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### Knowledge and Practice of Cervical Cancer Screening and its Associated Factors among Women Attending Maternal Health Services at Public Health Institutions of Assosa Zone, Benishagul-Gumuz, North west Ethiopia 2022.

Journal:	BMJ Open
Manuscript ID	bmjopen-2022-068860
Article Type:	Original research
Date Submitted by the Author:	02-Oct-2022
Complete List of Authors:	Gelassa, Firaol; Assosa University, Nursing Nagari, Shalama ; Assosa University, Public Health Imana, Desalegn; Assosa University, Nursing Belgafo, Dabeli; Assosa University, Nursing Teso, Daniel; Assosa University, Nursing Teshome, Debela; Assosa University, Nursing
Keywords:	Adult oncology < ONCOLOGY, Gynaecological oncology < ONCOLOGY, Urological tumours < ONCOLOGY





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## Knowledge and Practice of Cervical Cancer Screening and its Associated Factors among Women Attending Maternal Health Services at Public Health Institutions of Assosa Zone, Benishagul-Gumuz, North west Ethiopia 2022.

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**Background**: Cervical cancer is the fourth most common cancer among women. In 2020, about 604000 women were diagnosed with cervical cancer worldwide and about 342 000 women died from the disease. Early screening decreases the mortality from cervical cancer. However, little information available about the knowledge and practice of the women toward cervical cancer in d in the study area. Objectives: this study aimed to assess the knowledge, and Practice of cervical cancer screening and its associated factor among women reproductive age groups of Assosa zone Beneshagul - Gumuz Ethiopia 2022. Methodology: A facility-based crosssectional study was conducted. A systematic sampling technique was used to select 213 reproductive-age women from selected health institutions, from April 20/2022 to July 2022. Validated and Pre-tested questionnaire was used for data collection. Multi logistic regression analyses were done to identify factors independently associated with cervical cancer screening. Adjusted Odds Ratio with 95% CI was estimated to measure the strength of association. The level of statistical significance was declared at a p-value < 0.05. The results were presented in tables and figures. **Result**: - Knowledge of cervical cancer screening in this study was 53.5% and 36 % of respondents had practiced cervical cancer screening. Family history of cervical cancer [AOR=2.5, 95% CI (1.004-6.44)], place of residence [AOR= 3.68, 95% CI (2.23, 6.54), and availability of health service [AOR =1.963 95% CI (1.057-3.644)] were significantly associated with knowledge of cervical cancer screening and, educational status [AOR=2.811, 95% CI (1.038-7.610)], knowing someone diagnosed with cervical cancer [AOR= 8.3, 95% CI (2.404-28.697)], and not feeling at risk [AOR =2.696 95% CI (1.057-6.52)] were associated with the practice of cervical cancer screening. Conclusion and recommendation: - knowledge and practice of cervical cancer screening in this study were low. Awareness creation is crucial to ending cervical cancer-related mortality.

Key word:-Cervical screening reproductive age, Assosa

## Introduction

Cervical cancer is a type of cancer that occurs in the cells of the cervix, the lower part of the uterus that connects to the vagina (1). The major risk factor for cervical cancer is the infection with Human Papilloma Virus (HPV). Cervical cancer is the fourth most common cancer among women. In 2020, about 604000 women were diagnosed with cervical cancer worldwide and about 342 000 women died from the disease. About 85% of the case and 90% of the death is occurring in low-income countries (2)(3). Cervical cancer accounts for 22% of all female cancers and 12% of all newly diagnosed cancers every year in African women (4,5).

According to the report from WHO, globally cervical cancer incidence was 7.9%. New cases of cervical cancer occur more often in developing countries than in developed countries (6,7). In sub-Saharan Africa, the incidence and mortality rate of cervical cancer was 25.2% and 23.2% respectively (6,8). In Ethiopia, the incidence of cervical cancer is the second most common cancer (13.6%) next to breast cancer (32.9%). It accounted for a 16.5% mortality rate, and a five year prevalence was 18.2% (9). The annual incidence of cervical cancer in Ethiopia is, about 6294 new cases and the annual mortality is more than 4884. This shows that, the disease become a serious health problem in the country (11). Cervical cancer leads all the physical, Psycho-social and Economic impacts on the individual patient, family and community at large (i.e. Increased treatment-related expenses, loss of employment and consequent income, and changes in household responsibilities) (12). Moreover, cervical cancer disproportionately affects women at the low socioeconomic level, and thus the disease can have dramatic consequences on the living conditions of patients, including falling into poverty or being pushed into deeper poverty(13)(12).

Even though it is a dangerous medical condition, the evidence from different literature shows that early screening can reduce 50% of cervical cancer-related death(14). Cervical cancer screening is a way to detect abnormal cervical cells, including precancerous cervical lesions, as well as early cervical cancers. Routine cervical screening has been shown to greatly reduce both the number of new cervical cancers and deaths and morbidity due to the disease (6,7). I n 2020, the World Health Assembly adopted a new Global strategy to eliminate cervical cancer as a public health problem that must be met by 2030 for countries to be on the path toward cervical cancer elimination by setting a 90-70-90 strategy (i.e. 90% vaccinated for human papillomavirus (HPV), 70% screened for cervical cancer and 90% of identified disease received treatment).

Awareness about cervical cancer and the method of screening has significantly important to increasing the level of cervical cancer screening. Evidence shows Knowledge of women about cervical cancer screening is a crucial component. Recent kinds of literature show that Women with a better knowledge of cervical cancer were more likely to attend cervical cancer screenings. Lack of knowledge about cervical cancer remains an important factor that affects the participation of women in these screening practices (7,14). In spite of the importance of assessing the level of Knowledge about cervical cancer and the level of practice among reproductive-age women, little information was available about the knowledge and practice of the women toward cervical cancer in Ethiopia in General and in the study area in particular.

### **Materials and Methods**

The study was conducted in Assosa Zone, Benishangul-Gumuz, Ethiopia from April 20, 2022 to July 20/ 2022. Assosa Zone is located 667km from Addis Ababa, the capital city of Ethiopia. The Zone has one general hospital, one primary hospital, 24 health centers and 191 health posts. Those public health facilities gave both curative and preventive reproductive health service, including cervical cancer screening among reproductive age group women (15).

### **Patient and public Involvement**

Participants in this study were not involved in the design, conduct, or dissemination plans of our research. The investigators of this study developed the research questions and study design, which were then reviewed by the institutional review board of the Assosa University.

### Study design:

A facility based cross sectional study was employed

### Study participants and Sampling

### Source population

> All 15-49 years old women attending health facilities in the Assosa Zone.

### **Study population**

Systematically selected reproductive age group women who were attend selected health facilities of Assosa zone during the study period

### Sample size determination

Sample size was calculated using single population proportion formula with the assumption of knowledge about cervical cancer screening 14.8% (9). Assuming 95%, 5% margin of error. The sample size was 194, after adding 10% none respondent rate, the final sample size become 213

### Sampling procedures

There are eight districts in Assosa Zone. Considering homogeneity, three of them (i.e. Assosa district, Bambasi district and Homosha district) were selected using lottery method. Then after, the total sample size was allocated by probability proportional to size to each health facilities based on the number of eligible individual flow they have, which was estimated from the quarterly report of the given institution as follow:

ni= <u>n x Ni</u>

Ν

Where; ni = the sample size of the i<sup>th</sup> Health facility

Ni = population size of the i<sup>th</sup> health facility

n = n1+n2+...n4 is the total sample size (213)

 $N = N1 + N2 + ... N^{th}$  - is total population size of those health institution (1200)

Finally 213 study participants were selected using systematic sampling technique on daily flow from the respective health facilities

### A data collection procedure

Standardized and Structured interviewer-administered questionnaire adapted from other existing tools was contextualized and pretested for its reliability. The content validity of the questionnaire was reviewed by qualified obstetricians and public health specialists. The first part had socio demographic characteristics, the seconds, third part assessed the knowledge, and practice on cervical cancer screening and the last about associated factor of cervical cancer screening. Data was collected by five BSc nurses and 2 public health officer as a supervisor .The questionnaire which was prepared in English and translated to Amharic and back translated to English by see for the consistency of both the English and Amharic version of the questionnaire.

### **Data Quality Control**

The questionnaire was translated into the local language by experts. Finally, before data collection, it was re-translated back to English to verify consistency. Before starting the actual data collection, two days training was given for the data collectors and supervisors.

A pre-test was conducted on 5% of the sample size at adjacent health facility (Mange hospital) by data collectors and all necessary amendments were done accordingly. The reliability of the questionnaires was checked (Cranach's alpha.95 and 0.87,for Knowledge and practice questionnaire respectively). Before analysis, all collected data were checked for completeness

### **Operational definition**

- Knowledge about cervical cancer screening: We used a twenty nine items composite score of the knowledge to measure the knowledge level of respondents regarding vulnerable groups, risk factors, signs and symptoms and prevention methods of cervical cancer. The cumulative mean score of knowledge of participants about cervical cancer was estimated using mean score. Based on this, those respondents who had scored greater than or equal to the mean value were considered as Good Knowledge where as those respondents who had scored Less than the mean value were considered as Poor Knowledge (16).
- Good practice: Those respondents who screen for cervical cancer at least once (9,16)
- **Poor practice**: Those respondents who cannot screen for cervical cancer (9,16)

## **Data Processing and Analysis**

The completed questionnaires were coded and entered into the computer program Epi-Data version 3.1. SPSS version 27.0 was used for the analysis. Data were cleaned and edited using simple frequencies and cross tabulations before analysis. The cleaned final data were then analyzed using SPSS version 27.0. Descriptive statistics such as, frequencies, tabulation, percent and graphs were used to analyses the descriptive component. Bi-variable logistic regression analyses were done to see the association between each independent variable and the outcome variable. Variables with P-value >0.2 were the candidate for Multi-variable logistic regression Analysis The logistic regression model fitness was checked using Hosmer-Lemeshow and statistics, not significant was declared as a model fitted. Multicollinearity was checked (VIF <10) indicating the non- existence of multicollinearity among the variables in this study. Both crude and adjusted odds ratio along with 95% CI was estimated to measure the strength of association. The level of statistical significance was declared at a p-value of less than 0.05.

### Result

### Socio demographic characteristics of the study participants

A total of 213 women participated in the study yielding 100% response rate. High proportion of 62 (29.1%) of the respondents were within the age group of 20-24 years, with a mean( $\pm$ SD) age of 32.2 ( $\pm$ 13.8) years and most of 115(54%) the study participants were married. Regarding their educational status, 81 (38%) were illiterate and 75 (35.2%) and 47 (22.1%) of them were learned primary school and secondary school respectively (Table 1).

 Table 1:-Socio-demographic characteristics of the reproductive age women living in Assosa

 zone, Benishanigu-Gumuz, Ethiopia 2022. (n=213)

No	Variable	Category	Frequency (N)	Percent (%)
1		15-19	24	11.3
	Age category	20-24	62	29.1
		25-29	48	22.5
		30-34	32	15.0

		35-39	18	8.5
		>40 and above	29	13.6
2	Place of	Urban	79	37.08
	residence	Rural	134	62.92
2	Educational	Illiterate	81	38.0
	status	1-8th grade	75	35.2
		9-12th grade	47	22.1
		college and above	10	4.7
3	Marital status	Single	70	32.9
		Married	115	54.0
		Divorced	17	8.0
		Widowed	11	5.2
5	Religion	orthodox	142	66.7
		Muslim	39	18.3
		Protestant	21	9.9
		Catholic	11	5.2
6	Occupation	Farmer	49	49
	Status	Merchant	19	19
		Government employee	111	111
		Student	17	17
		Unemployed	7	7
		Daily laborer	10	10

# Knowledge of the participants, about risk factors, main symptoms, treatment options and prevention of the cervical cancer.

The current study revealed that, nearly half (46.48%) of the participants have poor knowledge toward the Cervical cancer screening. Seven Out of ten women's (155)) heard about cervical cancer, and the most common sources of information were social media 75(35.2%) Eighty one women's (38%) respond that the "main cause of Cervical cancer is HPV" (Figure1)

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Figure 1:- Over all knowledge of cervical screening among women reproductive age group of Assosa zone Beneshagul-Gumuz Ethiopia 2022

## Practice of cervical cancer screening among reproductive age

### women

Among all the respondents of the study only 77(36%) had cervical cancer screening (Figure 2)



Figure 2- Overall practice of cervical screening among women reproductive age group of Assosa zone Beneshagul-Gumuz Ethiopia 2022.

Of those who screened for cervical cancer, Forty seven (22.1%) screened in hospitals and the 6 (33.3%) screened at health center. Fifty one (23.9%) of them were screened by self-initiation and 10 (4.7%) were initiated health care providers. Respondents who have no screening practice where asked for their reasons for left unscreened and, 21 of them (16%) mentioned painful, 36(26%) feel shy, 18(15.3%) my husband is not agreeing for screening (Figure 3)

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Figure 3:- Reason for not screened for cervical screening among women reproductive age group of Assosa zone Beneshagul – Gumuz, Ethiopia 2022.

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## Factors associated with knowledge of reproductive age women toward cervical cancer screening

In bi-variable logistic regression analysis, Place of residence, marital status, education status, History of previous family planning, family history of cervical cancer, having partner diagnosed with sexual transmitted disease, information of cervical cancer, multiple sexual partner and availability of health service, were significantly associated with knowledge of cervical cancer screening.

In multivariate analysis family history of cervical cancer, being having partner diagnosed with sexual transmitted disease, having information about cervical cancer and availability of health service were found to be associated with the knowledge reproductive age women toward cervical cancer screening at P-value less than 0.05.

This study shows, those women living in the Urban area were 3.68 times more likely to have Knowledge about the cervical cancer when compared with rural residents (AOR= 3.68(2.23, 6.54)). In the current study, Women who had family history of cervical cancer were 2.5 times more likely to have knowledge of cervical cancer screening when compared with their counterpart (AOR=2.5, 95% CI (1.004-6.44)). (Table 2)

**Table 2**: -Multivariate logistic regression analysis for factors associated with knowledge of

 cervical cancer screening among reproductive age women in assosa zone Beneshangul- Gumuz

 Ethiopia, august 2022.

Variable		able Knowled		Crude OR (95%	Adjusted OR	P- Value
		Good	poor	CI)	(95%CI)	
Place of residence	Urban	52	27	1	1	
	Rural			5.6(1.54, 8.34)	3.68(2.23,6.54)	0.0001*
Marital status	Single	40	30	1		

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	Married	62	53	1.140(0.626-2.074)	1.065(0.578-1.963)	0.23	
	Widowed	6	11	2.444(0.812-7.355)	2.234(0.723- 6.903)	0.56	
	Divorced	6	5	1.111(0.310-3.987)	1.004(0.261-3.870)	0.78	Protect
	Illiterate	52	29	1	1		ed by c
Educational	Primary school	37	38	1.842(0.970-3.497)	1.187(0.574-2.455)	0.066	opyright, in
status	Secondary school	21	26	2.220(1.067-4.620	1.387(0.610- 3.151)	0.097	cluding for u
	College and above	4	6	2.690(0.701-10.315)	1.042(0.229-4.746)		ses related
Use family	Yes	99	71	1	1		to te
planning	No	15	28	2.603(1.296-5.227)	2.063(0.966-4.403)	0.343	xt and da
Family history	Yes	88	53	1	1		(ABES
cervical cancer	No	26	46	2.938(1.629-5.296)	2.543(1.004-6.440)	0.025*	iing, Al
Having partner	Yes	82	54	1	1		traini
with history of STI	No	32	45	2.135(1.209-3.771)	2.032(1.134, 3.643)	0.032*	ng, and sim
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NB: AOR= Adjusted odds ratio, COR= Crude odds ratio, CI= Confidence interval, \* statistically significant, STI- Sexually transmitted Infections.

# Factors associated with practice of reproductive age women toward cervical cancer screening

In bi-variable Logistic regression analysis, educational status, use of family planning, history of abortion, having knowledge about cervical cancer, knowing someone diagnosed with cervical cancer, the source of information, and number sexual partner found to be associated with cervical cancer screening practice.

In multivariate analysis educational status, having knowledge about cervical cancer, knowing someone diagnosed with cervical cancer, the source of information, and not feeling at risk were found to be statistically significant.

In this study women have completed secondary education had 2.8 time more likely to practice cervical cancer screening when compared with women who were un able to read and write (AOR=2.811(1.038-7.610)). Women who know someone diagnosed with cervical cancer were 8.3 times more likely to practice cervical cancer screening than women who did not know (AOR=8.3, 95% CI (2.404-28.697)). Women those who got the information were 3.1 times more likely to practice screening than those who did not have information (AOR=3.1, 95% CI (1.382-7.162). Those women who perceive their self as a risky group were 3.23 times more likely to seek for cervical screening when compared their counterpart (AOR = 3.2.3(1.524-5.049)) (Table 4)

**Table 3** -Multivariate logistic regression analysis for potential factors associated with practice of cervical cancer screening among reproductive age women in assosa zone Beneshangul Gumuz Ethiopia, august 2022.

Variable		De Practice of CC screening		Crude OR (95% CI)	Adjusted OR (95%CI)	P-value
		Yes	no			
	Un able to read	37	44	1	1	

	and write					
Educatio	Primary school	27	48	1.495(0.786-2.844)	1.699(0.719-4.015)	0.35
nal status	Secondary school	12	35	2.453(1.115-5.394)	2.811(1.038-7.610)	0.001*
	College and above	1	9	7.568(0.916-62.532)	8.708(0.963-78.782)	0.45
Use	Yes	72	98	1	1	
family planning	No	5	38	5.584(2.094-14.889)	0.877(0.193-3.993)	0.098
Abortion	Yes	28	37	1	1	
	No	49	99	1.529(0.840-2.782)	0.824(0.348-1.951)	0.076
Knowing	Yes	69	72	1	1	
dx about Cervical cancer	No	8	64	7.667(3.425-17.161)	8.306(2.404-28.697)	0.034
Informati	Yes	63	65	1	1	
on cervical CA	No	14	71	4.915(2.516-9.603)	3.146(1.382-7.162)	0.001*
Feeling at	Yes	88	60	1	1	
<b>FISK</b>	No	12	52	3.353(1.655-6.795)	3.264(1.524-5.049)	0.034*
Knowledg	Yes	59	64	1	1	
e of cervical cancer	No	18	72	3.687(1.972-6.896)	2.173(1.077-4.384)***	0.001*

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## **Structured Discussion**

### **Principal Findings**

This study identified that knowledge of cervical cancer screening in this study was 53.52% and 36 % of respondents had practiced cervical cancer screening. The current study investigated that, Family history of cervical cancer place of residence and availability of health service were significantly associated with knowledge of cervical cancer screening and, educational status knowing someone diagnosed with cervical cancer and not feeling at risk were independently associated with the practice of cervical cancer screening

### Results in the context of what is known

The level of Knowledge this study is comparable with the prevalence reported by the study done in Gondar University (59.3.3%). The present study finding is higher when compared to study done in higher when it compared to Study conducted in Adama town, Oromia and Garage Zone, Southern Ethiopia ,which was over all 14.8% and 26.2% respectively(9)(17). The discrepancy might be due to the study period and the nature of the study participants. In the current study, more than two-third (72.8%) of the study participants were heard about cervical cancer screening. This finding is found higher than with the study done in Nigeria, heard about cervical cancer screening which was 40% (18). The variety might be due to the gap in the study period and the recent WHO strategy which focuses on implementation of cervical cancer screening and information dissemination.

In the recent study, those women living in the urban are 3.68 more likely to have good knowledge when compared with those rural residents. This might be due to the fact that, those participants living in urban area are prone to the information and health care facility when compared with rural residents. More likely to visits the health care facility. This finding is supported by the studies done in china (18). In this study, those respondents who had a history of cervical cancer in the family were 2.5 times more likely to have good knowledge about cervical cancer screening than their counterparts. This might be due to the fact that information can easily disseminated in between the family. Respondents who had a history of multiple sexual intercourses were 1.9 times more likely good knowledge of cervical cancer screening compared

with those who had no multiple sexual intercourse. This might be due to those respondents who had multiple sexual partners might seek medical care for other reasons like STD-related symptoms, along with this they might get universal screening upon institutional visit. Respondents who had information about cervical cancer were 3.1 times more likely to practice cervical cancer screening than their counterparts. This might be due to that those respondents who had awareness of cervical screening might enforce them to visit health institutions

The finding of this study revealed that 36 % of respondents had practiced cervical This finding is higher than cancer screening. the study done Butajira in. Addis Ababa Ethiopia, Tanzania, and Kenya (15.1%, 21.9%, 14% town. and 22%) of respondents had practiced cervical cancer screening respectively (10,17,19). This difference might due to the difference in the background of the respondents, and the difference in the study period as the recent national policy highly emphasized to the cervical screening

### **Clinical implication**

Our main aim in this study was to assess the knowledge, practice and the associated factors of cervical cancer screening, among reproductive age women living in Assosa Zone. We quantitate the magnitude and the possible associated factors of Knowledge and practice of cervical cancer screening. Accordingly, the first major practical contribution of the present research is that it provides much needed empirical data on the actual jobs of cervical cancer screening strategy based on the identified factors in this study. This information is important given that, there is limitation of the study in the study area. The finding of this study will allow the stake holders, trainers, consultants and others to design initiatives based on what have been identified as the risk factor of poor knowledge and poor practice. In this sense, we believe that our research is especially timely to meet the WHO-strategy to eliminate the cervical cancer

## **Research implication**

The finding of this study help as base line data for the future research who wants to study on the subject area

### Strength and limitation of the study

The study was unique, as it comprehensively examined the health factors associated with Knowledge and practice of cervical cancer screening In Benishangul- Gumuz and provided cues for future cervical cancer prevention programs.

Despite these strength, due to the nature of the study design (Cross-sectional study design), inferring the causality was not possible. Self-reported data (e.g., history family history of cervical cancer and multiple sexual histories) might have recall and social desirability bias.

## Conclusion

More than half (53.52%) of reproductive health service clients in health care facility of Assossa Zone have Good knowledge about cervical cancer screening. Whereas the practice of cervical cancer screening was generally low. Place of residency, Family history of cervical cancer, having partner diagnosed with sexual transmitted disease, were significantly associated with knowledge of cervical cancer screening and educational status, having knowledge about cervical cancer, knowing someone diagnosed with cervical cancer, the source of information, and Individual feeling of at risk for cervical cancer were found to be statistically significant. Therefore, encouraging all reproductive age women visiting health facility toward cervical cancer screening regardless of the unit they visited is important to increase the cervical cancer screening practice.

### **Ethical Approval and Consent to participate**

The study was approved by the Assosa University, Health Sciences College Health Research Ethics Review Committee (CHRERC) (Ref.No.ASU/892/2014). The permission and support letter was obtained from the Assosa Zone and each health facilities. Voluntary informed, written, and signed consent was obtained from all subjects after describing the nature and purpose of the study by the language they can understand. Each data collectors and supervisor oriented to follow the national COVID-19 protocol during data collection period.

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## **Consent for publication**

Not applicable

## **Competing of Interest**

The authors declare that there is no any competing interest.

## Acknowledgements

The authors thanks all study participants and all the data collectors and supervisors for that this study would not have been possible without them.

### **Author's Contributions**

Firaol Regea Gelassa designed the study, developed the proposal, participated in the data collection, performed analysis, and drafted the manuscript. Shalama Lekasa Nagari, Desalegn Emana Jabena<sup>,</sup> Dabeli Belgafo, Daniel Tesso, Debela Teshome, approved the proposal with revisions, participated in data analysis, and revised subsequent drafts of the manuscript. All authors read and approved the final manuscript.

## **Financial disclosure statement (Funding agency)**

No funding agent

## Availability of data and materials

All relevant data are within the paper and its Supporting Information files

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Figure 1:- Over all knowledge of cervical screening among women reproductive age group of Assosa zone Beneshagul-Gumuz Ethiopia 2022



Figure 2- Overall practice of cervical screening among women reproductive age group of Assosa zone Beneshagul-Gumuz Ethiopia 2022.



Figure 3:- Reason for not screened for cervical screening among women reproductive age group of Assosa zone Beneshagul – Gumuz, Ethiopia 2022.

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### Knowledge and Practice of Cervical Cancer Screening and its Associated Factors among Women Attending Maternal Health Services at Public Health Institutions of Assosa Zone, Benishagul-Gumuz, North west Ethiopia 2022: a Crosssectional Study

Journal:	BMJ Open
Manuscript ID	bmjopen-2022-068860.R1
Article Type:	Original research
Date Submitted by the Author:	26-Feb-2023
Complete List of Authors:	Gelassa, Firaol; Assosa University, Nursing Nagari, Shalama ; Assosa University, Public Health Jebena, Desalegn; Assosa University, Nursing; Belgafo, Dabeli; Assosa University, Nursing Teso, Daniel; Assosa University, Nursing Teshome, Debela; Assosa University, Nursing
<b>Primary Subject Heading</b> :	Oncology
Secondary Subject Heading:	Public health, Obstetrics and gynaecology, Oncology
Keywords:	Adult oncology < ONCOLOGY, Gynaecological oncology < ONCOLOGY, Urological tumours < ONCOLOGY

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Knowledge and Practice of Cervical Cancer Screening and its Associated Factors among Women Attending Maternal Health Services at Public Health Institutions of Assosa Zone, Benishagul-Gumuz, North west Ethiopia 2022: a Crosssectional Study

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Background: Cervical cancer ranks as the second most frequent cancer among all women in Ethiopia and the second most frequent cancer among women between 15 and 44 years of age, resulting over 4884 mortality annually. Ethiopian Federal Ministry of health proposed move towards universal healthcare places emphasis on health promotion through education and screening, but there is little data on the baseline levels of knowledge and screening uptake regarding cervical cancer. Objectives: This study explored the levels of knowledge and screening rates of cervical cancer along its associated factor among women reproductive age groups of Assosa zone Beneshagul - Gumuz Ethiopia 2022. Methodology: A facility-based cross-sectional study was conducted. A systematic sampling technique was used to select 213 reproductive-age women from selected health institutions, from April 20/2022 to July 2022. Validated and Pre-tested questionnaire was used for data collection. Multi logistic regression analyses were done to identify factors independently associated with cervical cancer screening. Adjusted Odds Ratio with 95% CI was estimated to measure the strength of association. The level of statistical significance was declared at a p-value < 0.05. The results were presented in tables and figures. Result: - Knowledge of cervical cancer screening in this study was 53.5% and 36 % of respondents had practiced cervical cancer screening. Family history of cervical cancer [AOR=2.5, 95% CI (1.004-6.44)], place of residence [AOR= 3.68, 95% CI (2.23, 6.54), and availability of health service [AOR =1.963 95% CI (1.057-3.644)] were significantly associated with knowledge of cervical cancer screening and, educational status [AOR=2.811, 95% CI (1.038-7.610)], knowing someone diagnosed with cervical cancer [AOR= 8.3, 95% CI (2.404-28.697)], and not feeling at risk [AOR = 2.696 95% CI (1.057-6.52)] were associated with the practice of cervical cancer screening. Conclusion and recommendation: - knowledge and practice of cervical cancer screening in this study were low. Awareness creation is crucial to ending cervical cancer-related mortality.

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## Strengths and Limitations of this Study

- The study was unique, as it comprehensively examined the health factors associated with Knowledge and practice of cervical cancer screening In Benishangul- Gumuz region
- The results are generalizable to the reproductive age women living in the Assosa Zone
- Nature of the study design (Cross-sectional study design), inferring the causality was not possible.
- Self-reported data (e.g., Previous HPV screening and Vaccination,) might have recall bias

## Introduction

Cervical cancer is a type of cancer that occurs in the cells of the cervix, the lower part of the uterus that connects to the vagina (1). The major risk factor for cervical cancer is the infection with Human Papilloma Virus (HPV). Cervical cancer is the fourth most common cancer among women(2). In 2020, about 604000 women were diagnosed with cervical cancer worldwide and about 342 000 women died from the disease(3). About 85% of the case and 90% of the death is occurring in low-income countries (3,4). Cervical cancer accounts for 22% of all female cancers and 12% of all newly diagnosed cancers every year in African women (5,6).

According to the report from WHO, globally cervical cancer incidence was 7.9%(7). New cases of cervical cancer occur more often in developing countries than in developed countries (8,9). In sub-Saharan Africa, the incidence and mortality rate of cervical cancer was 25.2% and 23.2% respectively (8,10). In South Africa, cervical cancer ranks as the Second most frequent cancer among women and first most frequent cancer which accounts for15.85% of all female cancers among women between 15 and 44 years of age(11) About 3.2% of women in the general population are estimated to harbor cervical infection at a given time, and 64.2% of invasive cervical cancers are attributed to HPVs(12). In Tanzania, Current estimates indicate that every year, 10241 women are diagnosed with cervical cancer

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and 6525 die from the disease. Cervical cancer ranks as the first most frequent cancer among women in Tanzania and the 1st most frequent cancer among women between 15 and 44 years of age(13). According to the Tanzanian Cancer Registry, between 1998 and her 2000, cervical cancer accounted for 29.8% of all cancers in women in northern Tanzania(14). Ethiopia has a population of 33.7 million women ages 15 years and older who are at risk of developing cervical cancer. Current estimates indicate that every year 7445 women are diagnosed with cervical cancer and 5338 die from the disease. Cervical cancer ranks as the 2nd most frequent cancer among women in Ethiopia and the 2nd most frequent cancer among women between 15 and 44 years of age(15). It accounted for a 16.5% mortality rate, and a five year prevalence was 18.2% (16). The annual incidence of cervical cancer in Ethiopia is, about 6294 new cases and the annual mortality is more than 4884. This shows that, the disease become a serious health problem in the country(17). Cervical cancer leads all the physical, Psycho-social and economic impacts on the individual patient, family and community at large (i.e. increased treatment-related expenses, loss of employment and consequent income, and changes in household responsibilities (12,16). Moreover, cervical cancer disproportionately affects women at the low socioeconomic level, and thus the disease can have dramatic consequences on the living conditions of patients, including falling into poverty or being pushed into deeper poverty (12, 13, 16).

Even though it is a dangerous medical condition, the evidence from different literature shows that early screening can reduce 50% of cervical cancer-related death (18). Cervical cancer screening is a way to detect abnormal cervical cells, including precancerous cervical lesions, as well as early cervical cancers (8). Routine cervical screening has been shown to greatly reduce both the number of new cervical cancers and deaths and morbidity due to the disease (8,9). In 2020, the World Health Assembly adopted a new Global strategy to eliminate cervical cancer as a public health problem that must be met by 2030 for countries to be on the path toward cervical cancer elimination by setting a 90-70-90 strategy (i.e. 90%
vaccinated for human papillomavirus (HPV), 70% screened for cervical cancer and 90% of identified disease received treatment). Awareness about cervical cancer and the method of screening has significantly important to increasing the level of cervical cancer screening. Evidence shows Knowledge of women about cervical cancer screening is a crucial component. Recent kinds of literature show that Women with a better knowledge of cervical cancer were more likely to attend cervical cancer screenings(2). Lack of knowledge about cervical cancer remains an important factor that affects the participation of women in these screening practices (9,18). In spite of the importance of assessing the level of knowledge about cervical cancer and the level of practice among reproductive-age women, little information was available about the knowledge and practice of the women toward cervical cancer in Ethiopia in general and in the study area in particular.

### Methods

### Study Setting

Data collection was done in April 20, 2022 to July 20/ 2022 at Assosa Zone, Benishangul-Gumuz, Ethiopia. Zone is located 667km from Addis Ababa, the capital city of Ethiopia. The Zone has general hospital, one primary hospital, 24 health centers and 191 health posts.

These public health facilities in the region are fully owned and financed by the government serving a population of about 310,822, of whom 151,890 women who are living within the different districts of the region. Pap smear screening services are available only at two hospitals region (Mange and Assosa Hospital) from the given public health facilities in the region. While screening services are available at all hospital and Health centers. Those public health facilities gave both curative and preventive reproductive health service, including cervical cancer screening among reproductive age group women (19).

# Patient and public Involvement

Participants in this study were not involved in the design, conduct, or dissemination plans of our research. The investigators of this study developed the research questions and study design, which were then reviewed by the institutional review board of the Assosa University.

### Study design and population

We conducted a facility based cross sectional study at Assosa Region in 2022. The source population was all 15-49 years old women attending health facilities in the Assosa Zone and our source population was systematically selected reproductive age group women who were attend selected health facilities of Assosa zone during the study period.

### Sample size determination

Sample size was calculated using single population proportion formula with the assumption of knowledge about cervical cancer screening 14.8% (20) . Assuming 95% confidence level, 5% margin of error.  $n=z^2p (1-p)/d^2 = (1.96)^2 (0.148 \times 0.852)/(0.05)^2 = 194$ 

Where;

Z= 95% confidence level (1.96)

p= 14.8% of population proportion with knowledge of cervical cancer screening at Adama Ethiopia (26)

d= the margin of error =5%

adding none response rate of 10%. The sample size was 194, after adding 10% none respondent rate, the final sample size become 213

### Sampling procedures

There are eight districts in Assosa Zone. Considering homogeneity, three of them (i.e. Assosa district, Bambasi district and Homosha district) were selected using Computer generated

lottery method. Then after, the total sample size was allocated by probability proportional to size to each health facilities based on the number of eligible individual flow they have, which was estimated from the guarterly report of the given institution as follow:

n x Ni

ni=

Ν

Where; ni = the sample size of the i<sup>th</sup> Health facility

Ni = population size of the i<sup>th</sup> health facility

 $n = n1 + n2 + \dots n4$  is the total sample size (213)

 $N = N1 + N2 + ... N^{th}$  - is total population size of those health institution (1200)

Finally 213 study participants were selected using systematic sampling technique on daily flow from the respective health facilities

### A data collection procedure

In this study, the data were obtained by a interviewer-administered, structured questionnaire that was adapted from a questionnaire used in different studies done in different areas(14,21). The content validity of the guestionnaire was reviewed by gualified obstetricians and public health specialists. The first part had socio demographic characteristics, the seconds, third part assessed the knowledge, and practice on cervical cancer screening and the last about associated factor of cervical cancer screening. Data was collected by five BSc nurses and 2 public health officer as a supervisor. In these instances, the data collectors read out the questions, explained the meaning, if required, and scribed the answers. The guestionnaire was available in both English and Amharic Language

### Data Quality Control

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Before starting the actual data collection, two days training was given for the data collectors and supervisors. A pre-test was conducted on 5% of the sample size at adjacent health facility (Mange hospital) by data collectors and all necessary amendments were done accordingly. The reliability of the questionnaires was checked (Cranach's alpha.95 and 0.87, for Knowledge and practice questionnaire respectively). Before analysis, all collected data were checked for completeness

### Operational definition

- Knowledge about cervical cancer screening: We used a twenty nine items composite score of the knowledge to measure the knowledge level of respondents regarding vulnerable groups, risk factors, signs and symptoms and prevention methods of cervical cancer. The cumulative mean score of knowledge of participants about cervical cancer was estimated using mean score. Based on this, those respondents who had scored greater than or equal to the mean value were considered as good Knowledge where as those respondents who had scored Less than the mean value were considered as poor Knowledge (22).
- Good practice: Those respondents who screen for cervical cancer at least once (20,22)
- **Poor practice**: Those respondents who cannot screen for cervical cancer (20,22)

### Data Processing and Analysis

The completed questionnaires were coded and entered into the computer program Epi-Data version 3.1. SPSS version 27.0 was used for the analysis. Data were cleaned and edited using simple frequencies and cross tabulations before analysis. The cleaned final data were then analyzed using SPSS version 27.0. Descriptive statistics such as, frequencies, tabulation, percent and graphs were used to analyses the descriptive component. Bi-variable logistic regression analyses were done to see the association between each independent variable and the outcome variable. Variables with P-value >0.2 were the candidate for Multi-variable

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logistic regression Analysis The logistic regression model fitness was checked using Hosmer-Lemeshow and statistics, not significant was declared as a model fitted. Multicollinearity was checked (VIF <10) indicating the non- existence of multicollinearity among the variables in this study. Both crude and adjusted odds ratio along with 95% CI was estimated to measure the strength of association. The level of statistical significance was declared at a p-value of less than 0.05.

### Result

### Socio demographic characteristics of the study participants

A total of 213 women participated in the study yielding 100% response rate. High proportion of 62 (29.1%) of the respondents were within the age group of 20-24 years, with a mean(±SD) age of 32.2 (±13.8) years and most of 115(54%) the study participants were married. Regarding their educational status, 81 (38%) were illiterate and 75 (35.2%) and 47 (22.1%) of them were learned primary school and secondary school respectively (Table 1).

 Table 1:-Socio-demographic characteristics of the reproductive age women living in Assosa

 zone, Benishanigu-Gumuz, Ethiopia 2022. (n=213)

No	Variable	Category	Frequency (N)	Percent (%)
1		15-19	24	11.3
	Age category	20-24	62	29.1
		25-29	48	22.5
		30-34	32	15.0
		35-39	18	8.5
		>40 and above	29	13.6

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2	Place of	Urban	79	37.08
	residence	Rural	134	62.92
2	Educational	Illiterate	81	38.0
	status	1-8th grade	75	35.2
		9-12th grade	47	22.1
		college and above	10	4.7
3	Marital status	Single	70	32.9
		Married	115	54.0
		Divorced	17	8.0
		Widowed	11	5.2
5	Religion	orthodox	142	66.7
		Muslim	39	18.3
		Protestant	21	9.9
		Catholic	11	5.2
6	Occupation	Farmer	49	49
	Status	Merchant	19	19
		Government employee	111	111
		Student	17	17
		Unemployed	7	7
		Daily laborer	10 ~	10

Knowledge of the participants, about risk factors, main symptoms, treatment options and prevention of the cervical cancer.

The current study revealed that, more than half (53.52%) of the participants have good knowledge toward the Cervical cancer screening. Seven out of ten women's (155) heard

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about cervical cancer, and the most common sources of information were social media 75(35.2%) Eighty one women's (38%) respond that the "main cause of cervical cancer is HPV" (see figure1)

### Practice of cervical cancer screening among reproductive age women

Among all the respondents of the study only 77(36%) had cervical cancer screening (See figure 2). From those who screened for cervical cancer, fourty seven (22.1%) screened in hospitals and the Six (33.3%) screened at health center. Fifty one (23.9%) of them were screened by self-initiation and 10 (4.7%) were initiated health care providers. Respondents who have no screening practice where asked for their reasons for left unscreened and, 21 of them (16%) mentioned painful, 36(26%) feel shy, 18(15.3%) my husband is not agreeing for screening (See figure 3)

# Factors associated with knowledge of reproductive age women toward cervical cancer screening

In bi-variable logistic regression analysis, Place of residence, marital status, education status, History of previous family planning, family history of cervical cancer, having partner diagnosed with sexual transmitted disease, information of cervical cancer, multiple sexual partner and availability of health service, were significantly associated with knowledge of cervical cancer screening.

In multivariate analysis family history of cervical cancer, being having partner diagnosed with sexual transmitted disease, having information about cervical cancer and availability of health

cervical ca	cervical cancer screening at P-value less than 0.05.								
This study	This study shows, those women living in the urban area were 3.68 times more likely to								
Knowledge	Knowledge about the cervical cancer when compared with rural residents (AOR= 3.68 ( $^{2}$								
6.54)). In tl	ne current stu	udy, Wor	men who	had family history of	cervical cancer were 2.5	times			
more likely	y to have ki	nowledg	e of cer	vical cancer screening	g when compared with	their			
counterpar	rt (AOR=2.5,	95% CI (	1.04-6.44	)). (See table 2)					
Table 2: -	Multivariate I	ogistic r	egressior	analysis for factors a	associated with knowled	ge of			
cervical ca	incer screeni	ng amoi	ng repro	ductive age women	in assosa zone Benesha	ingul-			
Gumuz Eth	niopia, august	: 2022.	0	-					
		Knowle	odao of	k	1				
						P- value			
Variable				Crude OR (95% CI)	Adjusted OR (95%CI)				
		Good	poor	E.					
Place of	Urban	52	27	1	1				
	Rural	56	78	5 6(1 54, 8 34)	3 68(2 23,6 54)	0.0001*			
residence			, 0	3.0(1.3 1/ 0.3 1)	3.00(2.23)0.3 1)	0.0001			
residence									
residence Marital status	Single	40	30	1	2,				
residence Marital status	Single	40	30	1	2/				
residence Marital status	Single	40	30	1	2/				
residence Marital status	Single Married	40	30 53	1 1.140(0.626-2.074)	1.065(0.578-1.963)	0.23			
residence Marital status	Single Married Widowed	40 62 6	30 53 11	1 1.140(0.626-2.074) 2.444(0.812-7.355)	1.065(0.578-1.963) 2.234(0.723- 6.903)	0.23			
residence Marital status	Single Married Widowed Divorced	40 62 6	30 53 11 5	1 1.140(0.626-2.074) 2.444(0.812-7.355) 1.111(0.310-3.987)	1.065(0.578-1.963) 2.234(0.723- 6.903) 1.004(0.261-3.870)	0.23 0.56 0.78			
residence Marital status	Single Married Widowed Divorced	40 62 6 6	30 53 11 5	1 1.140(0.626-2.074) 2.444(0.812-7.355) 1.111(0.310-3.987)	1.065(0.578-1.963) 2.234(0.723- 6.903) 1.004(0.261-3.870)	0.23 0.56 0.78			

Educational	Primary school	37	38	1.842(0.970-3.497)	1.187(0.574-2.455)	0.066
status	Secondary school	21	26	2.220(1.067-4.620	1.387(0.610- 3.151)	0.097
	College and above	4	6	2.690(0.701-10.315)	1.042(0.229-4.746)	
Use family	Yes	99	71	1	1	
planning	No	15	28	2.603(1.296-5.227)	2.063(0.966-4.403)	0.343
Family history	Yes	88	53	1	1	
	No	26	46	2.938(1.629-5.296)	2.543(1.004-6.440)	0.025*
Having partner	Yes	82	54	1	1	
STI	No	32	45	2.135(1.209-3.771)	2.032(1.134, 3.643)	0.032*

NB: AOR= Adjusted odds ratio, COR= Crude odds ratio, CI= Confidence interval, \* statistically significant, STI- Sexually transmitted Infections.

# Factors associated with practice of reproductive age women toward cervical cancer screening

In bi-variable Logistic regression analysis, educational status, use of family planning, history of abortion, having knowledge about cervical cancer, knowing someone diagnosed with cervical cancer, the source of information, and number sexual partner found to be associated with cervical cancer screening practice.

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> In multivariate analysis educational status, having knowledge about cervical cancer, knowing someone diagnosed with cervical cancer, the source of information, and not feeling at risk were found to be statistically significant.

	this study women have completed secondary education had 2.8 time more likely to							
prac	practice cervical cancer screening when compared with women who were un able to read							
and	and write (AOR=2.811(1.038-7.610). Women who know someone diagnosed with cervical							
cano	cancer were 8.3 times more likely to practice cervical cancer screening than women who did							
not	know (AOR= 8.3,	, 95% C	I (2.404-	-28.697)). Women those	who got the information w	vere		
3.1	times more likely	to pract	tice scree	ening than those who d	id not have information (AC	DR=		
3.1,	95% CI (1.382-7.	162). Th	ose wor	men who perceive their	self as a risky group were 3	3.23		
time	s more likely to	seek for	cervical	screening when compa	ared their counterpart (AO	R =		
3.2.3	3(1.524-5.049))(	See Table	e 3)					
Tabl								
Iabi	e 3 -iviuitivariate	iogistic i	regressio	on analysis for potential	factors associated with prac	tice		
ot c	ervical cancer scr	reening	among	reproductive age wome	en in assosa zone Beneshar	ngul		
Gun	Gumuz Ethiopia, august 2022.							
		Practic	e of	12				
Variable		Practice CC scre	e of eening	Crude OR (95% CD	Adjusted OR (95%CD	P-value		
Variable		Practice CC scre	e of eening	Crude OR (95% CI)	Adjusted OR (95%CI)	P-value		
Variable		Practice CC scree Yes	e of eening no	Crude OR (95% CI)	Adjusted OR (95%CI)	P-value		
Variable	Un able to	Practice CC scree Yes 37	e of eening no 44	Crude OR (95% CI)	Adjusted OR (95%CI)	P-value		
Variable	Un able to read and write	Practice CC scree Yes 37	e of eening no 44	Crude OR (95% CI)	Adjusted OR (95%CI)	P-value		
Variable	Un able to read and write	Practice CC scree Yes 37	e of eening no 44	Crude OR (95% CI) 1	Adjusted OR (95%CI)	P-value		
Variable Education	Un able to read and write Primary school	Practice CC scree Yes 37 27	e of eening no 44 48	Crude OR (95% CI) 1 1.495(0.786-2.844)	Adjusted OR (95%CI) 1 1.699(0.719-4.015)	P-value 0.35		
Variable Education al status	Un able to read and write Primary school Secondary	Practice CC scree Yes 37 27 12	e of ening 100 44 48 48 35	Crude OR (95% CI) 1 1.495(0.786-2.844) 2.453(1.115-5.394)	Adjusted OR (95%CI) 1 1.699(0.719-4.015) 2.811(1.038-7.610)	P-value 0.35		
Variable Education al status	Un able to read and write Primary school Secondary school	Practice CC scree Yes 37 27 12	e of ening 44 48 35	Crude OR (95% CI) 1 1.495(0.786-2.844) 2.453(1.115-5.394)	Adjusted OR (95%CI) 1 1.699(0.719-4.015) 2.811(1.038-7.610)	P-value 0.35 0.001*		

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	College and	1	9	7.568(0.916-62.532)	8.708(0.963-78.782)	0.45
	above					
Use family	Yes	72	98	1	1	
planning	No	5	38	5.584(2.094-14.889)	0.877(0.193-3.993)	0.098
Abortion	Yes	28	37	1	1	
	No	49	99	1.529(0.840-2.782)	0.824(0.348-1.951)	0.076
Knowing	Yes	69	72	1	1	
dx about Cervical cancer	No	8	64	7.667(3.425-17.161)	8.306(2.404-28.697)	0.034
Informatio	Yes	63	65	1	1	
n cervical CA	No	14	71	4.915(2.516-9.603)	3.146(1.382-7.162)	0.001*
Feeling at	Yes	88	60	1 2	1	
risk	No	12	52	3.353(1.655-6.795)	3.264(1.524-5.049)	0.034*
Knowledg	Yes	59	64	1	1	
e of	No	18	72	3.687(1.972-6.896)	2.173(1.077-4.384)***	0.001*
cancer						

Discussion

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### **Principal Findings**

Knowledge of cervical cancer screening among women attending maternal health services in this study was 53.52% and 36 % of respondents had practiced cervical cancer screening. The current study investigated that, family history of cervical cancer, place of residence and availability of health service at nearby was significantly associated with knowledge of cervical cancer screening. Whereas, educational status knowing someone diagnosed with cervical cancer and not feeling at risk were independently associated with the practice of cervical cancer screening.

The level of knowledge this study is comparable with the prevalence reported by the study done in Gondar University (59.3.3%)(23). The present study finding is higher when compared to study done in higher when it compared to study conducted in Adama town, Oromia, Garage Zone, Southern Ethiopia, South Africa, Durban city and Tanzania city which was over all 14.8%, 26.2%, 33%, respectively(11,14,20,21). The discrepancy might be due to the study period and the nature of the study participants. In the current study, more than two-third (72.8%) of the study participants were heard about cervical cancer screening. This finding is found higher than with the study done in Nigeria, heard about cervical cancer screening which was 40% (24). The variety might be due to the gap in the study period and the recent WHO strategy which focuses on implementation of cervical cancer screening and information dissemination (25).

In the recent study, those women living in the urban are 3.68 more likely to have good knowledge when compared with those rural residents. This might be due to the fact that, those participants living in urban area are prone to the information and health care facility when compared with rural residents. This finding is supported by the studies done in china (26). In this study, those respondents who had a family history of cervical cancer were 2.5 times more likely to have good knowledge about cervical cancer screening than their

counterparts. This might be due to the fact that information can easily disseminated in between the family. The finding of this study revealed that 36% of respondents had practiced cervical

cancer screening. This finding is higher than the study done in, Butajira Ababa Ethiopia, Tanzania, and Kenva (15.1%, 21.9%, 14% town, Addis and 22%) of respondents had practiced cervical cancer screening respectively(16,21,27–29). This difference might due to the difference in the background of the respondents, and the difference in the study period as the recent national policy highly emphasized to the cervical screening.

Respondents who had information about cervical cancer were 3.1 times more likely to practice cervical cancer screening than their counterparts. This might be due to that those respondents who had awareness of cervical screening might enforce them to visit health institutions. In current study the women's who perceive susceptibility to cervical cancer were 2.69 more likely to practice cervical cancer screening when compared to their counterpart. This could be due to the fact that, positive health seeking behaviour toward cervical cancer increase the level of screening. This finding is similar with the study conducted in Addis Ababa, Ethiopia, Uganda (29–31)

### Clinical implication

Our main aim in this study was to assess the knowledge, practice and the associated factors of cervical cancer screening, among reproductive age women living in Assosa Zone. We quantitate the magnitude and the possible associated factors of Knowledge and practice of cervical cancer screening. Accordingly, the first major practical contribution of the present research is that it provides much needed empirical data on the actual jobs of cervical cancer screening strategy based on the identified factors in this study. This information is important given that, there is limitation of the study in the study area. The finding of this study will allow the stake holders, trainers, consultants and others to design initiatives based on what have been identified as the risk factor of poor knowledge and poor practice. In this sense, we believe that our research is especially timely to meet the WHO-strategy to eliminate the cervical cancer

### Research implication

The finding of this study help as base line data for the future research who wants to study on

the subject area

# Conclusion

L line ctive hr More than half (53.52%) of reproductive health service clients in health care facility of Assossa Zone have Good knowledge about cervical cancer screening. Whereas the practice of cervical cancer screening was generally low. Place of residency, Family history of cervical cancer, place of residence, were significantly associated with knowledge of cervical cancer screening and educational status, having knowledge about cervical cancer, knowing someone diagnosed with cervical cancer and Individual feeling of at risk for cervical cancer were found to be statistically significant. Therefore, reproductive health care workers and regional policy stakeholders are needed to demonstrate more commitment in creating awareness about cervical cancer in different geographical areas of the provinces in Benishangul-Gumuz region. Encouraging all reproductive age women visiting health facility toward cervical cancer screening specially reproductive age women those resides in rural area is important to increase the cervical cancer screening practice.

### Ethical Approval and Consent to participate

The study was approved by the Assosa University, Health Sciences College Health Research Ethics Review Committee (CHRERC) (Ref.No.ASU/892/2014). The permission and support letter was obtained from the Assosa Zone and each health facilities. Voluntary informed, written, and signed consent was obtained from all subjects after describing the nature and purpose of the study by the language they can understand. Each data collectors and supervisor oriented to follow the national COVID-19 protocol during data collection period.

# Consent for publication

Not applicable

# Competing of Interest

The authors declare that there is no any competing interest.

# Acknowledgements

The authors thanks all study participants and all the data collectors and supervisors for that this study would not have been possible without them.

### Author's Contributions

Firaol Regea Gelassa designed the study, developed the proposal, participated in the data collection, performed analysis, and drafted the manuscript. Shalama Lekasa Nagari, Desalegn Emana Jabena<sup>,</sup> Dabeli Belgafo, Daniel Tesso, Debela Teshome approved the proposal with revisions, participated in data analysis, and revised subsequent drafts of the manuscript. All authors read and approved the final manuscript.

# Financial disclosure statement (Funding agency)

No funding agent

# Availability of data and materials

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All re	levant data are within the paper and its Supporting Information files
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Julion



Figure 1:- Over all knowledge of cervical screening among women reproductive age group of Assosa zone Beneshagul-Gumuz Ethiopia 2022 BMJ Open: first published as 10.1136/bmjopen-2022-068860 on 15 May 2023. Downloaded from http://bmjopen.bmj.com/ on June 13, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES)

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Figure 2- Overall practice of cervical screening among women reproductive age group of Assosa zone Beneshagul-Gumuz Ethiopia 2022.



Figure 3:- Reason for not screened for cervical screening among women reproductive age group of Assosa zone Beneshagul – Gumuz, Ethiopia 2022.

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	ltem		Page
	No	Recommendation	No
Title and abstract	I	Knowledge and Practice of Cervical Cancer	1
		Screening and its Associated Factors among	
		Women Attending Maternal Health Services at	
		Public Health Institutions of Assosa Zone,	
		Benishagul-Gumuz, North west Ethiopia 2022: a	
		Cross-sectional Study	
		Background: Cervical cancer is the fourth most	3
		common cancer among women. In 2020, about	
		604000 women were diagnosed with cervical	
		cancer worldwide and about 342 000 women died	
		from the disease. Early screening decreases the	
		mortality from cervical cancer. However, little	
		information available about the knowledge and	
		mornation available about the knowledge and	
		practice of the women toward cervical cancer in in	
		the study area. Objectives: this study aimed to	
		assess the knowledge, and Practice of cervical	
		cancer screening and its associated factor among	
		women reproductive age groups of Assosa zone	
		Beneshagul - Gumuz Ethiopia 2022. Methodology:	
		A facility-based cross-sectional study was	
		conducted. A systematic sampling technique was	
		used to select 213 reproductive-age women from	
		colocted health institutions from April 20/2022 to	
		selected health institutions, non April 20/2022 to	
		July 2022. Validated and Pre-tested questionnaire	
		was used for data collection. Multi logistic	
		regression analyses were done to identify factors	
		independently associated with cervical cancer	
		screening. Adjusted Odds Ratio with 95% CI was	
		estimated to measure the strength of association.	

Introduction

p-value < 0.05. The results were presented in tables and figures. Result: - Knowledge of cervical cancer screening in this study was 53.5% and 36 % of respondents had practiced cervical cancer screening. Family history of cervical cancer [AOR=2.5, 95% CI (1.004-6.44)], place of residence [AOR= 3.68, 95% CI (2.23, 6.54), and availability of health service [AOR =1.963 95% CI (1.057-3.644)] were significantly associated with knowledge of cervical cancer screening and, educational status [AOR=2.811, 95% CI (1.038-7.610)], knowing someone diagnosed with cervical cancer [AOR= 8.3, 95% CI (2.404-28.697)], and not feeling at risk [AOR = 2.696 95% CI (1.057-6.52)] were associated with the practice of cervical cancer screening. Conclusion and recommendation: knowledge and practice of cervical cancer screening in this study were low. Awareness creation is crucial to ending cervical cancer-related mortality.

Background/rationale	2	Cervical cancer is a type of cancer that occurs in 4
		the cells of the cervix, the lower part of the uterus
		that connects to the vagina.The major risk factor
		for cervical cancer is the infection with Human
		Papilloma Virus (HPV). Cervical cancer is the
		fourth most common cancer among women. In
		2020, about 604000 women were diagnosed with
		cervical cancer worldwide and about 342 000
		women died from the disease. About 85% of the
		case and 90% of the death is occurring in low-
		income countries. Cervical cancer accounts for
		22% of all female cancers and 12% of all newly
		diagnosed cancers every year in African women. In

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		spite of the importance of assessing the level of	
		knowledge about cervical cancer and the level of	
		practice among reproductive-age women, little	
		information was available about the knowledge and	
		practice of the women toward cervical cancer in	
		Ethiopia in general and in the study area in	
		particular	
Objectives	3	<ul> <li>To determine knowledge of cervical cancer and 3</li> </ul>	
	-	screening among women reproductive age	
		group attending public health facilities of Associ	
		zono Bonoshagul gumuz Ethiopia	
		To determine practice of convicel concern	
		- To determine practice of cervical cancer	
		screening among women reproductive age	
		group attending public health facilities of	
		Asssoa zone Beneshagul gumuz Ethiopia	
		<ul> <li>To assess factors associated to cervical cancer</li> </ul>	
		screening among women reproductive age	
		group attending public health facilities of Asssoa	
		zone Beneshagul gumuz Ethiopia.	
Methods			
Study design	4	A facility based cross sectional study was employed 6	
Setting	5	The study was conducted in Assosa Zone, 6	
		Benishangul-Gumuz, Ethiopia from April 20, 2022	
		to July 20/ 2022. Assosa Zone is located 667km	
		from Addis Ababa, the capital city of Ethiopia	
Participants	6	Source population was All 15-49 years old women 6	
		attending health facilities in the Assosa Zone.Study	
		population was Systematically selected	
		reproductive age group women who were attend	
		selected health facilities of Assosa zone during the	
		study period. Inclusion Criteria: Reproductive age	
		group who attend Anti-Natal Care, Family Planning,	

_		
Po	st natal care and reproductive health department	
ar	e included to the study.	
$\sim$	hile, women with known mental illness, not	
wi	ling to response excluded during data collection.	
Variables 7 Do	ependent variables	On the mair
		dogumont
	<ul> <li>Knowledge of cervical cancer screening</li> </ul>	document
	<ul> <li>Practice on cervical cancer screening</li> </ul>	
	services.	
🔺 In	dependent variables	
	✓ Age	
	✓ Sex	
	✓ Educational status	
	✓ Occupation	
	✓ Religion	
	✓ Residence	
	Source of information about cervical cancer	
	✓ Smoking status	
	<ul> <li>History of abortion</li> </ul>	
	<ul> <li>Knowing someone with cervical cancer</li> </ul>	
	<ul> <li>Family history of cervical Cancer</li> </ul>	
	✓ History of previous cervical cancer	
	screening	
	✓ Knowledge of cervical cancer screening	
	✓ Number of sexual partner	
	✓ Availability of health service	
Data sources/ 8* Sv	stematically selected reproductive age group	8
measurement we	men who were attend selected health facilities	
of	Assosa zone during the study period. In this	
cti	dy the data were obtained by a interviewer-	
ىر م	ministered structured questionneine that was	
ad	ministered, subclured questionnaire that was	

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24			adapted from a questionnaire used in different studies done in different areas. The content validity of the questionnaire was reviewed by qualified obstetricians and public health specialists. The first part had socio demographic characteristics, the seconds, third part assessed the knowledge, and practice on cervical cancer screening and the last about associated factor of cervical cancer screening. Data was collected by five BSc nurses and 2 public health officer as a supervisor. In these instances, the data collectors read out the questions, explained the meaning, if required, and scribed the answers. The questionnaire was available in both English and Amharic Language	
26 -	5Bias	9	Information was given	
28 -	Study size	10	Transportation	
29 _ 30 31 32 33 34	Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	
35       -         36       37         38       39         40       41         42       43         44       45         46       47         48       49         50       51         52       53         54       55         56       57         58       59         60	Statistical methods	12	The completed questionnaires were coded and entered into the computer program Epi-Data version 3.1. SPSS version 27.0 was used for the analysis. Data were cleaned and edited using simple frequencies and cross tabulations before analysis. The cleaned final data were then analyzed using SPSS version 27.0. Descriptive statistics such as, frequencies, tabulation, percent and graphs were used to analyses the descriptive component. Bi- variable logistic regression analyses were done to see the association between each independent variable and the outcome variable. Variables with P- value >0.2 were the candidate for Multi-variable logistic regression Analysis The logistic regression model fitness was checked using Hosmer-	8&9

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	declared as a model fitted. Multicollinearity was checked (VIF <10) indicating the non- existence of multicollinearity among the variables in this study. Both crude and adjusted odds ratio along with 95% CI was estimated to measure the strength of association. The level of statistical significance was declared at a p-value of less than 0.05.
Results	
Participants	13* (A total of 213 women participated in the study 6 yielding 100% response rate
Descriptive data	<ul> <li>High proportion of 62 (29.1%) of the respondents 11</li> <li>were within the age group of 20-24 years, with a mean(±SD) age of 32.2 (±13.8) years and most of 115(54%) the study participants were married. Regarding their educational status, 81 (38%) were illiterate and 75 (35.2%) and 47 (22.1%) of them were learned primary school and secondary school respectively</li> <li>High proportion of 62 (29.1%) of the respondents 11</li> <li>were within the age group of 20-24 years, with a mean(±SD) age of 32.2 (±13.8) years and most of 115(54%) the study participants were married. Regarding their educational status, 81 (38%) were illiterate and 75 (35.2%) and 47 (22.1%) of them were learned primary school and secondary school respectively</li> </ul>
Outcome data	<ul> <li>15* The current study revealed that, more than half (53.52%) of the participants have good knowledge toward the Cervical cancer screening. Seven out of ten women's (155)) heard about cervical cancer, and the most common sources of information were social media 75(35.2%) Eighty one women's (38%) respond that the "main cause of Cervical</li> </ul>

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		cancer is HPV"	
Other analyses	17	Report other analyses done—eg analyses of	5,16
		subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	This study identified that, knowledge of cervical	10-16
		cancer screening in this study was 53.52% and 36 $\%$	
		of respondents had practiced cervical cancer	
		screening. The current study investigated that,	
		family history of cervical cancer, place of residence	
		and availability of health service were significantly	
		associated with knowledge of cervical cancer	
		screening and, educational status knowing someone	
		diagnosed with cervical cancer and not feeling at	
		risk were independently associated with the	
		practice of cervical cancer screening	
		The level of Knowledge this study is comparable	
		with the prevalence reported by the study done in	
		Gondar University (59.3.3%)(22). The present	
		study finding is higher when compared to study	
		done in higher when it compared to Study	
		conducted in Adama town, Oromia and Garage	
		Zone, Southern Ethiopia ,which was over all 14.8%	
		and 26.2% respectively(19)(20). The discrepancy	
		might be due to the study period and the nature of	
		the study participants. In the current study, more	
		than two-third (72.8%) of the study participants	
		were heard about cervical cancer screening. This	
		finding is found higher than with the study done in	
		Nigeria, heard about cervical cancer screening	
		which was 40% (23). The variety might be due to	
		the gap in the study period and the recent WHO	
		strategy which focuses on implementation of	
		cervical cancer screening and information	
		dissemination.	

Limitations	19	The study was unique, as it comprehensively examined the health factors associated with Knowledge and practice of cervical cancer screening In Benishangul- Gumuz The results are generalizable to the reproductive age women living in the Assoca Zone	2
		examined the health factors associated with Knowledge and practice of cervical cancer screening In Benishangul- Gumuz The results are generalizable to the reproductive	
		Knowledge and practice of cervical cancer screening In Benishangul- Gumuz The results are generalizable to the reproductive	
		screening In Benishangul- Gumuz The results are generalizable to the reproductive	
		The results are generalizable to the reproductive	
		age women living in the Assess Zone	
		age women nying in the Assosa Zone	
		Nature of the study design (Cross-sectional study	
		design), inferring the causality was not possible.	
		Self-reported data (e.g., Previous HPV screening	
		and Vaccination,) might have recall bias	
Generalisability	21	Generalized to all reproductive age women in	
		Benishangul-Gumuz	
Other informatior	ı	Ó.	
Funding	22	No funding agent	20

#### Knowledge and Practice of Cervical Cancer Screening and its Associated Factors among Women Attending Maternal Health Services at Public Health Institutions of Assosa Zone, Benishagul-Gumuz, North west Ethiopia 2022: a Crosssectional Study

Journal:	BMJ Open
Manuscript ID	bmjopen-2022-068860.R2
Article Type:	Original research
Date Submitted by the Author:	24-Mar-2023
Complete List of Authors:	Gelassa, Firaol; Assosa University, Nursing Nagari, Shalama ; Assosa University, Public Health Jebena, Desalegn; Assosa University, Nursing; Belgafo, Dabeli; Assosa University, Nursing Teso, Daniel; Assosa University, Nursing Teshome, Debela; Assosa University, Nursing
<b>Primary Subject Heading</b> :	Oncology
Secondary Subject Heading:	Public health, Obstetrics and gynaecology, Oncology
Keywords:	Adult oncology < ONCOLOGY, Gynaecological oncology < ONCOLOGY, Urological tumours < ONCOLOGY

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Knowledge and Practice of Cervical Cancer Screening and its Associated Factors among Women Attending Maternal Health Services at Public Health Institutions of Assosa Zone, Benishagul-Gumuz, North west Ethiopia 2022: a Crosssectional Study

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### Abstract

Background: Cervical cancer ranks as the second most frequent cancer among all women in Ethiopia and the second most frequent cancer among women between 15 and 44 years of age, resulting over 4884 mortality annually. Although there is a focus on health promotion through teaching and screening in Ethiopia's intended transition toward universal healthcare, there is little information available on baseline levels of knowledge and screening uptake related cervical cancer. Objectives: This study explored the levels of knowledge and screening rates of cervical cancer along its associated factor among women reproductive age groups of Assosa zone Beneshagul - Gumuz Ethiopia 2022. Methodology: A facility-based crosssectional study was conducted. A systematic sampling technique was used to select 213 reproductive-age women from selected health institutions, from April 20/2022 to July 2022. Validated and Pre-tested questionnaire was used for data collection. Multi logistic regression analyses were done to identify factors independently associated with cervical cancer screening. Adjusted Odds Ratio with 95% CI was estimated to measure the strength of association. The level of statistical significance was declared at a p-value < 0.05. The results were presented in tables and figures. Result: - Knowledge of cervical cancer screening in this study was 53.5% and 36 % of respondents had practiced cervical cancer screening. Family history of cervical cancer [AOR=2.5, 95% CI (1.004-6.44)], place of residence [AOR= 3.68, 95% CI (2.23, 6.54), and availability of health service [AOR =1.963 95% CI (1.057-3.644)] were significantly associated with knowledge of cervical cancer screening and, educational status [AOR=2.811, 95% CI (1.038-7.610)], knowing someone diagnosed with cervical cancer [AOR= 8.3, 95% CI (2.404-28.697)], and not feeling at risk [AOR = 2.696 95% CI (1.057-6.52)] were associated with the practice of cervical cancer screening. Conclusion and recommendation: - knowledge and practice of cervical cancer screening in this study were low. In the current study, low cervical creation is crucial to ending cervical cancer-related mortality.

Key word:-Cervical screening reproductive age, Assosa

## Strengths and Limitations of this Study

- The study was unique, as it comprehensively examined the health factors associated with Knowledge and practice of cervical cancer screening In Benishangul- Gumuz region
- The results are generalizable to the reproductive age women living in the Assosa Zone
- Nature of the study design (Cross-sectional study design); inferring the causality was not possible.
- Self-reported data (e.g. Previous HPV screening and Vaccination,) might have recall bias

BMJ Open: first published as 10.1136/bmjopen-2022-068860 on 15 May 2023. Downloaded from http://bmjopen.bmj.com/ on June 13, 2025 at Agence Bibliographique de Enseignement Superieur (ABES) .

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## Introduction

Cervical cancer is a type of cancer that occurs in the cells of the cervix, the lower part of the uterus that connects to the vagina [1]. The major risk factor for cervical cancer is the infection with Human Papilloma Virus (HPV). Cervical cancer is the fourth most common cancer among women [2]. In 2020, about 604000 women were diagnosed with cervical cancer worldwide and about 342 000 women died from the disease [3]. About 85% of the case and 90% of the death is occurring in low-income countries [3, 4]. Cervical cancer accounts for 22% of all female cancers and 12% of all newly diagnosed cancers every year in African women [5, 6].

According to the report from WHO, globally cervical cancer incidence was 7.9% [7]. New cases of cervical cancer occur more often in developing countries than in developed countries [8.9]. In sub-Saharan Africa, the incidence and mortality rate of cervical cancer was 25.2% and 23.2% respectively [8, 10]. In South Africa, cervical cancer ranks as the Second most frequent cancer among women and first most frequent cancer which accounts for15.85% of all female cancers among women between 15 and 44 years of age [11] About 3.2% of women in the general population are estimated to harbor cervical infection at a given time, and 64.2% of invasive cervical cancers are attributed to HPVs [12]. In Tanzania, Current estimates indicate that every year, 10241 women are diagnosed with cervical cancer

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and 6525 die from the disease. Cervical cancer ranks as the first most frequent cancer among women in Tanzania and the 1st most frequent cancer among women between 15 and 44 years of age [13]. According to the Tanzanian Cancer Registry, between 1998 and her 2000, cervical cancer accounted for 29.8% of all cancers in women in northern Tanzania [14]. Ethiopia has a population of 33.7 million women ages 15 years and older who are at risk of developing cervical cancer. Current estimates indicate that every year 7445 women are diagnosed with cervical cancer and 5338 die from the disease. Cervical cancer ranks as the 2nd most frequent cancer among women in Ethiopia and the 2nd most frequent cancer among women between 15 and 44 years of age [15]. It accounted for a 16.5% mortality rate, and five year prevalence was 18.2% [16]. The annual incidence of cervical cancer in Ethiopia is, about 6294 new cases and the annual mortality is more than 4884. This shows that, the disease become a serious health problem in the country [17]. Cervical cancer leads all the physical, Psycho-social and economic impacts on the individual patient, family and community at large (i.e. increased treatment-related expenses, loss of employment and consequent income, and changes in household responsibilities [12, 16]. Moreover, cervical cancer disproportionately affects women at the low socioeconomic level, and thus the disease can have dramatic consequences on the living conditions of patients, including falling into poverty or being pushed into deeper poverty [12, 13, and 16].

Even though it is a dangerous medical condition, the evidence from different literature shows that early screening can reduce 50% of cervical cancer-related death [17]. Cervical cancer screening is a way to detect abnormal cervical cells, including precancerous cervical lesions, as well as early cervical cancers [8]. Routine cervical screening has been shown to greatly reduce both the number of new cervical cancers and deaths and morbidity due to the disease [8.9]. In 2020, the World Health Assembly adopted a new Global strategy to eliminate cervical cancer as a public health problem that must be met by 2030 for countries to be on the path toward cervical cancer elimination by setting a 90-70-90 strategy (i.e. 90%).

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vaccinated for human papillomavirus (HPV), 70% screened for cervical cancer and 90% of identified disease received treatment). Awareness about cervical cancer and the method of screening has significantly important to increasing the level of cervical cancer screening. Evidence shows Knowledge of women about cervical cancer screening is a crucial component. Recent kinds of literature show that Women with a better knowledge of cervical cancer were more likely to attend cervical cancer screenings [2]. Lack of knowledge about cervical cancer remains an important factor that affects the participation of women in these screening practices [9.18]. In spite of the importance of assessing the level of knowledge about cervical cancer and the level of practice among reproductive-age women, little information was available about the knowledge and practice of the women toward cervical cancer in Ethiopia in general and in the study area in particular.

## Methods

## Study Setting

Data collection took place in Assosa Zone, Benishangul-Gumuz, Ethiopia, from April 20, 2022, to July 20, 2022. The distance from Zone and Ethiopia's capital city, Addis Ababa, is 667 kilometres. There are 24 health facilities, 191 health posts, one primary hospital, one general hospital, and one in the Zone.

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A total of 310,822 people live in the area, 151,890 of them are women living in its various districts. The government owns and funds all of the public health facilities in the area. From the list of public health institutions in the area, only two hospitals (Mange and Assosa Hospital) offer Pap smear screening services. Although, all hospitals and health facilities offer screening services. These public health clinics provided reproductive health services that were both curative and preventive, including cervical cancer screening for women who were of reproductive age. *[19]* 

## Patient and public Involvement

The research questions and study design were modified by the study's researchers, who subsequently had them approved by the Assosa University's institutional review board. None of the participants in this study were involved in its conception, execution, or dissemination strategies.

## Study design and population

We conducted a facility-based cross-sectional study in the Assosa Zone. The source population was all 15-49 years old women attending health facilities in the Assosa Zone and our source population was systematically selected reproductive age group women who were attend selected health facilities of Assosa zone during the study period.

### Sample size determination

Sample size was calculated using single population proportion formula with the assumption of knowledge about cervical cancer screening 14.8% (1) . Assuming 95% confidence level, 5% margin of error.  $n=z^2p (1-p)/d^2 = (1.96)^2(0.148 \times 0.852)/(0.05)^2 = 194$ 

Where;

Z= 95% confidence level (1.96)

p= 14.8% of population proportion with knowledge of cervical cancer screening at Adama Ethiopia [20]

d = the margin of error =5%

adding none response rate of 10%. The sample size was 194, after adding 10% none respondent rate, the final sample size become 213

### Sampling procedures

In Assosa Zone, there are eight districts. Three of them (namely Assosa district, Bambasi district, and Homosha district) were chosen using computer-generated lottery method in consideration of homogeneity. Following that, based on the number of eligible individual flows at each health facility, which was determined from the quarterly report of the specified institution, the entire sample size was proportionally distributed to each facility as follows:

ni = <u>n x Ni</u>

Ν

Where; ni = the sample size of the i<sup>th</sup> Health facility

Ni = population size of the i<sup>th</sup> health facility

n = n1+n2+...,n4 is the total sample size (213)

 $N = N1 + N2 + ... N^{th}$  - is total population size of those health institution (1200)

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Finally, 213 study participants were selected using systematic sampling technique based on daily flow from the relevant healthcare facilities.

### A data collection procedure

In this study, the data were obtained by an interviewer-administered, structured questionnaire that was adapted from a questionnaire used in different studies done in different areas [14, 21]. The content validity of the questionnaire was reviewed by qualified obstetricians and public health specialists. Socio-demographic parameters were assessed in the first section, knowledge and practice of cervical cancer screening were assessed in the second and third sections, and associated factors were covered in the last section. Five BSc nurses and two public health officers served as the data collectors and supervisors respectively. In these cases, the data collectors read out the questions, clarified their meaning as necessary, and recorded the responses. The questionnaire was available in both English and Amharic Language

## Data Quality Control

The supervisors and data collectors received two days of training before beginning the actual data collection. Data collectors conducted a pre-test on 5% of the sample size in a nearby hospital (Mange hospital), and all necessary adjustments were made as a result. It was determined whether the questionnaires were reliable (Cranach's alpha for the knowledge and practice questionnaires, respectively, was.95 and 0.87). Prior to analysis, the completeness of all acquired data was verified.

### Operational definition

• Knowledge about cervical cancer screening: We used a twenty nine items composite score of the knowledge to measure the knowledge level of respondents regarding

vulnerable groups, risk factors, signs and symptoms and prevention methods of cervical cancer. The cumulative mean score of knowledge of participants about cervical cancer was estimated using mean score. Based on this, those respondents who had scored greater than or equal to the mean value were considered as good Knowledge where as those respondents who had scored Less than the mean value were considered as poor Knowledge [22]

- Good practice: Those respondents who screen for cervical cancer at least once [20,22]
- Poor practice: Those respondents who cannot screen for cervical cancer [20,22]

### Data Processing and Analysis

The completed questionnaires were coded and entered into the computer program Epi-Data version 3.1. SPSS version 27.0 was used for the analysis. Data were cleaned and edited using simple frequencies and cross tabulations before analysis. The cleaned final data were then analyzed using SPSS version 27.0. Descriptive statistics such as, frequencies, tabulation, percent and graphs were used to analyses the descriptive component. Bi-variable logistic regression analyses were done to see the association between each independent variable and the outcome variable. Variables with P-value >0.2 were the candidate for Multi-variable logistic regression Analysis The logistic regression model fitness was checked using Hosmer-Lemeshow and statistics, not significant was declared as a model fitted. Multicollinearity was checked (VIF <10) indicating the non- existence of multicollinearity among the variables in this study. Both crude and adjusted odds ratio along with 95% CI was estimated to measure the strength of association. The level of statistical significance was declared at a p-value of less than 0.05.

## Result

Socio demographic characteristics of the study participants

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A total of 213 women participated in the study yielding 100% response rate. High proportion of 62 (29.1%) of the respondents were within the age group of 20-24 years, with a mean(±SD) age of 32.2 (±13.8) years and most of 115(54%) the study participants were married. Regarding their educational status, 81 (38%) were illiterate and 75 (35.2%) and 47 (22.1%) of them were learned primary school and secondary school respectively (Table 1).

 Table 1:-Socio-demographic characteristics of the reproductive age women living in Assosa zone,

 Benishanigu-Gumuz, Ethiopia 2022. (n=213)

No	Variable	Category	Frequency (N)	Percent (%)
1		15-19	24	11.3
	Age category	20-24	62	29.1
		25-29	48	22.5
		30-34	32	15.0
		35-39	18	8.5
		>40 and above	29	13.6
2	Place of residence	Urban	79	37.08
		Rural	134	62.92
2 Educational statu		Illiterate	81	38.0
		1-8th grade	75	35.2
		9-12th grade	47	22.1
		college and above	10	4.7
3 Marital status		Single	70	32.9
		Married	115	54.0
		Divorced	17	8.0
		Widowed	11	5.2
5	Religion	Orthodox	142	66.7
		Muslim	39	18.3
		Protestant	21	9.9
		Catholic	11	5.2

6	Occupation Status	Farmer	49	49
		Merchant	19	19
		Government employee	111	111
		Student	17	17
		Unemployed	7	7
		Daily laborer	10	10

Knowledge of the participants, about risk factors, main symptoms, treatment options and prevention of the cervical cancer.

The current study revealed that, more than half (53.52%) of the participants have good knowledge toward the Cervical cancer screening. Seven out of ten women's (155) heard about cervical cancer, and the most common sources of information were social media 75(35.2%) Eighty one women's (38%) respond that the "main cause of cervical cancer is HPV" (see figure1)

## Practice of cervical cancer screening among reproductive age women

Among all the respondents of the study only 77(36%) had cervical cancer screening (See figure 2). From those who screened for cervical cancer, fourty seven (22.1%) screened in hospitals and the Six (33.3%) screened at health center. Fifty one (23.9%) of them were screened by self-initiation and 10 (4.7%) were initiated health care providers. Respondents who have no screening practice where asked for their reasons for left unscreened and, 21 of them (16%) mentioned painful, 36(26%) feel shy, 18(15.3%) my husband is not agreeing for screening (See figure 3)

# Factors associated with knowledge of reproductive age women toward cervical cancer screening

In bi-variable logistic regression analysis, Place of residence, marital status, education status, History of previous family planning, family history of cervical cancer, having partner diagnosed with sexual transmitted disease, information of cervical cancer, multiple sexual

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partner and availability of health service, were significantly associated with knowledge of cervical cancer screening.

In multivariate analysis family history of cervical cancer, being having partner diagnosed with sexual transmitted disease, having information about cervical cancer and availability of health service were found to be associated with the knowledge reproductive age women toward cervical cancer screening at P-value less than 0.05.

This study shows, those women living in the urban area were 3.68 times more likely to have Knowledge about the cervical cancer when compared with rural residents (AOR= 3.68 (2.23, 6.54)). In the current study, Women who had family history of cervical cancer were 2.5 times more likely to have knowledge of cervical cancer screening when compared with their counterpart (AOR=2.5, 95% CI (1.04-6.44)). (See table 2)

2							
3 4	Marital status	Single	40	30	1		
5 6	0						
7		Married	62	53	1.140(0.626-2.074)	1.065(0.578-1.963)	0.23
0 9 10		Widowed	6	11	2.444(0.812-7.355)	2.234(0.723- 6.903)	0.56
10 11		Divorced	6	5	1.111(0.310-3.987)	1.004(0.261-3.870)	0.78
12 13		Illiterate	52	29	1	1	Cled
14 15		Primary school	37	38	1.842(0.970-3.497)	1.187(0.574-2.455)	0.066
16 17	Educational	Secondary school	21	26	2.220(1.067-4.620	1.387(0.610- 3.151)	0.097
18 19	status	College and above	4	6	2.690(0.701-10.315)	1.042(0.229-4.746)	,
20 21	Use family	Yes	99	71	1	1	
22 22	pianning	No	15	28	2.603(1.296-5.227)	2.063(0.966-4.403)	0.343 <b>G</b>
23 24 25	Family history	Yes	88	53	1	1	uses
25 26		No	26	46	2.938(1.629-5.296)	2.543(1.004-6.440)	0.025*
27 28	Having partner	Yes	82	54	1	1	
29 30	STI	No	32	45	2.135(1.209-3.771)	2.032(1.134, 3.643)	0.032*
31							

NB: AOR= Adjusted odds ratio, COR= Crude odds ratio, CI= Confidence interval, \* statistically significant, STI-Sexually transmitted Infections.

Factors associated with practice of reproductive age women toward cervical cancer screening

In bi-variable Logistic regression analysis, educational status, use of family planning, history of abortion, having knowledge about cervical cancer, knowing someone diagnosed with cervical cancer, the source of information, and number sexual partner found to be associated with cervical cancer screening practice.

In multivariate analysis educational status, having knowledge about cervical cancer, knowing someone diagnosed with cervical cancer, the source of information, and not feeling at risk were found to be statistically significant. In this study women have completed secondary education had 2.8 time more likely to

practice cervical cancer screening when compared with women who were un able to read and write (AOR=2.811(1.038-7.610). Women who know someone diagnosed with cervical cancer were 8.3 times more likely to practice cervical cancer screening than women who did not know (AOR= 8.3, 95% CI (2.404-28.697)). Women those who got the information were 3.1 times more likely to practice screening than those who did not have information (AOR= 3.1, 95% CI (1.382-7.162). Those women who perceive their self as a risky group were 3.23 times more likely to seek for cervical screening when compared their counterpart (AOR = 3.2.3(1.524-5.049)) (See Table 3)

Table 3 -Multivariate logistic regression analysis for potential factors associated with practice of cervical cancerscreening among reproductive age women in Assosa zone Beneshangul Gumuz Ethiopia, august 2022.

Practice	of CC		P-value
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Variable		Yes	no	Crude OR (95% CI)	Adjusted OR (95%CI)	
	Un able to read and write	37	44	1	1	
Educational	Primary school	27	48	1.495(0.786-2.844)	1.699(0.719-4.015)	0.35
status	Secondary school	12	35	2.453(1.115-5.394)	2.811(1.038-7.610)	0.001*
	College and above	1	9	7.568(0.916-62.532)	8.708(0.963-78.782)	0.45
Use family	Yes	72	98	1	1	
planning	No	5	38	5.584(2.094-14.889)	0.877(0.193-3.993)	0.098
Abortion	Yes	28	37	1	1	
	No	49	99	1.529(0.840-2.782)	0.824(0.348-1.951)	0.076
Knowing dx	Yes	69	72	1	1	
about Cervical cancer	No	8	64	7.667(3.425-17.161)	8.306(2.404-28.697)	0.034
Information	Yes	63	65	1	1	
cervical CA	No	14	71	4.915(2.516-9.603)	3.146(1.382-7.162)	0.001*
Feeling at	Yes	88	60	1	1	
risk	No	12	52	3.353(1.655-6.795)	3.264(1.524-5.049)	0.034*
Knowledge	Yes	59	64	1	1	
cancer	No	18	72	3.687(1.972-6.896)	2.173(1.077-4.384)***	0.001*
NB: A	OR= Adjusted odds	ratio, CO	R= Crude	odds ratio, CI= Confidence	interval, * statistically significan	t

## Discussion

In this study, the knowledge and practice of cervical cancer screening among women of reproductive age in Assosa Zone, Ethiopia was investigated. The Knowledge of cervical cancer screening among women attending maternal health services in this study was 53.52% and 36 % of respondents had practiced cervical cancer screening. Our study contributes to the understanding of factors associated with cervical cancer screening in Assosa Zone, Ethiopia, where the cervical cancer screening prevalence remains low [23]

According to this study investigated that, family history of cervical cancer, place of residence and availability of health service at nearby was significantly associated with knowledge of cervical cancer screening. Whereas, educational status knowing someone diagnosed with cervical cancer and not feeling at risk were independently associated with the practice of cervical cancer screening.

The level of knowledge this study is comparable with the prevalence reported by the study done in Gondar University (59.3.3%) [24]. The present study finding is higher when compared to study done in Adama town, Oromia, Garage Zone, Southern Ethiopia, South Africa, Durban city and Tanzania city which was over all 14.8%, 26.2%, 33%, respectively [11,14,20,21]. The discrepancy might be due to the study period and the nature of the study participants. In the current study, more than two-third (72.8%) of the study participants were heard about cervical cancer screening. This finding is found higher than with the study done in Nigeria, heard about cervical cancer screening which was 40% [25]. The variety might be due to the gap in the study period and the recent WHO strategy which focuses on implementation of cervical cancer screening and information dissemination [26]

In the recent study, those women living in the urban are 3.68 more likely to have good knowledge when compared with those rural residents. This might be due to the fact that, those participants living in urban area are prone to the information and health care facility when compared with rural residents. This finding is supported by the studies done in china [27] in this study; those respondents who had a family history of cervical cancer were 2.5

times more likely to have good knowledge about cervical cancer screening than their counterparts. This might be due to the fact that information can easily disseminated in between the family. The finding of this study revealed that 36% of respondents had practiced cervical

finding higher than the screenina. This is study done in, Butajira cancer Ababa Ethiopia, Tanzania, and Kenya 21.9%, Addis (15.1%, 14% and town, 22%) of respondents had practiced cervical cancer screening respectively [16, 21, 28–30] This difference might due to the difference in the background of the respondents, and the difference in the study period as the recent national policy highly emphasized to the cervical screening.

Respondents who had information about cervical cancer were 3.1 times more likely to practice cervical cancer screening than their counterparts. This might be due to that those respondents who had awareness of cervical screening might enforce them to visit health institutions. In current study the women's who perceive susceptibility to cervical cancer were 2.69 more likely to practice cervical cancer screening when compared to their counterpart. This could be due to the fact that, positive health seeking behaviour toward cervical cancer increase the level of screening. This finding is similar with the study conducted in Addis Ababa, Ethiopia, Uganda [30-32]

In line with other studies, this study has shown a positive relationship between perceived risky status and cervical cancer screening. Women of reproductive age who feel at risk are 3 times more likely to practice the cervical cancer screening. This might be due to the reality that having positive attitude (feeling at risky) toward cervical cancer might facilities women's to undertake preventive measures and encourage adoption of accurate health information on the benefits of cervical cancer screening [33] Preceding studies have also validated that having a having feeling at risky for the cervical cancer found to be a strong predictor of adherence to cervical cancer screening [34, 35]

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## Strengths and Limitations of this Study

The study was unique, as it comprehensively examined the health factors associated with Knowledge and practice of cervical cancer screening In Benishangul- Gumuz region. The results are generalizable to the reproductive age women living in the Assosa Zone. However, the natures of the study design (Cross-sectional study design), inferring the causality was not possible and self-reported data (e.g., Previous HPV screening and Vaccination,) might have recall bias

## Clinical implication

Our main aim in this study was to assess the knowledge, practice and the associated factors of cervical cancer screening, among reproductive age women living in Assosa Zone. We quantitate the magnitude and the possible associated factors of Knowledge and practice of cervical cancer screening. Accordingly, the first major practical contribution of the present research is that it provides much needed empirical data on the actual jobs of cervical cancer screening strategy based on the identified factors in this study. This information is important given that, there is limitation of the study in the study area. The finding of this study will allow the stake holders, trainers, consultants and others to design initiatives based on what have been identified as the risk factor of poor knowledge and poor practice. In this sense, we believe that our research is especially timely to meet the WHO-strategy to eliminate the cervical cancer

### Research implication

The finding of this study help as base line data for the future research who wants to study on the subject area. According to the current study, the place of residence is one of the factors which were significantly associated with the Knowledge of cervical cancer screening.

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Therefore, our study suggests the future researcher to investigate more about the urban rural disparity toward cervical cancer screening

## Conclusion

More than half (53.52%) of reproductive health service clients in health care facility of Assossa Zone have Good knowledge about cervical cancer screening. Whereas the practice of cervical cancer screening was generally low. Place of residency, Family history of cervical cancer, place of residence, were significantly associated with knowledge of cervical cancer screening and educational status, having knowledge about cervical cancer, knowing someone diagnosed with cervical cancer and Individual feeling of at risk for cervical cancer were found to be statistically significant. Therefore, reproductive health care workers and regional policy stakeholders are needed to demonstrate more commitment in creating awareness about cervical cancer in different geographical areas of the provinces in Benishangul-Gumuz region. Encouraging all reproductive age women visiting health facility toward cervical cancer screening specially reproductive age women those resides in rural area is important to increase the cervical cancer screening practice.

### Ethical Approval and Consent to participate

The study was approved by the Assosa University, Health Sciences College Health Research Ethics Review Committee (CHRERC) (Ref.No.ASU/892/2014). The permission and support letter was obtained from the Assosa Zone and each health facilities. Voluntary informed, **oral consent** was obtained from all subjects after describing the nature and purpose of the study by the language they can understand. Each data collectors and supervisor oriented to follow the national COVID-19 protocol during data collection period.

## Consent for publication

Not applicable

# Competing of Interest

The authors declare that there is no any competing interest.

## Acknowledgements

The authors thanks all study participants and all the data collectors and supervisors for that this study would not have been possible without them.

# Author's Contributions

Firaol Regea Gelassa designed the study, developed the proposal, participated in the data collection, performed analysis, and drafted the manuscript. Shalama Lekasa Nagari, Desalegn Emana Jabena<sup>,</sup> Dabeli Belgafo, Daniel Tesso, Debela Teshome approved the proposal with revisions, participated in data analysis, and revised subsequent drafts of the manuscript. All authors read and approved the final manuscript.

# Financial disclosure statement (Funding agency)

No funding agent

## Availability of data and materials

All relevant data are within the paper and its Supporting Information files

# Figure Caption

Figure 1:- Over all knowledge of cervical screening among women reproductive age group of

Assosa zone Beneshagul-Gumuz Ethiopia 2022

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Figure 3:- Reason for not screened for cervical screening among women reproductive age group of Assosa zone Beneshagul – Gumuz, Ethiopia 2022.

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Figure 1:- Over all knowledge of cervical screening among women reproductive age group of Assosa zone Beneshagul-Gumuz Ethiopia 2022 BMJ Open: first published as 10.1136/bmjopen-2022-068860 on 15 May 2023. Downloaded from http://bmjopen.bmj.com/ on June 13, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES)

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Figure 2- Overall practice of cervical screening among women reproductive age group of Assosa zone Beneshagul-Gumuz Ethiopia 2022.



Figure 3:- Reason for not screened for cervical screening among women reproductive age group of Assosa zone Beneshagul – Gumuz, Ethiopia 2022.

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	ltem		Page
	No	Recommendation	No
Title and abstract	I	Knowledge and Practice of Cervical Cancer	1
		Screening and its Associated Factors among	
		Women Attending Maternal Health Services at	
		Public Health Institutions of Assosa Zone,	
		Benishagul-Gumuz, North west Ethiopia 2022: a	
		Cross-sectional Study	
		Background: Cervical cancer is the fourth most	3
		common cancer among women. In 2020, about	
		604000 women were diagnosed with cervical	
		cancer worldwide and about 342 000 women died	
		from the disease. Early screening decreases the	
		mortality from cervical cancer However little	
		information suciable about the knowledge and	
		information available about the knowledge and	
		practice of the women toward cervical cancer in in	
		the study area. Objectives: this study aimed to	
		assess the knowledge, and Practice of cervical	
		cancer screening and its associated factor among	
		women reproductive age groups of Assosa zone	
		Beneshagul - Gumuz Ethiopia 2022. Methodology:	
		A facility based cross sectional study was	
		A lacinty-based cross-sectional study was	
		conducted. A systematic sampling technique was	
		used to select 213 reproductive-age women from	
		selected health institutions, from April 20/2022 to	
		July 2022. Validated and Pre-tested questionnaire	
		was used for data collection Multi logistic	
		was used for data conection. I full logistic	
		regression analyses were done to identify factors	
		independently associated with cervical cancer	
		screening. Adjusted Odds Ratio with 95% CI was	
		estimated to measure the strength of association.	
		The level of statistical significance was declared at a	
		The level of statistical significance was declared at a	

Introduction

p-value < 0.05. The results were presented in tables and figures. Result: - Knowledge of cervical cancer screening in this study was 53.5% and 36 % of respondents had practiced cervical cancer screening. Family history of cervical cancer [AOR=2.5, 95% CI (1.004-6.44)], place of residence [AOR= 3.68, 95% CI (2.23, 6.54), and availability of health service [AOR =1.963 95% CI (1.057-3.644)] were significantly associated with knowledge of cervical cancer screening and, educational status [AOR=2.811, 95% CI (1.038-7.610)], knowing someone diagnosed with cervical cancer [AOR= 8.3, 95% CI (2.404-28.697)], and not feeling at risk [AOR = 2.696 95% CI (1.057-6.52)] were associated with the practice of cervical cancer screening. Conclusion and recommendation: knowledge and practice of cervical cancer screening in this study were low. Awareness creation is crucial to ending cervical cancer-related mortality.

Background/rationale	2	Cervical cancer is a type of cancer that occurs in 4
		the cells of the cervix, the lower part of the uterus
		that connects to the vagina.The major risk factor
		for cervical cancer is the infection with Human
		Papilloma Virus (HPV). Cervical cancer is the
		fourth most common cancer among women. In
		2020, about 604000 women were diagnosed with
		cervical cancer worldwide and about 342 000
		women died from the disease. About 85% of the
		case and 90% of the death is occurring in low-
		income countries. Cervical cancer accounts for
		22% of all female cancers and 12% of all newly
		diagnosed cancers every year in African women. In

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		spite of the importance of assessing the level of	
		knowledge about cervical cancer and the level of	
		practice among reproductive-age women, little	
		information was available about the knowledge and	
		practice of the women toward cervical cancer in	
		Ethiopia in general and in the study area in	
		particular	
Objectives	3	<ul> <li>To determine knowledge of cervical cancer and</li> </ul>	3
		screening among women reproductive age	
		group attending public health facilities of Asssoa	
		To determine practice of cervical cancer	
		screening among woman reproductive age	
		screening among women reproductive age	
		Access and Banachagul surgur Ethiopia	
		<ul> <li>To assess factors associated to cervical cancer</li> </ul>	
		screening among women reproductive age	
		group attending public health facilities of Asssoa	
		zone Beneshagul gumuz Ethiopia.	
Mathada		7	
Methods			
Study design	4	A facility based cross sectional study was employed	6
Setting	5	The study was conducted in Assosa Zone,	6
		Benishangul-Gumuz, Ethiopia from April 20, 2022	
		to July 20/ 2022. Assosa Zone is located 667km	
		from Addis Ababa, the capital city of Ethiopia	
Participants	6	Source population was All 15-49 years old women	6
		attending health facilities in the Assosa Zone.Study	
		population was Systematically selected	
		reproductive age group women who were attend	
		selected health facilities of Assosa zone during the	
		study period. Inclusion Criteria: Reproductive age	
		group who attend Anti-Natal Care, Family Planning,	

_		
Po	st natal care and reproductive health department	
are	e included to the study.	
$\sim$	hile, women with known mental illness, not	
wi	ling to response excluded during data collection.	
Variables 7 De	ependent variables	On the main
		degument
	<ul> <li>Knowledge of cervical cancer screening</li> </ul>	document
	<ul> <li>Practice on cervical cancer screening</li> </ul>	
	services.	
_ In	lependent variables	
	✓ Age	
	✓ Sex	
	✓ Educational status	
	✓ Occupation	
	✓ Religion	
	✓ Residence	
	Source of information about cervical cancer	
	✓ Smoking status	
	<ul> <li>History of abortion</li> </ul>	
	<ul> <li>Knowing someone with cervical cancer</li> </ul>	
	<ul> <li>Family history of cervical Cancer</li> </ul>	
	✓ History of previous cervical cancer	
	screening	
	✓ Knowledge of cervical cancer screening	
	✓ Number of sexual partner	
	✓ Availability of health service	
Data sources/ 8* Sys	tematically selected reproductive age group	8
measurement wo	men who were attend selected health facilities	
of	Assosa zone during the study period. In this	
cti	dy the data were obtained by a interviewer-	
در	ministered structured questionnaire that was	
ad	ministered, structured questionnaire that Was	

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24			adapted from a questionnaire used in different studies done in different areas. The content validity of the questionnaire was reviewed by qualified obstetricians and public health specialists. The first part had socio demographic characteristics, the seconds, third part assessed the knowledge, and practice on cervical cancer screening and the last about associated factor of cervical cancer screening. Data was collected by five BSc nurses and 2 public health officer as a supervisor. In these instances, the data collectors read out the questions, explained the meaning, if required, and scribed the answers. The questionnaire was available in both English and Amharic Language	
26 -	5Bias	9	Information was given	
28 -	Study size	10	Transportation	
29 _ 30 31 32 33 34	Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	
35       -         36       37         38       39         40       41         42       43         44       45         46       47         48       49         50       51         52       53         54       55         56       57         58       59         60	Statistical methods	12	The completed questionnaires were coded and entered into the computer program Epi-Data version 3.1. SPSS version 27.0 was used for the analysis. Data were cleaned and edited using simple frequencies and cross tabulations before analysis. The cleaned final data were then analyzed using SPSS version 27.0. Descriptive statistics such as, frequencies, tabulation, percent and graphs were used to analyses the descriptive component. Bi- variable logistic regression analyses were done to see the association between each independent variable and the outcome variable. Variables with P- value >0.2 were the candidate for Multi-variable logistic regression Analysis The logistic regression model fitness was checked using Hosmer-	8&9

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	declared as a model fitted. Multicollinearity was checked (VIF <10) indicating the non- existence of multicollinearity among the variables in this study. Both crude and adjusted odds ratio along with 95% CI was estimated to measure the strength of association. The level of statistical significance was declared at a p-value of less than 0.05.
Results	
Participants	13* (A total of 213 women participated in the study 6 yielding 100% response rate
Descriptive data	<ul> <li>High proportion of 62 (29.1%) of the respondents 11</li> <li>were within the age group of 20-24 years, with a mean(±SD) age of 32.2 (±13.8) years and most of 115(54%) the study participants were married. Regarding their educational status, 81 (38%) were illiterate and 75 (35.2%) and 47 (22.1%) of them were learned primary school and secondary school respectively</li> <li>High proportion of 62 (29.1%) of the respondents 11</li> <li>were within the age group of 20-24 years, with a mean(±SD) age of 32.2 (±13.8) years and most of 115(54%) the study participants were married. Regarding their educational status, 81 (38%) were illiterate and 75 (35.2%) and 47 (22.1%) of them were learned primary school and secondary school respectively</li> </ul>
Outcome data	15* The current study revealed that, more than half 11,12,13,14 (53.52%) of the participants have good knowledge toward the Cervical cancer screening. Seven out of ten women's (155)) heard about cervical cancer, and the most common sources of information were social media 75(35.2%) Eighty one women's (38%) respond that the "main cause of Cervical

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		cancer is HPV"	
Other analyses	17	Report other analyses done-eg analyses of	5,16
		subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	This study identified that, knowledge of cervical	10-16
		cancer screening in this study was 53.52% and 36 $\%$	
		of respondents had practiced cervical cancer	
		screening. The current study investigated that,	
		family history of cervical cancer, place of residence	
		and availability of health service were significantly	
		associated with knowledge of cervical cancer	
		screening and, educational status knowing someone	
		diagnosed with cervical cancer and not feeling at	
		risk were independently associated with the	
		practice of cervical cancer screening	
		The level of Knowledge this study is comparable	
		with the prevalence reported by the study done in	
		Gondar University (59.3.3%)(22). The present	
		study finding is higher when compared to study	
		done in higher when it compared to Study	
		conducted in Adama town, Oromia and Garage	
		Zone, Southern Ethiopia ,which was over all 14.8%	
		and 26.2% respectively(19)(20). The discrepancy	
		might be due to the study period and the nature of	
		the study participants. In the current study, more	
		than two-third (72.8%) of the study participants	
		were heard about cervical cancer screening. This	
		finding is found higher than with the study done in	
		Nigeria, heard about cervical cancer screening	
		which was 40% (23).The variety might be due to	
		the gap in the study period and the recent WHO	
		strategy which focuses on implementation of	
		cervical cancer screening and information	
		dissemination.	

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Limitations	19 The	study was unique, as it comprehensive	ly 2
	exam	ined the health factors associated wit	th
	Knov	vledge and practice of cervical cance	er
	scree	ning In Benishangul- Gumuz	
	The	results are generalizable to the reproductiv	/e
	age v	vomen living in the Assosa Zone	
	Natu	re of the study design (Cross-sectional stud	ły
	desig	n), inferring the causality was not possible.	
	Self-	reported data (e.g., Previous HPV screenin	ng
	and \	/accination,) might have recall bias	
Generalisability	21 Gene	eralized to all reproductive age women i	in
	Benis	hangul-Gumuz	
Other information		Q.	
Funding	22 No fu	unding agent	20