

**ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE
SCHOOL OF NURSING AND MIDWIFERY
DEPARTMENT OF NURSING**

**RISK FACTORS OF BREAST CANCER AMONG PATIENTS
ATTENDING TIKUR ANBESSA SPECIALIZED HOSPITAL AND ST.
PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE, ADDIS
ABABA, ETHIOPIA: A CASE CONTROL STUDY**

By: Lidia Tolessa (BSc)

**A RESEARCH THESIS TO BE SUBMITTED TO THE SCHOOL OF GRADUATE
STUDIES ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES
SCHOOL OF NURSING AND MIDWIFERY DEPARTMENT OF NURSING IN
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER IN ONCOLOGY NURSING**

June, 2020

Addis Ababa, Ethiopia

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LIST OF ABBREVIATIONS AND ACRONYMS

BMI	Body Mass Index
CI	Confidence Interval
ETB	Ethiopian Birr
GLOBOCAN	Global Burden of Cancer Study
IARC	International Agency of Research for Cancer
FMOH	Federal Ministry of Health
LMIC	Low- and Middle-Income Countries
NGO	Non-Governmental Organizations
OPD	Out Patient Department
OR	Odd Ratio
PI	Principal Investigator
SPHMMC	St. Paul's Hospital Millennium Medical College
TASH	Tikur Anbessa Specialized Hospital
WHO	World Health Organization

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ABSTRACT

Introduction: Breast cancer is the leading cause of cancer-related death in women worldwide. In Ethiopia its incidence is rising, causing high rates of morbidity and mortality currently in the country. There is a variation in the prevalence of underlying risk factors among different countries. However, study that examines the local risk factors of breast cancer among women is limited in Ethiopia.

Objective: To assess risk factors of breast cancer among patients attending Tikur Anbessa Specialized Hospital and St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, 2020.

Methods: Institutional-based case-control study was conducted with a sample of 272 women (136 cases and 136 controls). Cases and controls were selected by a systematic random sampling technique. Data was collected by interviewer administered questionnaire and the collected data was cleaned for incompleteness using Epi data version 4.6. Data analysis was carried out using SPSS version 25. Descriptive statistics were employed and bivariate and multivariate analysis using Odds ratio (OR) were utilized to evaluate the association between dependent and independent variables. A p-value of less than 0.05 was considered as a level of significance for associations.

Results: In this study, a total of 272 participants with 136 cases and equal number of controls were participated. The mean ($\pm$ SD) age of the participants was 42.7($\pm$ 11.3) and 40.7($\pm$ 14.6) for the cases and controls respectively. Increased risk of breast cancer was associated with early onset of menarche (AOR=7.9; 95% CI (1.959-31.905)) and use of packed food or drinks (AOR=4.4; 95% CI (1.481-13.218)). Living in urban areas (AOR=0.1; 95% CI (0.016-0.712)) and increased parity (AOR=0.750; 95% CI 0.567-0.992) were associated with reduced risk of breast cancer.

Conclusion and recommendation: According to the finding of this study, place of residence, age at menarche, parity and use of packed food or drinks were associated with breast cancer. Therefore, attention should be given on specific risk factors, to reduce the increasing burden of the disease in our country.

1. INTRODUCTION

1.1 Background

Breast cancer is a type of cancer characterized by uncontrolled development and spread of abnormal breast cells (1,2). It is the most common cancer which affects 2.1 million women worldwide which implies 24.2% of all new cancer cases and leads to 627,000 (15%) life loss in 2018 (3,4). More than half of incident breast cancer cases and 60% of deaths occur within the developing nations like Africa (3,5).

In Ethiopia, according to data from the Addis Ababa cancer registry and Global Burden of Cancer Study (GLOBOCAN) 2018 report, the yearly incidence of cancer in the nation is around 67,573 cases and mortality over 47,954; Among this breast cancer is the first most frequently occurring cancer which accounts 15,244 (22.6%) of all cases of cancer and 8159 (17%) of cancer mortality. Additionally, it is the leading cancer among women which accounts 32.9% from a total of 46,373 new cancer cases in women (4,6).

According to the World Health Organization (WHO), a risk factor is any characteristic or exposure of a person that leads to increment in the probability of developing a disease (7). The causes of any cancer are not fully understood and there is no definite way to prevent cancer. Study into the causes of breast cancer has advanced and it can be described with some certainty the probability of a woman at high risk of the disease. So that, there are things people can do, that might lower the risk of having cancer and several risk factors are assumed to increase the disease occurrence which incorporates modifiable and non-modifiable risk factors (1,8).

American cancer society has recognized a number of risk factors for breast cancer which includes: early menarche, late menopause, nulliparity, late age at first pregnancy (>30), never breastfeeding a child, use of hormonal contraceptives, hormone therapy after menopause, drinking alcohol, smoking including secondhand smoke, obesity, physical inactivity, diet, and family history of breast cancer (8–10). However, a number of epidemiological studies conducted in different populations indicate that, incidence and mortality of breast cancer greatly vary between countries due to several reasons and variation in the prevalence of underlying

established and probable risk factors is one of those reasons. The incidence of breast cancer for migrants approaches that of their adopted homeland rather than their country of origin, which indicates that environmental and lifestyle factors contribute to the risk of developing breast cancer. However, these exposures associated with breast cancer risk are not certainly the causes of disease; rather, they are risk factors which help to distinguish women at higher risk of the disease (4,8,11–13). Despite a geographic variation in breast cancer risk and increased incidence of breast cancer in developing countries like Ethiopia, there are limited studies conducted on risk factors of breast cancer.

1.2. Statement of the Problem

Breast cancer is the most common problem and it is the driving cause of cancer-related death in women worldwide. In spite of the fact that breast cancer overwhelmingly happens in developed nations, these days its burden is expanding in developing nations due to factors such as westernized ways of life and urbanization (3,14–16). In many parts of Africa, the incidence and mortality rate of breast cancer is on the fast increment. While the incidence rate is still lower than other continents, Africa had the highest age-standardized mortality rate (17.3 deaths per 100,000 women annually) associated with breast cancer in the world. The incidence rate of breast cancer is projected to 162,419 new cases in Africa by the year 2030 (17,18).

In Ethiopia breast cancer incidence is rising and has become one of the foremost common cancers, causing high rates of morbidity and mortality currently in the country. The age-standardized incidence rate of breast cancer was 40.6 per 100,000 females (19). According to the Addis Ababa cancer registry, breast cancer incidence has shown a steady yearly growth from around 18 to 160 annual number of new cases between 1997 and 2012 in Addis Ababa, and this incidence has increased to 596 annual number of new cases in 2018 (20).

Some studies showed that, the diagnosis of breast cancer has several impacts including psychological distress of the disease on those affected and their family members, and household income is likely to drop significantly due to missed work and expenses associated with health care costs. Women living in a rural or regional area face issues such as traveling long distances for treatment, staying away from home, and disruption to family life. All these can affect the household budget. This in turn decreases productivity and affect the global economy (21–23). In low-income countries, breast cancer, along with cancers of the mouth and throat, and cervix have the greatest impact on economic costs. Thus, targeted prevention and treatment strategies aimed at preventable forms of cancer not only could save lives but also improve economic development prospects in many nations (24).

Primary prevention offers the greatest public health potential and most cost-effective long-term cancer control program. About 50% of breast cancers could be prevented if a maximal benefit is achieved through prevention programs and lifestyle modification is one of the breast cancer prevention components. However, adequate information is not available to validate specific

lifestyle modification programs especially from low and middle-income countries (LMICs) (9,25,26).

A study conducted in Africa on the management of breast cancer suggests that, there is a gap of research in LMICs, and research priorities should include exploring lifestyle changes and hormonal influences (27). Although the reduction of mortality from breast cancer might be achieved through improved early detection and treatment, primary prevention is the most cost-effective strategy of burden reduction. However, effective programs to prevent the onset of breast cancer have not been a priority for the health systems in Ethiopia and there is a lack of awareness on risk factors of cancer (23).

Moreover, African countries including Ethiopia, cannot adapt with the expanding incidence rates of breast cancer due to inappropriate treatment strategies in place and economic barriers. As a result, African countries should focus on preventive strategies through appropriate identification and exposure reduction to established risk factors. However, in this region, there is limited available local evidence to support in and verify the key risk factors involved and the level of risk they pose. Therefore, local studies should be introduced to identify the risk factors clearly in a local context which are playing a role in the rising incidence of breast cancer in sub-Saharan Africa. This in turn will inform the prioritization of interventions in the context of scarce resources (17,28). To my knowledge, there were no previous studies conducted on risk factors of breast cancer in our country. Hence, the main aim of this study is to identify the local risk factors involved for the increasing burden of the disease in the country to implement cost-effective strategies to prevent the disease and reducing its burden.

1.3. Justification

In Ethiopia, breast cancer is the first most frequently occurring cancer and it is the leading cause of morbidity and mortality in the country. It has several impacts on the affected person, family, and the country as a whole. As Ethiopia is one of the developing countries, it is a big challenge for the country to manage cases effectively due to economic barriers. A number of epidemiological studies conducted in different populations indicate that, incidence and mortality of breast cancer greatly vary between countries. And also, there is a variation of established and probable risk factors of breast cancer with geographic disparities. Due to this, identifying the local risk factors of breast cancer will contribute to the prioritization of interventions. Although primary intervention is an effective strategy to reduce the disease burden in a cost-effective manner, effective programs to prevent the onset of breast cancer have not been a priority for the health systems and there is a lack of awareness on risk factors of cancer. In our country, there were no previous studies conducted to determine local risk factors of breast cancer. Therefore, the finding of this study will contribute to the knowledge gap in this area.

1.4. Significance of the Study

The rationale behind this study was to assess the risk factors of breast cancer in TASH and SPHMMC. The finding of the study will help better understand the characteristics of local risk factors of breast cancer which in turn provide local stakeholders and non-governmental organizations (NGOs) with relevant information for future planning and interventions to provide effective breast cancer prevention strategies. It also helps health care providers to identify women with increased risk of breast cancer, to give accurate information for women regarding the risk of developing breast cancer and promoting behavioral modification related to risk factors which could be reflected in reducing the burden of the disease. In addition, it will provide further baseline information for other researchers who want to study on related topics.

2. LITERATURE REVIEW

2.1. Socio demographic factors

A case-control study conducted in Iran between December 2012 and September 2013 among 420 women (140 cases and 280 controls) suggested that secondary level of education (odds ratio (OR) 4.7, 95% confidence interval (CI) 2.11-10.83), was associated with a significantly increased risk of breast cancer (29).

In a case-control study of 432 female participants (214 cases and 218 controls) at Makkah region of Saudi Arabia between 2014 and 2016, being unemployed (OR 6.56, 95% CI: 3.83–11.37) and having a primary level of education (OR 58.56, 95% CI: 16.9– 202.82) had an increased positive association with breast cancer (30).

A case-control study conducted in Bangui in 2017 among 174 cases of breast Cancer and 348 age-matched controls showed that, women with breast cancer were more likely to have attained little or no education (OR 11.23, 95% CI: 4.65–27.14 and OR 2.40, CI: 1.15–4.99 respectively), and the odds of breast cancer were 2.09 times higher with a 95% CI of 1.18–3.71 among married women compared with singles. Decreased odds of breast cancer were associated with being employed (OR 0.32, 95%CI: 0.19–0.56), and living in urban areas (OR 0.16, 95% CI: 0.07–0.37) (31).

A similar study conducted in Dakar among 212 women with breast cancer and 424 control women in 2015 revealed a significant increase in breast cancer among illiterate women compared to educated women (OR 1.27, CI: 1.02-1.58) in premenopausal women and those without occupation (32).

A case-control study was conducted in Cameroon in 2015 and 105 patients with breast cancer were compared to 210 women who did not have breast cancer. The socio-demographic factors found to be significant were widowhood (OR 3.45, CI: 1.7-6.9), monthly income level < 86 US dollars (OR 2.19, CI: 1.31-3.65) and primary education level (OR 2.11, CI: 1.25-3.56). A higher level of education (OR 0.36, CI: 0.18 - 0.73) was associated with decreased odds of breast cancer (33).

2.2. Behavioral factors

A case-control study was conducted in Brazil from August 2014 to January 2018. There were 197 participants diagnosed with breast cancer and 344 control individuals. The results of the study showed that, sedentary behavior (OR 2.08; 95% CI: 1.12–3.85 and OR 1.81; 95% CI: 1.12–2.94) were associated with breast cancer risk in pre- and postmenopausal women respectively (34).

Similarly, a case-control study conducted in Vietnam among 269 women with breast cancer and 519 age-matched controls in 2015 revealed that, there was an increased risk of developing breast cancer with no engagement in physical activities (OR, 2.2; $p=0.04$) in premenopausal women (35).

A case-control study compared the dietary patterns of 233 breast cancer patients and 236 age-matched controls of Taiwanese women between 2010 and 2013. Meat and processed-meat patterns were significantly associated with breast cancer risk (OR 2.25, 95% CI: 1.69–2.98; OR 1.56, 95% CI: 1.14–2.13 respectively). A vegetarian diet (OR 0.42, 95% CI: 0.27–0.65) was also significantly associated with breast cancer (36).

A case-control study conducted in Satara district, India during year 2009 to 2011 among newly diagnosed 217 cases of breast cancer and equal number of matched controls showed that, the risk of developing breast cancer was 2.1 times in women consuming non-vegetarian diet, and 3.9 times with women consuming extra fat in diet (37).

A case-control study conducted in Iran between December 2012 and September 2013 among 420 women (140 cases and 280 controls) suggested that a high-fat diet (OR 2.76; 95% CI: 1.51–5.04), consumption soft drinks (OR 2.8; 95% CI: 1.9–4.3) and industrially produced juices (OR 2.7; 95% CI: 1.1–6.5) were associated with a significantly increased risk of breast cancer and diet containing sufficient fruit and vegetables (OR 0.22; 95% CI: 0.12–0.39) was associated with decreased risk of breast cancer (29).

2.3. Reproductive factors

From 2010–2013, a case-control study of female breast cancer was conducted (104 cases and 185 controls) among women in the Mariana Islands. Age at first live birth, among parous women, was higher among cases (mean 24.9 years) than controls (mean 23.2 years); with increased breast cancer risk (OR 2.53; 95% CI: 1.04–6.19 for age 30y compared to <20y) (38).

A case-control study was conducted in 2013 in Vietnam among 294 cases and an equal number of controls. Compared to nulliparous women, increasing parity was associated with a significantly decreased risk of breast cancer; that is, for four or more births with an odd ratio of 0.17 (95% CI 0.05–0.63) (39).

Another study conducted in Vietnam among 269 women with breast cancer and 519 age-matched controls in 2015 revealed that, the increased risk of breast cancer was observed with early age at first menstrual period (OR, 2.1; $p=0.001$), postmenopausal status (OR, 2.5; $p < 0.001$), and low number of pregnancies (OR, 2.2; $p < 0.001$) (35).

A case-control study was conducted in India among 105 breast cancer patients 105 controls between 2010 and 2011. Women with late age of menarche (OR 1.79, 95%CI: 0.67-4.90), less duration of menstrual years (OR 0.417 95%CI: 0.21-0.83) and early age at first childbirth between 20-30 (OR 0.24 95%CI: 0.13-0.46) with history of breastfeeding for 1-2 years (OR 0.33, CI: 0.15-0.70) were less likely to have breast cancer (40).

A case-control study conducted at Kyzylorda oblast of Kazakhstan including 114 cases of breast cancer and 196 controls showed that, the odds of breast cancer were 2.67 (95% CI: 1.62-4.40) times higher among women with a history of abortion than women with no history (41).

A case-control study conducted in Iran between December 2012 and September 2013 among 420 women (140 cases and 280 controls) showed that menopausal status (OR 2.54; 95% CI: 1.41-4.59), abortion (OR 2.13; 95% CI: 1.20-3.79), and oral contraceptive use (OR 3.18; 95%CI: 1.80-5.59) were factors associated with a significantly increased risk of breast cancer. Women with history of breastfeeding (OR 0.39, 95% CI: 0.16–0.97) were less likely to have breast cancer than those who never breast fed (29).

Another study comprising 521 women with incident breast cancer and 521 controls among young women in Southern Iran showed that, oral contraceptives usage (OR 1.52, 95% CI: 1.11–2.08), and low parity (OR parity 3 vs. 1–2: 0.33, 95% CI: 0.23–0.49) were related to a higher risk of breast cancer in young women (42).

In a case-control study of 432 female participants (214 cases and 218 controls) at Makkah region of Saudi Arabia between 2014 and 2016, the higher risk was involved in using a hormonal type of contraception (OR 6.78, 95% CI: 3.42–13.44) and beginning one's menstruation cycle at an early age (10 years old or less) increased the risk of breast cancer (OR 5, 95% CI: 1.12–22.29) (30).

A case-control study conducted in Bangui in 2017 among 174 cases of breast Cancer and 348 age-matched controls showed that, the odds of breast cancer is 5.41 (95% CI: 3.47–8.44), times higher among women with a history of abortion than none. Women with breast cancer were more likely to be nulliparous (OR 1.98, 95% CI: 1.12–3.49). Decreased odds of breast cancer were associated with late menarche (OR 0.18, 95% CI: 0.07–0.44), regular menstrual cycles (OR 0.44, 95% CI: 0.23–0.81), hormonal contraceptive use (OR 0.62, 95% CI: 0.41–0.93), and breastfeeding (OR 0.20, 95% CI: 0.04–0.85) (31).

However, a case-control study conducted in Cameroon in 2015 among 105 patients with breast cancer and 210 women who did not have breast cancer revealed that, decreased odds of breast cancer were associated with menopause (OR 0.37; CI: 0.22 - 0.62) and nulliparity (OR 0.46; CI: 0.26 - 0.08) (33).

A case-control study conducted between 2011 and 2012 among indigenous Ugandan women of 113 cases and 237 controls to determine breast cancer risk factors showed that, there was an interaction between age and ever hormonal contraceptive use. The OR of having breast cancer when younger women (<50 years) were compared to older ones (≥ 50 years), and ever hormonal contraceptive use to never use, was 0.13 (95% CI: 0.02- 0.83). These data suggest that in women aged ≥ 50 years, the risk for breast cancer in the group that had ever used hormonal contraceptives was significantly lower than in the group that had never used them (43).

A case-control study consisting of a total of 237 cases of breast cancer and 237 controls conducted in Morocco between January 2014 and April 2015 revealed that, women who reached menarche at age 13 years had a significantly higher risk of breast cancer, compared with women who reached menarche after age 13 years (OR 1.60, 95% CI: 1.08-2.38). Nulliparous women had a significantly higher risk of breast cancer compared with parous women (OR 3.77, 95% CI: 1.98-7.30). Women who were younger than 20 years at their first full-term pregnancy had a significantly lower risk of developing breast cancer, compared with women who were older than 20 years at their first full-term pregnancy (OR 0.41, 95% CI: 0.25-0.65) (44).

2.4. Biological factor

A matched case-control study involving 1489 patients with breast cancer and 1489 controls conducted between 2012 and 2013 in Han Chinese women showed that, family history was significantly related to breast cancer with OR of 2.418 (95% CI, 1.361– 4.294) (12).

A hospital-based case-control study comprising 521 women with incident breast cancer and 521 controls among young women in Southern Iran showed that, family history (OR: 1.61, 95% CI, 1.07–2.42) was related to a higher risk of developing breast cancer in younger women. There was no association between body mass index(BMI) and breast cancer risk in this study (42).

A case- control study conducted in Satara district, India during the year 2009 to 2011 among newly diagnosed 217 cases of breast cancer and an equal number of matched controls showed that, the risk of developing breast cancer was 2.38 times higher in overweight women (37).

A case-control study conducted in 2015 in Aristide Le Dantec Teaching Hospital in Dakar among 212 women with breast cancer and 424 control women showed that, breast cancer risk was significantly greater in women with a family history of the disease (OR 2.12, 95% CI, 1.35-3.3) (32).

2.5. Conceptual framework

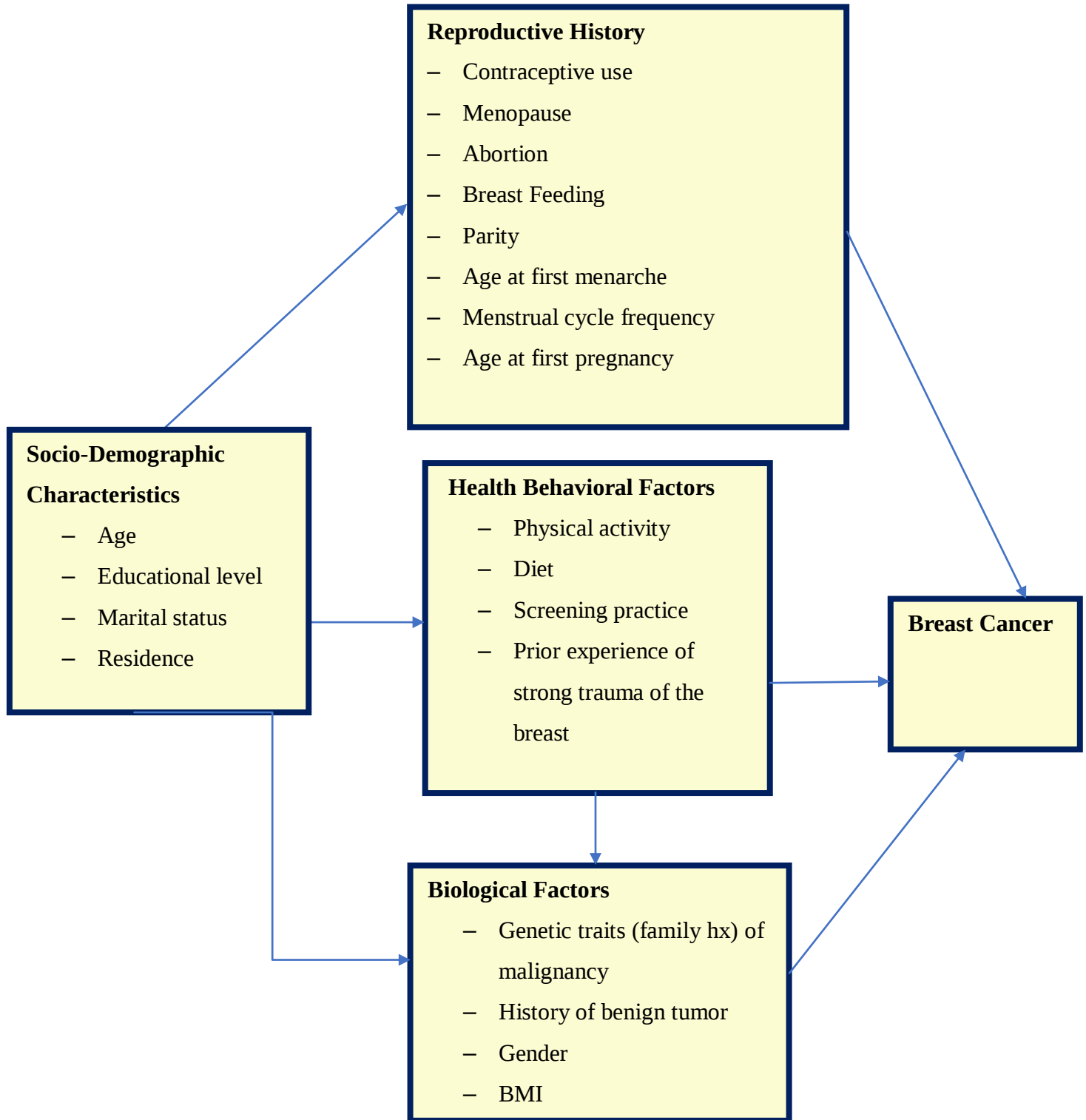


Figure 1. Conceptual framework of breast cancer risk factors (adapted from Hosseinzadeh, 2014 and Prihartono, 1995)

3. OBJECTIVES

3.1. General objective

To assess risk factors of breast cancer among patients attending Tikur Anbessa Specialized Hospital and St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, 2019/20.

3.2. Specific objectives

- To identify reproductive risk factors of breast cancer among patients attending Tikur Anbessa Specialized Hospital and St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, 2019/20.
- To determine behavioral risk factors of breast cancer among patients attending Tikur Anbessa Specialized Hospital and St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, 2019/20.
- To identify biological risk factors of breast cancer among patients attending Tikur Anbessa Specialized Hospital and St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, 2019/20.

4. METHODOLOGY

4.1. Study Area and Period

The study was conducted at TASH and SPHMMC, Addis Ababa, Ethiopia from February 16th to April 15th, 2020. TASH is found in Addis Ababa City, Lideta Sub City. The Hospital currently had 900 beds of which 35 were devoted to oncology patients (45). According to the registry in the unit, more than 972 new breast cancer cases were seen in this hospital per year (source: unpublished HMIS data from TASH adult oncology outpatient and inpatient abstract register book of 2019/20). In TASH oncology unit there were five senior oncologists, two palliative care specialists, thirty-three residents, four radiotherapists, three medical physicists, and twenty-three nurses. While SPHMMC is located in Addis Ababa city, Gulele sub city. The inpatient capacity is more than 700 beds. According to the registry in the hospital more than 720 new breast cancer cases were seen annually. In SPHMMC oncology unit there were two senior oncologists, twelve general practitioners and fourteen nurses. This study took place at the daycare oncology units of the two hospitals, and at surgical Out Patient Department (OPD) of SPHMMC and gastrointestinal unit OPD of TASH.

4.2. Study Design

A hospital based unmatched case-control study was conducted.

4.3. Population

4.3.1. Source population

Cases: All histologically confirmed breast cancer patients attending TASH and SPHMMC

Controls: All non-cancer cases attending TASH and SPHMMC

4.3.2. Study population

Cases: A selected new breast cancer patients attending TASH and SPHMMC daycare oncology units during the study period

Controls: A selected non-cancer patients attending TASH and SPHMMC OPD during the study period

4.4. Eligibility Criteria

4.4.1. Inclusion criteria

Cases: - New cases of breast cancer diagnosed within the past 12 months

- Age 18 years and older
- Female

Controls: - Non cancer patients

- Age 18 years and older
- Female

4.4.2. Exclusion criteria

Cases: - Recurrent breast cancer patients

- Those patients who had cancer from another site and disseminated to the breast
- Critically ill and mentally handicapped patients

Controls: - Relatives of cases

- History of neoplastic disease

4.5. Sample Size Determination

The sample size was calculated using double population proportion formula for five different variables (educational status, radiation exposure, abortion, nulliparity, and family history) using Epi-Info version 7.2 by assuming 95% level of confidence, 80% power, and one to one ratio of controls to case (1:1); and then the larger sample size was taken. The maximum sample size was obtained by considering a family history of breast cancer with an odd ratio of 2.12 from a previous study in Dakar (32). Accordingly, these yield a maximum sample size of 124 cases and 124 controls. Adding a 10% non-response rate, the final sample size required for the study is 136 cases and 136 controls with a total sample size of 272.

Table 1. Summary of sample size calculation based on five variables

Major Risk factors	Odds Ratio	95% CI	Cases	Controls	Total sample size
1. Family history	2.12	1.35–3.3	124	124	<u>248</u>
2. Abortion	5.41	3.47–8.44	120	120	240
3. Educational level	2.4	1.15–4.99	107	107	214
4. Nulliparity	3.77	1.98–7.3	44	44	88
5. Radiation exposure	8.21	5.04–13.38	22	22	44

4.6. Sampling Procedure

In this study, cases and controls were selected by a systematic random sampling method. Controls were selected from the surgical OPD at SPHMMC and gastrointestinal unit OPD at TASH. These units were selected randomly. Since the duration of the study was two months, the calculated flow within these days was 872 for surgical and 614 for GI unit and the required sample size was 80 and 56 respectively. Therefore, “K” was 11 for both. Based on a systematic random sampling technique every 11th study participants were enrolled in the study for the control group during the data collection period. On the other hand, for the selection of cases, the calculated flow of new breast cancer patients was 162 and 120 at the oncology units of TASH and SPHMMC respectively during the study period. Therefore, the proportional sample size was 78 at TASH and 58 at SPHMMC. The calculated “K” value was 2 for the selection of cases.

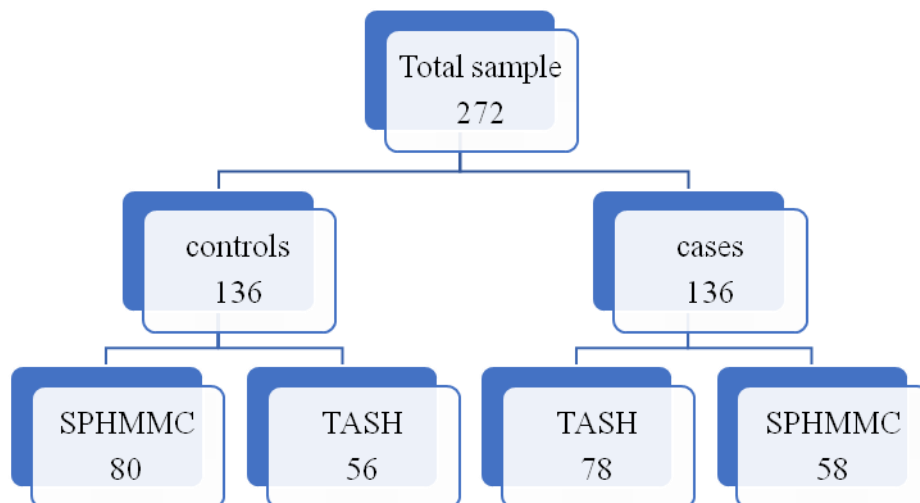


Figure 2. Diagrammatic representation of recruitment of participants

4.7. Data Collection Tool and Procedure

Data was collected from the respondents by an interviewer-administered questionnaire which was adapted from published literatures with modification (43,46). It includes the information about socio-demographic characteristics (age, residence, educational status, marital status, occupation, monthly income), behavioral factors (physical activity, diet, screening practice, history of trauma), reproductive history (contraceptive use, age at menarche and menopause, menstrual regularity, history of abortion, breastfeeding, age at first pregnancy, and number of pregnancy), and biological factors (history of benign tumor, family history of breast cancer, BMI). The English version of the questionnaires was translated into Amharic version and the translated Amharic version was translated back to English to ensure its consistency. The interview was conducted at oncology units of TASH and SPHMMC for the cases and at surgical unit of SPHMMC and gastrointestinal unit of TASH for the controls. Data was collected by four trained nurses for two days. The entire data collection period was supervised by one trained health professional and the principal investigator.

4.8. Study Variables

4.8.1. Dependent variable

Breast cancer

4.8.2. Independent variables

Socio-demographic factors

- Age
- Education level
- Areas of residence
- Marital status

Reproductive factors

- Age at first menarche
- Menstrual cycle frequency
- Age at first live birth
- Abortion
- Parity
- Number of children
- Breastfeeding
- Menopausal status
- Use of hormones (hormonal replacement therapy or contraceptive pills)

Health behavioral factors

- Diet
- Exercise
- Screening practice
- Trauma to breast

Biological factors

- History of benign tumor
- Family history
- BMI

4.9. Data Quality Assurance

Before the actual data collection pretest was done on 5% of the sample size at Zewditu Memorial Hospital by the principal investigator which was not included in the actual study. During the pretest, problems with clarity and relevance in the instrument were addressed. To ensure the data quality, the data collectors were provided training on the objective of the study, contents of the questionnaires, when to start and end the data collection process, how to select the participants, whom to include and exclude and how to maintain confidentiality of the study subjects. Supervisor had answered problems, assessed the completeness and consistency of the data.

4.10. Data Analysis Procedures

The collected data was coded, checked and entered into Epi data version 4.6. It was cleaned and edited accordingly and exported to SPSS version 25 for analysis and checked for missing values before analysis. Descriptive statistics including frequencies and proportions were employed. The analysis findings were presented using tables, figures, and graphs. Bivariate and multivariate logistic regression was used to measure the association of covariate with the outcome variable. The result of the final model was expressed in terms of OR and 95% CI and statistical significance was declared for the p-value of less than 0.05.

4.11. Ethical Consideration

Ethical clearance was obtained from ethical clearance committee of Addis Ababa University, College of health sciences, school of nursing and midwifery, department of nursing. After receiving ethical clearance, permission to conduct the research was obtained from TASH and SPHMMC. A verbal informed consent was obtained from all eligible participants, their participation was fully voluntary. The name of the participants was omitted from the questionnaire; instead, code numbers were used to confirm confidentiality.

4.12. Dissemination of the Result

The study result will be submitted to Addis Ababa University College of health science department of nursing and midwifery and it will be disseminated to TASH and SPHMMC. Furthermore, the paper will be presented in workshops, seminars. Finally, the manuscript will be submitted to scientific journals for possible publication.

4.13. Operational Definition

Case: Women diagnosed with a histologically confirmed breast cancer

Control: women with no history of neoplastic disease

Early menarche: women who have seen their first menstruation before the age of 12 years

Late menopause: when a women enters menopause at 55 years or older

Late parity: women who have given their first birth after the age of 30 years

Sufficient fruit: 2-3 serving of fruits per day

- 1 serving of fruit = 1 medium sized fruit

Sufficient vegetable: 3 serving of vegetable per day

- 1 serving of vegetable = half a cup of cooked vegetables or one cup of raw vegetables

High fat diet: daily consumption of fried food, animal fat and dairy product

Physically active: -150 minutes of moderate-intensity physical activity per week or

- 75 minutes of vigorous-intensity physical activity per week

- Sedentary: - work that involve sitting only with minimal walking
- Light physical activities: - activities that require minimal effort
- Moderate physical activities: - activities that are not exhausting, that increase the heart rate slightly and that may cause some light perspiration
- Vigorous physical activities: - activities that increase the heart rate and cause heavy perspiration

5. RESULTS

5.1 Socio Demographic Characteristics

A total of 136 breast cancer patients and 136 controls were participated in the study. The mean (+SD) age of the participants was 42.7($\pm$ 11.3) and 40.7($\pm$ 14.6) for cases and controls respectively. From the total participants, 78(57.4%) cases and 56(41.2%) controls were recruited from TASH, while 58(42.6%) cases and 80(58.8%) controls were from SPHMMC. Majority 115(84.6%) of cases and 131(96.3%) controls came from urban areas. Among these, more than half (59.6%) of the cases and 108(79.4%) controls came from Addis Ababa. From the total study participants, 43(31.6%) cases and 51(37.5%) controls had graduate and above educational level. Regarding the respondent's marital status, nearly 3/4th 97(71.3%) of cases and 80(58.8%) controls were married. From the total participants, more than 56.6%of cases and 83(61.0%) controls were unemployed while 59(43.4%) cases and 53(39.0%) controls were employed (Table 2).

Table 2. Socio-demographic characteristics of cases and controls at TASH and SPHMMC Addis Ababa, Ethiopia, 2020.

Variables	Cases n(%)	Controls n(%)	Subtotal n(%)
Place of residence			
Urban	115(84.6)	131(96.3)	246(90.4)
Rural	21(15.4)	5(3.7)	26(9.6)
Region			
Addis Ababa	81(59.6)	108(79.4)	189(69.5)
Oromia	31(22.8)	21(15.4)	52(19.1)
Amhara	11(8.1)	5(3.7)	16(5.9)
Others	13(9.6)	2(1.5)	3(1.1)
Educational Status			
No formal education	31(22.8)	22(16.2)	53(19.5)
Tenth grade complete or below	41(30.1)	44(32.4)	85(31.2)
Pre-university complete or below	21(15.4)	19(14.0)	40(14.7)
Graduate or post graduate and above	43(31.6)	51(37.5)	94(34.6)
Marital status			
Married	97(71.3)	80(58.8)	177(65.1)
Widowed	11(8.1)	16(11.8)	27(9.9)
Divorced	11(8.1)	7(5.1)	18(6.6)
Single	17(12.5)	33(24.3)	50(18.4)
Family monthly income			
≤ 1000	23(24.2)	24(25)	47(24.6)
1001-1999	7(7.4)	8(8.3)	15(7.9)
≥ 2000	65(68.4)	64(66.7)	129(67.5)

5.2. Behavioral Factors

From the total participants, most of the cases 118(86.8%) and 123(90.4%) controls conduct household activities. Among this, 50(42.4%) cases and 48(39.0%) controls conduct moderate intensity household activities. Regarding working hour among employed participants, the mean working hour per week of cases and controls was 48.3(± 17) and 47.6(± 16.7) respectively. Regarding physical activities, most of the cases 116(85.3%) and controls 117(86.0%) didn't conduct physical exercise. Almost all of the cases 70(97.2%) and controls 110(99.1%) eat less than one serving of fruits per day. Similarly, majority of cases 95(99.0%) and controls 115(89.8%) eat less than one serving of vegetables per day. However, there was statistically significant difference between the two groups in vegetable intake ($X^2=7.778$, $p=0.005$). Regarding exposure to smoked meat, 62(45.6%) cases and 42(30.9%) controls were exposed (Table 3).

There was a statistically significant association between case and control groups in exposure to packed food or drinks ($X^2=6.233$, $P=0.013$). From the total participants, 44(32.4%) cases and 26(19.1%) controls use packed food or drinks while 92(67.6%) cases and 110(80.9%) controls do not use (figure 3). Majority of the participants both in the case 129(94.9%) and control 133(97.8%) group have no history of trauma to breast (Table 3).

Use of packed food or drinks

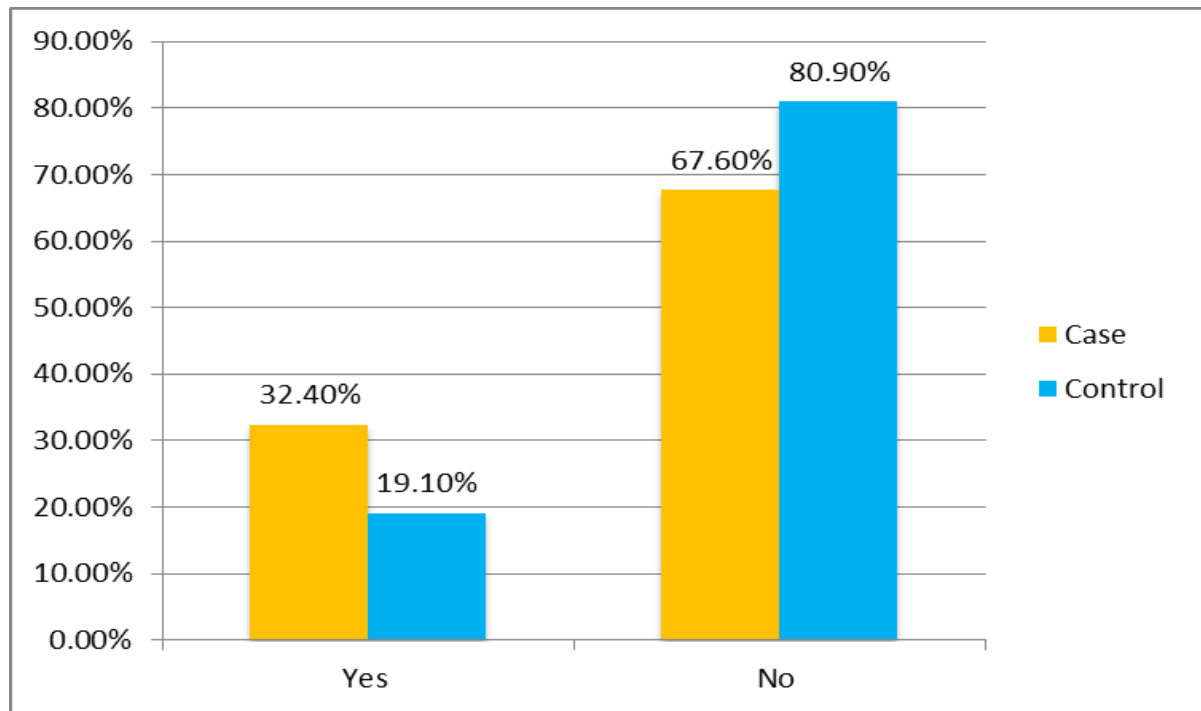


Figure 3. Use of packed food or drinks among cases and controls at TASH and SPHMMC Addis Ababa, Ethiopia, 2020.

Table 3. Behavioral factors among cases and controls at TASH and SPHMMC Addis Ababa, Ethiopia, 2020.

Variables	Cases n(%)	Controls n(%)	Subtotal n(%)	Chi square	P value
Household activities				0.910	0.340
Yes	118(86.8)	123(90.4)	241(88.6)		
No	18(13.2)	13(9.6)	31(11.4)		
Type of household activities				4.531	0.210
Sedentary	2(1.7)	3(2.4)	5(2.1)		
Light	46(39.0)	38(30.9)	84(34.9)		
Moderate	50(42.4)	48(39.0)	98(40.7)		
Heavy	20(16.9)	34(27.6)	54(22.4)		
Occupation for at least 6 months				0.598	0.439
Yes	94(69.1)	88(64.7)	182(66.9)		
No	42(30.9)	48(35.3)	90(33.1)		
Intensity of activity of occupation				4.064	0.255
Sedentary	32(34.0)	22(25.0)	54(29.7)		
Light	9(9.6)	8(9.1)	17(9.3)		
Moderate	21(22.3)	31(35.2)	52(28.6)		
Heavy	32(34.0)	27(30.7)	59(32.4)		
Physical activity				0.030	0.863
Yes	20(14.7)	19(14.0)	39(14.3)		
No	116(85.3)	117(86.0)	233(85.7)		
Intensity of exercise				0.027	0.987
Light	10(50.0)	9(47.4)	19(48.7)		
Moderate	8(40.0)	8(42.1)	16(41.0)		
Heavy	2(10.0)	2(10.5)	4(10.3)		
Fruit intake per week				0.954	0.329
≤ 7	70(97.2)	110(99.1)	180(98.4)		
> 7	2(2.8)	1(0.9)	3(1.6)		
Vegetable intake per week				7.778	0.005
≤ 7	95(99.0)	115(89.8)	210(93.8)		
> 7	1(1.0)	13(10.2)	14(6.2)		
Exposure to smoked meat				6.227	0.013
Yes	62(45.6)	42(30.9)	104(38.2)		
No	74(54.4)	94(69.1)	168(61.8)		
High fat diet				1.255	0.263
Yes	38(27.9)	30(22.1)	68(25.0)		
No	98(72.1)	106(77.9)	204(75.0)		
History of trauma to breast				1.661	0.197
Yes	7(5.1)	3(2.2)	10(3.7)		

No	129(94.9)	133(97.8)	262(96.3)		
Ever had a mammogram				2.369	0.124
Yes	8(5.9)	3(2.2)	11(4.0)		
No	128(94.1)	133(97.8)	261(96.0)		
Breast self-examination				0.015	0.902
Yes	55(40.4)	54(39.7)	109(40.1)		
No	81(59.6)	82(60.3)	163(59.9)		

5.3. Reproductive Factors

There was a statistically significant difference between case and control groups in age at menarche ($X^2=12.390$, $p=0.002$). From the total participants, nearly half 54(48.2%) of the cases and about 2/3 of controls 81(64.3%) had seen their first menstrual period between the age of 13-15 years. While 35(31.2%) cases and 16(12.7%) controls had seen their first menstrual period before the age of 12 and 23(20.5%) cases and 29(23.0%) controls after the age of 16 (figure 4).

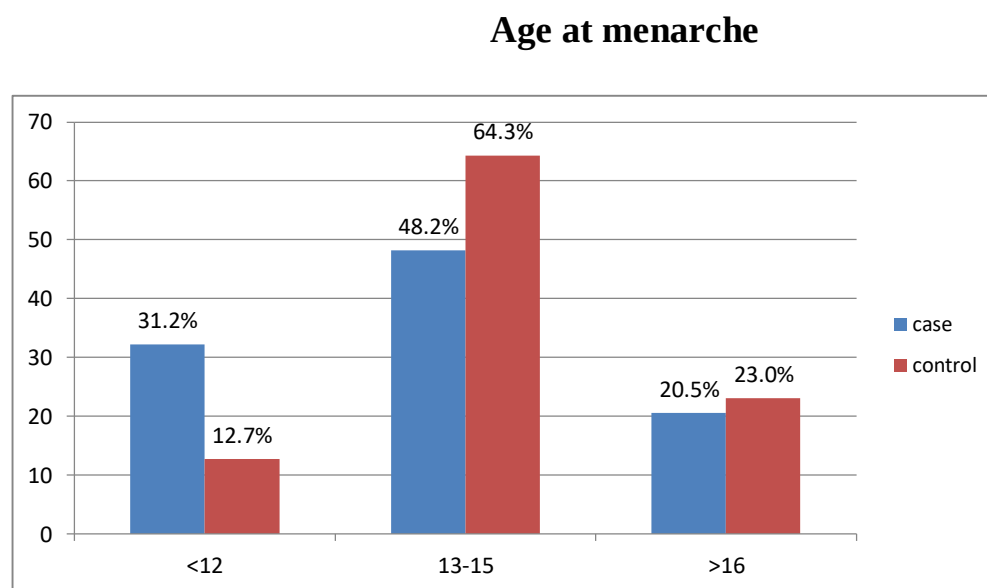


Figure 4. Age at menarche of cases and controls at TASH and SPHMMC Addis Ababa, Ethiopia, 2020.

Majority of cases and controls had regular menstrual period 109(80.1%), 120(88.2%) respectively. From the total of menopausal women, about 2/3 of cases (63.1%) and controls 35(68.6%) had menopause before the age of 45. From the total participants, 60(44.1%) cases and 53(39.0%) controls had history of using contraceptives. Among this, nearly half (47.5%) of the cases and 21(39.6%) controls used OCP, 35(57.4%) cases and 23(43.4%) controls used Depo provera, eight(13.1%) cases and nine(17.0%) controls used Implant, seven(11.5%) cases and nine(17.0%) controls used IUCD, while two(3.3%) cases and two(3.8%) controls used emergency contraceptives.

There was a statistically significant difference between cases and controls in parity ($X^2=7.190$, $p=0.007$). Majority of cases 107(78.7%) and more than half of controls 87(64.0%) were parous. Among the parous women, the mean number of children for the cases was $2.71(\pm 1.85)$ while for the controls $3.21(\pm 2.15)$. A total of 43(43%) cases have given their first birth between the age of 21-29, while nearly half 40(47.6%) of controls have given first birth before the age of 20. Around two third (67.6%) of the cases and more than 3/4th (77.2%) of controls had no history of abortion. From a total of parous women, majority of cases 91(87.5%) and controls 83(97.6%) had breastfed their children. In addition, there was a statistically significant difference between the two groups in breastfeeding ($X^2=6.591$, $p=0.010$). Regarding duration of breastfeeding among those who breastfed their children, majority of cases 79(86.8%) and controls 75(90.4%) breastfed greater than or equal to 13 months, 10(11.0%) cases and 5(6.0%) controls 7-12 months, while 2(2.2%) cases and 3(3.6%) controls breastfed less than or equal to 6 months (Table 4).

Table 4. Reproductive factors among cases and controls at TASH and SPHMMC Addis Ababa, Ethiopia, 2020.

Variables	Cases n(%)	Controls n(%)	Subtotal n(%)	Chi square	P value
Menstrual period regularity				3.342	0.068
Yes	109(80.1)	120(88.2)	229(84.2)		
No	27(19.9)	16(11.8)	43(15.8)		
Menopausal status				2.946	0.086
Premenopausal	71(52.2)	85(62.5)	156(57.4)		
menopausal	65(47.8)	51(37.5)	116(42.6)		
Age at menopause				1.888	0.389
≤ 45	41(63.1)	35(68.6)	76(65.5)		
46-54	24(36.9)	15(29.4)	39(33.6)		
≥ 55	0(0.0)	1(2.0)	1(0.9)		
Use of contraceptives				0.742	0.389
Yes	60(44.1)	53(39.0)	113(41.5)		
No	76(55.9)	83(61.0)	159(58.5)		
Duration of contraceptive use in years				1.292	0.256
≤ 4	27(45.0)	29(55.8)	56(50.0)		
> 4	33(55.0)	23(44.2)	56(50.0)		
Parity				7.190	0.007
Parous	107(78.7)	87(64.0)	194(71.3)		
Nulliparous	29(21.3)	49(36.0)	78(28.7)		
Age at first live birth				2.909	0.234
≤ 20	36(36.0)	40(47.6)	76(41.3)		
21-29	43(43.0)	32(38.1)	75(40.8)		
≥ 30	21(21.0)	12(14.3)	33(17.9)		
History of abortion				3.111	0.078
Yes	44(32.4)	31(22.8)	75(27.6)		
No	92(67.6)	105(77.2)	197(72.4)		
Breastfeeding				6.591	0.010
Yes	91(87.5)	83(97.6)	174(92.1)		
No	13(12.5)	2(2.4)	15(7.8)		

5.4. Biological Factors

Among the study participants, 107(78.7%) cases and 118(86.8%) controls have no family history of cancer while, 29(21.3%) cases and 18(13.2%) controls had family history of cancer. From those who had family history, 16(55.2%) cases and 12(66.7%) controls have history of cancer in their first-degree relatives. Regarding the type of cancer in the family, 18(62.1%) cases and six (33.3%) controls have history of breast cancer in their families. Majority of participants among cases 75(65.8%) and controls 74(70.5%) have a BMI of less than or equal to 24 (Table 5).

Table 5. Biological factors among cases and controls at TASH and SPHMMC Addis Ababa, Ethiopia, 2020.

Variables	Cases n(%)	Controls n(%)	Subtotal n(%)	Chi square	P value
History of benign tumor				8.192	0.004
yes	23(16.9)	8(5.9)	31(11.4)		
No	113(83.1)	128(94.1)	241(88.6)		
Family history of cancer				3.112	0.078
Yes	29(21.3)	18(13.2)	47(17.3)		
No	107(78.7)	118(86.8)	225(82.7)		
BMI				0.823	0.663
≤ 24	75(65.8)	74(70.5)	149(68.0)		
25-29	31(27.2)	23(21.9)	54(24.7)		
≥ 30	8(7.0)	8(7.6)	16(7.3)		

5.5. Factors Associated with Breast Cancer

Bivariate and multivariate analysis was performed between breast cancer (dependent variable) and socio-demographic, behavioral, reproductive and biological factors (independent variables).

According to univariate logistic regression analysis of sociodemographic variables, place of residence, educational status, and marital status were significantly associated with breast cancer. However, only place of residence remains significantly associated with breast cancer in multivariate logistic regression. It was found that the risk of breast cancer was lower by 90% among women who were living in urban areas than those living in rural areas. (AOR=0.1; 95% CI (0.016-0.712)).

Similarly, several behavioral risk factors were significantly associated with breast cancer in univariate logistic regression analysis. This includes exposure to smoked meat, use of packed food or drinks, history of trauma to breast, exposure to radiation, and history of mammogram examination. However, only use of packed food or drink remains significantly associated with breast cancer in multivariate logistic regression. It was found that women who have used packed food or drink were 4.4 times more likely to have breast cancer than those who have never used. (AOR=4.4; 95% CI (1.481-13.218)).

In addition to the socio-demographic and behavioral factors, various reproductive factors were found significantly associated with breast cancer in univariate logistic regression analysis. These were age at menarche, menstrual period regularity, menopausal status, number of children, age at first live birth, history of abortion and breastfeeding. However, in multivariate logistic regression, age at menarche and number of children remained significantly associated with breast cancer. In multivariate analysis, it was found that women who have seen their first menstrual period before the age of 12 had 7.9 times higher risk of developing breast cancer than those who have seen after the age of 12. (AOR=7.9; 95% CI (1.959-31.905)). For one unit increase in the number of children there was a 20% reduction in the risk of having breast cancer (AOR=0.750; 95%CI 0.567-0.992).

Table 6. Bivariate and multivariate logistic regression analysis of variables associated with breast cancer at TASH and SPHMMC Addis Ababa, Ethiopia, 2020.

Variables	Crude OR	95%CI for crude OR	P value	Adjusted OR	95% CI for Adjusted OR	P value
Place of residence						
Urban	0.209	0.076-0.572	0.002	0.108	0.016-0.712	0.021
Rural						
Exposure to smoked meat						
Yes	0.514	0.289-0.914	0.023	0.551	0.208-1.461	0.231
No						
Use of packed food or drinks						
Yes	2.023	1.158-3.536	0.013	4.424	1.481-13.218	0.008
No						
Age at menarche						
≤ 12	2.758	1.232-6.174	0.014	7.906	1.959-31.905	0.004
13-15	0.841	0.440-1.605	0.599	1.094	0.428-2.794	0.851
≥ 16						
Menstrual period regularity						
Yes						
No	1.858	0.950-3.633	0.070	0.941	0.313-2.833	0.914
Menopausal status						
Premenopausal	0.655	0.404-1.063	0.087	0.653	0.267-1.596	0.350
menopausal						
Number of children	0.882	0.763-1.019	0.089	0.750	0.567-0.992	0.043
Age at first live birth						
≤ 20						
21-29	1.493	0.786-2.837	0.221	1.013	0.388-2.644	0.979
≥ 30	1.944	0.839-4.505	0.121	1.035	0.310-3.456	0.955
History of abortion						
Yes	1.620	0.946-2.775	0.079	1.249	0.544-2.870	0.600
No						

6. DISCUSSION

Identification of breast cancer risk factors in the local context is very crucial in the early diagnosis and prevention of breast cancer. Among the several risk factors which have been assessed by this study, living in urban areas, and having larger number of children were associated with decreased risk of breast cancer, while early onset of menarche and use of packed food or drink were found to be significant risk factors for breast cancer.

In this study, place of residence has a significant effect to breast cancer. The study showed that, the odds of breast cancer were 0.9(90%) times lower among women who were living in urban areas than those living in rural areas (AOR=0.1; 95% CI (0.016-0.712)). This is consistent with a case-control study conducted in Bangui which showed that, decreased odds of breast cancer were associated with living in urban areas (OR 0.16, 95% CI: 0.07–0.37) (31). This might be due to higher educational status, better health services and better awareness of risk factors in urban areas.

According to this study, women who have used packed food or drink were 4.4 times more likely to have breast cancer than those who have never used. (AOR=4.4; 95% CI (1.481-13.218)). Similarly, a case-control study conducted in Iran suggested that, consumption soft drinks (OR 2.8; 95% CI; 1.9-4.3) and industrially produced juices (OR 2.7; 95% CI; 1.1-6.5) were associated with a significantly increased risk of breast cancer (29). A case-control study conducted in Taiwan compared the dietary patterns of 233 breast cancer patients and 236 age-matched controls. Accordingly, meat and processed-meat patterns were significantly associated with breast cancer risk (OR 2.25, 95% CI: 1.69–2.98; OR 1.56, 95% CI: 1.14–2.13 respectively) (36). However, in this study the variables did not show significant association with breast cancer. This might be due to variation in economic conditions and eating habits of the two populations.

According to the present study, the odds of breast cancer increase by 7.9 among women with early menarche before the age of 12 (AOR=7.9; 95% CI (1.959-31.905). This finding is consistent with a case-control study conducted in India between 2010 and 2011, and a similar study in Morocco between January 2014 and April 2015 with (OR 1.79, 95%CI: 0.67-4.90) and (OR 1.60, 95%CI: 1.08-2.38) respectively (40, 44). This might be due to longer duration of

exposure to endogenous estrogens. However, in a case-control study conducted in 2013 in Vietnam, age at menarche was not associated with increased breast cancer risk (39).

A case-control study consisting of a total of 237 cases of breast cancer and 237 controls conducted in Morocco between January 2014 and April 2015 revealed that, nulliparity was a significant risk for breast cancer. On the other hand, early age at first live birth was associated with decreased risk (44). Similarly according to the case-control study conducted in India between 2010 and 2011, women with age at first childbirth between 20-30 with history of breastfeeding for 1-2 years were less likely to have breast cancer (40). However, in the present study, parity, age at first live birth and history of breastfeeding did not show significant association with breast cancer. This difference might be due to higher prevalence of breastfeeding and early age at first birth in our country.

This study revealed that, for one unit increase in number of children there is a 20% decreased risk of breast cancer (AOR=0.750; 95%CI 0.567-0.992). Similarly, a case control study conducted in Vietnam showed that, increasing parity was associated with a significantly decreased risk of breast cancer; that is, for four or more births with an odd ratio of 0.17 (95% CI 0.05–0.63) (39). Another study conducted in southern Iran showed that, low parity (OR parity 3 vs. parity 1–2: 0.33, 95% CI: 0.23–0.49) was related to a higher risk of breast cancer in young women (42).

In a case-control study at Makkah region of Saudi Arabia between 2014 and 2016, the higher risk of breast cancer was observed in using a hormonal type of contraception (OR 6.78, 95%CI: 3.42–13.44) (30). Nevertheless, in a case-control study conducted in Bangui in 2017, decreased odds of breast cancer were associated with hormonal contraceptive use (OR 0.62, 95% CI: 0.41–0.93) and the odds of breast cancer is 5.41 (95% CI: 3.47–8.44) times higher among women with a history of abortion than none (31). Similar observation have also been made by a case-control study conducted at Kyzylorda oblast of Kazakhstan which showed that, the odds of breast cancer were 2.67 (95% CI: 1.62-4.40) times higher among women with a history of abortion than none (41). However, in the present study, either contraceptive use or history of abortion did not show significant association with breast cancer.

The finding of the present study did not show significant association of family history and breast cancer. This finding agrees with a similar study conducted in Vietnam which indicated that, there was no significant association between family history and breast cancer (35). However, a study conducted in Dakar and China showed that, breast cancer risk was significantly greater in women with a family history of the disease with an odd ratio of (OR 2.12, 95% CI, 1.35-3.3) and 2.418 (95% CI, 1.361– 4.294) respectively (12,32). This variation might be due to scarcity of data in the present study area.

7. STRENGTH AND LIMITATION OF THE STUDY

7.1. Strength of the Study

- This study is the first study in Ethiopia and can be used as a baseline for future studies.
- Interviewer administered questionnaires are more reliable and decreased non response rate.

7.2. Limitations of the Study

- This facility-based study is the first to assess the risk factors of breast cancer among women in Ethiopia. However, the findings of this study can only be generalized to women in the study setting.
- This case-control study cannot determine cause and effect.
- The information obtained from study subjects could be subject to recall bias.
- Wide confidence interval is noted in some of the multivariate analysis as a result of small sample size.

8. CONCLUSION AND RECOMMENDATION

8.1. Conclusion

This study assessed the relationship between a number of socio-demographic, behavioral, reproductive, and biological factors and the risk of breast cancer. According to the finding of this study, the risk of acquiring breast cancer was related to early onset of menarche and use of packed food and drinks. Living in urban areas and increased parity were associated with reduced risk of breast cancer. These findings were consistent with reports of different literatures. Therefore, focusing on preventable forms of these risk factors and increasing awareness of the community about the non-modifiable risks to promote early detection is important to reduce the increasing burden of breast cancer in our country.

8.2. Recommendations

For Federal Ministry of Health (FMoH)

- The FMoH should give emphasis on primary prevention of breast cancer based on risk factors and create programs to increase women's knowledge about primary prevention and early detection methods of breast cancer.

For health care providers

- Health care providers should give health education for women regarding the risk of developing breast cancer.
- They should promote behavioral modification related to risk factors of breast cancer and promote breast self-examination.

For future studies

- Future studies with a larger sample size and strong study design is recommended to better understand the local risk factors for breast cancer in our country.

ANNEXS

ANNEX I: References

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ANNEX- II: Questionnaire (English Version)

Information and Consent Form

Research Title: Risk Factors of Breast Cancer among Patients Attending Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia: A Case Control Study

Dear Respondent:

Introduction: My name is _____ and I am one of the data collectors entitled for the study being conducted at Addis Ababa University, School of Nursing and Midwifery. I kindly request you to participate in a study after you have understood the following information sheet.

Purpose of the study: the study aimed to assess risk factors of breast cancer among patients attending Tikur Anbessa Specialized Hospital and St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia. The research proposal has been approved by the Ethical and Review Committee of the Addis Ababa University, School of Nursing and Midwifery.

Role and benefit of participant: Your involvement in the study includes participation in face-to-face interview, which will take approximately 30 minutes. The study has no immediate benefits to the respondents, but will have benefits later in **Prevention of Breast Cancer** in our Country Ethiopia.

Harm of the study: There are no foreseeable physical, psychological or social risks or discomforts involved in participating in this study.

Confidentiality: Confidentiality will be ensured by not using your name or address on the questionnaire and final thesis report.

Rights of the participant: The participation in this study is voluntary; you can also withdraw at any time from the study if you feel uncomfortable. Refusal to participate will not affect your work or care you shall seek at any of the health facilities in any way. During the interview, you can ask questions which are not clear.

If you have any questions about the research or any related matters, please contact the researcher at +251-938121031, Email: lidut12@yahoo.com

Your participation will be greatly appreciated.

Respectfully,

Consent form

I understand the nature of the study, benefits, my right to voluntary participation, confidentiality and withdrawal from the study without any victimization. I have had the opportunity to ask questions and answered to my satisfaction.

I hereby freely consent to take part in this study.

Agreed _____

Don't agree _____

Date_____

Part I. Socio-demographic related questions

s.no.	Questions	Alternatives
1	What is your age?	----- (in Yrs.)
2	Where is your usual place of residence?	1. Urban 2. Rural
3	What is your region?	-----
4	What is your educational status?	1. No formal education 2. Tenth grade complete or below 3. Pre-university complete or below 4. Graduate or post graduate and above
5	What is your current marital status?	1. Married 2. Widowed 3. Divorced/separated 4. Single (never married) 5. Cohabiting (live together)
6	What is/ was your occupation (what kind of work do you mainly do)?	1. House wife 2. Private employee 3. Farmer 4. Government employee 5. Daily laborer

		6. Merchant 7. Student 8. Others (specify)_____										
7	What is your monthly family income in Birr?	-----										
8	Have you ever had a benign tumor?	1. Yes 2. No										
9a	Have your parents, children, brothers, or sisters ever been diagnosed as having any type of cancer?	1. Yes 2. No (skip 9b)										
9b	Please complete this chart for each relative diagnosed with cancer (If you have more than four relatives diagnosed with cancer, please include a separate page with this information)	<table> <tr> <th>Relative</th> <th>type of cancer</th> </tr> <tr> <td>-----</td> <td>-----</td> </tr> <tr> <td>-----</td> <td>-----</td> </tr> <tr> <td>-----</td> <td>-----</td> </tr> <tr> <td>-----</td> <td>-----</td> </tr> </table>	Relative	type of cancer	-----	-----	-----	-----	-----	-----	-----	-----
Relative	type of cancer											
-----	-----											
-----	-----											
-----	-----											
-----	-----											

Part II. Behavioral factors

Please see the following definitions before answering questions 1 and 2

Definition of categories for intensity of activity:

- Sedentary: - work that involve sitting only with minimal walking
- Light physical activities: - activities that require minimal effort
- Moderate physical activities: - activities that are not exhausting, that increase the heart rate slightly and that may cause some light perspiration

- Heavy physical activities: - activities that increase the heart rate and cause heavy perspiration

No.	Questions	Alternatives
1a	Do you conduct household activities?	1. Yes 2. No
1b	If your answer is yes, please specify the type of activities.	1. Sedentary 2. Light 3. Moderate 4. Heavy
1c	How long will it take you to accomplish the activities?	------(hours)

1d. please report about each job or occupation you had for at least 6 months

No.	Type of occupation	No. of days/wk	Working hour/day	Intensity of activity			
				Sedentary	Light	Moderate	Heavy
1							
2							
3							
4							
5							

2. Have you ever done physical activity?

1. Yes

2. No

If your answer is yes, please fill the following table

Type of activity	Frequency per week	Duration of activity in minute	Intensity of activity		
			Light	moderate	heavy

s. no.	Questions	Alternatives
3	How often do you eat fruits?	----- (per week)
4	How often do you eat vegetables?	----- (per week)
5a	Do you eat smoked meat?	1. Yes 2. No
5b	How often do you eat meat that had smoked?	----- (per week)
6a	Do you eat foods high in fat?	1. Yes 2. No (skip 6b)
6b	If yes, how often?	-----
7a	Do you use packed foods or drinks?	1. Yes 2. No (go to 8)
7b	If yes, please specify each	-----
7c	How often do you use packed foods or drinks?	-----

8	Have you ever got previous experience of strong trauma (injury) of the breast?	1. Yes 2. No
9	Have you ever been exposed to radiation?	1. Yes 2. No
10	Have you ever had a mammogram? (for respondent age ≥ 40 only)	1. Yes 2. No
11	Have you ever examined your own breasts?	1. Yes 2. No

Part III. Reproductive factors

s.no.	Questions	Alternatives
1a	At what age did you first begin your menstrual period?	----- years
1b	Is your menstrual period regular?	1. Yes 2. No
1c	Are you still menstruating?	1. Yes (skip 1d and 1e) 2. No
1d	At what age did you experience menopause (absence of menstrual period for more than 1 year)?	----- years
1e	Did you receive any medications because of menopause?	1. Yes 2. No (go to 2)

1f	What type of medicine?	1. Painkiller 2. Female hormones 3. I don't know	
1g	If you answer alternative 2 for question 1f, how many months have you taken female hormones?	-----	
2a	Have you ever (or are you currently) taking contraceptives for birth control?	1. Yes 2. No (skip 2b)	
2b	Please complete this chart	Name of birth control	duration of use
		-----	-----
		-----	-----
		-----	-----
3a	Have you ever been pregnant?	1. Yes 2. No	
3b	If yes, what is the total number of your pregnancies?	-----	
3c	How many children do you have?	-----	
3d	At what age did you have your first live birth?	-----	
3e	Have you ever had an abortion?	1. Yes 2. No	
3f	Have you ever breastfed your children?	1. Yes 2. No (skip 6b and c)	

3g	If yes, how many months do you breastfed?	1 st child----- 2 nd child----- 3 rd child ----- 4 th child----- 5 th child-----
3h	Which sides do you mostly breastfed?	1. Right side 2. Left side 3. Equally/interchangeably

Part IV. Anthropometric measurements

Height (cm) -----

Weight (Kg) -----

Thank you very much for your participation!!!

ANNEX III AMHARIC VERSION OF THE QUESTIONNAIRES

የአማርኛ ቋንቋ መጠይቅ

መረጃ መስጫ

መግቢያ: ስሜ _____ ሲሆን በአዲስ አበባ ዩኒቨርሲቲ፣ የነርስ እና አዋላጅ ነርስ ክፍል በሚከሄደው ጥናት ከመረጃ ሰብሳቢዎች ውስጥ አንዱ ነኝ። የሚከተለውን መረጃ ከተረዱ በኋላ በዚህ ጥናት ላይ እንዲሳተፉ በትህትና እጠይቆታለሁ።

የጥናቱ አላማ: የዚህ ጥናት አላማ በአዲስ አበባ ጥቁር አንበሳ ሰፔዛላይዝድ ሆስፒታልና በቅዱስ ጳውሎስ ሆስፒታል ህመማን ላይ የጡት ካንሰር አጋላጭ ምክንያቶችን ማጥናት ነው። ጥናቱ በአዲስ አበባ ዩኒቨርሲቲ፣ የነርስ እና አዋላጅ ነርስ ክፍል ኢትካል እና ሮቪው ካምፔ ፀድቆል።

የተሳታፊዎች ድርሻና ጥቅም: በጥናቱ ተሳታፊዎች ቢበዛ የግማሽ ሰዓት የፊት ለፊት ቃለ መጠይቅ ይጠበቅበታል። ይህ ጥናት ለተሳታፊዎች ምንም የተለየ ጥቅም የለውም፤ ነገር ግን የርሶ እውነተኛ መልሶች የጡት ካንሰርን በሀገራችን ላይ ለመከላከል ለሚደረገው ጥረት በጣም ጥቅም ያስገኛል።

ጥናቱ የሚያስከትለው ጉዳት: መጠይቁ ላይ በመሳተፍ ምንም የአካል፣ የስነ ልቦና ወይም የማህበረሰብ ላይ የሚደርሰበት ተፅዕኖ የለም።

ሚስጥራዊነት: ሚስጥሮ የተጠበቀ ሲሆን፤ የርሶ ስምም ሆነ አድራሻ በፅሁፍም ሆነ በጥናቱ ላይ አይጠቀስም።

የተሳታፊዎች መብት: በጥናቱ ለመሳተፍ የተሳታፊውን ሙሉ ፍቃደኝነት ይፈልጋል፤ እንዲሁም ባልተመች ጊዜ ከጥናቱ በማንኛውም ሰዓት መውጣት ይችላሉ። ባለመሳተፍ በሥራዎ ወይም ከሆስፒታሉ በሚሰጡ ምንም የህክምና አገልግሎት ላይ ተፅዕኖ አይፈጠርም። በመጠይቁ ወቅት ግልጽ ያልሆነሎትን ማንኛውንም ጥያቄ መጠየቅ ይችላሉ።

በዚህ ጥናት ላይም ሆነ በተያያዙ ጉዳዮች ላይ ለሚፈጠርበት ማንኛውም ጥያቄ በሰልክ ቁጥር 251-938121031 የጥናቱን ባለቤት ማግኘት ይቻላል።

ተሳትፎዎን በጣም እናከብራለሁ።

የፍቃድ መጠየቂያ

የጥናቱን ሁኔታ፤ጥቅም፤በፈቃደኝነት የመሳተፍ መብት፤ሚስጥር የተጠበቀ እንደሆነና ከጥናቱ በፈለኩት ጊዜ መዉጣት እንደምችል ተረድቻለሁ፡፡

ስለሆነም በዚህ ጥናት ላይ ለመሳተፍ፤

1. እስማማለሁ
2. አልስማማም

ቀን-----

ክፍል አንድ፡ ማህበራዊና ኢኮኖሚያዊ ነክ ጥያቄዎች

ተ. ቁ	ጥያቄዎች	አማራጮች
1	ዕድሜዎ ስንት ነው	----- (ዓመት)
2	የመኖርያ ቦታዎ	ሀ. ከተማ ለ. ገጠር
3	የሚኖሩበት ክልል	-----
4	የትምህርት ደረጃዎ	ሀ. ያልተማረ ለ. አሰረኛ ክፍልና ከዚያ በታች ሐ. የመሰናዳ ትምህርትና ከዚያ በታች መ. ምሩቅ፣ ድህረ ምሩቅ እና ከዚያ በላይ
5	የትዳር ሁኔታዎ	ሀ. ያገባ ለ. የትዳር ጎደኛው የሞተበት ሐ. የተፋታ/የተለያየ መ. ያላገባ ሠ. አብሮ መኖር
6	ሰራዎ/ይሠሩ የነበረው ሥራ ምንድን ነው (ምን አይነት ሥራ በብዛት ይሠራሉ)?	ሀ. የቤት እመቤት ለ. የግል ሠራተኛ ሐ. ገበሬ መ. የመንግሥት ሠራተኛ ሠ. የቀን ሠራተኛ

		ረ. ነጋጌ ሰ. ተማሪ ሸ. ሌሎች (እባኩትን ይጥቀሱ) _____
7	የቤተሰብ ወራዊ የገቢ መጠን በብር	-----
8	ከዚህ በፊት ጡቶት ላይ ካንሰር ያልሆነ እጢ ወቶቦት ያዉቃል?	ሀ አዎ ለ አይ
9ሀ	ከቤተሰቦች አባላት (ወላጆች፣ልጆች፣ወንድሞች፣ እህቶች) በካንሰር ህመም የተያዙ አሉ?	ሀ አዎ ለ አይ (እባኩትን ጥያቅ ቁጥር 8ለ ይዝለሉት)
9ለ	እባኩትን በካንሰር የተያዙ ዘመዶች መረጃዎች ሙሉ (ከአራት በላይ በካንሰር የተያዙ ዘመዶች ካሉት እባኩትን በተለየ ገፅ ላይ መረጃዎችን ሙሉ::)	ከዘመዶች ጋር ያሉት የካንሰር አይነት ግንኙነት ----- ----- ----- ----- ----- -----

ክፍል ሁለት፡ የኑሮ ዘይቤ ምክንያቶች

እባክትን ጥያቄ ቁጥር 1 እና 2ን ለመመለስ የሚከተሉትን ይመልከቱ

- መቀመጥ የሚበዛበት፡ ከጥቂት እንቅስቃሴ ውጪ መቀመጥ የሚበዛበት ስራ
- ቀላል፡ ጥቂት ድካም የሚፈልጉ እንቅስቃሴዎች
- መካከለኛ፡ የማያደክሙ እንቅስቃሴዎች፤ የልብ ምትን በጥቂቱ የሚጨምሩና ጥቂት ላብ የሚያመጡ እንቅስቃሴዎች
- ከባድ፡ የልብ ምትን የሚጨምሩና ከባድ ላብ የሚያመጡ እንቅስቃሴዎች

ተ.ቁ	ጥያቄዎች	አማራጮች
1ሀ	የቤት ውስጥ ተግባሮችን ያከናውናሉ	ሀ. አዎ ለ. አይደለም
1ለ	መልሶ አዎ ከሆነ የተግባሩን አይነት ይጥቀሱ	ሀ. መቀመጥ የሚበዛበት ለ. ቀላል ሐ. መካከለኛ መ. ከባድ
1ሐ	በቀን ውስጥ ምን ያህል ሰዓት ይፈጅቦታል	-----

1መ. እባክትን ቢያንስ ለስድስት ወራት ተቀጥረው የሰሩትን እያንዳንዱን ሰራዊት ይጥቀሱ።

ተ.ቁ	የሥራው አይነት	የቀን ብዛት/ በሳምንት	የሥራ ቆይታ ሰዓት/በቀን	የስራው አይነት			
				መቀመጥ የሚበዛበት	ቀላል	መካከለኛ	ከባድ
1							

2							
3							
4							
5							

2. የአካል ብቃት ያደርጋሉ?

2. አዎ

2. አይ

መልሱ አዎ ከሆነ፤ በዘንጠረዙ ያሉትን የሚከተሉትን ጥያቄዎችን ይመሉ።

የአካል ብቃት አይነት	በሰውነት ውስጥ ሰንቴ ይሰራሉ	የሚሰሩበት የጊዜ ቆይታ በደቂቃ	የእንቅስቃሴው አይነት		
			ቀላል	መካከለኛ	ከባድ

ተ.ቁ	ጥያቄዎች	አማራጮች
3	በምን ያህል ጊዜ ፍራፍሬ ይመገባሉ?	----- (በሰዎች)
4	በምን ያህል ጊዜ አትክልት ይመገባሉ?	----- (በሰዎች)
5ሀ	የበሰለ ስጋ ይመገባሉ?	ሀ አዎ ለ አይ (እባካችን ወደ ጥያቄ ቁጥር 6 ይሂዱ)

5ለ	በምን ያህል ጊዜ የበሰለ ሰጋ ወይም አሳ ይመገባሉ?	----- (በሳምንት)
6ሀ	የቅባት ይዘቱ ከፍተኛ የሆነ ምግብ ይመገባሉ?	ሀ አዎ ለ አይ (እባካትን ወደ ጥያቄ ቁጥር 7 ይሂዱ)
6ለ	መልሶ አዎ ከሆነ፡ ለምን ያህል ጊዜ?	ሀ በየቀኑ ለ በሳምንት አንዴ ሐ በወር አንዴ
7ሀ	የታሽገ ምግብ ወይም መጠጥ ይጠቀማሉ?	ሀ አዎ ለ አይ(እባካትን ወደ ጥያቄ ቁጥር 8 ይሂዱ)
7ለ	መልሶ አዎ ከሆነ እባኩን እያንዳንዱን ይጥቀሱ	-----
7ሐ	በምን ያህል ጊዜ ይጠቀማሉ?	-----
8	ከዚህ በፊት ከፍተኛ ጉዳት በጡቶት ላይ ደርሶባት ያውቃል?	ሀ አዎ ለ አይ
9	ለራዲየሽን ተጋልጠው ያውቃሉ?	ሀ አዎ ለ አይ
10	ማሞግራም ወይም የጡት ምርመራ አድርገው ያውቃሉ?(40 ዓመት እና ከዚህ በላይ ለሆኑ ተሳታፊዎች)	ሀ አዎ ለ አይ
11	ጡቶትን በራስዎ መርምረው ያውቃሉ?	ሀ አዎ ለ አይ

ክፍል ሦስት፡ የሰነድ ተዋልዶ ምክንያቶች

ተ፣ቁ	ጥያቄዎች	አማራጮች
1ሀ	የወር አበባዎ በሰንት ዕድሜዎ መጣበት?	----- (ዓመት)
1ለ	የወር አበባዎ በየወሩ በትክክል ይመጣል?	ሀ አዎ ለ አይደለም
1ሐ	የወር አበባዎ አሁንም ይመጣል?	ሀ አዎ (እባካትን ጥያቄ ቁጥር 1መ እና 1ሠ ይዝለሉት) ለ አይደለም
1መ	በሰንት ዓመቶ ነበር የወር አበባዎ ያቆመው (የወር አበባዎ ከቆመ ከአንድ ዓመት በላይ ከሆነው)?	----- ዓመት
1ሠ	የወር አበባ በማቆሞ የወሰዱት መድኃኒት አለ?	ሀ አዎ ለ አይ (እባካትን ወደ ጥያቄ ቁጥር 2 ይሂዱ)
1ረ	መልሶ አዎ ከሆነ፣ ምን አይነት መድኃኒት ነው የወሰዱት?	ሀ ህመም ማሰታገሻ ለ ሆርሞን ሐ አላውቅም
1ሰ	ለጥያቄ ቁጥር 1ረ መልሶ ለ ከሆነ ለምን ያህል ጊዜ ነው የወሰዱት?	-----
2ሀ	የቤተሰብ ወሊድ መጠቆሚያ ወስደው (እየወሰዱ) ያገኛሉ?	ሀ አዎ ለ አይደለም (እባካትን ጥያቄ ቁጥር 2ለ ይዝለሉት)
2ለ	እባካትን ቻርቱን ይሙሉ	የወሊድ መጠቆሚያ አይነት የወሰዱበት የጊዜ ቆይታ ----- -----

		----- -----
3ሀ	አርግዘው ያውቃሉ?	ሀ አዎ ለ አይ
3ለ	ሰንት ጊዜ አርግዘዋል?	-----
3ሐ	ሰንት ልጆች አሉት?	-----
3መ	የመጀመሪያ ልጄን ሲወልዱ ሰንት ዓመቶ ነበር?	-----
3ሠ	የፅንሰ መጨናገፍ አጋጥሞት ያውቃል?	ሀ አዎ ለ አይ
3ረ	ልጆችን አጥብጠዋል?	ሀ አዎ ለ አይ ((እባኮትን ጥያቄ ቁጥር 7ለ እና 7ሐ ይዝለሉ)
3ሰ	ለምን ያህል ጊዜ ልጆችን አጥብጠዋል?	የመጀመሪያ ልጄን----- የሁለተኛ ልጄን----- የሳስተኛ ልጄን----- የአራተኛ ልጄን----- የአምስተኛ ልጄን-----
3ሸ	በየትኛው በኩል ነበር ብዙ ጊዜ ጡት የሚያጠቡት ?	ሀ በቀኝ በኩል ለ በግራ በኩል ሐ እኩል እያቀያየሩ

ክፍል አራት፡ የተሳታፊዎች ልኬቶች

ቁመት (cm) -----

ክብደት (Kg) -----

ሰለተሳትፊ እጅግ በጣም አመሰግናለው!!!

APPROVAL SHEET
ADDIS ABABA UNIVERSITY
COLLEGE HEALTH SCIENCE SCHOOL OF NURSING AND
MIDWIFERY
DEPARTMENT OF NURSING

I, the undersigned MSc student, declare that I have submitted my original thesis work on a title “Risk factors of breast cancer among patients attending Tikur Anbessa Specialized Hospital and St. Paul’s Hospital Millennium Medical College, Addis Ababa, Ethiopia: a case control study” for the examination.

Submitted by:

Lidia Tolessa

Name of student

Signature

Date

This thesis work has been submitted for examination with my approval as an advisor.

Approved by:

1. Dr. Endalew Gemechu

Name of Major Advisor

Signature

Date

2. Mr. Negalign Getahun

Name of Co-Advisor

Signature

Date

APPROVAL BY THE BOARD OF EXAMINATION

This thesis by Lidia Tolessa is accepted in its present form by the board of examiners as satisfying proposal requirement for the degree of masters in **oncology nursing**.

EXAMINER:

Dr. Rajalakshmi Somanathan	_____	_____	_____
NAME	RANK	SIGNATURE	DATE

RESEARCH ADVISORS:

<u>Dr. Endalew Gemechu</u>	_____	_____	_____
NAME	RANK	SIGNATURE	DATE

<u>Mr. Negalign Getahun</u>	_____	_____	_____
NAME	RANK	SIGNATURE	DATE

DEPARTMENT HEAD

<u>Mr. Nigussie Tadele</u>	_____	_____	_____
NAME	RANK	SIGNATURE	DATE