



**ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH**

**DETERMINANTS OF CERVICAL CANCER SCREENING
DISPARITIES IN ADDIS ABABA, ETHIOPIA**

BY: MIRESA MIDAKSA(BSc.)

**A THESIS SUBMITTED TO COLLEGE OF HEALTH
SCIENCE, SCHOOL OF PUBLIC HEALTH, ADDIS ABABA
UNIVERSITY IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF
GENERAL PUBLIC HEALTH**

**SEPTEMBER 2019,
ADDIS ABABA**

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**ADDIS ABABA UNIVERSITY,
SCHOOL OF GRADUATE STUDIES**

This is to certify that the thesis prepared by Miresa Midaksa, entitled: “Determinants of cervical cancer screening disparities in Addis Ababa, Ethiopia”, and submitted in partial fulfilment of the requirements for the degree of Masters (General Public Health) complies with the regulation of the University and meet the accepted standards with respect to originality and quality.

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DECLARATION

I, the undersigned, declare that this thesis is my original work and has not been presented for partial requirement of degree in any other University and that all sources and materials used for the thesis work have been fully acknowledged.

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This is to certify that the above declaration made by the candidate is correct to the best of my knowledge as an advisor.

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ABSTRACT

Background: - Cervical cancer is the fourth most common cancer in women worldwide and the leading cause of cancer deaths in developing countries. Cervical cancer belongs to the group of cancers that are preventable & treatable by vaccination of HPV and by early diagnoses and screening. However, most patients, 80% of patients, in developing countries like Ethiopia, screened late with advanced stage disease in which treatment may involve multiple modalities that is associated with low participation in cervical cancer screening services.

Objective:- This study was aimed to assess the determinants of cervical cancer screening disparities among women in Addis Ababa, Ethiopia.

Methods: Institutional based case control study was conducted. Controls were women who have received screening services during the last 3-5 years and cases were randomly selected women coming for other services but not ever screened and aware of the screening service. Accordingly, 294 women were enrolled. Data was collected by using structured questionnaire through interviewing. Bivariate and multivariable logistic regression analysis was performed to assess the association between each explanatory variables and screening disparity.

Results: The study shows respondents having higher sexual autonomy were 3.128 times more likely to have better practice on CC screening than those having lower sexual autonomy [(AOR=3.128, 95% C.I:(1.730, 5.658)]. Women who were referred from other health facility 67.5 % more practice to be screened CC than those not referred from other health facility [(AOR=0.325, 95% C.I: (0.147, 0.720)]. In addition to this, women who have 1-4 children 2.844 times more likely to have a better practice on CC screening than those having no child [(AOR=2.844, 95% C.I: (1.344, 6.014)].

Conclusion: This study revealed women's own sexual autonomy, exposure to referral health system and giving more birth contribute CC screening disparities. Thus, incorporating these factors align with CC service into local health policy efforts will enable better targeted interventions in Addis Ababa and, could also provide focus on issues of sexual autonomy which is linked to gender.

Keywords: Cervical cancer, screening disparity, determinants

ABBREVIATIONS AND ACRONYMS

AOR- Adjusted odd ratio

ART – Antiretroviral therapy

CC- Cervical cancer

CI- Confidence interval

ETB- Ethiopian birr

HCP- Health care provider

HIV- Human immunodeficiency virus

HF- Health facility

HPV –Human Papilloma Virus

OR- Odd ratio

PAP Test- Papanicolaou test (cytology- based method for cervical cancer screening)

SNNP- Southern nations, nationalities and people

STI – Sexually transmitted infection

USA – United states of America

VIA- Visual inspection with acetic acid

TABLE OF CONTENTS

DECLARATION	III
1. INTRODUCTION	1
1.1 BACKGROUND	1
1.2. STATEMENT OF THE PROBLEM	2
1.3. RATIONALE AND SIGNIFICANCE OF THE STUDY	3
1.4. EXPECTED OUTCOME	3
2. LITERATURE REVIEW	4
2.1. CERVICAL CANCER SCREENING DISPARITIES	4
2.2. ASSOCIATED FACTORS FOR CERVICAL CANCER SCREENING DISPARITIES	4
2.2.1. <i>Marital status</i>	4
2.2.2. <i>Perceived barriers</i>	4
2.2.4. <i>Immigrant status</i>	5
2.2.5. <i>Partners</i>	6
2.2.6. <i>Age</i>	6
2.2.7. <i>Duration of residency</i>	7
2.2.8. <i>Sexual autonomy</i>	7
2.2.9. <i>Risk factors of cervical cancer and screening disparities</i>	8
2.2.10. <i>Intellectual disability</i>	8
2.2.11. <i>Housing condition and wealth index</i>	9
2.2.12. <i>Health related factors</i>	9
2.3. INCONSISTENCY OF CERVICAL CANCER SCREENING DISPARITIES	9
RESEARCH QUESTIONS	11
3. OBJECTIVES	12
3.1. GENERAL OBJECTIVE	12
3.2. SPECIFIC OBJECTIVES	12
4. METHODS	13
4.1. STUDY DESIGN AND SETTING	13
4.2. POPULATION	13
4.2.1. <i>Source population</i>	13
4.2.2. <i>Study population</i>	13
4.2.3. <i>Sample size</i>	13
4.3. DATA COLLECTION AND ANALYSIS	16
4.3.1. <i>Study variables and operational definitions</i>	16
4.3.2. <i>Data collection tools</i>	16
4.3.3. <i>Data collection procedures</i>	16
4.3.4. <i>Data quality management</i>	17
4.3.5. <i>Data processing and analysis</i>	17

4.4. ETHICAL CONSIDERATION	18
4.5. DISSEMINATION OF RESULTS	18
5. RESULTS	19
5.1. SOCIO DEMOGRAPHIC CHARACTERISTICS OF THE PARTICIPANTS	19
5.1.1. <i>Partner’s Socio-demographic factors</i>	21
5.1.2. <i>Economic factors of the participants</i>	23
5.1.3. <i>Participants’ Sexual autonomy</i>	24
5.1.4. <i>Health and health system related factors</i>	24
5.1.6. <i>Cervical cancer information/knowledge/ related factors</i>	26
5.2. IDENTIFICATION OF DETERMINANT FACTORS	29
5.2.1. <i>Factor identification and model diagnosis</i>	29
5.2.2. <i>Determinant of cervical cancer screening disparity among women</i>	31
6. DISCUSSION	34
7. STRENGTH AND LIMITATION OF THE STUDY	36
7.1. STRENGTH OF THE STUDY	36
7.2. LIMITATIONS	36
8. CONCLUSION AND RECOMMENDATIONS	37
8.1. CONCLUSION	37
8.2. RECOMMENDATIONS	37
9. ANNEXES	42
ANNEX 1. ENGLISH VERSION CONSENT FORM AND QUESTIONNAIRES	42
9.1. CONSENT FORM	42
9.2. QUESTIONNAIRES	43
ANNEX 2. የአማርኛ የፈቃደኝነት ቅፅና መጠይቆች	50

LIST OF TABLES AND FIGURES

List of tables

Table 1: Socio-Demographic information of the study participants with respect to cervical cancer screening in Addis Ababa,2019	20
Table 2: Partner’s Socio-demographic factors with respect to cervical cancer screening in Addis Ababa, 2019.....	22
Table 3: Economic factors of the participants align with cervical cancer screening in Addis Ababa, 2019.....	23
Table 4: Participants’ sexual autonomy and cervical cancer screening in Addis Ababa, 2019	24
Table 5: Health and health system related factors association with cervical screening in Addis Ababa, 2019.....	25
Table 6: Maternal health related factors with respect to cervical cancer screening in Addis Ababa, 2019.....	26
Table 7: Cervical cancer information/knowledge/ related factors association with cervical cancer screening in Addis Ababa, 2019.	27
Table 8: Types of CC screening among screened participants in Addis Ababa in 2019.	28
Table 9: Frequency of CC screening among screened participants in the last 3-5 years in Addis Ababa, 2019.....	29
Table 10:Shows the multiple logistic regression analyses that determine the cervical cancer screening among women lived in Addis Ababa, 2019.-----	33

List of figures

Figure 1. Conceptual Framework Developed from Review of Different Literatures	10
Figure 2: Sampling diagram	15
Figure 3: time of last CC screening done among screened participants in Addis Ababa, 2019.	28

1. INTRODUCTION

1.1 Background

Cervical cancer is a malignant neoplasm from functional unit, cells devising in the cervix uteri. It begins from a single cell in which its transformation into tumor cell is progressive. Human papillomavirus (HPV) is primary cause of cervical cancer which is preventable through screening and early treatment by vaccination of HPV (1, 2). Any woman who is sexually active is at risk of getting HPV(3).

Cervical cancer deaths and associated health care and social costs can be avoided through appropriate screening (3-5). The incidence and mortality of cervical cancer have reduced in countries by organized screening programs(6, 7). However, a study shows that the proportion of women detected for treatment through screening has decreased over time and survival outcomes remain poor as the number of female cancer early diagnosed and screened has decreased over time(8). The severity and the preventive effect of cervical cancer screening can be affected by the coverage of participation to be screened and timely follow up. Studies indicate more than half of all invasive cervical cancers diagnosed in countries by organized screening programs go up of under or un-screened women(9-11).

Cervical cancer is usually developed after prolonged phase of pre-invasive lesions in the cervix. So, early identification and treatment at its pre-invasive stage can benefit the clients and decrease the burden of morbidity and mortality resulting from cervical cancer. The probability of an early disease in an apparently healthy and asymptomatic individual is determined by screening; diagnosis is performed after a positive screening test to confirm diagnosis of cancer for treatment. Recently, in Ethiopia cervical cancer screening centers are being established to provide screening services for all eligible women. However, screening uptake in the community is low(12-14). Cervical screening and follow-up are recommended for all asymptomatic women, irrespective of cultural background(15). However, studies reveal that there were cervical cancer screening disparities that could be explained in terms of being rarely or never screened of cervical cancer was more likely compared to being recently screened(15-17).

1.2. Statement of the Problem

Cervical cancer is the fourth most common cancer in women worldwide and the leading cause of cancer deaths in developing countries. Globally, an estimated 570,000 new cases and approximately 275,000 deaths reported annually. Moreover, 90 % of the cases and most of the deaths occur in developing countries where most women remain undiagnosed and have limited or no access to treatment(3, 18). Cervical cancer incidence rates in sub-Saharan Africa including Ethiopia are the highest worldwide. It is the second leading cause of female cancer in Ethiopia(19).

In Ethiopia, according to Federal Ministry of Health 2017 report about 7,095 cervical cancer new cases and 4,732 deaths are reported annually. In the country the cervical cancer screening rate is extremely low(2.9%)(20). Most (80%) of patients in Ethiopia diagnosed late with advanced stage disease in which treatment may involve multiple modalities(1, 20). Beside this, even if the cancer center increased relative to the previous, the trends of cancer is not declined(21).

Detection of cancer through screening at an early stage can be considered as marker for access to health care and preventive health services; cervical cancer screening could also be used as effective measures of reducing income disparity in cancer stage at diagnoses(2, 22, 23). Incidence and mortality can be reduced by detecting precancerous lesions then prompt treatment which can prevent its progression thereby increasing patient survival. Screening test detects precancerous lesions and early invasive cancer to control the disease burden which is important priority criteria for political determination to support screening policy. Moreover the ability and efficiency of the health care services to meet the demands of diagnostic, treatment and follow-up care services arising out of screening programs(11, 24).

Basically, non-physicians can perform the simple and affordable screening and treatment procedures like VIA to screen and cryotherapy to treat, if they receive adequate ongoing training. The incidence and mortality resulting from cervical cancer have substantially declined in most developed countries. However, the use of this healthcare service in some countries offering universal cervical screening involves different significant disparities (23, 25). In Ethiopia, even it was expected incidence of cervical cancer is declining,

women typically present for cancer care at late stage in the disease, where treatment is most ineffective since the determining factor, screening disparity is observed (26).

Factors like women's employment, educational level and household wealth index were also reported to affect utilization of cervical screening. Religious and cultural beliefs can also influence cervical cancer screening uptake. Beside this, prevalence of Pap test was 19% higher among women those had sexual autonomy than women who didn't have sexual autonomy(27-31). In the contrary, there is evidence showing that there was no association between receiving Pap smear of cervical cancer screening with respect to age, level of education, perceived health status or the identified enabling factors rather only duration of residence was significantly associated(32). Socio-demographic factors and sexual autonomy which affect cervical cancer screening disparities are not well studied in Ethiopia and there is a need to further study to identify and test these problem in order to improve cervical cancer screening of women.

1.3. Rationale And Significance of the Study

In spite of knowing the determinants of CC screening that are initiating or reinforcing individuals to be diagnosed early are very important, little is known why individuals are screened and diagnosed early for cervical cancer. This research was conducted to fill the gap by exploring the determinants of disparities of CC screening why only few, women screened while the rest were not screened because of poor screening practice.

Screening of cervical cancer is a key factor for prevention and treatment of the disease. Therefore, assessment of determinants of cervical cancer screening disparities can assist to increase the screening rate of cervical cancer which is crucial for early treatment and prevention of the disease. Thus, it will contribute to minimize the morbidity and mortality of women due to cervical cancer in Ethiopia.

1.4. Expected Outcome

Assessment of determinants of cervical cancer screening disparities and giving recommendation for concerned bodies enable intervention on the determinants support to increase the early diagnoses and screening for treatment of the disease that decrease the incidence and mortality of the disease. Then cervical cancer disease will be prevented and healthy productive women will be increased.

2. LITERATURE REVIEW

2.1. Cervical Cancer Screening Disparities

Despite of cervical cancer is preventable through screening and treatment; the screening participation became lower than the desired level over the two past decades in Ontario, Canada(4). A study done in Mekele Ethiopia, reveals among 1186 eligible women only 19.8% of them screened for cervical cancer screening(33). Likewise nationally, there is cervical screening disparities; only 20% of cervical cancer cases early diagnosed for treatment while the rest remained late in Ethiopia since screening rate was extremely low(34, 35).The proportion of women being never screened for cervical cancer be varied by area of residence, demographic characteristics and health beliefs(36). A study conducted in New York shows significance differences when data were examined across all study participants ($p < 0.001$) between race/ethnicity groups of 50% study participants in HPV co-testing utilization. This research finding reveals Non-Hispanic black women (49.1%) were least likely to be screened by HPV co-testing and Hispanic women (68.2%) were most likely to undergo this screening method after all which contribute to mortality to incidence ratios racial disparity. In such conditions cervical screening uptake is recommended to illuminate the incidence of cervical cancer(20, 33, 37, 38).

2.2. Associated Factors For Cervical Cancer Screening Disparities

2.2.1. Marital status

A study conducted in Klang Valley Malaysia, reveals marital status was significantly associated with uptake of cervical cancer screening in the past 3 years. Married women were 2 folds more likely to be screened compared to unmarried women (AOR= 2.257, 95% CI=1.006-4.361). Likewise, Women with regular HCP and women with high knowledge were more likely to be screened compared to those do not have regular HCP (AOR=2.693, 95% CI=1.001-4.062) and, with low knowledge (AOR=3.217, 95% CI= 1.027-6.216) respectively. Women with low perceived barrier were 3 folds more likely to be screened (AOR=3.110, 95% CI=2.461-6.426) than women with higher perceived barrier(39, 40).

2.2.2. Perceived barriers

Other research examined patterns of non-screening among Appalachian women, 222 women who fell outside of screening recommendations for timing of Pap test.

Additionally key barriers were identified as independently and significantly with being rarely or never screened for cervical cancer.

The corresponding variables were independently associated with significantly increased odds of being never or rarely screened for cervical cancer, compared to being recently screened for cervical cancer: belief that a Pap test is embarrassing (OR = 2.48, 95% CI:1.22-5.02); belief that lack of health insurance makes it difficult to obtain a Pap test (OR =2.18, 95% CI: 1.19-3.98); belief that cervical cancer screening is unnecessary without symptoms (OR = 2.56, 95% CI: 1.36-4.82)(15, 37)

2.2.3. Educational status

Socio demographic and economic can influence cervical cancer screening uptake. 60.4% of the participants in the study that were aged 30 to 49 years of which almost three quarters from the African Black population group (74.3%) and had Grade eight or more education (75.3%) respectively. About 50% (53.8%) came from urban and almost 405 (39.9%) were employed. Almost one third (33.2%) had one or chronic conditions, only 13.0% had medical aid and 29% engaged in moderate or vigorous physical activity. Among who got tested for HIV in the study 20.8% were HIV positive and from those who were tested for antiretroviral therapy (ART) 39.7% were on ART. In terms of cervical screening, 52% ever had smear PAP test (89.2% in within the last 10 years) while breast cancer screening, 13.4% ever had mammography. In the multivariable logistic regression women with higher education; and those non-black African, having medical aid and having chronic conditions were more likely to undergo a Pap smear test whereas living in rural areas was related to a lower likelihood of receiving cervical screening(41, 42).

2.2.4. Immigrant status

A study done in Finland reveals disparities in cervical screening of participation based on essential confounding variables that had significant interactions among which immigrants had lower likelihood of screening participation compared with general Finnish population. Married Finns and Somalis participated in screening more relative to Russians and Kurds. Adjusting only for age, the screening participation among all immigrant groups was significantly lower. More over after adjusting for age and socio-demographic and health related confounders the disparities remained compared with the reference group (Finns' OR = 1.00) that all immigrant groups indicated a significantly lower likelihood of cervical

screening participation: Russians 0.32(95% CI 0.18-0.58), Somalis 0.10(95% CI 0.04-0.23), and Kurds 0.17(95% CI 0.09-0.35). The study also tested that the country of origin-confounder interactions on screening participation, with $P < 0.15$ as threshold(40).

There is evidence suggesting migrant women with both parents migration background residing in Germany utilized cancer screening less often than non-immigrant women independently of demographic and socioeconomic factors(43). There is also an evidence that shows nativity and neighborhood socioeconomic status can influence on stage and survival of cervical cancer (44).

2.2.5. Partners

A demographic related study reveals that almost 50% of study participants were one lifetime partner, most of the remaining women reporting 2-3 life time partners (44.3%; range of 1-50 partners); having four or more sexual partners in a time period of greater than 3 years from previous screening or never having had is statistically associated with non-adherence. A higher number of lifetime sexual partners and a longer period of time since the last cervical screening were the only variables significantly associated with non-attendance to the screening appointment ($p=0.03$ and $p=0.04$ respectively). Majority of the participants lived less than 10 km from a health clinic and required public transportation for travel with which most of them reach the clinic in less than half hour while 14% of patients reported requiring more than 1 hour traveling to the clinic(10).

2.2.6. Age

Another research shows the vast majority of women in Britain those most not involved in cervical screening is either unaware or would like to be screened but is unable to translate their positive intentions to be screened into action. Age was significantly associated with non-participation; women in each age group over 34 years were significantly less likely to be unaware of screening than women in the 25 to 34 years age group. Older women were also less likely to be screened than the youngest age group while women aged 55-64 years were significantly more likely to be screened. Compared with women in the highest social grade to those of lower social grade, were more likely to be unaware and to be screened.

Likewise relative to women worked full-time, those who were not working were more likely to unaware of cervical cancer screening. Compared with single women married

women were more likely to be aware of screening. White British women compared to women from each minority group were more likely to be aware of to be screened(27, 45).

2.2.7. Duration of residency

On the other hand, a study indicates there was no association between receiving Pap smear and age, level of education, perceived health status, or the identified enabling factors in Minnesota, USA. Only duration of residence in the United States was significant in relation to cervical cancer screening in the final model of multivariate logistic regression analysis. The odds of ever having had Pap smear screening for recent immigrant (≤ 5 years) were only 40% of the odds for established immigrants (>5 years) (OR = 0.40, 95% CI = 0.24-0.65, $p < 0.001$)(32).

A cross-sectional study conducted in Southern Italy shows cervical cancer screening disparity was associated with duration of residency. In the past 3 years routine Pap smear test the cervical cancer screening participation was significantly more likely in women with longer duration in Italy (OR=1.6=0; 95% CI 1.29 to 1.97; $P < 0.001$) and in South America (OR=8.36; 95% CI 1.99 to 35.06; $P=0.004$) compared with European female immigrants, while a lower likelihood of cervical participation was seen in Asian women (OR=0.41; 95% CI 0.22 to 0.76; $P=0.005$) compared European female immigrants (46).

2.2.8. Sexual autonomy

Cervical cancer screening can be also influenced by both individual and community factors. The prevalence of Pap test history was 19% higher among women those had sexual autonomy than women who did not have sexual autonomy. Pap test history prevalence was also higher among communities compromised of higher proportions of women with sexual autonomy and higher education. The multivariate analysis indicated that the prevalence of cervical cancer screening was higher among women's aged 35-49 years than women aged 15-24 years. Moreover, women's employment, amount of media exposure, household wealth index, visiting a health facility in 12 months than did their counterparts and health insurance were significantly associated with use of cervical cancer screening and its prevalence was also higher(27). Screening of cervical cancer can also be influenced by lack of service provider flexibility, male physician provider, transportation, privacy; preferable test for cancer(47, 48).

2.2.9. Risk factors of cervical cancer and screening disparities

Study conducted in Yirgalem Hospital, Southern Region Nations and Nationality of Ethiopia shows from the screened and diagnosed clients in consecutive 7 years, the prevalence of the cervical cancer is 16.5%. Risk factors that are significantly associated with cervical cancer are maternal occupation, education status, mothers address, having multiple sexual partners, being HIV positive, exposure of STI and early age initiation of sexual intercourse are identified predictors of cervical cancer compared with no-cancerous patients by using bivariate analysis. These risk factors are also associated factors for cervical cancer screening disparities(10, 27, 39, 42, 45). Controlling potential confounders, being HIV positive, having multi sexual partners, having STI history and initiation of early sexual intercourse was independently significantly associated with cervical cancer(49).

Similarly study conducted in Mekele zone, Northern Ethiopia shows these factors are statistically significantly associated with cervical cancer screening uptake. The prevalence of cervical cancer screening found with this study was 19.8% which indicate huge screening disparities. Significant predictors of cervical cancer screening were knowledge on cervical cancer and screening (AOR=2.355, 95%CI=1.155-4.802), perceived barriers to premalignant cervical lesions screening (AOR=2.256, 95%CI = 1.447-3.517), perceived susceptibility to cervical cancer (AOR = 2.225, (95%CI = 1.308-3.783), sexually transmitted disease history (AOR = 1.635, 95% CI = 1.094-2.443), HIV sero status (AOR = 5.614, 95% CI = 2.595-12.144), multiple sexual partners history (AOR = 1.635, 95%CI = 1.094-2.443) and age (AOR = 1.799, 95%CI = 1.182-2.39); among 1186 age eligible women (33).

2.2.10. Intellectual disability

A study reveals that most of women lived in urban setting (72.4%) women with intellectual disability and 76.1% for women without intellectual disability in Pap test groups. For the women with intellectual disability, the largest proportion lived alone or with family members 46.2% for the Pap testing groups, followed by type of residence.

Overall 35.2% of the women with intellectual disability and 14.6% of the women without intellectual disability had no screening with Pap testing. Full adherence for Pap testing was 24.3% for women with intellectual disability and 46.3% for women without

intellectual disability. Compared to no screening the odds of being fully or partially adherent were lower for women with intellectual disability than for women without intellectual disability after adjusting covariates. Women who were dually insured by Medicare and Medicaid had 4.70 fold (95% CI 3.64, 6.08) odds of full adherence and 3.01 fold (95% CI 2.34, 3.86) odds of partial adherence(50).

2.2.11. Housing condition and wealth index

Another study bivariate analysis reveals age, immigrant status, income and housing had statistically significant associations with cancer screening. Patients who were up to date with cervical cancer screening were significantly younger than those were overdue. It was also shown that people living below the lower income cut-off before taxes were less likely to be up to date on cervical screening. Housing status was also associated with cervical screening. Screening was less common among patients who rented a home. The relationship between housing status and lower income cut-off before taxes was indicated that those who were homeowners, the vast majority lived above the 90.9% for cervical cohort. Similarly, of those who were neither homeowners nor renters most were below the lower income cut-off before taxes 76% for cervical cohort(31, 51).

2.2.12. Health related factors

There is also an evidence showing greater cervical cancer screening awareness and participation was associated with health insurance in which the effect can be varied by race/ethnicity and age, shorter distance to health services, education level, household expenditure, menopausal status and social participation(27, 40, 50-52). With another finding higher number of health care providers was positively associated with screening(OR for 1 unit increase in number of providers = 1.01, 95% CI 1.00, 1.01); visiting a non-government facility was significantly associated with more likelihood of being screened compared with visiting governmental facility (OR = 2.56, 95% CI: 1.18-5.57) (53).

2.3. Inconsistency of Cervical Cancer Screening Disparities

Literatures show that there is inconsistent knowledge on cervical cancer screening disparities; In many researches cervical cancer disparities is significantly associated with determinants like ethnicity, belief that lack of health insurance makes difficult to obtain Pap test, Socioeconomic factors, awareness , working time, employment condition,

immigrant status, income, housing and intellectual disabilities whereas few studies show that there is no association between cervical cancer screening with respect to determinant factors like age, level of education, mode of transportation, household socioeconomic status, perceived health status. This disparity could be observable across countries. But the determinants of the disparities need further investigation on factors of screening disparities; especially in developing countries like Ethiopia, since studies previously done focused only on the side of late diagnosed and screened cases missing those early diagnosed and screened cases(20, 27, 31, 32, 35-37, 40, 45, 49, 50, 53).

2.4. Conceptual Framework

The conceptual framework used shown with the diagram below was developed by reviewing literatures. The summary of this conceptual framework for cervical cancer screening uptake shortly illustrates the association of different factors with respect to cervical screening uptake that can affect the screening. These factors were: socio-demographic factors, health and system related factors, economic factors, individual knowledge/information/ on cervical screening and sexual autonomy.

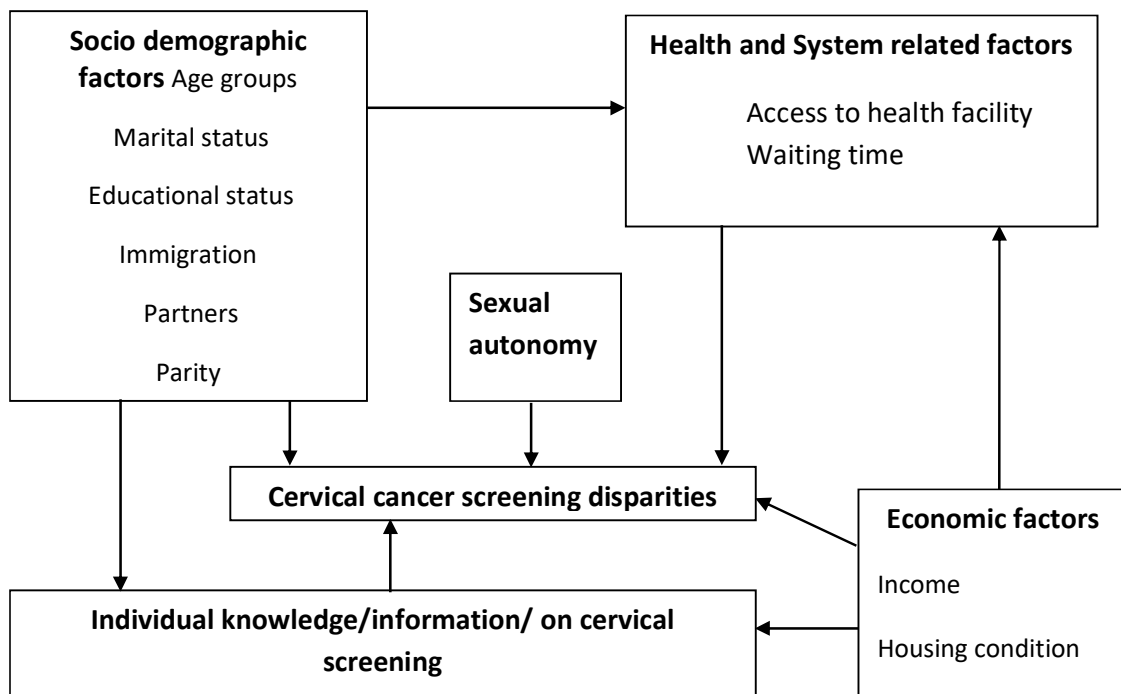


Figure 1. Conceptual Framework Developed from Review of Different Literatures

(10, 20, 27, 31, 33, 35-37, 40, 45, 41, 42, 47, 48,49, 53).

Research Questions

1. What are the socio-demographic factors that affect cervical cancer screening disparities?
2. What is the effect of sexual autonomy on cervical cancer screening disparities?

3. OBJECTIVES

3.1. General Objective

To assess the determinants of cervical cancer screening disparities among women in Addis Ababa, Ethiopia.

3.2. Specific objectives

To determine effect of socio-demographic factors on cervical cancer screening disparities.

To assess the effect of sexual autonomy on cervical cancer screening disparities.

4. METHODS

4.1. Study Design and Setting

Institutional based unmatched case control study design was implemented from December 01/2018 to March 2019. The study was conducted in Addis Ababa, Ethiopia. According to the central statistics authority for 2018 mini EDHS, the population of Addis Ababa was about 4 million, of whom 52.6% were females. The city has 11 governmental hospitals, 1,072 private hospitals and non-governmental clinics, and 104 health centers. So the study was conducted in the selected 5 health institutions providing cervical cancer screening in Addis Ababa, the capital city of Ethiopia. These health institutions were the study site because they were the centers in the city providing both screening and other services.

4.2. Population

4.2.1. Source population

The source population was women in reproductive age in Addis Ababa, Ethiopia.

4.2.2. Study population

The study subjects were all reproductive 30-49 age group from selected health facilities in Addis Ababa during the study period.

Inclusion criteria: women aged 30-49 years who were permanent resident in Addis Ababa were included.

Exclusion criteria: women who were severely ill during data collection period, women who had undergone total hysterectomy and women who were not aware of CC screening services were excluded.

Controls were women who had received and aware of screening services in the past 3-5 years and Cases were randomly selected women who were aware of CC screening and coming for other services but never screened for cervical cancer.

4.2.3. Sample size

Cervical cancer screened clients and other clients attending other services from the health institutions providing both cervical cancer screening and other health care services were enrolled in this study after calculating sample size. The sample size was computed by statacalc command of epi info7; by assumption of 95% confidence level, 80% power, and 2

to 1 ratio of control to case; by taking OR = 1.9, percent of controls exposed 60.7% and percent of cases exposed 41.7%(17). Accordingly sample size was 99 cases and 197 controls including non-respondents. The calculation was the same with double proportion formula.

$$n1 = \left[\frac{(z_{\alpha/2} \sqrt{(3/2)(pq)} + z_{\beta} \sqrt{(p1q1 + (p2q2)/r)})}{(P1-p2)} \right]^2 \quad \text{where } P=(P1 +P2)/2, q=1-p, q1=1-p1, q2=1-p2$$

$$n1 = \left[\frac{(1.96(\sqrt{(3/2)(0.512 \times 1 - 0.512)}) + 0.84 \sqrt{(0.607 \times 1 - 0.607 + (.583 \times .417)/2})}{(0.607 - 0.417)} \right]^2 = 134$$

134 was for one group → for two groups 268, by adding non respondent rate 10% sample size would be 294. Which was almost similar with that of calculated with epi info 7 statcalc 296.

In similar fashion for the second factor of socio-demographic factors, for parity; by taking OR = 2.4, percent of controls exposed 2% and percent of cases exposed 20.4%(10). Accordingly sample size was 92 cases and 184 controls including non-respondents. The calculation was the same with double proportion formula.

$$n1 = \left[\frac{(z_{\alpha/2} \sqrt{(3/2)pq} + z_{\beta} \sqrt{(p1q1 + (p2q2)/r)})}{(P1-p2)} \right]^2 \quad \text{where } P=(P1 +P2)/2, q=1-p, q1=1-p1, q2=1-p2$$

$$n1 = \left[\frac{(1.96(\sqrt{(3/2)(0.112 \times 1 - 0.888)}) + 0.84 \sqrt{(0.02 \times 1 - 0.02 + (.796 \times .204)/2})}{(0.02 - 0.204)} \right]^2 = 125$$

125 was for one group → for two groups 250, by adding non respondent rate 10% sample size would be 275. Which was almost similar with that of calculated with epi info 7 statcalc 276.

However, the sample size for sexual autonomy (296) was more than that of parity (276) and hence, the greater sample size which was of sexual autonomy was used for the study.

4.2.4. Sampling procedures

Five out of 26 health facilities were selected randomly by lottery method; based on flow of clients and currently provision of cervical cancer screening services. The proportion of women selection from the health facilities was in accordance with proportional allocation. All clients who had received cervical cancer screening services in the last 3-5 years would be taken as controls from the health facilities whose presence and consent was confirmed until the required number was achieved. Cases were women who came for other services and who were aware of CC screening services. Every fifth clients were selected to be interviewed. In case if they were not aware of the service the next person would be interviewed. In such away the selection and interviewing continued until the required figure was reached assuming the cases client flow was 20 women per day based on the average number of client flows at health facilities. The Primary data was collected from screened cervical cancer and other clients attending care at these selected facilities and data collectors were those who worked at cervical cancer screening and treatment centers in Addis Ababa city.

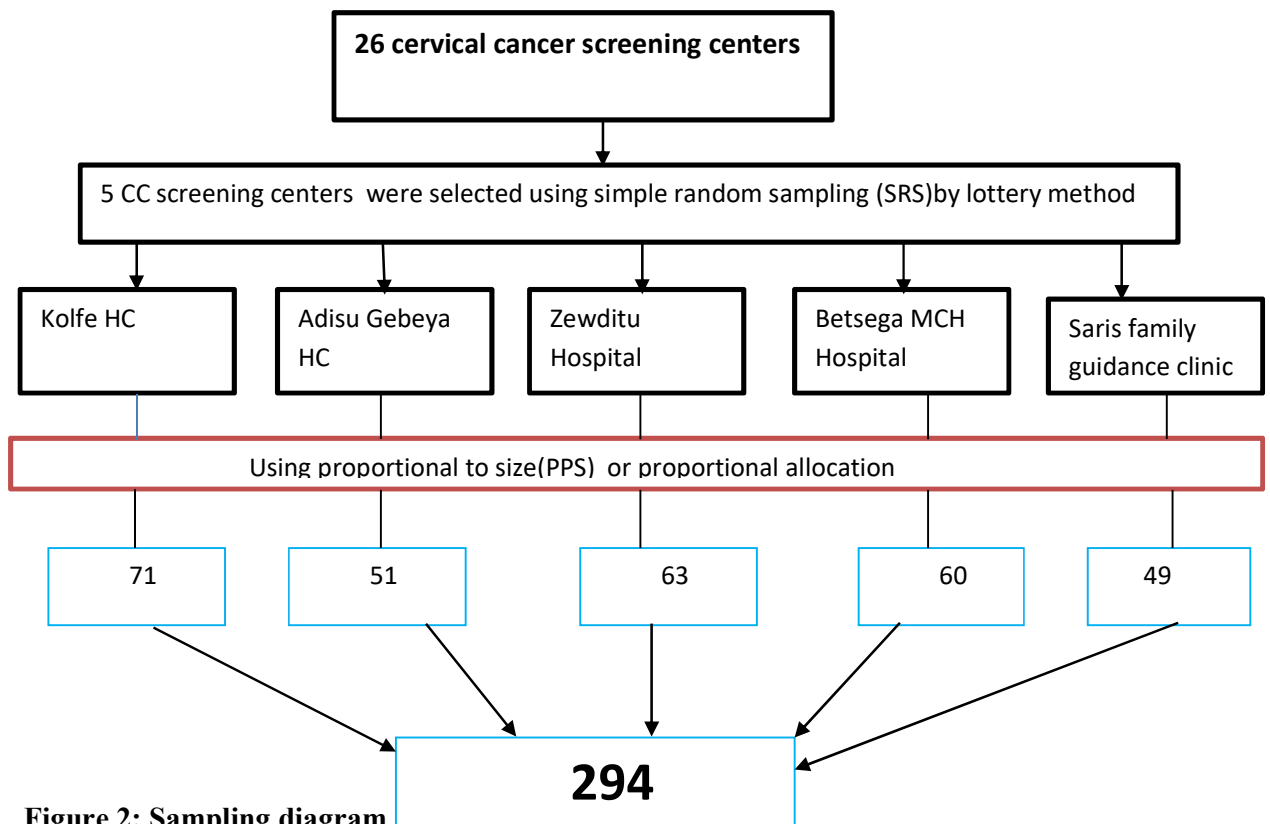


Figure 2: Sampling diagram

4.3. Data Collection and Analysis

4.3.1. Study variables and operational definitions

4.3.1.1. Study variables

Dependent variables:- cervical cancer screening status

Independent variables:- age, educational status, marital status, occupation, monthly income, sexual autonomy, visiting health facility in the last 12 month, transportation provided from referring health institution, gravidity, parity.

4.3.1.2. Operational definitions

Cervical screening disparity: the differences or discrepancies or gap of cervical cancer non screened versus cervical cancer screened coverage.

Early diagnosed: women screened in the last 3-5years, at an early stage before the disease become advanced, when it has high potential for cure (starting from 30-65 years) for cervical cancer.

Co-Testing: Use of both the Pap test and HPV test to screen for cervical cancer in women aged 30-65 years.

Screening program: testing asymptomatic individuals with an accurate screening test to identify those likely to have cervical cancer and to further investigate them to confirm or exclude the disease.

Sexual autonomy:- the autonomy of women to decide on sexual matters including cervical cancer screening services.

4.3.2. Data collection tools

A structured, pre tested questionnaire was used. The questionnaire was prepared in English first then translated to Amharic and finally translated back to English to confirm validity of translation.

4.3.3. Data collection procedures

Socio demographic and socio economic characteristics of women, reproductive variable (parity, sexual autonomy), wealth index and health conditions associated with outcome was collected using structured questionnaires through face to face interview by 9 trained

nurses. Sexual autonomy was assessed by asking 5 questions: 1. Can you say ‘no’ to your husband/partner if you do not want to have sexual intercourse? 2. In your opinion, is a husband justified in hitting or beating his wife if she refuses to have sex with him? 3. Could you ask your husband/ partner to use a condom if you wanted him to? 4. If a wife knows her husband has a disease that she can contract during sexual intercourse, is she justified in asking him to use a condom when they have sex? 5. Is a woman justified in refusing sex if she is tired/not in the mood?(48)

4.3.4. Data quality management

The quantitative data collection and supervision had been carried out by 9 nurses who had previous data collection experience. To ensure standardization and good quality of data, three days training was given on the questionnaire and the informed consent process. Supervision was conducted in collaboration with supervisors throughout the data collection process. All filled questionnaires were checked for consistency. The questionnaires were pretested on 5% of total sample size of women who were attending care at cervical cancer centers in Addis Ababa city. Pretest had been done with data collectors to explore any challenges or difficulties that might occur in the actual data collection process, to observe the interaction of data collectors with respect to respondents, to pinpoint differences and in the questioning process and test the reality and validity of the questionnaire and correction had been given accordingly after pretest was done. The questionnaire was checked for completeness during data collection by data collectors themselves before leaving the study subjects.

4.3.5. Data processing and analysis

Collected data was entered into epi-data and checked for error before data analysis was performed. Then data was then exported StataSE 14(64-bit) for analysis. PCA (Principal component analysis) was used to construct sexual autonomy index. Frequencies and percentage were produced to describe socio-demographic characteristics of the study participants and bivariate analysis of each variable with the outcome variable was done to produce COR. Variables with p value < 0.25 were included into multivariable logistic regression to assess the effect of independent variables on cervical cancer screening disparities by controlling the effect of covariates. Hosmer-lameshow test had been used to check the model goodness of fit. P -value less than 0.05 was used to decide the presence

of statistical significance association. AOR and its respective 95% confidence interval was used to report variable found to have a statistically significant association with cervical cancer screening disparities.

4.4. Ethical Consideration

Ethical issue was assured by Addis Ababa University College of health science internal review board. Consent for conducting the research was received from administrative body and the health institutions providing cervical screening and treatment services. The information sheet consent was prepared and administered by trained data collectors to each respondent. The sheet contained information about the purpose of the study and the right of the respondents not to take part in the study. Moreover, the collected data was kept confidentially and the study was undertaken according to the scheduled time.

4.5. Dissemination of Results

The data of the research was stored and protected in Addis Ababa university research library. The result can be used for policy makers, in health sector for the purpose of intervention to decrease the cervical cancer disparities; since the research assess the determinants of the cervical cancer screening disparities. Further it could be disseminated and implemented by government, concerned body; it could be also utilized for research purposes.

5. RESULTS

5.1. Socio Demographic Characteristics of the Participants

A total of 98 (33.3%) cases and 196 (66.7%) controls study participants were enrolled; of whom 2, 1 for case and 1 for the control group refused to participate in the study. That is, the non-response rate of the study was 1%. The reported reason for non-participation was refusal; i.e., because of most of the issued questions were sensitive the respondents shay to respond the answer of the question.

Among the study participants, 121 (61.73%) of the controls and 74 (75.51%) of the cases were found to be in the age group of 30-39 years old while 75(38.27%) of the controls and 24 (24.49%) were found in the age group of 40-49 years old. The mean and standard deviation of the age of controls and cases were 37.34 ± 6.75 and 37.57 ± 5.56 years respectively.

Regarding educational status of the participants, about 65(33.16%) of the controls and 42(42.86%) of the cases attended primary education followed by secondary education 57(29.08%) of the controls and 23(23.47%) of the cases. The religion distribution of the participants, 128(65/31%) of the controls and 68(69.39%) of the cases belonged to Orthodox. Pertaining the occupational status of the participants, 83(42.35%) of the controls and 38(38.78%) of the cases were employee/private workers. Concerning to the marital status, about 131(66.84%) of the controls and 75(76.53%) of the cases were currently married (Table 1).

Table 1: Socio-Demographic information of the study participants with respect to cervical cancer screening in Addis Ababa,2019

Variable	controls		Cases		Total	
	N=196	%	N=98	%	N=294	%
Age of the participants						
30-39 Years	121	61.73	74	75.51	195	66.33
40-49 Years	75	38.27	24	24.49	99	33.67
Mean (SD)	37.34 (6.75)		37.57 (5.56)		36.41 (6.50)	
Education level						
No formal education	29	14.80	15	15.31	44	14.97
Formal education	41	20.92	16	16.33	57	19.39
Primary	65	33.16	42	42.86	107	36.39
Secondary	57	29.08	23	23.47	80	27.21
College	4	2.04	2	2.04	6	2.04
Religion						
Orthodox	128	65.31	68	69.39	196	66.67
Islam	40	20.41	17	17.35	57	19.39
Protestant	21	10.71	11	11.22	32	10.88
Catholic	7	3.57	2	2.04	9	3.06
Occupation						
Housewife	43	21.94	36	36.73	79	26.87

Employee/private	83	42.35	38	38.78	121	41.16
Student	2	1.02	1	1.02	3	1.02
Merchant	41	20.92	17	17.35	58	19.73
Local drink seller	9	4.59	2	2.04	11	3.74
Daily laborer	5	2.55	2	2.04	7	2.38
Unemployed	13	6.63	2	2.04	15	5.10
Marital status						
Currently married	131	66.84	75	76.53	206	70.07
Separated	10	5.10	4	4.08	14	4.76
Divorced	15	7.65	7	7.14	22	7.48
Widowed	12	6.12	3	3.06	15	5.10
Unmarried	28	14.29	9	9.18	37	12.59

Source: Own data, 2019

5.1.1. Partner's Socio-demographic factors

Regarding the age of participants' partners, 80(40.82%) of the controls and 52 (53.06%) of the cases fall within the range of 30-39 years. Concerning to their educational level, majority of the controls' and the cases' partners were attended primary school by accounting 92 (46.94%) and 50 (5.02%) respectively. In similar manner, the partners' occupation status, 102 (52.04%) of the controls' and 64 (65.31%) of the cases were used to work as employee/private business (Table 2)

Table 2: Partner's Socio-demographic factors with respect to cervical cancer screening in Addis Ababa, 2019

Variable	controls		cases		Total	
	N=196	%	N=98	%	N=294	%
Age of partners						
30-39 Years	80	40.82	52	53.06	132	44.90
40-49 Years	65	33.16	35	35.71	100	34.01
>50 Years	51	26.02	11	11.22	62	21.09
Mean (SD)	42.45 (8.19)		39.47 (7.05)		41.46 (7.94)	
Education level						
Illiterate	30	15.31	15	15.31	45	15.31
Formal education	58	29.59	23	23.47	81	27.55
Primary	92	46.94	50	51.02	142	48.30
Secondary	14	7.14	9	9.18	23	7.82
College	2	1.02	1	1.02	3	1.02
Partners occupation						
Farmer	7	3.57	1	1.02	8	2.72
Employee/private	102	52.04	64	65.31	166	56.46
Student	2	1.02	3	3.06	5	1.70
Merchant	76	38.78	27	27.55	103	35.03
Local drink seller	5	2.55	0	0.00	5	1.70
Daily laborer	4	2.04	3	3.06	7	2.38

Source: Own data, 2019

5.1.2. Economic factors of the participants

About 89(45.41%) of the controls and 45 (45.92%) of the cases' monthly income was greater than 1500 ETB while 14 (7.14%) of the controls and 5 (5.10%) of the cases' monthly income was fall within the range of 500-1000 ETB. Regarding the housing condition of the participants, majority of the controls and cases were living in the private rent house by accounting 89 (44.41%) and 44 (44.90%) respectively (Table 3).

Table 3: Economic factors of the participants align with cervical cancer screening in Addis Ababa, 2019

Variable	controls		Cases		Total	
	N=196	%	N=98	%	N=294	%
Monthly income						
<500 ETB	47	23.98	33	33.67	80	27.21
500-1000 ETB	14	7.14	5	5.10	19	6.46
1000-1500 ETB	46	23.47	15	15.31	61	20.75
>1500 ETB	89	45.41	45	45.92	134	45.58
Housing condition of participants						
Own outright	80	40.8	39	39.80	119	40.48
Own mortgage	8	4.08	3	3.06	11	3.74
Rent from local authority	17	8.67	12	12.24	29	9.86
Rent privately	89	45.4	44	44.90	133	45.24
Others	2	1.02	0	0.00	2	0.68
Partners occupation						
Farmer	7	3.57	1	1.02	8	2.72
Employee/private	102	52.0	64	65.31	166	56.46
Student	2	1.02	3	3.06	5	1.70
Merchant	76	38.7	27	27.55	103	35.03
Local drink seller						
Daily laborer	5	2.55	0	0.00	5	1.70
	4	2.04	3	3.06	7	2.38

Source: Own data, 2019

5.1.3. Participants' Sexual autonomy

Pertaining to participants' sexual autonomy, five components of sexual autonomy were analyzed by PCA with STATA software, because sexual autonomy is not a single factor rather consists composite of factors. Accordingly, the principal component analysis was done using five questions of sexual autonomy. Doing that, only two factors passed the principal component correlation/analysis/ having more than 1 eigenvalue. Then Using one of these factors, STATA categorize the data into two; meaning low and high sexual autonomy. Moreover, about 98 (50%) of the controls and 77(78.6%) of the cases had low sexual autonomy. On the other hand, about 98 (50%) of the controls and 21 (21.4%) of the cases had high sexual autonomy(Table 4).

Table 4: Participants' sexual autonomy and cervical cancer screening in Addis Ababa, 2019

Variable	controls		Cases		Total	
	N=196	%	N=98	%	N=294	%
Sexual autonomy						
Low	98	50	77	78.6	175	59.5
High	98	50	21	21.4	119	40.5

Source: Own data, 2019

5.1.4. Health and health system related factors

Concerning to health and health related factors of Cervical Cancer (CC), about 173 (88.20%) of the controls and 80 (81.63%) of the cases visited health facility in the last 12 month. Likewise, 67 (34.10%) of the controls and 12 (12.24%) of the cases were referred from other health facility. Similarly, about 52 (77.60%) of the controls and 9 (75.00%) of the cases visited public health institutions in the past 12 months (Table 5).

Table 5: Health and health system related factors association with cervical screening in Addis Ababa, 2019.

Variable	controls		cases		Total		
	N=196	%	N=98	%	N=294	%	
Did you visit health facility in the last 12 month?	Yes	173	88.2	80	81.63	253	86.05
	No	23	11.7	18	18.37	41	13.95
Are you referred from other health facility?	Yes	67	34.1	12	12.24	79	26.87
	No	129	65.8	86	87.76	215	73.13
Which health institution have you visited?	Publi	52	77.6	9	75.00	61	77.22
	Privat	15	22.3	3	25.00	18	22.78
Does transportation provided for you from	Yes	6	8.96	1	8.33	7	8.86
	No	61	91.0	11	91.67	72	91.14
How long you stay to reach this health facility?	Mean	77.28		81.25		77.886	
	SD	52.900		36.440		50.569	

Source: Own data, 2019

5.1.5. Maternal health related factors

Majority of the mothers which is 107 (54.5%) of the controls and 52 (53.06%) of the cases became pregnant 2-5 times during the data collection. In addition to this, about 158 (80.6%) of the controls and 67 (68.37%) of the cases gave births 1-4 times. Similarly, 157 (80.1%) of the controls and 70 (71.14%) of the cases currently have 1-4 children (Table 6).

Table 6: Maternal health related factors with respect to cervical cancer screening in Addis Ababa, 2019.

Variable		Controls		Cases		Total	
		N=196	%	N=98	%	N=294	%
How many times you become pregnant (number of pregnancy)?	1 time	64	32.65	36	36.73	100	34.01
	2-5	107	54.59	52	53.06	159	54.08
	>5 times	25	12.76	10	10.20	35	11.90
How many times you gave birth (parity)?	0	18	9.18	23	23.47	41	13.95
	1-4	158	80.61	67	68.37	225	76.53
	>4	20	10.20	8	8.16	28	9.52
How many children did you have?	0	20	10.20	21	21.43	41	13.95
	1-4	157	80.10	70	71.43	227	77.21
	>4	19	9.69	7	7.14	26	8.84

Source: Own data, 2019

5.1.6. Cervical cancer information/knowledge/ related factors

Regarding cancer distribution between partners, only 1% of the cases have experienced cancer but in the family members, about 24 (12.2%) of the controls and 4 (4.08%) of the cases reported that their close family members have cancer. In similar manner, about 14 (7.14%) of the controls and 2 (2.04%) of the cases reported that their close friends have cancer (Table 7).

Table 7: Cervical cancer information/knowledge/ related factors association with cervical cancer screening in Addis Ababa, 2019.

Variable		controls		cases		Total	
		N=196	%	N=98	%	N=294	%
Your partner has cancer?	Yes	0	0.00	1	1.02	1	0.34
	No	181	92.35	89	90.82	270	91.84
	Don't know	15	7.65	8	8.16	23	7.82
Close family member has cancer?	Yes	24	12.24	4	4.08	28	9.52
	No	150	76.53	82	83.67	232	78.91
	Don't know	22	11.22	12	12.24	34	11.56
Other family member has cancer?	Yes	13	6.63	5	5.10	18	6.12
	No	148	75.51	77	78.57	225	76.53
	Don't know	35	17.86	16	16.33	51	17.35
Close friend has cancer?	Yes	14	7.14	2	2.04	16	5.44
	No	159	81.12	84	85.71	243	82.65
	Don't know	23	11.73	12	12.24	35	11.90
Other friend has cancer?	Yes	13	6.63	5	5.10	18	6.12
	No	139	70.92	76	77.35	215	73.13
	Don't know	44	22.45	17	17.35	61	20.75

Source: own data, 2019

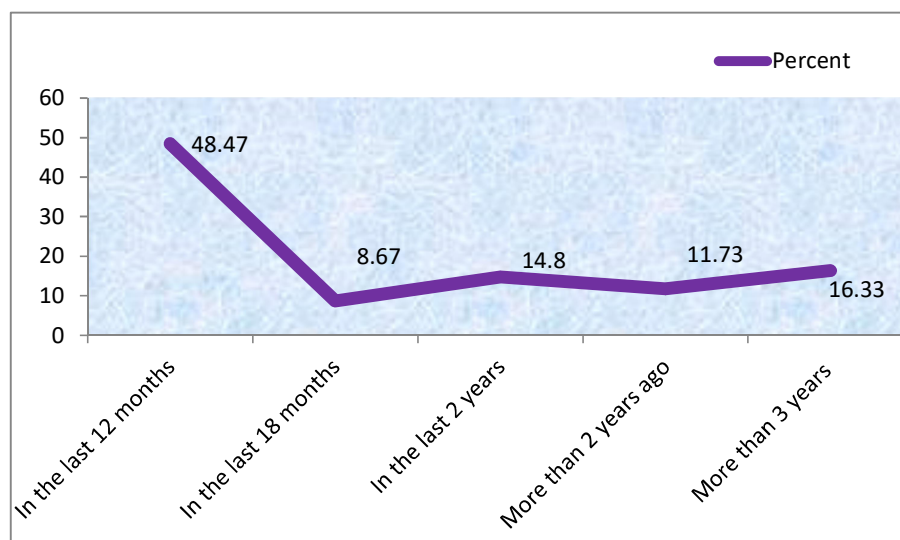
Regarding the CC screening of the participants, visual inspection and Pap smear testing were the major types of screening. That is, accounting to the entire 196 (100.0%) screened participants 93 (47.45%) of them used visual inspection; likewise, 93 (47.45%) others used Pap smear test. However, very few, 1 (0.51%), respondents informed that they used both Pap smear and co-testing, likewise, 1 (0.51%) other respondent used visual inspection and co-testing (Table 8).

Table 8: Types of CC screening among screened participants in Addis Ababa in 2019.

Types of screening	Freq.	Percent
Visual inspection	93	47.45
Pap smear	93	47.45
Co-testing	3	1.53
Visual inspection and Pap smear	5	2.55
Pap smear and Co-testing	1	0.51
Visual inspection and C0-testing	1	0.51
Total	196	100.00

Source: Own data, 2019

Regarding time of CC screening, about 48.47%, 14.8% and 16.33% of the treated participants were screened in the last 12 months, in the last two years and in the past more than three years respectively (Figure 3)



Source: own data, 2019

Figure 3: time of last CC screening done among screened participants in Addis Ababa, 2019.

Screening frequency history of the participants among 194 screened group: 32(16.33%) controls screened every 12 months, 25(12.76%) controls screened every 2 years, 40(20.41%) screened every 3 years while 68(34.69%) controls screened every 5 years (table 9).

Table 9: Frequency of CC screening among screened participants in the last 3-5 years in Addis Ababa, 2019.

Screening frequency	CC	Percent	Total	Percent
Every 12 months	32	16.33	32	16.33
Every 18 months	8	4.08	8	4.08
Every 2 years	25	12.76	25	12.76
Less frequently than 2 years	6	3.06	6	3.06
Every 3 years	40	20.41	40	20.41
Less frequently than 3 years	5	2.55	5	2.55
Every 5 years	68	34.69	68	34.69
Less frequently than 5 years	12	6.12	12	6.12
Total	196	100.00	196	100.00

Source: own data, 2019

5.2. Identification of Determinant Factors

5.2.1. Factor identification and model diagnosis

The previous few topics described about demographic, social, economic, health related, sexual autonomy, and awareness of community regarding cervical cancer screening in Addis Ababa city with the selected health facilities. For the assessment of this study a binary logistic regression model was implemented. Based on the respondents practice on possible to protect oneself from cervical cancer, it was primarily categorized as dependent variable, cervical cancer screening, into a dummy format. That is, “0” and “1” category forms, meaning, the value “0”, is assigned to whichever response indicates a lack or absence of the characteristic of interest. For instance, in this case, “0” was used to code the answer “No” to the question such as ‘did you ever screen cervical cancer?’ The value of “1” is used to indicate a “Yes” answer. A similar approach is also used when coding the independent variables. This binary logistic regression is carried out by taking into consideration the conceptual framework, shown in *Figure 1*, for assessing the relative effect of the explanatory variables over the dependent.

The study has examined various causal factors which are assumed to have the effect on community practice regarding cervical cancer screening. In the bivariate analysis, it has tried to incorporate factors like socio-demographic effects such as variables like age structure of the respondents and the partners, sex, level of education of the respondents and the partners, religion, and respondent and partners' occupation. Similarly, economic factors like monthly income and housing condition of the respondent was integrated with CC screening. Under the sexual autonomy and health related factors: level of sexual autonomy, women visit to the health centers, duration of visit of the health center, availability of transportation to travel into the health centers, number of pregnancy, giving birth(parity), and number of children the respondents had considered as the influential factor which can affect women to receive the cervical cancer screening. Finally, the domain which considered under this study was cervical cancer information, knowledge and history; attritions like having, the participant or any family members, a cervical cancer. To avoid an excessive number of variability and unstable estimates in the subsequent model, in the case of COR variables which have a significant value less than 0.05 under considered, similarly, in the case of AOR only variables that have reached a p-value less than 0.05 were taken into consideration in the subsequent analyses.

So, according to the first step of logistic regression analysis result of this study, the identified factors found to be significantly related to cervical cancer screening is analyzed and shown in *Table 10*. As the outcome elaborates, variables like age of the respondent and the partner, monthly income of the household and referred from health facility passed the examination. That is those considered variables are identified factors which capable to affect the dependent variable cervical cancer screening disparities among women in Addis Ababa, Ethiopia with a sig. value of 0.05.

The next step is running multiple logistic regression analyses based on the identified factors. To regress the model enters method was used. It is used hierarchically to assess the relative effect of those variables that have significant relationship with the outcome variables which in this case is cervical cancer screening disparity among women. In here the variables regress genealogically escalating from one factor to the other. For instance, first the effects of selected socio-demographic factors on cervical cancer screening were assessed; second, the factor of economy was added to the above effect; then followed

sexual autonomy and health related factors were included. And finally, the cervical cancer information, knowledge and history were analyzed to put out the final overall result. In the output, only the final overall result is shown.

Before depth analysis was done some diagnosis had been applied. All the analyses have been dealt with the multicollinearity among independent variables and the goodness of fit of the model was checked through STATA default collinearity diagnostics and Hosmer and Lemshow goodness of fit tests respectively.

Multicollinearity exists when there are strong correlations among the predictors. If the tolerance value below 0.10 or the Variance Inflation Factor (VIF) greater than 10, multicollinearity problem would be a serious influential factor which interrupt the considered model. Tolerance is a test statistics used to indicate the variability of the specified independent variable whether explained by other independent variables in the model or not.

STATA software manages multicollinearity by its default. If there is a strong relationship between independent variables, before the software run the model and find the relationship it control the problem and give a report in which variable multicollinearity occurred. Accordingly, as the output illustrated, there is no any report which indicate the presence of association between independent variables. That is, there is no evidence which indicate the correlation among the explanatory variables.

Bivariate regression analyses results

5 variables are found to be important in bivariate analyses based on their Omni best test and P value of each variable ($P \leq 0.25$). These are parity, referred from health facility, sexual autonomy, respondents' and partners age.

5.2.2. Determinant of cervical cancer screening disparity among women

The results from multiple logistic regression demonstrate the variables that are important in predicting CC screening disparities among women. As the third column of the table shows that out of a total of 5 predictor variables in the model and only 3 of them passed the prime test; sexual autonomy, referred from other health facility and parity were statistically significant to affect the CC screening disparities among women with a 95%

confidence level. Moreover, the rest two variables, monthly income and occupation of the participants failed to be significant in multiple logistic regression model.

There is strong association between sexual autonomy and CC screening. In other term, more numbered sexual autonomy owners play more significant role to practice CC screening than participants who have less sexual autonomy. Respondents who have higher sexual autonomy were 3.128 times more likely to have good practice on CC screening than participant who have lower autonomy, under the consideration of all other factors take as a constant [(AOR=3.128, 95% C.I:(1.730, 5.658)].

The study also finds out that a woman who referred from other health facility is the other determinant factor with capable to affect the women practice on CC screening. Rendering to the result reveled in the table below a woman who referred from other health facility is more likely to have a better practice on CC screening than who was not referred. In more elaboration, a woman who referred from other health facility 67.5 % more practice to screen CC than a woman who was not referred from other health facility, after taking the other effect as a constant [(AOR=0.325, 95% C.I: (0.147, 0.720)].

Moreover, there is strong association between parity and the women practice on CC screening. That is, mothers who gave a low birth more significant practice on CC screening than the mothers who did not have any parity. Explicitly, mothers who have 1-4 children 2.844 times more likely to have a better practice on CC screening than mothers who did not have any children, under the consideration of all other factors take as a constant [(AOR=2.844, 95% C.I: (1.344, 6.014)].

Table 10: Shows the multiple logistic regression analyses that determine the cervical cancer screening among women lived in Addis Ababa, 2019.

Variables	Screening status		COR (95% C.I)	AOR (95% C.I)
	Controls(N=196)	Cases(N=98)		
Age of the participants				
30-39 years	121(61.73%)	74 (75.51%)	1	1
40-49 years	75 (38.27%)	24 (24.49%)	1.91 (1.11, 3.29)*	0.728 (0.299,1.77)
Age of the partners				
30-39 years	80(40.82%)	52 (53.06%)	1	1
40-49 years	65 (33.16%)	35 (35.71%)	1.207 (0.704, 2.070)	0.859 (0.445, 1.659)
>50 years	51 (26.02%)	11 (11.22%)	3.014 (1.439, 6.311)*	2.763 (0.817, 9.340)
Sexual autonomy				
Low	98(50%)	77 (78.57%)	1	1
High	98(50%)	21 (21.43%)	3.667(2.100, 6.405)*	3.128 (1.73, 5.658)*
Referred from other HF				
Yes	67 (34.18%)	12 (12.24%)	1	1
No	129 (65.82%)	86(87.76%)	0.269 (0.137, 0.526)*	0.325 (0.147, 0.720)*
How many times gave birth(parity)				
0	18(9.18%)	23(23.47%)	1	1
1-4	158(80.61%)	67(68.37%)	3.013(1.527, 5.946)*	2.844 (1.344, 6.014)*
>4	20(10.20%)	8(8.16%)	3.194(1.450, 8.912)*	1.617 (0.436, 5.992)

*P<0.05

CI: Confidence interval, COR: Crude odd ratio, AOR: Adjusted odd ratio for age, sexual autonomy, referred from HF and parity

Source: own data, 2019

6. DISCUSSION

A case control study was conducted to determine the socio-demographic factors and sexual autonomy on cervical cancer screening disparities. Structured questionnaire was used to collect data related cervical cancer screening services.

The rationale of cervical cancer screening using different tests is for increasing the screening rate of cervical cancer that is crucial for treatment and prevention of the disease. However, full compliance with screening recommendations is important to accomplish this goal. This individual based study examined cervical cancer screening disparities among women clients those who were aware of the service before and were receiving services at five health facilities of Addis Ababa city; at Kolfe health center, Adisu Gebeya health center, Zawuditu memorial hospital, Betsega maternal and child center, and Saris Family Guidance clinic.

To our knowledge, this is the first study to assess the effect of sexual autonomy on cervical cancer screening uptake in Ethiopia. The study subjects who had high sexual autonomy had three folds odds of being screened compared to those who had low sexual autonomy. This finding showed the positive influence of low sexual autonomy; gender inequality, which can affect cervical cancer screening. This is similar with the study conducted in Kenya(27). But it is not consistent with the study conducted in Lesotho and Namibia. The reason of disagreement might be the difference in study subjects in which this study subjects includes only women who were aware of the screening service for both control and cases while the Lesotho and Namibia studies included study subjects who were aware of screening services and who were not (54,56). In addition to this the study done in both Lesotho and Namibia were cross-sectional study design which had no habit of detecting association between sexual autonomy and cervical cancer screening uptake.

We found that women those referred from other health facilities were 67.5% more likely to be screened than those who were not referred from other health facilities. This might be those referred from other health facility might be told about risk of not having cervical screening for their wellbeing. They might be also told about free service of cervical cancer screening service from referring health facility. There was neither consistent nor inconsistent study done before on the effect of referral health facilities services with cervical cancer screening utilization.

The finding indicated that parity has also been associated to cervical cancer screening. Having 1-4 times giving birth was significantly associated with cervical cancer screening by which four folds more likely to be screened compared with those had given no birth. Women with higher number of births are more likely to have had more previous attachments with health facilities that can expose to reproductive health services. Thus with these contacts, such women have more opportunities to deal with the cervical cancer screening matters compared to those women who have never been pregnant. Consequently, those who did not give birth might be not screened due to low probability of being exposed to health facility to be screened. This is consistent with the study conducted in Nigeria, Namibia, Jamaica, China and Ethiopia(48, 55-58). In the contradiction with the finding, studies conducted in Norway and South-East Nigeria were inconsistent(59, 60). In those studies the sample of the participants were all age group women, especially around one fourth of the sample size was less than 30 years. Additionally, for the South-East Nigeria, the study was conducted whose sample was focused on only women attending meeting at Anglican church that might affect sample representativeness.

The mean and standard deviation of the age of controls and cases were 37.34 ± 6.75 and 37.57 ± 5.56 years respectively. This implies that most of the early adult participants screened than the oldest counterpart. But in the multiple logistic regression age of respondents doesn't show significance effect on cervical cancer screening disparity. This finding was in agreement with other studies conducted in different parts of the world(54, 55, 58-60). But this finding was in conflict with the studies conducted in South Africa and Namibia(56, 61). These evidences indicated that there is significant effect of age on women whose age lie in older age(40-59 years and above) of South Africa. While the age of 15-64 years was for Namibia on cervical cancer screening disparities. Even if the difference in age was observed between these studies that might be a case for contradiction, the reason for inconsistency might need further research.

7. STRENGTH AND LIMITATION OF THE STUDY

7.1. Strength of the Study

The study design used for this study was case control study; the finding of the study could detect association between sexual autonomy and cervical cancer screening disparities which was not addressed well yet especially in Ethiopia.

7.2. Limitations

Since the study used case control study design there might be prone to recall bias. Since some questions on sexual autonomy were sensitive, it might lead to social desirability bias.

8. CONCLUSION AND RECOMMENDATIONS

8.1. Conclusion

This study determined that women factors; women's own sexual autonomy, exposure to referral health system and giving more birth(1-4times) parity all contribute screening disparities.

8.2. Recommendations

The findings provide suggestions for future studies to sermon these factors associated with cervical cancer screening disparities in Ethiopia. In the present context of extending access to screening service with referral system, more recognition of women sexual autonomy, having more birth of women can be taken as potential of reproductive health services disparities which should be used to inform policies and programs. Incorporating women sexual autonomy, enhancing referral health system align with cervical cancer service into local health policy efforts will enable better targeted interventions in Addis Ababa. The finding also improve cervical cancer screening uptake, adds another to the multitudes reasons practical and ideological to focus global attention on issues of sexual autonomy which is linked to gender.

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9. Annexes

Annex 1. English version consent form and questionnaires

9.1. Consent Form

Greeting

My name is-----, The interview's data is collected for the research purpose that is conducted by master's student, Mr. Miresa Midaksa at Addis Ababa University School of Public Health. The main purpose of this study is to assess determinants of cervical cancer screening disparities. I am inviting women receiving cervical cancer care and other services at health institutions.

So I would like to ask you some questions about issue related to determinants of cervical cancer screening disparities. Your name will not be recorded. All information you give will be kept strictly with care and you have the right not to respond any question you don't want to.

Yes-----, No-----

Name and signature of the interviewer certifying that the informed consent has been verbally by respondents-----

Principal Investigator Name and address

Name: Miresa Midaksa

Telephone: 0913937445

Email address: fm.grace97@gmail.com

9.2. Questionnaires

This questionnaire is designed to assess determinants of cervical cancer screening disparities in Addis Ababa health institutions providing cervical cancer services. All participants are kindly requested to give their response for all questions and permit review of their record. Your kind answer has great value to the outcome of the research and that all the answers and your identity are kept with confidentiality. If you need clarification you can communicate with the interviewer.

Thank you in advance!

INSTRUCTION: CIRCLE THE CODE NUMBER GIVEN PARALLEL TO THE ANSWER YOU CHOOSE AND FOR QUESTIONS THAT YOU GIVE DIRECT ANSWER, WRITES THE ANSWER IN THE SPACE PROVIDED IFF THE PARTICIPANT IS AWARE OF CERVICAL CANCER SCREENING SERVICE.

Interview Information

Code ----- health facility's name & address-----

Number	Question	Response	Skip
101.	Date of interview	//	
102.	Data Time Point (1-3)	up to	
103.	Household No.		
104.	Kebele name	<i>(text)</i>	
105.	Kebele Code (HDSS code)		
106.	Gote	<i>(text)</i>	
107.	Subject's ID		
108.	Interviewer's ID		
109.	Outcome of this Interview	1. Completed 2. Incomplete 3. Refused	

Format 1: General information, Household and Socioeconomic Characteristics

Number	Question	Responses	Skip
201.	In what month and year were you born?	Month..... Don't know month 9999 Year..... Don't know year..... 99	
202.	How old are you now? COMPARE AND CORRECT AND /OR IF INCONSISTENT	_____years	
203.	What is the highest level of school you attended?	Primary (1-8)1 Secondary(9-12)2 College/university3 Read and write4 Illiterate5	
204.	What is your religion?	Orthodox Christian1 Islam2 Protestant3 Catholic4 Other (specify)99	
205.	What is your occupation?	Farmer and housewife1 Housewife2 employee/private3	

		Student4 Merchant5 Local drink seller6 Commercial sex worker7 Daily laborer8 Unemployed9 Farmer and merchant10 Other (specify)99	
206.	How much does you earn per month?	<500 ETB 500-1000 ETB 1000-1500 ETB >1500 ETB	
207.	What is your marital status?	Currently married1 Separated2 Divorced3 Widowed4 Never married/single/99	
208.	How old is your partner?	_____years	
209.	What is your partner/husband educational status? (highest level of school attended)	Primary (1-8)1 Secondary(9-12)2 College/university3 Read and write4 Illiterate5	

210.	What is your partner/husband occupation?	Farmer1 employee/private2 Student3 Merchant4 Local drink seller5 Daily laborer6 Unemployed7 Merchant and farmer8 Other (specify)99	
211.	Where is your residential area?	Urban 1 Rural 2	
212.	How many years you lived in Addis Ababa?		
213.	Which describes best your living arrangement?	Own outright..... 1 Own mortgage 2 Rent from local authority/housing association/..... 3 Rent privately 4 Other (specify) 99	
214.	Do you or anyone living with you own a car or van?	No 1 Yes, one 2 Yes, more than one 3	

Format 2: Questions about access of health and health related conditions.

Number	Question	Responses	Skip
215.	Can you say ‘no’ to your husband/partner if you do not want to have sexual intercourse?	Yes..... 1 No/not sure 2	
216.	In your opinion, is a husband justified in hitting or beating his wife if she refuses to have sex with him?	Yes..... 1 No/not sure 2	
217.	Could you ask your husband/partner to use a condom if you wanted him to?	Yes..... 1 No/not sure 2	
218.	If you know your husband has a disease that you can contract during sexual intercourse, are you justified in asking him to use a condom when you have sex?	Yes..... 1 No/not sure 2	
219.	Are you justified in refusing sex if you are tired/not in the mood?	Yes..... 1 No/not sure 2	
220.	Is health care access covered by health insurance?	Yes 1 No 2	
221.	Did you visit health facility in the last 12 month?	Yes 1 No 2	
222.	Are you referred from other health facility	Yes 1 No 2	If no skip to 226
223.	Which health institution have you visited	Public..... 1	

		private..... 2	
224.	Does transportation provided for you from referring health institution	Yes 1 No 2	
225.	How long you stay to reach this health facility	___/___-/_	
226.	How many times you become pregnant?	1 2-4 >4	
227.	How many times you gave birth?	0 1-4 >=4	
228.	How many children did you have?	0 1-4 >=4	
Have you, your family or close friends had cancer? (Do not read the responses. Allow respondent to answer, and then fill each item below.)			
229.	You	1=Yes 2=No 0= Don't know	
230.	Partner	1=Yes 2=No 0= Don't know	
231.	Close family member	1=Yes 2=No 0= Don't know	
232.	Other family member	1=Yes 2=No 0= Don't know	
233.	Close friend	1=Yes 2=No 0= Don't know	
234.	Other friend	1=Yes 2=No 0= Don't know	
235.	Have you heard of cervical cancer?	1=Yes 2=No	

236.	Did you have any kind of cervical cancer screening?	1=Yes 2=No	
237.	Which type cervical screening did you have been?	Visual inspection 1 Pap smear 2 HPV test 3 Co-testing 4	
238.	When was the last time that you had a pap test /VIA/HPV/ Co-testing?	In the last 12 months 1 In the last 18 months 2 In the last 2 years 3 More than 2 years ago 4 In the last 3 years 5 More than 3 years 6 In the last 5 years.....7 More than 5 years/once until now..8	
239.	How often do you have pap tests /VIA/HPV/ Co-tests?	Every 12 months 1 Every 18 months 2 Every 2 years 3 Less frequently than every 2 years ..4 Every 3 years 5 Less frequently than every 3 years.6	
240.	When did you have your post treatment?	After 1 year..... 1 After 3 years 2 After 5 years 3	

Annex 2. የአማርኛ የፈቃደኝነት ቅፅና መጠይቆች

9.1. አባሪ 1. የፈቃደኝነት ቅፅ

ጤና ይስጥልን!

ስሜ _____ ይበላል፤ይህ መረጃ የሚሰበሰበው በአዲስ አበባ ዩኒቨርሲቲ የህብረተሰብ ጤና ትምህርት የድህረ ምረቃ ጥናቱን ለሚሰራ ለአቶ ምሬሳ ሚደቅሳ ነው። የዚህ ጥናት ዋና አላማው የማህፀን በር ካንሰር ቅድመ ምርመራ ክፍተት/ ልዩነት/ ሊያመጡ የሚችሉ መንስዔዎችን ለመዳሰስና ለመለየት ነው። ከጤና ተቋማት የማህፀን በር ቅድመ ምርመራ አገልግሎት የወሰዱትንና የቅድመ ምርመራውን ያላገኙ ነገር ግን ስለ አገልግሎቱ ግንዛቤ ያላቸውና ለሌላ አገልግሎት የመጡ ሴቶች በጥናቱ ውስጥ እንዲሳተፉ አደርጋለሁ።

የማህፀን በር ካንሰር ቅድመ ምርመራ ክፍተት ወይም ልዩነት ሊያመጡ በሚችሉና ተያያዥ ጉዳዮችን በተመለከተ አንዳንድ ጥያቄዎችን ለመጠየቅ እፈልገለሁ። ስሞትን አልመዘግብም። የሚሰጡኝን መረጃ በሙሉ በአግባቡ በመያዝ ለማንም ሰው ሳይወጣ የሚጠበቅ ሲሆን የማይመቻትንና መመለስ የማይፈልጉትን ጥያቄ ያለመመለስ ይችላሉ።

መጠየቁን ለመመለስ ተጠያቂ ፈቃደኛ ናቸው?

አዎ----- አይደለም-----

ቃለ መጠየቁን የሚያደርገውና ምላሽ የሚሰጡ ሰዎችን በቃል መስማማታቸውን ያረጋገጠ የጠያቂው ስምና ፊረማ -----

ጥናቱን የሚያካሄደው ስምና አድራሻ

ስም: ምሬሳሚደቅሳ

ስልክቁጥር: 0913937445

ኢ-ሜይል: fm.grace97@gmail.com

9.2. አባሪ 2. የጥናቱ መጠይቆች

ይህ መጠይቅ የተዘጋጀው በአዲስ አበባ ጤና ተቋማት የቅድመ ማህፀን በር ካንሰር አገልግሎት እየሰጡ ያሉ ላይ የማህፀን በር ካንሰር ቅድመ ምርመራ ልዩነት ሊያመጡ የሚችሉ መንስዔዎችን ለመዳሰስ ነው። ሁሉም ተሳታፊዎች ሁሉንም ጥያቄዎችን ለመመለስ እንዲሁም ምላሻቸው እንዲመዘገብ ፈቃደኝነታቸውን እንዲያረጋገጡ ይጠየቃሉ። የሚሰጥዎ ምላሽ ለጥናቱ ውጤት በጣም ወሳኝ ነው፤ የሚሰጡት ምላሽዎና ማንነትዎ ምስጥር የተጠበቀ ይሆናል። ግልፅ ያልሆነሎት ነገር ካለ ግልፅ እንዲደረግሎዎት መጠየቅ ይቻላል።

ላደረጉት በጎ ተግባር እናመሰግናለን!

መጠየቁ ከመገባቱ በፊት ተሳታፊ ስለ ማህፀን በር ካንሰር ቅድመ ምርመራ አገልግሎት ግንዛቤ መኖሯን ከተረጋገጠ ብቻ ነው፤

የቃለመጠየቅትዕዛዝ፡ ለየመጠየቆቹ በተሰጣቸው ውክያቱ ምላሽ ለተሰጡትን ምላሽ በተቀመጠላቸው በታላይ ይሞሉታል።

የቃለ መጠየቅ መረጃ

መለያኮድ----- የጤና ተቋሙ አድራሻ ----- የተቋሙ ስም-----

ተ.ቁ	መጠይቅ	ምላሽ	መሸገሪያ
101.	የቃለ መጠየቅ	/ / /	
102.	የሚያጠቃልለው ጊዜ(1-3)	እስከ	
103.	የቤት ቁጥር		
104.	ቀበሌ		
105.	የቀበሌ ኮድ (HDSS code)		
106.	ጎጥ		
107.	የተሳታፊ ID		
108.	የጠያቂው ID		
109.	የቃለ መጠየቁ ሁኔታ	1. የተሟላ 2. በከፊል 3. ፍቃደኛ አለመሆን	

ቅፅ 1: አጠቃላይ መረጃ፣የቤት ሁኔታ፣የማህበራዊና ኢኮኖሚያዊ ጉዳዮችን በተመለከተ

ተ.ቁ	መጠይቅ	ምላሽ	
201.	በየትኛው ወርና ዓመተምህረት ነው የተወለዱ?	ወር..... ወሩን አላውቆም 9999 ዓ.ም..... አላውቅም..... 99	
202.	አሁን እድሜዎት ስንት ነው? /ካልተገጣጠመ ማስተያየት/	_____ ዓመት	
203.	የደረሱበት የትምህረት ደረጃ ስንት ነው?	የመጀመሪያ ደረጃ (1-8).....1 የሁለተኛ ደረጃ(9-12).....2 ኮሌጅ/ዩኒቨርሲቲ3 ማንበብና መጻፍ4 ምንም ያልተማረ5	
204.	ኃይማኖትዎ ምንድን ነው?	ኦርቶዶክስ1 እስላም2 ፕሮቴስታንት3 ካቶሊክ4 ሌላ (ይገለፅ)99	
205.	ስራዎት ምንድን ነው?	የቤትእመቤት1 ገበሬእናየቤትእመቤት.....2 የመንግስትሰሪተኛ/የግል.....3	

		ተማሪ4 ነጋዴ5 የባህል መጠጥ ሸያጩ.....6 ሴተኛ አዳሪ7 የቀን ሰራተኛ.....8 ስራ የሌለው.....9 ገበሬና ነጋዴ.....10 ሌላ (ይገለፅ)99	
206.	ደሞዝዎች በወር ስንት ነው?	<500.00 ETB 500-1000.00 ETB 1000-1500.00 ETB >1500.00 ETB	
207.	የትዳርዎ ሁኔታ?	ቅርብ ጊዜ ያገባች1 የተለያዩዎች2 የፈታች3 ባሏ የሞተባት4 ያለገባች99	
208.	የጓደኛዎች እድሜ ?	_____ ዓመት	
209.	የጓደኛዎች የትምህርት ደረጃ ጣሪያ ስንት ነው?	የመጀመሪያ ደረጃ (1-8).....1 የሁለተኛ ደረጃ(9-12)2 ኮሌጅ/ዩኒቨርሲቲ3 ማንበብና መፃፍ4 ምንም ያልተማረ5	

210.	የጓደኛዎች /የባለቤቶች ስራ ምንድን ነው?	ገበሬ1 የመንግስት ሰረተኛ/የግል..... 2 ተማሪ3 ነጋዴ4 የባህል መጠጥ ሸያጩ5 የቀን ሰራተኛ.....6 ስራ የሌለው7 ገበሬና ነጋዴ8 ሌላ (ይገለፅ)99	
211.	መኖሪያ ቤቶች ቦታ የት ነው?	ከተማ 1 ገጠር 2	
212.	አዲስ አበባ ምን ያህል ጊዜ ኖሮታል?		
213.	የሚኖሩበትን መኖሪያ ሁኔታ የቱ ይገልጻል?	የግሌ ነው ያለኝ..... 1 በብድር የተሰራ 2 የመንግስት በኪራይ/የማህበር.....3 ኪራይ ከግል 4 ሌላ (ይገለፅ) 99	
214.	እርሶ ወይም አብሮት የሚኖር ሰው መኪና ይኖረዋል?	የለም..... 1 አዎን፣አንድ..... 2 አዎን፣ከአንድ በላይ 3	

ቅፅ 2 የጤናና ጤና ነክ አቅርቦት ጋር የተያያዙ መጠይቆች

ተ.ቁ	መጠይቅ	ምላሾች	
215.	የግብረ-ስጋ ግንኙነት ማድረግ በማይፈልግቡት ጊዜ ለባለቤቶቻቸው/ለእጮቻቸው/እምቢ ማለት ይችላሉ?	አዎን 1 አልችልም/እርግጠኛ አይደለሁም..... 2	
216.	እንደ እርሶ አመለካከት፣ባል ምስቱ ወስብ ላለመድረግ ስትፈልግ መምታት/መቅጣት አለበት?	አዎን1 የለበትም/እርግጠኛ አይደለሁም..... 2	
217.	ኮንዶም መጠቀም ስፈልጉ ባለቤቶቻችን ይጠይቃሉ/ያስፈቅዳሉ?	አዎን 1 አልጠይቅም/እርግጠኛ አይደለሁም..... 2	
218.	ባለቤቶቻቸው በግብረ-ስጋ ግንኙነት የሚተላለፍ በሽታ ካለው በወስብ ጊዜ ኮንዶም መጠቀም ይኖርቦታል?	አዎን 1 አይደለም/እርግጠኛ አይደለሁም..... 2	
219.	ወስብ ለማድረግ ፍላጎት ከሌሎች/ ከደከሞች ዎስብ ማድረግ እምቢ ማለት ይችላሉ?	አዎን 1 አልችልም/እርግጠኛ አይደለሁም..... 2	
220.	የጤና አገልግሎት በጤና መድን የሸፈነል?	አዎን 1 የለም..... 2	
221.	በዚህ 12 ወራት ውስጥ የጤና ተቋም ሄዷል?	አዎን 1 አይደለም 2	
222.	ከሌላ ጤና ተቋም ነው	አዎን 1	ምላሹ አይደለም

	ወደዚህ የተላኩ?	አይደለም..... 2	ከሆነ ወደ ተ.ቁ 226 እለፉ
223.	የሄዱበት የጤና ተቋም የትኛው ነው?	የህዝብ 1 የግል 2	
224.	ወደዚህ ስላኩ ከተላኩበት ጤና ተቋም የትራንስፖርት አገልግሎት አግኝተዋል?	አዎን 1 የለም..... 2	
225.	እዚህ ጤና ተቋም ለመድረስ ምን ያህል ጊዜ ፈጀቦት?	___ / ___ - / _____	
226.	ምን ያህል ጊዜ ነው ያረገዙት?	0 1 2-4 >4	
227.	ስንት ጊዜ ነው የወለዱት?	0 1-4 >=4	
228.	ስንት ልጆች ይኖሩታል?	0 1-4 >=4	
እርሶ፣ከቤተሰብ ወይም የእርሶ ዳደሻ ካንሰር አለው? (ምላሹን አታንብቡት. ተጠያቂ እንዲትመልስ ይፈቀድላችኋል ከዚያ በኋላ እያንዳንዱ በአግባቡ ይሞላ.)			
229.	እርሶ	1=አዎ 2= የለም 0= አላውቅም	
230.	ባለቤት/እጮሻ	1=አዎ 2= የለም 0= አላውቅም	
231.	የቅርብ ዘመድ/ቤተሰብ	1=አዎ 2= የለም 0= አላውቅም	
232.	ሌላ ቤተሰብ/ ዘመድ	1=አዎ 2= የለም 0= አላውቅም	
233.	የቅርብ ዳደሻ	1=አዎ 2= የለም 0= አላውቅም	
234.	ሌላ ዳደሻ	1=አዎ 2= የለም 0= አላውቅም	
235.	ስለ ማህፀን በር ካንሰር ሰምቶት ያውቃሉ?	1= አዎን 2= አላውቅም	

236.	የማህፀን በር ካንሰር ቅድመ ምርመራ አድረገዎ ያውቃሉ?	1= አዎን 2= አላውቅም	
237.	የትኛውን የቅድመ የማህፀን ካንሰር ምርመራ አደረጉ?	ቪ.አይ.ኤ 1 ፖፕስሚር 2 ኤች. ፒቪቴስት 3 ኮ-ቴስቲንግ 4	
238.	መቼ ነው የመጨረሻ የማህፀን ካንሰር የቅድመ ምርመራ በቅርብ ጊዜ ውስጥ ያደረጉት?	ባለፉት 12 ወራት ውስጥ 1 ባለፉት 18 ወራት ውስጥ..... 2 ባለፉት 2 ዓመታት ውስጥ..... 3 ከ 2 ዓመት በላይ ይሆናል4 ባለፉት 3-5 ዓመታት ውስጥ.....5 ከ 5 ዓመት በላይ ይሆናል/እስካሁን 1 ጊዜ.... 6	
239.	በየስንት ጊዜ ነው የማህፀን ካንሰር ቅድመ ምርመራውን የሚያደርጉት?	በየ 12 ወራት 1 በየ 18 ወራት 2 በየ 2 ዓመቱ 3 2 ዓመት በማይበልጥ ጊዜ ውስጥ 4 በየ 3 ዓመቱ 5 3 ዓመት በማይበልጥ ጊዜ ውስጥ..... 6 በየ 5 ዓመቱ..... 7 5 ዓመት በማይበልጥ ጊዜ ውስጥ 8	
240.	መቼ ነው የማህፀን በር የድህረ ህክምና ያገኙት?	ከ 1 ዓመት በኋላ 1 ከ 3 ዓመት በኋላ 2 ከ 5 ዓመት በኋላ 3	