All information given by the respondents was treated with utmost secrecy to protect the participants' personal integrity'. Participation into the study was voluntary and thus, participants were free to opt out of the study if they felt their personal space was being violated.

CHAPTER FOUR: RESULTS

4.1 Introduction.

In this chapter, all of the findings of the study are presented, taking into consideration the aims that were investigated. The answers of both dependent and independent variables are analyzed, and an estimate of the connection between them is provided. Both descriptive analysis and inferential analysis are performed on certain variables. Descriptive analysis is used to summarize the data which has been obtained. Finally, an interpretation of the data that was studied is presented at the end of the chapter. The chapter demonstrates the link between the research variables in the regression model.

4.2 Response Rate

A total of 375 questionnaires were administered out of which 371 were correctly filled and returned for analysis representing a 97.9% response rate.

4.3 Sociodemographic Characteristics

The respondents were to choose a category that best fit their socio demographic characteristic. The findings are represented in Fig. 4.1

Table 4.1 Socio-demographic characteristics of pregnant mothers (15-49 years) attending ANC at Pumwani Maternity Hospital

Variable	Attributes	Frequencies	Percentages
Age	15-21	61	16.35
	22-28	112	30.03
	29-35	95	25.47
	36-42	70	18.77
	43-49	35	9.38
	Total	**373**	**100**
County	Machakos	23	6.13
	Mombasa	1	0.27
	Nairobi	270	72
	Nandi	1	0.27
	Kirinyaga	1	0.27
	Kiambu	79	21.01
	Total	**375**	**100**
Marital Status			
	Married	259	69.44
	Not Married	114	30.56
	Total	**373**	**100**
Income	0-10,000	184	49.33
	10,001-20,000	54	15.48
	20,001-30,000	58	16.55
	30,001-above	69	18.5
	Total	**373**	**100**
Education Level	No Education	12	3.22
	Primary complete	53	14.21
	Primary incomplete	16	4.29
	Secondary and above	292	78.28
	Total	**373**	**100**
Work	Business	143	38.34
	Student	40	10.72
	Office work	78	20.91
	Farming	23	6.17
	House wife	89	23.86
	Total	**373**	**100**

Medical Insurance cover	Yes	200	53.62
	No	173	46.38
	Total	**373**	**100**
Cultural Issues	No	335	89.81
	Yes	38	10.1
	Total	**373**	**100**

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4.3.1 Age category distribution.

Participant demographics characteristics drawn from the study indicates that 16.35 % (61) of the respondents are aged between 15-21 years, 30.03 % (112) are aged between 22-28 years, 25.47 % (95) of the respondents are aged between 29-35 years, and 18.77 % (70) are aged between 36-42 years while 9.38 % (35) are aged between 43-49 years.
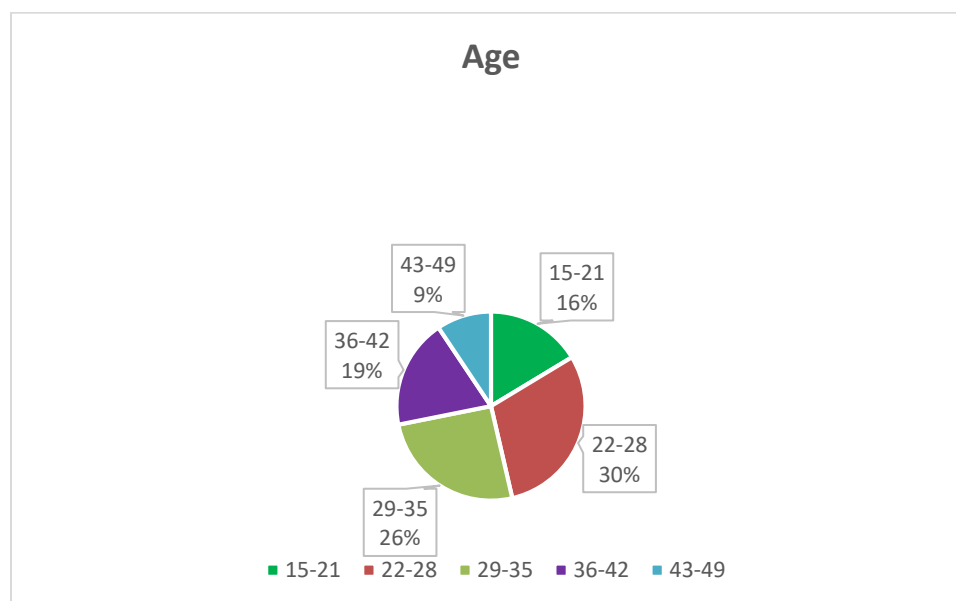
Figure 4.1: Age Distribution.

4.3.2 County of residence

In terms of the respondent's county of residence, majority of the respondents 72 % (270) were from Nairobi while minority 0.27 % (1) came from Mombasa, Nandi and Kirinyaga. The rest of the respondents came from Machakos 6.13 % (23) and Kiambu 21.01 % (79).

4.3.4 Marital Status Distribution.

Concerning the respondents marital status, 259 (69.44 %) of the respondents are married while 114 (30.56 %) are not married.
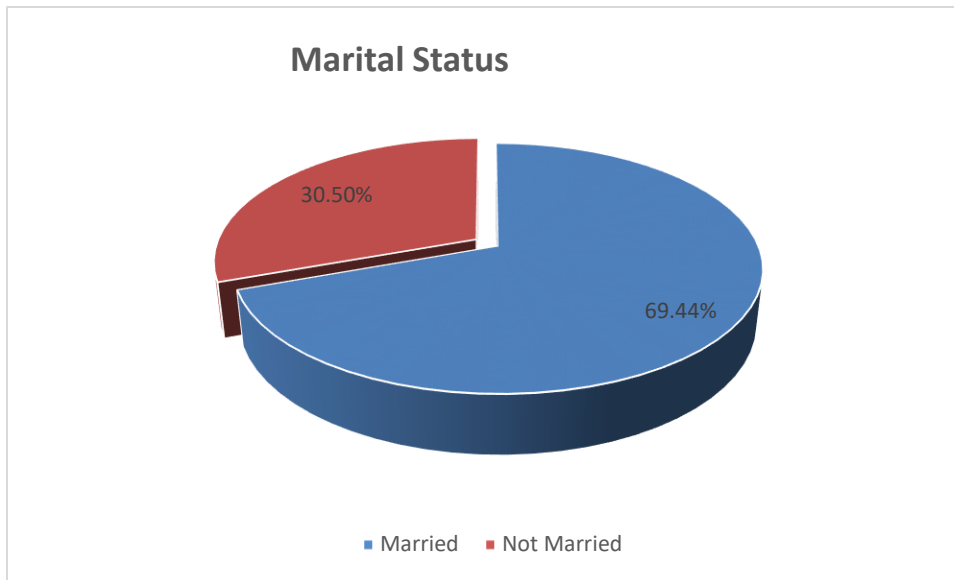
Figure 4.2: Marital Status Distribution

4.3.5 Monthly Income

In regard to the respondent's income, 49.33 % (184) earn of between 0-10000, 15.48 % (54) earn between 10,001-20,000, 16.55 % (58) earn between 20,001-30,000 while 18.5 % (69) 30,001-above
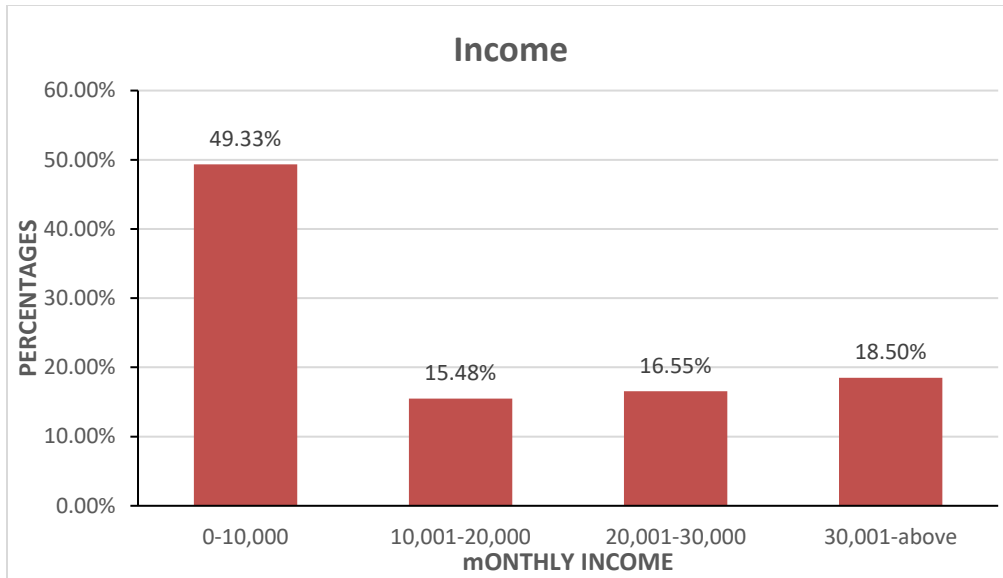
Figure 4.3: Monthly Income

4.3.6 Education Level

Most of the respondents 78% (292) had highest level of education of secondary and above, 14.2% (53) had completed primary level, 4.29% (16) had not completed primary level and 3.22% (12)had not gone for formal education. As shown in figure 4 below
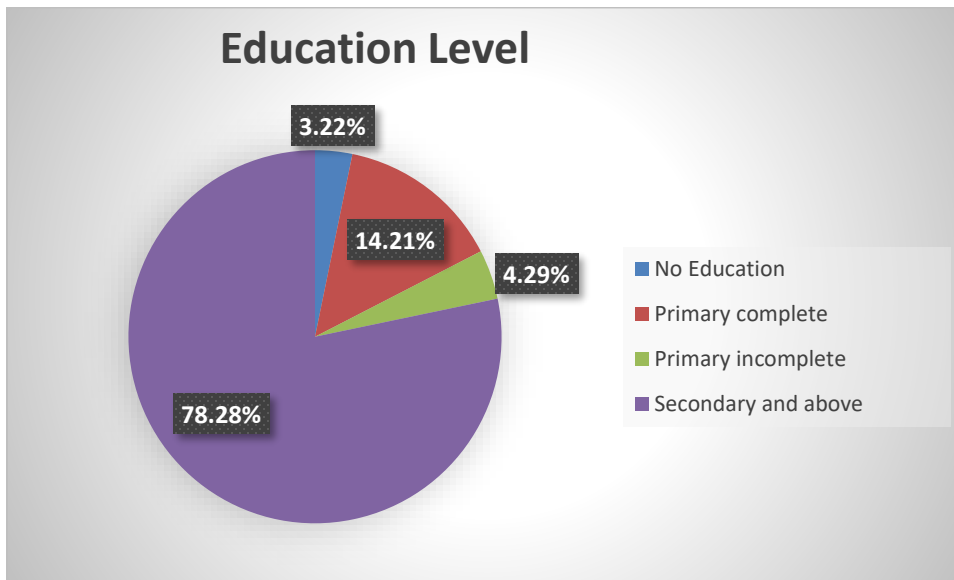
Figure 4.4: Education Level

4.3.7 Occupation

Majority 38.34% (143) of the respondents were in business, 23.86% (89) were housewives, and 20.91% (78) had office work. Minority of the respondents were farmers 6.17 %(23) followed by students 10.72 %(40). This is demonstrated on the figure below
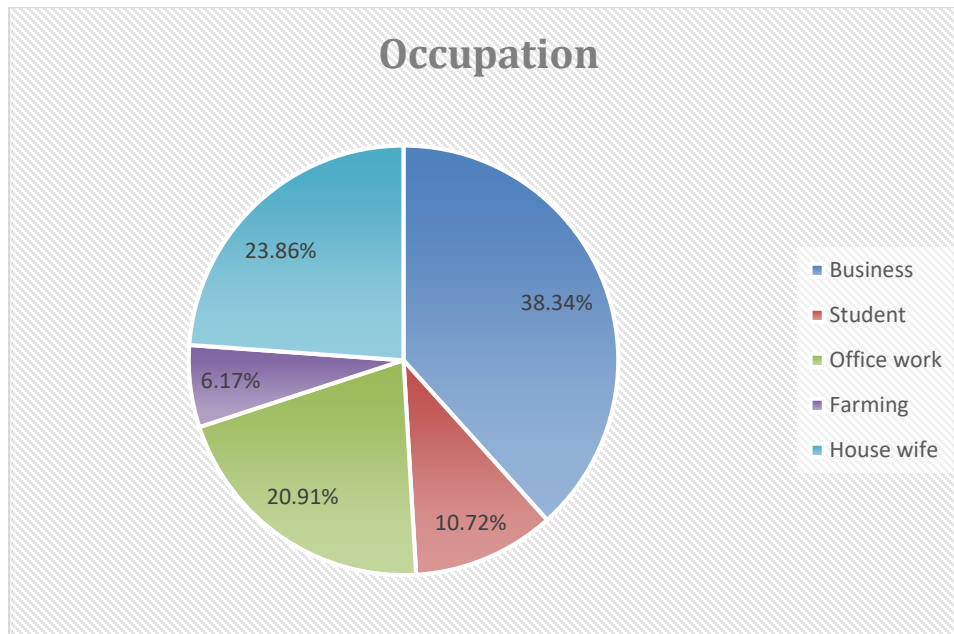
Figure 4.5: Occupation type

4.3.8 Access to medical insurance cover.

53.62% (200) of the respondents were covered under medical insurance. However, the rest of the respondents 46.38%(173) did not have any access to medical insurance cover. This has been shown below:

Access to medical insurance cover

46.38%

53.62%

■ Yes ■ No
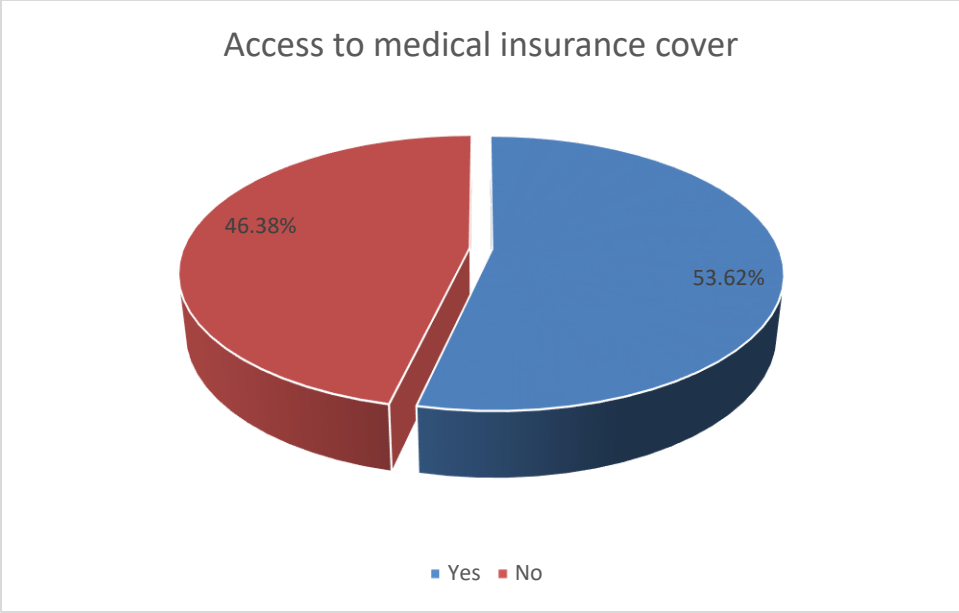
Figure 4.6: Access to medical Insurance

4.3.9 Access to reading/communication materials.

Most of the respondents 71.47% (n=268) reported that they had access to cell phones as a communication material, 59.47% (n=223) had access to television, 20.27% (n=76) had access to radio and 10.93% (n=41) had access to pregnancy journals/newspapers.
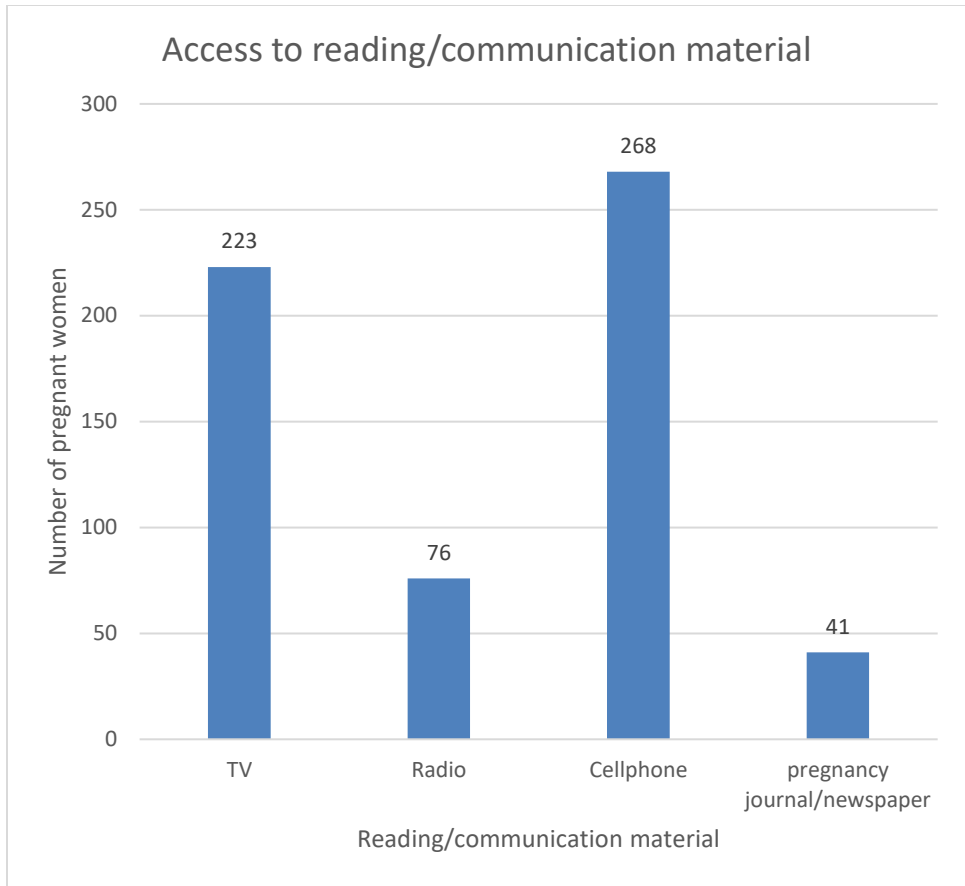
Figure 4.7: Access to reading/communication material

4.3.10 Cultural issues

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10.19% (38) of the respondents reported to be associated with different cultural issues within their community regarding obstetric period. The rest of the respondents 89.81% (335) were not associated with any cultural beliefs.

4.4 Obstetric Characteristics

Study participants were to choose the answer that best describes their obstetric characteristics under the 5 categories indicated. The findings are represented in Fig. 4.2

Table 4.2 Obstetric characteristics of pregnant mothers (15-49 years) attending ANC at Pumwani Maternity Hospital

Variable	Attributes	Frequencies	Percentages
Gestation Week			
	Week 1-Week 13	70	18.72
	Week 14-week 27	167	44.66
	Week 28-Week 42	137	36.63
	Total	**374**	**100**
Parity			
	0	79	21.18
	1	113	30.29
	2	103	27.61
	3	36	9.65
	4 and above	42	10.99
	Total	**373**	**100**
Gravidity			
	1	79	21.18
	2	113	30.29
	3	101	27.08
	4 and above	80	21.18
	Total	**373**	**100**
Complications	Yes	85	22.74
	No	288	77.26
	Total	**373**	**100**
Number of ANC visits			
	1	49	13.14
	2	91	24.40
	3	92	24.66
	4 and above	141	37.80
	Total	**373**	**100**

4.4.1 Gestation Week

18.72 % (70) of the respondents were on their first trimester (Week 1-Week 13), 44.66 % (167) were on their second trimester (Week 14-week 27) while 36.63 % (137) were on their third trimester (Week 28-Week 42). This is well demonstrated below;
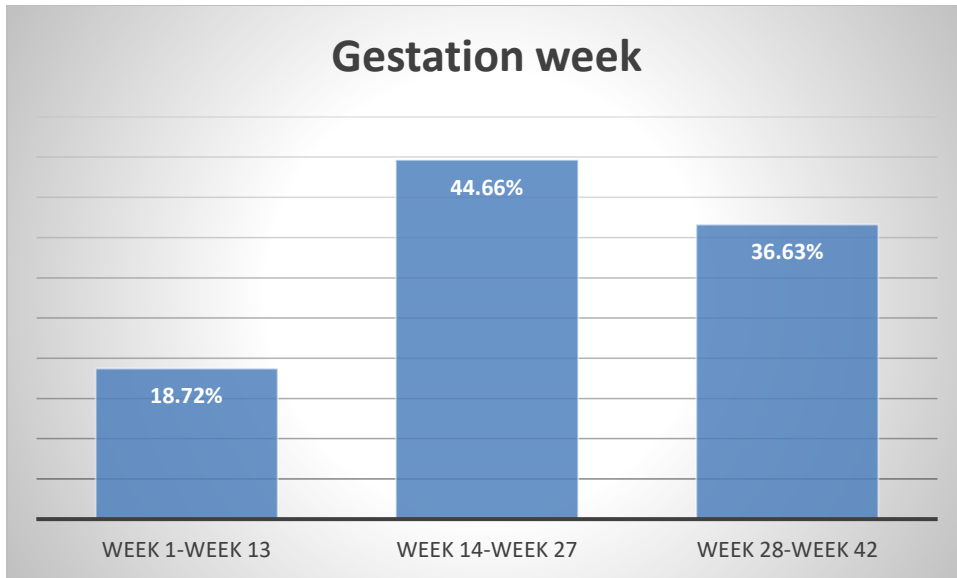
Figure 4.8: Gestation week

4.4.2 Parity

In regards to parity, 21.18 % (79) of the respondents did not have previous births, 30.29 % (113) had one birth, 27.61 % (103) had 2 births, and 9.65 % (36) had parity three while 10.99 % (42) had parity of four and above.

4.4.3 Gravidity

21.18 % (79) of the respondents were in their first pregnancy, 30.29 % (113) were on their second pregnancy, 27.08 % (101) were on their third pregnancy while 21.18 % (80) had a pregnancy of four and above.

4.4.4 Pregnancy complications.

The study findings indicates that 85 (22.74 %) of the respondents had experienced at least a complication while 288 (77.26 %) had not experienced any complication.
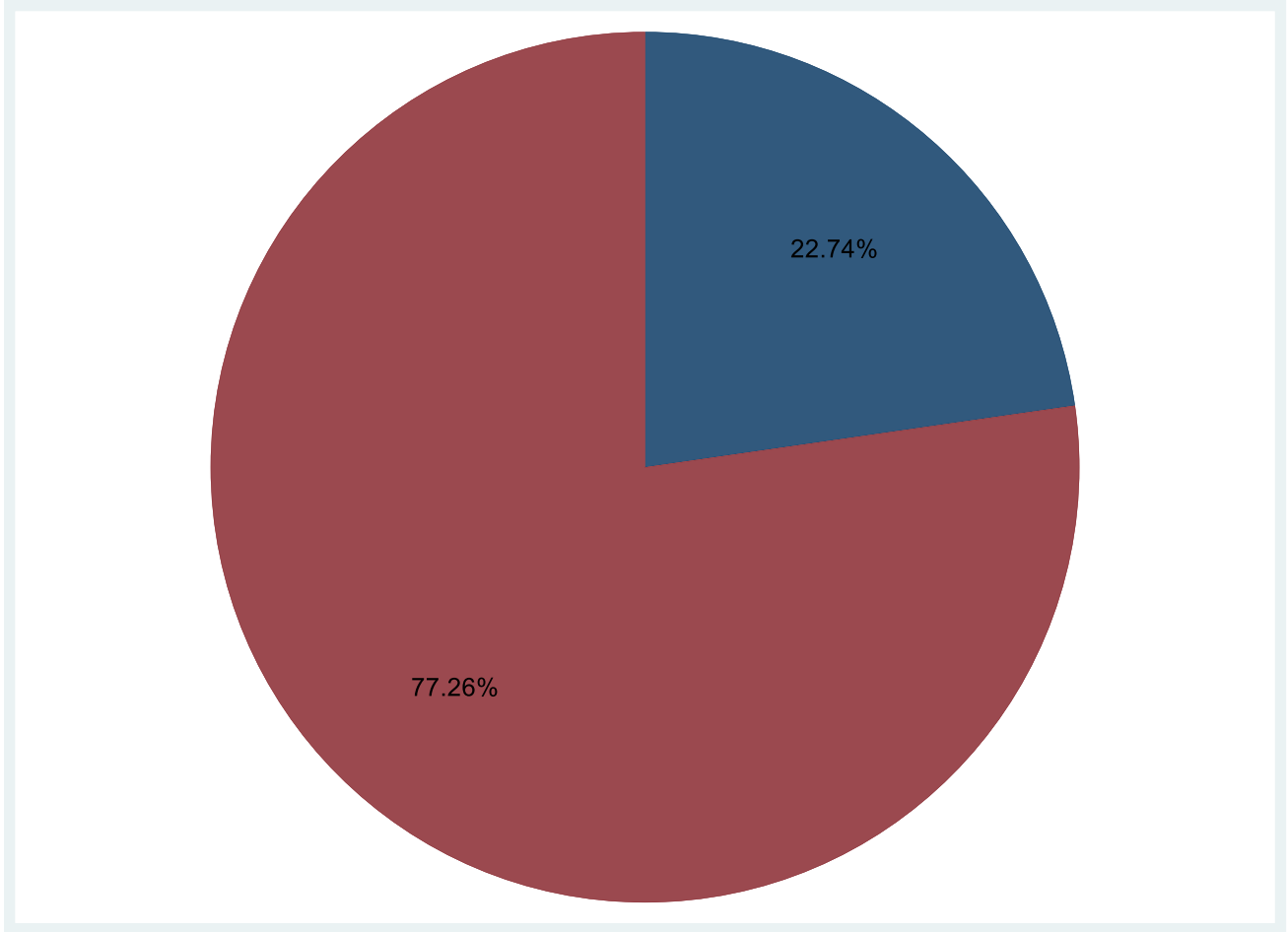
Yes	85	
No	288	
Total	**373**	

Figure 4.9: Complications in pregnancy

4.4.5 ANC Visits

The study findings indicates that 13.14 % of the respondents had one ANC visit, 24.40 % had two ANC visits , 24.66 % of the respondents had three ANC visits while 37.80 % had four ANC visits.
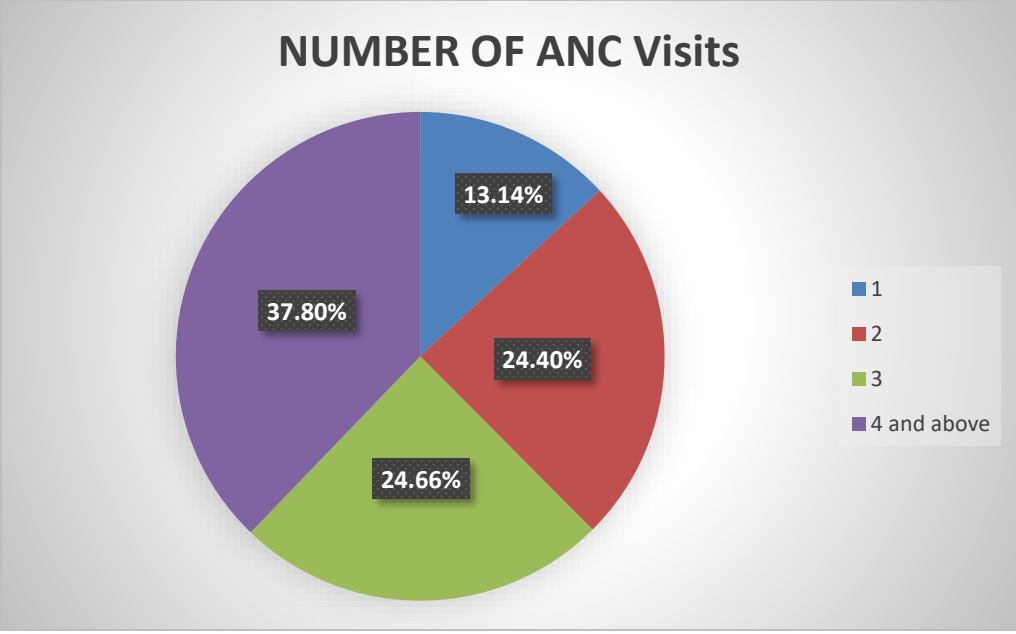
Figure 4.10: Number of ANC visits.

4.5 Antenatal danger signs

4.5.1 Knowledge of danger signs during antenatal

In terms of the proportions of the knowledge in key danger signs during pregnancy, 35.3 % (132) of the respondents do not have the required knowledge on severe vaginal bleeding while 64.7 % (242) have the knowledge. 28.3 % (106) do not have the knowledge on headache during pregnancy against 71.7 % (269).

The respondents who had knowledge on blurry vision during pregnancy were 52.3 % (196) while 47.7 % (179) did not have the knowledge. 64.5 % (242) of the respondents had the knowledge on swelling of hands/face/feet during pregnancy, 35.5 % (133) against 64.5 % (242) had the knowledge on number of reduced foetal movements during pregnancy.

Lastly, 40.5 % (152) of the respondents had knowledge on abdominal pain while majority of the respondents 59.5 % (223) did not have the knowledge on abdominal pain.

Table 4.3 Proportion of women who report to be aware of danger signs during pregnancy.

Variable	Attributes	Frequencies	Percentages
Severe vaginal bleeding	No	132	35.3
	Yes	242	64.7

	Total	**374**	**100**
Headache	No	106	28.3
	Yes	269	71.7
	Total	**375**	**100**
Blurry vision	No	179	47.7
	Yes	196	52.3
	Total	**375**	**100**
Swelling of hands/face/feet			34.9
	No	131	
	Yes	244	65.1
	Total	**375**	**100**
No/Reduced Foetal Movement	No	133	35.5
	Yes	242	64.5
	Total	**375**	**100**
Abdominal pain	No	223	59.5
	Yes	152	40.5
	Total	**375**	**100**

4.5.2 Danger signs experienced during antenatal.

In terms of the proportions of women who experienced danger signs during pregnancy, 77.13 % (290) of the respondents reported to not have experienced severe vaginal bleeding while 22.67 % (85) have experienced it. 63.47 % (238) have not experienced headaches during pregnancy against 36.53 % (137).

The respondents who had experienced blurry vision during pregnancy were 19.47 % (73) while 80.53 % (302) hadn't experienced it. 32 % (120) of the respondents had experienced swelling of hands/face/feet during pregnancy, 21.07 % (79) against 78.93 % (296) had experienced reduced foetal movements during pregnancy.

Lastly, 31.2 % (117) of the respondents experienced abdominal pain while majority of the respondents 68.8 % (258) had never experienced abdominal pains during pregnancy.

In general, blurry vision was the least experienced pregnancy danger sign by pregnant women at PMH 19.47 % (302) while swelling of hands/face/feet was the most experienced pregnancy danger sign 32 %(120)

This is demonstrated in table 4.4.

Table 4.4 Proportion of women who report to have experienced danger signs during Pregnancy

Variable	Attributes	Frequencies	Percentages
Severe vaginal bleeding	No	290	77.33
	Yes	85	22.67
	Total	**375**	**100**
Headache	No	238	63.47
	Yes	137	36.53
	Total	**375**	**100**
Blurry vision	No	302	80.53
	Yes	73	19.47
	Total	**375**	**100**
Swelling of hands/face/feet	No	255	68
	Yes	120	32
	Total	**375**	**100**
No/Reduced Foetal Movement	No	296	78.93
	Yes	79	21.07
	Total	**375**	**100**
Abdominal pain	No	258	68.8
	Yes	117	31.2
	Total	**375**	**100**

4.5.3 Lost Pregnancy.

Concerning if the respondents have lost any pregnancy, 86.4% (n=324) have not lost any pregnancy and 13.6% (n=51) have lost pregnancy
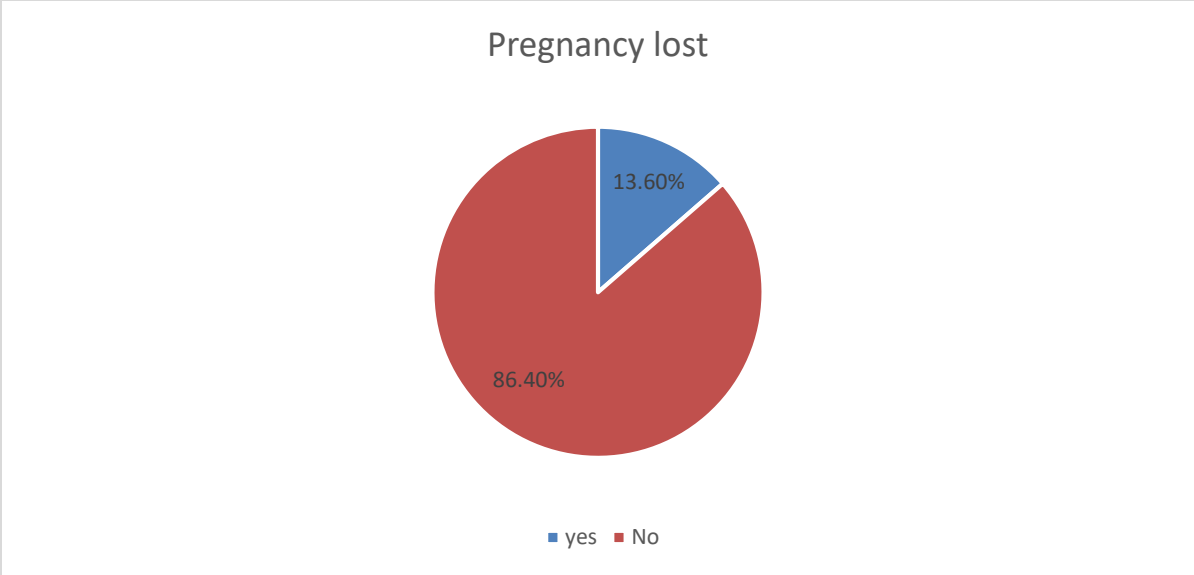
Figure 4.11: Loss of pregnancy

4.5.4 Educator on Pregnancy danger sings

Most of the respondents 77% (n=289) reported that they received education on pregnancy danger signs from a nurse, 45.87% (n=172) received information from doctors, 23.73% (n=89) received information from clinical officers, 27.73% (n=104) from nutritionist, 36.27% (n=136) received education from students and 17.6% (n=66) were taught by friends
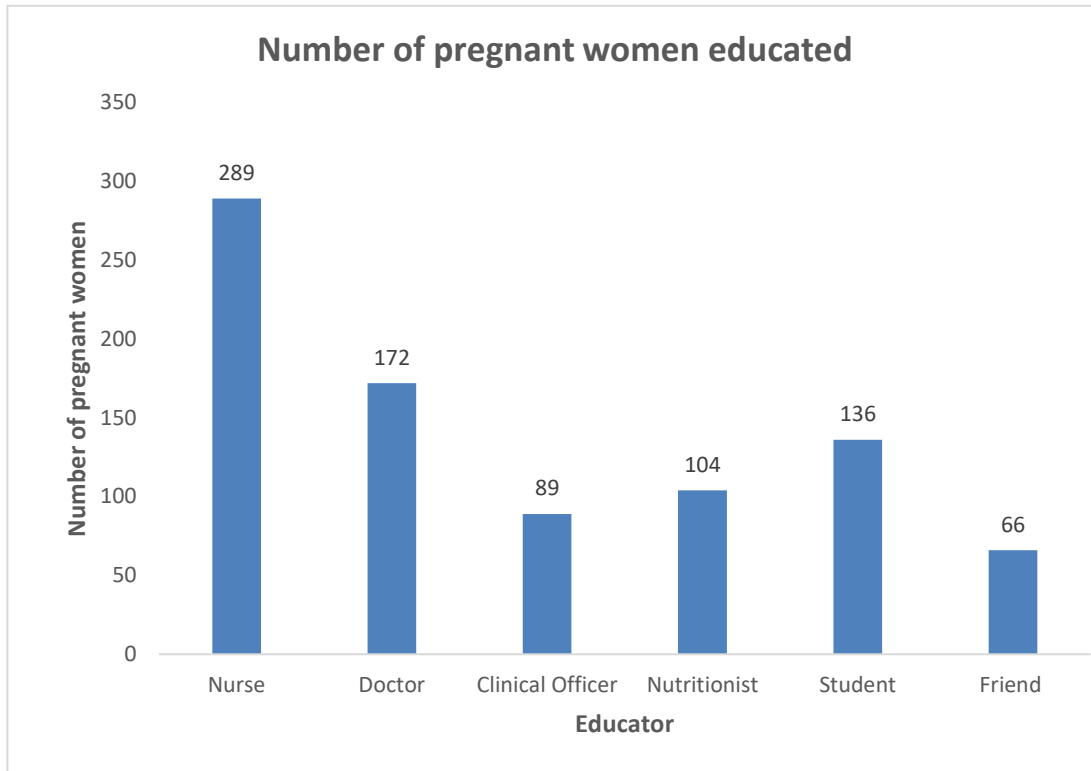
Figure 4.12: Educator on Pregnancy danger sings

4.6 Delivery danger signs

4.6.1 Knowledge of danger signs during delivery

In regard to the knowledge on childbirth danger signs, 43.7 % (164) of the respondents had knowledge on premature rapture of membrane, while majority of the respondents 56.3 % (211) did not have the knowledge. On green fluid as danger sign, 56.8 % (213) had the knowledge while 43.2 % (162) did not have any knowledge.

55.5 % (208) of the respondents had knowledge on high fever as danger sign during pregnancy while 44.5 % (167) of the respondents did not have the knowledge. 53.3 % (201) had knowledge on prolonged labor while 46.7 % (174) were unaware of the prolonged labor as one of the danger signs. Only 42.7 % (160) understood convulsion as being one of the danger signs during childbirth, the rest 57.3 % (215) had no understanding.

Out of the 375 respondents, only 42.1 % (158) are aware of retained placenta as one of the danger signs in pregnancy while 57.9 % (217) had no knowledge on this. Lastly, in regard to swollen hand/face/feet 44.3 % (166) had knowledge on this being one of the danger signs against 55.7 % (209) who did not have any knowledge, this was aligned to baby hand/feet coming first whereby

47.2 % (177) of the respondents understood this as one of the danger signs while 52.8 % (198) did not have the knowledge on this. Table 4.5 demonstrates this.

Table 4.5 Proportion of women who report to be aware of danger signs during

Childbirth

Variable	Attributes	Frequencies	Percentages
Premature Rapture of Membrane		Freq.	Percent
	No	211	56.3
	Yes	164	43.7
	Total	**375**	**100**
Green fluid	No	162	43.2
	Yes	213	56.8
	Total	**375**	**100**
High fever	No	167	44.5
	Yes	208	55.5
	Total	**375**	**100**
Prolonged labor	No	174	46,7
	Yes	201	53.3
	Total	**375**	**100**
Convulsion	No	215	57.3
	Yes	160	42.7
	Total	**375**	**100**
Retained Placenta	No	217	57.9
	Yes	158	42.1
	Total	**375**	**100**
Swollen hand/face/feet	No	209	55.7
	Yes	166	44.3
	Total	**375**	**100**
Baby hand /feet comes first	No	198	52.8
	Yes	177	47.2
	Total	**375**	**100**

4.6.2 Danger signs experienced.

In regard to experience of childbirth danger signs, 12.54 % (47) of the respondents had experienced premature rapture of membrane, while majority of the respondents 8.47 % 328) did not experience

it. On green fluid as danger sign, 21.07 % (79) had experienced it while 78.93 % (296) did not experience it.

27.2 % (102) of the respondents had experienced high fever as danger sign during pregnancy while 72.8 % (273) of the respondents had never experienced it. 21.6 % (81) had experienced prolonged labor while 78.4 % (294) have not experienced prolonged labor as one of the danger signs. Only 13.87 % (52) have experienced convulsion as being one of the danger signs during childbirth, the rest 86.13 (323) have never experienced it.

Out of the 375 respondents, only 13.07 % (49) have experienced retained placenta as one of the danger signs in pregnancy while 86.93 % (326) have not experienced it. Lastly, in regard to swollen hand/face/feet 25.07 % (94) have experienced it against 74.923 % (281) who have never experienced it, this is aligned to baby hand/feet coming first whereby 17.07 % (64) of the respondents experienced this as one of the danger signs while 82.93 % (311) did not experience it

This is demonstrated in table 4.6.

Table 4.6 Proportion of women who report to have experienced danger signs during Childbirth

Variable	Attributes	Frequencies	Percentages
Premature Rapture of Membrane		Freq.	Percent
	No	328	87.47
	Yes	47	12.54
	Total	**375**	**100**
Green fluid	No	296	78.93
	Yes	79	21.07
	Total	**375**	**100**
High fever	No	273	72.8
	Yes	102	27.2
	Total	**375**	**100**
Prolonged labor	No	294	78.4
	Yes	81	21.6
	Total	**375**	**100**
Convulsion	No	323	86.13
	Yes	52	13.87
	Total	**375**	**100**
Retained Placenta	No	326	86.93
	Yes	49	13.07
	Total	**375**	**100**
Swollen hand/face/feet	No	281	74.93
	Yes	94	25.07

	Total	375	100
Baby hand /feet comes first	No	311	82.93
	Yes	64	17.07
	Total	375	100

4.7 Postpartum danger signs

4.7.1 Knowledge of postpartum danger signs

Of the danger signs,45.6 % (171) understand that swollen hands/faces/feet are one of the danger signs during postpartum. 56.5 % (212) also understand that severe headache are the major danger signs in postpartum. In regard to convulsion being one of the danger signs, 49.9 % (187) believe this is a risk during postpartum. Minority of the participants 41.6 % (156) believe that loss of consciousness is one of the danger signs in postpartum period. Other dangers signs experienced during postpartum period include excessive bleeding (49.6 %), foul odour (42.9), bleeding after delivery (25.3 %), fever (37.1 %) , burning sensation while urinating (36.5 %), visual impairment (13.3 %) , difficulty in breathing (35.7 %) and dark urine (32.5 %).

Table 4.7 Proportion of women who report to have knowledge of danger signs after Childbirth

Variable	Attributes	Frequencies	Percentages
Swollen hands/feet/face	No	204	54.4
	Yes	171	45.6
	Total	**375**	**100**
Severe headache	No	163	43.5
	Yes	212	56.5
	Total	**375**	**100**
Convulsion	No	188	50.1
	Yes	187	49.9
	Total	**375**	**100**
Loss of consciousness	No	219	58.4
	Yes	156	41.6
	Total	**375**	**100**

Excessive bleeding	No	189	50.4
	Yes	186	49.6
	Total	**375**	**100**
Foul odour	No	214	57.1
	Yes	161	42.9
	Total	**375**	**100**
No bleeding after delivery	No	280	74.7
	Yes	95	25.3
	Total	**375**	**100**
Fever	No	236	62.9
	Yes	139	37.1
	Total	**375**	**100**
Burning Sensation while urinating	No	238	63.5
	Yes	137	36.5
	Total	**375**	**100**
Visual Disturbance	No	275	86.67
	Yes	100	13.33
	Total	**375**	**100**
Difficulty in breathing	No	241	64.3
	Yes	134	35.7
	Total	**375**	**100**
Dark Urine	No	252	67.2
	Yes	123	32.8
	Total	**375**	**100**

4.7.2 Danger signs experienced during postpartum.

In terms of postpartum danger signs 19.47 % (73) against 80.53 % (302) of the respondents experienced excessive bleeding as danger signs experienced in postpartum, 19.2 % (72) against 80.8 % (303) experienced foul odour and 10.67 % (40) against 89.34 % (335) experienced no bleeding after delivery.

22.13 % (83) have experienced fever as a danger sign in postpartum while 77.87 % (292) have never experienced it. 20.8 % (78) against 79.2 % (297) have experienced burning sensation while urinating, 13.33 % have experienced visual disturbance while 86.67 % (325) have no experience on this.

Loss of conscious is also considered one of the danger signs during postpartum, majority of the respondents 87.47 % (328) have never experienced it while only 12.53 % (47) have experienced this as danger sign. This is same to severe headache where majority of the respondents 80.27 % (280) against 25.33 % (95) have never experienced it as one of the danger signs in postpartum period. 19.72 % (74) of the respondents have experienced swollen hands and feet being one of the danger signs while 80.27 % (301) have never experienced it.

Lastly, only 5.87 % (22) have had trouble in breathing as one of the danger signs in postpartum period while the rest 94.13 % (353) have had never experienced difficulty in breathing as one of the danger signs in postpartum period.

Table 4.8 Proportion of women who report to have experienced danger signs after Childbirth

Variable	Attributes	Frequencies	Percentages
Excessive bleeding	No	302	80.53
	Yes	73	19.47
	Total	**375**	**100**
Foul odour	No	303	80.8
	Yes	72	19.2
	Total	**375**	**100**
No bleeding after delivery	No	335	89.34
	Yes	40	10.67
	Total	**375**	**100**
Fever	No	292	77.87
	Yes	83	22.13
	Total	**375**	**100**
Burning Sensation while urinating	No	297	79.2
	Yes	78	20.8
	Total	**375**	**100**
Visual Disturbance	No	325	86.67
	Yes	50	13.33
	Total	**375**	**100**
AA	No	346	92.27
	Yes	29	7.73
	Total	**375**	**100**
Loss of consciousness	No	328	87.47
	Yes	47	12.53
	Total	**375**	**100**
Severe Headache	No	280	74.67

	Yes	95	25.33
	Total	**375**	**100**
Swollen hands face/feet	No	301	80.27
	Yes	74	19.73
	Total	**375**	**100**
Difficulty in breathing	No	353	94.13
	Yes	22	5.87
	Total	**375**	**100**

4.7.3 Importance of knowledge on postnatal danger signs

Majority of the respondents, 82.93% (n=311) strongly agree that there is importance of having knowledge on post-natal danger signs, 15.2% (n=57) agreed, 1.87% (n=7) were not sure. As shown in figure 4.13.
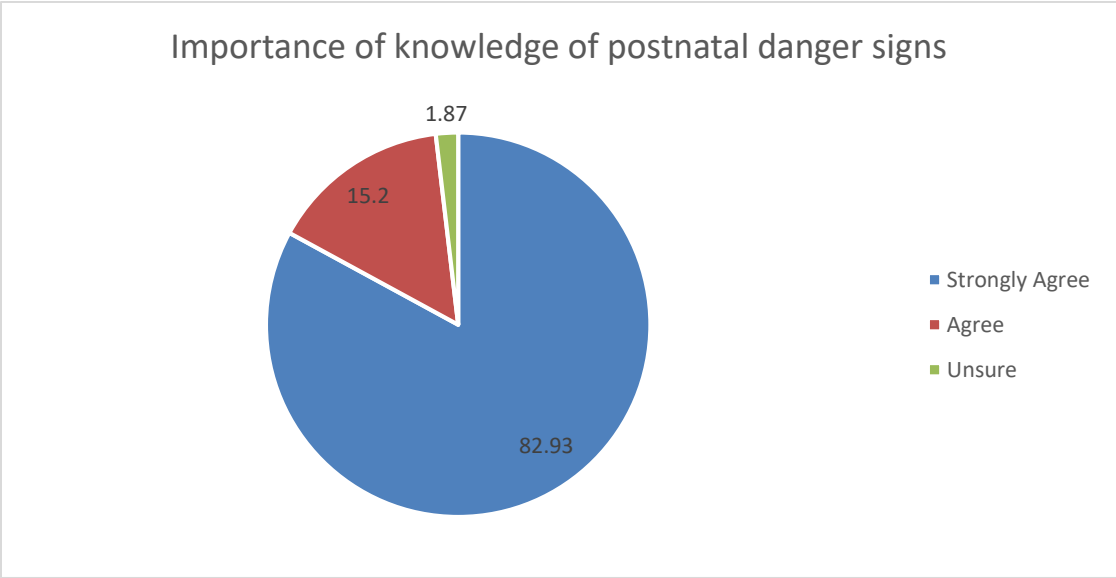
Figure 4.13: Importance of knowledge on postnatal danger signs

4.7.4 Health care workers should educate women about postnatal danger signs

A good number of respondents,74.67% (n=280) strongly agree that the health workers should educate mothers on post-natal danger signs, 23.2% (n=87) agree and 2.13% (n=8) were unsure. As shown in figure 4.14
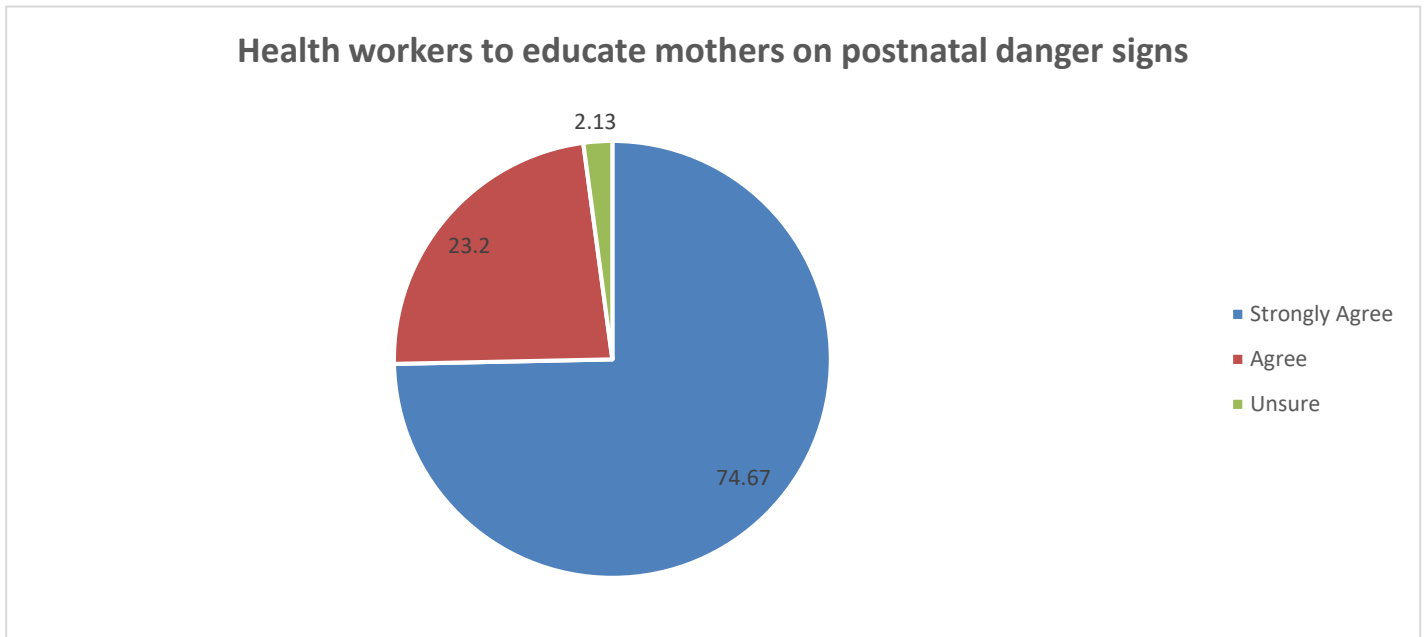
Figure 4.14: Health care workers should educate women about postnatal danger signs

4.7.5 Perception of postnatal danger signs education before discharge.

A larger percentage of respondents, 73.07% (n=274) strongly agree that health care workers should always offer post-natal danger signs education before discharge, 24.26% (n=91) agree, 2.13% (n=8) were unsure. As shown in figure 4.15
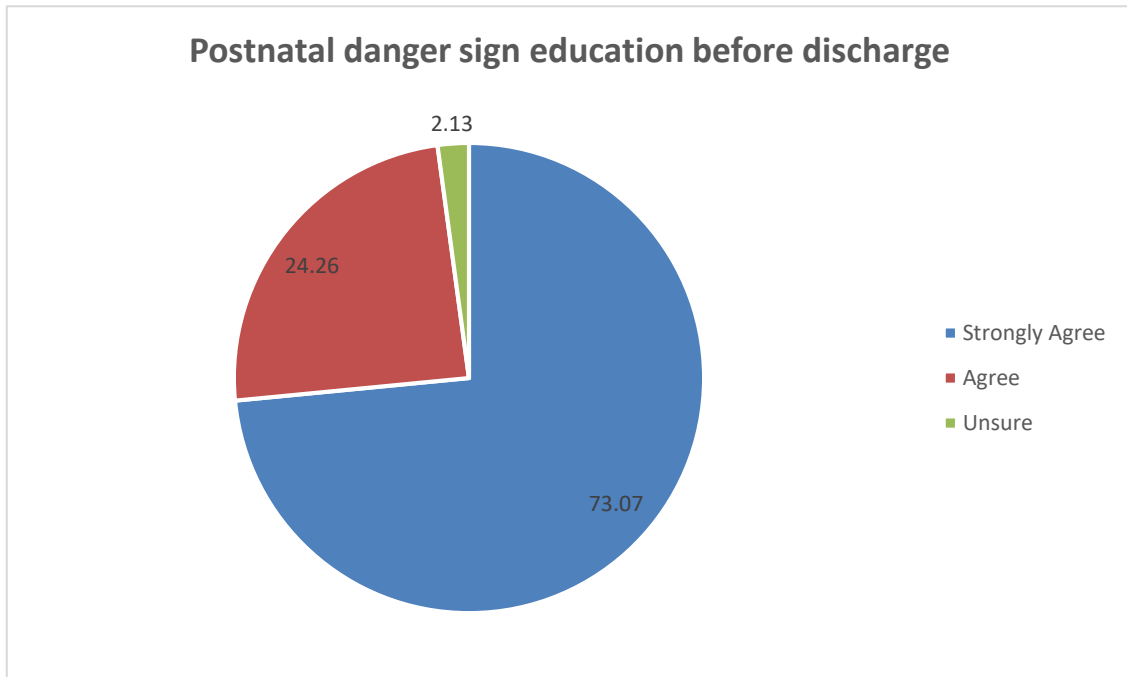
Figure 4.15: Perception of postnatal danger signs education before discharge

4.7.6 View on importance of sharing of post-natal danger signs knowledge with partner.

73.6% (n=276) of the respondents strongly agree that it is crucial to share knowledge on post-natal danger signs with their partners. 22.4% (n=84) agree, 3.73% (n=14) were unsure while only 0.27% (n=1) disagree. As shown in figure 4.16
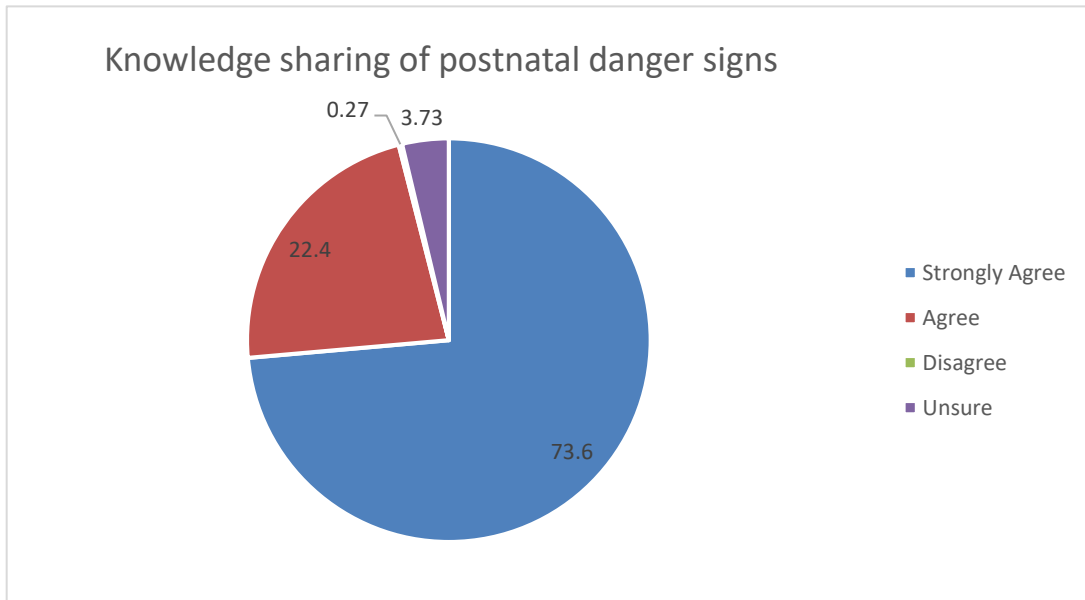
Figure 4.16 : View on importance of sharing of post-natal danger signs knowledge with part-ner.

4.7.7 Seeking for clarification about postnatal danger signs should be from health workers.

Majority of the respondents 71.2% (n=267) strongly agree that clarifications on postnatal danger signs should be from health care workers. 21.6 %(n=81) agee, 6.4 %(n=24) were unsure. However, 0.53% (n=2) disagree and 0.27% (n=1) strongly disagree.
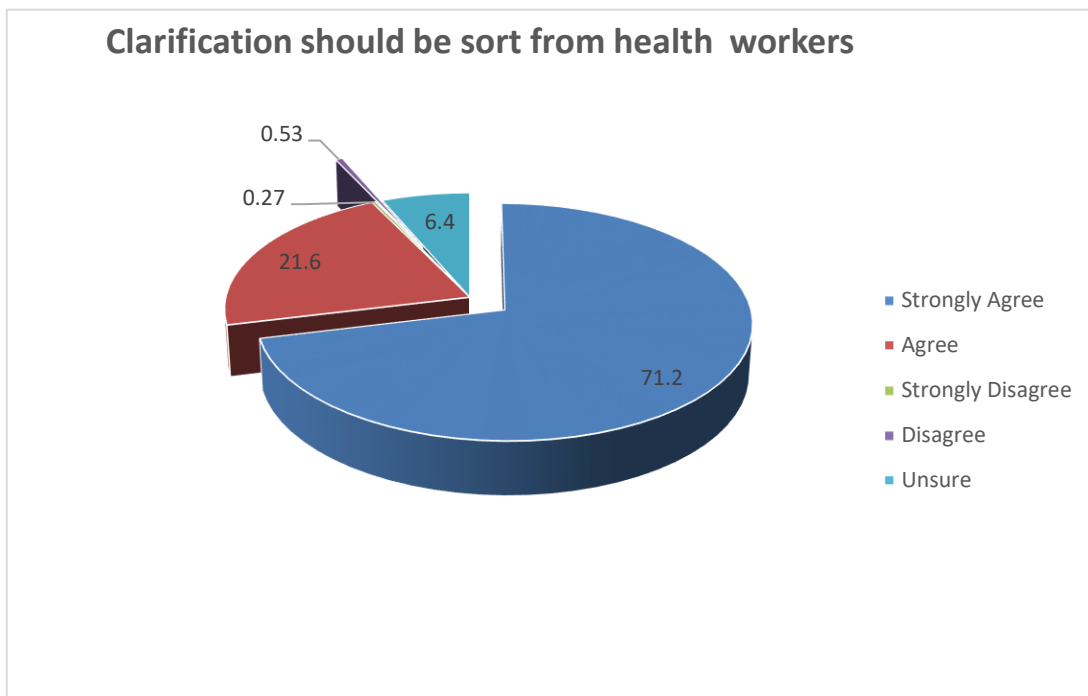
Figure 4.17: Seeking for clarification about postnatal danger signs should be from health workers

4.8 Overall knowledge of danger signs

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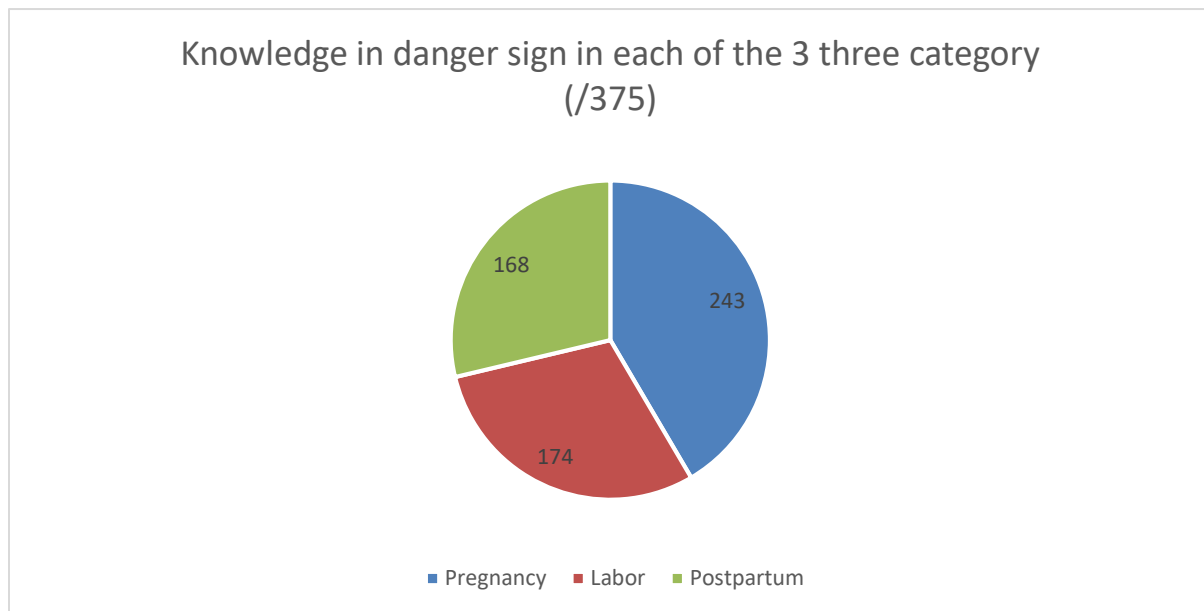
Figure 4.18: Overall knowledge of danger signs

The above table shows participants knowledge in at least three of the danger signs in each of the category i.e pregnancy, labor and postpartum.

Knowledge in at least three pregnancy danger signs is 65 % (243), while labor 46 % (174) and postpartum 45 % (168). This is from all the 375 responses drawn in each of the categories.

4.9 Association of knowledge of obstetric danger signs and socio-demographic characteristics

By comparing chi-square critical value to p-value of 0.05, the study findings indicates significant that occupation (Chi Square = 16.182   df= 4, $\chi2$= 0.0.003) and access to cost of ANC care had significant association (Chi Square = 6.6017 df= 2 , $\chi2$= 0.037) with knowledge in pregnancy while age (Chi Square = 4.562 df= 6 , $\chi2$= 0.597), marital status (Chi Square = 1.5727 df= 2 , $\chi2$= 0.460) , education (Chi Square = 6.5842 df= 3 , $\chi2$= 0.086) , income (Chi Square = 4.1341 df= 4 ,

χ2= 0.388) and access to cost of reading/listening material (Chi Square = 20.8573 df= 20 , χ2= 0.403) had no significant association with knowledge in pregnancy.

The study findings also indicated significance association in marital status (. Chi Square = 8.9735 df= 2, χ2= 0.011), occupation (Chi Square = 20.970 df= 4, χ2= 0.0.000) and income and access to cost of reading/listening materials (Chi Square = 33.8285 df= 20, χ2= 0.027) with knowledge in labor. While the study did not indicate any significance association in age (Chi Square = 10.1540 df= 6 , χ2= 0.118), education (Chi Square = 5.194 df= 3 , χ2= 0.158) and access to cost of antenatal care (medical/health insurance cover (Chi Square = 2.2970 df= 2 , χ2= 0.324) with knowledge in labor.

Lastly, by taking p-value to be 0.05, the study findings indicate significance association in access to cost of antenatal care (Chi Square = 9.5098 df= 2, χ2= 0.009) and access to cost of reading/listening materials (Chi Square = 34.1152 df= 20, χ2= 0.025) with knowledge in postpartum. While age (Chi Square = 12.0614 df= 6 , χ2= 0.061) , marital status (Chi Square = 0.6407 df= 2 , χ2= 0.726), education (Chi Square = 2.14301 df= 3 , χ2= 0.488), occupation (Chi Square = 4.4684 df= 4 , χ2= 0.346) and income (Chi Square = 2.5544 df= 4 , χ2= 0.635)were found to have insignificant association with the knowledge in postpartum.

This is demonstrated in the table 4.9.

Table: 4.9 Association between knowledge of at least 3 danger signs during pregnancy, labor and postpartum period and socio-demographic characteristics of pregnant women in PMH

Variable	Pregnancy	Labor	Postpartum
Age	Chi Square = 4.562 df= 6 , χ2= 0.597	Chi Square = 10.1540 df= 6 , χ2= 0.118	Chi Square = 12.0614 df= 6 , χ2= 0.061
Marital Status	Chi Square = 1.5727 df= 2 , χ2= 0.460	Chi Square = 8.9735 df= 2 , χ2= 0.011	Chi Square = 0.6407 df= 2 , χ2= 0.726
Education level	Chi Square = 6.5842 df= 3 , χ2= 0.086	Chi Square = 5.194 df= 3 , χ2= 0.158	Chi Square = 2.14301 df= 3 , χ2= 0.488
Occupation	Chi Square = 16.182 df= 4 , χ2= 0.0.003	Chi Square = 20.970 df= 4 , χ2= 0.0.000	Chi Square = 4.4684 df= 4 , χ2= 0.346
Income	Chi Square = 4.1341 df= 4 , χ2= 0.388	Chi Square = 11.3283 df= 4 , χ2= 0.023	Chi Square = 2.5544 df= 4 , χ2= 0.635

Access to cost of ante-natal care (medi-cal/health insurance cover)	Chi Square = 6.6017 df= 2 , χ2= 0.037	Chi Square = 2.2970 df= 2 , χ2= 0.324	Chi Square = 9.5098 df= 2 , χ2= 0.009
Access to cost of read-ing/listening materials	Chi Square = 20.8573 df= 20 , χ2= 0.403	Chi Square = 33.8285 df= 20 , χ2= 0.027	Chi Square = 34.1152 df= 20 , χ2= 0.025

4.10 Relationship of knowledge of obstetric danger signs and obstetric characteristics

Pregnant women in Week 14-27 of gestation are 0.908 times less likely to have knowledge of pregnancy danger signs, 1.432 times more likely to have knowledge of labour danger signs, and 1.893 times more likely to have knowledge of post-partum danger signs compared to those in week1-13. On the other hand, Pregnant women in Week 28 -42 have 0.872 chance of having knowledge in pregnancy danger signs, 2.054 chance of having knowledge of labour danger signs and 2.340 chance of knowledge of post-partum danger signs compared to those in week 1-13 of gestation.

Pregnant women with a parity of 2 are 2.098 times more likely to have knowledge of pregnancy danger signs, 1.350 times more likely to have knowledge of labour danger signs and 0.544 times less likely to have knowledge of post-partum danger signs compared to those with a parity of 1. Pregnant women with a parity of 3 are 1.856 more likely to have knowledge of pregnancy danger signs, 1.595 times more likely to have knowledge of labour danger signs and 2.673 times more likely to have knowledge of post-partum danger signs compared to women with parity 1. For women with parity of 4 and above, they are 3.214 times more likely to have knowledge of pregnancy danger signs, 2.907 times more likely to have knowledge of labour danger signs and 2.543 times more likely to have knowledge of post-partum danger signs compared to those of parity of 1.

Pregnant women with a gravidity of 2 are 2.780 times more likely to have knowledge of pregnancy danger signs, 0.876 times less likely to have knowledge of labour danger signs and 1.144 times more likely to have knowledge of post-partum danger signs compared to those with a gravidity of 1. Pregnant women with a gravidity of 3 are 2.704 more likely to have knowledge of pregnancy danger signs, 1.234 times more likely to have knowledge of labour danger signs and 1.579 times more likely to have knowledge of post-partum danger signs compared to women with gravidity 1. For women with gravidity of 4 and above, they are 3.214 times more likely to have knowledge of pregnancy danger signs, 1.345 times more likely to have knowledge of labour danger signs and 3.098 times more likely to have knowledge of post-partum danger signs compared to those of gravidity of 1.

Pregnant women who encounter complications in pregnancy are 2.409 times more likely to have

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knowledge of pregnancy danger signs, 1.908 times more likely to have knowledge of labour danger signs and 3.114 times more likely to have knowledge of post-partum danger signs compared to those who do not.

Table 4.10 demonstrates the association.

Table: 4.10 Association between knowledge of at least 3 danger signs during pregnancy, labor and postpartum period and obstetric characteristics of pregnant women in PMH

Variables	Knowledge about danger sign of pregnancy (CI 95%) Odds	Knowledge about danger sign of labour -(CI 95%)	Knowledge about danger sign of postpartum (CI 95%)
Gestation Week			
Week 1 – Week 13	1	1	1
Week 14 – Week 27	0.908 (0.467, 1.568)	1.432 (0.865, 1.788)	1.893 (1.652, 2.467)
Week 28 – Week 42	0.872 (0.269, 1.543)	2.054 (1.501, 2.436)	2.340 (2.046, 2.670)
Parity (Total no. of births)			
1	1	1	1
2	2.098 (1.891, 2.543)	1.350 (1.098, 1.543)	0.544 (0.234, 0.965)
3	1.856 (1.642, 2.133)	1.595 (1.221, 1.977)	2.673 (2.233, 3.018)
4 and above	3.214 (2.895, 3.542)	2.907 (2.561, 3.445)	2.543 (2.010, 3.179)
Gravidity (Total no. of pregnancies			
1	1	1	1
2	2.780 (2.590, 2.984)	0.876 (0.325, 1.890)	1.144 (1.091, 1.432)
3	2.704 (2.431, 2.901)	1.234 (1.098, 1.567)	1.579 (1.132, 1.901)
4 and above	3.214 (3.019, 3.412)	1.345 (1.126, 1.495)	3.098 (2.986, 3.543)
Number of ANC visits			
1	1	1	1
2	2.443 (2.156, 3.000)	1.889 (1.823, 1.890)	2.001 (1.991, 2.025)
3	2.789 (2.511, 2.908)	1.784 (1.440, 1.900)	1.654 (1.443, 1.890)
4 and above	3.575 (3.019, 3.412)	2.130 (1.550, 2.603)	0.945 (0.558, 1.331)
Complications			
Yes	2.409 (1.651, 2.789)	1.908 (1.856, 2.245)	3.114 (2.576, 3.467)

| No | 1 | 1 | 1 |

CHAPTER FIVE: DISCUSSION.

5.1 Introduction

An interpretation of the data analysis, conclusions, and recommendations based on the findings are presented in this chapter. The chapter also provides a summary of the findings that were addressed in the previous chapter. The purpose of this study was to assess the level of awareness that pregnant women who visited the antenatal clinic at PMH had regarding obstetric danger indicators and the factors that are linked with them. It has been determined how the findings compare to those of other study that has been conducted in the past.

5.2 Socio-demographic details

A total of 375 pregnant women had participated in this study. Majority of them belonged to age group 22-28(30.03%).

Majority of the respondents 69.44%, were married. This means that most of them had family ties and responsibilities which influenced their access to knowledge about obstetric danger signs.

Most of the respondents, reside in Nairobi County. This means most respondents visit health facilities near their area of residence for ANC services thus easy access to the cost of ANC visits and fair access to knowledge about obstetric danger signs.

Most of the pregnant women visiting PMH for antenatal care were businesswomen while few of them were farmers. Even so, majority of them earned a monthly income of below 10,000.

Education level of secondary and above was the level in which most respondents had reached to in terms of education.

Majority of the respondents were not associated with any cultural issues within their community.

5.3 Obstetric details

Regarding Maternal Health Service utilization, 41 pregnant women (37.80%) had made 4 visits and more, 92 (24.60%) in their third visit, 91 (24.40%) in their second visit while 49 (13.14%) in their first antenatal visit. Of all the women, 85 (22.7 4%) of them had had complications during pregnancy.

On gravidity and parity, 80 pregnant women (21.18%) have had more than three numbers of pregnancies while 42 have had more than three deliveries.101 women (27.08%) have had three pregnancies while 36 (9.65%) have had three deliveries.113 women (30.29%) were on the second pregnancy while 79 (21.18%) were on their first pregnancy. Of the 375 women, 103 (27.61%) had had two prior deliveries, 113 (30.29%) had had one delivery, while 79 (21.18%) had never given birth before.

167 (44.66%) of the respondents were on their second trimester, 137 (36.63%) were on their third trimester, while 70 (18.72%) were on their first trimester

5.4 Knowledge of danger signs during pregnancy, childbirth and post-partum and associated factors

The present study assessed the knowledge of obstetric complications through emphasis on questions related to danger signs associated with pregnancy, childbirth and post-delivery. The most mentioned danger sign of pregnancy was severe headache (71.7%) followed by severe vaginal bleeding (64.7%). Abdominal pain was the least mentioned danger sign in pregnancy (40.5%), followed by blurry vision (52.3%). This is inconsistent with other studies conducted in Ethiopia and other countries (Bogale and Markos, 2015), (Mbalinda *et al.*, 2014)(Doctor *et al.*, 2013), where severe vaginal bleeding was the most mentioned danger sign. This may be attributable to the fact that headaches are often triggered by a change in hormones and extremely common in the first few months of pregnancy.

Similarly, the most mentioned danger sign during childbirth was green fluid (56.8%) followed by high fever (55.5%). Yet the least mentioned danger sign of labour was retained placenta (42.1%), followed by convulsions (42.7%).

In the post-partum period, the commonly mentioned danger sign was severe headache (56.5%) followed by convulsions 49.9%. Visual disturbance (13.33%) was the least recognised danger sign after delivery followed by dark urine (32.8%). This was inconsistent with studies done in Ethiopia and Uganda where severe vagina bleeding was the most mentioned danger signs after delivery(Dangura, 2020),(Kabakyenga et al., 2011).

The findings from this study showed that knowledge about key danger signs of pregnancy was higher (65%) compared to knowledge on delivery (46%) and postpartum danger signs (45%). These findings are higher than studies done in Bureti subcounty in kenya(Phanice and Zachary, 2018) Raya Kobo District(Bililign and Mulatu, 2017), rural Tanzania (Pembe *et al.*, 2009) and Somali regional state of Ethiopia (Maseresha, Woldemichael and Dube, 2016). These findings are higher than other studies conducted in Egypt 26% (Rashad 2010), jordan 15.2%) uganda 19% ((Kabakyenga *et al.*, 2011)) shashamane town ethiopia 40% (Wassihun *et al.*, 2020), and SA (Hoque and Hoque, 2011) 52%This difference might be attributed to socio-cultural differences such a religion, beliefs, social classes, buying habits, demographics, attitudes etc and differences in implementation of health programs in these states.

From the findings, the women's occupations played a role in influencing women's knowledge. Studies in Jordan (Okour, Alkhateeb and Amarin, 2012)and Egypt (Rashad and Essa, 2010) revealed similar results whereas studies in Ethiopia (Hailu and Berhe, 2014) and Tanzania (Pembe *et al.*, 2009) showed no association at all. Even so, working women have more opportunities to gain and share experiences with others as compared to those who do not work. (Okour, Alkhateeb and Amarin, 2012) add to the researcher's findings that occupation exposes women to more information and knowledge.

This study identifies that women's monthly income had a significant effect on increasing their knowledge about pregnancy danger signs. A similar finding was reported in Nigeria (Doctor *et al.*, 2013) where higher socioeconomic status was less deterred by cost barriers especially when making decisions on medical care than mothers with lowers socioeconomic status. These findings reveal an advantage for pregnant women with an income as these women visit health facilities where they hear and learn more about danger signs. Women with higher income levels often have better access to educational resources. Education serves as a key determinant in increasing awareness about pregnancy danger signs. Initiatives that focus on providing education and information to women, especially those with lower incomes, can empower them to recognize and respond to potential risks during pregnancy.

The relationship between women's income and knowledge of pregnancy danger signs is complex, influenced by socioeconomic factors, education, and access to healthcare. Bridging the gaps in knowledge requires a multi-faceted approach that addresses disparities in income and educational opportunities. Empowering women economically, implementing inclusive healthcare policies, and leveraging technology are integral steps toward ensuring that all women, regardless of income, have access to vital information for a healthy pregnancy. By prioritizing maternal health education, societies can contribute to reducing maternal mortality rates and promoting the overall well-being of both mothers and their children (Rashad and Essa, 2010).

According to the findings of this study, Income was found to be a significant factor in in defining the knowledge level of the warning symptoms of pregnancy. A similar conclusion was observed in Nigeria (Doctor et al., 2013), where moms with greater socioeconomic position were less discouraged by cost constraints, particularly when it came to making decisions regarding medical care, in comparison to mothers with lower socioeconomic status. The results of this study indicate that pregnant women who have a source of income have an advantage since they are more likely to attend health facilities, where they are exposed to and educated on various warning flags.

In this study, the level education was not significantly associated with knowledge of obstetric danger signs in all the three stages. This is inconsistent with (Bililign and Mulatu, 2017) which established that those who were having a higher level of education were likely to have knowledge on the obstetric danger signs during pregnancy and postpartum periods. A similar outcome was revealed by a study that was carried out in rural Tanzania. The study found that moms who attended secondary or higher education were approximately six times more likely to notice obstetric danger symptoms (Pembe *et al.*, 2009) . Another study conducted in Nigeria finds that ever attending education was associated with increased odds of knowing obstetric danger signs (Hailu, Gebremariam and Alemseged, 2010). According to the findings of a similar study carried out in the East Gojjamn zone of Ethiopia, the levels of maternal education (secondary school) were found to improve the likelihood of knowledge about obstetric risk symptoms by a factor of two (Amenu *et al.*, 2016). This could be an indication that despite the education level of women, pregnant women have taken up the responsibility of their health especially on matters concerning maternal health.

Other socio-demographic characteristics like age and level of education, were not associated with the knowledge of obstetric danger signs. This is consistent with (Phanice and Zachary 2018)'s study conducted in Bureti subcounty, Kericho County. The findings of this study, on the other hand, contradict those of earlier research carried out in Malaysia, Tanzania, Ethiopia, and Nigeria. The disparity in findings may be partially ascribed to the fact that different

methodological approaches were utilized for this particular investigations. In other words, these investigations found that a good obstetric awareness was present if at least two risk signs were recognized during the course of this research. Mentioning three danger signs was regarded to be knowledgeable.

Another characteristic that was found to have a significant association with mothers' knowledge of danger indicators during pregnancy was the number of antenatal care visits that they had before to becoming pregnant. The likelihood of moms being educated of danger indicators during pregnancy was four times higher for women who visited the ANC clinic more than four times, compared to mothers who only visited the clinic once. This was consistent with (Bililign and Mulatu, 2017) where frequency of ANC visits was significantly associated with knowledge of obstetric danger sign. Mothers who had four ANC follow-ups had a 91% higher level of knowledge regarding pregnancy danger symptoms compared to mothers who had only one visit. In a similar vein, moms who had four ANC follow-ups were discovered to have a 47% higher likelihood of being aware of the risk signals of pregnancy compared to mothers who had only one visit only. This result is in line with the findings of the research carried out in Tanzania (Pembe *et al.*, 2009). Researchers in Nigeria and Ethiopia (Wassihun et al., 2020) found that ANC visits were a predictor of knowledge of danger indicators during pregnancy, birth, and the postpartum period. These findings were similar to those found in other studies conducted in Nigeria and Ethiopia. As a result, it is necessary for the stakeholders to encourage ANC follow-up, which should include the frequency of visits in accordance with the standard established by who of eight ANC visits.

5.5 Conclusion

The level of knowledge about postpartum danger signs were lower compared to knowledge of danger signs during pregnancy and delivery. Also, knowledge about danger signs of pregnancy, childbirth and postpartum were affected by exposure to reading materials.

From the study done, it can be concluded that the overall knowledge on obstetric danger signs is fair because most of the respondents were aware of two or more signs. Awareness of antenatal danger signs is the best while awareness of danger signs after labour was the worst.

Most of the respondents agreed that having knowledge about obstetric danger signs is important but very few know the various danger signs.

Having experienced any obstetric danger signs does not have much significant connection with knowledge about obstetric danger signs.

Most of the respondents have strong hopes in health workers to educate them about obstetric danger signs and also to detect danger signs early and manage them.

Most of the respondents had achieved education up to or above secondary level. This reflects on fair knowledge of obstetric danger signs.

A large percentage of respondents believe that sharing information about obstetric danger signs with their partners is important.

5.6 Limitation of the study.

We cannot indicate the direction of causation to the associative relationships because of the nature of the study design.

Study participants were restricted to those who attended an antenatal clinic in Pumwani Maternity hospital in Nairobi. Thus, the results are difficult to generalize to all antenatal women residing in Kenya, or those in other countries.

Another limitation was that the survey questionnaire was distributed to women who were sitting close to one another while waiting for antenatal services. Inadequate space and close proximity between women when answering the questionnaire may have affected the responses that some women provided.

The questionnaire was administered in English alone. This might have affected the response of the women who did not understand.

5.7 Recommendations

- ❖ There is need to increase the number of ANC sessions whereby women are educated on obstetric danger signs. It should be made to happen on each day of an ANC visit so as to enhance retention. Health worker should also keep abreast with trends concerning obstetric danger signs so that they give up to date information to the women.

- ❖ Basing on the fact that most respondents view that sharing information on obstetric danger signs with their partners is important health workers should encourage antenatal women to come along with their partners. Males in the community should be educated on the importance of accompanying the partners for ANC visits to get first-hand information.

- ❖ The cost of reading materials concerning obstetric danger signs should be subsidized and made available at health facilities so that antenatal women are able to purchase easily. Brochures of Pamphlets concerning selected obstetric danger signs should be issued during antenatal care visits. This will enhance recall, retention and offer additional offer additional information which is good to know.

5.8 Areas of future research.

- Knowledge of obstetric danger signs among married men.
- Factors affecting the decision to attend ANC visits.

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APPENDICES

APPENDIX A: Consenting/Assenting Explanation Form

TITLE OF THE STUDY: ___ASSESSMENT OF KNOWLEDGE OF OBSTETRIC DANGER SIGNS AND ITS ASSOCIATED FACTORS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC AT PUMWANI MATERNITY HOSPITAL _____

INVESTIGATORS, THEIR CONTACTS AND ROLES

Principal Investigator: Name- **Gladys Ayitso Chilo**

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Institutional Affiliation: Name **– KNH-UON ERC**

        Contacts **- 0202726300   ext.44102)**

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INTRODUCTION OF THE STUDY:

I am **Gladys Ayitso Chilo**, a student in the school of public health in the University of Nairobi. The study is a requirement for the award of a master's degree in Public Health of The University of Nairobi. The purpose of this study is to assess the knowledge of obstetric danger signs and its associated factors among pregnant women attending antenatal clinic at Pumwani Maternity Hospital.

You have been selected because you satisfy the conditions for participants for the study and you will provide important information for the study. You are therefore invited to take part in the study

VOLUNTARY PARTICIPATION AND WITHDRAWAL

Your participation in the research is completely voluntary. There is no penalty whatsoever, if you choose not to participate/take part in the study you can withdraw anytime during the study period since there is no penalty for such decision. Even when you consent to the study, you are not compelled to respond to a question that you are not comfortable with. Some question maybe personal, but confidentiality is assured and the information provided by you will not be connected to you since names will not be recorded anywhere.

BENEFITS AND RISKS

As a voluntary participant in the study, there is no direct benefit although your idea will be very helpful to the stake holders to provide more friendly and effective information that can help us assess the level of knowledge on obstetric danger signs and any factors that may influence knowledge of obstetric danger signs. There are no major risks for taking part in the study.

WHAT WILL HAPPEN IF YOU DECIDE TO BE IN THIS RESEARCH STUDY?
If you agree to participate in this study, the following things will happen:
You will be taken to a private area where you feel comfortable and then given a pre tested questionnaire for filling. This process will last approximately 20 minutes. The questionnaire will cover topics such as demographic information, obstetric history, antenatal danger signs, labour danger signs and post-natal danger signs.

CONFIDENTIALITY

You will be provided with a consent form which you will be requested to sign, and you will be left with a copy. Your name is not required and should not be written anywhere in the study documents. Moreover, do not give any personal identification in the questionnaire. All the questionnaires will be kept safely and destroyed after the study. There shall be no way to identify individual participants.

WHAT IF YOU HAVE QUESTIONS IN FUTURE?

If you have further questions or concerns about participating in this study, please call or send a text message to me (the principal investigator) on **0726549731** or the lead supervisor Dr.Pamela Godia on **0722659282**.

For more information about your rights as a research participant you may contact the Secretary/Chairperson, Kenyatta National Hospital-University of Nairobi Ethics and Research Committee Telephone No. 2726300 Ext. 44102 email uonknh_erc@uonbi.ac.ke.

The principal investigator will pay you back for your charges to these numbers if the call is for study-related communication.

APPENDIX B: Consenting Form

STUDY NUMBER ---------------------

I have read this consent form or had the information read to me. I have had the chance to discuss this research study with a study counsellor. I have had my questions answered in a language that I understand. The risks and benefits have been explained to me. I understand that my participation in this study is voluntary and that I may choose to withdraw any time. I freely agree to participate in this research study.

I understand that all efforts will be made to keep information regarding my personal identity confidential.

By signing this consent form, I have not given up any of the legal rights that I have as a participant in a research study.

I agree to participate in this research study: **Yes ( ) No (   )**

Participant signature / Thumb stamp _____   **Date** _____

Signature of the guardian _____   **Date** _____

Signature of researcher/research assistant _____ **Date**_____

APPENDIX C: Assenting Form

STUDY NUMBER ----------------------

I have read this consent form or had the information read to me. I have had the chance to discuss this research study with a study counsellor. I have had my questions answered in a language that I understand. The risks and benefits have been explained to me. I understand that my participation in this study is voluntary and that I may choose to withdraw any time. I freely agree to participate in this research study.

I understand that all efforts will be made to keep information regarding my personal identity confidential.

By signing this consent form, I have not given up any of the legal rights that I have as a participant in a research study.

I agree to participate in this research study: **Yes ( ) No ( )**

Participant signature / Thumb stamp _____   **Date** _____

Signature of the guardian _____   **Date** _____

Signature of researcher/research assistant _____ **Date**_____

Researcher's statement

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and has willingly and freely given his/her consent.

Researcher 's Name: _____   **Date**: _____

Signature

_____

APPENDIX D: QUESTIONNAIRE FOR PREGNANT WOMEN ATTENDING ANTENATAL CLINIC AT PUMWANI MATERNITY HOSPITAL

This questionnaire is designed to help explore some of the issues associated with knowledge of obstetric danger signs. Your cooperation in completing this would be much appreciated. Responses will be anonymous, and no comments will be attributable to individuals. Please note that your participation in this study will be voluntary.

<u>**SECTION A: DEMOGRAPHIC INFORMATION**</u>.

Indicate by use of a (√) in the bracket that best suits your opinion.

1   What is your age?........................

    Between15- 21 Years   ( )

    Between 22-28 years   ( )

    Between 29-35   ( )

    Between 36-42   ( )

    Between 43-49   ( )

2   In which county do you stay?

    Machakos   ( )

    Kiambu   ( )

    Nairobi   ( )

    Others (specify) ……………………..

3   Are you married?

    Yes   ( )

    No   ( )

4   What is your education level?

    No education   ( )

    Primary incomplete   ( )

    Primary Complete   ( )

    Secondary and above   ( )

5   What do you do for a living?

Business   ( )

Office Work   ( )

Farming   ( )

Housewife   ( )

Student   ( )

6   What is your average monthly income?

0-10,000   ( )

10,001-20,000   ( )

20,001-30,000   ( )

30,001 and above   ( )

7   Do you have a medical/health insurance cover?

Yes   ( )

No   ( )

8   Which of these reading material/communication materials do you own/can access to gain knowledge about obstetric danger signs?

Television   ( )

Radio   ( )

Cellphone   ( )

Pregnancy journals/newspaper ( )

9   Are there any cultural issues in your community that influence your access to antenatal clinics and   medical care?

Yes   (   )

No   (   )

10 Which are these cultural issues?

SECTION B: OBSTETRIC HISTORY

Kindly respond to all items indicated.

1   What is your gestational age?

Week 1-Week 13   ( )

Week 14-Week 27 ( )

Week28-Week 42 ( )

2   How many births have you had before?

1 ( )

2 ( )

3 ( )

4 and above ( )

3   How many times have you attended antenatal clinic for the current pregnancy?

1 ( )

2 ( )

3 ( )

4 and above ( )

4   What is the total number of pregnancies that you have had?(including the one you are carrying)

1 ( )

2 ( )

3 ( )

4 and above ( )

5   In your current pregnancy, do you have any complications?

Yes ( )

No ( )

SECTION C: ANTENATAL DANGER SIGNS

Indicate by use of a (√) in the bracket that best suits your opinion.

1   Are you aware of these as danger signs in pregnancy?

Severe Vaginal Bleeding (soaks a pad every hour)   (   )

Headache ( )

Blurring of vision ( )

Swelling of hands/face and/or feet ( )

No/Reduced foetal movement ( )

Pain in the abdomen ( )

2 Which of these are you experiencing or ever experienced?

Severe vaginal Bleeding ( )

Severe Headache ( )

Blurring of vision ( )

Swelling of hands/face and/or feet ( )

No/Reduced foetal movement ( )

Pain in the abdomen ( )

None ( )

3 Have you ever lost a pregnancy?

Yes ( )

No ( )

4 Have you ever received knowledge about obstetric danger signs during your antenatal visits?

Yes ( )

No ( )

5 Who educated you about the antenatal danger signs?

Nurse ( )

Doctor ( )

Clinical officer ( )

Nutritionist ( )

Student ( )

Friend ( )

None ( )

SECTION D: DANGER SIGNS DURING LABOUR

Indicate by use of (√) in the bracket that best suits your opinion.

1 Do you understand the following as danger signs during labour?

Premature rupture of membranes   (   )

Meconium stained fluid (green fluid)   (   )

High Fever   (   )

Prolonged labour more than 12 hours   (   )

Convulsions   (   )

Retained placenta   (   )

Swollen hands/face and/or feet   (   )

Baby hand/feet comes first   (   )

2 Which of these have you ever experienced?

Premature rupture of membranes   (   )

Meconium stained fluid (green fluid)   (   )

High Fever   (   )

Prolonged labour more than 12 hours   (   )

Convulsions   (   )

Retained placenta   (   )

Swollen hands/face and/or feet   (   )

Baby hand/feet comes first   (   )

 None   (   )

3 Which of the following have you ever received knowledge about danger signs during labour?

 Premature rupture of membranes   (   )

Meconium stained fluid (green fluid)   (   )

High Fever   (   )

Prolonged labour more than 12 hours   (   )

Convulsions   (   )

Retained placenta   (   )

Swollen hands/face and/or feet ( )

Baby hand/feet comes first ( )

None ( )

SECTION E: POSTNATAL DANGER SIGNS

Indicate by use of a (√) in the bracket that best suits your opinion.

1   Do you understand the following as postnatal danger signs?

Swollen hands / face and/feet ( )

Severe headache ( )

Convulsions ( )

Loss of consciousness ( )

Excessive bleeding (soaks a pad every hour for 2 hours) ( )

Foul odour from the vagina ( )

No bleeding after delivery ( )

Fever ( )

Dark urine ( )

Burning sensation while urinating ( )

Visual disturbance ( )

Difficulty in Breathing ( )

2   Which of these have you ever experienced?

Excessive bleeding ( )

Foul odour from the vagina ( )

No bleeding after delivery ( )

Fever ( )

Dark urine ( )

Burning sensation while urinating ( )

Visual disturbance ( )

Convulsion ( )

Loss of conscious ( )

Severe headache ( )

Swollen hands / face   (   )

Difficulty in breathing   (   )

None   (   )

3.Kindly indicate with a (√) where appropriate

		Strongly Agree	Agree	Unsure	disagree	Strongly disagree
1	Knowledge about postnatal danger signs is important.					
2	Health care workers should educate women about postnatal danger signs					
3	Education about postnatal danger signs before discharge is vital					
4.	Sharing your knowledge about postnatal danger signs with your partner is important.					
5.	Seeking for clarification about postnatal danger signs should be from health workers.					

We have come to the end of our Questionnaire. Before we close, do you have any final question for me?

If **yes**, what is the question/s?

Thank you for your time and response.

APPENDIX E: KNH-UON ETHICS APPROVAL

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Ref: KNH-ERC/A/30

7th February, 2022

APPROVED
0 7 FEB 2022

Gladys Ayitso Chilo
Reg. No. H57/11828/2018
Dept. of Public and Global Health
Faculty of Health Sciences
University of Nairobi

Dear Gladys,

RESEARCH PROPOSAL: ASSESSMENT OF KNOWLEDGE OF OBSTETRIC DANGER SIGNS AND ITS ASSOCIATED FACTORS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC AT PUMWANI MATERNITY HOSPITAL (P784/09/2021)

This is to inform you that KNH-UoN ERC has reviewed and approved your above research proposal. Your application approval number is **P784/09/2021**. The approval period is 7th February 2022 – 6th February 2023.
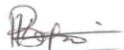
This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by KNH-UoN ERC.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to KNH-UoN ERC 72 hours of notification.
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH-UoN ERC within 72 hours.
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to KNH-UoN ERC.

Protect to discover

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

DR. BEATRICE K.M. AMUGUNE
SECRETARY, KNH-UoN ERC

c.c.   The Dean-Faculty of Health Sciences, UoN
       The Senior Director, CS, KNH
       The Chairperson, KNH- UoN ERC
       The Assistant Director, Health Information, KNH
       The Chair, Dept. of Public and Global Health, UoN
       Supervisor: Dr. Pamela Miloya Godia, Dept. of Public and Global Health, UoN

Protect to discover