DETERMINANTS OF INFERTILITY AMONG MARRIED WOMEN ATTENDING INFERTILITY CLINICS, AT TWO TEACHING HOSPITALS IN ADDIS ABABA, ETHIOPIA

A THESIS SUBMITTED TO ADDIS ABEBA UNIVERSITY COLLAGE OF HEALTH SCIENCE DEPARTMENT OF OBSTETRICS AND GYNECOLOGY FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR SPECIALIZATION IN OBSTETRICS AND GYNECOLOGY

Principal Investigator: Seblewongel Matewos (MD, Resident in Obstetrics and Gynecology, AAU)

Advisors:

Dr. Eskinder Kebede (Associate Professor and Consultant Obstetrician and Gynecologist, Reproductive endocrinology and minimal access surgery subspecialist, AAU)

Dr. Abera Bedada (Assistant Professor and Obstetrician and Gynecologist, AAU)

September 2021

APPROVAL SHEET

ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES, SCHOOL OF MEDICINE, DEPARTMENT OF OBSTETRICS AND GYNECOLOGY, POSTGRADUATE PROGRAM

I, Dr. Seblewongel Matewos , hereby declare that this thesis entitled "**Determinants of infertility among married women attending infertility clinics, at two teaching hospitals in Addis Ababa, Ethiopia**" in line with the requirement of graduate studies was fully undertaken by me under the guidance of my advisors and that I have, to the best of my knowledge and effort, avoided plagiarism or duplication of materials unless and otherwise cited and/or acknowledged and that it has not been so far submitted for any form of publication or consideration before the final approval.

Seblewongel Matewos (MD) _____ _____

Principal investigator Signature Date

We hereby certify that we have read and evaluated this research thesis relating to "**Determinants of infertility among married women attending infertility clinics, at two teaching hospitals in Addis Ababa, Ethiopia"** under our guidance from its inception up to in its current format and that it can be submitted for final approval in partial fulfillment to the Degree of Specialty in Obstetrics and Gynecology..

_____ _____ _____

1. Advisor Signature Date

_____ _____ _____

2. Advisor Signature Date

As a member of the MSC research open defense examination, I certify that I have read and evaluated the thesis prepared by Seblewongel Matewos (MD), and examined the candidate. I recommend that the thesis be accepted as fulfilling the thesis requirements for the Specialty certificate in Obstetrics and Gynecology.

_____ _____ _____

Examiner Signature Date

Acknowledgment

I would like to thank the Department of Obstetrics and Gynecology, Addis Ababa University for giving me the opportunity to undertake this research as part of the requirement for specialization in Gynecology and Obstetrics.

I would like to extend my deepest gratitude to my advisers Dr.Eskinder Kebede and Dr. Abera Bedada for their meticulous advice, valuable comments encouragement in all stages of this thesis.

My gratitude also goes to data collectors and all study participants who took part in this study and showed a great effort in acquiring appropriate information.

Finally, I would like to forward my gratitude to my husband for his support throughout the process.

Contents

List of tables

List of figures

Acronyms

ANC	Antenatal Care
AOR	Adjusted Odds Ratio
BMI	Body Mass Index
CI	Confidence Interval
COC	Combined Oral Contraceptive
COD	Crude Odds Ratio
EDHS	Ethiopian Demographic Health Survey
GMH	Ghandi Memorial Hospital
HIV	Human Immuno-Deficiency Virus
IUCD	Intra-Uterine Contraceptive Device
OR	Odds Ratio
PCOS	Polycystic Ovarian Syndrome
PI	Principal Investigator
PID	Pelvic Inflammatory Disease
STDs	Sexually Transmitted Diseases
STI	Sexually Transmitted Infection
TASH	Tikur Anbesa Specialized Hospital
TB	Tuberclosis
WHO	World Health Organization

Abstract

Background: Infertility is a global public health issue affecting approximately 8 to 12% of couples worldwide, with 9% of the global average. In Ethiopia, according to the DHS data, the prevalence of primary and secondary infertility in 2005 was 3.3% 4.6% respectively. The prevalence differs by place of residence, marital status, age of respondent, age at first marriage, and number of unions. The causes of infertility are various, including socio-economic factors, lifestyle, reproductive history, and childbearing status. In developing societies, childlessness is often highly stigmatized and leads to profound social suffering for infertile women; however, most infertile people in the developing world have virtually no access to effective treatment.

Objective: To identify the determinants of infertility among married women attending an infertility clinic at two teaching hospitals in Addis Ababa, Ethiopia

Methods: An institution-based unmatched case-control study was conducted at two teaching hospitals, gynecology and obstetrics infertility clinics in Addis Ababa. A total of 234 women was included in the study. Study participants was selected using a systematic random sampling technique for both cases and controls. Data was collected using a pre-tested interviewer-administered structured questionnaire by trained data collectors. The data was checked for completeness, cleaned, entered, and analyzed using SPSS version 24.0.

Results: Approximately 52.6% (41 females) of the samples had secondary infertility, while 47.4% had primary infertility (37 females). After logistic regression was made, the determinants of infertility identified were age of women (AOR=4.914; 95%CI: 2.3.60, 10.230), menstrual regularity (AOR= 2.859; 95%CI: 1.338, 6.109), history of TB infection (AOR = 8.518; 95%CI: 1.554, 46.702) and frequency of sexual intercourse (AOR= 5.304; 95%CI: (2.046, 13.749)

Conclusion and recommendations: Secondary infertility accounts for 52.6% of the infertile women, while primary infertility accounts for 47.4% of them. Age of women, menstrual regularity, History of TB infection and frequency of sexual intercourse were found to be determinants of female infertility.

1. Introduction

1.1Background

Childbearing and raising of children are crucial events in every human's life and are strongly linked with the fundamental goals of completeness, joy, and family integration(1). Infertility is a global problem that affects the social, economic, and psychological wellbeing of couples. The definition of infertility varies across professions as different experts employ definitions that are convenient for their purpose. According to the WHO, the clinical definition of infertility is "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse (2). Primary infertility is the inability to bear any children. Secondary infertility is the inability to become pregnant after previously conceiving, whether or not the first pregnancy came to full term(3).

Infertility is a global public health issue affecting approximately 8 to 12% of couples worldwide, with 9% of the global average(4,5). In couples experiencing infertility, 20-30% of cases are due to male factors, 20-35% is due to female factors, and 25-40% are due to combined problems in both parts. In 10 – 20% cases, no cause is found(6). The rates even go up to 186 million people around the world(7). In some regions of the world, the rates of infertility are much higher, reaching up to 30% of populations(5,8),especially in regions with high infertility prevalence, including South Asia, sub-Saharan Africa, the Middle East and North Africa, Central and Eastern Europe, and Central Asia(9). In addition to the higher prevalence of overall infertility in developing countries, there are significant differences in the primary and secondary infertility rates. Secondary infertility is much more common in resource-poor countries, especially in Africa and Latin America, and among middle and high-income couples(10).

In Ethiopia, according to the DHS data, the prevalence of primary and secondary infertility in 2005 was 3.3% 4.6% respectively. The prevalence differs by place of residence, marital status, age of respondent, age at first marriage, and number of unions. Infertility is higher in urban areas and among women married more than once (11).

1.2 Statement of the Problem

Infertility affects an estimated 48 million women worldwide, with the highest prevalence in South Asia, Sub-Saharan Africa, North Africa/Middle East, and Central/Eastern Europe and Central Asia(9).

Most developed countries have declining fertility rates marked by late marriage, postponed childbearing and primary infertility. But in developing countries the situation is quite different. The high prevalence of sexually transmitted infections, postpartum infections, post-abortion infection, previous contraceptive complications, tubal damage, polycystic ovary syndrome (PCOS), and pelvic inflammatory diseases (PIDs) increased the rates of secondary infertility(12).

The causes of infertility are various, including socio-economic factors, lifestyle, reproductive history, and childbearing status. All these factors can contribute to the development of infertility through different pathways(13).The risk factors for infertility include smoking, obesity, alcohol consumption, advanced maternal age, sexually transmitted infection, and many others(1,13,14).

In developing societies, childlessness is often highly stigmatized and leads to profound social suffering for infertile women ; however most infertile people in the developing world have no access to effective treatment(8). In Ethiopia, infertility affects the life of infertile women with various emotional and social effects(15).

1.3 Significance of the study

Infertility is a neglected health problem in many developing nations, including Ethiopia. The concern of these countries is more on ways of controlling fertility and related social, economic, and political burdens.

In Ethiopia, even if the problem exists, very little has been explored regarding women infertility and its determinant factors. Rigorous research is required on these issues and its implications for clinical and programmatic needs. This study explored the determinant factors of infertility among women attending infertility clinics at two teaching hospitals in Addis Ababa, which helps practitioners to be in a better position to understand the situation to prevent infertility and assist women. It will also serve as an important tool for possible interventions aimed at prevention and management of infertility in the country.

1.4 Literature Review

1.4.1 Socio-demographic factors

A cross-sectional study was done in a private infertility care in Dhaka showed that a strong association exists between sub fertility and increasing female age (16). When compared with women younger than 20, the odds of sub fertility were six times as high for women aged 20–34, and 13.6 times as higher for women 35 or older(17).

A large prospective cohort study among rural Chinese women was done in 2017. It showed that a later age at menarche of >15 years was associated with an increased risk of infertility(18). This was also described in a case-control study done in Dessie, which showed that the odds of infertility among women whose age at menarche was greater than or equal to 14 years was 3.2 times higher than that among women whose age at menarche was less than 14 years(19). In contrast, in a study done in New York City, women who experienced menarche at a younger age (defined as <13) were more likely to suffer from abnormally age-specific diminished functional ovarian reserve(20). Abeer Miri Abdullah and Shukriyia Shadhan stated in their study the relationship between age at menarche and female infertility is insignificant(21).

In a community-based cross-sectional study done in India, demographic factors like higher educational level, employment, and high socioeconomic condition were significantly associated with primary infertility(22). In contrast to this, a descriptive study done in Egypt low level of education was significantly associated with secondary infertility, where cases of low level of education level had a double risk for secondary infertility compared to cases with a high level of education(23).

According to a study done in Iran, the odds of infertility increased by 0.98 for each one-year increase in the individuals' age (95% CI =1.3-3.12%)(24). This significant relationship between age at marriage and infertility has also been described in different studies (25).

The role of genetics in infertility has always been of interest, although much information about its role in secondary infertility is not known. In a study carried out in Alexandria, infertility was associated with a family history of infertility among mothers and sisters (26). In consonance with this study, Madonna et al. described that respondents with a family history of secondary infertility were 4.5 times more likely to have secondary infertility. (OR = 4.500, P = 0.0005)(27).

1.4.2 Factors associated with reproductive history

According to the findings of different studies, reproductive system disorders are found to be factors affecting infertility. The case-control study done in Dessie: showed odds of infertility among women whose menstruation flow was greater than three days were 4.2 times higher than those among women whose menstruation flow was less than or equal to three days (19). This is in line with a case-control study done in India (25).

A cross-sectional, descriptive study conducted in Egypt found a significant association between Infertility and irregular menstruation (28). This positive correlation between infertility and menstrual irregularity was also described in a study done in Upper Egypt (29). On the other hand, a Study done in China showed no association between infertility and menstrual irregularity (30). The relationship was described as insignificant in studies done in Southwest Nigeria(31) and India (25).

According to a study done in Dessie, the odds of infertility among women whose age at the first pregnancy was less than 21 years were 2.9 times higher than those among women whose age at first pregnancy was greater than or equal to 21 years(19). Similarly, in the study done in Rwanda, women in secondary infertile relationships were more likely to have had their first pregnancy before the age of 21 years (AOR = 2.56) (32).

Some studies have shown that women delivered by cesarean section were less likely to have a subsequent pregnancy compared with those who had instrumental or assisted vaginal delivery and spontaneous vaginal delivery (33,34). A study done in Nigeria also found that previous cesarean section was a risk factor for secondary infertility (27). In contrast to this, Collin et al. showed no association between mode of delivery and secondary infertility in sub-Saharan Africa. In addition, the fertile group had cesarean section more than the infertile group (35).

A study conducted by the World Health Organization in 33 different countries showed that in Africa, over 85% of women had an infertility diagnosis attributable to an infection compared with 33% of women worldwide (5). In a study done in India, there was a significant association between STI as a risk factor for primary and secondary infertility, irrespective of the type of STI (25). Blumer et al. reported in their study that women with episodes of genital infection had a 10 fold risk of subsequent tubal infertility irrespective of the type of microorganisms causing the infection

(36). Employing a syndromic approach, a study done in Nigeria found a statistically significant relationship between positive history of STIs and secondary infertility (OR = 3.333). This showed that women with a history of STI were more than three times more likely to have secondary infertility (31).

1.4.3 Lifestyle and Behavioral Risk Factors

The American Society for Reproductive Medicine reports that 12% of infertility cases are the result of women weighing either too much or too little (37). Esmaeilzadeh et al. found in their study that infertile women had a 4.8-fold increased risk of obesity and almost a 3.8-fold increased risk of being overweight compared to fertile women (38). A cross-sectional study in China showed that both underweight and obesity are risk factors for infertility. In that study, the incidence of primary and secondary infertility was higher in women with a BMI of less than 18.5 kg/m^2 (39). In contrast, there was a study in Finland, in that body mass index was similar between women with and without experienced infertility (40). The insignificant relationship between BMI and infertility was also shown in the study done Iraq (21).

Some studies have shown that infertility is directly related to current smoking and alcohol consumption. In the Nigerian study, women who used alcohol were 14 times more likely to have secondary infertility (OR = 14.00, P = 0.0019) (27). Amirkhani et al.; study in Tehran found that exposure to passive smoking increased the risk of infertility. In this study, the odds of female infertility factor in alcoholic women were 0.78 higher compared to those who did not mention the history of alcohol consumption (41). This is in line with a study done in Egypt (42). But Romero et al, in Spain found active smoking and passive smoking to be insignificant as a risk factor for infertility (43). Another study done in Zambia, tried to correlate partners consumption of alcohol with infertility and found that women whose partners consumed alcohol had a more than two times the risk of being infertile. In that study, the woman's consumption of alcohol had no effect on her infertility status (44).

According to a study done in Dessie women who had multiple sexual partners had 5.3 times more chance of infertility than those who did not have multiple sexual partners (19). A study done in Rwanda suggested that secondary infertile women represent a distinct group of infertile women

characterized by a risky sexual behavior profile, often starting in adolescence, which predisposes them to a first pregnancy, HIV infection, other STIs, and subsequent infertility (45).

1.4.4 Factors associated with medical and surgical history

According to a study in India, there was a significant association between history of previous surgical operations such as abdominal exploration and appendectomy and the occurrence of infertility (25). A study which was done in Egypt Also, found a significant association between infertility and a history of appendectomy ($P < 0.001$) (28). In a case control study done in Spain, there was a statistically significant association between pelvic surgery and infertility (43). However, a more recent study reported that although previous appendectomy was associated with intra-abdominal adhesions, and these were in turn associated with tubal pathology, appendectomy was not directly associated with compromised tubal patency, but previous appendectomy may indirectly affect female fertility through mechanisms other than direct tubal obstruction (46).

Thomas Egbe et al. in their study found that diabetes mellitus has a 10.5-fold association with tubal infertility(47) . Besides, One study reported that a history of infertility, particularly that related to ovulation disorders and tubal blockage, is significantly associated with a higher risk of type-2 diabetes mellitus (48). In a study done in India, Infectious causes such as pelvic inflammatory disease and tuberculosis were significantly associated with tubal factor infertility.

2. Objectives

General objective

To assess the determinants of infertility among married women attending infertility clinics at two teaching hospitals in Addis Ababa, Ethiopia

Specific objectives

- To identify Sociodemographic, reproductive, medical and surgical factors associated with infertility
- To determine the proportions of primary and secondary infertility

3. Methods

3.1 Study Setting

The study was conducted in Addis Ababa, the largest and the capital city of Ethiopia. As of 2018, the city had estimated 7.178 million inhabitants with male to female ratio of 0.91. Regarding medical services, the city currently has more than 41 hospitals, 28 health centers, 35 health posts, and more than 500 clinics. There are more than 12 public and more than 25 private hospitals in the city(49). Of the total 12 public hospitals, 2 of them selected by convenience and included in the study. The names of hospitals are Tikur Anbesa Specialized Hospital (TAH) and Gandhi Memorial Hospital (GMH). The first hospital is managed by Addis Ababa University, while the other is managed by the Addis Ababa Health Bureau. Both of the selected hospitals have infertility clinics.

3.2 Study design

An institution-based unmatched case-control study was conducted at two teaching hospitals gynecology and obstetrics infertility clinic in Addis Ababa town from February 20 to April 30, 2021.

3.3 Source and Study Population

All infertile married women aged 15 to 49 years and all married women aged 15 to 49 years who conceived within one year of cohabitation and following at infertility and family planning clinics respectively in two teaching hospitals were source populations. The sample of infertile married women aged 15 to 49 years and a sample of married women aged 15 to 49 years who have conceived within one year of cohabitation and following at family planning clinics in two teaching hospitals present at the time of data collection were the study populations.

3.4 Eligibility Criteria

Inclusion criteria

Women who fail to achieve a clinical pregnancy for 12 months or more with regular unprotected sexual intercourse (cases) and married women aged 15 to 49 years who conceived within one year of cohabitation and following at family planning clinics (controls) at two teaching hospitals were included.

Exclusion criteria

Women who conceived after infertility treatment, women for whom infertility work up started earlier (before 12 months), women whose male partners are infertile, and couples who were using contraceptives were excluded.

3.5 Sample size

The required sample size is computed using open Epi Info version 7.2.1 by considering the assumption that the ratio of cases to controls is 1: 2, the power is 90, the confidence level is 95%, the odds ratio (OR) is 2.89, the proportion of exposed cases (P1) is 40, and the proportion of exposed controls (P2) is 18.6 (by taking having multiple sexual partners associated with female infertility from a recent study conducted in Dessie (19) .

$$\text{Sample size} = \frac{r+1}{r}\frac{(p^*)(1-p^*)(Z_\beta + Z_{\alpha/2})^2}{(p_1 - p_2)^2}$$

Where:

α: The probability of type I error (significance level) is the probability of rejecting the true null hypothesis

β: The probability of type II error (1 - power of the test) is the probability of failing to reject the false null hypothesis which is the power of study, taken as 90 % in this study it's Z_β=Value is 1.28

P*: Average proportion exposed $\frac{18.6\% + 40\%}{2}$

P_1: The proportion for cases: 40 %

P_2: The proportion for controls: 18.6 %

OR: The calculated odds ratio: 2.86

r: The ratio of case-control (1 case/r controls): value for ‘r’ is 2 in this study

Sample size (cases) $$\frac{2+1(0.293)\,(1-0.293)\,(1.28+1.96)^2}{2(0.4-0.186)^2}$$

$$\frac{3\,(0.293)\,(0.707)\,(3.244)^2}{2\,(0.4-0.186)^2}$$

The result is 71.08 rounded to 71. Since the control to case ratio is 2, the number of controls and total number of samples were 142 and 213 respectively. Taking the non-response rate of 10%, the final sample size was 234, and since the ratio of cases to controls is 1:2, 78 samples were cases and 156 were taken as controls.

3.6 Sampling technique

All infertile women who are following at the infertility clinics at two teaching hospital, fulfilled the inclusion criteria and who were willing to participate in the study during the study period were included as cases and all women who conceived within 1 year of cohabitation and came for family planning service and who were willing to participate during the study period were included as controls.

3.7 Operational Definitions

Cases: are Married/cohabited women aged between 15 and 49 years who failed to achieve a clinical pregnancy after 12 months or more with regular unprotected sexual intercourse.

Controls: are Married women aged between 15 and 49 years who delivered in the past one year and attending family planning clinics in the two teaching hospitals

Secondary infertility: defined as the failure to conceive after 1 year of regular intercourse without contraceptive in a woman who had conceived in the past irrespective of the outcome

History of contraceptive use is the use of contraceptive method (COC, IUD, implants, and injectable) before 2 years.

Substance use: is an intentional ingestion of one or more psychostimulant drugs (alcohol, khat, and cigarette smoking). Individuals who used any of the substances at least once in their lifetime were classified as ever users, and those who consumed at least once within the last 30 days were classified as current users.

Regular menstrual cycle: Cyclic menstruation persists throughout the reproductive era of life with an average rhythm of 28 plus or minus 7 days, inclusive of 4–6 days of bleeding.

Having multiple sexual partners: Engaging in sexual activities with two or more people in one's life time

Normal male sperm analysis: is when all parameters are in normal range (the volume > 1:5ml, sperm concentration > 15 million sperm/ml, shape > 4%, and motility > 32% with forward progression (50)

STI: A syndromic approach will be used to define STI. Women who reported history of lower abdominal pain, vaginal discharge, ulceration, and painful urination (or whose medical records indicated any of the above) will be considered as having a history of STIs

3.8 Data collection procedures

Tools of data collection: The data was collected using a pre-tested interviewer administered structured questionnaire. The questionnaire was prepared in English and translated to Amharic language and then translated back to English by different people and used in the data collection. The questionnaire was developed according to the objectives of the study.

Methods of data collection: Four midwifes were trained and collected data with regular supervision by the principal investigator. Medical and laboratory results were checked from the participant's medical chart. The women were asked during their visit to health facilities for health services. Body mass index (BMI) was calculated for each participant.

3.9 Data quality assurance

The questionnaire was pretested on 5% of the participants having similar socio-cultural characteristics. Collected data were re-checked for completeness and necessary measures was taken to standardize and ensure its validity.

3.10 Variables of the study

Dependent variable

- Infertility

Independent variables

- **Socio-demographic and cultural factors: age**, marital status, religion, occupation, and education
- Age at menarche
- Duration of Menstrual cycle
- Regularity of menstrual cycle
- Menstruation flow in days
- Previous use of contraceptives
- Family history of infertility
- BMI (kg/m^2)
- Having Multiple sexual partners
- History of STI
- Duration of cohabitation
- Frequency of sexual intercourse
- Previous history of TB infection
- Medical diseases
- Previous surgery…

3.11 Data Management and Analysis Procedure

Data was entered, cleaned, and checked for frequencies, accuracy, consistencies, missed values, and variables using SPSS version 25. Any error identified during data entry was corrected after the revision of the original completed questionnaire. All data obtained from the study population was entered, cleaned, and analyzed by the investigator.

To explain the study population in relation to relevant variables, univariate analysis was done using frequency and percentage. Associations between dependent and independent variables were assessed using bivariate analysis, and their strength is presented using odds ratios and 95% confidence intervals. Multiple logistic regressions used to determine the relative importance of a set of predictive variables, while controlling for potential confounding variables.

3.12 Ethical Consideration

Ethical clearance for this research was obtained from the Research and Publications Committee of Addis Ababa University. A letter of permission and support was also obtained from Addis Ababa University, Tikur Anbesa Specialized Hospital and Gandhi Memorial Hospital.

During data collection, the study participants were informed about the purpose of the study and the importance of their participation in the study. Before starting the interview, verbal consent was obtained from individual participants after they understand the consent form. Generally, the study participants were informed that participation is voluntary; they were also informed that they can skip question(s) if they do not want to answer fully or partly and possibility of quitting the process at any time. Confidentiality of the information and their privacy was maintained throughout the data collection process and then after.

3.13 Dissemination of Results

After completion of the research the findings of the study will be presented for defense and the final research paper will be submitted to the department of Gynecology and Obstetrics, College of Health Sciences, Addis Ababa University, governmental organizations, and non-governmental organizations interested in the subject matter. Efforts will be exerted to present the findings of this study in different conferences and workshops and will be sent for publication in scientific journals.

4. Result

4.1 Sociodemographic characteristics of participants

A total of 234 participants were included in the study. Cases included 78 females attended infertility clinic, their mean age was 31.03 ± 5.71 years and controls included 156 females attended family planning clinic in the same hospitals as case, their mean age was 26.93 ± 4.78 years. Infertile females were classified into Primary and secondary infertile females. Approximately 52.6% (41 females) of the samples had secondary infertility, while 47.4% had primary infertility (37 females). The mean age of primary and secondary infertile females were 29.24 ± 5.85 and 32.63 ± 5.13 years respectively.

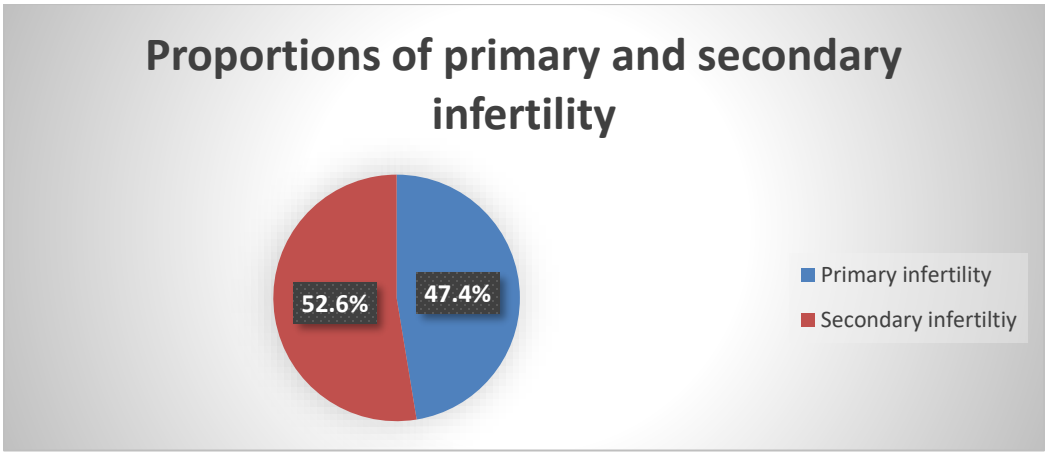

Figure 1: Proportions of primary and secondary infertility at GMH and TASH infertility clinics, Addis Ababa, Ethiopia, 2021

Among cases 48.7 % were above the age of 30 while only 16 % of the controls were above 30 yrs. Old. When categorized by age only 1.3 % of the cases was less than the age of 20 while 7.1 % of the cases were less than 20 yrs. of age. Age 21-34 and age >35 accounted for 65.4 % and 33.3 % of the cases respectively where as these age group accounted for 85.9% and 7.1 % of the controls respectively.

Regarding religion Orthodox Christian, Muslim and protestant religions accounts for 39 (50%), 27 (34.6 %) and 12 (15.4%) of the cases respectively. Whereas these religions accounts for 101 (64.7%), 43 (27.6 %) and 12 (7 .7%) of the controls respectively.

Most of the participants, 41(52.60%) cases, and 89 (57.10%) controls were housewives (home-makers). Only 3.8 % 0f the controls were never married while all cases and the rest of controls were married during the data collection. Eleven (14.1%) of the cases and 7 (4.6%) of the controls their spouse had marital relationship previously.

Table 1: Sociodemographic characteristics of study participants at GMH and TASH, Addis Ababa, Ethiopia, 2021.

Variable	**Category**	**Cases, n (%)**	**Controls, n (%)**
Age	≤30 years	40 (51.3%)	131 (84%)
	>30 years	38 (48.7%)	25 (16%)
Religion	Orthodox Christian	39 (50%)	101 (64.7%
	Muslim	27 (34.6 %)	43 (27.6%)
	Protestant	12 (15.4%)	12 (7.7%)
Occupation	Housewife (Home maker)	41 (52.6%)	89 (57.1%)
	Gov't Employee	16 (20.5%)	22 (14.1%)
	Private Employee	12 (15.4%)	23 (14.7%)
	Merchant	4 (5.1%)	8 (5.1%)
	Daily Laborer	4 (5.1%)	7 (4.5%)
	Other	1 (1.3%)	7 (4.5%)
Level of Education	Illiterate	12 (15.4%)	14 (9%)
	Read and write	15 (19.2%)	10 (6.4%)
	Primary school (1-8)	23 (29.5%)	59 (37.8%)
	Secondary school (9-12)	13 (16.7%)	45 (28.8%)
	Tertiary or College/University	15 (19.2%)	28 (17.9%)
Age at first marriage	<20 Years	17(21.8%)	49 (32.2%)
	≥20 Years	61 (78.2)	103 (67.8%)
Duration of cohabitation	≤ 5 years	37 (47.4%)	90 (59.6%)
	>5 years	41 (52.6%)	61 (40.4%)
Spouse married previously	Yes	11 (14.1%	7 (4.6%)
	No	67 (85.9%)	145 (95.4%)
Family history of infertility	Yes	5 (6.4%)	6 (3.8%)
	No	73 (93.6%)	150 (96.2%)

4.2 Reproductive characteristics of participants

Sixty-four (82.1%) of the cases and 108 (69.2%) of the controls started their first menstruation at the age of 14 and above. Twenty-five (32.1%) of the cases and 26 (16.7%) of the controls had irregular menses. Majority of the cases and the controls, 57 (95%) and 127 (91.4%) respectively, had menstrual cycle length of 24-38 days. Before, during or after their menstrual cycle 49 (62.8%) and 77 (49.4 %) of the cases and controls respectively, experienced mild to severe dysmenorrhea. Regarding menstrual flow length 62 (79.5%) of the cases and 130 (83.3%) of the cases had 3–8-day length menses.

Twenty-eight (35.9%) of the cases and 45 (28.8%) of the controls had history of abortion. Among the abortions, 10 (12.8%) of the cases and 4 (2.6%) of the control's termination was surgical. Among the total participants 13(16.7%) of the cases and 107(68.6%) of the controls used contraceptive before two years.

Using syndromic approach, twelve (15.4%) of the cases and 8 (5.1%) of the controls had history of sexually transmitted infection. All the study participants were tested for HIV. Six (7.7%) of the cases and only 1 (0.6%) of the controls were tested positive for HIV. The reproductive characteristics of the participants summarized on table 2.

4.3 Lifestyle characteristics of participants

The lifetime prevalence of alcohol consumption among cases and controls was 30.8 % (24) and 34.6% (54) respectively. The lifetime prevalence of alcohol consumption among the participants' spouses was 41% among the cases and 42.9% among the controls. All of the participants stated that they have never smoked cigarette. Majority of the participants, 74 (94.9%) of the cases and 135 (86.5%) of the controls consumed coffee. Eight (10.3%) of the cases and 7 (4.5%) of the cases found to be underweight. Fourteen (17.9%) of the cases and 44 (28.4%) of the cases were overweight. Seven (9%) of the cases and 5(3.2%) of the controls were obese.

Table 2: Reproductive characteristics of women seeking heath service at GMH and TASH clinics, Addis Ababa, Ethiopia, 2021

Variable	Category	Cases, n (%)	Controls, n (%)
Age at first Menstruation	<14 years	14 (17.9%)	48(30.8%)
	≥14 Years	64(82.1%)	108(69.20%)
Regular menstrual cycle	Yes	53 (67.9%)	130(83.3%)
	No	25(32.1%)	26(16.7%
Menstrual cycle Length	<24 days	0(0.0%)	1(0.7%)
	24-38 days	57(95. %)	127(91.4%)
	>38 days	3(5%)	11(7.9%
Dysmenorrhea	Yes	49(62.8%)	77(49.4%
	No	29(37.2%)	79 (50.6%)
Severity of Dysmenorrhea	Mild	18 (36.7%)	25(32.5%)
	Moderate	20 (40.8%)	36(46.8%)
	Severe	11 (22.4%)	15(19.5%)
	Incapacitating	0(0%)	1(1.3%)
HIV test	Positive	6(7.7%)	1(0.6%)
	Negative	72 (92.3%)	155(99.4%)
History of STI	Yes	12 (15.4%)	8(5.1%)
	No	66 (84.6%)	148(94.9%)
History of Abortion	Yes	28(35.9%)	45(28.8%)
	No	50(64.1%)	111(71.2%)
Sexual intercourse frequency	>3/week	7(9.0%)	42(27.5%)
	<3/week	71(91%)	111(72.5%)
Contraceptive use before 2 Years	Yes	13(16.70%)	107(68.06%)
	No	65(83.3%)	49(31.04)

4.4 Medical and Surgical characteristics of the Participants

Eleven (14.1%) of the cases and only 3 (1.9%) of the controls had history of medical illness. Six (7.7%) of the cases and 2(1.3%) of the controls had chronic hypertension. Eight (10.3%) of the cases and 2 (1.3%) of the controls had history of treatment for pulmonary, intestinal, and genital TB. One of the cases and one of the controls had Diabetes mellitus. Six of the cases (7.7%) and two (1.3%) of the controls had hypertension.

4.5 Determinants of women's infertility

Binary logistic regression was done to see the association of female infertility and different factors. According to the bivariate analysis age of participants (COR=4.978; 95%CI: 2.687, 9.222), Spouse having another relationship before starting to live with the study participant (COR= 3.401; 95%CI: 1.263 9.160), history of STI (COR=3.34; 95%CI: 1.313,8.615), HIV status COR=12.92; 95%CI : (1.527,109.278), Age of menstruation, (COR=2.032; 95%CI:1.039,3.974), Menstrual cycle regularity (COR=2.358; 95%CI:1.25,4.451), history of previous TB infection (COR=8.8; 95%CI: (1.822,42.5), Frequency of sexual intercourse(COR=4.93; 95%CI: 2.115,11.474), History of surgical abortion (COR=5.58; 95%CI:1.693,18.448) and hypertension (COR=6.417; 95%CI: 1.267,32.57) showed significant association. While family history of infertility, BMI, diabetes mellitus history of previous surgery, having multiple sexual partners didn't show significant association with women infertility.

After controlling all other variables using multivariate regression model, Spouse having relationship before starting to live with the study participant, history of STI, HIV status, Age of menarche, History of surgical abortion and hypertension were not significant factors associated with female infertility. However, age of women (AOR=4.914; 95%CI: 2.360, 10.230), menstrual regularity (AOR= 2.859; 95%CI: 1.338, 6.109), History of TB infection (AOR = 8.518; 95%CI: 1.554, 46.702) and frequency of sexual intercourse (AOR= 5.304; 95%CI: (2.046, 13.749) remained significantly associated with women infertility.

Table 3: Determinants of infertility among women seeking heath service at GMH and TASH clinics, Addis Ababa, Ethiopia, 2021

Variable	Category	Case, n (%)	Controls, n (%)	COR (95%CI)	AOR (95% CI)	P-Value
Age of Participants	≤ 30 Years	40 (51.3%)	131 (84%)	1	1	
	> 30 Years	38 (48.7%)	25 (16%)	**4.978 (2.687,9.222)**	**4.914 (2.360,10.230)**	**0.000**
Spouse married previously	Yes	11 (14.1%	7 (4.6%)	3.401(1.263,9.160)	1.274(0.345,4.704)	0.015
	No	67 (85.9%)	145 (95.4%)	1	1	
Age at first menstruation	<14 Years	14 (17.9%)	48(30.8%)	1	1	
	≥14 Years	64(82.1%)	108(69.20%)	2.032 (1.039,3.974)	1.371(0.628,2.992)	0.038
Regular menstrual cycle	Yes	53 (67.9%)	130(83.3%)	1	1	**0.008**
	No	25(32.1%)	26(16.7%	**2.358(1.25,4.451)**	**2.859(1.338,6.109)**	
HIV Test	Positive	6(7.7%)	1(0.6%)	12.92(1.527,109.278)	7.091(0.635,79.196)	0.019
	Negative	72 (92.3%)	155(99.4%)	1	1	
Sexual intercourse frequency	>3 /week	7(9.0%)	42(27.5%)	1	1	
	<3/week	71(91%)	111(72.5%)	**4.93(2.115,11.474)**	**5.304(2.046,13.749)**	**0.000**
History of STI	Yes	12 (15.4%)	8(5.1%)	3.34 (1.313,8.615)	2.517(0.753,8.419)	0.011
	No	66 (84.6%)	148(94.9%)	1	1	
History of surgical abortion	yes	10(12.8%)	4(2.6%)	5.58(1.693,18.448)	2.83(0.63,12.713)	0.005
	No	68(87.2%)	152(97.4%)	1	1	
History of TB infection	Yes	8 (10.3%)	2(1.3%)	**8.8(1.822,42.5)**	**8.518(1.554,46.702)**	**0.007**
	No	70(89.7%)	154(98.7%)	1	1	
Hypertension	Yes	6(7.7%)	2(1.3%)	6.417(1.267,32.57)	2.184(0.259,18.423)	0.025
	No	72(92.3%)	154 (98.7%)	1	1	

COR = Crude Odds Ratio; AOR = Adjusted Odds Ratio; CI = Confidence Interval.

The odds of infertility among women whose age greater than 30 years of age was 4.9 times higher than those among women whose age was less than 30 years of age. Similarly the odds of infertility among women whose menstrual cycle was irregular was 2.86 times higher than those whose menstrual cycle was regular. Women who had sexual intercourse frequency of less than three times per week are 5.3 times more likely to be infertile than those women who had more than three times sexual intercourse per week. Women who had a history of TB infection were 8.5 times more likely to be infertile than those who did not have a history of TB infection

5. Discussion

In this study it was found that the proportion of Primary and secondary infertility to be 47.4% and 52.6% respectively. This proportion is comparable to African pooled proportion of primary and secondary infertility that is 49.91% and 49.79% respectively which was showed in systematic review with meta-analysis by Melese Shenkut et al (51). The proportion of secondary infertility found in this study was slightly lower than the study done in Cameroon which showed the proportion of about 62% (47).

According to the finding of this study the odds of infertility among women whose age greater than 30 years of age was 4.9 times higher than those among women whose age was less than 30 years of age. This is similar to a study done in a private infertility care in Dhaka which showed a strong association exists between sub fertility and increasing female age (16). When compared with women younger than 20, the odds of sub fertility were six times as high for women aged 20–34, and 13.6 times as higher for women 35 or older(17). The study done on Zambia also showed similar finding. Women aged between 30-34 years had higher infertility rates than did the other age groups (44).

This study showed that the odds of infertility among women whose menstrual cycle was irregular was 2.86 times higher than those whose menstrual cycle was regular. This result is in line with a cross-sectional, descriptive study conducted in Egypt which found a significant association between infertility and irregular menstruation, AOR= 7.193; 95%CI: (2.297, 22.562) (28). This positive correlation between infertility and menstrual irregularity was also described in a study done in Upper Egypt (29). On the other hand, a study done in China showed no association between infertility and menstrual irregularity (30). The relationship was described as insignificant in studies done in Southwest Nigeria (31) and India (25).

According to the finding of this study women who had a history of TB infection were 8.5 times more likely to be infertile than those who did not have a history of TB infection.

Another significant determinant of infertility found in this study was frequency of sexual intercourse : women who had frequency of less than three times per week are 5.3 times more likely to be infertile than those women who had more than three times sexual intercourse per week. A study done in one infertility hospital in India showed the frequency of sexual intercourse is significantly associated with infertility(52).

Another interesting finding in this study was the prevalence of HIV in infertile women is higher among infertile couples than the fertile couples (7.7% Vs 0.6%). This indicates that voluntary HIV counselling and testing of infertile couples may identify new HIV infections and increase opportunities for HIV care and prevention.

In this study history of STI was not significantly associated to women infertility. In contrary to this study conducted by the World Health Organization in 33 different countries showed that in Africa, over 85% of women had an infertility diagnosis attributable to an infection compared with 33% of women worldwide (5). In a study done in India, there was a significant association between STI as a risk factor for primary and secondary infertility, irrespective of the type of STI (25). Blumer et al. reported in their study that women with episodes of genital infection had a 10 fold risk of subsequent tubal infertility irrespective of the type of microorganisms causing the infection(36). The difference in this finding may be explained by the method of data collection regarding the presence of STI. It is also subjected for recall bias.

6. Limitation of the study

This Study's limitation is it didn't assess endocrinology factors. The other limitation is the study areas are referral centers and applying the result to the general population may be difficult.

7. Conclusion

Secondary infertility accounts for 52.6% of the infertile women, while primary infertility accounts for 47.4% of them. Age of women, menstrual regularity, History of TB infection and frequency of sexual intercourse were found to be determinants of female infertility.

8. Recommendations

- Targeted interventions and strategies to address the identified modifiable risk factors needs to be implemented through health professionals, professional associations, Ministry of health and development partners
- Early diagnosis and treatment of Tuberculosis
- Thorough identification and investigations for women with menstrual irregularity
- Health education and counseling for couples about the risk factors and frequency of coital intercourse
- HIV testing and counseling for infertile couples

9. References

1. Roupa Z, Polikandrioti M, Sotiropoulou P, Faros E, Koulouri A, Wozniak G, et al. Cause of infertility in woman at reproductive age. Heal Sci J [Internet]. 2009;3(2):80–7. Available from: www.hsj.gr

2. Zegers-Hochschild F, Adamson GD, de Mouzon J, Ishihara O, Mansour R, Nygren K, et al. International Committee for Monitoring Assisted Reproductive Technology (ICMART) and the World Health Organization (WHO) revised glossary of ART terminology, 2009. Vol. 92, Fertility and sterility. United States; 2009. p. 1520–4.

3. Rutstein SO, Shah IH. Infecundity, infertility, and childlessness in developing countries. DHS Comparative Reports 9. DHS Comp Reports. 2004;9:pages 13-50.

4. Balen AH, Rutherford AJ. Management of infertility. Br Med J. 2007;335(7620):608–11.

5. Ombelet W, Cooke I, Dyer S, Serour G, Devroey P. Infertility and the provision of infertility medical services in developing countries. Hum Reprod Update. 2008;14(6):605–21.

6. Mustafa M, Hadi J, Iiizam EM, Aliya S. Male and Female Infertility : Causes , And Management Male and Female Infertility : Causes , And Management. IOSR J Dent Med Sci. 2019;18(October):27–32.

7. Inhorn MC, Patrizio P. Infertility around the globe: New thinking on gender, reproductive technologies and global movements in the 21st century. Hum Reprod Update. 2014;21(4):411–26.

8. Nachtigall RD. International disparities in access to infertility services. Fertil Steril ;American Soc Reprod Med. 2006 Apr;85(4):871–5.

9. Mascarenhas MN, Flaxman SR, Boerma T, Vanderpoel S, Stevens GA. National, Regional, and Global Trends in Infertility Prevalence Since 1990: A Systematic Analysis of 277 Health Surveys. PLoS Med. 2012;9(12):1–12.

10. Sharma S, Mittal S, Aggarwal P. Management of infertility in low resource countries. BJOG. 2009 Oct;116 Suppl:77–83.

11. Fikrewold Haddis, Daniel Sahleyesus, Biruk Tensou. Infertility in Ethiopia: prevalence and associated risk factors. Popul Assoc Am Annu Meet. 2010;1–14.

12. Butler PA. Assisted reproduction in developing countries —facing up to the issues ART in developing countries —a response to individual need or a social priority ? Prog Reprod Heal Res. 2003;63(63):01–8.

13. Deyhoul N, Mohamaddoost T, Hosseini M. Infertility-related risk factors: A systematic review. Int J Women's Heal Reprod Sci [Internet]. 2017;5(1):24–9. Available from: http://dx.doi.org/10.15296/ijwhr.2017.05

14. Borsha N. Selected Risk Factors of Primary Infertility among Young Women at Jorhat City: A Case Control Study. Int J Pure Appl Biosci. 2018;6(6):293–8.

15. Meskelu J, Berhane Y. Experiences of women with infertility and their treatment seeking

practices: a qualitative study results: conclusion: Ethiop J Reprod Heal. 2018;10(4):33–42.

16. Chowdhury MA, Haque MM, Chowdhury S, Prodhania MS. Determinants of Infertility Among Couples Seeking Treatment in A Selected Clinic in Dhaka City. Chattagram Maa-O-Shishu Hosp Med Coll J. 2014;13(3):42–5.

17. Killick S, Trussell J, Cleland K, Moreau C. Factors associated with subfertility among women attending an antenatal clinic in Hull. Hum Fertil. 2009;12(4):191–7.

18. Zhou Z, Zheng D, Wu H, Li R, Xu S, Kang Y, et al. Epidemiology of infertility in China: a population-based study. BJOG An Int J Obstet Gynaecol. 2018;125(4):432–41.

19. Bayu D, Egata G, Kefale B, Jemere T. Determinants of Infertility among Married Women Attending Dessie Referral Hospital and Dr. Misganaw Gynecology and Obstetrics Clinic, Dessie, Ethiopia. Int J Reprod Med. 2020;2020:1–6.

20. Weghofer A, Kim A, Barad DH, Gleicher N. Age at menarche: A predictor of diminished ovarian function? Fertil Sterility; Am Soc Reprod Med [Internet]. 2013;100(4):1039–43. Available from: http://dx.doi.org/10.1016/j.fertnstert.2013.05.042

21. Abdullah AM, Shadhan S, Al-Ogaili C. Risk Factors of Infertility Among Young Women at Al-Najaf City. Int J Sci Res Publ [Internet]. 2016;6(12):21–30. Available from: www.ijsrp.org

22. Katole A, Saoji A. Prevalence of primary infertility and its associated risk factors in urban population of central India: A community-based cross-sectional study. Indian J Community Med [Internet]. 2019 Oct 1;44(4):337–41. Available from: http://www.ijcm.org.in/article.asp?issn=0970-0218

23. Eraky EM, El-nasr EMS. Risk Factors of Secondary Infertility among Women Attending Outpatient Clinic at Cairo University Hospital ; Suggested Guideline. World J Nurs Sci. 2016;2(1):1–10.

24. Moridi A, Roozbeh N, Yaghoobi H, Soltani S, Dashti S, Shahrahmani N, et al. Etiology and risk factors associated with infertility. Int J Women's Heal Reprod Sci [Internet]. 2019;7(3):346–53. Available from: https://doi.org/10.15296/ijwhr.2019.57

25. M. M, V. R. Selected risk factors of infertility in women: case control study. Int J Reprod Contraception, Obstet Gynecol. 2015;4(6):1714–9.

26. Mokhtar S, Hassan HA, Mahdy N. Risk Factors For Primary and Secondary Female Infertility in Alexandria : A Hospital Based Case. J Med Res Inst. 2006;27(4):245–52.

27. Madonna Ogechukwu Emmanuel, Joseph Ayodeji Olamijulo1 EEE. Risk factors associated with secondary infertility in women of childbearing age: A matched case–control study. Trop J Obstet Gynaecol. 2017;08(4):725–36.

28. Sanad Z, El-Hady Kalil N, El-Rahman Beddah E. Infertility and related risk factors among women attending rural family health facilities in Menoufia Governorate YR - 2019/10/1. Menoufia Med J. (4 UL-http://www.mmj.eg.net/article.asp?issn=1110-2098;year=2019;volume=32;issue=4;spage=1365;epage=1370;aulast=Sanad;t=5):1365 OP-1370 VO – 32.

29. Hassan H. Infertility profile, psychological ramifications and reproductive tract infection among infertile women, in northern upper Egypt. J Nurs Educ Pract. 2015 Dec 21;6.

30. Xiaoli S, Mei L, Junjun B, Shu D, Zhaolian W, Jin W, et al. Assessing the quality of life of infertile Chinese women: a cross-sectional study. Taiwan J Obstet Gynecol. 2016 Apr;55(2):244–50.

31. Irinyenikan TA. Risk Factors for Female Infertility At a Tertiary Health Facility in Akure, South-West Nigeria. Int J Med Med Res. 2020;5(2):61–8.

32. Dhont N, Luchters S, Muvunyi C, Vyankandondera J, De Naeyer L, Temmerman M, et al. The risk factor profile of women with secondary infertility: An unmatched case-control study in Kigali, Rwanda. BMC Womens Health. 2011;11.

33. Mollison J, Porter M, Campbell D, Bhattacharya S. Primary mode of delivery and subsequent pregnancy. BJOG. 2005 Aug;112(8):1061–5.

34. Bhattacharya S, Porter M, Amalraj E, Templeton A, Hamilton M, Lee AJ, et al. The epidemiology of infertility in the North East of Scotland. Hum Reprod. 2009 Dec;24(12):3096–107.

35. Collin SM, Marshall T, Filippi V. Caesarean section and subsequent fertility in sub-Saharan Africa. BJOG. 2006 Mar;113(3):276–83.

36. Teeple E, Collins J, Shrestha S, Dennerlein J et al. Sexually Transmitted Diseases and Infertility. Am J Obs Gynecol. 2018;176(1):139–48.

37. ASRM. Quick Facts About Infertility [Internet]. 2015. p. American Society for Reproductive Medicine. Available from: http://www.asrm.org/detail.aspx?id=2322

38. Esmaeilzadeh S, Delavar MA, Basirat Z, Shafi H. Physical activity and body mass index among women who have experienced infertility. Arch Med Sci. 2013;9(3):499–505.

39. Cong J, Li P, Zheng L, Tan JT. Prevalence and risk factors of infertility at a rural site of Northern China. PLoS One. 2016;11(5):1–11.

40. Klemetti R, Raitanen J, Sihvo S, Saarni S, Koponen P. Infertility, mental disorders and well-being - A nationwide survey. Acta Obstet Gynecol Scand. 2010;89(5):677–82.

41. Amirkhani J, Yadollah-Damavandi S, Mirlohi SM-J, Nasiri SM, Parsa Y, Gharehbeglou M. Correlation between Abortion and Infertility among Nonsmoking Women with a History of Passive Smoking in Childhood and Adolescence. Int J Reprod Med. 2014;2014:1–4.

42. Farahat HG, Marey HMG, Badawi NM, Allam HK, Issa MMM. Prevalence of occult refractive errors in primary school students. Menoufia Med J. 2017;31(1):267–72.

43. Romero Ramos R, Romero Gutiérrez G, Abortes Monroy I, Medina Sánchez HG. [Risk factors associated to female infertility]. Ginecol Obstet Mex. 2008 Dec;76(12):717–21.

44. Kalima-munalula MN, Ahmed Y, Vwalika B. Factors associated with infertility among women attending the gynaecology clinic at University Teaching Hospital, Lusaka, Zambia. Med J Zambia. 2017;44(1):41-44–44.

45. Dhont N. Clinical, epidemiological and socio-cultural aspects of -infertility in resource-poor settings. Evidence from Rwanda. Facts, views Vis ObGyn. 2011;3(2):77–88.

46. Becker VM, Silver S, Seufert R, Muensterer OJ. The association of appendectomy, adhesions, tubal pathology, and female infertility. J Soc Laparoendosc Surg. 2019;23(1).

47. Egbe TO, Nana-Njamen T, Elong F, Tchounzou R, Simo AG, Nzeuga GP, et al. Risk factors of tubal infertility in a tertiary hospital in a low-resource setting: a case-control study. Fertil Res Pract. 2020;6(1):1–9.

48. Tobias DK, Gaskins AJ, Missmer SA, Zhang C, Chavarro JE. History of infertility and risk of type 2 diabetes mellitus : a prospective cohort study. Diabetologia. 2015;(December 2017).

49. Agency CS. Population Projections for Ethiopia. 2013;(July).

50. Organization WH. WHO Laboratory Manual for the Examination and Processing of Human Semen (5th edition)]. Vol. 5th editio. 2010.

51. Abebe MS, Afework M, Abaynew Y. Primary and secondary infertility in Africa: systematic review with meta-analysis. Fertil Res Pract. 2020;6(1):1–11.

52. Nursing G. a Study To Identify the Risk Factors Associated With Infertility Among Women Attending Infertility Clinic At Sandhya Hospital , Vallalar , Vellore Obstetrics and Gynecological Nursing. 2014;(October).

10. Annexes

Annex I: Information Sheet

Introduction

This information sheet is prepared to explain the study you are being asked to join. Please listen carefully and ask any questions about the study before you agree to join. You may ask questions at any time after joining the study.

Objectives

This study intends to identify the determinants of infertility and their associations with infertility among married women attending infertility clinics at two teaching hospitals in Addis Ababa, Ethiopia.

How you are selected

You are selected to be part of the study through a random sampling process. It is completely by chance that you are included in the study.

Benefits and risks

The information we obtain from this study will help us to identify the determinant factors of infertility, and we will forward recommendations to modify modifiable factors. This study will have no harm to you except for the time that you will spend with us.

Content and time

This study involves interviews that include questions about your demographic information, reproductive, medical, and surgical history. Our data collection will take about 20 minutes.

Confidentiality

We will not share information linked to your name or any other personal identifier to anyone. Whatever information you provide to us will also be kept strictly confidential.

Voluntary participation

If you have questions or points of clarifications, you can ask me at any time. You may also stop participation at any time if you feel discomfort or unhappy by the process. However, we hope that you will participate fully in this study since your experiences and advice are important for the study.

Do you have any questions about the study before we proceed to the interview? Please let me know if anything I have stated is not clear; I will be happy to explain it further to ensure you understand.

Contact

In case you need more information about the survey, you may contact the PI of the study.

Dr. Seblewongel Matewos, through the following address:

PI's full name: Seblewongel Matewos

Cell phone address: +251910642840

E-mail:seblewongelmatewos@gmail.com

Can I proceed to the interview now?

Yes ---------- Proceed to the interview

No ---------- Stop

Name of Data collector: _____

Signature of the Data collector _____ Date: _____ Time _____

Annex II Consent form

Addis Ababa University, College of Health Sciences Department of Obstetrics and Gynecology

Questionnaire designed to identify determinants of infertility among married women attending infertility clinics, at two teaching hospitals in Addis Ababa, Ethiopia.

Greetings;

My name is _____ from _____

We are conducting a study intends to identify the determinants of infertility and their associations with infertility among married women attending infertility clinic at two teaching hospitals in Addis Ababa, Ethiopia namely Tikur Anbessa Specialized Hospital and Ghandi Memorial Hospital. You are kindly requested to be included in the study; which will have importance in improving the infertility care which is being provided. The study is anonymous; your personal information will be kept strictly confidential. Your participation in the study is voluntary and you have the right not to participate in the study.

The study has approval and ethical clearance from department of Gynecology and Obstetrics & research and publication committee of Addis Ababa University.

May I continue?

If yes, continue interviewing

If No, thank and stop interviewing.

Annex III: Questionnaire-English

Part I: Socio-demographic characteristics of respondents

Q.#	Questions	Coding categories	Skip to Q.# or section__
101	How old are you?	Age in complete years---------- Don't know----------99	
102	What is your religion?	Orthodox----------01 Muslim ----------02 Protestant ----------03 Other (Specify)_____97	
103	Marital status	Never married ----------01 Currently married----------02 Separated ----------03 Widowed ----------04	
104	How many marital/cohabitation relationship do you have till now?	_____(In numbers)	
105	How old were you when you get married?	During 1st marriage _____yrs old During 2nd marriage _____yrs old During 3rd marriage _____yrs old During 4th marriage _____yrs old	
106	For how many years have you cohabited in your current relationship?	_____complete years	

107	Did your spouse have marital relationship with others before starting to live with you?	Yes----------01 No----------02	
108	If the answer for '107' is yes, How many relationships did he have?	_____(In numbers)	
109	What is your occupation?	Housewife (Home maker)-------01 Government employee----------02 Private employee----------03 Merchant----------04 Daily laborer----------05 Other (specify)_____	
110	What is your family average income per month?	_____(Eth. Birr)	
111	What is your level of education?	Illiterate----------01 Read and write----------02 Primary school (1-8) -------03 Secondary school (9-12) ----------04 Tertiary or college/university ------05	
112	Does your mother or any of your sisters have history of infertility (suffered from inability to conceive)?	Yes----------01 No----------02	

2 Respondents Reproductive health history

201	What was your age when you saw your first menstruation?	Age in completed years_____	
202	Is your menstrual cycle regular?	Yes----------01 No----------02	If No skip to Qn. No 204
203	If it is regular what is the length of your menstrual cycle?	<24 days----------01 24-38 days----------02 >38 days ----------03	
204	For how long does your menses stay when it comes?	<3 days ----------01 3-8 Days----------02 >8 Days----------03	
205	Do you experience cramps before, during, or after your period?	Yes----------01 No----------02	
206	If the answer for Qn 205 is 'Yes' how do you describe the pain?	Mild----------01 Moderate----------02 Severe----------03 Incapacitating----------04	
207	At what age was your first sexual intercourse?	Age in complete years_____	
208	How often do you have sexual intercourse with your spouse?	>3 time/week----------01 1-3 time/week----------02 <1 times/week----------03	
209	Has your spouse diagnosed with infertility previously?	Yes----------01 No----------02	

210	What is your obstetric history looks like?	Gravidity____ Parity_____ Abortion _____ Ectopic_____ Molar_____	
211	Do you have previous history of cesarean delivery?	Yes----------01 No----------02 If yes number of previous c/s _____	
212	Do you have history of Abortion (termination of pregnancy) previously?	Yes----------01 No----------02 If yes number of previous abortions___	If the answer is "NO" skip to 214
213	If the answer is yes for ''Qn 212''what was the mode of termination? (multiple responses are possible)	Spontaneous----------01 Medical----------02 Surgical----------03	
214	Have you ever experienced these symptoms? (multiple responses are possible)	Abnormal vaginal discharge----------01 Itching or irritation of vulva----------02 Boils/ulcers/warts around vulva--------03 Pain in lower abdomen not related to menses----------04 Pain during urination or defecation----05 Painful blister like lesions in and around vagina----------06 Low back ache----------07 Pain during sexual intercourse-------08 Spotting after sexual intercourse-------09	
215	Have you ever used contraceptive methods 2 years back?	Yes----------01 No----------02	If the Answer for Qn 215 is "NO" skip to 217

216	If the answer is yes for 215 what methods did you use? (multiple responses are possible)	COC----------01 Injectables----------02 IUCD----------03 Implants----------04 Barrier methods----------05 Others (please specify) _____	
217	Have you ever tested for HIV?	Yes----------01 No----------02	
218	If the answer is yes for 217, what was the result?	Positive----------01 Negative----------02 Unknown----------03	

3. Life Style and Behavioral characteristics

301	How many life time sexual partners do you have?	_____	
302	Do you currently (in the past 30 days) smoke tobacco?	Daily .....01 Less than daily----------02 Not at all----------03 Refused to answer.....99	
303	Have you smoked tobacco in the past?	Daily .....01 Less than daily----------02 Not at all----------03 Refused to answer.....99	
304	How often does *anyone* smoke inside your home?	Daily ----------01 Weekly----------02 Monthly----------03 Less than monthly----------04 Never .....05 don't know .....06 Refused to answer.....99	

305	How often do you have a drink containing alcohol?	Never----------01 Monthly or less----------02 2-4 times per month----------03 2-3 times per week----------04 4+ times per week----------05	
306	How often does your partner have a drink containing alcohol?	Never----------01 Monthly or less----------02 2-4 times per month----------03 2-3 times per week----------04 4+ times per week----------05	
307	Do you use or have you ever used (circle all that apply):	Coffee----------01 How many cups per day? ____ Recreational drugs (Marijuana, Cocaine, etc.)----------02 Chat(Khat)----------03	
308	What is your BMI? (To be measured and calculated by data collector)	Weight_____ Height_____ BMI (in Kg/M2)_____	
309	What is your blood Type?	Blood type _____(If known)	

4. Medical and surgical history

401	Do you have any medical disease?	Yes----------01 No----------02	If the answer is "NO" skip to 403
402	If the answer for Qn 401 is 'yes' what type of medical disease do you have?	Diabetes mellitus----------01 Hypertension----------02 Thyroid disease----------03 Tuberculosis----------04 Other (Please specify)_____	
403	Have you undergone any previous surgery other than cesarean section?	Yes----------01 No----------02	If the answer for '403' is 'NO; skip to 406
404	If the answer for Qn 403 is 'yes' when was your last surgery?	_____Days back _____Months back _____Years back	
405	If the answer for Qn 403 is 'yes' what was the reason for surgery?	Appendectomy----------01 Fallopian tubules surgery----------02 For bowel abnormality----------03 Other (please specify)_____	
406	Have you ever treated for TB?	Yes----------01 No----------02	
407	If the answer for Qn 406 is 'yes', What was the type of TB?	Pulmonary----------01 Intestinal----------02 Genital TB----------03 Lymph node----------04 Other (please specify)_____	

<u>For infertile participants only</u>

What is the type of infertility?

Primary infertility ----------01

Secondary infertility----------02

What is the duration of infertility?

_____ (In complete years)

Thank you very much for your participation!

Annex IV: Information sheet, consent form and questionnaire-Amharic

የመረጃ መስጫ ገጽ

መግቢያ

ይህ ገጽ የተዘጋጀዉ እንዲሳተፉ ስለተጠየቁበት ጥናት ለመግለጽ ነዉ። እባክዎ በጥንቃቄ ያድመጡና በጥናቱ ከመሳተፍዎ በፊት ስለጥናቱ ግልጽ ያልሆነልዎት ነገር ካለ ይጠይቁ። ነገር ግን መሳተፍ ከጀመሩ በኋላ በማንኛዉም ጊዜ ጥያቄ መጠየቅ ይችላሉ።

የጥናቱ አላማ

የዚህ ጥናት አላማ ከመሀንነት ጋር ተያያዥነት ያላቸዉን ጉዳዮችና ከመሀንነት ጋር ያላቸዉን ዝምድና መለየት ነዉ። ጥናቱ የሚካሄደዉም በአዲስ አባባ በሚገኙ ሁለት የማስተማሪያ ሆሰፒታሎች ክትትል እያደረጉ በሚገኙ የመሀንንት ችግር ያለባቸዉ ያገቡ ሴቶች ላይ ነዉ።

የተሳታፊዎቸ አመራረጥ

በዚህ ጥናት ላይ እንዲሳተፉ የተደረጉት ሙሉበሙሉ እጣን መሰረት ባደረገ ልየታ ነዉ።

በጥናቱ በመሳተፍ የሚገኝ ጥቅም እና ጉዳት

ከዚህ ጥናት የምናገኘዉ መረጃ ከመሀንነት ጋር የተያያዙ ጉዳዮችን ለመለየት ይረዳናል። በተገኘዉ መረጃ መሰረትም ሊለወጡ በሚችሉ አጋላጭ ሁኔታዎች ላይ አስተያየቶችንና ምክረ ሀሳቦችን እንሰጣለን። በዚህ ጥናት በመሳተፍዎ ከኛ ጋር ከሚያሳልፉት ጊዜ ዉጭ የሚደርስብዎት ምንም አይነት ጉዳት የለም።

የመጠይቁ ይዘትና የሚወስደዉ ጊዜ

የዚህ ጥናት መጠይቅ የስነ-ህዝብ፣ ስነ ተዋልዶ፣ ከዚህ በፊት ስለነበሩ የዉሥጥ ደዌና ቀዶ-ህክምና ሁኔታዎች ጥያቄዎችን አካቶ ይዟል። የሚዎስደዉም ጊዜ 20 ደቂቃዎችን ነዉ።

ሚስጥራዊነት

ከስምዎ ጋር የተያያዘ ወይም ማንነትዎን የሚለይ መረጃ ለማንም ይፋ አናደርግም። የሚሰጡን ማንኛዉም መረጃ በጥብቅ የሚጠበቅ ይሆናል ።

በፈቃደኝነት ላይ የተመሰረተ ተሳትፎ

ጥያቄ ካለዎት ወይም ግልጽ እንዲሆንልዎት የሚፈልጉት ነገር ካለ ባማንኛዉም ጊዜ መጠየቅ ይችላሉ። ሁሉንም ወይም የተወሰኑትን ጥያቄዎች መመለስ ካልፈለጉ አለመመለስ ይችላሉ:: እንዲሁም በማንኛዉም ጊዜ ቃለመጠይቁን የማቋረጥ መብት አለዎት። ነገር ግን የእርስዎ ተሳትፎና የሚሰጡን ምክር ለጥናቱ እጅግ አስፈላጊ በመሆኑ ሙሉ በሙሉ ይሳተፉሉ ብለን ተስፋ እናደርጋለን።

መጠይቁን ከመቀጠላችን በፊት የሚጠይቁት ጥያቄ አለዎት? እስካሁን ከተነጋገርነዉ ግልጽ ያልሆነ ነገር ካለ እባክዎ ይንገሩን። መረዳትዎን እስከምናረጋግጥ ድረስ በደስታ ለመግለጽ ዝግጁዎች ነን።

አድራሻ

ስለጥናቱ የበለጠ መግለጫ ማገኘት ከፈለጉ የጥናቱን አድራጊ የሚያገኙበት መረጃ ከዚህ በታች ተቀምጧል።

የጥናት አድራጊ ሙሉ ስም: ዶ/ር ሰብለወንጌል ማቴዎስ

ስልክ: +251910642840

ኢ-ሜይል:Seblewongelmatewos@gmail.com

መጠይቁን መቀጠል እንችላለን?

አዎ ---------- ቃለመጠይቁን ይቀጥሉ

አንችልም ---------- ቃለመጠይቁን ያቋርጡ

የመረጃ ሰብሳቢዉ ስም: _____

የመረጃ ሰብሳቢዉ ፊርማ_____ ቀን: _____ ሰዓት _____

የስምምነት መግለጫ ቅጽ

አዲስ አባባ ዩኒቨርሲቲ የጤና ሳይንስ ኮሌጅ የማህጸናና ጽንስ ትምህርት ክፍል

ከመህንነት ጋር ተያያዥነት ያላቸዉን ጉዳዮችና ከመህንነት ጋር ያላቸዉን ዝምድና ለመለየት የተዘጋጀ መጠይቅ ። ጥናቱ የሚካሄደዉም በአዲስ አባባ፣ ኢትዮጵያ በሚገኙ ሁለት የማስተማሪያ ሆሰፒታሎች ክትትል እያደረጉ በሚገኙ የመህንንት ችግር ያለባቸዉ ያገቡ ሴቶች ላይ ነዉ።

ጤና ይስጥልኝ;

ስሜ _____ይባላል። የመጣሁት ከ _____ነዉ።

ከመህንነት ጋር ተያያዥነት ያላቸዉን ጉዳዮችና ከመህንነት ጋር ያላቸዉን ዝምድና ለመለየት በአዲስ አባባ፣ ኢትዮጵያ በሚገኙ ሁለት የማስተማሪያ ሆሰፒታሎች እነሱም በጥቁር አንበሳ ስፔሻላይዝድ ሆስፒታል እና በጋንዲ መታሰቢያ ሆስፒታል ክትትል እያደረጉ በሚገኙ የመህንንት ችግር ያለባቸዉ ያገቡ ሴቶች ላይ ጥናት እያደረግን እንገኛለን። በጥናቱ እንዲሳተፉ በትህትና እንጠይቅዎታለን። ይህም ለመህንነት የሚሰጠዉን አገልግሎት ለማሻሻል ይረዳል። ጥናቱ የተሳታፊዎችን ማንነት አይገልጽም። የሚሰጡን የግል መረጃ ሚስጥራዊነቱ ይጠበቃል። የሚያደርጉት ተሳትፎ በፈቃደኝነት ላይ የተመሰረተ ነዉ። በጥናቱ ያለመሳተፍ መብት አለዎት።

ይህ ጥናት ከአዲስ አበባ ዩኒቨርሲቲ ማሕጸንና ጽንስ ትምህርት ክፍልና የጥናትና ምርምር ኮሚቴ የስነ-ምግባርና አግባብነት ማረጋገጫ አግኝቷል።

መቀጠል እችላለሁ?

ከተስማሙ፣ መጠይቁን ይቀጥሉ።

ካልተስማሙ፣ አመስግነዉ መጠይቁን ያቋርጡ።

መጠይቅ

ክፍል 1: የተሳታፊዎች የስነ-ሕዝብ መረጃ

ጥ.ቁ	ጥያቄዎች	የመለያ ክፍሎች	ወደ ጥያቄ ቁጥር ይለፉ
101	እድሜዎ ስንት ነዉ?	እድሜ (በዓመት)---------- አላዉቀዉም----------99	
102	ሐይማኖትዎ ምንድን ነዉ?	ኦርቶዶክስ----------01 ሙስሊም ----------02 ፕሮቴስታንት ----------03 ሌላ (ይግለጹ)_____97	
103	የጋብቻዎ ሁኔታ ምን ይመስላል?	ያላገቡ ----------01 በአሁኑ ጊዜ በትዳር ላይ----------02 የተለያዩ ----------03 ባል የሞተባት----------04	
104	እስካሁን ስንት የትዳር ግንኙነቶች አለዎት?	_____(በቁጥር)	
105	ጋብቻ ሲመሰርቱ ዎይም ከትዳር አጋርዎ ጋር አብረዉ መኖር ሲጀምሩ እድሜዎ ምን ያህል ነበር?	የመጀመሪያዉ ትዳር _____ አመት ሁለተኛ ትዳር _____አመት ሶስተኛ ትዳር _____አመት አራተኛ ትዳር _____አመት	
106	አሁን ባለዎት የትዳር ግንኙነት ለምን ያህል ጊዜ ቆዩ?	_____አመታት	

107	የትዳር አጋርዎ ከእርስዎ ጋር መኖር ከመጀመራቸዉ በፊት ሌላ የትዳር ግንኙነት ነበራቸዉ?	አዎ ----------01 አልነበራቸዉም----------02	
108	ለጥያቄ ቁጥር 107 መልሱ አዎ ከሆነ ፣ ምን ያህል ግንኙነት ነበራቸዉ?	_____(በቁጥር)	
109	ስራዎት ምንድን ነዉ?	የቤት እመቤት -------01 የመንግስት ሰራተኛ----------02 በግል ድረጅት ቅጥረኛ----------03 ነጋዴ----------04 የቀን ሰራተኛ----------05 ሌላ (ይጠቀስ)_____	
110	የቤተሰብዎ አማካይ የወር ገቢ ምን ያህል ነዉ?	_____(በኢት ብር)	
111	የትምህርት ደረጃዎ ምን ያህል ነዉ?	መደበኛ ት/ት ያልተማሩ----------01 መጻፍና ማንበብ የሚችሉ----------02 የመጀመሪያ ደረጃ ት/ት (1-8)----------03 ሁለተኛ ደረጃ (9-12)----------04 ኮሌጅ/ዩኒቨርሲቲ----------05	
112	የእርስዎ እናት ወይም ከእህቶችዎ ዉስጥ መሐንነት ወይም ያለመዉለድ ችግር የነበረበት /ያለበት አለ?	አዎ----------01 የለም----------02	

2. የተሳታፊዎች የስነ ተዋልዶ ጤና ታሪክ

201	የወር አበባ ለመጀመሪያ ጊዜ ባዩ ጊዜ እድሜዎ ምን ያህል ነበር?	_____(በአመት)	
202	የወር አበባዎ በትክክል ኡደቱን ጠብቆ ይመጣል?	አዎ----------01 ይዛባል----------02	መልስዎ “ይዛባል ከሆነ” ወደ ጥያቄ 204 ይለፉ
203	ጊዜዉን ጠብቆ የሚመጣ ከሆነ በየስንት ቀን ነዉ የሚመጣዉ?	<ከ 24 ቀን ባነሰ ጊዜ ዉስጥ----------01 በየ 24-38ቀን ----------02 በየ >38 ቀን ----------03	
204	የወር አበባዎ ሲመጣ ምን ያህል ጊዜ ይቆያል?	ከ 3 ቀናት ያነሰ----------01 ከ3-8 ቀናት----------02 ከ 8 ቀናት የበለጠ----------03	
205	የወር አበባዎ ከመምጣቱ በፊት፣ በሚመጣበት ጊዜ ወይም ከመጣ በኋላ ህመም ይሰማዎታል?	አዎ----------01 አይሰማኝም----------02	
206	ለጥያቄ ቁጥር 205 መልሱ «አዎ» ከሆነ ሕመሙን እንዴት ይገልጹታል?	አነስተኛ----------01 መካከለኛ----------02 በጣም ከፍተኛ----------03 ስራ ለመስራት የማያስችል----------04	
207	ለመጀመሪያ ጊዜ የግብረ-ስጋ ግንኙነት ሲያደርጉ እድሜዎት ስንት ነበር?	_____(በአመት)	

208	ከትዳር አጋርዎ ጋር የግብረ-ስጋ ግንኙነት የሚያደርጉት በየስንት ጊዜዉ ነዉ?	በሳምንት ከ 3 ጊዜ በላይ----------01 በሳምንት ከ1-3 ጊዜ----------02 በሳምንት ከአንድ ጊዜ በታች----------03	
209	ከዚህ በፊት የትዳር አጋርዎ የታዎቀ የመሀንነት ችግር አለባቸዉ?	አዎ ----------01 የለባቸዉም----------02	
210	ከዚህ በፊት ከእርግዝናና ከወሊድ ጋር የተያያዘ ያለዎት ታሪክ ምን ይመስላል?	የእርግዝና ብዛት____ የወሊድ ብዛት_____ ውርጃ _____ ከማህጸን ዉጭ_____ ትክክለኛ ያልሆነ እርግዝና አፈጣጠር (Molar pregnancy) _____	
211	ከዚህ በፊት በኦፕራሲዮን ወልደዋል?	አዎ ----------01 አልወለድኩም----------02 መልሱ አዎ ከሆነ _____ጊዜ	
212	ከዚህ በፊት ዉርጃ (የጽንስ ማቋረጥ አጋጥሞዎት ያዉቃል)	አዎ----------01 አያዉቅም----------02 መልሱ አዎ ከሆነ ምን ያህል ጊዜ___	መልስዎ “አያዉቅም ከሆነ” ወደ ጥያቄ 214 ይለፉ
213	ለጥያቄ ቁጥር ‘’212’’ መልስዎ አዎ ከሆነ የተቋረጠብት መንገድ ምንድን ነበር? (ከአንድ በላይ መልስ መስጠት ይቻላል)	በራሱ ጊዜ----------01 በመድሀኒት----------02 በመሳሪያ ተጠርጎ----------03	

214	ከዚህ በታች የተዘረዘሩት ምልክቶች ታይቶብዎት ያዉቃል? (ከአንድ በላይ መልስ መስጠት ይቻላል)	ጤናማ ያልሆነ የማህጸን ፈሳሽ----------01 ዉጫዊ ብልት አካባቢ መቆጣት ወይም ማሳከክ----------02 ዉጫዊ ብልት አካባቢ መቁሰል፣ ዉሃ ማዘል/ክንታሮት --------03 ከወር አባባ ጋር ያልተያያዘ ከእምብርት በታች የሚሰማ የሆድ ህመም----------04 ሲሸኑ ወይም ሲጸዳዱ ህመም መሰማት----05 ህመም ያላቸዉ ዉሀ ያዘሉ ቁስሎች በዉስጠኛዉ የማህጸን ክፍል መዉጣት-----06 የታችኛዉ የጀርባ ክፍል ህመም መሰማት---07 በግብረስጋ ገንኙነት ወቅት ህመም መሰማት-08 ከግብረ-ስጋ ግንኙነት በሗላ ደም መፍሰስ---09	
215	ከዛሬ ሁለት አመት በፊት የእርግዝና መከላከያ ዘዴዎችን ተጠቅመዉ ያዉቃሉ?	አዎ----------01 አላዉቅም----------02	መልስዎ “አላዉቅም ከሆነ” ወደ ጥያቄ 217 ይለፉ
216	ለጥያቄ ቁጥር 215 መልሱ «አዎ» ከሆነ ምን አይነት የእርግዝና መከላከያ ዘዴዎችን ተጠቅመዋል? ((ከአንድ በላይ መልስ መስጠት ይቻላል)	በአፍ የሚወሰድ የወሊድ መከላከያ እንክብል-01 በመርፌ የሚሰጥ የእርግዝና መከላከያ-------02 በማህጸን የሚቀመጥ የእርግዝና መከላከያ----03 በክንድ የሚቀበር የእርግዝና መከላከያ--------04 የወንድ የዘር ፍሬ ወደ ሴት ብልት እንዳይገባ መከላከያ ዘዴዎ----05 ሌላ (እባክዎ ይግለጹት)_____ _____	

217	የኤች አይ ቪ ምርመራ አድርገዉ ያዉቃሉ?	አዎ ----------01 አላዉቅም----------02	
218	ለጥያቄ ቁጥር 217 መልስዎ «አዎ» ከሆነ ዉጤቱ ምን ነበር?	ፖዘቲቭ----------01 ኔጌቲቭ----------02 አይታዎቅም----------03	

3. የተሳታፊዎች የአኗኗር ዘይቤና ባህርይ መገለጫዎች

301	በህይዎት ዘመንዎ ምን ያህል የጾታ ግንኙነት አጋር ኖሮዎት ያዉቃል?	_____በቁጥር	
302	በአሁኑ ጊዜ (ባለፉት 30 ቀናት ዉስጥ) ሲጋራ አጭሰዋል?	በየቀኑ .....01 በየቀኑ ባይሆንም አልፎ አልፎ----------02 በፍጹም አላጨስም----------03 መልስ መስጠት አልፈልግም.....99	
303	ከዚህ በፊት ሲጋራ ያጨሱ ነበር?	በየቀኑ .....01 በየቀኑ ባይሆንም አልፎ አልፎ----------02 በፍጹም አላጨስም----------03 መልስ መስጠት አልፈልግም.....99	
304	በቤትዎ ዉስጥ የሚኖር ሲጋራ የሚያጨስ ሰዉ አለ? ምን ያህል?	በየቀኑ ----------01 በየሳምንቱ----------02 በየወሩ----------03 ከበየወሩ ባነሰ ሁኔታ----------04 ፈጽሞ የለም .....05 አላዉቅም .....06 መልስ መስጠት አልፈልግም.....99	

305	አልኮሆልነት ያለቸዉን መጠጦች ይጠቀማሉ? ምን ያህል?	ፈጽሞ----------01 በወር አንድ ጊዜ ወይም ከዚያ ባነሰ ጊዜ---02 በወር ከ2-4 ጊዜ----------03 በሳምንት ከ2-3 ጊዜ----------04 በሳምንት ከ4 ጊዜ በላይ----------05	
306	የትዳር አጋርዎ አልኮሆልነት ያለቸዉን መጠጦች ይጠቀማሉ? ምን ያህል??	ፈጽሞ----------01 በወር አንድ ጊዜ ወይም ከዚያ ባነሰ ጊዜ---02 በወር ከ2-4 ጊዜ----------03 በሳምንት ከ2-3 ጊዜ----------04 በሳምንት ከ4 ጊዜ በላይ----------05	
307	የሚከተሉትን ነገሮች ይጠቀማሉ? (መልስ ሊሆኑ የሚችሉትን ያክብቡ):	ቡና----------01 በቀን _____ስኒ አነቃቂ እጾች (ማሪዋና፣ ኮኬይን ወዘተ----------02 ጫት----------03	
308	የሰዉነት ክብደትዎና ቁመትዎ ምጣኔ ጠቋሚ ምን ያህል ነዉ? (በመረጃ ሰብሳቢዉ ተለክቶ የሚሰላ)	ክብደት_____ ቁመት_____ የሰዉነት ክብደትና ቁመት ምጣኔ ጠቋሚ (BMI) (በኪግ/ሜ2)_____	
309	የደም አይነትዎ ምንድን ነዉ?	የደም አይነት _____(የሚታዎቅ ከሆነ)	

4. የተሳታፊዎች የቀድሞ ህመምና የቀዶ ህክምና ታሪክ

401	የታዎቀ የዉስጥ ደዌ ህመም አለብዎ?	አዎ----------01 የለብኝም----------02	የጥያቄዉ መልስ የለብኝም ከሆነ ወደ ጥያቄ 403 ይለፉ
402	ለጥያቄ ቁጥር 401 መልስዎ አዎ ከሆነ ያለብዎት ህመም ምን አይነት ነዉ?	የስኪር በሽታ ----------01 የደም ግፊት----------02 የታይሮይድ/እንቅርት----------03 የሳንባ ነቀርሳ----------04 ሌላ (እባክዎ ይግለጹ)_____	
403	ለመዉለድ ከሚደረግ ቀዶ ሕክምና ዉጭ ሌላ ቀዶ ህክምና ተደርጎልዎት ያዉቃል?	አዎ----------01 አያዉቅም----------02	የጥያቄ 403 መልስ 'አያውቅም' ከሆነ ወደ ጥያቄ 406 ይለፉ
404	የጥያቄ ቁጥር 403 መልስዎ አዎ ከሆነ ለመጨረሻ ጊዜ የቀዶ-ህክምና የተደረገልዎት መቼ ነበር?	_____ቀናት በፊት _____ወራት በፊት _____አመታት በፊት	
405	ለጥያቄ ቁጥር 403 መልስዎ አዎ ከሆነ ቀዶ ሕክምና የተደረገልዎት በምን ምክንያት ነበር?	ትርፍ አንጀትን ለማስወገድ----------01 የእንቁላል ማስተላለፊያ ቱቦ ችግር---------02 ለትልቁ ወይም ትንሹ አንጀት ችግሮች----------03 ሌላ (እባክዎ ይግለጹ)_____ _____	
406	ለቲቢ /ሳምባ ነቀርሳ በሽታ ታክመዉ ያዉቃሉ?	አዎ ----------01 አላዉቅም----------02	

407	ለጥያቄ ቁጥር 406 መልስዎ አዎ ከሆነ የሳንባ ነቀርሳዉ አይነት ምን ነበር?	የሳምባ ----------01 የአንጀት----------02 የመራቢያ አካላት----------03 የሰዉነት እጢ (lymph node)----------04 ሌላ (እባክዎ ይግለጹ)_____ _____	

<u>የመሐንነት ችግር ላለባቸዉ ተሳታፊዎች ብቻ</u>

የመሀንነት ችግሩ ምን አይነት ነዉ?

ከዚህ በፊት ምንም አይነት እርግዝና ያልነበራት ----------01

ከዚህ በፊት እርግዝና ወይም ወሊድ የነበራት----------02

የመሀንነት ችግሩ ለምን ያህል ጊዜ የቆየ ነዉ?

_____ (በአመት)

ስለተሳትፎዎ በጣም እናመሰግናለን!

DECLARATION

By my signature below, I declare and affirm that this thesis is my own work. I have followed all ethical principles of scholarship in the preparation, data collection, data analysis and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources in this document. Every serious efforts been made to avoid any plagiarism in the preparation of this thesis.

This thesis is submitted in partial fulfilment of the requirement for the specialization certificate in Obstetrics and Gynaecology in Addis Ababa University School of Medicine. I would like to declare that this thesis has not been submitted to any other institution anywhere for the award of any academic specialization, degree, diploma or certificate.

Name: _____ Signature _____ Date _____