Socio-demographic and lifestyle factors associated with spontaneous abortion among women attending Thika District level V hospital, Kenya

Emmah Nyambura Mwangi

A thesis submitted in partial fulfillment for the degree of Master of Science in Public Health in the Jomo Kenyatta University of Agriculture and Technology

2011

DECLARATION

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

Signature…….…..... Date: …….

Emmah Nyambura Mwangi

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

1. Signature……..... Date……

Prof. Zipporah Ng'ang'a

JKUAT, Kenya.

2. Signature…… Date……

Mr. Joseph Mutai

KEMRI, Kenya.

3. Signature…… Date…….

Mr. Lawrence Muthami

KEMRI, Kenya.

DEDICATION

I dedicate this thesis to my dear parents Mr. and Mrs. Mwangi, my sisters Irene, Pauline, Lillian and brother Joel for their love, support, and encouragement during the course of this study.

ACKNOWLEDGEMENTS

This work has been accomplished with the assistance of many people who deserve special mention for their support. Firstly, glory be to God for all was made possible by Him, he gave me grace and strength to complete this study even in the midst of various challenges. My sincere appreciation goes to my supervisors Prof Zipporah Ng'ang'a of Jomo Kenyatta University of Agriculture and Technology, Mr. Joseph Mutai of Kenya Medical Research Institute, and Mr. Lawrence Muthami of Kenya Medical Research Institute, for their availability and accessibility for constant consultations, constructive criticism and general guidance throughout the entire study. Their reproof, encouragement and love gave me courage to face the challenges since they have been through this road before me.

I would also want to sincerely thank my colleagues and friends Mr. Samuel Wachira, Ms. Mercy Njeru, Mrs. Beatrice Kithuka, Ms. Rachael Wanjiku and Mrs. Susan Githii who have been of great encouragement and support throughout this study.

Last but not least, my appreciation goes to the staff of Jomo Kenyatta University of Agriculture and Technology, Kenya Medical Research Institute and Thika District level V hospital, Kenya for their timely support and assistance.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS AND ACRONYMS

ACNM	American College of Nurse-Midwives
ANC	Antenatal Care
CI	Confidence interval
HIV/AIDS	Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome
FH	Family History
OR	Odds Ratio
PAC	Post Abortion Care
SAB	Spontaneous Abortion
KEMRI	Kenya Medical Research Institute
UK	United Kingdom
UNICEF	United Nations Children's Fund
UNFPA	United Nations Population Fund
USA	United States of America
WHO	World Health Organization
MOH	Ministry Of Health

DEFINITION OF TERMS AS USED IN THIS STUDY

Abortion	This is the expulsion of a dead fetus weighing less than 500g.
Induced abortion	This is an abortion that occurs with outside intervention.
Spontaneous abortion	This is an abortion that occurs without outside intervention.
Recurrent spontaneous abortion	This is a spontaneous abortion occurring in 3 or more consecutive pregnancies.
Stillbirth	This is the delivery of a fetus that has died before birth.
Domestic violence	This refers to being battered for example through being slapped, hit, or pushed violently.
Sexual violence	This refers to being forced into sexual intercourse without one's will.
Emotionally unwell	This refers to feeling 'stressed', 'anxious', 'depressed', 'out of control', or 'overwhelmed'.
Early pregnancy loss	This refers to when a spontaneous abortion occurs before the sixth week.
Clinical spontaneous abortion	This refers to when a spontaneous abortion occurs after the sixth week.

Late spontaneous abortion	This is an abortion occurring between the twelfth and the twentieth week of gestation.

ABSTRACT

Globally, an estimated 210 million women become pregnant annually and more than 25% of these pregnancies end in abortion or an unplanned birth. While many abortions may result from the desire to delay or avoid pregnancy, it is estimated that 15% to 20% of pregnancies end in spontaneous abortion which may be associated with maternal diseases such as malaria, HIV/AIDS and maternal lifestyle such as heavy caffeine intake before and during pregnancy and exposure to domestic violence. The understanding of the etiology of spontaneous abortion is still limited as few studies have been conducted on the same. Information on the occurrence as well as exposure factors of spontaneous abortion is non existent in Kenya. The main objective of this study was to determine the socio-demographic and lifestyle factors associated with spontaneous abortion among women attending Thika District level V hospital, Kenya. A cross-sectional descriptive study was carried out in Thika District level V hospital, Kenya that included a total of 196 ante-natal and post-natal women who were systematically selected to participate in the study. A pretested questionnaire was then administered to women within the child bearing age (18-49 years) to determine the level of occurrence as well as exposure factors of spontaneous abortion. Level of occurrence based on "ever suffered" a spontaneous abortion was 28.6%. Having a family history of spontaneous abortion was the only socio-demographic factor significantly ($p<0.020$) associated with spontaneous abortion. A woman had a 2.4-fold risk (OR= 2.4, 95% CI= 1.135-5.073) of experiencing a spontaneous abortion if she had such a history.

Among the lifestyle factors, coffee intake during pregnancy was significantly ($p < 0.002$) associated with spontaneous abortion with 37.9% of those reporting to have taken coffee during pregnancy experiencing a spontaneous abortion relative to18.3% of those not taking coffee. Further research through controlled studies on the quantity and duration of coffee intake that predisposes one to spontaneous abortion is however necessary in order to corroborate these findings. Exposure to X-ray treatments during pregnancy was also significantly ($p<0.001$) associated with spontaneous abortion with 70% of those who had been exposed to X-rays experiencing a spontaneous abortion. Ante-natal clinic attendance was also significantly ($p< 0.005$) associated with spontaneous abortion whereby there was a decreased risk (OR=0.23; CI= 0.08- 0.69) of experiencing a spontaneous abortion if a woman was attending ante-natal clinic. A significant association ($p<0.001$) was also observed between malaria and spontaneous abortion. The results of this study provide evidence that several lifestyle factors are associated with spontaneous abortion among women attending Thika District level V hospital. Advice to encourage women to adopt an appropriate lifestyle such as ante-natal clinics attendance needs to be emphasized. The results also provide a basis for further work so that more evidence can be provided on the etiology of spontaneous abortion.

CHAPTER ONE:

1.0 INTRODUCTION

1.1 Background information

Globally, an estimated 210 million women become pregnant and more than 25% of these pregnancies will end in abortion or an unplanned birth (Bankole *et al.*, 1998; DaVanzo *et al.*, 1998). While many abortions may result from the desire to delay or avoid pregnancy, it is estimated that 15% to 20% of pregnancies will end in spontaneous abortion or stillbirths which may be associated with maternal diseases such as malaria, HIV/AIDS and exposure to domestic violence (Fraser and Cooper, 2003). Spontaneous abortion is the most common complication of early pregnancy with most studies demonstrating a spontaneous abortion rate of 10-15 % (Petrozza and Inna, 2006).

The majority of spontaneous abortions occur in the first trimester and less than three percent occur in the second trimester (Topping and Farquharson, 2007). One of the most common symptoms of a spontaneous abortion is bleeding (Gracia *et al.*, 2005). About 20 to 30% of pregnant women have some bleeding at least once during the first 20 weeks of pregnancy with fewer than half of these episodes resulting in a spontaneous abortion (Hutchon, 1998). Complications that arise from both spontaneous and induced abortions may include incomplete abortion, hemorrhage, sepsis, and psychological trauma (Venners *et al*., 2004).

There are many reasons why a spontaneous abortion can occur and hence not all of them can be identified. The etiology can be divided into embryonic and/or maternal factors, although it is more likely to be multi-factorial. Embryonic factors may include; embryonic disease, disorder, or damage (Vitzthum *et al.*, 2006). Maternal factors may include; maternal exposure to high doses of toxic agents, radiation or chemotherapy, maternal diseases, and trans-placental infections (Regan and Rai, 2000).

In developing countries, 15% of all pregnancies end in spontaneous abortion because of either fetal or maternal causes. Half (50%) of SAB cases have been associated with fetal chromosomal anomalies and the maternal factors that have been associated with SAB include; maternal age, maternal occupation, maternal lifestyle, maternal infections and disease such as malaria in the developing world (Carolyn, 2007).

The only national estimate of abortion in Kenya is based on a study of women with abortion related complications who were admitted in public hospitals over a three month period in 2002. The study estimated that each year, an estimated 316,560 spontaneous and induced abortions occur in Kenya (Ipas, 2004). Each year, an estimated 21,000 women are admitted to Kenyan public hospitals for treatment of complications from incomplete abortion (induced or spontaneous) and 28% of these experience severe complications such as uterine perforation and shock (Ipas, 2004). The overall maternal mortality ratio in Kenya stands at 560 deaths per 100,000 live births (WHO, 2005).

1.2 Statement of the problem

In developing countries, 15% of all pregnancies end in SAB because of either fetal or maternal factors (such as socio-demographic and lifestyle factors). In Kenya, an estimated 316,560 spontaneous and induced abortions occur each year (Ipas, 2004) and the overall maternal mortality ratio stands at 560 deaths per 100,000 live births (WHO, 2005).The main complications of SAB are infections and excessive bleeding that affect a woman's overall health. Although a woman may quickly recover physically, psychological recovery for parents in general may take longer An abortion (whether spontaneous or induced) not only affects the health of a woman, but also the economic status of a country as funds have to be allocated to deal with the complications that arise.

1.3 Justification

Induced abortion accounts for 68,000 maternal deaths worldwide and is the leading cause of maternal mortality (13%) since it is mostly performed under unsafe conditions. Of the women who survive unsafe abortions, 5 million will suffer long term health complications (Lisa and Nawal, 2009). In eastern Africa as a whole, the estimated number of induced abortions in 2003 was 2.3 million, or 39 abortions per1, 000 women of reproductive age (Ipas, 2004). Statistics on spontaneous abortion on the other hand are not well publicized as few studies have been done on the same (Lynn *et al*., 1996). This has mainly been contributed by majority of the studies focusing on abortion as a whole and not solely on spontaneous abortion.

An example of such studies in Kenya is a study that was conducted in 2002 by Hailemichael *et al.,* (Hailemichael *et al.,* 2005). There is no study that has been carried out in Kenya on level of occurrence as well as exposure factors associated with spontaneous abortion. This study was therefore carried out in order to fill this knowledge gap as well as generate data on spontaneous abortion which is currently non existent in Kenya.

1.4 Research questions

1. What is the level of occurrence of SAB?
2. What are the socio-demographic factors associated with SAB?
3. What are the lifestyle factors associated with SAB?

1.5 Objectives

1.5.1 Main objective

To determine the socio-demographic and lifestyle factors associated with SAB among women attending Thika District Level V hospital, Kenya.

1.5.2 Specific objectives

1. To determine the level of occurrence of SAB.

2. To determine the socio-demographic factors associated with SAB.

3. To determine the lifestyle factors associated with SAB.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Adverse pregnancy outcomes

A pregnancy may either result in a live birth after the gestation period is over or in other adverse pregnancy outcomes such as spontaneous abortion, induced abortion, still birth, preterm birth among others. Worldwide, 210 million conceptions occur annually with almost half not resulting in a live birth (Van, 2008). Eighty million pregnancies end early, 42 million of these are terminated through abortions, and another 3 million babies are stillborn (99% of them occurring in low and middle income countries) (Joy *et al*., 2010). Spontaneous abortion is the most common complication occurring in 15% of clinically recognized pregnancies (Coste *et al.*, 1991).

Fetal chromosomal anomalies as well as maternal factors such as maternal age, structural anomalies of the genital tract, infections, maternal disease, and environmental factors have been associated with fifty percent of spontaneous abortions (Carolyn, 2007). Induced abortion on the other hand accounts for 68,000 maternal deaths worldwide and is the leading cause of maternal mortality (13%) since it is mostly performed under unsafe conditions.

Of the women who survive unsafe abortions, 5 million will suffer long term health complications (Lisa and Nawal, 2009). In eastern Africa as a whole, the estimated number of induced abortions in 2003 was 2.3 million, or 39 abortions per 1,000 women of reproductive age (Ipas, 2004). A study carried out in Kenya revealed that the overall maternal mortality ratio in Kenya stands at 560 deaths per 100,000 live births. A Kenyan woman has a one in 39 chance of dying from pregnancy-related causes (WHO, 2005).

Globally, an estimated 13 million babies are born prematurely, with the rates being highest in low and middle income countries. Preterm birth is the leading direct cause of neonatal death with more than one million preterm newborns dying annually. Preterm birth is also the dominant risk factor for neonatal mortality (Joy *et al.*, 2010). A study in Southern Malawi among pregnant women after delivery showed that 17·3% babies were preterm and 3·7% were stillborn. Intra-uterine growth retardation occurred in 20·3% of whom 38·2% were low birth weight and 9·1% were born prematurely (Kalanda *et al.*, 2005). Another study in Tanzania showed that among 1,017 pregnancies, 49 were still born yielding a still birth risk of 50.0 per 1,000 deliveries (Roland *et al*., 2009)

2.2 Classification of spontaneous abortion

The World Health Organization classifies spontaneous abortion into mainly four categories: threatened, inevitable, incomplete and complete abortion. A threatened abortion occurs when there is unprovoked vaginal bleeding, with or without lower abdominal pain during a pregnancy of less than 22 weeks gestation but the pregnancy may continue. An inevitable abortion is one in which the pregnancy cannot continue whereby specific clinical features indicate that the pregnancy is in the process of physiological expulsion from within the uterine cavity. In this case the pregnancy proceeds to incomplete or complete abortion. An incomplete abortion is one in which the products of conception are partially expelled while in a complete abortion, all the products of conception are completely expelled (WHO, 2003).

2.3 Magnitude of spontaneous abortion

Prospective studies have found that 25% of pregnancies are spontaneously aborted by the sixth week (Wilcox *et al*., 1999; Wang *et al*., 2003). Clinical spontaneous losses occur in 8% of pregnancies (Wang *et al*., 2003). The rate of spontaneous abortion between 8.5 weeks and birth is about 2% (Rodeck and Martin, 1999) but the risk decreases sharply after the 10th week. A study in Sweden found that out of 320 'ever pregnant' women (those who fell pregnant within the study period), 80 women had experienced a spontaneous abortion. 76.3% had experienced one SAB, 16.3% had experienced two SABs and 7.4% had experienced 3 or more SABs.

The spontaneous abortion rates varied at different ages; among women aged 20-24 years, the rate was 13.5% while those between 25-29 years had a 12.3% rate. Those women who were aged between 30-34 years and 35-39 years had a rate of 10.3% and 17.5% respectively (Blohm *et al*., 2008). In another study in Denmark, out of 1,221,546 pregnancy outcomes in 634,272 women, spontaneous abortion accounted for 80% of the fetal losses resulting in an overall risk of 10.9%. The risk varied from a minimum of 8.7% by age of 22 years and 84.1% by age of 48 years or more (Andersen *et al*., 2000). In Canada, a study involving 56, 000 women found an overall spontaneous abortion rate of 21.6% in previous pregnancies (Ben *et al.*, 1992) while another study in the UK found a lifetime prevalence for spontaneous abortion of 22.7% (Andrea *et al*., 2010). From a total of 2467 pregnancies, 9.5% of them ended up in spontaneous abortion in a study in South Africa (Braimoh *et al.*, 2010).

In Kenya, a study that was conducted in 2002 by Hailemichael *et al*., revealed that 80% of the 809 study cases had retained products of conception upon presentation for care. The remaining were diagnosed with complete abortion (10%); inevitable abortion (5%); missed abortion (1%) and 'other' diagnoses which included septic abortion, septic abortion and perforated uterus, and recurrent abortion which accounted for 4%. Overall, 56% of the women were classified as low (likely to have had a spontaneous abortion) (Hailemichael *et al*., 2005). In Kenya, the estimate of the total number of abortion cases (spontaneous or induced) admitted annually to public hospitals is about 20,893 (Ipas, 2004).

2.4 Signs and symptoms of spontaneous abortion

The signs and symptoms of spontaneous abortion vary according to the time of pregnancy. At up to six weeks, only small blood clots may be present, possibly accompanied by mild cramping. At 6 to 13 weeks, a clot will form around the embryo or fetus and the placenta with many clots being expelled prior to a completed abortion. The process may take a few hours or be on and off for a few days. Symptoms vary widely and can include vomiting and loose bowels, possibly due to physical discomfort. At over 13 weeks the fetus may be easily passed from the womb; however the placenta is more likely to be fully or partially retained in the uterus, resulting in an incomplete abortion. Late spontaneous abortion may begin with a gush of fluid when the membranes rupture and if the cervix is dilated. If products of conception remain in the uterus after the abortion, vaginal bleeding may occur and an infection may also develop, causing fever, pain, and sometimes sepsis (Robert *et al*., 2009).

2.5 Etiology of spontaneous abortion

There are many reasons why a spontaneous abortion can occur and hence not all of them can be identified. They may include infections from certain viruses most notably from cytomegalovirus, herpes virus, parvovirus, and rubella virus (Robert *et al*., 2009). Chromosomal abnormalities are responsible for most spontaneous abortions (two thirds to three-quarters in various studies) occurring during the first trimester (Rosenthal, 1999) and they are found in more than half of embryos spontaneously aborted in the first 13 weeks. A pregnancy with a genetic problem has a 95% probability of ending in spontaneous abortion. Most chromosomal problems happen by chance and have nothing to do with the parents hence they are unlikely to recur (Montvale, 1994).

Progesterone deficiency may cause early spontaneous abortions, women diagnosed with low progesterone levels may be advised to take progesterone supplements in the first trimester of pregnancy. However, no study has shown that general first-trimester progesterone supplements reduce the risk of spontaneous abortion (Montvale, 1994). Uterine malformation and growths in the uterus (fibroids) or cervical problems may account for up to 15% of pregnancy losses in the second trimester (Montvale, 1994). These conditions may also contribute to premature birth (Rosenthal, 1999).

2.6 Abortion related complications

Complications of unsafe abortion include incomplete abortion, hemorrhage, sepsis, uterine perforation, intra-abdominal injury, psychological trauma, and maternal death (Venners *et al*., 2004). Women who have suffered a spontaneous abortion or still birth may experience some of these complications, which may need emergency follow-up treatment.

2.7 Management of abortion complications

Women seek post abortion care due to complications related to spontaneous or induced abortion. Post abortion care is essential for the management of the complications that arise from an abortion (spontaneous and induced). It entails three critical elements that include: emergency treatment for complications of spontaneous or induced abortion; post abortion family planning counseling services and linkages to other reproductive health service, such as management of sexually transmitted diseases (Carolyn, 2007).

CHAPTER THREE:

3.0 METHODOLOGY

3.1 Study area

This study was carried out at Thika District level V hospital, Kenya which is in Thika West District, Kiambu County. Thika west district has its headquarters in Thika town. According to the 2009 census, the whole of Thika district has a population of 645,713 (Kenya Bureau of statistics, 2009). Thika town is located on a gentle plain before the ascent into the central highlands. Small valleys are present on the Western and Northern edges following the Chania and Thika Rivers that have waterfalls and meet on the North Western edge of the town. The climate is moderate tropical with sunshine most of the year round and typical average temperatures of 25°C during the day with the hottest period in January & February leading to the long rains and the coldest in July after. The "long rains" season occurs from March/April to May/June. The "short rains" season occurs from October to November/December. Thika is known as a center for light industry especially in food & horticulture processing (Thika district strategic plan, 2005-2010).

3.2 Study design

This was a cross sectional descriptive study which utilized a detailed semi-structured questionnaire (Appendix II).

3.3 Study population

The study population consisted of women attending Thika Distict level V hospital for antenatal and postnatal care within the period of Nov 2010-Jan 2011.

3.3.1 Inclusion criteria

- Women between 18-49 years (child bearing age) and consent.
- Women not presenting with threatened abortion**.**

3.3.2 Exclusion criteria

- Women below18years and above 49 years.
- Women who fit the inclusion criteria but do not consent.
- Women presenting with threatened abortion

3.4 Sample size determination

According to the American college of nurse-midwives, 15% of all pregnancies in developing countries (African) end in SAB because of either fetal or maternal causes (ACNM, 2007). This study therefore assumed a prevalence rate of 15%

Formula of sample size determination:

$$n = \frac{Z^2_{1-\infty/2}\, P\,(1-P)}{d^2}$$

Description:

n= required sample size

z= confidence level at 95% (standard value of 1.96)

p= estimated prevalence of spontaneous abortion (0.15)

d= level of precision at 5 %(0.05) (Fisher *et al*., 1998).

n=196

3.5 Sampling procedure

Systematic random sampling was used to sample every 5th woman who was attending antenatal or postnatal clinic and fitted the inclusion criteria. This was done as they exited from the clinic after which they were interviewed individually behind a closed door so as to ensure that only the principal investigator was in contact with the respondents so that privacy could be maintained for the respondents to answer the questions comfortably.

3.6 Data collection

Data was collected through a pre-tested semi structured questionnaire (Appendix II) which was administered by the principal investigator to women aged between 18-49 years after obtaining informed consent from them. The information sought was on; socio-demographic factors (such as age, marital status and education level), lifestyle characteristics (such as alcohol and coffee intake) and the health seeking behaviour of respondents (such as ANC attendance).

3.7 Data analysis

Data was entered into MS Excel database. Errors were minimized by cleaning and rechecking all data entries with the original data forms. Data was then transferred to SPSS version 12 for analysis. Descriptive statistics were used at the initial stage of data analysis after which bivariate analysis on categorical variables was first performed to determine variables that would be included in binary logistic regression.

Multivariate analysis was then performed to calculate adjusted odds ratio for the independent association between spontaneous abortion and the predictive variables. Data generated from the unstructured questions was coded based on themes and discussed. The exact binomial confidence limits method by Collet, 1999 was used to determine 95%CI for proportions.

3.8 Ethical considerations

Approval to conduct this study was obtained from the scientific steering committee (SSC) at the Kenya Medical Research Institute (KEMRI) (Appendix IV) and National Ethical Review Committee (NERC) (Appendix V) for scientific and ethical approvals respectively. Consent was sought from the respondent through the attached consent form (Appendix I) and a courtesy call was paid to the medical superintendent in charge of Thika District level V hospital, Kenya by the principal investigator to inform her of the intended study. Respondents were assured that no person-identifiers would be used for publication. Codes were assigned on all information about the participants and handled with utmost confidentiality making it difficult to relate the data to respondents and only used for intended purposes. The women presenting with threatened abortion were referred to the obstetric gynaecologist and excluded from the study.

3.9 Study limitation

The main limitation of this study was the inability to involve more than one hospital in the research due to lack of funding.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic characteristics of respondents

A total of 196 women with a mean age of 27.6 years (SE=0.43) ranging between 18-49 years were interviewed to establish their socio-demographic and lifestyle characteristics as well as the level of occurrence of SAB. The majority (62) of the respondents were between 21-25 years with the 41-45 year age group having the least (7) number of respondents. Majority (88.8%) of the respondents were married, 9.2% were single and only 2% were divorced/separated or widowed. Almost half (44.4%) of the respondents had acquired up to primary education with the remaining 42.9% and 12.8% having secondary and university/college education respectively **(Table 4.1).**

Table 4.1 Socio-demographic characteristics of respondents

Variable	Frequency n=196	Percentage
Age group		
16-20	19	9.7
21-25	62	31.6
26-30	59	30.1
31-35	36	18.4
36-40	13	6.6
41-45	7	3.6
Marital status		
Married	174	88.8
Single	18	9.2
Divorced/Separated/widowed	4	2.0
Education level		
Primary and below	87	44.4
Secondary	84	42.9
Tertiary	25	12.8
Occupation		
Housewife	97	49.5
Casual worker	81	41.3
Formal employment	18	9.2

4.1.1 Life style characteristics of respondents

This study also explored life style characteristics of the respondents. Coffee intake was reported in 52.6% of the respondents with 54.4% of them reporting monthly intake during pregnancy. Alcohol was reported in 6.6 % of the respondents, 57.1% reporting monthly intake. Majority (90.8%) of the respondents had been exposed to domestic violence during pregnancy.

Exposure to sexual violence during pregnancy was reported in 4.1% of the respondents. Most of the respondents (92.3%) attended antenatal clinics during pregnancy while 64.3% of the respondents used contraceptives (**Table 4.2**).

Table 4.2 Life style characteristics of respondents

Variable	Frequency (n=196)	Percentage
Alcohol intake		
No	183	93.4
Yes	13	6.6
Coffee intake		
No	93	47.4
Yes	103	52.6
Domestic violence exposure		
No	178	90.8
Yes	18	9.2
Sexual violence exposure		
No	188	95.9
Yes	8	4.1
Emotionally unwell		
No	139	70.9
Yes	57	29.1
X-ray treatments		
No	156	79.6
Yes	40	20.4
ANC attendance		
No	15	7.7
Yes	181	92.3
Contraceptive use		
No	70	35.7
Yes	126	64.3

The health seeking behavior of the 56 respondents who had ever suffered a spontaneous abortion showed that almost half (42.9%) of them were informed by physicians about the reasons that might have caused them to suffer a spontaneous abortion. Thirty two (57.1%) of the respondents who were not informed of what might have led to their pregnancy loss gave various reasons that they thought would have led to their loss of pregnancy. Majority (21.4%) thought that stress could have caused it, 10.7% thought that heavy tasks could have led to them experiencing a spontaneous abortion, 17.9% thought that drugs (unspecified over the counter drugs) would have been the reason for spontaneous abortion while the rest (8.9%) had no idea of what would have led to their pregnancy loss **(Table 4.3).**

Table 4.3 Reasons given by physicians and respondents as to what might have led to pregnancy loss

Reasons given to respondents by physicians	Frequency n= 56	Proportion
Obstetric reasons	13	23.2
Stress	3	5.4
Heavy tasks	4	7.1
Falling sick	4	7.1
Total	**24**	**42.9**
Reasons given by respondents		
Heavy tasks	6	10.7
Drugs (unspecified over the counter drugs)	9	17.9
Stress	12	21.4
No idea	5	8.9
Total	**32**	**57.1**

4.1.2 Level of occurrence of spontaneous abortion

The overall level of occurrence of spontaneous abortion was 28.6% (56/196). This occurrence was based on the question 'ever suffered' a spontaneous abortion in your life time. Majority (20.4%) of the respondents had experienced one spontaneous abortion and only 1.5% experienced 3 or more spontaneous abortions On the other hand, 71.4% of the respondents had never suffered a spontaneous abortion in their lifetime (**Table 4.4).**

Table 4.4 Level of occurrence of spontaneous abortion

No. of SABs experienced	Frequency	Proportion
0	140	71.4%
1	40	20.4%
2	13	6.7%
3	2	1.0%
4	1	0.5%

4.1.3 Level of occurrence of spontaneous abortion in relation to various socio-demographic factors

Generally, the association between most of the socio-demographic factors and the level of occurrence of SAB was not statistically significant. Examining age in relation to level of occurrence of SAB showed no significant association ($\chi^2_{4,\ 0.05}$= 7.60, p= 0.11) **(Table 4.5).**

However, the level of occurrence of SAB varied among the different age groups with the highest occurrence (9.7%) (CI=5.9-14.7) being recorded among women aged between 26-30 years followed by women aged between 31- 35 years (6.1%) (3.2-10.5) (**Fig 4.1**).

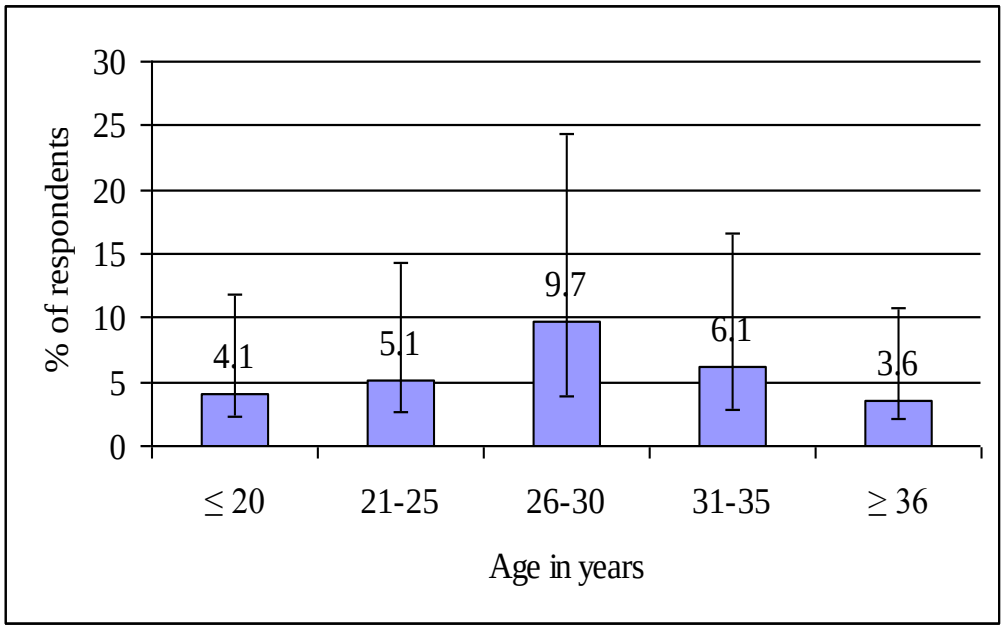

Fig 4.1: Level of occurrence of Spontaneous abortion by age group

Due to the low frequencies among the divorced/separated and the widowed respondents, marital status was regrouped to never married and ever married. Marital status was then examined in relation to occurrence of spontaneous abortion and found to have no significant [OR= 1.04, (CI= 0.35-3.08), p= 0.94)] association **(Table 4.5).** Though the relationship between education level and level of occurrence of spontaneous abortion was not significant ($\chi^2_{2,\ 0.05}$= 0.53, p= 0.77) (**Table 4.5**).

Occurrence of spontaneous abortion was highest (31%) (CI=21.3-41.9) among the respondents who had secondary education and least (24%) (CI=9.3-45.1) among the university/college graduates (**Fig 4.2**).

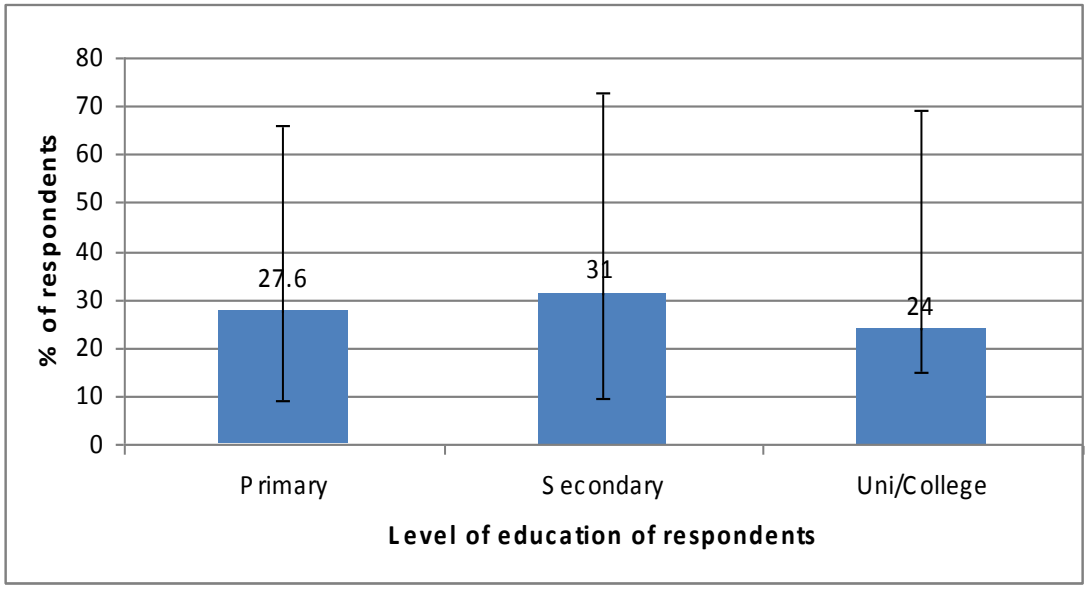

Fig 4.2 Level of occurrence of spontaneous abortion by education level

Although the association between occupation and spontaneous abortion was not statistically significant ($\chi^2_{2,\ 0.05}$= 2.56, p= 0.28) **(Table 4.5)**, occurrence of spontaneous abortion varied between the different occupations. Casual workers had the highest occurrence (34.6%) (CI=24.3-46.0) of spontaneous abortion followed by those in formal employment (27.8%) (CI= 9.7-53.5) while women who were housewives had the least (23.7%) (CI= 15.7-33.4) occurrence of spontaneous abortion **(Fig 4.3).**

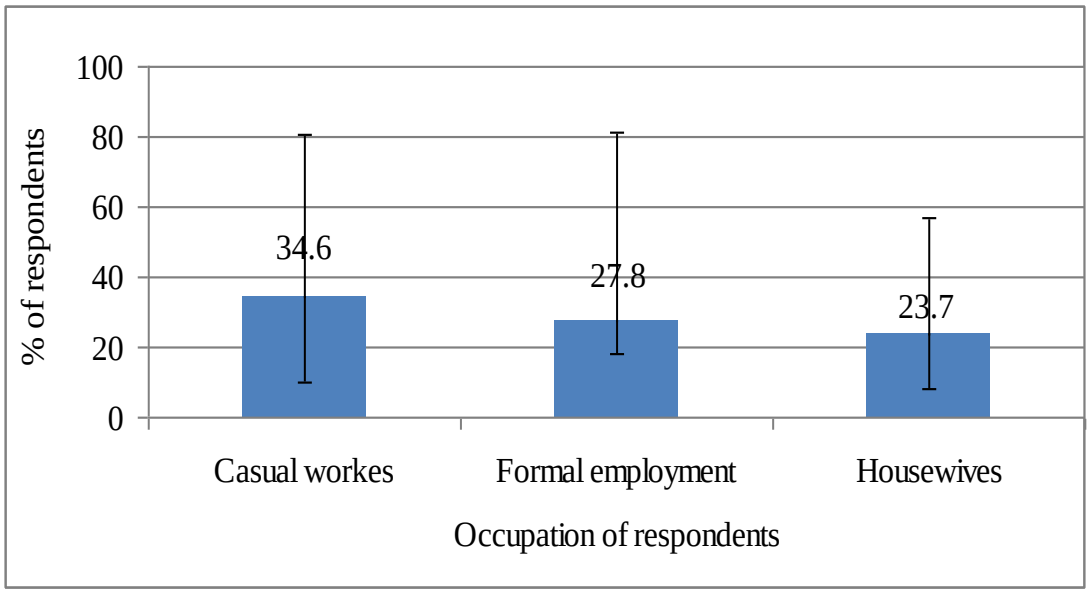

Fig 4.3 Level of occurrence of spontaneous abortion by occupation

Having a family history of spontaneous abortion was significantly ($p< 0.02$) associated with spontaneous abortion. A woman had a 2.4-fold risk (OR= 2.4, 95% CI= 1.135-5.073) of experiencing a spontaneous abortion if she had such a history **(Table 4.5**). Those who had a family history of spontaneous abortion had a higher occurrence (44.4%) (CI= 27.9-61.9) of spontaneous abortion compared to those that did not have such a history (25%) (CI=18.5-32.4) **(Fig 4.4)**.

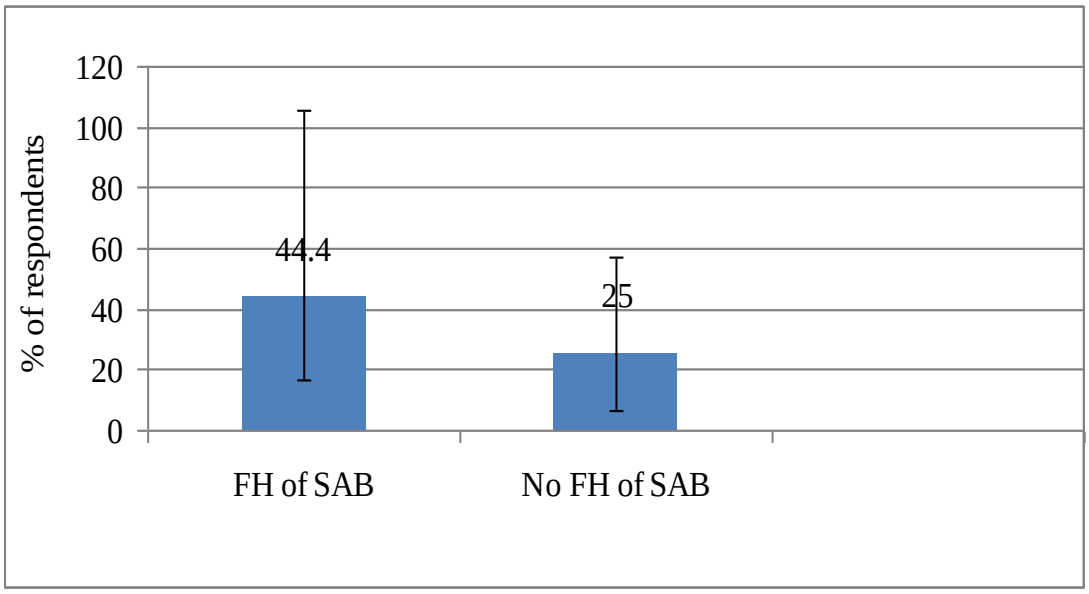

Fig 4.4 Level of occurrence of spontaneous abortion by family history

Environmental toxins that 49 respondents reported to have been exposed to included; pesticides, textile residues as well as other forms of chemicals. More than half of them (57%) reported to have been exposed to pesticides used at the flower farm where they work or hair chemicals for the salon workers while 43% had been exposed to textile residues **(Fig 4.5).**

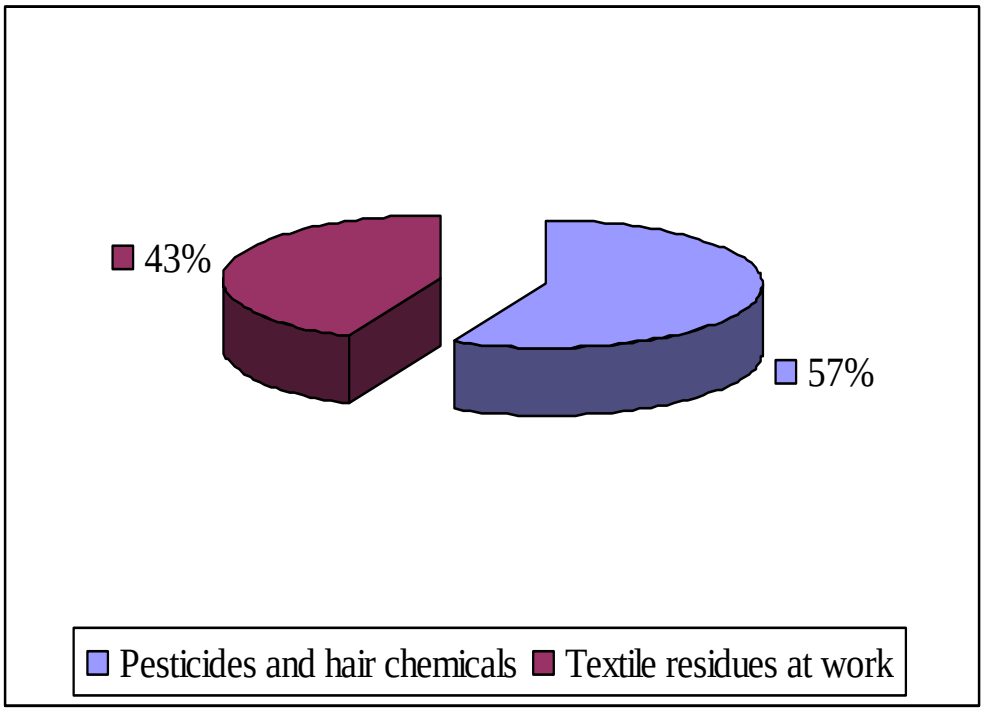

Fig 4.5 Environmental toxins that respondents were exposed to

There was no significant difference [(OR= 1.67, (CI=0.84-3.32), p=0.14)] of experiencing spontaneous abortion after exposure to such toxins. Similarly, the relationship between parity and occurrence of spontaneous abortion was not statistically significant [OR=1.4, (CI=0.74-2.80), p= 0.28)] **(Table 4.5).**

Table 4.5: Bivariate analysis of socio-demographic factors in relation to level of occurrence of spontaneous abortion

Variables	Chi-square	df	p value	Odds ratio	lower CI	upper CI
Socio- demographic factors						
Marital status	0.01	1	0.94	1.04	0.35	3.08
Age	7.59	4	0.11			
Parity	1.17	1	0.28	1.44	0.74	2.80
Family history	5.44	1	***0.02**	2.40	1.14	5.07
Level of education	0.53	2	0.77			
Occupation	2.56	2	0.28			
Exposure to environmental toxins	2.13	1	0.14	1.67	0.84	3.32

Note: * variables significant at the 5% level

4.1.4 Level of occurrence of spontaneous abortion in relation to various lifestyle factors

Several life style characteristics had a significant association with spontaneous abortion. Respondents who took coffee during pregnancy had a higher occurrence (37.9%) of spontaneous abortion compared to those that were not taking coffee (18.3%) **(Table 4.6).** A significant association ($p< 0.02$) was observed between coffee intake and spontaneous abortion with women who took coffee having a 2.7-fold risk (OR= 2.7, 95%CI= 1.41-5.27) of experiencing a spontaneous abortion **(Table 4.7).** Alcohol intake was reported by 6.6% of the respondents with those taking alcohol during pregnancy having a higher occurrence (38.5%) of spontaneous abortion compared to 27.9% of those that were not taking alcohol **(Table 4.6).** There was however no significant association between alcohol intake and occurrence of spontaneous abortion [(OR= 1.62, (CI= 0.51-5.18), p=0.41)].

Exposure to domestic violence during pregnancy was not significantly [(OR= 2.17, (CI= 0.81-5.81), p= 0.41)] **(Table 4.7)** associated with spontaneous abortion although those exposed to domestic violence had a higher (44.4%) occurrence of spontaneous abortion compared to those that were not exposed (27%) **(Table 4.6)**. Exposure to sexual violence during pregnancy was reported by 8 respondents all of whom reported to have been forced into sexual intercourse. The relationship between exposure to sexual violence and spontaneous abortion was however not statistically significant [(OR=0.35, (CI= 0.04-2.87), p=0.30)] **(Table 4.7).**

Having been emotionally unwell during pregnancy, was significantly [(OR= 2.17, (CI= 1.13-4.20), p=0.019)] associated with occurrence of spontaneous abortion **(Table 4.7).**

A higher occurrence (40.4%) of spontaneous abortion was observed in those reporting to have been emotionally unwell compared to 23.7% of those reporting not to have been emotionally unwell **(Table 4.6).** A highly significant association was observed between exposure to X-ray treatments and spontaneous abortion ($p<0.001$) with respondents exposed to X-ray treatments having a 10.7-fold risk (OR= 10.7; 95% CI= 4.84-23.51) of experiencing a spontaneous abortion **(Table 4.7).** A very high occurrence (70%) of spontaneous abortion was observed in respondents exposed to X- ray treatments during pregnancy compared to 17.9% of those that were not exposed to such treatments **(Table 4.6).**

Attendance of antenatal clinic during pregnancy was significantly ($p<0.005$) associated with spontaneous abortion whereby a decreased risk [(OR= 0.234; 95% CI= 0.079-0.692)] of experiencing a spontaneous abortion was observed if one was attending antenatal clinic **(Table 4.7).** The occurrence of spontaneous abortion was lower (26%) among respondents who were attending antenatal clinic during pregnancy compared to those that were not attending antenatal clinic (60%) **(Table 4.6).** Having malaria during pregnancy was significantly associated with spontaneous abortion ($p< 0.001$) with a woman having a 3.1-fold risk (OR=3.1; CI= 1.59- 6.01) of experiencing a spontaneous abortion if she had malaria.

Although having fibroids during pregnancy was not significantly [(OR=3.9, (CI= 0.64-24.03), p=0.12) **(Table 4.7)** associated with spontaneous abortion, women who had fibroids had a higher occurrence (60%) of spontaneous abortion compared to those that did not have fibroids (27.7%) **(Table 4.6)**. Similarly, use of contraceptives was not significantly associated with spontaneous abortion [(OR= 0.90, (CI= 0.48-1.71), p=0.74)] **(Table 4.7).**

Table 4.6 Level of occurrence of spontaneous abortion in relation to life style factors

		Spontaneous abortion		
		Yes	No	
Life style characteristics		n (%)	n (%)	Total
Alcohol	Yes	5(38.5)	8(61.5)	13(100)
	No	51(27.9)	132(72.1)	183(100)
	Total	56 (28.6)	140 (71.4)	196(100)
Coffee				
	Yes	39(37.9)	64(62.1)	103(100)
	No	17(18.3)	76(81.7)	93(100)
	Total	56(28.6)	140(71.4)	196 (100)
Domestic violence				
	Yes	8(44.4)	10(55.6)	18(100)
	No	48(27)	130(73)	178(100)
	Total	56(28.6)	140(71.4)	196(100)
Sexual violence	Yes	1(12.5)	7(87.5)	8(100)
	No	55(29.3)	133(70.7)	188(100)
	Total	56(28.6)	140(71.4)	196(100)
Emotionally unwell	Yes	23(40.4)	34(59.6)	57(100)
	No	33(23.7)	106(76.3)	139(100)
	Total	56(28.6)	140(71.4)	196(100)
X-ray treatments				
	Yes	28(70)	12(30)	40 (100)
	No	28(17.9)	128(82.1)	156(100)
	Total	56(28.6)	140(71.4)	196(100)
Attendance of ANC				
	Yes	47(26)	134 (74)	181(100)
	No	9(60)	6(40)	15(100)
	Total	56 (28.6)	140 (71.4)	196 (100)
Malaria in pregnancy				
	Yes	25(46.3)	29(53.7)	54(100)
	No	31(21.8)	111(78.2)	142 (100)
	Total	56 (28.6)	140 (71.4)	196(100)
Fibroids in pregnancy				
	Yes	3(60)	2(40)	5 (100)
	No	53(27.7)	138(72.3)	191(100)
	Total	56 (28.6)	140 (71.4)	196(100)
Contraceptive use				
	Yes	35(27.8)	91(72.2)	126 (100)
	No	21(30)	49(70)	70(100)
	Total	56(28.6)	140 (71.4)	196 (100)

Table 4.7 Bivariate analysis of lifestyle factors in relation to level of occurrence of spontaneous abortion

Variables	Chi-square	df	p value	odds ratio	lower CI	upper CI
Lifestyle factors						
Alcohol	0.667	1	0.414	1.618	0.506	5.176
Coffee	9.185	1	***0.002**	2.724	1.409	5.269
Domestic violence	2.447	1	0.118	2.167	0.808	5.813
Sexual violence	1.056	1	0.304	0.345	0.042	2.874
Emotionally unwell	5.465	1	***0.019**	2.173	1.126	4.195
X-ray treatments	42.266	1	***<0.001**	10.667	4.840	23.509
ANC Attendance	7.862	1	***0.005**	0.234	0.079	0.692
Malaria	11.474	1	***0.001**	3.087	1.585	6.013
Fibroids	2.483	1	0.115	3.906	0.635	24.033
Contraceptive use	0.109	1	0.741	0.897	0.472	1.707

Note: * variables significant at the 5% level

4.1.5 Multivariate analysis

In order to establish the variables that were associated with spontaneous abortion a multivariate logistic regression analysis procedure was carried out. The cut-off point for variable inclusion to the analysis was pegged at p=0.2 for the bivariate variables that attained the probability of inclusion. Stepwise logistic regression, forward selection, procedure was used. Subsequent variable inclusion or exclusion in the stepwise procedure the p-value=0.05 was used. The optimal number of variables that were identified to be associated with spontaneous abortion are presented in the **table 4.8** below and the computed level of significance. For every selected variable the coefficient B, standard error, level of significance, the adjusted odds ratio and their confidence intervals are provided.

Table 4.8 Variables that were significantly associated with spontaneous abortion at p<0.05

Variables	B	S.E.	df	Sig.	Adjusted OR (Exp(B))	95% C.I for Adjusted OR (Exp(B)) Lower	Upper
Coffee	0.964	0.424	1	p<0.023	2.622	1.142	6.023
Emotionally unwell	1.008	0.445	1	p<0.023	2.739	1.146	6.549
X-ray treatment	2.549	0.478	1	p<0.001	12.791	5.013	32.637
ANC Attendance	-1.991	0.703	1 1	p<0.005	0.137	0.034	0.542
Malaria	1.043	0.441	1	p<0.018	2.837	1.196	6.730

The variables observed to be the predictors of spontaneous abortion were: use of coffee which was associated with a more than 2.6-fold risk [OR=2.622, (CI=1.142-60.23), p < 0.023)]; being emotionally unwell during pregnancy had more than 12.79-fold risk [(OR=12.791, (CI=5.013-32.637), p<0.001)]; attendance of antenatal clinics was associated with a decreased risk [(OR=0.137, (CI=0.034-0.542), p<0.005)] of spontaneous abortion; Malaria was associated with an increased 2.84-fold risk [(OR=2.837, (CI=1.196-6.730), p<0.018)] and exposure to X-ray treatments during pregnancy which was associated with a 12.79-fold increased risk [(OR= 12.791, (CI= 5.013- 32.637), p< 0.05)] **(Table 4.8)**.

CHAPTER FIVE

5.0 DISCUSSION

5.1 Level of occurrence of spontaneous abortion

The overall level of occurrence of spontaneous abortion among women aged 18-49 years was 28.6% in this cross-sectional study. These findings are in agreement with comparable occurrence rates that have been obtained in other studies. A study in Cameroon obtained an occurrence rate of 25% (Alio, 2009), while in another study in Canada an overall occurrence rate of 21.6% was obtained (Ben, *et al*., 1992). First trimester spontaneous abortions accounted for the majority (58.9%) of the spontaneous abortions recorded in Thika District level V hospital, and this is in line with what was observed in a USA study where 75% of 189 pregnancies were lost during the first trimester (Wilcox *et al*., 1999) suggesting that extra care should be taken by women during their first trimester of pregnancy.

For the respondents who had ever suffered a spontaneous abortion (28.6%), majority (20.4%) of them had experienced at least one spontaneous abortion and with the least (1.5%) having experienced three or more spontaneous abortions which is in agreement to what was observed in a Sweden study where majority (76.3%) of the respondents had also experienced one spontaneous abortion with the least (7.4%) experiencing three or more spontaneous abortions (Blohm *et al*., 2008).

This may imply that women take extra care of subsequent pregnancies after experiencing a spontaneous abortion, such that majority only end up experiencing only one spontaneous abortion in their life time.

5.2 Socio-demographic factors associated with spontaneous abortion

Majority of the respondents who had ever suffered a spontaneous abortion in this study were between 26-30 years with a mean age of 28.5 (SE=0.47). Comparable findings were obtained in a Cameroon study that had over just half of its respondents suffering a spontaneous abortion being less than 30 years with a mean age of 29.9 (Alio, 2009). At Thika District level V hospital, it was observed that the occurrence rate of spontaneous abortion varied with age groups whereby, among women aged ≤ 20 years, the rate was 4.1% while those between 21-25 years had a 5.1% rate. The women aged between 26-30 years, 31-35years and ≥ 36years had a rate of 9.7%, 6.1% and 3.6% respectively. These findings agree with observations made in a Sweden study whereby the occurrence rate of spontaneous abortion varied with age groups with women aged 20-24 years having an occurrence rate of 13.5% while those between 25-29 years had a 12.3% rate. Those aged between 30-34 years and 35-39 years had a rate of 10.3% and 17.5% respectively (Blohm *et al*., 2008).

Findings of this study showed no significant ($p>0.05$) association between marital status and spontaneous abortion. Similar findings which are in agreement to the findings of this study were also observed in a study in Italy where no association emerged between marital status and spontaneous abortion (Fabio *et al*., 1991). Having a family history of spontaneous abortion was observed to be significantly [(OR=2.4 (C.I= 1.14- 5.07), $p< 0.020$)] associated with spontaneous abortion in this cross sectional study with a woman reporting to have had such a history having a 2.4-fold risk of experiencing spontaneous abortion with 95% C.I of OR varying between 1.14 to 5.07. Findings similar to these were observed in a Saudi Arabia study where a significant association was observed between having a family history of spontaneous abortion and the level of occurrence of spontaneous abortion (Lubna *et al*., 1995). Such findings show that a family history of spontaneous abortion may suggest a hereditary linkage.

Among women attending Thika District level V hospital, it was observed that parity was not significantly ($p> 0.05$) associated with spontaneous abortion which is in agreement to what was observed in a study in France (Coste *et al*., 1991). This study also established that there was no significant ($p>0.05$) association between level of education and spontaneous abortion and this is in line with what was observed in other studies in UK and France (Maconochie *et al*., 2006; Coste *et al*., 1991). In this study, no significant association ($p>0.05$) was observed between a person's occupation and spontaneous abortion.

Similar findings which are in agreement to this were observed in the UK where no significant association was observed between employment status and spontaneous abortion (Maconochie *et al*., 2006). Exposure to environmental toxins such as dust from textile residues, hair chemicals and pesticides was not significantly ($p>0.05$) associated with spontaneous abortion in this study which disagrees with observations made from a China study that found an elevation in risk (OR=1.89, 95% CI: 1.20–3.00) of women exposed to environmental/occupational toxins such as synthetic fibers (Eva *et al*., 2009). The findings of this study may have differed due to the fact that the China study was able to obtain occupational exposures of respondents from factory personnel records as opposed to self reports which was the case in this study.

Findings of this study showed that most of the socio-demographic factors were not significantly associated with spontaneous abortion which is in agreement with what was observed in another study in Italy that found no association between socio-demographic characteristics (such as education, marital status and age of partner) and spontaneous abortion (Fabio *et al*., 1991). This may imply that socio-demographic factors are less likely to influence spontaneous abortion.

5.3 Life style factors associated with spontaneous abortion

In the light of the data obtained from this cross-sectional study, though coffee was observed to be significantly [(OR= 2.72 (CI= 1.41-5.27); P<0.002)] associated with spontaneous abortion, the study did not establish the quantity and the duration of intake that constitutes a risk factor. Further research through controlled studies is therefore necessary especially in an African setting like Kenya where coffee is not the highest revenue earner and may likely not be consumed by a majority of the population. Studies outside Africa have however been carried out to determine the association between coffee and spontaneous abortion, taking into consideration the quantity and the duration of intake.

A case control study in Italy observed the multivariate odds ratio of spontaneous abortion in coffee drinkers as compared with non-coffee drinkers. The multivariate odds were; 1.2, 1.8 and 4.0 respectively, for drinkers of 1, 2 or 3 and 4 or more cups of coffee per day. With regard to duration in years of coffee drinking, the estimated multivariate odds ratios of spontaneous abortion in comparison with non-coffee drinkers were; 1.1 (95% CI= 0.9–1.4) and 1.9 (95% CI =1.5–2.6) for women reporting a duration of coffee consumption ≤10 or ≥10 years. The study further concluded that coffee drinking early in pregnancy was associated with increased risk of spontaneous abortion.

According to Fabio *et al*., this may suggest a biological implication but epidemiological inference on causality is difficult and still open to debate (Fabio *et al*., 1998). However, this study did not establish any evidence against alcohol intake and spontaneous abortion ($p > 0.05$) among respondents in Thika District level V hospital which is in agreement with observations in a UK study where no association was observed between alcohol consumption and spontaneous abortion (Maconochie *et al.*, 2006). Contrary to what was observed in a Cameroon study whereby exposure to any type of spousal violence (domestic, emotional, sexual) was associated with an increased risk of any fetal demise (spontaneous abortion or still birth or both) (Alio, 2009), this study showed no significant ($p>0.05$) association between domestic violence and spontaneous abortion. The contradicting findings may be attributed to failure of respondents in this study to probably give correct information regarding their exposure to domestic violence or due to their social-cultural dynamics.

This study observed that being emotionally unwell during pregnancy (whereby a methodology used in a UK study that described this state as being "stressed", "anxious", "overwhelmed" or "out of control" was adopted) was significantly [(OR= 2.17 (CI= 1.13-4.20); $p< 0.019$)] associated with spontaneous abortion. A woman had a 2.2-fold risk of experiencing a spontaneous abortion if she was emotionally unwell during pregnancy. These findings agreed with observations made in the United Kingdom whereby stress increased the risk of experiencing a spontaneous abortion (Maconochie *et al.*, 2006).

This may suggest that promoting one's well-being especially during pregnancy may be one of the ways of reducing the risk of suffering a spontaneous abortion. Findings of this study showed that treatment with radiation (X-rays) during pregnancy was significantly [(OR=10.67 (CI= 4.84-23.51); P< 0.001)] associated with spontaneous abortion. There was a 10.7-fold risk of experiencing a spontaneous abortion if one was exposed to such treatment. A Danish study similarly found a 23% excess risk for spontaneous abortion related primarily to prior radiation treatments and especially high-dose radiotherapy to the ovaries and uterus (Jaenette *et al*., 2008). However, unlike the Danish study that was able to classify radiation doses as high or low, this study did not classify radiation similarly and hence a further study is necessary in order to corroborate the results. Malaria was significantly [(OR= 3.09 (CI= 1.59- 6.01); p< 0.001)] associated with spontaneous abortion in this study.

Women who had malaria during pregnancy were 3.1 times more likely to experience a spontaneous abortion suggesting that malaria may be one of the main diseases associated with spontaneous abortion at Thika District level V hospital. The findings of this study are in agreement with reports of a study in Africa that noted that malaria was the main disease associated with spontaneous abortion in the developing world (Carolyn, 2007). No significant (p>0.05) association was observed between contraceptive use and spontaneous abortion in this cross-sectional study which is similar to what was observed in another study in Italy that found no association between contraceptive use and spontaneous abortion (Fabio *et al*., 1991).

Antenatal clinics attendance was significantly associated [(OR= 0.234 (CI= 0.79-0.69), p<0.005)] with spontaneous abortion with women who attended ante-natal clinic during pregnancy having a decreased risk of suffering a spontaneous abortion which implies that ANC attendance is important for a healthy reproductive outcome. The findings of this study are comparable to the findings of a study conducted in Kwale District, Kenya, which found a positive relationship between ANC attendance and perinatal outcomes with women attending antenatal clinic being more likely to have a live birth (Celia *et al*., 2008). Findings of this study showed that having fibroid in pregnancy was not significantly (p>0.05) associated with spontaneous abortion. These findings disagreed with observations made by Benson *et al*., who observed that spontaneous abortion rates were greatly increased (14%) in pregnant women with fibroids compared with pregnant women without fibroids (7.6%) (Benson *et al*., 2001). The findings of this cross-sectional study may have differed as a result of having only 5 out of the 196 respondents reporting to have had fibroids in pregnancy with only 3 suffering a spontaneous abortion.

The health seeking behavior of the respondents who had suffered a spontaneous abortion showed that after they sought medical attention, an obstetric reason was the main factor cited by doctors as to what might have led to the spontaneous abortion. The other factors were stress, heavy tasks or falling sick especially with malaria. Similarly, a study in Africa found that maternal life style and disease such as malaria were some of the factors that may cause spontaneous abortion in the developing world (Carolyn, 2007).

Stress was the main factor cited by respondents that may have been responsible for spontaneous abortion in this study. Many epidemiologic studies have been performed to determine if stress may be a factor in the etiology of spontaneous abortion in humans (O'Hare and Creed, 1995). O'Hare and Creed observed that women admitted to a hospital with spontaneous abortions had experienced more stress in early pregnancy (as evaluated by a questionnaire) compared to women whose pregnancies had progressed to labor (O'Hare and Creed, 1995).

5.4 CONCLUSIONS

- Spontaneous abortion is a reproductive health problem among women in Thika West District as an occurrence rate of 28.6% is high compared to the 15% rate that has been observed in most studies (Ben *et al*., 1992).

- Having a family history of spontaneous abortion was the only socio-demographic factor likely to influence spontaneous abortion.

- Use of coffee, being emotionally unwell, ANC attendance, having malaria in pregnancy and exposure to X-rays were the lifestyle factors and the health seeking behaviour likely to influence spontaneous abortion.

5.5 RECOMMENDATIONS

- The MOH in collaboration with WHO needs to facilitate research on level of occurrence of SAB in various parts of Kenya so as to generalize the findings nationally.

- As far as lifestyle factors are concerned, the MOH should facilitate research on the quantity and the duration of coffee intake that predisposes a woman to SAB.

- Health care providers need to exercise caution when dealing with women of reproductive age group as far as exposure to X-rays is concerned.

- Health care providers should as well encourage expectant women to seek support through counseling if emotionally unwell, attend antenatal clinics and use insecticide treated nets to reduce risk of malaria as this might lower their risk of suffering a SAB.

- Health care providers should also advise women to seek early antenatal care incase they are aware of having a family history of spontaneous abortion.

REFERENCES

Alio A. (2009). Spousal violence and potentially preventable single and recurrent spontaneous fetal loss in an African setting: cross-sectional study *The Lancet* **373:**318-324

American College of Nurse- Midwives (2007). Meeting health care needs of women experiencing complications of miscarriage and unsafe abortion: USAID post abortion care program. *J Midwifery Womens Health* **52**: 368-375.

Andersen N. A., Wohlfahrt J., Christens P., Olsen J. and Melbye M. (2000). Maternal age and fetal loss: population based register linkage study. *Br Med J* **320**: 1708–1712.

Andrea V., Lynn C. and Timothy D. (2010). Exploring genetic and environmental influences on miscarriage rates: A twin study. *Twin Research and Hum Gen* **13**: 201-206.

Bankole A., Singh S. and Haas T. (1998). Reasons why women have induced abortions: Evidence from 27 countries. *Int Fam Plann Perspect* **24:** 117-127.

Ben G., Alison D., McDonald. and Margaret S. (1992). Cigarette, Alcohol and Coffee and spontaneous abortion. *Am J Public Health* **82**: 85-87.

Benson B., Chow J. and Chang W. (2001). Outcome of pregnancies in women with uterine leiomyomas identified by sonography in the first trimester. *J Clin Ultrasound* **29**: 261-264.

Blohm F., Friden B. and Milsom I. (2008). A prospective longitudinal population-based study of clinical miscarriage in an urban Swedish population. *Br J Obstet Gynecol* **115**:176-183.

Braimoh B., **Danuta K.**, **Dick H. and Kerry W.** (2010). Time-to-pregnancy and pregnancy outcomes in a South African population. *BMC Public Health* **10:**1471-2458

Carolyn C. (2007). Meeting health care needs of women experiencing abortion complications. *J Midwifery Womens Health* **52**: 368-375.

Celia A., Salim B., Khalid K., Richard L. and Walter M. (2008). Antenatal care and perinatal outcomes in Kwale district, Kenya. *BMC Pregnancy Childbirth* **8**:2

Coste J., Job S. N. and Ferandez H. (1991). Risk factors for spontaneous abortion: a case control study in France. *Hum Reprod* **9**: 1332-1337.

Collet D. (1999). Method described by D. Collett: 95% Exact binomial confidence limits for the proportion k/ n. Modelling binary data. Chapman & Hall/CRC, Boca Raton Florida, p. 24.

DaVanzo J., Adamson D. and Bulatao R.A. (1998). Population Matters policy brief: The unmet need for contraception in developing countries. *J Midwifery Womens Health* **52**: 368-375.

Eva Y., Roberta M., Dao L., Karen J., Dawn F., Janice E., George A., Patrick J., David B. and Harvey C. (2009). Dust and Chemical Exposures, and Miscarriage Risk Among Women Textile Workers in Shanghai, China. *Occup Environ Med* **66**: 161-168.

Fabio P., Liliane C., Elisabetta D., Raffaella M., Matteo S., Giovanni Z., Luigi F. and Guido B. (1998). Coffee consumption and risk of hospitalized miscarriage before 12 weeks of gestation. *Hum Reprod* **13**: 2286-2291.

Fabio P., Luca B., Luigi F., Fedele L., La Vecchia C. and Acaia B. (1991). Risk Factors for Spontaneous Abortion. *Int J Epidemiol* **20**:157-161.

Fishers A., Andrew E. and Townsend W. (1998) Hand book for family planning operations research designs (2nd edition). Population council: USA.

Fraser D.M. and Cooper M.A. (2003). Meeting health care needs of women experiencing complications of miscarriage and unsafe abortion: USAID'S post abortion care program. *J Midwifery Womens Health* **52**: 368-375

Gracia C., Sammel M., Chittams J., Hummel A., Shaunik A. and Barnhart K. (2005). Risk factors for spontaneous abortion in early symptomatic first-trimester pregnancies. *Obstet Gynecol* **106**: 993–999.

Hailemichael G.,Maria F.G.,Antony M. and Brooke R.J. (2005). The magnitude of abortion complications in Kenya. *Br J Obstet Gynecol* **112**: 1229-1235

Hutchon D. (1998). Understanding miscarriage or insensitive abortion: time for more defined terminology. *Am J Obstet Gynecol* **179**: 397–398.

Ipas (2004). A National assessment of the magnitude and complications of unsafe abortion in Kenya.

Jaenette F., Wither., John D., Anne L., Kristen F., Marilyn S. and Jorgen H. (2008). Spontaneous abortion in a Danish population based cohort of childhood cancer survivors. *J Clin Oncol* **26**: 4340-4346.

Joy E., Michael G., Toni M., Craig E. and Cynthia S. (2010). Global report on preterm birth and stillbirth: definitions, description of the burden and opportunities to improve data. *BMC Pregnancy Childbirth* **10**:1471-2393

Kalanda B., Verhoeff H., Chimsuku L., Harper. and Brabin J. (2005), Adverse birth outcomes in a malarious area. *Epidemiol Infect* **134**: 659-666

Kenya Bureau of Statistics (2009). Kenya census

Lisa B. and Nawal M. (2009). Unsafe Abortion: Unnecessary Maternal Mortality. *Obstet Gynecol* **2**: 122-126

Lubna A., Ansary A., Gbolaha O. and Zainab A. B. (1995). Risk factors for spontaneous abortion among Saudi women. *J Comm Health* **20**: 491-500

Lynn F., Irene D. and Laurie A. (1996). A woman's doctor's guide to miscarriage. *Obstet Gynecol* **8**:403

Maconochie N., Doyle P., Prior S. and Simmons R. (2006). Risk factors for first trimester miscarriage-results from a UK- population-based case control study. *Br J Obstet Gynecol* **114**: 170-186.

Montvale N. (1994). What to do when miscarriage strikes". The PDR family guide to women's health and prescription drugs. *Am J Obstet Gynecol* **179**: 397-398.

O'Hare T. and Creed F. (1995). Life events and miscarriage. *Br J Psychiat* **167**: 799-805

Petrozza J. and Inna B. (2006). "Recurrent early Pregnancy Loss" *Obstet Gynecol* **13**: 965-980

Regan L. and Rai R.(2000). Epidemiology and the medical causes of miscarriage. *Clin Obstet Gynecol* **14**:839-854.

Robert S., Justin L. and Barbara P. (2009). Women's health Issues: home health handbook. Published by Merck research laboratories **2nd ed:** 1489.

Rodeck C. and Martin W. (1999). Fetal Medicine: Basic Science and Clinical Practice (Elsevier Health Sciences) Churchill Livingstone publishers **38th ed**: 835

Roland K., Tarik K., Elmar S., Ellen H., Gernard I. and Wafaie W. (2009) Predictors of still birth among HIV- infected Tanzanian women. *Obstet Gynecol* **88**: 584-592.

Rosenthal M. (1999). "The Second Trimester". The Gynecological Sourcebook to clinical pregnancy: a population-based prospective study. *Fertil Steril* **79**:577.

Thika District Strategic Plan for Implementation of the National Population Policy for Sustainable Development (2005-2010). Population, development and reproductive health. National Coordinator Agency for Population and Development publishers. Pages 9-16.

Topping J. and Farquharson R.G. (2007). Spontaneous miscarriage. In: Dewhurst's Textbook of Obstetrics and Gynaecology. Oxford, UK: Blackwell Publishing **7th ed**: 94-99.

Van P. (2008).Levels and trends in the incidence of unsafe abortions and related mortality. Women Deliver conference. *Br J Gen Pract* **58**: 370-373.

Venners S., Wang X., Chen C., Wang L., Chen D., Guang W., Huang A., Ryan L., O'Connor J., Lasley B., Overstreet J. and Wilcox A. (2004). "Paternal smoking and pregnancy loss: a prospective study using a biomarker of pregnancy. *Am J Epidemiol* **159**: 993–1001.

Vitzthum V.J., Spielvogel H. and Thornburg J. (2006). A prospective study of early pregnancy loss in humans. *Fertil Steril* **86**:373-379.

Wang X., Chen C. and Wang L. (2003). Conception, early pregnancy loss, and time to clinical pregnancy: a population based prospective study. *Fertil Steril* **79**: 577.

WHO (2003). 'Vaginal bleeding in early pregnancy and childbirth': a guide for midwives and doctors. http:// www.who.int/making_pregnancy_safer/documents/en/

WHO (2005). Maternal Mortality in 2005: Estimates Developed by WHO, UNICEF, UNFPA and the World Bank. www.who.int/reproductivehealth/publications/maternal_mortality_2005/ mme_2005.

Wilcox A., Baird D. and Weinberg C. (1999). Time of implantation of the conceptus and loss of pregnancy. *N Engl J Med* **340**: 1796–1799.

APPENDICES

Appendix I: CONSENT TO PARTICIPATE IN RESEARCH

How are you, my name is Emmah Mwangi from Jomo Kenyatta University of Agriculture and Technology; I am conducting a study on; socio-demographic and life style factors associated with spontaneous abortion among women attending Thika District level V hospital, Kenya.

PURPOSE OF THE STUDY

The main purpose of the study is: To determine the socio-demographic and lifestyle factors that are associated with spontaneous abortion among women attending Thika District level V hospital, Kenya, in order to identify gaps that may require further research.

PROCEDURE

If you volunteer to participate in this study, I will ask you to fill the following questionnaire and participate in a discussion where necessary.

POTENTIAL RISKS AND DISCOMFORTS

There are no known harms associated with your participation in this research. There will be no monetary benefits associated with your participation in this study except gathering baseline information on factors that may be associated with spontaneous abortion.

Although some of the questions may appear uncomfortable for you, it is necessary for you to answer them with honesty so that we may come up with accurate information that may warrant further investigations on this distressing outcome.

ANTICIPATED BENEFITS TO SUBJECTS

There are no direct benefits to you for participating in this study. A probable benefit of participating in this study is that you will be a part of the people that will contribute important information on spontaneous abortion which is a subject that has rarely been addressed in Kenya and this may provide a basis for further investigations on this distressing outcome.

ALTERNATIVES TO PARTICIPATION

You are free to participate or not.

PRIVACY AND CONFIDENTIALITY

No reports will identify you individually in anyway. Study numbers rather than names will be used to label all study materials and interviews. A list linking your names and study numbers will be maintained by the research staff and stored in a locked place where other people cannot access it. No information about you or provided by you during the research will be disclosed to others without your permission, except: if necessary to protect your rights or welfare, or if required by law. When the results of the research are published or discussed in conferences, no information will be included that would reveal your identity and any stored data will be destroyed immediately after analysis.

CONSEQUENCES OF WITHDRAWAL

I understand that I may at any time during the study revoke my consent and withdraw from the study without any loss or penalty. My refusal to participate in the study will involve no penalty or loss of benefits to which I am otherwise entitled.

IDENTIFICATION OF INVESTIGATORS

If you have any questions about the research, please feel free to contact the principal investigator. If I have ay further questions I may contact Miss Emmah Nyambura Mwangi; Mobile: 0724165189; Email: emmahmwas@yahoo.com.au

RIGHTS OF RESEARCH SUBJECTS

You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you feel you have been treated unfairly, or you have questions regarding your rights as a research subject, you may contact the chairman of the Ethical Review Committee on the Use of Human Subjects, KEMRI using the address below;

Chairman/ Secretary NERC

Box 54840-00200 Nairobi

Tel 254 (020) 2722541, 2713349

Mobile; 0722-205901, 073334003

Email: director@kemri.org; info@kemri.org

I have read and understood what this study entails, the risks and the benefits of participating in this study have been explained to me and I agree to voluntarily participate. I also understand that I may at any time during the study revoke my consent and withdraw from the study without any loss or penalty.

Signature of the interviewee	Name	Date
Signature of the interviewer	Name	Date

SWAHILI TRANSLATION OF THE CONSENT FORM

KIAMBATISHO I: IDHINI YA KUHUSIKA KATIKA UTAFITI

Habari yako, jina langu ni Emmah Mwangi kutoka Chuo kikuu cha Jomo Kenyatta cha kilimo na teknologia; ninafanya utafiti kuhusu sababu za kijamii na maisha zinazohusiana na uaviagi wa mimba yenyewe kati ya wanawake wanaohudhuria hospitali ya wilaya ya Thika.

SABABU YA UTAFITI

Sababu ya kufanya utafiti huu ni kutambua sababu za kijamii na maisha zinazohusiana na uaviagi wa mimba yenyewe ili kubaini mapungufu yatakayohitaji utafiti zaidi.

UTARATIBU

Ukijitolea kuhusika katika utafiti huu, nitakuuliza ujibu maswali haya na pia uhusike na majadiliano ambapo yatatakikana.

UWEZEKANO WA HATARI NA UPUNGUFU

Hakuna hatari zijulikanazo zinazohusishwa na kuhusika kwako katika utafiti huu. Hakuna faida zozote za kifedha utakazopata ila tu kukusanya ujumbe kuhusu sababu ambazo zinaweza kuhusishwa na uaviaji mimba yenyewe. Ingawa maswali mengine yanaweza kuonekana kukutia wasiwasi, ni muhimu uyajibu kwa uaminifu ili tuweze kukusanya taarifa sahihi inayoweza kubalisha uchunguzi zaidi juu ya matokeo haya ya usumbufu.

MAFANIKIO YA KUTARAJIWA NA WAHUSIKA

Hakuna faida ya moja kwa moja kwa ajili ya kushiriki katika utafiti huu. Faida inayowezekana ya kushiriki katika utafiti huu ni kuwa utakuwa sehemu ya watu watakaochangia taarifa muhimu juu ya uaviaji wa mimba yenyewe ambalo ni somo limeshugulikiwa mara chache katika Kenya na hii inaweza kutoa msingi kwa ajili ya uchunguzi zaidi juu ya matokeo haya ya usumbufu.

NJIA MBADALA ZA KUSHIRIKI

Uko huru kushiriki au kutoshiriki.

FARAGHA NA KUWEKA SIRI

Hakuna taarifa zitakazokutambua wewe binafsi katika njia yeyote. Idadi za utafiti badala ya majina zitatumika kutambua vifaa vyote vya utafiti na mahojiano. Orodha ya kuunganisha majina yako na idadi za utafiti itahifadhiwa na wafanyakazi wa utafiti na kuhifadhiwa mahali ambapo pamefungwa ambapo watu wengine hawawezi kuipata.Hakuna habari kukuhusu wewe au zitakazotolewa na wewe wakati wa utafiti zitakuwa wazi kwa watu wengine bila ruhusa yako, isipokuwa: kama muhimu kulinda haki yako au ustawi, au kama itatakikana na sheria. Wakati matokeo ya utafiti yatakapochapishwa au kujadiliwa katika mkutano, hakuna taarifa itakayowekwa ambayo itaonyesha utambulisho wako na taarifa yoyote itakayokuwa imehifadhiwa itaharibiwa mara moja baada ya uchambuzi.

MATOKEO YA KUJIONDOA

Ninaelewa kwamba ninaweza wakati wowote wakati wa utafiti rekebisha idhini yangu na kujiondoa kutoka kwa utafiti bila ya kupoteza kitu chochote au kupewa adhabu. Kukataa kwangu kushiriki katika utafiti hakutahusisha adhabu au hasara ya faida ambayo ninahaki ya kuipokea.

UTAMBULISHO WA WAKAGUZI

Kama una maswali kuhusu utafiti, tafadhali jisikie huru kuwasiliana na mchunguzi mkuu. Kama mimi nina maswali zaidi ninaweza kuwasiliana na Emmah Nyambura Mwangi, Simu: 0724165189,

Barua pepe: emmahmwas@yahoo.com.au

HAKI ZA ATAKAYEHUSIKA KATIKA UTAFITI

Wewe huondoi madai yoyote ya kisheria, haki au suluhisho kwa sababu ya ushiriki wako katika utafiti huu. Ikiwa unahisi kuwa umechukuliwa kwa njia isivyo haki, au una maswali kuhusu haki yako kama ambaye aliyehusika katika utafiti, unaweza wasiliana na mwenyekiti wa kamati ya maadili ya marekebisho ya matumizi ya binadamu, KEMRI kutumia anwani ifwatayo;

Mwenyekiti/Katibu ERC

Sanduku la Posta 54840-00200 Nairobi

Nambari ya Simu 254 (020) 2722541, 2713349

Simu ya kibinafsi, 0722-205901, 073334003

Barua pepe: director@kemri.org; info@kemri.org

Nimesoma na kuelewe utafiti huu unahusu nini, nimeelezwa kuhusu hatari na faida za kushiriki katika utafiti huu na ninmekubali kwa hiari yangu kushiriki. Ninaelewa kwamba ninaweza wakati wowote wakati wa utafiti rekebisha idhini yangu na kujiondoa kutoka kwa utafiti bila ya kupoteza kitu chochote au kupewa adhabu.

Sahihi ya anayehojiwa	Tarehe	Jina
Sahihi ya anayehojiana	Tarehe	Jina

Appendix II: QUESTIONNAIRE

INTRODUCTION

How are you, my name is Emmah Mwangi from Jomo Kenyatta University of Agriculture and Technology; I am conducting a study on socio-demographic and lifestyle factors associated with spontaneous abortion among women attending Thika District level V hospital, Kenya and would appreciate your assistance and contribution for the success of the study by consenting to participate. There are no known harms associated with your participation in this research and there will be no monetary benefits or reward for your participation in this study except that you will be a part of the people that will contribute important information on spontaneous abortion which is a subject that has rarely been addressed in Kenya and this may provide a basis for further investigations on this distressing outcome. No reports will identify you individually in anyway. Study numbers rather than names will be used to label all study materials and interviews. A list linking your names and study numbers will be maintained by the research staff and stored in a locked place where other people cannot access it.

I. Socio-demographic characteristics of patients

Name (optional) _____ Study number ☐

1. When were you born? ___/___/___

2. What is your marital status?

(i) Married
(ii) Single
(iii) Divorced/separated
(iv) Widowed

3. What is your highest level of education?

(i) Primary
(ii) Secondary
(iii) University/college

4. How many children have you given birth to?

How many are alive?	How many are dead?

5a. Do you have a child that has any disability?

(i) Yes
(ii) No

5b.If yes, please specify……

……

6. What is your current occupation?

(i) Housewife
(ii) Casual worker
(iii) Formal employment

7a. At your occupation, are there any environmental toxins that you think you are exposed to?

(i) Yes
(ii) No

7b. If yes, please explain……

……

8. Is there any relative/ family member who has experienced a spontaneous abortion in the past?

(i) Yes
(ii) No

II. Life style factors associated with spontaneous abortion.

9. Do you engage in any of the following habits during pregnancy and if so how often?

Habit	Yes	No	How often	
Smoking			No. of sticks/day	
Alcohol			(i)Daily (ii)weekly (iii) monthly	
Coffee			(i)Daily (ii)weekly (iii)monthly	
Drugs (e.g. heroin, cocaine)			(i)Daily (ii)weekly (iii)monthly	

10. If you have experienced a spontaneous abortion, did you engage in any of the following habits prior to that spontaneous abortion?

Habit	Yes	No	How often	
Smoking			No. of sticks/day	
Alcohol			(i)Daily (ii)weekly (iii)monthly	
Coffee			(i)Daily (ii)weekly (iii)monthly	
Drugs (e.g. heroin, cocaine)			(i)Daily (ii)weekly (iii)monthly	

11a. Have you ever suffered from domestic violence (being battered e.g. through being slapped, hit, or pushed violently) during pregnancy?

(i) Yes
(ii) No

11b. If yes, please explain……

…….

12a. Have you ever suffered from sexual violence (being forced into sexual intercourse without your will) during pregnancy?

(i) Yes
(ii) No

12b. If yes, please explain…….

……...

13a. Have you ever been emotionally unwell (feeling 'stressed', 'anxious', or 'depressed',) during pregnancy?

(i) Yes
(ii) No

13b. If yes, please explain……

…….

14a. Have you ever suffered from any form of accident (fall, trauma) during pregnancy?

(i) Yes
(ii) No

14b. If yes, please explain the form of accident……

……

15. Have you ever been exposed to X-rays during pregnancy?

(i) Yes
(ii) No

16. Which main foods do you consume during pregnancy?

(i) Vegetables and Fruits
(ii) Meat
(iii) Milk
(iv) Fatty foods
(v) Others (specify)……..

17. What are your reasons of choosing the type of food you consume during pregnancy?

(i) Appetite
(ii) No other foods available
(iii) Other reasons(specify)……

III. Occurrence of spontaneous abortion

18. Do you attend ante-natal clinics as scheduled during pregnancy?
    (i) Yes
    (ii) No

19. Do you know what a spontaneous abortion is?
    (i) Yes
    (ii) No

20. During your visits to the clinic, have you ever been educated about spontaneous abortion as one of the major complications of a pregnancy?
    (i) Yes
    (ii) No

21a. Do you know what causes a spontaneous abortion?
    (i) Yes
    (ii) No
21b. If yes, please explain……

……..

22. Have you ever suffered a spontaneous abortion?
    (i) Yes
    (ii) No

<u>If no, skip to question 29</u>

23. How many spontaneous abortions have you suffered? .....

24a. How old was/were the pregnancy (cies)?
    (i) 1-3 months
    (ii) 3-6 months
    (iii) 6-9 months

24b.Please specify for each if you have suffered more than one spontaneous abortion

……

IV. Health seeking behavior that may have an influence on spontaneous abortion

25. After it happened, did you seek any medical attention?
    (i) Yes
    (ii) No
26a. If yes, were you told about the cause of the spontaneous abortion?
    (i) Yes
    (ii) No
26b. If yes, please specify…….....

27. If no, what in your opinion do you think caused the spontaneous abortion?

……

……

28a. Did you experience any symptoms prior to the spontaneous abortion?

(i) Yes
(ii) No

28b. If yes, could you please specify the symptoms? (List three main ones)

29. What should a woman do when she experiences a spontaneous abortion?

……

……

30. How do you think a woman can prevent a spontaneous abortion? (List three main ones)

31. Have you ever suffered from any of the following diseases or infection during pregnancy, did you seek medical help and if yes were you given medication?

Disease/Infection			Medical help		Medication	
	Yes	No	Yes	No	Yes	No
Diabetes						
Malaria						
HIV/AIDS						
Fibroids						
Urinary tract infections						
Others(specify)						

32a. Have you ever used a contraceptive to prevent pregnancy?

(i) Yes
(ii) No

32b. If yes, which contraceptive method do you use?

(i) Oral contraceptives
(ii) Intra Uterine Device
(iii) Intravenous contraceptives

33. If you have ever experienced a spontaneous abortion, which contraceptive method were you using before it happened?

(i) Oral contraceptives
(ii) Intra Uterine Device
(iii) Intravenous contraceptives

We have come to the end of the interview and we thank you very much for your time and cooperation.

KIAMBATISHO II: MASWALI

UTANGULIZI

Habari yako, jina langu ni Emmah Mwangi kutoka chuo kikuu cha Jomo Kenyatta cha kilimo na teknologia; ninafanya utafiti kuhusu sababu za kijamii na maisha zinazohusiana na uaviagi wa mimba yenyewe kati ya wanawake wanaohudhuria hospitali ya wilaya ya Thika na nitashukuru msaada wako na mchango kwa ajili ya mafanikio ya utafiti kwa kukubali kushiriki. Hakuna hatari zijulikanazo zinazohusishwa na kuhusika kwako katika utafiti huu. Hakuna faida zozote za kifedha utakazopata ila tu kukusanya ujumbe kuhusu sababu ambazo zinaweza kuhusishwa na uaviaji mimba yenyewe. Ingawa maswali mengine yanaweza kuonekana kukutia wasiwasi, ni muhimu uyajibu kwa uaminifu ili tuweze kukusanya taarifa sahihi inayoweza kubalisha uchunguzi zaidi juu ya matokeo haya ya usumbufu. Hakuna taarifa zitakutambua wewe binafsi katika njia yeyote. Idadi za utafiti badala ya majina zitatumika kutambua vifaa vyote vya utafiti na mahojiano. Orodha ya kuunganisha majina yako na idadi za utafiti zitahifadhiwa na wafanyakazi wa utafiti na kuhifadhiwa mahali ambapo watu wengine hawawezi kuipata.

I. Sifa za kijamii na demographia za wagonjwa

Jina (kwa hiari yako) _____ Idadi ya utafiti

1. Ulizaliwa lini? ___ /_____/ _____

2. Hali yako ya ndoa

i) Umeolewa
ii) Hujaolewa
iii) Umetalakiwa/mmetengana
iv Mjane

3. Kiwango chako cha juu cha elimu ni kipi?
i) Msingi
ii) Sekondari
iii) chuo kikuu

4. Umezaa watoto wangapi?

Wangapi wako hai?	Wangapi wamekufa?

5a. Una mtoto yeyote ambae ana ulemavu?
i) Ndio
ii) La
5b. Kama ni ndio tafadhali fafanua _____

6. Kazi unayofanya sasa ni ipi?
i) Mke nyumbani
ii) mfanyakazi wa kawaida
iii) ajira rasmi

7a. Katika kazi yako, kuna sumu ambayo unadhani wewe ni wazi kwayo?

i) Ndio

ii) La

7b. Kama ni ndio tafadhali fafanu _____

8. Je, kuna ndugu / mtu wa familia ambaye amewahi kabiliwa na mimba kuavya yenyewe hapo awali?

i) Ndio

ii) La

II. Sababu za kimaisha zinazohusiana na uaviaji wa mimba yenyewe

9. Je, unajihusisha kwa namna yoyote na tabia zifuatazo wakati wa ujauzito na kama ni hivyo mara ngapi?

Tabia	Ndio	La	Mara ngapi	
Kuvuta sigara			Idadi ya vijiti/siku	
Kunywa pombe			i)Kila siku ii)Kila wiki iii) Kila mwezi	
Kunywa kahawa			i)Kila siku ii)Kila wiki iii) Kila mwezi	
Kutumia madawa ya kulevya			i)Kila siku ii)Kila wiki iii)Kila mwezi	

10. Ikiwa umewahi kabiliwa na mimba kuavya yenyewe,ulijihusisha kwa namna yoyote na tabia zifuatazo kabla ya matokeo hayo?

Tabia	Ndio	La	Mara ngapi	
Kuvuta sigara			Idadi ya vijiti/siku	
Kunywa pombe			i)Kila siku ii)Kila wiki iii) Kila mwezi	
Kunywa kahawa			i)Kila siku ii)Kila wiki iii) Kila mwezi	
Kutumia madawa ya kulevya			i)Kila siku ii)Kila wiki iii)Kila mwezi	

11a. Je, unakabiliwa na unyanyasaji wa kimwili (kupewa adhabu ya mwili kama vile kupigwa kofi,kugongwa au kusukumwa na nia ya kukunyanyasa) wakati wa ujauzito?

i) Ndio
ii) La

11b. Kama ni ndio tafadhali fafanua _____

12a. Umewahi kabiliwa na vurugu za kingono (kulazimishwa kushiriki ngono bila hiari yako) wakati wa ujauzito?

i) Ndio
ii) La

12b. Kama ni ndio tafadhali fafanua _____

13a. Umewahi kabiliwa na shida za kihisia (‘kuhisi ‘stress’, ‘kudunda moyo’, au ‘kuvunjika moyo’) wakati wa ujauzito?

i) Ndio
ii) La

13b. Kama ni ndio tafadhali fafanua _____

14a. Umewahi kabiliwa na aina yoyote ya ajali (kuanguka, kiwewe) wakati wa ujauzito?

i) Ndio
ii) La

14b. Kama ni ndio tafadhali fafanua _____

15. Ulikuwa wazi kwa mionzi wakati wa ujauzito?

i) Ndio
ii) La

16. Ni vyakula vipi vikuu unavyokula wakati wa ujauzito?

i) Mboga na Matunda
ii) Nyama
iii) Maziwa
iv) vyakula vya mafuta
v) Vingine (fafanua) _____

17. Sababu zako za kuchagua aina ya chakula wewe hula wakati wa ujauzito ni zipi?

i) Hamu
ii) Hakuna vyakula vingine vinapatikana
iii) Sababu nyingine (fafanua) _____

III. Tukio la uaviaji wa mimba yenyewe

18. Unahudhuria kliniki za kuzalisha kama ilivyopangwa wakati wa ujauzito?

i) Ndio
ii) La

19. Unajua uaviaji wa mimba yenyewe ni nini?

i) Ndio
ii) La

20. Wakati wa ziara yako ya kliniki, umewahi elimishwa kuhusu uaviaji wa mimba yenyewe kama moja ya matatizo makubwa wakati wa ujauzito?

i) Ndio
ii) La

21. Unajua nini husababisha mimba kuavya yenyewe?

i) Ndio
ii) La

21b. Kama ni ndio tafadhali fafanua _____

_____

22. Je, umewahi kabiliwa na mimba kuavya yenyewe?

i) Ndio
ii) La

Kama ni hapana, ruka mpaka swali 29

23a. Mimba hiyo likuwa ya miezi ngapi?

i) miezi 1-3
ii) miezi 3-6
iii) miezi 6-9

23b. Tafadhali fafanua kwa kila moja kama umeavya mimba zaidi ya moja

_____

24. Ni mimba ngapi zako zimeavya zenyewe?

_____

Tabia za kiafya zinazoweza kuwa na uhusiano na mimba kuavya yenyewe

25. Baada ya kutokea, je, ulitafuta matibabu yoyote?

i) Ndio
ii) La

26a. Kama ndio, uliambiwa kuhusu sababu ya mimba hiyo kuavya yenyewe?

i) Ndio
ii) La

26 b. Ikiwa ndio, tafadhali eleza _____

27. Kama ni hapana, je, kwa maoni yako unadhani nini ilisababisha hiyo mimba kuavya yenyewe?

_____

_____

28a. Je, ulikumbwa na dalili zozote kabla ya mimba kuavya yenyewe?

i) Ndio

ii) La

28b.Ikiwa ndio, tafadhali eleza dalili hizo (Orodhesha tatu kuu)

29. Mwanamke anapaswa kufanya nini baada ya mimba kuavya yenyewe?

_____

_____

30. Je, unafikiri mwanamke anaweza kuzuia mimba isiavye yenyewe kivipi? (Orodhesha njia tatu kuu)

31. Je, umewahi kabiliwa na magonjwa au maambukizi yoyote yafuatayo wakati wa ujauzito,ulitafuta matibabu na kama ni ndio ulipewa dawa?

			Matibabu		Madawa	
Ugonjwa/maambukizi	Ndio	La	Ndio	La	Ndio	La
Diabetes						
Malaria						
HIV						
Fibroids						
Urinary tract infections						
Mengine(Fafanua)						

32a. Umewahi tumia njia ya kupanga uzazi?

i) Ndio
ii) La

32b. Kama ni ndio,ni njia ipi ya kupanga uzazi unayotumia?

i) Madawa ya kunywa(njia simulizi)
ii) kifaa cha uterus
iii) Sindano

33. Kama umewahi kabiliwa na mimba kuavya yenyewe,ni njia ipi ya kupanga uzazi ulikuwa ukitumia kabla ya mimba hiyo kuavya?

i) Madawa ya kunywa(njia simulizi)
ii) kifaa cha uterus
ii) Sindano

Tumefika mwisho wa mahojiano na ninakushukuru sana kwa muda wako na ushirikiano.

APPENDIX IV

KENYA MEDICAL RESEARCH INSTITUTE

P.O. Box 54840 - 00200 NAIROBI, Kenya
Tel: (254) (020) 2722541, 2713349, 0722-205901, 0733-400003; Fax: (254) (020) 2720030
E-mail: director@kemri.org info@kemri.org Website:www.kemri.org

ESACIPAC/SSC/ 7066 **16th November, 2010**

Emmah Mwangi

Thro'
Director, CPHR
NAIROBI

Forwarded 19/11/10

REF: SSC No.1889 (Revised) – Socio-demographic and lifestyle factors associated with spontaneous abortion among women attending Thika District hospital, Central Kenya.PI: Emmah Mwangi (CPHR)

I am pleased to inform you that the above-mentioned proposal, in which you are the PI, was discussed by the KEMRI Scientific Steering Committee (SSC), during its **173rd meeting** held on **Tuesday 2nd November, 2010** and has since been approved for implementation by the SSC.

The SSC however, advises that work on this project can only start when ERC approval is received.

Sammy Njenga, PhD
SECRETARY, SSC

KEMRI RECEIVED 19 NOV 2010 CENTRE FOR PUBLIC

APPENDIX V

KENYA MEDICAL RESEARCH INSTITUTE

P.O. Box 54840 - 00200 NAIROBI, Kenya
Tel: (254) (020) 2722541, 2713349, 0722-205901, 0733-400003; Fax: (254) (020) 2720030
E-mail: director@kemri.org info@kemri.org Website:www.kemri.org

KEMRI/RES/7/3/1 **November 30, 2010,**

TO: **EMMAH MWANGI (PRINCIPAL INVESTIGATOR)**
TM-310-0280/09,
ITROMID STUDENT

THRO': **DR. YERI KOMBE,**
THE DIRECTOR, CPHR,
NAIROBI

RE: **SSC PROTOCOL NO. 1889 (*INITIAL SUBMISSION*): SOCIO-DEMOGRAPHIC AND LIFESTYLE FACTORS ASSOCIATED WITH SPONTANEOUS ABORTION AMONG WOMEN ATTENDING THIKA DISTRICT HOSPITAL, CENTRAL KENYA**

Make reference to your letter dated 26th November, 2010 received on 26th November, 2010. Thank you for your response to the issues raised by the Committee. This is to inform you that the issues raised during the 184th meeting of KEMRI/National Ethical Review Committee held on 23rd November, 2010, have been adequately addressed.

Due consideration has been given to ethical issues and the study is hereby granted approval for implementation effective this **30th day of November 2010,** for a period of twelve (12) months.

Please note that authorization to conduct this study will automatically expire on **29th November 2011.** If you plan to continue with data collection or analysis beyond this date, please submit an application for continuing approval to the ERC Secretariat by **15th October 2011.**

You are required to submit any amendments to this protocol and other information pertinent to human participation in this study to the ERC prior to initiation. You may embark on the study.

Yours sincerely,

R. C. KITHINJI,
FOR: SECRETARY,
KEMRI/NATIONAL ETHICS REVIEW COMMITTEE

In Search of Better Health