ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH

ASSESSMENT OF THE UPTAKE AND DETERMINANTS OF CERVICAL CANCER SCREENING AMONG WOMEN IN SLUM AREAS OF ADDIS ABABA, ETHIOPIA

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I undersigned agree to accept all responsibilities for the scientific and ethical conduct of this research project and declare that this thesis is my original work in partial fulfillment of the requirement for the Master of Public Health in Epidemiology and Biostatistics

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Approval of the primary advisor

This thesis work has been submitted with our approval as university advisor.

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APRROVAL BY EXAMINATION BOARD

This thesis by Rahel Mekonnen is accepted in its present form by the board of examiners as satisfying thesis requirements for the review of degree of masters of public health in Epidemiology and Biostatistics

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Abstract

Background: Cervical cancer is the fourth most common cancer in women and the fourth leading cause of cancer deaths in women. Cervical cancer is preventable through screening, and vaccination. Despite public health efforts, screening remains low among women in slum areas where socioeconomic vulnerabilities like limited education and poor health seeking behavior further limit the uptake.

Objective: The aim of the study was to assess the uptake and determinant of cervical cancer screening in selected slum areas of Addis Ababa, Ethiopia.

Methods: Community-based cross-sectional study was conducted among 576 women who live in a selected slum area of Addis Ababa from February to May 2025, using a multistage sampling technique. The study used a mixed method approach. Quantitative data was collected using structured questionnaires, while qualitative data was collected using focus group discussions and in-depth interviews. Descriptive analysis, binary logistic regression and Multivariable logistic regression were applied to summarize and show association of the quantitative data. Qualitative data was coded using MAXQDA software and analyzed through thematic analysis.

Result: The study showed the prevalence of cervical cancer screening among women in slum area of Addis Ababa was 25%. Women aged 40 and above had 2.5 times higher odds of screening(AOR = 2.56; 95% CI: 1.43 - 4.58), women with higher education had 4.4 times higher odds of screening (AOR = 4.42; 95% CI: 1.96 - 9.96) and those with good knowledge had 5.37 times higher odds of screening (AOR = 5.37; 95% CI: 3.20 - 8.98), while those practicing health-seeking behaviors were more likely to get screening (AOR = 2.09; 95% CI: 1.25 - 3.48). These factors significantly influenced cervical cancer screening uptake in the study population. Qualitative findings showed that low awareness, cultural beliefs, and fear of judgment hindered cervical cancer screening uptake. Discomfort with male healthcare providers and being judged by their community was a key barrier.

Conclusion and Recommendation: Cervical cancer screening uptake in the study area falls significantly short of the global coverage targets set for elimination efforts, indicating a need for substantial intervention. The study found particularly low screening rates among younger women, those with no formal education and with poor health-seeking behavior and limited knowledge of cervical cancer and its screening. Targeted education initiatives and integrated awareness programs are essential to increase screening uptake among vulnerable groups.

Key words: Cervical Cancer, Screening, Slum Area, Vulnerability, Addis Ababa

Abbreviations and Acronym

ANC: Antenatal Care
AOR: Adjusted odds ratio
CC: Cervical Cancer
CCS: Cervical Cancer Screening
FGD: Focused group discussion
FMoH: Federal Ministry of Health.
HIV: Human Immunodeficiency Virus
HPV: Human Papilloma Virus
IDI: In depth interview
SRH: Sexual Reproductive Health
STI: Sexual transmitted Disease
VIA: Visual inspection with acetic Acid
WHO: World Health Organization

Table of Contents

List of tables

List of figures

Introduction

1.1 Background

Cervical cancer is a major global health problem affecting women and it remains a leading mortality cause especially among women in law resource setting. In 2022 globally, around 660,000 new cervical cancer cases were diagnosed and approximately 350,000 deaths in the same year(1).The incidence and mortality rates are disproportionality high in low-middle income countries where 94% of cervical cancer deaths occur. In low-income countries like sub-Saharan Africa, it remains the leading cause of cancer death among women (1) .

Low cervical cancer screening uptake rates in slum areas across different countries result in an increased risk of developing cervical cancer and higher mortality rates. A study in Nigeria and Kenya show cervical cancer screening rates are low which leading to late-stage diagnoses exacerbated by misconceptions and stigma, and limited healthcare access(2,3).

In 2022 cervical there were approximately 8,168 new cases and it accounts for about 15.5% of all new cancer cases among women in Ethiopia. And CCS has been associating with decline in cervical cancer mortality rate.in countries where there is a regular and widespread screening program the incidence of cervical cancer has decreased significantly(2).Screening and subsequent treatment of precancerous lesions are cost-effective health interventions for preventing cervical cancer. 2017 population-based WHO Steps survey on the utilization rate of CCS services in Ethiopia was found to be 2.9% (4) and In 2020, A meta-analysis study in Ethiopia estimated pooled prevalence of CCS service utilization rate appeared to be 13.46%.(5) This shows that the uptake of CCS rates is increasing in Ethiopia but it is far below the WHO target of 70% screening rate by 2030 for cervical cancer elimination(1).

Slum areas are highly congested urban areas characterized by substandard housing that is unsanitary buildings, poverty and social disorganization (2)In 2018 approximately 14 million slum residents were living in Ethiopia. they face vulnerabilities that significantly impact their health. These vulnerabilities include inadequate access to healthcare, financial constraints, limited transportation options, and under-resourced facilities. Lack of health education and awareness further exacerbates these issues(6)

The utilization of CCS in Ethiopia is hindered by major predictors such as lack of awareness, socio demographic factor, knowledge, Cultural beliefs and practices can also influence health-seeking behavior which usually leads to harmful practices that compromise health, which can negatively impact health outcomes(5,7–9)

1.2 Statement of the problem

Cervical cancer is a significant public health challenge in low-middle income country like Ethiopia, particularly among women living in slum areas of Addis Ababa. It is the second leading cause of mortality and morbidity among women in Ethiopia(1). Women's health in Addis Ababa slums is significantly impacted by the lack of access to cervical cancer screening programs, largely due to factors such as poor roads, inadequate infrastructure, cultural beliefs, and a significant lack of education about cervical cancer prevention(10). Major factors contributing to this low uptake in Addis Ababa slum area include socioeconomic barriers, lack of awareness about cervical cancer and its screening, inadequate healthcare infrastructure and cultural perceptions surrounding health issues among women (11)

Resources inequality in CCS in Addis Ababa slum areas significantly impacts access to essential healthcare services among women. The existing healthcare facilities often struggle with staffing shortages and lack of trained personnel to provide essential services (12)That contribute to increased risk of developing advanced cervical cancer and increased mortality. Most existing research on CCS has been conducted in urban areas and few studies conduct in rural areas of Ethiopia (13), but there is a significant gap in understanding the specific factors affecting CCS in slum areas of Addis Ababa. Due to the lack of localized studies the findings cannot be applied to the particular socio-economic and cultural contexts of these areas. A study shows Vulnerable urban centers in Ethiopia require focused health interventions due to the significant health disparities faced by their residents. These communities often struggle with inadequate healthcare facilities, limited access to essential services, and high levels of poverty. Many individuals lack awareness of health issues and available services, which further complicates their ability to seek care(10). Moreover, health seeking behavior disparities exacerbate these inequalities, as women from low-income backgrounds may face additional barriers such as transportation difficulties, lack of health insurance, and low health literacy(14). These factors contribute to less likely to receive timely and effective CCS among women in slum areas. Up to now no study in the slum areas of Addis Ababa Ethiopia has addressed the factors affecting CCS. Therefore, considering inequalities of CCS and the low level of knowledge and difference in screening in different geographical areas of Ethiopia, it is very useful to conduct a study emphasizing knowledge and Awareness of and access to screening facilities in slum areas. This study can enable health policymakers to consider effective strategies to lower inequalities and increase cervical cancer coverage.

1.3 Significance of the study

This study aims to increase CCS rates among women in slum areas of Addis Ababa to address a major public health issue. Identifying factors that affect screening uptake will give a valuable insight to help policymakers and healthcare providers to fight cervical cancer. This study also aims to address specific social and economic challenges faced by women in these communities which makes the development of targeted interventions to improve screening rates.

The findings may help inform health planning and policy decisions aimed at improving cervical cancer screening uptake thereby supporting broader efforts to reduce the burden of cervical cancer.

Literature review

2.1 Cervical Cancer

Cervical cancer is one of the most common cancers and a leading cause of cancer-related death in women in the world. Approximately 600,000 new cases diagnosed annually and 311,000 deaths each year. Over 85% of cervical cancer cases and deaths take place in low- and middle-income countries especially among vulnerable groups. sub-Saharan Africa has highest burden of cervical cancer. Among the 20 countries in the world 18 are in the WHO African region. In 2022, the region accounted for 23% of global cervical cancer mortality(1). In 2020, Ethiopia reported 7,445 new cases of cervical cancer and resulting in 5,338 deaths during the same year (8). This shows cervical cancer disproportionately affects women living in poverty and it is more prevalent in countries with limited healthcare infrastructure. It is estimated that roughly 33.7 million women aged 15 and above are at risk of developing this condition in Ethiopia.

2.2 Cervical Cancer Screening

The World Health Organization (WHO) has established a comprehensive initiative aimed at the prevention and elimination of cervical cancer as a public health problem. In November 2020, The Global Strategy for cervical cancer elimination outlines a limit for cervical cancer elimination at 4 cases per 100,000 women. The initiative aims to achieve three goals by 2030, vaccinating 90% of girls with the HPV vaccine by age 15, screening 70% of women at ages 35 and 45 using a high-performance test, and ensuring 90% of women with cervical disease receive the necessary treatment. Initiative is an important public health effort to fight a preventable disease that disproportionately affects women particularly in poorer regions and shows a commitment to achieve global health equity(15)

To combat the rise of cervical cancer, Ethiopia rolled out a comprehensive public health strategy that includes the HPV vaccination program initiated in 2018, targeting girls aged 14. Additionally, there are CCS programs intended to improve early detection (14).

2.3 Prevalence of cervical cancer screening

In global effort to eliminate CCS plays an important role in the comprehensive prevention and control besides HPV vaccination. A study done in United States shows regular cervical screening was associated with a 90% reduction in the odds of non-localized cervical cancer,

and a 57% reduction in the odds of Stage I cervical cancer, compared to women who did not attend screening for 5 years (15).

According to a review and synthetic analysis published in the Lancet in 2022, global life time coverage of CCS is 36%. Also 84% of women in age group of 30–49 years living in high income countries and 48% living in upper middle-income countries had been screened in their lifetime, compared to 9% of women in this age group in lower-middle-income countries and 11% in low-income countries(16).A meta-analysis in 2021 shows the uptake of CCS in Sub-Saharan Africa was 12.87%(19) Therefore 90% of cervical cancer related deaths occurs in women living in low- and middle-income countries.

In 2023 a summary report showed 0.6% of Ethiopian women between the age 18 and 69 were checked for cervical cancer every three years. (20) The pooled national level of CCS among age-eligible women in Ethiopia was 13.46% (21)CCS uptake among women living with HIV was 57.5%. These results show the uptake remains inadequate compared to international standards and the urgent need better CCS programs in Ethiopia particularly among the general female population.

In Addis Ababa CCS is a significant public health concern especially in urban slum. The prevalence of screening in Addis Ababa was 6.8% according to study in 2019 (19). This result showed very low CCS rate. Studies conducted in various countries on slum settings shows low rate of screening, Study in Lagos, Nigeria reported that only 4.2% of women in urban slums were aware of cervical cancer, which is extremely low compared to other regions(20). A study conduct in Old Hubli, Karnataka, India, showed that only 7.5% of respondents had heard about cervical cancer, highlighting a significant gap in knowledge (10). Women who live in slum areas often face many challenges to attend in CCS program including Socioeconomic factors, such as poverty and low educational levels, contribute to the lack of awareness and access to screening services, cultural stigmas associated with cancer and fear of diagnosis which prevent them from seeking preventive care (20,21).

2.4 Socio-Demographic, economic, and cultural factors influencing CCS uptake

CCS uptake can be significantly influenced by various socio-demographic factors like age, marital status, occupation and educational attainment. Study in Ethiopia showed that age of women is the one predictor of CCS uptake. Women at the age range of 30-39 were 4.58 times more likely to be screened compared to women in young age 21-29(5)This result is consistent in different studies in different countries. Study in Nigeria showed that Women aged 40-45

years utilized CCS services more than any other age group at the bi-variate level. In addition, the logistic regression models showed that women in the two oldest age groups (40-45 and >45) were more than twice as likely to utilize screening services compared to those in youngest age group (15-19) (25) studies describe that at peak age of 30 and 60 the lesions become symptomatic and women see themselves as being at risk of invasive cervical cancer and seek medical care and screening services (5)

Educational level is also one of the predictors of CCS. Women with higher educational attainment has an access to health information, increased awareness and understanding of cervical cancer and prevention methods (26) A study conducted in Ethiopia, Gonder, showed that women with higher levels of education are 5.3 times more likely to engage in screening practices than women without education(27). Therefore, education plays an important role in screening uptake

A study conducted in Ethiopia; Gomma District showed married women were 10.74 times more likely to uptake CCS than unmarried women (5). A study in United States also showed 75.1% of married participants underwent CCS (25). Marital status has been shown to influence screening intentions. Married women usually have more support and encouragement from their partners to participate in screenings.

Women with higher income levels and stable employment are more likely to have access to healthcare services, which facilitates their participation in screening programs. A study in Ethiopia showed Women employed in governmental organization were 2.61 times more likely to use the CCS service than house wife's (7)And according to a study conducted in eastern Ethiopia showed Respondents who had monthly income of 2501(45.52 $) and above Ethiopian birr were 61.1% less likely to undergo CCS as compared to those who had monthly income ≤500(9.10$) Ethiopian birr (21) Income and employment status have also significantly impact CCS behaviors (21).

Cultural factors including beliefs and attitudes towards health and healthcare systems have a major impact on CCS. A study in Tikur Anbessa Specialized Hospital in Ethiopia reported that poverty along with other socio-cultural practices like early marriage, high parity and to certain extent polygamy were identified as factors that increased the vulnerability of women to cervical cancer (11) In other study in India also showed cultural influences significantly impact CCS uptake in India. Those are religious stigma, societal norms regarding modesty, and fear of social isolation discourage women from seeking healthcare services. Many women face restrictions on their autonomy, requiring permission from male family members to access healthcare, which further limits their ability to participate in screening programs.

Additionally, negative community perceptions of cancer can lead to avoidance of screening due to associated stigma(29), Giving attention for these cultural influences through different community engagement and education is important for improving awareness and increasing screening participation among women.

2.5 Health Seeking Behavior

Health-seeking behavior regarding cervical cancer screening among women is a multifaceted issue influenced by various factors like socio-economic, cultural factor, awareness and Knowledge about cervical cancer. Understanding these behaviors is crucial to increase screening uptake and reduce cervical cancer morbidity and mortality.

Most of the participants emphasized that early treatment seeking was very limited, particularly in rural areas. They stated that most women with CC symptoms only seek treatment after the disease reached an advanced stage with the women suffering intolerable pain (30)

A study in India indicates cultural perceptions and beliefs also play an important role in shaping health-seeking behavior. Many women in slum areas harbor fears and misconceptions about cervical cancer screening, often viewing it as unnecessary if they do not exhibit symptoms. Addressing these cultural barriers through community engagement and education is essential for improving screening uptake (31)

Access to healthcare services significantly impacts health-seeking behavior. In slum areas, logistical challenges such as distance to healthcare facilities, lack of transportation, and limited availability of screening services can hinder women's ability to seek care. A study indicated that many women reported a lack of information about where to access screening services, which directly affected their willingness to participate in screening programs(22) Therefore improving the accessibility and quality of cervical cancer screening services is important to enhance health-seeking behavior among women in these communities.

A cross sectional study shows the prevalence of health seeking behavior for cervical cancer among the study participants was only 14.2% in Hosanna Ethiopia (32). Individuals having poor knowledge score were about 7 times more likely not to show health seeking behavior when compared to those who have had good knowledge score for prevention and control of cervical cancer Interventions aimed at increasing awareness, improving access to services, and addressing cultural stigmas are essential for enhancing screening uptake in these vulnerable populations (32).

A study in Hossana, Ethiopia shows 30% women who had health seeking behavior for cervical cancer did not get screening service. The reasons for not being screened for cervical cancer were unavailability of the service nearby, not being informed of where to get the service, and economic problem (32).

2.6 Knowledge and awareness about CCS

Knowledge and awareness about cervical cancer and its screening among women in Ethiopia particularly those rural and in slum areas low. Barriers such as low literacy rates, socio-economic challenges, and cultural misconceptions significantly effective knowledge dissemination.

In sub–Saharan Africa, a meta-analysis revealed that knowledge about CCS was significantly associated with CCS. Women who knew about cervical cancer are nearly five times more likely to use CCS than those who did not. Studies have shown that awareness about CCS is a priority in resource-limited countries like Ethiopia(19)

According to a study in Ethiopia there was a link between cervical cancer awareness and the willingness to utilize CCS. Similarly, in this study, participants who were aware that cervical cancer is communicable, killer, and preventable were found to be substantial predictors of the willingness to utilize CCS compared with those who were unaware. 53.7% had heard about cervical cancer. Among those who heard about cervical cancer 41.3% had good knowledge (9)

A cluster randomized trial in southern Ethiopia showed structured couple education and counseling intervention increased the knowledge of cervical cancer from 32.6% to 98.6% among participants and lead to a remarkable rise in screening uptake from 2.1% to 72.5% (33)Educational interventions have an important role in enhancing knowledge and awareness and resulting in improved screening behaviors. Addressing these barriers can increasing CCS rates and reducing the incidence of cervical cancer among women in Ethiopia.

Several socio-economic and educational factors contribute to the low levels of knowledge about cervical cancer and its screening in Ethiopia. Studies showed Low literacy levels among women especially in slum areas limit the acquisition of health information. Many women depend on verbal communication of health information which are not always reliable. Women living in low-income households usually prioritize immediate economic needs over health education. Economic constraints can limit their access to health information and healthcare services including CCS. Therefore, Socio-economic and educational factors are barriers to knowledge and awareness (11).

2.7 Review of Slum area

The term "slum," which emerged in the 1820s, has historically been associated with the poorest quality housing and unsanitary living conditions, often serving as a refuge for marginal activities such as crime and drug abuse(34). In contemporary discourse, the term has evolved, becoming less pejorative in developing countries, where it simply denotes lower-quality or informal housing. This study employs the term "slum" to encompass a broad spectrum of low-income settlements characterized by inadequate living conditions (34).

Today, slums encompass large informal settlements that reflect the depth of urban poverty in developing cities. Although they go by different names and feature a variety of tenure systems and housing types, from basic shacks to unexpectedly well-kept buildings they all tend to share a common feature like limited access to clean water, electricity, sanitation and other essential services (38).

The rapid growth of slums, characterized by overcrowding, socio-economic exclusion, and degraded environmental conditions has been linked to significant declines in urban health and social indicators, often reversing progress made in rural areas (38). In particular, the urban poor face adverse Sexual and Reproductive Health (SRH) outcomes, including high rates of unwanted pregnancies, elevated fertility rates, increased prevalence of sexually transmitted infections (STIs), and poor maternal and child health outcomes. The urgent need for targeted interventions in these communities is underscored by the challenges they face, including inadequate access to healthcare services and limited health education, which further exacerbate the under-utilization of available resources. Addressing these issues is crucial for improving health outcomes and achieving equity in health access for slum residents.

2.6 Conceptual framework

The conceptual framework is organized based on reviewed literature. The relationship between CCS and its influencing factors is multifaceted it includes Socio-demographic, Economic and cultural factors, Health seeking behavior, Knowledge and awareness affect cervical cancer screening directly.

Studies indicate that old age, married women and those with higher educational levels are more likely to participate in CCS due to increased health seeking behavior and support. Economic factors, such as income and employment status, significantly impact access to healthcare services and health seeking behavior. Cultural beliefs also play a crucial role as stigma and misconceptions can prevent women from seeking screening.(27)

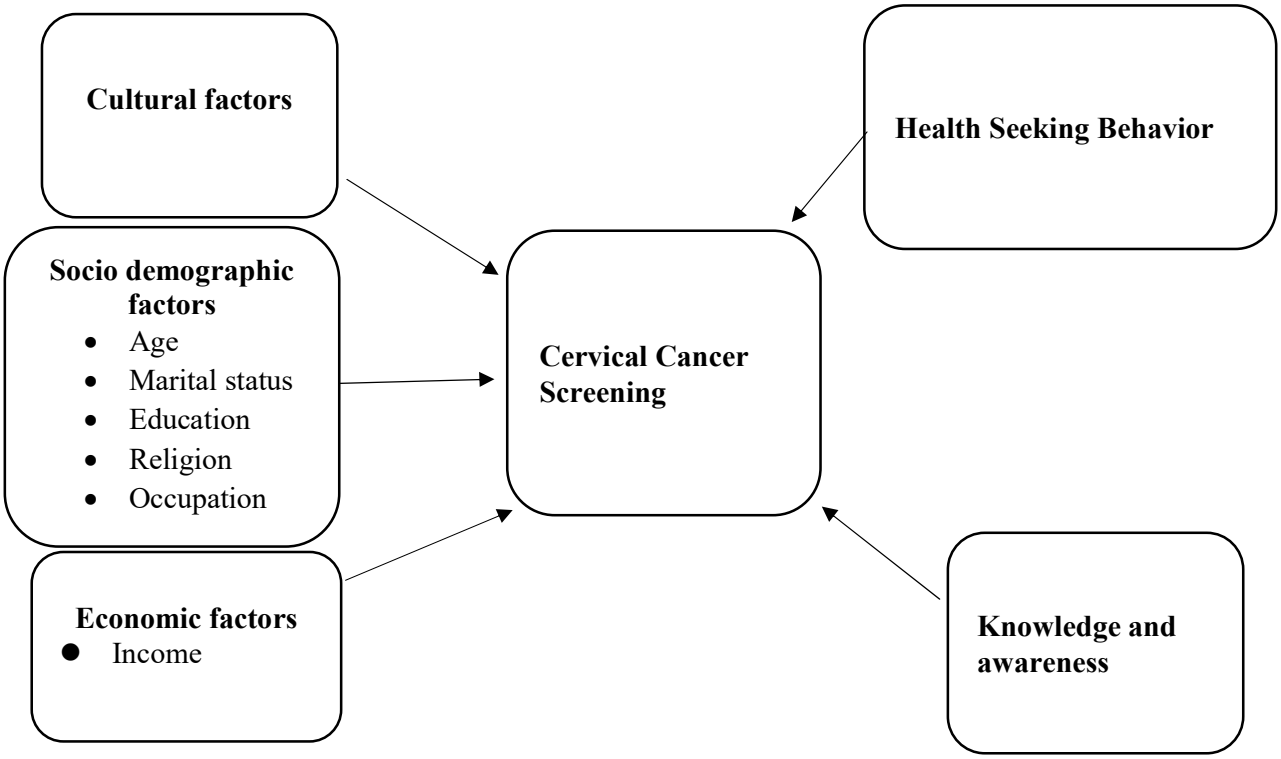

Figure 1 Conceptual frame work on the uptake and determinants of cervical cancer screening, Source: It is developed by the investigator after reviewed different literature

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Objective

3.1 General objective

To assess the uptake of cervical cancer screening and identify its determinants among women living in slum areas of Addis Ababa

3.2 Specific objectives:

1. To assess the uptake of cervical cancer screening among women living in slum areas of Addis Ababa.
2. To identify factors affecting cervical cancer screening uptake among women in slum areas of Addis Ababa.
3. To explore the personal, social, cultural and financial barriers that influence CCS uptake among women living in slum areas of Addis Ababa.

Methods

4.1 Study setting

The study was conducted in Addis Ababa slum areas. Addis Ababa is the capital city of Ethiopia. It is not only the political and administrative center of the country but also a major hub for culture, education, and commerce in the region. It is the focal point of this study on CCS.
It is divided into 11 sub-cities (Addis Ketema, Akaky Kaliti, Arada, Bole, Gulele, Kirkos, Kolfe Keranio, Lideta, Nifas Silk-Lafto, Yeka and Lemikura) and each comprise 10-15 woreda which shows divers range of socioeconomic conditions thus it is also home to significant slum areas. Although the city has many modern institutions and infrastructure, it is also home to significant slum areas, where poverty and inadequate access to healthcare services are prevalent. These slum areas are characterized by overcrowding, limited sanitation facilities, and a lack of resources, which contribute to health disparities among the population(34).

4.2 Study design and period

A sequential mixed study design (quantitative and qualitative) was employed. In the first phase of the study, a cross-sectional study design was conducted to determine the uptake and determinants of CCS among women who reside in selected slum area of Addis Ababa. The study was conducted from February 1 to May 20, 2025.
The quantitative data was collected using structured questionnaires and focused group discussion and In-depth interview was employed among women in the community to explore factors affecting the CCS uptake.

4.3 Source population

Women who are living in slum areas of Addis Ababa and women within age group of 30-49, According to WHO guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention, priority should be given to screening women aged 30–49 years in the general population of women (1).

4.4 Study population

The study group included women within group of 30-49 and who are living in selected slum areas of Addis Ababa. The selected slum areas are Kolfe Keraniyo kebele 02, Nifas silk lafto woreda (Mekenisa), Addis ketema woreda 7(Atobis tera) and Kirkos woreda 6 (Cherkos). This site was selected in consultation with the Addis Ketema, Kolfe Keraniyo, Kirkos and Nifas silk sub-City Administration office, Woreda Administrations office Executive Head and other officials. The definition provided by the United Nations Human Settlements Program (UN-HABITAT) was used to guide the selection of the study setting. According to UN-HABITAT, a slum is an urban area marked by inadequate basic services, poor-quality housing, overcrowding, exposure to hazards, insecure land tenure and social marginalization (34).

4.5 Eligibility criteria

4.5.1 Inclusion criteria

Women in age range of 30-49 and reside in the specific slum area for at least six months.

4.5.2 Exclusion criteria

Women in age range of 30-49 but who were unable to provide informed consent due to severe cognitive impairment.

4.6 Sample size determination

Quantitative

The sample size of this study was determined considering the two objectives. For both objectives, sample size was obtained using single population proportion technique with an assumption of margin of error 4% and 95% confidence level. Epi info was used to calculate the sample size.

Specific objective 1: prevalence of CCS

The sample size is determined using single population proportion formula by considering proportion of CCS among women aged between 30-49 (p) = 13 % (21), z=standard score corresponding 95% confidence interval 1.96 and d =marginal error corresponding (d) 4%. n= sample size required is calculated as:

$$n= (z)^2 p(1-p) /d^2$$

$$n = (1.96)^2 0.13(0.87)/ (0.04)^2$$

n = 272

After using design effect 1.5 and adding 10% non-response rate the final sample size become 449.

Specific objective 2: Age

Age is one of the socio-demographic predictors for CCS. Olde age (>39) women are more likely to be screened than young ones. Therefore, sample size for the study is determined using single population proportion formula by considering proportion of CCS among women aged between 30-49 (p) = 17.6 % (12), z=standard score corresponding 95% confidence interval 1.96 and d =marginal error corresponding (d) 4%. n= sample size required is calculated as:

$$n= (z)^2 p(1-p) /d^2$$

$$n = (1.96)^2 0.176 (0.824)/ (0.04)^2$$

$$n = 349$$

After using design effect 1.5 and adding 10% non-response rate the final sample size become 576.

Health seeking behavior

A cross sectional study shows the prevalence of health seeking behavior for cervical cancer among the study participants was only 14.2% (32). Therefore, sample size for the study was determined using single population proportion formula by considering proportion of CCS among women aged between 30-49 (p) = 14.2 % (34), z=standard score corresponding 95% confidence interval 1.96 and d =marginal error corresponding (d) 4%. n= sample size required is calculated as:

$$n= (z)^2 p(1-p) /d^2$$

$$n = (1.96)^2 0.142 (0.858)/ (0.04)^2$$

$$n = 293$$

After using design effect 1.5 and adding 10% non-response rate the final sample size become 484.

Table 1- Summary of sample size calculation for assessment of the uptake and determinants of cervical cancer screening in slum areas, Addis Ababa Ethiopia 2025.

Specific	Assumptions (Proportions)	Sample	Total Sample Size with

Objective			Size	design effect 1.5 and 10% non-response rate
1	Prevalence of uptake of cervical cancer screening (21)	13%	272	449
2	Age (12)	17.6 %	349	576
3	Health seeking behavior (32)	14.2 %	293	484

The final sample size was taken based on feasibility and the maximum sample size from the list of variables for the objectives is 576.

Qualitative

Purposive sampling approach was employed to select participants and 8 participants were recruited 2 persons from each site for in depth interview and discussion was made with four focus groups from each sub-city and each FGD consisted 3 participants.

4.7 Sampling Procedures

Quantitative

A multi-stage sampling technique was used to select women who live in slum area of Addis Ababa. First four sub-cities were selected from the 11 sub-cities lists using simple random sampling technique and from each selected sub-city, kebeles were selected using stratified sampling technique which are known to have slum areas. And lastly slum areas identified specifically within each kebele.

A proportional allocation of the sample to the respective slum area communities was done based on the population size. Systematic sampling used every 4^{th} house. And for a household with more than one aged between 30-49 a lottery method was used to select one woman.

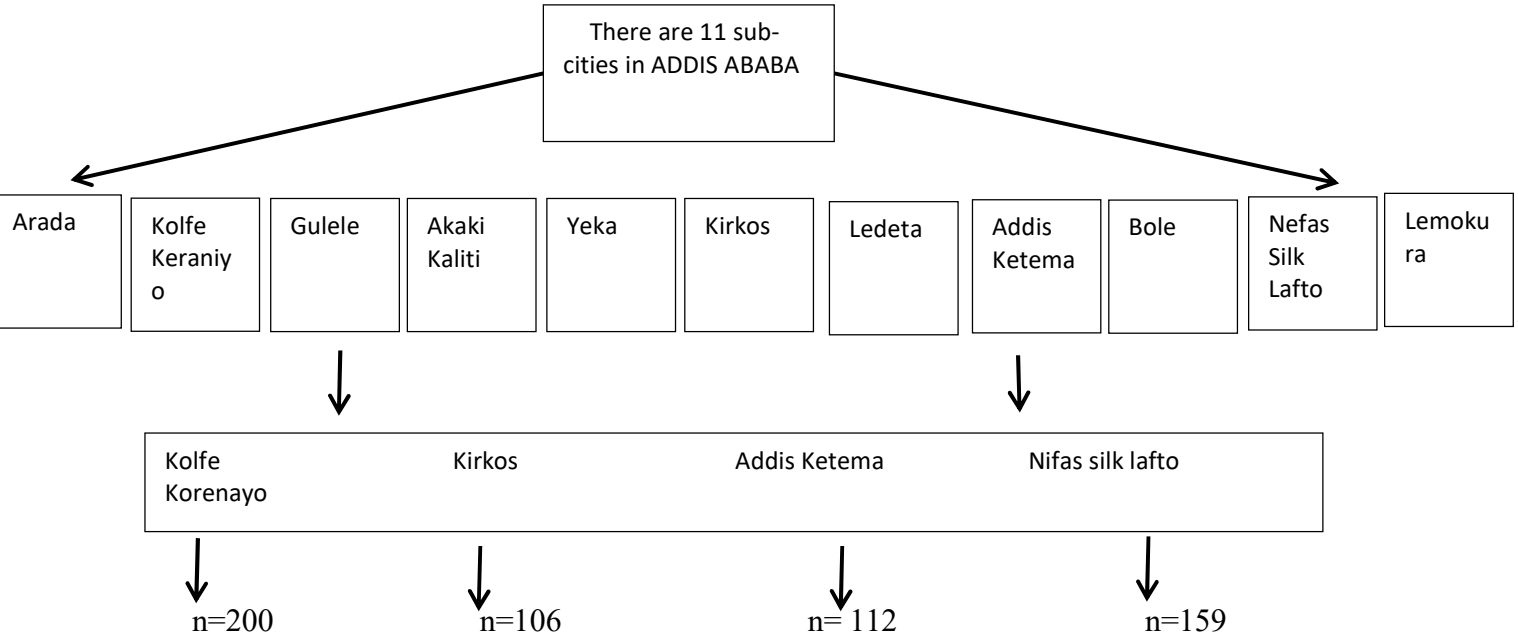

Figure 2 Multi stage sampling

4.8 Data collection procedure

Quantitative Data

The study used a face to face interview. Eight data collectors and two supervisors were involved in the data collection, and two-day training program was given to familiarize themselves with the study objectives, data collection tools, and ethical considerations. Pretest was conducted before starting the data collection. The Data collection was conducted using Kobotoolbox data collection tool.

A structured questionnaire was the primary tool for quantitative data collection. This questionnaire was designed to capture a wide range of information, including demographic Information in age, marital status, education, and occupation is adopted from data abstraction form for quantitative survey. History of CCS, frequency, type of screening test used, knowledge and awareness on CC and CCS and health seeking behavior was also included in the questionnaire.

Qualitative Data

Purposive sampling approach was employed to select participants. Open-end questions were used to explore women's awareness and knowledge regarding CCS, personal social and economic barriers regarding CCS. A total of eight participants for IDI and 12 participants for

FGD took part. Two well experienced data collector was involved in the data collection and one supervisor was involved. Training was given for 2 days. To monitor saturation interviews were transcribed and analyzed concurrently with data collection using thematic analysis. The interviews were continued until saturation is observed with concurrent analysis.

4.9 Variables

Dependent variable

Uptake and determinants of CCS in slum area of Addis Ababa.

Independent variable

- Socio demographic factor like age, marital status, educational status and occupation
- Cultural background
- Economical factor
- Health seeking behavior
- Knowledge and awareness about CCS

4.10 Operational definitions:

Slum areas: is a section of urban setting characterized by lack of basic services, relatively substandard housing, overcrowding, vulnerable to hazards, insecure tenure, and social exclusion(34).

The UN-HABITAT measurement assesses:

- ✓ Housing Quality: Durability and security of housing, overcrowding, construction materials, and property rights.
- ✓ Access to Safe Water: Availability and quality of drinking water.
- ✓ Sanitation: Toilets and sewage systems.
- ✓ Health Services: Access to healthcare facilities, their affordability, and quality. Education and Employment: Assesses educational opportunities and job prospects.
- ✓ Security of Tenure: Legal status of housing and land ownership.
- ✓ Infrastructure and Services: Access to essential services like roads, electricity, and drainage.

- ✓ Environmental Sustainability: Waste management, green spaces, and environmental protection.

Cervical cancer screened: refers to individuals have ever undergone cervical cancer screening at least once in her lifetime regardless of the timing. The screening methods include Visual Inspection with Acetic Acid (VIA), HPV or Pap smear test.

Cervical cancer non-screened: refers to individuals who have not undergone any cervical cancer screening tests within the past year.

Health seeking behavior: it will be measured using four items with five points of and based on the mean score, women were classified in to having health seeking behavior and not having health seeking behavior(35).

Good health seeking behavior: refers to women who score equal to or above the mean value will be categorized as having good health seeking behavior(35).

Bad health seeking behavior: refers to women who score below the mean value will be categorized as having bad health seeking behavior(35).

Knowledge and Awareness: defined as the participants' ability to answer multiple questions which includes the symptoms, risk factors, prevention methods, and available screening procedures for cervical cancer. (36)

Good knowledge: Participants who score equal to or above the mean value of the total knowledge score will be considered to have good knowledge(36).

Poor knowledge: Participants who score below the mean value will be considered to have poor knowledge(36).

4.11 Data management

Trained data collectors gathered the data through face-to-face interviews using structured questionnaires and in-depth interviews. The data collection process was closely monitored with daily checks conducted to ensure the completeness of each questionnaire. During data cleaning, logical checks were applied to identify any errors. Finally, double data entry was carried out to verify data consistency and the dataset was exported to STATA version 17 for analysis.

4.12 Data analysis procedure

Quantitative Analysis:

The data was checked for completeness and consistency prior to data entry and cleaning. And data was exported to STATA version 17 for further analysis. Descriptive statistics, including frequencies, proportions, and cross-tabulations, were used to summarize categorical data. For continuous variables, means and standard deviations were calculated. Bivariate logistic regression was conducted to examine the association between independent and dependent variables. Variables with a p-value ≤ 0.25 in the bivariate analysis were included in the final multi variable logistic regression model. Odds ratios with 95% confidence intervals were reported for the logistic regression analysis. A p-value of less than 0.05 was considered statistically significant. Before actual data analysis, missing value and outliers was checked by drawing histograms.

Data analysis for specific objective 1: uptake of cervical cancer screening

Descriptive analysis was used to summarize the data on CCS uptake focusing on categorical variables. Frequencies and percentages were calculated. Cross-tabulations was used to explore the relationships between variables such as socio-demographic factors (e.g., age, gender, and education level) and CCS uptake. To test for statistical significance between categorical variables, a Chi-square test will be conducted. This will help to identify whether there are any significant differences in CCS uptake based on socio-demographic characteristics.

Data analysis plan for specific objective 2: factors affecting cervical cancer screening

Socio-demographic and economic

The second objective includes the socio-demographic, economic, and cultural factors that affect the uptake of CCS. To analyze these relationships, multivariate regression analysis was used, specifically using logistic regression techniques. This method allows us to model the association between multiple independent variables (such as age, income, education, and cultural beliefs) and the dependent variable (CCS uptake).

Before logistic regression bi-variate analysis was performed to assess the strength and direction of relationships between individual independent variables and the outcome. Variables that showed an association (p-value $\leqslant 0.25$) in the bivariate analysis were included in the final multivariable logistic regression model. Odds ratios with 95% confidence intervals were

calculated, and a p-value of less than 0.05 was considered statistically significant in the final model.

Health Seeking Behavior

Descriptive statistics will first be used to summarize health-seeking behaviors and then inferential analysis using logistic regression was performed to assess the relationship between health-seeking behavior and CCS uptake.

Knowledge and Awareness About CC and CCS

Descriptive statistics will first be used to summarize knowledge and awareness About CC and CCS and then inferential analysis using logistic regression was performed to assess the relationship between knowledge and awareness and CCS uptake.

4.13 Data quality assurance

Before data collection, the English version of the questionnaire was translated into Amharic (the local language). The investigator entered the coded questionnaires into EpiData version 3.1. Data cleaning was conducted by running frequency checks on each variable to ensure clarity, completeness, and consistency. A pretest was carried out on 5% of the study participants in Kolfe Keraniyo Sub-City, Kebele 15 (Lomi Meda) prior to the actual data collection. During the pretest, participants were asked whether any of the questions were confusing, difficult to understand or answer, upsetting, or offensive. The data collection process was supervised, and the completeness was checked daily, Logical checking technique was employed to identify errors during data cleaning and double data entry was performed to check the consistency of the data. And exported to STATA version 17 for analysis. Two days training was given to the data collectors and supervisor by principal investigator with the additional training to the supervisor for data quality management.

4.14 Ethical consideration

This study was conducted after obtaining ethical clearance from the Ethical Review Committee of the School of Public Health at Addis Ababa University. Permission to carry out the study was also secured from the respective sub-city bureaus in Addis Ababa. Informed consent was

obtained in a clear and comprehensive manner, outlining the study's purpose, procedures, potential risks, and benefits. Participants were made fully aware of their rights and were informed that their participation was voluntary. The selection of participants was done equitably to avoid the exploitation of vulnerable populations. Confidentiality was ensured by training data collectors not to record any identifying information. The principle of beneficence was guided the study design by implementing educational components that enhance awareness of cervical cancer and screening benefits, while minimizing any potential harms through psychological support and careful management of sensitive topics related to women's health.

4.15 Dissemination

The findings of this study will be presented to the School of Public Health, College of Health Sciences, Addis Ababa University, as partial fulfillment of the requirements for a Master of Public Health degree in Epidemiology and Biostatistics. The final report will also be submitted to the Addis Ababa Regional Health Bureau and other relevant stakeholders. Additionally, the results will be presented during the thesis defense, and efforts will be made to submit the research findings to local and/or international peer-reviewed journals for publication.

5. Result

5.1 Quantitative results

5.1.2 Socio-demographic characteristics

Out of the 576 samples approached for the study, 574 women were interviewed and provided complete responses, which make the response rate to be 99.65%. The participants had a mean age of 39.76 years (SD = 4.97), with the largest age group being 30–39 years (55.23%) and those aged 40–49 years (44.77%).

In terms of marital status, the majority were married (58.9%), while 22.5% were single, 10.1% were divorced, and 8.5% were widowed. Educational status varied with 42.5% having completed primary education. About 20.6% of the women were illiterate, and 17.3% could only read and write without formal schooling. Secondary education was reported by 16.7% of participants, and only 3% had graduated from college.

Regarding occupation 36.9% were employed in the private sector, 28.9% identified as housewives, and 15.2% were commercial sex workers. Government employment accounted for 8.4% of respondents, while 6.5% were merchants. A small proportion were involved in other types of work (3.8%), and 0.35% were students.

The mean monthly income of the participants was ETB 4,715.07 (SD = 3,582.66). A majority (61.7%) earned between ETB 2,001 and 6,000, 21.3% earned less than ETB 2,000, and 13.1% earned between ETB 6,001 and 10,000. Only 4.0% of the respondents reported earning more than ETB 10,000 per month. (Table 2)

Table 2 Socio Demographic characteristics of women living in slum area of Addis Ababa March, 2025.

Variable	**Category**	**Frequency (574)**	**Percent %**
Age	Mean (SD) 39.76 (4.97)		
	30-39	322	55.23 %
	40-49	261	44.77%
Marital status	Single	129	22.47 %

	Married	338	58.89 %
	Divorced	58	10.10 %
	Widowed	49	8.54 %
Education	Illiterate	118	20.56 %
	Read and write only	99	17.25 %
	Primary education	244	42.51 %
	Secondary education	96	16.72 %
	Graduated from college	17	2.96 %
Occupation	Commercial sex worker	87	15.16 %
	Government employee	48	8.36 %
	Housewife	166	28.92 %
	Private	212	36.93 %
	Merchant	37	6.45 %
	Other	22	3.83 %
	Student	2	0.35 %
Income	Mean (SD) 4715.07 (3582.66)		
	< 2,000 ETB	122	21.25 %
	> 2,000 &<= 6,000 ETB	354	61.67 %
	> 6,000 &<= 10,000 ETB	75	13.07 %
	> 10,000 ETB	23	4.01 %

5.1.2 Housing characteristics of respondents

In terms of housing conditions, the majority of the participants (65.5%) lived in single-room dwellings, while 27.9% resided in multi-room houses, and 6.6% reported sharing housing with others. Regarding housing ownership, 61.2% of respondents lived in rental houses, 22.3% owned their homes, and 16.6% resided in government-provided housing.

Household size was predominantly large, with 89.6% of participants living in households with six or more members. Small households (1–2 members) made up 7.7%, and medium-sized households (3–5 members) constituted 2.8%.

When assessing sanitation, the vast majority (87.5%) of participants used shared toilet facilities, while only 11.2% had access to private flush toilets. A small proportion reported having no toilet (1.1%) or using pit latrines (0.3%). In terms of water access, 41.7% of respondents obtained water from piped sources located outside the home, 33.2% had piped water in-house, 24.4% used public taps, and only 0.7% relied on other water sources.

Concerning household energy sources, charcoal was the most commonly used (46.2%), followed by electricity (44.1%). Smaller percentages of participants used firewood (7.7%), gas (1.9%), or reported no reliable energy source (0.2%).

Flooring materials varied slightly, with 49.1% of homes having cemented floors and 48.3% having dirt floors. Other types of flooring, including tiled (0.7%), wood (1.6%), and other materials (0.4%), were uncommon. Almost all households (98.6%) had iron sheet roofing, while a few had concrete roofs (0.5%) or other roofing materials (0.9%).

5.1.3 Cervical cancer screening uptake

Out of the 574 women, 143 participants (24.91%) reported having undergone cervical cancer screening (CCS), while the majority 431 women (75.09%) had never been screened.

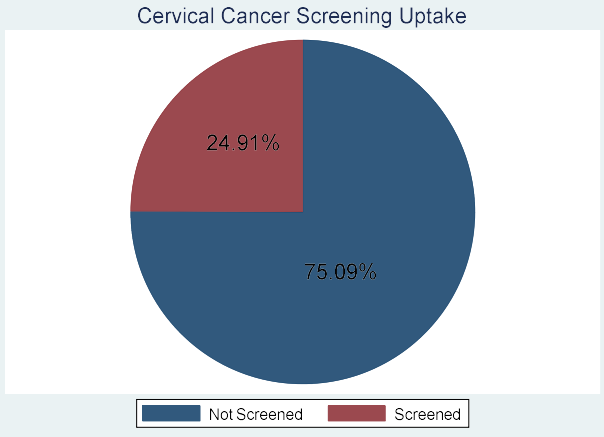

Figure 3 Figure 3 Cervical cancer screening uptake of participant

Among those who underwent screening, the most common reason stated was a doctor's request (38.46%), followed by participation in a general screening program (33.57%), and self-conviction (27.27%). Among those who had not been screened, the leading reason was the perception of being healthy (47.33%), followed by the belief that the procedure is painful (17.87%). 26.45% gave no response, while other reasons included embarrassment (2.32%), cost concerns (0.70%) and various unspecified factors (5.34%).

Table 3 Cervical cancer screening uptake of women living in slum area of Addis Ababa March, 2025

Variables	**Category**	**Frequency (576)**	**Percent %**
CCS uptake	Yes	143	24.91 %
	No	431	75.09 %
Reason for CCS uptake	Health workers request	55	38.46 %
	No response	1	0.70 %
	Self-conviction	39	27.27 %
	part of a general screening program	48	33.57 %
Reason for non-CCS uptake	I am healthy	204	47.33 %
	It is Expensive	3	0.70 %
	It is embarrassing	10	2.32 %
	It is painful	77	17.87 %
	No response	114	26.45 %
	Other	23	5.34 %

5.1.4 Health seeking behavior

Among the 574 participants, health-seeking behaviors and risk exposures varied notably. Only 42.68% of respondents reported seeking treatment during their last illness, while the majority (57.32%) did not pursue any form of care. Preventive health practices were moderately common; 67.94% of respondents had undergone general health screening. However, only 32.06% had ever checked their blood pressure and 39.27% had checked their blood sugar levels, indicating gaps in routine health monitoring. Regarding HIV testing, responses were evenly split, with 49.65% having been tested and 50.35% never tested.

In terms of maternal and child health practices, 64.8% of respondents reported vaccinating their children or eligible family members. Approximately 44.6% had monitored the growth of a recent child in the family, while 34% had not, and 21.4% indicated this was not applicable to them. Engagement in antenatal care (ANC) was encouraging, with 70.73% of participants reporting they had followed ANC for their most recent pregnancy, although 7.32% had not and 21.95% found the question not applicable.

Participation in health-oriented leisure activities was very low. Only 13.07% reported engaging in aerobic physical activity, and 14.63% participated in any other health-promoting leisure activity. Concerning risk behaviors, alcohol consumption was reported by 70.16% of respondents, a relatively high figure, while tobacco use was much lower, with only 8.01% reporting smoking and 91.99% indicating they did not smoke. (Table 4)

Table 4 Health seeking behavior of women living in slum area of Addis Ababa March, 2025

Variables	Category	Frequency (574)	Percent %
During your last illness did you seek treatment?	yes	245	42.68%
	No	329	57.32%
Screening for general health		390	67.94%
Ever checked blood pressure	Yes	184	32.06%
	No	390	67.94%
Ever checked your blood sugar level	Yes	225	39.27%
	No	348	60.73%
Ever tested for human immune deficiency virus (HIV) infection	Yes	285	49.65%
	No	289	50.35%
Vaccinated children and any family member who is eligible	Yes	372	64.8%
	No	70	12.2%
	Not related	132	23%
Monitor the growth of recent child in family	Yes	256	44.6%
	No	195	34 %

	Not related	123	21.4%
Followed antenatal care for the resent pregnancy	Yes	406	70.73%
	No	42	7.32%
	Not related	126	21.95%
Health oriented leisure activities			
Aerobic physical activities	Yes	75	13.07%
	No	499	86.93%
Health oriented leisure activities	Yes	84	14.63%
	No	490	85.37%
Risk exposure			
Take alcohol?	No	171	29.84%
	Yes	402	70.16%
Smoke tobacco	No	528	91.99 %
	Yes	46	8.01%
Chew Khat	No	506	88.15 %
	Yes	68	11.85 %

Scoring of Health-Seeking Behavior

Health-seeking behavior was assessed using 12 items covering health service utilization, preventive practices, physical activity, and risk avoidance behaviors. Each question was scored as 1 for positive (health-promoting) behavior and 0 for negative (non-health-promoting) behavior, except for "Not related" responses, which were excluded from the total score. The total score for each respondent was then compared against the mean value of all valid scores.

Health-seeking Behavior

Based on the analysis of the health-seeking behavior scores, 225 respondents (39.20%) were classified as having good health-seeking behavior, while the majority, 349 respondents (60.80%), were categorized as having bad health-seeking behavior.

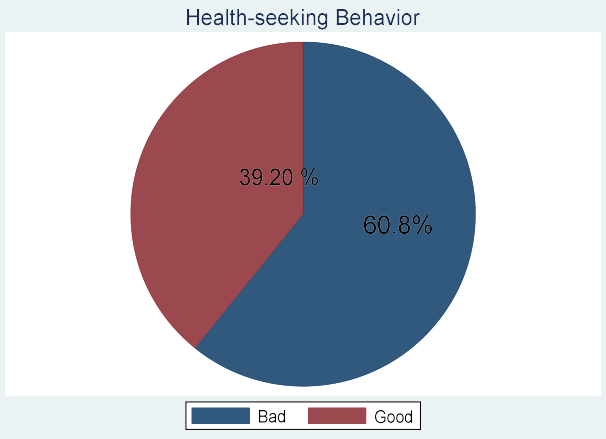

Figure 4 Health seeking behavior of the participant

5.1.5 Knowledge and awareness on CC and CCS

Out of 574 women surveyed, only 34.5% had ever heard of cervical cancer, with the majority (65.5%) indicating no prior awareness. Among those aware, the primary sources of information were media (42.0%) and health personnel (38.8%). However, knowledge about the cause of cervical cancer was low—only 7.7% correctly identified a virus as the cause, while over half (53.2%) responded with "do not know."

Regarding risk factors, 31.3% recognized having multiple sexual partners as a predisposing factor, while 36.3% were unaware of any. Common misconceptions included repeated abortion, poor hygiene, and urinating on the sun. Symptoms were similarly misunderstood; only 13.2% identified vaginal bleeding, and 39.5% admitted to not knowing any symptoms.

When asked about who is at risk, 39.6% correctly identified sexually active women, but nearly 28.2% responded "do not know." Similarly, 50.9% believed women with multiple sexual partners were at higher risk, while 29.8% did not know. Just over half (54.4%) believed cervical cancer is preventable. Among them, the most recognized prevention methods included avoiding multiple sexual partners (42.6%) and seeking screening services (37.2%).

Only 24.0% had knowledge of any screening procedure. Pap smear was the most commonly known method (40.3%), and health care providers were the most cited source of screening information (52.9%). While 49.8% believed the aim of screening is to prevent cervical cancer, 16.0% did not know its purpose.

Knowledge about appropriate screening timing and frequency was varied—only 24.9% said it should start once a woman is sexually active, and 24.6% said it should be done yearly. Notably, 27.4% gave inconsistent responses, and 20.4% admitted they did not know.

Most participants (65.0%) believed cervical cancer is curable if detected early. Still, 41.0% did not know what makes treatment effective. Chemotherapy (19.7%) and surgery (10.2%) were the most known treatment options, while a large majority (66.1%) did not know of any treatments.

Table 5 Knowledge and awareness on CC and CCS of women living in slum area of Addis Ababa March, 2025

Question	Response Option	Frequency	Percent
Awareness on cervical cancer			
Haveyoueverheardof cervical cancer?	Yes	198	34.49%
	No	376	65.51%
Wheredidyouhear about cervical cancerforthefirst time?	Media	158	42.02%
	Healthpersonnel	146	38.83%
	Teachers	4	1.06%
	Relatives	17	4.52%
	Friends	47	12.5%
	Religion	3	0.8%
	Otherspecify	1	0.27%
Cause of cervical cancer			
Whatisthecause ofcervical cancer?	Virus	29	7.71%
	Bacteria	47	12.5%
	Fungus	7	1.86 %
	Throughgenesfromfamily	14	3.72%

	Urinatingon thesun	24	6.38%
	Do not know	200	53.19 %
	Otherspecify	55	14.63%
Predisposing factors of cervical cancer			
Whatarethepredisposing factorsto cervicalcancer?	Havingmultiple sexual partners	152	31.28%
	Early onset sexual intercourse	48	9.9%
	Family history of cervical cancer	19	3.92%
	Infection by virus causing cervicalcancer	24	4.95%
	Cigarette smoking	24	4.95%
	Low immunity due to HIV/AIDS	15	3.09%
	Repeated abortion	26	5.35%
	Donotknow	148	36.27 %
	Other:	32	6.6%
	low personal hygiene	25	
	STI disease	2	
	Old age women	5	
Sign and symptoms of cervical cancer			
Whatarethesignsandsymptomsof cervicalcancer?	Vaginal bleeding	64	13.22%
	Foullyvaginaldischarge	166	34.3%
	Pelvic orbackpain	56	11.57%
	Postcoital bleeding	27	5.58%
	I don’t know	191	39.46%
	Other	30	6.20%
Whoisatrisk ofdeveloping cervical cancer?	Allwomen	95	16.55%
	Marriedwomen	62	10.80%

	HIVpositivewomen	31	5.4%
	Womenwho are sexually active	227	39.55%
	I don't know	162	28.22 %
	Othersspecify	15	2.61%
Whoismore likelyatrisk	HIVpositivewomen	35	6.10%
of	Womenwithmultiple sexual	292	50.87%
developingcervicalcancer	partners.		
?	Womenwithfamily historyof	34	5.92%
	cervicalcancer		
	Allwomen	76	13.24%
	I don't know	171	29.79%
	Othersspecify	20	3.48%
Prevention of cervical cancer			
Iscervicalcancer	Yes	312	54.36 %
preventable	No	262	45.64%
disease?			
Ifyestoquestion	Avoid multiple sexual	188	42.63%
"Iscervicalcancer	Partners		
preventable	Avoid early onset sexual	37	8.39%
disease?"how?	intercourse		
	Quitsmoking	4	0.91%
	Throughvaccination	58	13.15%
	Seekscreening services	164	37.19%
	Do notknow	39	8.84%
	Other	33	7.48%
	- Keeping personal hygiene	13	
Methods of cervical cancer screening			
Doyouknowanyscreening	Yes	138	24.04%

?	No	436	75.96%
procedurestodetectcervical cancer?			
If yes, which cervicalcancerscreening methodsdo you know?	Papsmear	98	40.33%
	VIA	33	13.64%
	HPV testing	14	5.79%
	Others	28	11.57%
Fromwheredidyou heard about cervicalcancerscreening methods for the first time?	Hospital	37	26.81%
	Health care providers	73	52.90%
	Television	7	5.07%
	Radio	1	0.72%
	Friend	12	8.70%
	Relative	5	3.62%
	Otherspecify	3	2.17%
Whatisthe aimof cervical cancer screening?	Toprevent cervical Cancer	286	49.83 %
	Ithelpsforearly detectionof cervicalcancer	75	13.07%
	It helps for early seek of treatment	44	7.67%
	It helps to treat cervical cancer	64	11.15%
	Do not know	92	16.03%
	Other	13	2.26%
Frequency of cervical cancer screening			
Whenawoman should have screening?	Whenmenstruationstarts	107	18.64%
	Assoon assexually active	143	24.91%
	At the age of 30	97	16.9%
	Whenstarthavingchildren.	37	6.45%

	Aftermenopause	7	1.22%
	Do not know	133	23.17%
	Other	50	8.71%
Howfrequent,screeningsh	Once everyyear	141	24.56 %
ouldbe	Onceeverytwoyears	61	10.63%
done forcervical cancer?	Onceeverythreeyears	75	13.07%
	Once every 5years	23	4.01%
	Do notknow	117	20.38%
	Others	157	27.35 %
Treatments of cervical caner			
Iscervicalcancercurable	Yes	373	64.98%
(treatable) if detected	No	76	13.24%
early?	Don’tknow	125	21.78 %
Whatthingsmakecervical	Seekingtreatmentat early	206	44.21%
cancer curableoncediagnosed?	Stage		
	Seeking treatment at late stage	13	2.79%
	Seekingtreatmentatearlyor late stage, don’t have difference	44	9.44%
	Don’tknow	191	40.99 %
	Others	6	1.28%
Whattreatmentmodalities	Herbalremedies	20	3.51%
doyou knownforcervicalcancer	Surgery	58	10.19%
	Radiotherapy	26	4.57%
	Chemotherapy (oral medication)	112	19.68%
	Cryotherapy	1	0.18%
	LEEP	0	0

	Do not know	376	66.08%
	Other	20	3.51%

Knowledge on cervical cancer and cervical cancer screening scoring

Participants knowledge about cervical cancer and its screening was assessed using a 17-item multiple-choice questionnaire. The questions covered various aspects, including causes, risk factors, symptoms, high-risk groups, prevention methods, types of screening, benefits of screening, appropriate screening age, recommended frequency, and available treatment options. Each correct response was score 1 point, while incorrect or "don't know" answers scored 0, yielding a total knowledge score ranging from 0 to 17. Multiple answers were possible for several of the questions. To categorize the level of knowledge the mean score was used as a cutoff point:

- Good knowledge: Score ≥ 6.5
- Poor knowledge: Score < 6.5

Out of the 574 samples knowledge about cervical cancer and its screening was categorized into two levels. The results showed that 66.2% (n = 380) of participants had poor knowledge—scoring below the mean value—while 33.8% (n = 194) demonstrated good knowledge, with scores at or above the mean. This suggests that the majority of women in the study had limited awareness of cervical cancer and related preventive measures.

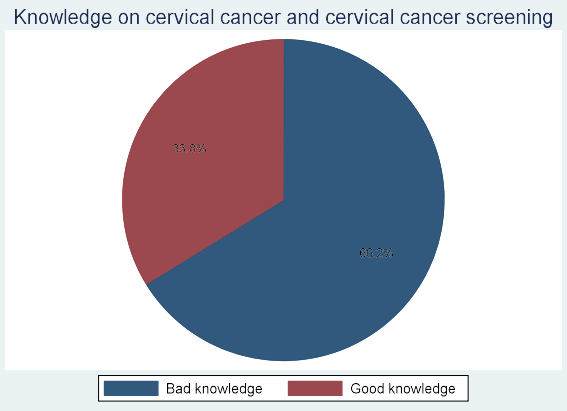

Figure 5 knowledge on cervical cancer and cervical cancer screening

5.1.6 Bi-variate and multi variable logistic regression analysis output of factors associated with CCS uptake. (n=574)

Table 6 Bi-variate and multi variable logistic regression analysis output of factors associated with CCS uptake among women living in slum area of Addis Ababa, 2025

Variable	Screened n (%)	Not screened n (%)	COR (95% CI)	AOR (95% CI)	P-value
Age Group					
30–39 (Reference)	65 (20.19)	257 (79.81)			
40–49	78 (30.95)	174 (69.05)	1.77 (1.21-2.59)	2.20 (1.33-3.65)	0.002**
Marital Status					
Single (Reference)	53 (41.09)	76 (58.91)			
Married	63(18.64)	275 (81.36)	0.33 (0.21 - 0.51)	0.73 (0.36 - 1.47)	0.378
Widowed	10 (20.41)	39 (79.59)	0.37 (0.17 - 0.80)	0.55 (0.19 - 1.56)	0.260
Divorced	17 (29.31)	41 (70.69)	0.59 (0.31 - 1.16)	1.15 (0.47 - 2.82)	0.766
Educational Status					
Illiterate (Reference)	23 (19.49)	95 (80.51)			
Primary Education	53 (21.72)	191 (78.28)	1.15(0.66 - 1.98)	1.44 (0.72 - 2.91)	0.306
Read and write only	17 (17.17)	82 (82.83)	0.86 (0.43 - 1.71)	0.78 (0 .32 - 1.87)	0.578
Secondary Education	42 (43.75)	54 (56.25)	3.21 (1.75 - 5.90)	4.42 (1.96 - 9.96)	<0.001
Graduated	8 (47.06)	9 (52.94)	3.67(1.28 -10.55)	6.85 (1.55 - 30.25)	0.011
Occupation					
Housewife (Reference)	27 (16.27)	139 (83.73)			
Commercial sex worker	65 (74.71)	22 (25.29)	15.21 (8.06 - 28.71)	13.60 (5.92 - 31.26)	<0.0001
Government employee	9 (18.75)	39 (81.25)	1.19 (0.52 - 2.73)	0.47 (0.17 -1.29)	0.143
Private Business	35 (16.51)	177 (83.49)	1.02 (0.59 - 1.76)	0.99 (0.53 - 1.87)	0.980
Merchant	4 (10.81)	33 (89.19)	0.62 (0.20 - 1.90)	0.59 (0.17 - 2.08)	0.416
Other	3 (13.64)	19(86.36)	0.61 (0 .13 - 2.77)	1.27 (0.25 -6.53)	0.767
Student	0 (0)	2 (100)	1 (empty)	1	
Income					
Upper Middle (Reference)	20 (26.67)	55 (73.33)			
Low	25 (20.49)	97 (79.51)	0.71 (0.36 - 1.39)	1.06 (0.44 - 2.55)	0.890
Low Middle	92 (25.99)	262 (74.01)	0.97 (0.55 -1.70)	1.39 (0.67 -2.90)	0.375
Upper	6 (26.09)	17 (73.91)	0.97 (0.34 - 2.80)	0.35 (0.08 - 1.56)	0.170

Health-seeking Behavior					
Bad Health-seeking Behavior (Reference)	63 (18.05)	286 (81.95)			
Good Health-seeking Behavior	80 (35.56)	145 (64.44)	2.50 (1.70 - 3.68)	2.087 (1.25 - 3.48)	0.005**
Knowledge Level					
Poor Knowledge (Reference)	56 (14.74)	324 (85.26)			
Good Knowledge	87 (44.85)	107 (55.15)	4.70 (3.15 - 7.02)	5.368 (3.20 - 8.98)	<0.0001

*Statistically significant at p-value < 0.05, ** Statistically significant at p-value < 0.01, ***Statistically significant at p-value < 0.001 COR = crude odds ratio at 95% confidence interval; AOR = adjusted odds ratio at 95% confidence interval.

In the bi-variate analysis, several variables showed significant crude associations with CCS uptake; however, after adjusting for potential confounders in the multivariate model, only a subset remained statistically significant. Age was a significant predictor: women aged 40–49 were 2.2 times more likely to undergo CCS than those aged 30–39 (AOR = 2.2, 95% CI: 1.33-3.65, p = 0.002). Education also showed a strong positive association; women with secondary education had 4.42 times higher odds of CCS uptake compared to illiterate women (AOR = 4.42, 95% CI: 1.96–9.96, p< 0.001), and those who had graduated had even greater odds (AOR = 6.85, 95% CI: 1.55–30.25, p = 0.011). Occupation was another influential factor: commercial sex workers had significantly higher odds of CCS uptake than housewives (AOR = 13.60, 95% CI: 5.92–31.26, p< 0.001). Meanwhile, other occupational categories such as government employees, merchants, and those in private business did not show a significant difference. Income level was not independently associated with CCS uptake in the adjusted model. In terms of behavioral factors, women with good health-seeking behavior were twice as likely to be screened as those with poor behavior (AOR = 2.09, 95% CI: 1.25–3.48, p = 0.005). Most notably, knowledge level was a strong predictor of screening: women with good knowledge about cervical cancer and screening were over five times more likely to have been screened (AOR = 5.37, 95% CI: 3.20–8.98, p< 0.001). These findings underscore the importance of educational interventions and

behavior-change communication to enhance awareness and good health behaviors, particularly among less educated, younger, and lower-engaged populations. (Table 6)

5.2 Qualitative study results

5.2.1 Socio-demographic characteristics of the study participants

Table 7 Socio-demographic characteristics of IDI and FGD to explore uptake and determinants of cervical cancer screening in slum areas of Addis Ababa, 2025

Characteristics	IDI (n=8)	FGD1 (n=3)	FGD2 (n=3)	FGD3 (n=4)	FGD4 (n=4)
Age	35–42	30–39 (1), 40–49 (2)	30–39 (2), 40–49 (1)	30–39 (2), 40–49 (1)	30–39 (2), 40–49 (1)
Marital Status	Married (4), Single (3), Widowed (1)	Single (2), Married (1)	Single (2), Married (1)	Married (3)	Married (2), Divorced (1)
Education	Illiterate (1), Read & write (1), Primary (5), Secondary (1)	Illiterate (2), Primary (1)	Illiterate (1), Secondary (2)	Illiterate (2), Primary (1), Secondary (1)	Primary (2), Secondary (1)
Occupation	Housewife (1), Self-employed (4), Employed (1), Unemployed (2)	Housewife (1) Self-employed (2)	Housewife (1) Self-employed (2)	Housewife (3), Self-employed (1)	Housewife (2), Self-employed (1)
Number of Children	0 (3), 1 (1), 2–3 (2), ≥4 (2)	0 (1), 1–3 (2)	0 (1), 1–3 (2)	1–3 (1), ≥4 (2)	1–3 (3)

In in-depth interview half of the participants were married (50%) and over a third were single (37.5%). Most (70%) had at least primary education. Half were self-employed (50%), with others employed in government (25%), unemployed, or housewives (each 12.5%). About 63% had experienced childbirth. In FDG most participants were aged 35–39 (58.3%), half were married (50%), and a third were single (33.3%). The majority were housewives (58.3%) or self-employed (41.7%). Regarding education, 41.7% were illiterate, while 25% each had primary and secondary education. Most (66.7%) had 1–3 children.

Theme 1: Awareness of cervical cancer

This major theme encompasses three sub-themes: having Awareness, Lack of Awareness, and Areas for Improvement.

Sub-theme 1: Having Awareness

Both FGD and IDI participants showed varying degrees of awareness about cervical cancer, including its causes, symptoms, and prevention strategies. Participants described cervical cancer as a disease that feels unpredictable, almost coincidental. One moment, a person may seem completely healthy; the next, they may have cervical cancer. Additionally, one participant expressed the belief that poor hygiene, such as inadequate washing or the use of unclean materials, could contribute to the development of cervical cancer.

"Cervical cancer, to me, feels like a disease that just happens—it's coincidental. You might be fine one day, and then suddenly you hear you have it. I also believe that if a woman doesn't take care of her hygiene, like not washing properly or using unclean materials, that can cause cervical cancer" (IDI Participant 1).

One participant expressed the belief that having multiple sexual partners increases the risk of cervical cancer, citing the possibility of exposure to various infections, some of which could lead to cancer in the cervix. Additionally, she mentioned hearing those self-induced abortions, especially when performed repeatedly, can be highly dangerous. According to her understanding, repeated procedures may cause internal damage, which, over time, might contribute to the development of cancer. both factors are seen as potential causes of cervical cancer.

"I know that having sex with multiple people can lead to cervical cancer. People say that when a woman has many partners, she is more likely to get infected with different diseases, and one of those could cause cancer in the womb. Also, I have heard that doing abortions by yourself, especially when it is done more than once, can be very dangerous. If a woman keeps doing that, it can hurt the inside of her body, and over time, that damage might turn into cancer. So, for me, I think both of these things are causes of cervical cancer" (IDI Participant 8). I addition *"From what I understand, you can get cervical cancer if you touch someone's wound, especially during sex. And being with many sexual partners, that too."* (FGD 4, participant C)

Some participants expressed the belief that untreated infections in the reproductive organs could gradually develop into cervical cancer. They mentioned hearing that if an infection is left

untreated for too long, it may worsen over time and potentially lead to cancer. Based on this understanding, they emphasized the importance of early treatment to prevent more serious health complications. This perspective, shared by those around them, was seen as logical and reasonable.

"I think if you have an infection in your reproductive organs, and you don't treat it properly. it can spread and slowly turn into cancer over time. That is what I've heard. Like, if you leave the infection for too long, it keeps getting worse and might change into cervical cancer. So, I believe it is important to treat any kind of infection early before it causes bigger problems. That is what people around me say, and I think it makes sense" (IDI Participant 7).

Some participants shared their views on the signs and symptoms of cervical cancer. One commonly mentioned symptom was persistent itching in the vaginal area, which they believed could indicate an underlying issue. Additionally, they noted that an unusual, foul-smelling discharge might be a warning sign. While they acknowledged not knowing all the symptoms, these were frequently discussed as possible indicators based on what they had heard from others.

"*One of the symptoms is itching in the vaginal area. Like, if someone is always feeling discomfort or irritation down there, it could be a sign. And also having a bad-smelling discharge, something unusual that doesn't smell normal, people say that could be a sign too. I don't know everything about the symptoms, but those are the things I have heard people mention"* (IDI Participant 8).

"I've heard that the symptoms include burning when you pee and sometimes there's a smelly discharge."(FGD 4 participant C)

Some participants shared their views on cervical cancer prevention. One commonly mentioned method was using condoms, as they believed it could help reduce the risk of disease transmission and potentially prevent cervical cancer. Additionally, they emphasized the importance of vaccination, personal hygiene, including regular washing and wearing clean underwear, as key practices to protect one's health.

"*For prevention, what I know is that using a condom can help. People say it protects you from diseases, so I believe it might help prevent cervical cancer, too. And also, keeping personal hygiene is important. You have to keep yourself clean. Washing regularly, wearing clean underwear. that's how I believe you can protect yourself"* (IDI Participant 6).

In addition to this, another respondent also stated as "*For prevention, taking the vaccine is important. I've heard the vaccine can protect you from getting cervical cancer, so if it's available, it's good to take it. Also, if you have any kind of infection, especially in the reproductive area. it's important to treat it early. If you leave it for too long, it could turn into something more serious. And I also believe drinking a lot of water helps. It keeps your body clean and healthy*" (IDI Participant 7). and on FGD *" I heard that getting vaccinated helps prevent it. I don't know anything else. I don't know how the screening is done I never heard someone explain it."* (FGD 4 participant B)

One participant emphasized the importance of cervical cancer screening, believing that early detection is crucial in preventing the disease from worsening. They noted that if identified early, medical treatment could be more effective. Additionally, they expressed concern that some people may not realize how cervical cancer can begin, potentially from an infection, and gradually become more serious if left unchecked. For them, screening is not just about diagnosis but also a proactive step in protecting the body from further harm.

*"I believe that checking for cervical cancer is important. Doing the screening helps you know if you have the disease early, before it gets worse. If you catch it early, the doctors can treat it with medicine. I think some people do not realize that cervical cancer can start small maybe with a bacteria or virus, and if you don't catch it in time, it can grow and become more serious. So, going for screening helps to stop it from spreading. It's not just about finding out if you're sick, it also helps to keep your body safe from more damage" (*IDI participant 1).

Sub-theme 2: Lack of awareness

One participant expressed that she doesn't know about cervical cancer, its symptoms, or its causes. She felt uninformed about the disease, explaining that she had never encountered information about it through formal education or media sources. Emphasizing the importance of awareness, she urged those knowledgeable about cervical cancer to take the initiative in educating others.

"I honestly don't know anything about cervical cancer, its symptoms or the factors that cause it. I studied accounting and have a diploma in the field, so I never learned anything related to health in my education. How would I know about cervical cancer? No one ever taught me? I haven't heard anything about it from any kind of media. people like you who know about these

things should be the ones to teach us" (IDI Participant 2). Other participants also stated that "*I don't knowthe signs and symptoms, I really don't know what to look for. No one has explained it to me properly, so I wouldn't even know if something was wrong."* (FGD3 Participant A).

Sub-theme 3: Areas Need Improvement

Participants emphasized the need for equal access to cervical cancer education, stating that the government and health workers should provide information to everyone without favoritism. They expressed that all individuals, regardless of their background or financial status, deserve the same knowledge and opportunity to protect their health.

"I believe the government or health workers should come and teach us all equally, without favoring one group over another. We all need the same knowledge and the same chance to protect our health. no matter who we are or how much money we have" (IDI Participant 4).

One participant suggested that patients should have the option to choose who examines them, particularly regarding the gender of the healthcare professional. They emphasized that this choice could be significant for many individuals, as personal and cultural factors often make women uncomfortable with male providers during screenings. They believed that ensuring the availability of female healthcare workers would encourage more women to seek cervical cancer screening.

"If I could make one suggestion, it would be that we should at least be given a choice about who examines us especially when it comes to the gender of the health professional. It would make a big difference for many of us. For personal and cultural reasons, a lot of women feel very uncomfortable being screened by male professionals. I think more women would be willing to get screened if they knew for sure that a female health worker would be available" (IDI Participant 5).

Theme 2: Barriers to cervical cancer screening

This major theme encompasses the following sub-themes: Socioeconomic barriers, Psychosocial and cultural barriers, and no barriers.

Sub-theme 1: Socioeconomic barriers

One participant highlighted a common barrier to cervical cancer screening, explaining that in their community, people generally do not visit healthcare facilities unless they are seriously ill and unable to tolerate the pain any longer. Routine checkups and screenings are not part of their usual healthcare practices. Many hold the belief that there is no need to go to a clinic if they feel

fine, a mindset that has been ingrained over the years. The participant emphasized that this reluctance is not due to opposition to screening but rather a lack of understanding of its importance in early detection and prevention.

"In our community, most people don't go to the health facility unless they're sick, like when it gets serious and they can't take the pain anymore. We're not used to going for checkups or getting screened when we feel fine. It's just not part of our lifestyle. People think, 'Why go to the clinic if you're not sick?' That's how we've been living for years. So, it's not that people are against screening, it's more that they don't understand the importance of doing it early" (IDI Participant 8).

Some participants highlighted financial difficulties as a barrier to cervical cancer screening. One individual shared their experience, explaining that while at the hospital, they were advised to undergo screening. However, the screening equipment at the health center was not functioning, and they were directed to another facility. Unfortunately, due to financial constraints, they were unable to afford the screening elsewhere and ultimately did not proceed. Since then, they have not attempted to get screened again.

"I've faced financial problems when it comes to screening. One time I was at the hospital and they told me I needed to get screened. But the machine at the health center wasn't working, and they told me I had to go somewhere else to do it. The problem was I couldn't afford it at that time. I didn't have enough money to pay for the screening somewhere else, so I just didn't go. I haven't checked again since then" (IDI Participant 3).

Sub-theme 2: Psychosocial and cultural barriers

Participants highlighted a lack of awareness as a significant barrier to cervical cancer screening. One participant shared, "The main reason she hasn't undergone cervical cancer screening is that she knows nothing about the disease. No one has ever explained it to her.

"As I mentioned earlier, the main reason I haven't gone for cervical cancer screening is that I don't know anything about the disease. No one has explained it to me. I didn't learn about it in school since my studies were in accounting, and I've never seen anything about it or heard anything. I simply don't know what the screening involves, why it is important or even where I should go to get it done" (IDI Participant 2).

Some participants highlighted fear of community judgment as a significant barrier to cervical cancer screening. In their community, social status plays a pivotal role, with individuals often

evaluated based on their perceived standing. While some are respected, others face criticism, which influences personal health decisions. For instance, a woman considering screening may fear becoming the subject of gossip or speculation, with others assuming she has a serious health condition. This level of scrutiny can feel overwhelming and discouraging. Despite her desire to prioritize her health, the risk of judgment or misinterpretation can be a strong deterrent. As a result, remaining silent may seem like the safest way to avoid unwanted attention and social stigma.

"In our community, there's a lot of judgment based on status. Some people are respected, while others are looked down on, and that affects how we act. If I decide to go for a screening people might start talking or assume that I'm sick. They may think that I must have something serious. That kind of attention is uncomfortable. Even if I want to take care of my health. I don't want to become a target for gossip or judgment. So sometimes it's easier to just stay quiet to avoid being misunderstood" (IDI Participant 4-6).

Sub-theme 3: No barriers

One participant shared that she has not encountered any social barriers to undergoing cervical cancer screening. She emphasized that nothing is embarrassing about getting screened and believes that others' opinions should not influence such an important personal decision. To her, cervical cancer screening is no different from visiting a doctor for any other health concern—it is simply a responsible step in maintaining one's well-being.

"I haven't faced any kind of social barrier when it comes to screening. For me, there is nothing embarrassing about getting screened for cervical cancer. It's part of my health, and I believe that taking care of my body is my own responsibility. I don't think other people's opinions should matter when it comes to something so important. This is a personal matter just like going to the doctor for any other illness. I know some people might feel shy or worry about what others will say" (IDI Participant 6).

The majority of participants emphasized that cervical cancer screening is provided free of charge. They noted that cost is not a barrier to accessing cervical cancer screening services.

"There's no payment for the screening itself. it's free. The only thing it costs me is about 10 birr for transportation to get to the health center. Even if I don't have it, I think I would borrow money from someone for transport. But honestly, the cost isn't what is stopping me" (IDI Participant 7). other participant states that *"Money isn't an issue and the Health-center is close*

by. I don't lose anything by going. The service is there for free and that helps. The problem is not what it costs." (FGD1 Participant C)

5. Discussion

This present study assessed the prevalence and associated factors of cervical cancer screening uptake in slum area of Addis Ababa. The finding revealed that 24.91% of participants had been screened for cervical cancer and several socio-demographic related, health seeking behavior, knowledge and awareness variables were significantly associated.

The cervical cancer screening rate of 24.91% observed in this study among women in slum areas of Addis Ababa falls markedly below the 70% screening coverage target set by the WHO's 2030 global strategy for cervical cancer elimination (37). Achieving the global elimination goals requires not only scaling up screening but also addressing the underlying barriers such as low awareness, poor health-seeking behavior, and educational disparities identified in this study.

The finding of the prevalence rate is in line with the study in Jimma, Ethiopia 38% (7), Adigrat 38.1 %(38) and India 20.9%(39). Although this study was conducted in an urban slum setting the barriers to cervical cancer screening identified among participants closely similar those observed in rural areas of Ethiopia and other low-income countries. both contexts have limited access to quality health services, low health literacy, and significant socioeconomic constraints.

This finding is higher than a study South Sudan 11.5% (40) And in urban slum area of Legos, Nigeria 0.7% (23)(41). The relatively higher prevalence of CCS uptake observed in the slum areas of Addis Ababa is because of dominant presence of commercial sex workers in these communities. In this study 45% of women who were screened were commercial sex workers. They were targeted through cervical cancer screening health campaigns as part of broader sexual and reproductive health interventions. These targeted screening campaigns increase the accessibility and awareness of CCS among this high-risk group. By that means elevating the overall screening uptake in these slum settings compared to other populations where such focused interventions might be lacking. CCS uptake among sex workers living in Nairobi, Kenya was 45.3% within the past 1year. Meta-analysis showed all implemented programs successfully reached female sex workers and provided them with CCS. The most effective strategies were the Screen and Treat approach that introducing CCS into existing STI services in drop-in or outreach

health facilities (41). A study conducted in Shashemene town in west Arsi, Ethiopia shows CCS uptake among female commercial sex workers was 20% (42), this low CCS rate in this study is likely because it was conducted in 2021 which is before Ethiopia's National Cancer Control Plan was fully implemented. Before this plan awareness and access to organized screening programs were limited which led to lower uptake. Since then efforts to increase awareness and expand screening services have likely improved CCS rates.

According to the Ethiopia National Cancer Control Plan targeted interventions like integrating cervical cancer screening and vaccination programs are prioritized to address high-risk populations including female sex workers. The plan emphasizes the importance of expanding access to screening services through community awareness campaigns, outreach activities and integration into existing healthcare services particularly in areas where the population of sex workers are significant. these strategic measures significantly boost the screening rate in this high-risk group (43).

Among the socio demographic factor age is one of the factors that is significantly associated with CCS uptake. This study revealed women aged 40–49 were 2.2 times more likely to undergo CCS than those aged 30–39 (AOR = 2.2, 95% CI: 1.33-3.65, p = 0.002). and it was consistent with other studies done in Ethiopian, Deberemarkos, St Paul Hospital (39) (44) South Korea (45) and Philippines (46). These could be due to the fact that older women seek reproductive health service during child birth and family planning services and studies describe that at peak age of 30 and 60 the lesions become symptomatic and women see themselves as being at risk of invasive cervical cancer and seek medical care and screening services.

Marital status was strongly associated factor in studies conducted in Ethiopia, Jimma (7), and Iran (14) This association is commonly attributed to factors such as greater social support from spouses, which increased health-seeking behavior within marital relationships and there will be increased exposure to reproductive health services during pregnancy and childbirth, but not in this study, other similar to findings have shown in St Paul Hospital (44) and Philippine (46). The absence of a significant relationship between marital status and screening uptake in this study may show the unique characteristics of study population. Specifically, a large proportion of the

screened women were commercial sex workers they usually do not conform to traditional marital patterns. They access CCS through targeted outreach programs and health campaigns.

Higher education has also large impact, this study shows a strong positive association woman with secondary education had 4.42 times higher odds of CCS uptake compared to illiterate women (AOR = 4.42, 95% CI: 1.96–9.96, $p< 0.001$), and those who had graduated had even greater odds (AOR = 6.85, 95% CI: 1.55–30.25, $p = 0.011$. And it was consistent with other studies conducted in Ethiopia, Asella (47), Romanian (48), Philippine (46) and Ghana (49). Educated women are more receptive to health messages in medias, magazines and more likely to seek preventive services.

In this study household income showed no significant association with CCS uptake, which contrasts with many previous studies showing a positive association (44) (45) (48)](46). This lack of association in this study can be justified by the unique socioeconomic context of the slum setting where the majority of households (approximately 60%) have low incomes ranging from 2000 to 5000 ETB. This income homogeneity likely limits variability in economic status and it makes income a less distinctive factor in influencing screening uptake within this population.

The findings of this study reveal that occupation is significantly associated with CCS uptake, with commercial sex workers having markedly higher odds of screening compared to housewives (AOR = 13.60, 95% CI: 5.92–31.26, $p < 0.001$). This big difference shows the impact of targeted interventions and outreach programs focused on commercial sex workers because they are recognized as a high-risk group. In contrast other occupational groups such as government employees, merchants, and private business workers did not display a significant difference in screening uptake compared to housewives. Studies in Romania showed Employment status significantly influenced screening uptake (48) and study in St Paul hospital showed self-employed women were more likely to be screened compared with governmental employed women (44).

This study shows Women with good health-seeking behavior were twice as likely to be screened for cervical cancer (AOR = 2.09, 95% CI: 1.25–3.48, $p = 0.005$), showing the critical role of health seeking behavior in increasing screening uptake. the result is consistent with other Studies, research in Hossana town, Ethiopia, showed a strong positive link between good health-seeking

behavior and CCS utilization (50). Study in Arbamench emphasize poor knowledge and absence of information as significant barriers to health-seeking reinforce this finding (32).

This finding is also supported by qualitative result that shows the underlying social and cultural attitudes that implies health-seeking practices. As described by participants there is a common practice in the community to delay seeking health care service until symptoms become severe. Preventive measures such as checkups or screenings are not commonly practiced it reflects a belief that healthcare is only necessary in the presence of illness. This cultural norm shows a lack of awareness about the importance of preventive value of cervical cancer screening. Both quantitative and qualitative findings suggest that improving health-seeking behavior through education, awareness campaigns and community engagement could significantly enhance cervical cancer screening uptake.

Several studies showed knowledge on CC and CCS is critical determinant of screening uptake. Study from Dodoma, Tanzania similarly reported that higher cervical cancer knowledge significantly increased the likelihood of screening uptake, underscoring that informed women are more likely to recognize the importance of early detection and seek screening services (51). Moreover, study in Uganda have repeatedly identified that inadequate knowledge and awareness remain major barriers to CCS uptake, and improving knowledge through health education initiatives consistently correlates with increased screening rates (52). Consistently the quantitative finding of this study shows a strong and statistically significant association between knowledge level and cervical cancer screening (CCS) uptake. Women with good knowledge were over five times more likely to have undergone screening (AOR = 5.37, 95% CI: 3.20–8.9). This association is further supported by qualitative data which offered contextual understanding of how lack of knowledge as a major barrier. One participant clearly expressed her unfamiliarity with cervical cancer, stating, “I honestly don’t know anything about cervical cancer, its symptoms or the factors that cause it… I haven’t heard anything about it from any kind of media. People like you who know about these things should be the ones to teach us” (IDI Participant 2). Another stated, “No one has explained it to me properly, so I wouldn’t even know if something was wrong” (FGD3 Participant A). These narratives align with the statistical findings, showing how poor knowledge on CC and CCS contributes to low screening uptake.

In contrast some studies reveal that while awareness about CC and screening programs may be relatively high and the actual screening uptake remains low this suggesting that knowledge alone

may not fully translate into practice. A national survey in China found high awareness and willingness to screen among women, yet only about 60% had ever been screened. this indicate other factors such as accessibility, cultural beliefs, and health system limitations also influence uptake (53). These contrasts show that although knowledge is a strong predictor as this study confirms a comprehensive cervical cancer prevention strategy should also address barriers to convert awareness into action effectively.

The qualitative findings from this study show a pattern of personal, socio-cultural and financial barriers to CCS. The lack of knowledge and awareness about CC due to social misconceptions. In this study some participants state the cause of CC is sitting on hot stones in sunny days and recurrent induced abortion. This aligns with findings from Malawi, where misconceptions about the causes of CC such as attributing it to illegal abortions or the use of substances for terminating pregnancies reflect a widespread misunderstanding of the causes of the diseases (54).

Similarly, in Ghana, participants often believed that screening is only necessary when symptoms are present. It shows a limited understanding of the importance of screening (55), This misconception leads to low uptake of screening services.

Fear and stigma also emerged as a factor. Some participants in this study shared concerns about how the community would perceive them if they were seen seeking screening services, suggesting an underlying stigma associated with the procedure. This fear was mirrored in Ghanaian women who associated a cancer diagnosis with imminent death, thus preferring to avoid the test altogether out of psychological distress and fear of the unknown (55).

The gender of the healthcare provider was another key barrier to screening uptake. Several participants in this study indicated that they would feel uncomfortable being examined by male healthcare professionals, this sentiment commonly expressed in both Nigeria and Ghana(55,56). Similarly study in Ghana, women mentioned shyness and privacy concerns especially with young male doctors as reasons for avoiding CCS services (55). The findings underscore the significant influence of screening service provider gender on CCS uptake, emphasizing the importance of incorporating gender-sensitive strategies within screening programs to address cultural norms and comfort.

Financial constraints were a significant barrier identified. In this study while most participants noted that CCS services were offered for free in health centers other still other participants shared experiences where they were referred to facilities for screening but could not afford the

service, particularly when local health centers lacked functioning equipment. This situation discouraged further efforts to seek healthcare services. A qualitative study in Ghana similarly noted women experienced financial obstacles that limited access (55). These findings indicate how financial strain intersects with healthcare system limitations to hinder timely CC prevention efforts.

Strength

One of the strengths of this study is the use of mixed method design this allow more comprehensive understanding in deeper explanation. And the quantitative data was collected using Kobotoolbox which minimizes missing data.

Limitation

One of the limitations of this study is it is cross sectional study and it doesn't show temporal relationships. The other limitation of this study is that the distance to the nearest health facility was not included as a variable in the questionnaire. Although the researcher observed and confirmed that the distance ranges between 1 km and 3.2 km across the study sites, this factor was not quantitatively assessed in the analysis, which may have influenced screening uptake in this context and screening uptake were not compared with better-off areas of Addis Ababa. This lack of comparison may have resulted in an overestimation of screening uptake among vulnerable populations. Additionally, the data is self-reported and it is prone to memory bias and social desirable bias. It could be is also culturally sensitive for some women to ask for sexual and reproductive health this may lead to under-report.

Conclusions

This study showed cervical cancer screening uptake among women in slum areas of Addis Ababa is 24.91%, which falls significantly short of the global coverage target of 70% screening set by the WHO's 2030 global strategy for cervical cancer elimination. This evident gap shows the urgent need for substantial intervention to accelerate progress toward the elimination goals.

The study identified particularly low screening rates among younger women, those with no formal education, and individuals with poor health-seeking behavior and limited knowledge about cervical cancer and its screening. To improve screening rates targeted health education, community awareness campaigns, and improved availability of accessible and female-friendly health services are essential. Strengthening these areas could lead to higher participation and early detection of cervical cancer and finally reducing the burden of cervical cancer in vulnerable populations and aligning with global elimination efforts.

Recommendations

Based on the findings, the following recommendations are forwarded.

To public health practitioners:

Implement targeted awareness and education campaigns focusing on the importance of cervical cancer screening especially those with low education levels using community-based education programs using visual aids and among younger women by integrating cervical cancer awareness and screening education into school and university health programs as well as collaborate with youth associations to improve their knowledge and participation.

Promote community-based outreach programs that encourage routine health check-ups and early screening practices to improve health-seeking behaviors.

Engage community leaders and local organizations to address cultural beliefs, misconceptions and social barriers to create a supportive environment for women to seek screening services.

To the health system:

Ensure accessible female-friendly cervical cancer screening services are available within slum communities and are culturally acceptable to increase uptake and allocate resources to train healthcare providers on culturally sensitive approaches and improve the availability of female healthcare workers to reduce discomfort during screening.

To other researchers:

Investigate effective community engagement strategies and interventions tailored to low-resource urban settings to elevate screening rates and evaluate the impact of awareness campaigns and healthcare service improvements on increasing screening participation over time.

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ASSURANCE OF PRINCIPAL INVESTIGATOR

I, the undersigned agree to accept all responsibilities for the scientific and ethical conduct of the research project. I will provide timely progress report to my advisor and seek the necessary advice and approval from my primary advisors in the module of the research. I will communicate timely to my advisors all stakeholders involved in the study including any source of funding for this research.

Name of the student: Rahel Mekonnen Gonfa

Date: December 02, 2024.

Signature: 

Approval of the primary Advisor

Name of the primary advisor: Prof. Wakgari Deressa (MPH,PhD)

Date: December 02, 2024.

Signature: 

Annex

Annex I: Participant information sheet

My name is _____. I am working as a data collector for the study conducted among women aged between 30-49 by Rahel Mekonnen who is studying for her Master's degree at Addis Ababa University, Collage of Health Science, and School of Public Health. I kindly request you to give me your attention to explain you about the study and study participant.

The study title: Assessment of the uptake and determinants of cervical cancer screening in slum areas of Addis Ababa Ethiopia

Purpose of the study: The main aim of this study is to write a thesis as a partial fulfillment of a Master's degree in public health for the principal investigator. After completion of this study the result will be used as evidence and input to increase the cervical cancer screening rate.

Procedure and duration: I will be assessing the uptake and determinants of cervical cancer screening in using Questionnaires. and this may take 20 to 25 minute.

Risks and benefits: Risk of participating in this study is none since the study does not have invasive procedure and need collecting any samples. There would have no any direct benefits for being study participant. But indirectly the findings from this research will be important for increasingcervical screening rate and for scientific knowledge.

Confidentiality: All information collected kept confidential and names will not be written.

Rights: Giving permission for this study is voluntary. You have the right to permit or not for this study. If you decide to permit the study, you have the right to terminate the study at any time if you consider something related to the study is wrong.

Contact address: If you have any question, which is not clear, you can contact the investigator.

Investigator: Rahel Mekonnen Gonfa

Mob: 0915580179, Email: rahelmekonnen116@gmail.com

Advisor: Prof. Wakgari Deressa, 0911483714

Addis Ababa University, College of Health Science, school of public health

Annex II. Informed consent form

Detail information about the study is explained to me. I have understood that the objective of this study is to assess the uptake and determinants of cervical cancer screening in slum areas of Addis Ababa, Ethiopia.

In addition, I understand about how the data collection is proceeding and the time it takes to complete the data collection. I also understand that the research imposes no risk on me. I assured that there would be confidentiality of my response and collected data used only for the study. It also explained to me that I have the right to stop participation at any time.

Furthermore, I understood that participating in this study is important for scientific knowledge and base for further study. Therefore, I have now consented to participate in the study by signing this form.

Signature of participants_____ date _____

Name and signature of data collector_____ date _____

Annex III: Questionnaire, English version

Identification number _____ Address_____

I Socio-Demographic Information

S.No	Questions	Responses	Code
101	Age in years	_____	
102	Marital status	1. Single 2. Married 3. Widowed 4. Divorced	
103	Educational status	1. Illiterate 2. Read and Write only 3. Primary education 4. Secondary education 5. Graduated from college	
104	Occupation of respondents	1. Housewife 2.Government employee 3. Private Business 4.Student 5. Merchant 7.other(specify)	
105	Monthly household income	_____	

II. Housing condition

S.No	Questions	Responses	Code
201	What type of housing do you live in?	1. Single room 2. Multi-room house 3. Shared with others 4. Temporary structure (e.g., shack, hut)	

202	Do you own or rent the house you live in?	1. Own 2. Rent	
203	How many people live in your household?		
204	What type of toilet facility do you have?	1. Private (flush toilet) 2. Shared toilet 3. Pit latrine 4. No toilet	
205	How do you access water?	1. Piped water in-house 2. Piped water outside 3. Well 4. Public tap 5. Other (please specify)	
206	What is the primary source of energy used in your home?	1. Electricity 2. Gas 3. Charcoal 4. Firewood 5. Kerosene 6. None/other (please specify)	
207	What type of flooring does your home have?	1. Cemented 2. Tiled 3. Dirt 4. Wood/other material	
208	What material is your roof made of?	1. Iron sheets 2. Thatch 3. Concrete 4. Other (please specify)	

III. Uptake of cervical cancer screening

S.No	Questions	Responses	Code
301	Have you ever screened for cervical cancer in the past years?	1.Yes 2.No 3.I don't know	
302	Reason of uptake of cervical cancer screening?	1.Doctor request 2. Self conviction 3.part of a general screening program4.No response	
303	Reason for non-Uptake of cervical cancer screening?	1.It is painful 2. It is Expensive 3.It is embrassing 4.I am healthy 5. No response 6. other_____	

IV. Health seeking behavior

401	During your last illness did you seek treatment?	1. Yes 2. No	
402	**Screening for general health** Have you ever checked your blood pressure to know the level of your blood pressure? Did you ever checked your blood sugar level to know the level of your blood sugar? Have you ever tested for human immune deficiency virus (HIV) infection for early care and treatment?	 1. Yes 0. No 1. Yes 0. No 1. Yes 0. No	

	Did you vaccinated children and any family member who is eligible for? Did you or member of your family monitor the growth of recent child in family? Did you or member of your family followed antenatal care for the resent pregnancy?	1. Yes 0. No 1. Yes 0. No 1.Yes 0. No	
403	**Health oriented leisure activities** Aerobic physical activities (walking, running, swimming, and bicycling) Health oriented leisure activities (playing tennis, jumping rope, lifting weight)	1. Yes 0. No 1.Yes 0. No	
404	**Risk exposure** Did you take alcohol? Did you smoke tobacco products? Did you chew Khat?	1. No 0.Yes 1. No 0.Yes 1.No 0.Yes	

405	Have you had an intention to be screened for cervical cancer in the health facility?	1. Yes 2. No If yes go to 303	
406	If no for question no 301 what would be your reason?	1. Have not heard about the disease 2. I felt that the disease is not serious 3. Service is not available nearby 4. Not aware of screening test 5. Others (specify)_____	

407	If yes for question no 301, has anyone ever recommended for you to be tested or screened for cervical cancer?	1. Yes 2. No If No go to 305	
408	If yes for question No 303, who recommended it for you?	1. Spouse 2. Colleague 3. Neighbor 4. Health worker 5. Relatives 6. Others (specify)_____	

V. Knowledge and Awareness ofthewomenoncervicalcancerandcervicalcancerscreening

Qn No.	**Questionnaire**	**Response**	Skip
501	Haveyoueverheardof cervical cancer?	Yes ..... 1 No 2	**Ifnoskip to206**
502	Wheredidyouhear about cervical cancerforthefirst time?	Media ..... 1 Healthpersonnel .....2 Teachers ..... 3 Relatives..... 4 Friends…..... 5 Religion….....6 Otherspecify.....98	

503	Whatisthecause ofcervical cancer?	Bacteria… ..... 1 Virus.....2 Fungus.....3 Throughgenesfromfamily.4 Urinatingon thesun..... 5 Do not know….....99 Otherspecify..... 98	

504	Whatarethepredisposingfactorsto cervicalcancer?(**multipleanswers are possible**)	Havingmultiple sexual partners..... 1 Early onset sexual intercourse.....2 Family history of cervical cancer.....3 Infection by virus causing cervicalcancer .....4 Cigarette smoking..... 5 Low immunity due to HIV/AIDS.....6 Repeated abortion. .....7 Donotknow…..... 99 Other 98	
505	Whatarethesignsandsymptomsof cervicalcancer?(**multipleanswer is possible)** **(Probe)**	Vaginal bleeding… ..... 1 Foullyvaginaldischarge.....2 Pelvic orbackpain….....3 Postcoital bleeding.....4 I don't know….....99 Otherspecify..... 98	
506	Whoisatrisk ofdeveloping cervical cancer?(**multipleansweris possible)** **(Probe)**	Allwomen…..... 1 Marriedwomen..... 2 HIVpositivewomen..... 3 Womenwho are sexually active… ..... 4 I don't know…..... 99 Othersspecify 98	
507	Whoismore likelyatrisk of developingcervicalcancer?(**multiple answer is possible**)	HIVpositivewomen..... 1 Womenwithmultiplesexual partners.....2	

	(Probe)	Womenwithfamily historyof cervicalcancer .....3 Allwomen….....4 I don't know…..... 99 Othersspecify 98	
508	Iscervicalcancer preventable disease?	Yes ..... 1 No..... 2 Don'tknow 99	**Ifnoto question no 208skipto 510**
509	Ifyestoquestion No**208**, how? (**multipleanswersarepossible) (Probe)**	Avoid multiple sexual partners…..... 1 Avoid early onset sexual intercourse…..... 2 Quitsmoking.....3 Throughvaccination… ..... 4 seekscreening services .....5 Do notknow ..... 99 Other(pleaseexplain… 98	
510	Doyouknowanyscreening procedurestodetectcervicalcancer?	Yes .....1 No..... 2	Ifno skip to questionno 5 13
511	Ifyestoquestionno210,which cervicalcancerscreeningmethodsdo you know? (multiple answers are possible)	Papsmear.....1 VIA .....2 HPV testing…..... 3 othersspecify 98	
512	Fromwheredidyou heard about cervicalcancerscreeningmethods for the first time?	Hospital…..... 1 Health care providers ..... 2 Television…..... 3 Radio…..... 4 Friend…..... 5 Relative… 6	

		Otherspecify.....98	
513	Whatisthe aimof cervical cancer screening?	Toprevent cervical cancer..... 1 Ithelpsforearlydetectionof cervicalcancer .....2 It helps for early seek of treatment… .....3 It helps to treat cervical cancer.....4 Do not know….....99 Other(pleaseexplain 98	
514	Whenawoman should have screening?	Whenmenstruationstarts...1 Assoon assexually active ..... 2 At the age of 30….....3 Whenstarthavingchildren.4 Aftermenopause… ..... 5 Do not know…..... 99 Other… 98	
515	Howfrequent,screeningshouldbe done forcervical cancer?	Once everyyear ..... 1 Onceeverythreeyears..... 2 Once every 5years.....3 Do notknow….....99	

		Others specify 98	
516	Iscervicalcancercurable(treatable) if detected early?	Yes .....1 No.....2 Don’tknow… 99	If no skip to questionno 520
517	Whatthingsmakecervicalcancer curableoncediagnosed?	Seekingtreatmentat early stage ..... 1 Seeking treatment at late stage ..... 2 Seekingtreatmentatearlyor late stage Don’t have difference. .....3 Don’tknow. .....99 Others…..... 98	
518	Whattreatmentmodalitiesdoyou knowforcervicalcancer(multiple answers are possible) **(Probe)**	Herbalremedies .....1 Surgery…..... 2 Radiotherapy .....3 Chemotherapy(oral medication).....4 Cryotherapy..... 5 LEEP…..... 6 Do not know….....99 Other… 98	

IV. Qualitative questions

Exploring Factors Affecting the Uptake of Cervical Cancer

1. Socio-demographic characteristics of participants

Characteristic	The number of participants
1. Age group (years)	
25-29	
30–39	
40–49	
50+	
2. Marital status	
Married	
Single	
Separated	
Divorced	
Widowed	
3. Employment status	
Employed/self-employed	
Unemployed	
Retired	
4. Education status	
Primary	
Secondary	
Tertiary/higher	
None	
5. Number of children	
1–3	
4-6	
7+	

2. The 6 key questions below will lead the focus group discussions (FGDs) on factors affecting the uptake of cervical cancer screening services at public health centers.

Purpose of FGD and In-depth Interview

The purpose of this FGD is to explore in-depth, demand-side factors influencing the uptake of quality cervical cancer screening services among women who visit outpatient clinics. The study intends to specifically elucidate the following:

1. Women's perception or awareness about cervical cancer and its screening service.

2. Personal, financial, and sociocultural factors affecting the uptake of cervical cancer screening services.

3. Suggestions for improving the uptake of cervical cancer screening services.

Focus Group Discussion Guide

Key questions	Probes
1. Perception or awareness What is your **perception or awareness** of cervical cancer and its screening services?	1. What risk factors can you mention? 2. What signs and symptoms are you aware of? 3. What preventive measures do you know? 4. What is your understanding of the screening?
2. Personal barriers What are the **personal barriers** to the uptake of cervical cancer screening services?	1. What is the influence of education, lack of knowledge of screening facilities, language, and marital status/childcare on the uptake of cervical cancer screening? 2. What is the impact of a perceived lack of susceptibility to and severity of disease, feeling of embarrassment, fear of the procedure/pain, and preference for the gender of the care giver on the uptake of cervical cancer screening?
3. Financial barriers What are the **financial barriers** to the uptake of cervical cancer screening services?	1. What is the influence of out-of-pocket payment, transportation, and lost wages on pursuing cervical cancer screening?

4. Sociocultural barriers What are the **socio-cultural barriers** to the uptake of cervical cancer screening services?	1. What are the myths/misconceptions about cervical cancer screening? 2. What kind of stigma/discrimination did you encounter while seeking cervical cancer screening? 3. What are the views of different religious beliefs on cervical cancer screening?
5. Suggestions What are your **suggestions** for improving the cervical cancer screening uptake by primary healthcare facilities?	1. What do you think are the best ways to improve public awareness, transportation, and referral networks in cervical cancer screening?
6. Other factors Are there any **other factors** you would like to mention about the uptake of cervical cancer screening?	

Annex IV: Amharic version participant Information sheet

የኔ ስም _____። በአዲስ አበባ ዩኒቨርሲቲ ሁለተኛ ዲግሪዋን በጤና ሳይንስ ኮሌጅ እና በህብረተሰብ ጤና ትምህርት ቤት በመማር ላይ የምትገኝ ውራሄል መኮንን ከ30-49 መካከል ባሉ ሴቶች መካከል ለሚካሄደው ጥናት መረጃ ሰብሳቢ ሆኜ እየሰራሁነው። ስለ ጥናቱ እና የጥናቱ ተሳታፊ ለእርስዎ ለማስረዳት ትኩረትዎን እንዲሰጡኝ በአክብሮት እጠይቃለሁ።

የጥናት ርዕስ፡ በአዲስ አበባ ነዋሪ በሆኑ ሰፈር አካባቢዎች የማኅጸን በር ካንሰር ምርመራ አወሳሰድ እና ውሳኔዎች ግምገማ
የጥናቱ ዓላማ፡ -የዚህ ጥናት ዋና ዓላማለዋና መርማሪ በሕብረተሰብ ጤና ማስተርስ ዲግሪ በከፊል ማሟያ ሆኖ ተሲስ መጻፍነው። ይህ ጥናት ከተጠናቀቀ በኋላ ውጤቱ የማህፀን በር ካንሰርን የመመርመር መጠን ለመጨመር እንደ ማስረጃ እና ግብአት ጥቅምላይ ይውላል።
የሂደቱ ሂደት እና የቆይታ ጊዜ፡ መጠይቆችን በመጠቀም የማኅጸን በር ካንሰር ምርመራ አወሳሰዱን እና ውሳኔዎችን እገመግማለሁ። እና ይህ ከ 20 እስከ 25 ደቂቃዎች ሊወስድ ይችላል.
ጉዳቶች እና ጥቅማጥቅሞች፡ ጥናቱ ሰውነት ላይ ጉዳት ሂደት ስለሌለውና ሙኛ መሰብሰብ ስለማያስፈልገው በዚህ ጥናት ውስጥ የመሳተፍ ስጋት ምንምየለም። የጥናት ተሳታፊ ለመሆን ምንምአይነት ቀጥተኛ ጥቅሞች አይኖሩም። ነገር ግን በተዘዋዋሪ ከዚህ ምርምር የተገኙት ግኝቶች የማኅጸን ካንሰር ምርመራ መጠንን ለመጨመር እና ለሳይንሳዊ እውቀት ጠቃሚይሆናሉ.
ምስጢራዊነት፡ ሁሉምየተሰበሰቡ መረጃዎች በሚስጥር ተጠብቀውእና ስሞች አይጻፉም።
ሙብቶች፡ -ለዚህ ጥናት ፈቃድ መስጠት በፈቃደኝነት ነው። ለዚህ ጥናት ፈቃድ የመስጠት ወይምየመስጠት ሙብት አልዎት። ጥናቱን ለመፍቀድ ከወሰኑ,ከጥናቱ ጋር የተያያዘ ነገር ስህተት እንደሆነ ካሰቡ በማንኛውምጊዜ ጥናቱን የማቋረጥ ሙብት አለዎት.
አድራሻ፡ ምንምአይነት ጥያቄ ካሎት፣ ግልፅ ያልሆነ መርማሪውን ማነጋገር ይችላሉ።
መርማሪ ራሄል መኮንን ጎንፋ
ሞባይል፡ 0915580179 ኢሜል፡ rahelmekonnen116@gmail.com
አማካሪ፡ ፕሮፌሰር ዋቅጋሪ ዴሬሳ፡ 0911483714
አዲስ አበባ ዩኒቨርሲቲ፣ የጤና ሳይንስ ኮሌጅ፣ የሕብረተሰብጤና ትምህርት ቤት

Annex V. Amharic version Informed consent form

የ ስ ምምነ ት መዋ ዋ ያ ቅ ጽ

ስ ለ ጥ ና ቱ ዝ ር ዝ ር መ ረ ጃ ተ ብ ራ ር ቶ ል ኛ ል . የ ዚ ህ ጥ ና ት አ ላ ማ በ አ ዲ ስ አ በ ባ ፣ ኢ ት ዮ ጵ ያ ሰ ፈ ር አ ካ ባ ቢ ዎ ች የ ማ ህ ፀ ን በ ር ካ ን ሰ ር ምር መ ራ ን አ ወ ሳ ሰ ድ እ ና መ መ ዘ ኛ ዎ ች ን መ ግ ም ግ ም እ ን ደ ሆ ነ ተ ረ ድ ቻ ለ ሁ ።
በ ተ ጨ ማ ሪ ም ፣ የ መ ረ ጃ አ ሰ ባ ሰ ብ ሂ ደ ት እ ን ዴ ት እ ን ደ ሚ ካ ሄ ድ እ ና የ መ ረ ጃ አ ሰ ባ ሰ ብ ን ለ ማ ጠ ና ቀ ቅ ስ ለ ሚ ወ ስ ደ ው ጊ ዜ ተ ረ ድ ቻ ለ ሁ ። ጥ ና ቱ በ እ ኔ ላ ይ ም ን ም አ ይ ነ ት ስ ጋ ት እ ን ደ ማ ይ ፈ ጥ ር ም ተ ረ ድ ቻ ለ ሁ ። ለ ጥ ና ቱ ብ ቻ ጥ ቅ ም ላ ይ የ ዋ ለ ው የ ም ላ ሽ እ ና የ ተ ሰ በ ሰ በ መ ረ ጃ ሚ ስ ጥ ራ ዊ እ ን ደ ሚ ሆ ን አ ረ ጋ ግ ጫ ለ ሁ ። በ ማ ን ኛ ው ም ጊ ዜ ተ ሳ ት ፎ ን የ ማ ቆ ም ሙ ብ ት እ ን ዳ ለ ኝ ም ገ ል ፆ ል ኛ ል ።
በ ተ ጨ ማ ሪ ም ፣ በ ዚ ህ ጥ ና ት ው ስ ጥ መ ሳ ተ ፍ ለ ሳ ይ ን ሳ ዊ እ ው ቀ ት እ ና ለ ቀ ጣ ይ ጥ ና ት መ ሰ ረ ት አ ስ ፈ ላ ጊ መ ሆ ኑ ን ተ ረ ድ ቻ ለ ሁ ። ስ ለ ዚ ህ ፣ አ ሁ ን ይ ህ ን ን ቅ ጽ በ መ ፈ ረ ም በ ጥ ና ቱ ለ መ ሳ ተ ፍ ተ ስ ማ ም ቻ ለ ሁ ።

የ ተ ሳ ታ ፊ ዎ ች ፊ ር ማ _____ ቀ ን _____
የ መ ረ ጃ ሰ ብ ሳ ቢ ው ስ ም እ ና ፊ ር ማ _____ ቀ ን _____

Annex VI: Amharic Version Questionnaire

አዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ፣ የህብረተሰብ ጤና ትምህርት ቤት

ማጠይቁ

ማለያ ቁጥር _____ አድራሻ _____

I የሶሺዮ-ስነ -ሕዝብ ማረጃ

ኤስ.አ ይ	**ጥያቄዎች**	**ምላሾች**	**ኮድ**
101	ዕድሜበዓመታት	_____	
102	ሃይማኖት	1. ኦርቶዶክስ 2. ፕሮቴስታንት 3. ካቶሊክ 4. ሙስሊም 5.ሌሎች	
103	የጋብቻ ሁኔታ	1. ያላገባ 2. ያገባ 3.ባልቴት 4.የተፋታ	
104	የትምህርት ደረጃ	1. ያልተማረ 2. የመጀመሪያ ደረጃ ትምህርት 3. ሁለተኛ ደረጃ ትምህርት 4. ከኮሌጅ የተመረቀች።	
105	ምላሽ ሰጪዎች ሥራ	1. የቤት እመቤት 2.የመንግስት ሰራተኛ 3. የግል ንግድ 4.ተማሪ 5.ነጋዴ 7.ሌላ (ይግለጹ)	
106	ወርሃዊ ገቢ	1. <1170 ብር 2. ≥1170 ብር __	

II. የማኅጸን ካንሰር ምርመራን መውሰድ

ኤስ.አ ይ	**ጥያቄዎች**	**ምላሾች**	**ኮድ**
201	ባለፉት ዓመታት የማህፀን በር ካንሰር ምርመራ አድርገሽ ታውቂያለሽ?	1.አዎ 2.አይደለም 3.አላውቅም።	
202	የማህፀን በር ካንሰር ምርመራ የሚወሰድበት ምክንያት?	1.የዶክተር ጥያቄ 2. በራስ መቀጣት 3.የአጠቃላይ የማጣሪያ ፕሮግራም አካል 4.ምንም ምላሽ የለም	

203	የ ማኅ ጸ ን በ ር ካ ን ሰ ር ምር መራ ያ ል ተ ደ ረ ገ በ ት ምክ ን ያ ት?	1.ያ ማል 2.ውድ ነ ው 3.ያ ሳ ፍ ረ ኛ ል 4.ጤና ማ ነ ኝ 5.ምን ም ምላ ሽ የ ለ ም 6.ሌ ላ _____	

II ጤና ፍለ ጋ ባ ህ ሪ

ኤስ .አ ይ	**ጥያ ቄ ዎች**	**ምላ ሾ ች**	**ኮ ድ**
301	ምር መራ ውን የ ማድ ረ ግ ፍላ ጎ ት ነ በ ረ ሽ? በ ውስ ጥ የ ማኅ ጸ ን ካ ን ሰ ር ምር መራ የ ጤና ተ ቋ ም?	1. አ ዎ 2. አ ይ አ ዎ ከ ሆነ ወደ 303 ይ ሂ ዱ	
302	ለ ጥያ ቄ አ ይ ደ ለ ም ከ ሆነ 201 ምን ሊ ሆ ን ይ ች ላ ል ምክ ን ያ ት ህ ?	1. ስ ለ እ ሱ አ ል ሰ ማ ሁ ም 2. በ ሽ ታ ው ከ ድ ባ እ ን ዳ ል ሆ ነ ተ ሰ ማ ኝ 3. አ ገ ል ግ ሎ ት በ አ ቅ ራ ቢ ያ አ ይ ገ ኝ ም 4. የ ማ ጣ ሪ ያ ምር መራ ን አ ለ ማ ወ ቅ 5. ሌ ሎ ች (ይ ግ ለ ጹ) _____	
303	ለ ጥያ ቄ ቁ ጥ ር 301 አ ዎ ከ ሆ ነ የ ማ ህ ፀ ን በ ር ካ ን ሰ ር ምር መራ ለ ማድ ረ ግ ጠ ቆ ሞ ት ሰ ው አ ለ ?	1. አ ዎ 2. አ ይ ካ ል ሆ ነ ወደ 305 ይ ሂ ዱ	

304	ለጥያቄ ቁጥር 303 አዎ ከሆነ ፣ ማን ጠቁሞዎታል?	1. የትዳር ጓደኛ 2. የስራ ባልደረባ 3. ጎረቤት 4. የጤና ሰራተኛ 5. ዘመዶች 6. ሌሎች (ይግለጹ)_____	

እውቀትን ለማግ ምየ ጥራት ጥያቄዎች

ተ.ቁ	መጠይቅ	መልስ	ዝለል
201	ከዚህበፊትስለማህፀንጫፍ ካንሰርበሽታሰምተውያውቃሉ?	አዎ .....1 አላዉቅም 2	**አላዉቅምካሉ ወደጥያቄ ቁጥር 206**
202	ለመጀመሪያግዜስለማህፀንጫፍ ካንሰርበሽታከየትሰሙ?	ከመገናኛብዙሐን .....1 ከጤና ባለሙያ .....2 ከአስተማሪ (መምህር)… .....3 ከዘመድ.....4 ከጓደኞቼ .....5 ከሐይማኖትተቋም ..... 6 ሌላካለይጥቀሱ 98	
203	ለማህፀንጫፍካንሰርመከሰት ምክንያቱምንድነዉ?	ባክቴሪያ .....1 ቫይረስ .....2 ፈንገስ .....3 በዘርይተላለፋል .....4 ሌላካለይጥቀሱ 98	

204	እርሰዎየሚያውቋቸውለማህጸን ጫፍካንሰርሊያጋልጡየሚችሉ	ከተለያዩወንዶችጋርየታዊግኑኝነትመፈፀም.....1 እድሜሰይደርስየታዊግኑኝነትመፈፀም 2	
	ሁኔታዎችንይጥቀሱልን (**ብዙ አማራጮችአሉ፣ከአንድመልስ በላይመመለስይቻላል**)	በቤተሰብየበሽታታሪክካለ .....3 በሽታውን ሊያመጣ በሚችልቫይረስ መያዝ (መጠቃት).....4 ሲጋራማጨስ ..... 5 የበሽታመከላከልአቅምመዳከምበኤችአይቪኤድስምክንያት .....6 አላዉቅም.....9 9ሌሎችካሉይጠቀሱ 98	
205	እርሰዎየሚያውቋቸውየማህጸን ጫፍካንሰር ምልክቶች ካሉ ይጥቀሱልን (**ብዙአማራጮችአሉ፣ ከአንድመልስ በላይመመለስ ይቻላል**)	በማህፀንደምመፍሰስ .....1 ሽታያለዉየማህጸንፈሳሽ .....2 የወገብወይምየዳሌአከባቢህመም ..... 3 የህመምስሜትከግብረስጋግኑኝነትበኃላ .....4 አላዉቅም ..... 99 ሌሎችካሉይጠቀሱ 98	
206	ለማህጸንጫፍካንሰርተጋላጭ የሆኑትከነዚህየማህረሰብክፍሎ ች የትኞቹናቸዉብለዉያስባሉ?	ሁሉምሴቶች .....1 ያገቡሴቶች .....2 በደማቸዉውስጥኤችአይቪቫይረስያለባቸዉ ሴቶች ..... 3 አላዉቅም .....99 ሌላካለይጥቀሱ 98	

207	በይበልጥለማህጸንጫፍካንሰር ተጋላጭየሆኑትከነዚህየማህረሰ ብክፍሎች የትኞቹ ናቸዉ(ብዙ **አማራጮችአሉ፣ ከአንድመልስ በላይ መመለስ ይቻላል)**	በደማቸዉውስጥኤችአይቪቫይረስያለባቸዉሴቶች .....1 ከተለያዩ ወንዶች ጋር ፆታዊ ግኑኝነት የሚፈፅሙ ሴቶች .....2በቤተሰብየበሽታታሪክያለባቸዉሴቶች .....3 ሁሉምሴቶች .....4 አላዉቅም .....99 ሌላካለይጥቀሱ 98	
207	የማህጸንጫፍካንሰርሊከላከሉት የሚችሉት በሽታ •ነዉ ብለዉ ያስባሉ?	አዎ .....1 አይደለም .....2 አላዉቅም 99	**አይደለምካሉ ወደጥያቄ ቁጥር 209**
208	አዎከሆነለጥያቄቁጥር 209 እንዴት ነዉሊከላከሉት የሚችሉት?(ብዙ **አማራጮች አሉ፣ ከአንድ መልስ በላይ መመለስ ይቻላል)**	ከተለያዩ ወንዶችጋርፆታዊግኑኝነትአለመፈፀም .....1 እድሜሰይደርስፆታዊግኑኝነትአለመፈፀም .....2 ሲጋራአለማጨስ .....3 ለበሽታዉአምጪቫይረስክትባትመከተብ .....4 የማህፀንጫፍካንሰርቅድመምርመራማድረግ .....5 አላዉቅም .....99 ሌላካለይጥቀሱ 98	
209	ከዚህበፊትስለማህፀንጫፍ ካንሰርቅድመምርመራዘዴዎች ሰምተዉያዉቃሉ? **(በደንብይጠየቅ)**	አዎ .....1 አላዉቅም 2	**አላዉቅምካሉ ወደጥያቄ ቁጥር 212**
210	አዎንካሉየትኞችንየማህፀንጫፍ ካንሰርቅድመምርመራዘዴዎች ያዉቃሉ?(ብዙ **አማራጮች አሉ፣ ከአንድ መልስ በላይ መመለስ ይቻላል)**	ፓፕእስሚር (ከማህጸንጫፍተቆንጥሮየሚሰራምርመራ) .....1 ቪአይኤ .....2 የሁማንፓፒሎማቫይረስምርመራ .....3 ሌላካለይጠቀሱ 98	

211	ለመጀመሪያ ግዜስለማህፀንጫፍ ካንሰር ቅድመ ምርመራ ዘዴዎች ከየት ሰሙ?	ከመገናኛብዙሐን .....1 ከጤና ባለሙያ ..... 2 ከአስተማሪ (መምህር)... .....3 ከዘመድ.....4 ከጓደኞቼ ..... 5 ከሐይማኖትተቋም 6	
212	የማህፀንጫፍካንሰርቅድመ ምርመራለምንይረዳል (ይጠቅማል) ብለዉያስባሉ?(ብዙ አማራጮች	የማህፀንጫፍካንሰርንለመከላከል .....1 የማህፀንጫፍካንሰርቀድሞመኖሩንለማወቅ .....2 የማህፀንጫፍካንሰርካለቶሎህክምናዉንለማግኘት .....3 የማህፀንጫፍካንሰርንለማከም 4	
	አሉ፣ከአንድመልስበላይመመለስ ይቻላል)	አላዉቅም .....99 ሌላካለይጥቀሱ 98	
213	አንዲትሴትየማህፀንጫፍካንሰር ቅድመምርመራማድረግያለባት መቼነዉብለዉያስባሉ?	የወርአበባማየትስትጀምር ..... 1 የግብረስጋግኑኝነትልክእንደጀመረች .....2 30ዓመትሲሆናት .....3 ልጅከወለደችበኃላ .....4 የወርአበባማየትስታቆምወይምከአረጠችበኃላ ..5 አላዉቅም ..... 99 ሌላካለይጠቀስ 98	
214	በደሟውስጥኤችአይቪኤድስ ቫይረስያለባትሴትየማህፀንጫፍ ካንሰር ቅድመ ምርመራማድረግ ያለባትመቼነዉብለዉያስባሉ?	የወርአበባማየትስትጀምር ..... 1 በማንኛዉምየእድሜክልልዉስጥ .....2 የግብረስጋግኑኝነትልክእንደጀመረች .....3 30ዓመትሲሆናት .....4 ልጅከወለደችበኃላ ..... 5 የወርአበባማየትስታቆምወይምከአረጠችበኃላ .....6 አላዉቅም ..... 99 ሌላካለይጠቀስ 98	

215	አንድሰዉየ ማህፀንቈፍካንሰር ቅድመ ምርመራ በየስንት ጊዜዉ ማድረግአለበትብለውያስባሉ?	በዓመትአንድግዜ .....1 በሶስትዓመትአንድግዜ ..... 2 በአምስትዓመትአንድግዜ ..... 3 አላዉቅም .....99 ሌላካለይጠቀስ 98	
216	በደሟውስጥኤችአይቪኤድስ ቫይረስያለባትሴትየ ማህፀንቈፍ ካንሰርቅድመምርመራበየስንት ጊዜዉ ማድረግ አለበት ብለው ያስባሉ?	በዓመትአንድግዜ .....1 በሁለትዓመትአንድግዜ .....2 በሶስትዓመትአንድግዜ .....3 በአምስትዓመትአንድግዜ .....4 አላዉቅም ..... 99 ሌላካለይጠቀስ 98	

217	የ ማህ ጸ ን ጫፍ ካ ን ሰ ር ን ቶ ሎ ከ ታ ወ ቀ ሊ ድ ን ወ ይ ም ሊ ታ ከ ም ይ ች ላ ል ብ ለ ዉ ያ ስ ባ ሉ ?	አ ዎ ..... 1 አ ይ ች ል ም ..... 2 አ ላ ዉ ቅ ም 99	
218	አ ን ድ ሰ ዉ በ ማህ ጸ ን ጫፍ ካ ን ሰ ር ከ ተ ያ ዘ በ ኃ ላ እ ን ዲ ድ ን አ ስ ተ ዋ ፅ ኦ የ ሚ ያ ደ ር ገ ዉ ም ን ድ ነ ዉ ብ ለ ዉ ያ ስ ባ ሉ ?	በ ሽ ታ ዉ የ ጀ መ ረ አ ከ ባ ቢ ቶ ሎ ብ ሎ ህ ክ ም ና ማ ግ ኘ ት .....1 በ ሽ ታ ዉ ከ ጀ መ ረ ዘ ግ ይ ቶ ህ ክ ም ና ማ ግ ኘ ት ..... 2 ቶ ሎ ም ሆ ነ ዘ ግ ይ ቶ ህ ክ ም ና ማ ግ ኘ ት ጥ ቅ ም የ ለ ዉ ም .....3 አ ላ ዉ ቅ ም .....99 ሌ ላ ካ ለ ይ ጠ ቀ ስ 98	
219	እ ር ሰ ዎ የ ሚ ያ ዉ ቋ ች ዉ የ ማህ ፀ ን ጫፍ ካ ን ሰ ር ህ ክ ም ና ካ ለ ይ ጥ ቀ ሱ (ብ ዙ አ ማ ራ ጮ ች አ ሉ ት ፣ ከ አ ን ድ መ ልስ በ ላ ይ መ መ ለ ስ ይ ቻ ላ ል)	የ ባ ህ ል ህ ክ ም ና ..... 1 ቀ ዶ ጥ ገ ና .....2 የ ጨ ረ ር ህ ክ ም ና ..... 3 ኬ ሞ ቴ ራ ፒ (በ አ ፍ የ ሚ ወ ሰ ድ ኪ ኒ ን)… .....4 ክ ራ ዮ ቴ ራ ፒ ..... 5 አ ላ ዉ ቅ ም ..... 99 ሌ ላ ካ ለ ይ ጥ ቀ ሱ 98	

Annex VII: Training Manual for Data Collectors

Introduction:

The present manual will help the data gatherer to obtain information in a correct way for the study entitled, ASSESSMENT OF THE UPTAKE AND DETERMINANTS OF CERVICAL CANCER SCREENING IN SLUM AREAS OF ADDIS ABABA ETHIOPIA 2025. In this training, the objectives of the study, data acquisition methods, ethical issues, and practical and standardized data collection procedures will all be discussed.

Objectives of the Study are:

1. To assess the uptake of CCS among women living in slum areas of Addis Ababa.
2. To identify factors affecting CCS uptake among women in slum areas of Addis Ababa

Training Objectives

After this training, data collectors will:

- Interpretive understanding of the background, importance, and aims of the study.
- Be able to apply data collection techniques accurately using structured software-based questionnaire.
- Show evidence of understanding the ethical guidelines, specifically in relation to requesting informed consent.

Sections of Training

Study Background and Setting: The study focuses on assessing the uptake and determinants of cervical cancer screening among women living in slum areas of Addis Ababa, Ethiopia. This setting is characterized by limited access to healthcare services, low awareness of cervical cancer, and various socio-economic challenges that may hinder women's participation in screening programs.

Importance of the Study: Understanding the factors influencing cervical cancer screening uptake is important for developing effective interventions to increase screening rates among women in slum areas. By identifying knowledge gaps, health-seeking behaviors, and socio-cultural barriers. The study can inform targeted educational campaigns and policy initiatives aimed at enhancing awareness and accessibility of cervical cancer screening services.

1. Understanding uptake of cervical cancer screening

Definition of Uptake cervical cancer screening:

The uptake of cervical cancer screening refers to the proportion of eligible women who participate in recommended screening programs such as Pap smears or HPV tests in the past years

Factors Influencing Uptake:

Various factors can influence the uptake of cervical cancer screening:

- ✓ Awareness and knowledge about cervical cancer,
- ✓ accessibility of screening services
- ✓ socio-economic status
- ✓ cultural beliefs and
- ✓ healthcare provider recommendations.

Importance of Measuring Uptake:

Monitoring the uptake of cervical cancer screening is important for evaluating the effectiveness of public health initiatives, identifying barriers to access, and implementing targeted interventions to improve screening rates and reduce cervical cancer incidence and mortality.

2. Ethical and Professional Conduct in Data Collection

- Informed Consent: Explain the research objective and procedure to participants, particularly emphasizing voluntary participation and anonymity.
- Confidentiality and Respect: Preserve the anonymity of participants, handle information carefully, and treat each interview with professionalism and sensitivity.
- Responding to Participant Discomfort: If an observer reports symptoms of discomfort or heat illness during data acquisition, stop data collection and request assistance when appropriate.

3. Data Collection Tools and Procedures

Questionnaires (Survey Data):

- Administered through Open Data Kit (ODK) on mobile devices with enhanced accuracy and simplified data entry.

- Data are acquired regarding demographics, uptake of cervical cancer screening in the past, health seeking behavior and knowledge and awareness on cervical cancer screening.
- Data collectors will carry out test interviews in order to become familiar with the questionnaire and to detect possible issues.

4. Practical Exercises

- Simulated Interviews: Role-play to practice administration of the questionnaire in order to facilitate ease of use of information likely to be perceived as sensitive.

5. Quality Control and Data Handling

- Daily Review Meetings: The supervisor will review answered questionnaires every day to make sure questionnaires are valid and consistent.
- Data Security: All electronic data should be safely stored and daily back up and physical data should be handled carefully to immune against unauthorized access.

6. Operational Definitions

Slum areas:is a section of urban setting characterized by lack of basic services, relatively substandard housing, overcrowding, vulnerable to hazards, insecure tenure, and social exclusion.(30).

The UN-HABITAT measurement assesses:

Housing Quality: Durability and security of housing, overcrowding, construction materials, and property rights.

Access to Safe Water: Availability and quality of drinking water.

Sanitation: Toilets and sewage systems.

Health Services: Access to healthcare facilities, their affordability, and quality. Education and Employment: Assesses educational opportunities and job prospects.

Security of Tenure: Legal status of housing and land ownership.

Infrastructure and Services: Access to essential services like roads, electricity, and drainage.

Environmental Sustainability: Waste management, green spaces, and environmental protection.

Cervical cancer screened: refers to individuals who have undergone any cervical cancer screening tests within the past year.

Cervical cancer non screened: refers to individuals who have not undergone any cervical cancer screening tests within the past year.

Health seeking behavior: it will be measured using four items with five points of and based on the mean score , women were classified in to having health seeking behavior and not having health seeking behavior.

Knowledge: defined as the participants' ability to accurately describe the symptoms, risk factors, prevention methods, and available screening procedures for cervical cancer.

Awareness: defined as the participants' recognition and understanding of the importance and availability for cervical cancer screening.

7. Final Reminders for Data Collectors

- Ethical Conduct: Not to forget to take every participant seriously, comfort and discretion for every participant are to be considered.
- Focus on Quality: Confirm completeness and accuracy of all data entries prior to leaving the field.
- Team Collaboration: Work closely with team members in order to standardize both methods of data collection and protocols.

Annex VIII: Scoring of Health-seeking behavior and Knowledge regarding CC and CCS

Scoring of Health-Seeking Behavior

Health-seeking behavior was assessed using 12 items covering health service utilization, preventive practices, physical activity, and risk avoidance behaviors. Each question was scored as 1 for positive (health-promoting) behavior and 0 for negative (non-health-promoting) behavior, except for "Not related" responses, which were excluded from the total score. The total score for each respondent was then compared against the mean value of all valid scores; as follows:

Table 6 Scoring of Health-Seeking Behavior

Question	Score
1. During your last illness did you seek treatment?	Yes = 1, No = 0
2. Have you ever checked your blood pressure to know the level of your blood pressure?	Yes = 1, No = 0
3. Did you ever checked your blood sugar level to know the level of your blood sugar?	Yes = 1, No = 0
4. Have you ever tested for human immune deficiency virus (HIV) infection for early care and treatment?	Yes = 1, No = 0
5. Did you vaccinated children and any family member who is eligible for?	Yes = 1, No = 0, Not Related= -
6. Did you or member of your family monitor the growth of recent child in family?	Yes = 1, No = 0, Not Related= -
7. Did you or member of your family followed antenatal care for the recent pregnancy?	Yes = 1, No = 0, Not Related= -
8. Aerobic physical activities (walking, running, swimming, and bicycling)	Yes = 1, No = 0
9.Health oriented leisure activities (playing tennis, jumping rope, lifting weight)	Yes = 1, No = 0

10.Did you take alcohol?	Yes = 0, No = 1
11.Did you smoke tobacco products?	Yes = 0, No = 1
12. Did you chew Khat?	Yes = 0, No = 1

knowledge regarding cervical cancer and cervical cancer screening scoring

Participants knowledge about cervical cancer and its screening was assessed using a 17-item multiple-choice questionnaire. The questions covered various aspects, including causes, risk factors, symptoms, high-risk groups, prevention methods, types of screening, benefits of screening, appropriate screening age, recommended frequency, and available treatment options. Each correct response was score 1 point, while incorrect or "don't know" answers scored 0, yielding a total knowledge score ranging from 0 to 17. Multiple answers were possible for several of the questions.

To categorize the level of knowledge the mean score was used as a cutoff point:

- Good knowledge: Score ≥ 6.5
- Poor knowledge: Score < 6.5

Question	Score Assigned
1. Whatisthecause ofcervical cancer?	Virus = 1 Bacteria = 0 Fungus = 0 Throughgenesfromfamily=0 Urinatingon thesun=0 Do not know=0
2. Whatarethepredisposingfactorsto cervicalcancer?	Havingmultiple sexual partners=1 Early onset sexual intercourse=1

	Family history of cervical cancer=1 Infection by virus causing cervicalcancer=1 Cigarette smoking=1 Low immunity due to HIV/AIDS=1 Repeated abortion=0 Donotknow=0
3. Whatarethesignsandsymptomsof cervicalcancer?	Vaginal bleeding=1 Foullyvaginaldischarge=1 Pelvic orbackpain=1 Postcoital bleeding=1 I don't know=0
4. Whoisatrisk ofdeveloping cervical cancer?	Allwomen=1 Marriedwomen=1 HIVpositivewomen=1 Womenwho are sexually active=1 I don't know=0
5. Whoismore likelyatrisk of developingcervicalcancer?	HIVpositivewomen=1 Womenwithmultiplesexual partners=1 Womenwithfamily historyof cervicalcancer=1 Allwomen==0 I don't know=0
6. Iscervicalcancer preventable disease?	Yes=1 No=0
7.ifpreventable,how?	Avoid multiple sexual partners=1 Avoid early onset sexual intercourse=1 Quitsmoking=1 Throughvaccination=1

	Seekscreening services=1 Do notknow=1
Doyouknowanyscreening 8. procedurestodetectcervicalcancer?	Yes=1 No=2
9. Which cervicalcancerscreeningmethodsdo you know?	Papsmear=0 VIA=0 HPV testing=0
Whatisthe aimof cervical cancer 10. screening?	Toprevent cervical cancer=1 Ithelpsforearlydetectionof cervicalcancer=1 It helps for early seek of treatment=1 It helps to treat cervical cancer=0 Do not know=0
Whenawoman should have 11. screening?	Whenmenstruationstarts=0 Assoon assexually active=1 At the age of 30=1 Whenstarthavingchildren=0 Aftermenopause=0 Do not know =0
Howfrequent,screeningshouldbe 12. done forcervical cancer?	Once everyyear=0 Onceeverytwoyears=1 Onceeverythreeyears=1 Once every 5years=1 Do notknow
Iscervicalcancercurable(treatable) 13. if detected early?	Yes=1 No=0
Whatthingsmakecervicalcancer 14. curableoncediagnosed?	Seekingtreatmentat early stage=1 Seeking treatment at late stage=0

	Seekingtreatmentatearlyor late stage Don’t have difference=0 Don’tknow=0
Whattreatmentmodalitiesdoyou 15. knowforcervicalcancer	Herbalremedies=0 Surgery=1 Radiotherapy=1 Chemotherapy(oral medication)=1 Cryotherapy=1 LEEP=1 Do not know=0

Annex IX: Qualitative data Emerging theme

Emerging theme

The study aims to explore uptake and determinants of cervical cancer screening in slum areas of Addis Ababa, Ethiopia. Two key themes emerged through a comprehensive thematic analysis of in-depth interview data collected through a semi-structured questionnaire: Awareness of cervical cancer and Barriers to cervical cancer screening. The initial coding process generated 40 codes. However, after careful refinement, these were streamlined into 33 codes and 6 sub-themes. This analysis is supported by 65 quotations that effectively capture the uptake and determinants of cervical cancer screening.

Table I: themes, sub-themes, and codes identified through in-depth interviews on the uptake and determinants of cervical cancer screening in slum areas of Addis Ababa, Ethiopia.

Themes	Description of themes	Sub-themes	Codes
Awareness of cervical cancer	emphasis on participants' awareness of the cervical cancer signs and symptoms, risk factors, preventive measures, and their suggestions needs improvement in the health institution and the community.	Having awareness	It is a disease
			Abortion
			Many partners
			Climatic factor
			Infection
			Poor hygiene
			Sign and symptom
			Keep hygiene
			STI protective barriers
			Avoid sitting on hot things
			Vaccination
			Early screening
		Lack of awareness	I have no information on CCS
			I don't know the signs and symptoms
			Uncertain to signs and symptoms
		Areas need Improvement.	Create awareness
			Screening materials

			Everything was good
			The right to choose our health providers
Barriers to cervical cancer screening	Emphasizing barriers to cervical cancer screening involves identifying and addressing the obstacles that prevent individuals from accessing timely and effective screening services.	Socioeconomic barriers	Financial problem
			Uncertain about financial
			Life style
			Time
			Poor community awareness
		Psychosocial and cultural barriers	Lack of knowledge
			Religion
			Fear
			Fear male health providers
			Fear of community
			Fear of the procedure
		No barriers	No financial issue
			No social stigma
			No barriers