

Knowledge of Cervical Cancer Screening in Adult Women: Meta-Analysis

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ABSTRACT

Background: Cervical cancer is the fourth common cancer worldwide and the second most common cancer cases in women. Cervical cancer screening allows detection of abnormal cervical cells. Having knowledge about cervical cancer and its screening can increase the absorption of services for cervical cancer screening. This study was aimed to determine the comparison of participation in cervical cancer screening in adult women with high education with adult women with low education.

Subjects and Method: This study was a systematic review and meta-analysis with the following PICO, population: adult women. Intervention: high knowledge. Comparison: low knowledge. Results: cervical cancer screening. The articles used in this study were obtained from two databases, namely Google Scholar and Pubmed. Keywords to search for "Knowledge," "screening" "cervical cancer" "adult women". The articles included are full-text articles with a cross-sectional study design from 2016 to 2022 and report multivariate analysis with Adjusted Odds Ratio (aOR). Articles were analyzed using the Review Manager 5.3 aplikasi application.

Results: Systematic study and meta-analysis of this study A total of 16 articles from 2 African continents (Ethiopia, Nigeria, Southern Ethiopia, South west Ethiopia, Ivory Coast, South Africa, Northwest Ethiopia, Cameroon, eastern Ethiopia, Ghana), and Asia (Thailand and Malaysia). Showed that women with high knowledge had an attitude to cervical cancer screening 3.63 times compared to women with low knowledge and the results were statistically significant (aOR = 3.63; 95% CI = 2.11 to 6.24; p<0.001).

Conclusion: A high level of knowledge increases attitudes to cervical cancer screening in adult women.

Keywords: screening, cervical cancer, knowledge.

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BACKGROUND

Cervical cancer is the fourth common cancer worldwide and the second most common cancer cases in women. The incidence of cervical cancer increases with age after the age of 30 years. According to the National Cancer Registry report, there has been a

10% increase in the incidence of cervical cancer in women aged 50-60 years (20-30% incidence rate per 100,000 population), with the peak incidence occurring between the ages of 65 and 69 years (Abugu and Nwagu, 2021).

Cervical cancer causes 530,000 new cases and 280,000 deaths annually in adult women, of which 88% occur in low-income countries where access to pre-cancer screening and treatment is limited. Incidence and mortality in sub-Saharan Africa are among the highest in the world and account for more than 70% of the global cervical cancer burden with 70,000 new cases each year (Jemal et al., 2012).

In low-income countries, cervical cancer is associated with significant morbidity and mortality. This is mainly due to lack of or poor access to screening options and treatment services. Cervical cancer screening is a test for precancerous lesions. Currently, the available options of cervical cancer screening are Pap smear, visual inspection with acetic acid and HPV testing for high-risk HPV types. Early detection and treatment of precancerous lesions can prevent cervical cancer (Heyi et al., 2018).

Cervical cancer screening allows detection of abnormal cervical cells. A study conducted in Ethiopia found that screening uptake is still low. A study in Addis Ababa found that self-reported screening uptake was 11.5% in 2015, 10.8% in Addis Ababa in 2018, 10% in Gondar in 2018, and 20.9% in Debremarkos in 2017, and 85.8% of women in Ethiopia. The South had no intention of screening at all (Destaw et al., 2021).

Having knowledge about cervical cancer and its screening can increase the absorption of services for cervical cancer screening, this is also related to the use of screening services. Cervical cancer screening helps to detect pre-cancerous lesions before they progress to a cancerous stage which in turn reduces the associated mortality. In Ethiopia, screening services for cervical precancerous lesions are available to all women in public health institutions. Women's knowledge of cervical cancer for screening determines the uptake of services

and cervical cancer screening (Geremew et al., 2018). This study was aimed to determine the comparison of participation in cervical cancer screening in adult women with high education with adult women with low education.

SUBJECTS AND METHOD

1. Study Design

This was a systematic research and meta-analysis. The articles used in this study were obtained from several databases, namely Google Scholar and PubMed with a research deadline of 2016-2022. Time frame or language, article selection is done using PRISMA flow chart. Keywords to search for articles are as follows "Knowledge," "screening" "cervical cancer" "adult women" and other terms combined with the Boolean AND and OR operators.

2. Inclusion Criteria

The inclusion criteria in this research article were: full-text article using a cross-sectional study design, research subjects are adult women, research results was cervical cancer screening, multivariate analysis with adjusted Odds Ratio (aOR) to measure the estimated effect.

3. Exclusion Criteria

The exclusion criteria in this research article were: articles published in languages other than English, statistical results reported in the form of bivariate analysis, articles before 2016.

4. Definition Operational of Variable

The search for articles was carried out by considering the eligibility criteria determined using the PICO model. Population: adult women. Intervention: knowledge, Comparison: low knowledge. Results: cervical cancer screening.

Knowledge High levels of knowledge and higher education about a disease can encourage women to do cervical cancer screening because they already know the

symptoms and risks. Knowledge of adult women was carried out using a questionnaire.

Low knowledge A low level of knowledge can lead to ignorance about the dangers of a disease and cause women to refuse or even not know the benefits of cervical cancer screening. Knowledge of adult women is carried out using a questionnaire.

5. Study Instruments

Research is guided by the PRISMA flow diagram and quality assessment using the Joanna Briggs Institute (JBI, 2020).

6. Data Analysis

The data in the study were analyzed using the Review Manager application (RevMan 5.3). Forest plots and Funnel plots were used to determine the size of the relationship and heterogeneity of the data. The fix effect model is used to determine the homogeneity of the data, while the random effect model is used to determine the heterogeneity of the data.

RESULTS

In this study, the article search process was carried out through several journal databases, including Google Scholar, and PubMed. The review process for related articles can be seen in the PRISMA flow chart in figure 1. Research related to Knowledge of Cervical Cancer Screening in Adult Women consists of 16 articles from the initial search process yielding 475 articles, after the deletion process of published articles with 21 of them meeting the requirements for text review further complete.

A total of 16 articles that met the quality assessment were included in the quantitative synthesis using meta-analysis. It can be seen in Figure 2 that the research articles come from two continents, namely Africa (Ethiopia, Nigeria, Southern Ethiopia, South west Ethiopia, Ivory Coast, South Africa, Northwest Ethiopia, Cameroon, eastern Ethiopia, Ghana), and Asia (Thailand and Malaysia). Table 1, the researchers conducted an assessment of the quality of the study.

Meta-analysis of 16 cross-sectional study articles showed a heterogeneity value of $I^2 = 78\%$, so that the distribution of data was declared heterogeneous, the analysis model used was the random effect model. Based on the results of the forest plot, it showed that women with good knowledge had a cervical cancer screening rate of 3.63 times compared to women with low education and the results were statistically significant (aOR= 3.63; 95%CI= 2.11 to 6.24; $p < 0.001$)

The funnel plot shows that there is a potential for publication bias which is indicated by the overestimate effect which is characterized by an asymmetric distribution between the right and left plots, 8 plots on the right, 6 plots on the left and 2 plots touching the vertical line. The plot on the left side has a standard error (SE) between 0 and 1. The plot on the right side of the graph has a standard error (SE) between 0 and 1.5.

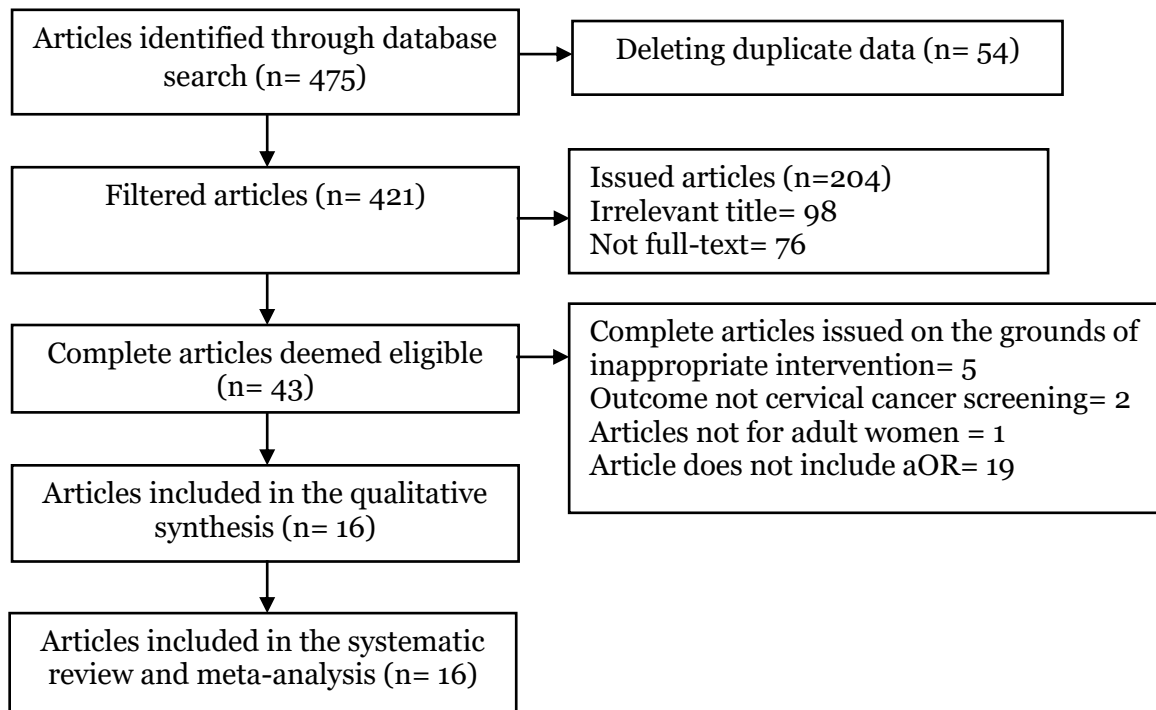


Figure 1. PRISMA Flowchart



Figure 2. Map of Study Area

Table 1. Critical Appraisal of primary studies entered using the Joanna Briggs Institute (JBI) assessment

No	Evaluation Indicator	Publication (Author and Year)							
		Getache et al. (2019)	Songsiriphan et al. (2020)	Abugu and Nwagu (2021)	Nigusie et al. 2019	Tekle et al. (2020)	Abdullah, et al. (2016)	Boni et al. (2021)	Ampofo et al. (2020)
1	Are the criteria for inclusion in the sample clearly defined?	2	2	2	2	2	2	2	2
2	Are the research subjects and settings described in detail?	2	2	2	2	2	2	2	2
3	Is exposure measured in a valid and reliable way?	2	2	2	2	2	2	2	2
4	What are the objective, standard criteria used for the measurement of the condition?	2	2	2	2	2	2	2	2
5	Were confounding factors identified?	2	2	2	2	2	2	2	2
6	Are strategies for dealing with confounding stated?	2	2	2	2	2	2	2	2
7	Are results measured in a valid and reliable way?	2	2	2	2	2	2	2	2
8	Was appropriate statistical analysis used?	2	2	2	2	2	2	2	2
9	Are the criteria for inclusion in the sample clearly defined?	2	2	2	2	2	2	2	2
Total		18	18	18	18	18	18	18	18

Note: 2= Yes; 1= Can't tell; 0= No

Table 2. Continue

No	Evaluation Indicator	Publication (Author and Year)							
		Mabotja et al. (2021)	Destaw et al. (2021)	Okyere et al. 2021	Belay et al. (2020)	Aynalem et al. (2020)	Tsegay et al. (2020)	Geremew et al. (2018)	Heyi et al. (2018)
1	Are the criteria for inclusion in the sample clearly defined?	2	2	2	2	2	2	2	2
2	Are the research subjects and settings described in detail?	2	2	2	2	2	2	2	2
3	Is exposure measured in a valid and reliable way?	2	2	2	2	2	2	2	2
4	What are the objective, standard criteria used for the measurement of the condition?	2	2	2	2	2	2	2	2
5	Were confounding factors identified?	2	2	2	2	2	2	2	2
6	Are strategies for dealing with confounding stated?	2	2	2	2	2	2	2	2
7	Are results measured in a valid and reliable way?	2	2	2	2	2	2	2	2
8	Was appropriate statistical analysis used?	2	2	2	2	2	2	2	2
9	Are the criteria for inclusion in the sample clearly defined?	2	2	2	2	2	2	2	2
Total		12	18	18	18	18	18	18	18

Note: 2= Yes; 1= Can't tell; 0= No

Table 3. Description of the primary studies included in the meta-analysis

Author (year)	Country	Study Design	Sample		P	I	C	O	aOR (95%CI)
			Total Screening Participants	High Knowledge					
Getachew et al. (2019)	Ethiopia	Cross-sectional	236	144	Adult female	High knowledge	Low knowledge	Cervical cancer screening	1.80 (0.70 to 4.60)
Songsiriphan et al. (2020)	Thailand	Cross-sectional	300	62	Female aged 22-50 years	High knowledge	Low knowledge	Cervical cancer screening	6.23 (1.84 to 21.07)
Abugu and Nwagu (2021)	Nigeria	Cross-sectional	144	68	Adult female	High knowledge	Low knowledge	Cervical cancer screening	1.36 (0.35 to 5.27)
Tekle et al. (2020)	Southern Ethiopia	Cross-sectional	516	177	Female 30-40 years old	High knowledge	Low knowledge	Cervical cancer screening	7.30 (2.53 to 21.01)
Nigussie et al. (2019)	South West Ethiopia	Cross-sectional	737	108	Women aged 30-49 years	High knowledge	Low knowledge	Cervical cancer screening	3.47 (1.47 to 8.21)
Abdullah et al. (2016)	Malaysia	Cross-sectional	515	313	Adult female	High knowledge	Low knowledge	Cervical cancer screening	11.26 (1.50 to 86.25)
Boni et al. (2021)	Abidjan	Cross-sectional	1158	786	The median woman is 32 years old	High knowledge	Low knowledge	Cervical cancer screening	2.80 (1.20 to 6.60)
Mabotja et al. (2021)	South Afrika	Cross-sectional	737	215	Adult female	High knowledge	Low knowledge	Cervical cancer screening	2.50 (1.00 to 6.30)
Destaw et al. (2021)	Northwest Ethiopia	Cross-sectional	464	154	Adult female	High knowledge	Low knowledge	Cervical cancer screening	8.40 (3.33 to 21.21)

Table 4. Cont.

Author (year)	Country	Study Design	Sample		P	I	C	O	aOR (CI95%)
			Total Screening Participants	Higher Knowledge					
Okyere et al. (2021)	cameroon	Cross-sectional	13616	1049	Adult female	High knowledge	Low knowledge	Cervical cancer screening	1.85 (1.03 to 3.31)
Belay et al. (2020)	Eastern ethiopia	Cross-sectional	601	173	Women aged 30-39 years	High knowledge	Low knowledge	Cervical cancer screening	4.80 (1.50 to 15.50)
Aynalem et al. (2020)	Northwest ethiopia	Cross-sectional	822	199	Women aged 30-49 years	High knowledge	Low knowledge Marital status	Cervical cancer screening	7.27 (2.07 to 25.11)
Tsegay et al. (2020)	Northern Ethiopia	Cross-sectional	601	117	Female aged 15-49 years	High knowledge	Low knowledge	Cervical cancer screening	3.70 (1.44 to 9.43)
Geremew et al. 2018	Northwest ethiopia	Cross-sectional	1137	131	Women aged 30-49 years	High knowledge	Low knowledge	Cervical cancer screening	7.21 (3.41 to 15.29)
Heyi et al. (2018)	Ethiopia	Cross-sectional	845	602	18-32 years old woman	High knowledge	Low knowledge	Cervical cancer screening	0.13 (0.04 to 0.37)
Ampofo et al. (2020)	Ghana	Cross-sectional	200	31	Adult female	High knowledge	Low knowledge, Marital status	Cervical cancer screening	121.90 (14.09 to 1054.47)

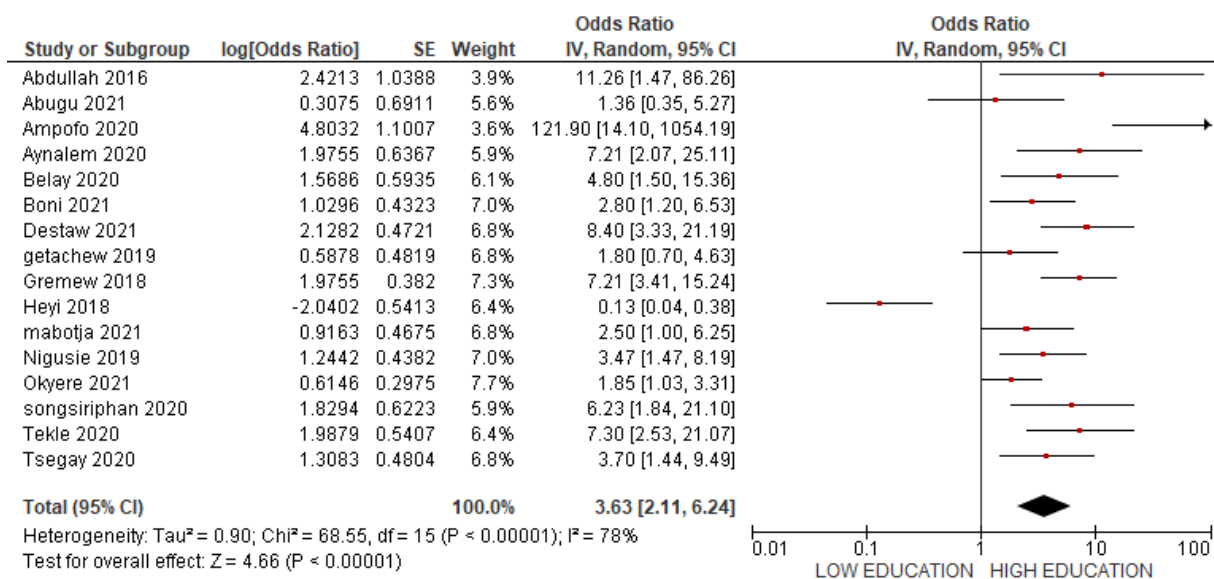


Figure 3. Forest plot Knowledge of Cervical Cancer Screening

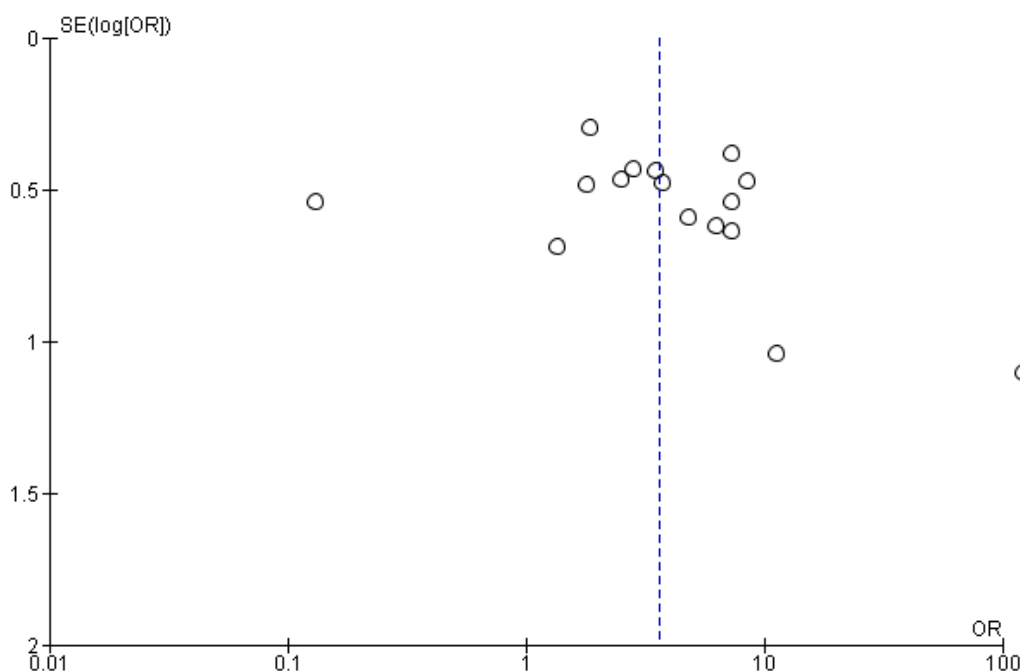


Figure 4. Funnel Plot Knowledge of Cervical Cancer Screening

DISCUSSION

Based on the results of a systematic study and meta-analysis, there were 16 articles from 2 continents, Africa (Ethiopia, Nigeria, Southern Ethiopia, South west Ethiopia, Ivory Coast, South Africa, Northwest Ethiopia, Cameroon, eastern Ethiopia, Ghana), and Asia (Thailand). and Malaysia), with the research subjects in each country,

namely adult women aged 15-50 years. The results of this study showed that women with high knowledge had a cervical cancer screening rate of 3.63 times compared to women with low education and the results were statistically significant (aOR= 3.63; 95%CI= 2.11 to 6.24; p<0.001).

The meta-analysis also explains that women who have low knowledge tend not

to participate in cervical cancer screening, while women with higher education have a large participation in cervical cancer screening. This study discusses cervical cancer screening which is very important because it is one way to determine the incidence of cervical cancer cases in an area.

There are a number of obstacles and challenges in implementing the absorption of cervical cancer screening in an area, one of which is due to the lack of women's knowledge about the signs, symptoms and dangers of cervical cancer. This is the reason women in the world continue to face high problems related to the risk of death and illness caused by cervical cancer. By 2020 psychological, emotional, and knowledge related factors will become a significant concern among women in Southeast Asia (Chua et al., 2021).

According to research conducted by Ampofo et al., 2020 reported that (87%) were interested in participating in the screening who were highly educated women, this was associated with an increase in education in Ghana over the years. Also the fact that a large proportion of women are interested in cervical cancer screening means that national screening programs with intensive education and awareness are likely to see increased uptake.

This study has documented that women with low knowledge are less likely to participate in cervical cancer screening. Important barriers related to perceived lack of vulnerability, feelings of shame, fear of being misdiagnosed and pain, fear, high costs, busy work schedule, lack of knowledge about screening facilities, gender of screening and communication barriers influenced women's interest to participate in screening. (Ampofo et al., 2020). Therefore, the health services of each country must

develop accordingly, be adapted to the culture of educational materials about cervical cancer screening to inform women especially those without formal education through social media, television, radio and public information systems to increase absorption.

Knowledge about cervical cancer and health workers are sources of information related to adequate knowledge about cervical cancer screening. Health education and awareness creation regarding cervical cancer screening is very important for women. Particular attention should be paid to information on eligible age groups, recommended frequencies and screening procedures used.

In the long term, national screening programs should be instituted to increase the uptake of cervical cancer screening. Increasing women's knowledge about the symptoms and risks of cervical cancer is deemed necessary, both formally and informally through mass media, socialization and counseling so that the number of women who are screened can increase and accelerate the process of prevention and treatment.

AUTHORS CONTRIBUTION

I Gusti Agung Ngurah Putra Pradnyantara is the main researcher who selects the topic, searches for and collects research data. Indah Adhitama Chrisnanda analyzes data and reviews research documents.

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CONFLICT OF INTEREST

There was no conflict of interest in this study.

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