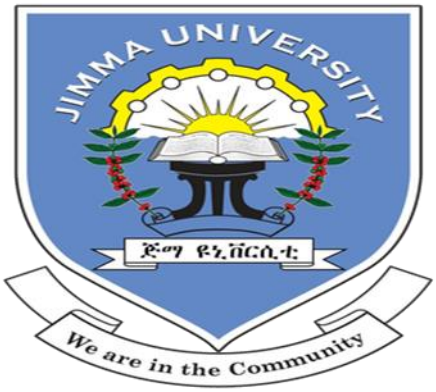

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ANATOMY COURSE UNIT

PREVALENCE AND ASSOCIATED FACTORS OF PRECANCEROUS CERVICAL LESIONS AMONG WOMEN VISITED JIMMA UNIVERSITY MEDICAL CENTER, JIMMA, ETHIOPIA: A RESTROSPECTIVE STUDY

BY: - JALALLI TAKELE

A THESIS SUBMITTED TO ANATOMY COURSE UNIT, DEPARTMENT OF BIOMEDICAL SCIENCES, FACULTY OF MEDICAL SCIENCES, INSTITUTE OF HEALTH, JIMMA UNIVERSITY FOR PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR DEGREE OF MASTER OF SCIENCES (M.Sc.) IN CLINICAL ANATOMY

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PREVALENCE AND ASSOCIATED FACTORS OF PRECANCEROUS CERVICAL LESIONS AMONG WOMEN VISITED JIMMA UNIVERSITY MEDICAL CENTER, JIMMA, ETHIOPIA: A RESTROSPECTIVE STUDY

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ABSTRACT

Background: Cervical cancer is one of the most common causes of cancer incidence and mortality in women worldwide. Almost all cervical cancer (99%) is linked to infection with high-risk human papilloma viruses (HPV). Despite the wide recognition of the disease and its' serious public health problem in developing countries including Ethiopia, associated factors for precancerous cervical lesion is not well identified and documented.

Objective: To assess the prevalence of precancerous cervical lesion and its associated factors among women visited Jimma university medical center gynecology and obstetrics department

Methods: An institution-based retrospective cross-sectional study was conducted from October 15-30. A total of 190 randomly selected medical records of women of reproductive age group that came to gynecology and obstetrics department of JUMC for screening from September 2017 to August 2021 was reviewed. Data were collected using a data extraction checklist from medical records by trained data collectors. Data was entered into Epi Data version 3.1 and analyzed by SPSS version 26. Descriptive statistics like frequency, percentage and proportion was computed to describe the study population. Bivariate and multivariate logistic regression analysis was performed to identify the associated factors for precancerous cervical lesions. Adjusted odds ratio (AOR) with 95% confidence interval and p-value <0.05 was used to determine the level of significant association.

Results: Out the total of 190 screened women of reproductive age group, the majority, 97.4 % of them were never screened for precancerous cervical lesion before. The prevalence of precancerous cervical lesion was found to be 6.84% (95 %CI=3.7-11.4). After controlling the effect of other confounding variables, age of the participant (AOR= 5.43:95%CI:1.02,28.82), educational status (AOR=8.84:95%CI: 1.03-75.05) and previous history of sexually transmitted infections (AOR=7.71:95%CI:1.53-38.89) were found to be significantly associated with precancerous cervical lesion at p-value <0.05.

Conclusion and recommendation: This study confirmed that age of the participant, educational status, and previous history of STIs were found to be significantly associated with precancerous cervical lesion. Thus, women aged >35 years, primary and below education, a history of STIs, and those with a higher risk of precancerous lesions should be encouraged to be screened frequently for cervical cancer. Appropriate community mobilization, campaigns, and education programs need to be employed for creation of awareness about precancerous cervical lesion at the study area.

Key words

Cervical cancer, human papilloma virus, precancerous cervical lesion, reproductive age group, factors

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ACRONYMS AND ABBREVIATIONS

AOR	Adjusted Odds Ratio
BSc	Bachelor of science
COR	Crude Odd Ratio
CIN	Cervical Intraepithelial Neoplasia
HR-HPV	High-Risk Human Papilloma Virus
HPV	Human Papilloma Virus
HAART	Highly active antiretroviral therapy
IRB	Institutional Review Board
ICC	Invasive Cervical Cancer
JMC	Jimma Medical Center
JU	Jimma University
MSc	Master of science
PCCL	Precancerous Cervical Lesion
SNNP	Southern Nation, Nationality and Peoples of Ethiopia
STI	Sexually Transmitted Infection
STD	Sexually Transmitted Disease
SPSS	Statistical Package for Social Science
VIA	Visual Inspection with Acetic Acid
WHO	World Health Organization

1. INTRODUCTION

1.1. Background

Uterine cervix, considered anatomically as ‘the neck of the uteri, is the lower cylindrical part of the pear-shaped uterus. Typically, it is a narrow tube approximately about 2.5 cm long and 0.33cm thick in an adult non-pregnant woman. The cervix is composed of two regions, the ecto-cervix, and the endo-cervical canal. The ecto-cervix is a portion of a cervix that projects into vagina. Lined by stratified squamous non-keratinized epithelium. The external OS, an opening in the exo-cervix, a transition to upper part of vagina. The endo-cervical canal is inner part of the cervix, lined by a mucous-secreting simple columnar epithelium. The blood supply to the cervix is via uterine artery from internal iliac artery and blood drainage is to the uterine vein via a plexus in the broad ligament of the uterus. The cervix is innervated by inferior nerve fibers of utero-vaginal plexus [1].

Cervical cancer is one of the commonest cancers ranking as the fourth most common cause of cancer incidence and mortality in women worldwide. Human papilloma virus (HPV) has a causal relationship with cervical cancer. Almost all cervical cancer (99%) is linked to infection with high-risk HPV, an extremely common virus transmitted through sexual contact [2.3].

Persistent infection with high-risk human papillomavirus (HR-HPV) is an important cause of precancerous cervical lesion and cervical cancer. The distribution rate of HR-HPV infection increases from the normal cervix to inflammation to cervical intraepithelial neoplasia (CIN) to cervical cancer. In 2018 more than 311,000 women died from cervical cancer and more than 85% of these deaths occurring in low- and middle-income countries [4, 5].

Older age, history of multiple sexual partners and sexual transmitted infections were associated with increased risk of precancerous lesion. Therefore, women with higher risk of precancerous lesions should be encouraged to be screened more frequently for cervical cancer [6].

Common reasons given by women for not undergoing screening were feeling of healthiness because of absent symptoms followed by emotional barriers like fear of test procedure is painful and embarrassment. Symptoms generally do not appear until abnormal cervical epithelial cells became cancerous and advanced invading nearby tissue. The most common symptoms are copious foul-smelling vaginal discharge, abnormal bleeding or inter-menstrual bleeding, postictal bleeding, postmenopausal bleeding, or backache [7, 8].

Although cervical carcinoma does not develop suddenly from normal epithelium but is presented by a precancerous lesion like LSIL and HSIL which needs to be detected at the earliest. Cervical cancer is one form of cancer that can be prevented. Primary prevention supportive of effort to increase public knowledge and the ability of individuals to make healthy lifestyle choices. Secondary prevention aims at detection and treatment of precursors. One of the screening modalities for precancerous cervical lesion is Visual Inspection with Acetic Acid which is preferable in low resource settings. Visual inspection of the cervix with acetic acid wash (VIA) is simple and affordable that does not require well established laboratory settings and advanced testing requirements Experiences in developed countries have shown that widely standardized national cervical cancer screening programs can significantly reduce the incidence and new cases of mortality from cervical cancer. This is the evidence that general awareness about cervical cancer, screening programs, and the improvement of existing health care services can reduce the burden of the cervical cancer for women and for health care system [9-12].

This study informs the prevalence and associated factors of precancerous cervical lesion at Jimma university medical center, Jimma, Ethiopia.

1.2. Statement of the Problem

Cervical cancer is a leading cause of death among women in developing countries, affecting women at a time of life critical to social and economic stability. It a global health problem and numerous studies confirmed that the majority (80%) of new cases are found in found in central and South America, Eastern Africa, south and south-east Asia [2,11]. An estimated 604,237 cases; representing 6.5% of all female cancer and 341,843 deaths in 2020 world-wide. Ninety percent of the cases were reported from less developed countries where access to prevention and treatment were limited [12].

The incidence of cervical cancer is very high in sub-Saharan Africa and the five-year prevalence of the disease ranges 27.6% with an incidence rate of 26% and 23% of mortality [13]. The rate can be up to 15 times higher in poor countries compared with industrialized ones. A mortality rate of 35 per 100,000 is reported in Eastern Africa and there is no functional cancer registries and record-keeping for true incidence of cervical cancer in many African countries [14]. Though, the prevalence of cervical cancer in African countries ranges from 12% to 46% [13].

In Ethiopia cervical cancer is a disproportionately affecting women that have a low socio-economic status [15]. It is the 2nd most common cancer and the second-most deadly cancer among women aged 15 to 44 years followed by breast cancer [16]. The international agency for research on cancer assessment reported that, in Ethiopia 7450 new cervical cancer cases were diagnosed 5340 women die from cervical cancer each year [17]. This indicates the disease is becoming a major cause of morbidity and mortality among women in the country [18].

In Ethiopia, different studies were conducted to determine the prevalence and factors associated with precancerous lesions of the cervix. According to a systematic review and meta-analysis conducted by Tsehay and Afwork, the prevalence of precancerous cervical lesion in Ethiopia ranges from 6.7% to 27.7%. The review confirmed that pooled prevalence of the precancerous lesions of the cervix among Ethiopian women was 9.43% [16]. Another recent review by Zena et al., also suggested that the prevalence of precancerous cervical lesion in the country was 13.4% [13].

Even though cervical cancer is preventable disease, due to absence or poor quality of screening programs for precursor lesion and early-stage cancer, lack of functional referral system, limited access to health care services and lack of knowledge among women are the main reasons for higher incidence and mortality in developing countries [19]. Primary and secondary prevention mechanisms such as awareness creation and screening targeting particularly age eligible part of the population should be widely initiated [20].

The cost for treatment of advanced stage of cervical cancer is higher than pre-invasive cervical cancer which could be due to the reason that cases at early stages might be recovered with minor procedures while other cases at other stages demand intensive diagnostic and therapeutic procedures. It may also be due to limited availability of treatment option for advanced cervical cancer stages in Ethiopia, patients die quickly while a patient who screened at early stage tries all treatment options available [20].

It assumed that screening coverage in developing world is low, and the self-reported data collected in 55 countries between 2005 and 2018, the prevalence of cervical cancer screening coverage was 43.6% ranging from 0.3% to 97.4% [21]. Besides, there is wide variation in the level of effective coverage across the countries from over 80% in Austria and Luxembourg to 1% or less in Bangladesh, Ethiopia, and Myanmar [22].

Numerous studies confirmed that different factors were associated with precancerous cervical lesions. Identifying these factors plays an important rule for planning and screening and treatment program that can reduce the morbidity and mortality of the disease. In Ethiopia, early initiations of first sexual intercourse, multiple sexual partners and a history of sexually transmitted infections were found to be the common factors associated with cervical lesion [30,31,43,45]. Despite the wide recognition of the disease and its' serious public health problem in developing countries including Ethiopia, associated factors for precancerous cervical lesion is not well identified and documented.

1.3. Significant of the Study

Screening for precancerous cervical lesions is mandatory for early prevention and protection of cervical cancer morbidity and mortality and building a healthy productive woman. On the other hand, well organized precancerous cervical lesion screening program and assessment of cytological abnormality in the community is vital in the view of to make recommendation for improvement. Reports describing precancerous cervical lesions in parts of our country specially using Bethesda classifications is not well developed.

Therefore, this study aims to assess prevalence and factors associated with cervical epithelial cell abnormalities detected using visual inspection with acetic acid among age eligible females attended at gynecology and obstetrics department of Jimma university medical center and to compare the finding with other edited national and international data. Therefore, this study will be significant to determine and reveal possible recommendations.

Findings of this will be help nation to improve the awareness related to precancerous screening utilization by coming up with relevant evidence for addressing factors associated with abnormal cytological smear.

Further, since there are not sufficient studies done on prevalence and patterns of cervical epithelial neoplasia detected in visual inspection with acetic acid in our setup, this study will have input in providing information for those who will be interested to conduct further studies and expected to fill gaps in this area of research and add to the existing body of knowledge.

2. LITERATURE REVIEW

A precancerous cervical lesion, which is also called an intraepithelial lesion, are changes to cervical cells that make them more likely to develop into cancer eventually if left untreated. It may take 10 years or more for precancerous conditions of the cervix to turn into cervical cancer, but in some cases like for high-risk groups, it may take lesser time. Columnar cells constantly changed to squamous cells at transformation zone of cervix, where precancerous condition is happening because of Human papilloma virus (HPV) [11].

Cervical intraepithelial neoplasia (CIN) is a premalignant lesion in transition zone of cervix that could develops into cervical cancer. The cervical intraepithelial neoplasia classification system involves three deferent degrees of dysplasia ranging from CIN1/mid to CIN2/moderate, and CIN3/sever dysplasia. The Bethesda system developed CIN2 and CIN3 as combined into one group, termed high-grade squamous intraepithelial lesion (HSIL), meanwhile CIN1 result are termed as low- grade squamous intraepithelial lesion [22,23].

2.1. Prevalence of Cytological Abnormalities

The estimated age-standardized incidence of cervical cancer was 13·1 per 100 000 women globally and varied widely among countries, with rates ranging from less than 2 to 75 per 100 000 women. Cervical cancer was the leading cause of cancer-related death in women in eastern, western, middle, and southern Africa [6].

A retrospective study conducted in Beijing China, from the A total of 728,704 women from the 18 districts of Beijing participated in the screening program, representing 9.4% of the 25 to 65-year-old female population in Beijing in 2009. Of these participants, 366 women (50.2 per 100,000) were diagnosed as CIN I, 248 (34.0 per 100,000) as CIN II, 265 (36.4 per 100,000) as CIN III and 89 (12.2 per 100,000) as having cervical cancer. Prevalence of HSIL (CIN grades II and III) was 70.40 per 100,000 women [24].

A study conducted in Turkey indicated that the prevalence of cervical cytological abnormalities was 1.8 % in general. The prevalence of cytological diagnosed cervical invasive neoplasia was 0.025% [25]. Study conducted in Saudi Arabia also refers that, out of

total sufficient smears, 261 (5%) were identified as abnormal Invasive adenocarcinoma accounted for 14 cases (4%) with a similar age range as invasive squamous cell carcinoma [26].

A multi-center cross-sectional study conducted among women attending cervical cancer screening in Kumasi, Ghana shows out of the total participants 3.7% were positive for intraepithelial lesion or malignancy [27]. Another hospital based cross sectional study conducted in Cameroon shows that out of 60 women who enrolled, 3.33% were positive for precancerous cervical cancer. The women at risk of precancerous cervical lesion are within the age range of 31-45 years [28].

An institution based cross sectional study conducted among women employee of Almada textile in Adwa town located in northern part of Ethiopia shows out of the total number of participants (6.7%) [95% CI: 4.4, 9.6] were found to be positive for a precancerous cervical lesion. The study participants who were infected with STIs during the cervical cancer screening campaign were nearly 50 times more likely to have precancerous cervical lesion as compared to their counterparts [AOR=49.88 (95% CI: 16.59, 149.91)][29].

Study conducted at Tikur Anbessa hospital, Addis Ababa, Ethiopia, out of the total number of patients included and evaluated for cytology examination, the results revealed that 141 (60.5%) samples were normal while 92 (39.5%) were abnormal. Of those with abnormal cytology results, the prevalence of high grade squamous intraepithelial lesion (HSIL) at 68.5% (95% CI: 58.8–78.2) was significantly higher than low grade squamous intraepithelial lesion (LSIL) at 6.5% (95% CI: 1.4–11.7) and invasive cervical carcinoma (ICC) at 25% (95% CI: 16–34.1). The prevalence of abnormal cytology findings among women also presenting with STI appears to be significantly higher [15].

A hospital based un-matched case control study conducted in selected health facilities in Addis Ababa among women screened for cervical cancer, the prevalence of precancerous cervical cancer was 12.8%. This study also shows that from all the study participants 61.40% of the case and 36.68% of the control were found to be in the age group of 40-49 years old [7].

A hospital-based cross-sectional study conducted in three hospitals of Southern Nations Nationalities and People Region (SNNPR) of Ethiopia (Hawassa University Referral hospital, Yirgalem Regional Hospital and Wolayita Sodo Hospital) screening and treatment centers for precancerous cervical cancer lesion (PCCL) in HIV- infected women in southern Ethiopia Out of total number of participants screened HIV- infected women, 99 (22.1 %) [95% CI: 18.3%-25.9%] were found to be positive for PCCL. 345 (77%) of them were negative for precancerous cervical cancer and four (0.9%) of them were suspicious for invasive cervical cancer [30]. Another, cross sectional study conducted in Jimma Ethiopia at Jimma model clinic, out of total number of women who were screened with VIA test, 12.9% were found to have VIA positive result [31].

2.2. Factors Associated with Prevalence of Cervical Lesion

There are a wide range of risk factors for cervical cancer. These factors can be categorized as socio-demographic factors, reproductive health factors and lifestyle and sexual behavior factors as demonstrated in the following subsections.

2.2.1. Socio-demographic Characteristics

Different studies suggested that precancerous cervical lesion was associated with the age of respondents. One of the studies conducted in Jimma indicated that older women (>40) are the most at risk for developing cervical cancer) (OR= 4.7; 95%CI= 2.3-9.6) [19]. Another study conducted from Sude Oromia region, where being older age is significantly associated with higher risk of developing cervical lesion (AOR, 3.5; 95% CI: 1.32-9.39) [32]. A study from Addis Ababa also confirmed that women aged ≥45 years had a higher odd of having precancerous cervical lesion compared to younger counterparts (≤ 24 years) (AOR = 8.1; 95%CI: 1.53-42.3) [33].

Residency is also another risk factor for precancerous cervical lesion. A study conducted in East Gojjam, found that women who were residing rurally were 2.04 times as likely to develop precancerous cervical lesions as urban dwellers (AOR 2.04, 95% CI 1.12–3.7) [34]. The reason for a higher prevalence in rural areas could be financial and transportation problems may hinder access to hospitals for cervical cancer screening. Besides, those who

resides rurally have lower access to information about cervical cancer and screening services [34,35].

Marital status of women is another sociodemographic factor that was stated as a risk factor for precancerous cervical lesion by different studies. A study conducted in Amhara regional state revealed that single women were associated with the presence of precancerous cervical lesion compared to married one' (AOR=4. 90, 95% CI:1.246–10.284) [36]. Another study from Debre Markos Hospital, Northwest Ethiopia reported that being divorced (AOR=3.2,95%CI:1.19-8.77) and widowed (AOR=3.0,95%CI:1.12, 8.09) were the risk factor for precancerous cervical lesion [37].

Studies suggested that educational status of participants was found to have a substantial influence on the magnitude of precancerous cervical lesion [38,39]. Women who have higher education and adequate information are more likely to protect themselves and seek cervical screening services; that aids from having abnormal cervical lesions. In other words, limited access to information and knowledge about cervical cancer may increase having of abnormal cervical lesions [39]. A study in Harar reveals that, women with no formal education was found to have 2.7 times higher odds to have precancerous cervical lesion (AOR-2.68 (CI-1.32-5.46) [40] and report from Zambia (AOR=0.48;95%CI:0.30-0.77) [41] and Kenya (AOR=0.97;95 CI:0.57-1.67) [42], where women who attained higher education had reduced risk of cervical lesion.

2.2.2. Reproductive Health Characteristics

Different studies indicated that prolonged use of contraceptives is significantly associated with precancerous cervical lesion. For example, as a study in east Gojjam states that women who had used oral contraception were 9.1 times as likely to develop precancerous cervical lesions as IUD users (AOR= 9.11, 95% CI: 1.14–72.8) [34]. A study in Debre Markos referral hospital also assures long term oral contraceptive pills (OCP) use (AOR= 11.9, 95 % CI: 2.1 - 16.7) [37] were significant predictors of precancerous cervical lesion. Another study in Adama town also indicated that women who were using oral contraception were two times at risk for developing precancerous cervical lesion than who weren't using (AOR = 2.342, 95% CI: 1.006-4.216) [43]. The higher prevalence for prolonged oral contraceptive

users was explained due to increase eversion of the columnar epithelium to the ectocervix, which enhances the exposure of the columnar epithelium to HPV infection.

Parity is an important reproductive health characteristic factor associated with precancerous cervical lesion. A study conducted in public hospitals of Oromia region, Ethiopia states that women with parity of four or more children had two times higher odds being positive for cervical cancer as to those with parity of less than four. (AOR: 2.3, 95% CI: 1.3–4.0) [44]. Another study conducted at Debre Markos referral hospital, East Gojjam states that parity greater than three (AOR 10.9, 95 % CI: 4.2 - 16.8, $p < 0.001$) was significantly associated with precancerous cervical lesion [34]. A study conducted in Jimma Ethiopia also indicated that multiparity of women who had more than 4 children is strongly related with the development of cervical cancer (OR =10.3, 95% CI= 3.6-29.0) [19].

Menstrual history is also another risk factor associated with precancerous cervical lesion. A study conducted in Adama Hospital Medical College; indicated that in women with absence of menses were 82 % less likely to have precancerous cervical lesion compared to those who had a regular menstrual history (AOR) = 0.18, 95% CI:.04-0.87) [45]. The higher prevalence for those women who didn't see menses could be attributed to their practices; for example, material used for protection during menstruation; could increase the risk of human papillomavirus infections. Another study conducted in public hospitals of Oromia region confirmed that women with a history of postcoital bleeding had three times higher odds of developing precancerous cervical lesion than those who didn't have postcoital bleeding (AOR: 3.3, 95% CI: 1.2–8.0) [44].

2.2.3. Lifestyle & Sexual Behavioral Characteristics

According to the previous study conducted in Jimma, Age at first sex was stated as a risk factor for the increasing risk of precancerous cervical lesion. The study refers that initiation of sexual intercourse earlier than 16 years was found to be an independent predictor increasing the risk of VIA positive by 2.2 times as compared to clients who started at the age of 16 or more years (AOR=2.2;95 % CI:1.1-4.3) [31]. Another study in Bahirdar town, Ethiopia states that women who had a history of early initiation of first sexual intercourse before 18 years and less were at a higher risk to develop precancerous cervical lesion than

those whose age is ≥18 years' age (AOR = 1.68, 95% CI: 1.015–2.804) [46]. This study is also strengthened by another finding in Adama town, where initiation of sexual intercourse earlier than the age of 15 years has 5.6 times risk for the development of precancerous cervical lesion (AOR = 6.703; P < 0.001) [43].

Different studies confirmed that having multiple sexual partners and a partner who had a partner having another sexual partner were both a strong association with precancerous cervical lesion. A study conducted in Adama town confirmed that having more five sexual partners has six times risk to develop precancerous cervical lesion (AOR = 5.864; 95% CI: 2.677-12.843; P < 0.0) [43]. Another study in Adama hospital medical college states that women who had a partner having another sexual partner were more likely to have precancerous cervical lesion compared to those who had partner not having another sexual partner (AOR = 2.41; 95% CI: 1.08-5.38) [45]. Both studies stated that, sexual activity may increase the chance of transmission of human papilloma virus (HPV). Studies also relates having fewer sexual partners with fewer chances to encounter someone who has HPV infection.

Previous history of sexually transmitted was found to be one of the risk factors for developing precancerous cervical lesion. Studies conducted in public hospitals of Oromia region (AOR: 1.9, 95% CI:1.1–3.5)[44], Adama hospital medical college (AOR = 2.65; 95% CI:1.26, 5.56)[45], Adama town (AOR = 2.485; P < 0.015)[43], south Ethiopian (AOR=2.30;95% CI:1.23-4.29)[30], east Gojjam (AOR=3.40, 95% CI: 1.32–8.78)[34], north Ethiopia (AOR = 49.88, 95% CI: 16.59-149.91)[29] and Bahirdar town (AOR =1.74, 95% CI:1.087–2.790) [46] confirmed that women had a previous history of STIs were more likely to have precancerous cervical lesion as compared to those who didn't have the infection.

As studies suggested, previous history of smoking had a positive association with prevalence of cervical lesion. A study conducted in public hospitals of Oromia region suggested that women who have a history of smoking had nine times higher odds of having cervical lesion than non-smokers (AOR: 8.9, 95% CI: 1.6–48.0) [44]. A European prospective investigation also reported that a reported smoking status was associated with a two-fold increased risk of

cervical cancer and long-term smoking more than 8years was associated with increased risk of cervical intraepithelial neoplasia grade 3 or more [47,48].

HIV status is also reported as a risk factor for the development of precancerous cervical lesion in many studies. For example, a study conducted in east Gojjam, northwest Ethiopia confirmed that women who had HIV-Positive status were 4.8 times as likely to have precancerous cervical lesion as HIV-negatives (AOR= 4.89, 95% CI: 1.54–15.49) [34]. Other studies conducted in southern Ethiopia also confirmed a higher prevalence of precancerous cervical lesion (22.1%) (95% CI: 18.3-25.9) among HIV-Positive women [30]. Both studies explained that high prevalence of precancerous lesion in HIV-Positive women reveals that cervical cancer is a significant public health problem among HIV-infected women.

2.3. Conceptual Framework

The conceptual framework was adapted after reviewing different literatures. This conceptual framework shows linkage how sociodemographic characteristics, reproductive characteristics and patients factors associated with precancerous cervical lesion. Conceptual framework showing factors associated with precancerous cervical lesion were shown in Figure 1.

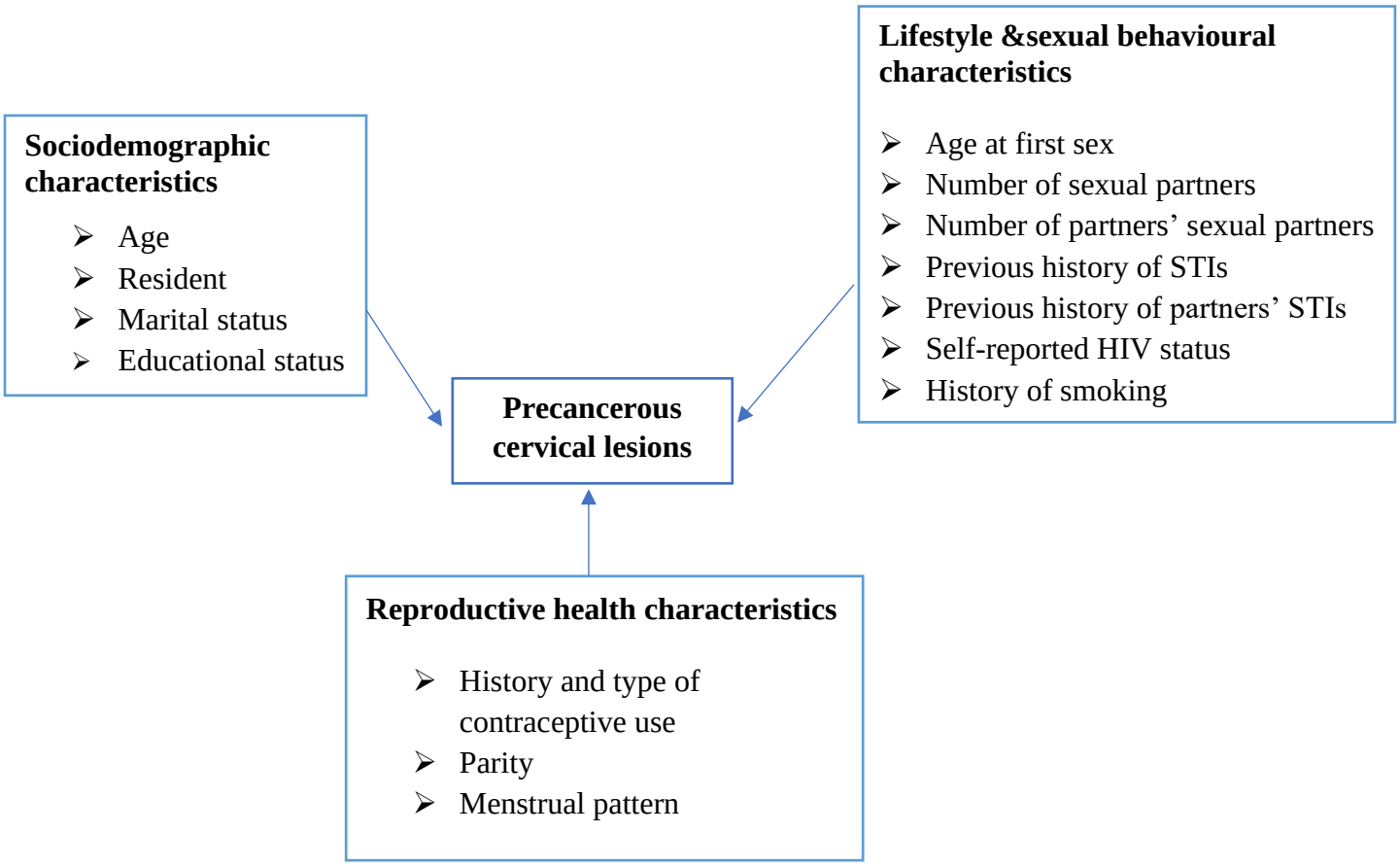

Figure 1 Conceptual framework showing factors associated with precancerous cervical lesion

3. OBJECTIVES

3.1. General Objective

- To assess the prevalence of precancerous cervical lesion and its associated factors among women visited Jimma university medical center, Jimma, Southwest Ethiopia

3.2. Specific Objectives

- To determine the prevalence of precancerous cervical lesions among women visited Jimma university medical center, Jimma, Southwest Ethiopia,
- To identify the factors associated with precancerous cervical lesions among women visited Jimma university medical center, Jimma, Southwest Ethiopia,

4. METHODS AND MATERIALS

4.1. Study Area

The study was conducted at Jimma university medical center (JUMC), located in Jimma City (352 Km south-west of Addis Ababa). It is one of the oldest (established in 1930) teaching and referral hospitals in southwest Ethiopia [49].

Currently, the hospital serves as referral center for surrounding health centers and has the capacity of 800 beds. It is providing services for approximately 15,000 inpatient, 160,000 outpatient attendants, 11,000 emergency cases, and 4500 deliveries/year from the catchment population of 15 million people. It has 1600 staff members and 32 care units.

4.2. Study Design and Period

An institution-based retrospective (among women screened for cervical cancer from September 2017 to August 2021) cross-sectional study. Data was collected from October 15 - 30, 2021

4.3. Population

4.3.1. Source Population

The source population was all women of reproductive age group who came for cervical cancer screening from September 2017 to August 2021 at Jimma University Medical Center gynecology and obstetrics department.

4.3.2. Study Population

The study population was randomly selected women of reproductive age group who came for cervical cancer screening at Jimma University Medical Center (JUMC) gynecology and obstetrics department from September 2017 to August 2021 fulfilling eligibility criteria.

4.4. Eligibility Criteria

4.4.1. Inclusion Criteria

Randomly selected medical records of women of reproductive age group that came to gynecology and obstetrics department of JUMC for screening from September 2017 to August 2021 was included.

4.4.2. Exclusion Criteria

Medical records of women of reproductive age group with incomplete information which missed more than 10% of the variables and records lost during the time of data collection were considered as exclusion criteria.

4.5. Sample Size and sampling technique and procedure

4.5.1. Sample Size Determination

Sample size was determined using a single population proportion formula by considering the following assumptions: 12.9% proportion (P) of precancerous cervical finding among clients reported previously from Ethiopia such as Family Guidance Association of Ethiopia, in Jimma Ethiopia; 95% confidence interval; margin of error 5% and 10% nonresponse rate.
Enter here the formula

$$n = \frac{Z\alpha/2)\,(p)(q)}{(d^2)}$$

Where,

n= sample size

Zα/2 at 95% confidence interval= 1.96

P= Prevalence, 12.9% % from the study conducted in Jimma; Ethiopia by Deksissa et al., 2015 [31].

D= margin of error (0.05)

$$n = \frac{(1.96)^2\ 0.129(1-0.129)}{(0.05)^2} = 173$$

10% non-response rate was added for incomplete records

n= 173+ (173*10/100) = 190

Therefore, total sample size calculated was 190

4.5.2. Sampling Technique and Procedure

The medical records number (MRN) of all women of reproductive age group was collected from gynecology and obstetrics department of JUMC health management information system (HMIS) registration book within the study period. A systematic random sampling technique was employed to select the study population. The ordering number on the gynecology and obstetrics department ward logbook of five years (September 2017 to August 2021) was used to find the sampling frame and to employ the interval technique. Every 17th card number was selected by taking the 3rd one as a random start. This is by taking the total number of patients admitted from September 2017 to August 2021 (3235) and dividing by total sample size (190).

4.6. Variables of the Study

4.6.1. Dependent Variable

Precancerous Cervical Lesions

4.6.2. Independent Variables

Sociodemographic characteristics

- Age
- Resident
- Marital status
- Educational status

Lifestyle and Sexual Behaviour characteristics

- Age of first sexual practice
- Smoking

- History of STI
- Multi-sexual partner
- HIV Status

Reproductive characteristics

- History and type of Contraceptive use
- Parity
- Menstrual pattern

4.7. Operational definitions

Visual Inspection of the Cervix with Acetic Acid (VIA)
Screening method which involves naked-eye inspection of the uterine cervix 1 min after application of a 3–5% solution of acetic acid using a cotton swab or a spray

VIA Positive test result: presence of raised and thickened white plaques or aceto-white epithelium, usually near squama-columnar junction (SCJ).

VIA Negative result: presence of smooth, pink, uniform and featureless cervix, cervical ectropion, polyp, cervicitis, inflammation and/or cyst after applying dilute solution of acetic acid

Precancerous Lesion of the Cervix
A premalignant lesion of the uterine cervix that can progress to cervical cancer if left untreated

Sexually Transmitted Infections (STI)
In this study, STI refers to women with a history of STI related syndromes such as lower abdominal pain, vaginal discharge, pain in urination, genital ulcer, and/or inguinal bubo that was indicated in records reviewed.

4.8. Data Collection Tools, Personnel, and Procedures

4.8.1. Data Collection Tools and Techniques

The data were collected by using a structured checklist which is adapted and modified from previous literatures. First MRN was taken from Health Management Information System (HMIS) registration book. Then patient medical cards were obtained from the patients' chart room. Necessary information was extracted from the card and patient history in medical card based the inclusion and exclusion criteria. These includes, time of examination, sociodemographic characteristics (age, resident, educational level, and marital status), client related information's (age of first sexual intercourse, smoking, history of STI, multiple sexual partner and HIV status) and clients reproductive characteristics (parity, history and types of contraceptive use and menstrual pattern).

4.8.2. Data Collectors

The data were collected by two nurses (one midwifery and one general nurse) working in the hospital who were trained on data collection tools for half day. To maintain the quality of the data, the data collection process was supervised by the principal investigator and the general practitioner from gynecology and obstetrics department.

4.8.3. Data Collection Procedure

The data collection process was started after getting the permission letter from the department to the hospital so that it is possible to communicate gynecology and obstetrics department. JUMC was selected hence it is the only institution who performed cervical cancer screening by the time of data collection. A systematic random sampling method was applied to choose the study populations.

4.8.4. Data Quality Assurance

Data collectors and supervisors were trained for half day before data collection on data collection techniques and tools. A pre-test was performed on 5% of the total sample size of the patients' card before data collection to give the necessary correction on the checklist. The principal investigator has checked the data for completeness and consistency daily.

4.8.5. Data Management

Information was extracted from the medical card and inpatients logbook via a structured data collection tool which is adjusted according to its result from the pre-test. Data entry and management were done by creating variables for data coding and assigning numerical values for quantitative analysis.

4.9. Data Analysis

Data were entered into Epi-Data version 3.1 and then exported to SPSS version 21 for analysis. Descriptive statistics such as frequency, proportion percentage, mean with standard deviation, or median with interquartile range were computed based on the nature of variables. Besides. the assumption of independent variables correlation and the presence of possible outliers was checked. Bivariate and multivariable logistic regression analysis was employed to identify factors associated with precancerous cervical lesions. Factors with a p-value of less than 0.25 in the bivariate logistic regression analysis became a candidate variable to enter the multivariable logistic regression analysis. Multivariable logistic regression analysis was fitted to control confounding variables and to identify independent factors associated with precancerous cervical lesions. The odds ratio with 95% CI and p-value were used to declare statistical significance. P-values of less than 0.05 was considered statistically significant factors associated with precancerous cervical lesions. Goodness of model fitness has checked via Hosmer-Leme show Test and p-value above 0.05 was counted as test satisfied.

4.10. Ethical Consideration

Ethical clearance for the study was obtained from the Ethical Review Board of Jimma University Institute of Health on 05/10/2020. After approval from Jimma University Institute of Health Research and Postgraduate IRB granted official letter was written from the biomedical sciences department to Jimma medical center. A permission letter was obtained from the hospital administrative body for the gynecology and obstetrics department of JUMC before data collection. Privacy of the patient was kept confidentially by using codes on the checklist.

4.11. Dissemination Plan

The final report of this study will be presented, and a comprehensive report will be submitted to Jimma University, Biomedical Department, and Anatomy course unit as partial fulfillment for the requirement of Master of Science in clinical anatomy. It is also planned to communicate the Finding to relevant and concerned/ responsible bodies. It will be ready for users at the health science library of Jimma University. Lastly, efforts will be made to publish the paper in an international journal.

5. RESULTS

5.1. Socio-demographic Characteristics

A total of 190 women of reproductive age group who came to Jimma university medical center gynecology and obstetrics department for cervical screening from 2017-2021 were included in the study. The age of the participants ranged from 20 to 52 years, with a mean (+standard deviation) age of 33.78 ±6.46 where, the majority 134 (70.2%) of them were aged ≤35 years and the rest 56 (29.5%) were in the age group of >35 years. Majority of participants were rural dwellers (70%). Among the study participants, 86.3% and 68.4 % of them were married and primary and below in education. Sociodemographic characteristics of the participants were shown in Table 1.

Table 1 Socio-demographic characteristics of participants at JUMC, Jimma Southwest Ethiopia, September 2017- August 2021

Variables	Frequency (n)	Percentage
Age in years (N=190)		
≤35	134	70.5
>35	56	29.5
Residence (N=190)		
Rural	133	70.0
Urban	57	30.0
Marital Status (N=190)		
Non-married*	26	13.7
Married	164	86.3
Educational Status (N=190)		
Primary and below	130	68.4
Secondary and above	60	31.6

* Non-married includes single, widowed, and divorced

5.2. Reproductive Health Characteristics

In this study, 58(30.5%) of the participants had used contraception: 7(3.7%),12(6.3) and 31(16.3%) used pills, implant and injectables respectively. Eight (4.2%) of participants reported the use of (IUCD (five), bilateral tubal ligation (BTL)(one), condom(one) and calendar methods (one). Most of the respondents (169(88.9%) had one and above babies and the rest 21(11.1%) didn't gave birth. A majority (119, 62.6%) had an irregular menstrual pattern and 5(2.6%) of the participants encountered postcoital spotting. Reproductive health characteristics of the participants were shown in Table 2.

Table 2 Reproductive characteristics of participants at JUMC, Jimma Southwest Ethiopia, September 2017- August 2021

Variables	**Frequency (n)**	**Percentage**
History of contraceptive use (N=190)		
Yes	58	30.5
No	132	69.5
Type of contraceptive use (N=58)		
Pills	7	3.7
Implant	12	6.3
Injectables	31	16.3
Others*	8	4.2
Parity (N=190)		
Nulliparous	21	11.1
Primiparous and more	169	88.9
Menstrual Pattern (N=190)		
Regular	54	28.4
Irregular	119	62.6
Menopause	12	6.3
Postcoital spotting	5	2.6

*Other includes IUCD, BTL, Condom & Calendar method

5.3. Lifestyle and Sexual Behavior Characteristics

The majority 185(97.4%) of the respondents had never been screened for cervical cancer before. The mean age of first sexual intercourse of women was 17.55+3.01 SD where the majority 109 (57.4%) of the participants reported their first sexual intercourse were below 18 years. One hundred eighty-six (97.9%) participants didn't have a history of smoking. Three fourths of the participants 141 (74.2%) and 107 (56.3%) of their partners had history of sexual intercourse with one person. Forty-two (22.1%) of the participants and 35 (18.4%) of the participants' partners had a history of sexually transmitted infections (STI). The majority 97 (55.8) of the participants reported their HIV status as negative; and 11 (5.8%) of the participants reported their status as reactive. All reactive participants were following highly active antiretroviral therapy (HAART). Lifestyle and sexual behavior characteristics of the participants were shown in Table 3.

Table 3 Lifestyle and sexual behavior characteristics of participants at JUMC, Jimma Southwest Ethiopia, September 2017- August 2021

Variables	Frequency (n)	Percentage (%)
Previously screened for cervical lesion (N=190)		
First time	185	97.4
Second time	5	2.6
Age at first sex (N=190)		
<18	109	57.4
≥ 18	81	42.6
History of smoking (N=190)		
Yes	4	2.1
No	186	97.9
Number of sexual partners (N=190)		
One	141	74.2
Multiple	49	25.8
Number of partners' sexual partners (N=190)		
One	107	56.3
Multiple	76	40.0
Unknown	7	3.7
Previous history of STI (N=190)		
Yes	42	22.1
No	148	77.9
Previous history of partners' STI status (N=190)		
Yes	35	18.4
No	142	74.7
Unknown	13	6.8
Self-reported HIV status (N=190)		
Positive	11	5.8
Negative	97	51.1
Unknown	82	43.2
HIV positives currently on HAART (N=11)		
Yes	11	100%
No	-	-

5.4. Prevalence of Precancerous Cervical Lesion

Out of 190 screened women of reproductive age group, 6.84% (95 %CL=3.7-11.4) were found to be positive for precancerous cervical lesion while 93.16% had negative test result. All participants who were positive for precancerous cervical lesion were eligible for cryotherapy. Among a total of 190 participants, 170 (89.5%) were counseled to return in five

years and 13(6.8%), 3(1.6%) and 4(2.1%) were recommended to return in one, two and three years respectively. The prevalence of precancerous cervical lesion of the participants were shown in Figure 2.

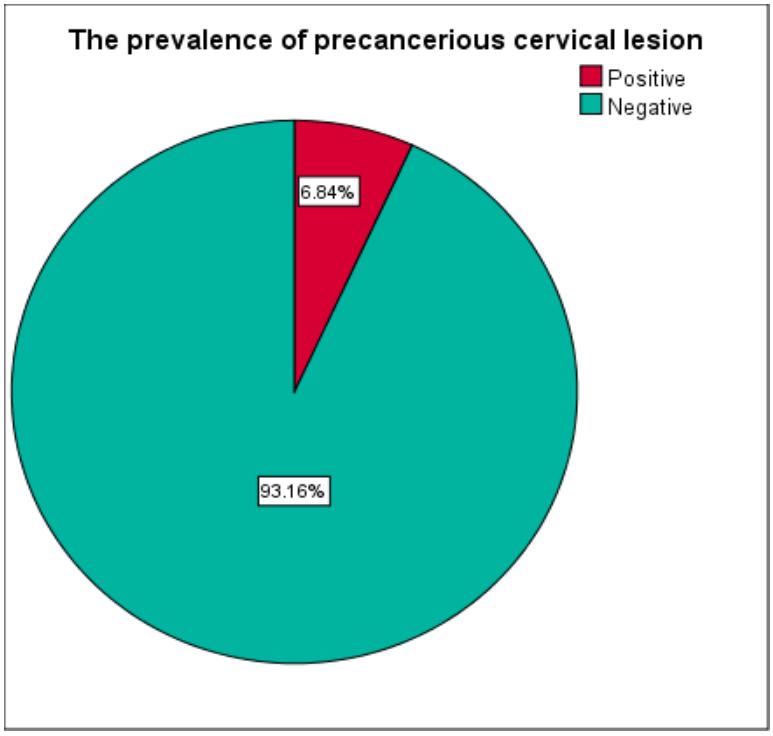

Figure 2 The prevalence of precancerous cervical lesion among women at JUMC, Jimma Southwest Ethiopia, September 2017-August 2021

5.5. Factors Associated with Precancerous Lesions of the Cervix

Bivariate logistic regression analysis was conducted first to assess any association between individual independent variables and prevalence of cervical lesion. Variables having a p-value less than 0.25 in bivariable logistic regression analysis were selected as a candidate variable to be included in multivariable logistic regression analysis. In bivariate analysis outcome, age of the respondent, educational status, age at first sexual intercourse, parity, menstrual pattern, number of sexual partners and previous history of STI were associated with outcome variables. Bivariable logistic regression for factors associated with prevalence of precancerous cervical lesion were shown in Table 4.

Table 4 Bivariable logistic regression for factors associated with prevalence of precancerous cervical lesion at JUMC, Jimma Southwest Ethiopia, September 2017- August 2021

Variables	Prevalence of cervical lesion		COR (95%CI)	P-value
	Positive	Negative		
Age				
≤35	4(3%)	130(97%)	1	
>35	9(16.1%)	47 (83.9%)	6.22(1.83-21.16)	0.003
Education				
Primary and below	11(8.5%)	119(91.5%)	2.68(0.57-12.4)	
Secondary and above	2(3.3%)	58(96.7%)	1	0.20
Age at first sex				
<18	11(10.1%)	98(89.9%)	4.43(0.95-20.59)	0.057
≥18	2(2.5%)	79(97.5%)	1	
Parity				
Nulliparous	3(14.3%)	18(85.7%)	1	
Primiparous and more	10(5.9%)	159(94.1%)	0.37(0.09-1.49)	0.16
Menstrual Pattern				0.095
Regular	4(7.4%)	50(92.6%)	1	
Irregular	6(5%)	113(95%)	1.2(0.015-0.94)	0.04
Menopause	1(8.3%)	11(91.7%)	0.08(0.01-0.57)	0.01
Postcoital spotting	2(40%)	3(60.0%)	0.15(0.13-0.00)	0.15
Number of sexual Partners				
One	5(3.5%)	136(96.5%)	1	
Multiple	8(16.3%)	41(83.7%)	5.30(1.64-17.11)	0.00
Previous history of STI				
Yes	9(21.4%)	33(78.6%)	9.81(2.85-33.82)	0.00
No	4(2.7%)	144(97.3%)	1	

After controlling the effect of other confounding factors on multivariate analysis, age of the participant, educational status and previous history of sexually transmitted diseases were found to be significantly associated with precancerous cervical lesion at p-value <0.05. Women aged above 35 years were 5.4 times more likely to have precancerous cervical lesion compared as those aged below or equal to 35 years (AOR=5.43 95%CI:1.02-28.82).

Odds of having precancerous cervical lesion among women who had primary and below education were 8.84 times likely to develop precancerous cervical lesions compared with to those women who had secondary and above educational level (AOR=8.84:95%CI: 1.03-75.05). Women who had a previous history of sexually transmitted infection were 7.71 times as likely to develop precancerous cervical lesion as those who hadn't previous history of STI (AOR=7.71:95%CI:1.53-38.89). Multivariable logistic regression analysis for factors associated with precancerous cervical lesion were shown in Table 5.

Table 5 Multivariable logistic regression analysis showing factors associated with precancerous cervical lesion at JUMC, Jimma Southwest Ethiopia, September 2017- August 2021

Variables	Prevalence of cervical lesion		AOR (95%CI)	P-value
	Positive	Negative		
Age				
≤35	4(3%)	130(97%)	1	
>35	9(16.1%)	47 (83.9%)	5.43(1.02-28.82)	**0.046***
Education				
Primary and below	11(8.5%)	119(91.5%)	8.84(1.03-75.05)	**0.047***
Secondary and above	2(3.3%)	58(96.7%)	1	
Age at first sex				
<18	11(10.1%)	98(89.9%)	2.62(0.38-18.11)	0.32
≥18	2(2.5%)	79(97.5%)	1	
Parity				
Nulliparous	3(14.3%)	18(85.7%)	1	
Primiparous and more	10(5.9%)	159(94.1%)	0.37(0.05-2.49)	0.31
Menstrual Pattern				
Regular	4(7.4%)	50(92.6%)	1	0.15
Irregular	6(5%)	113(95%)	0.35(0.02-6.16)	0.47
Menopause	1(8.3%)	11(91.7%)	0.07(0.00-1.20)	0.06
Post-coital spotting	2(40%)	3(60.0%)	0.18(0.00-6.15)	0.34
Number of sexual Partners				
One	5(3.5%)	136(96.5%)	1	
Multiple	8(16.3%)	41(83.7%)	2.85(0.63-12.74)	0.17
Previous history of STI				
Yes	9(21.4%)	33(78.6%)	7.71(1.5-38.89)	**0.013***
No	4(2.7%)	144(97.3%)	1	

6. DISCUSSION

This study was to assess the prevalence of precancerous cervical lesion and associated factors among women attending cervical screening at Jimma university medical center, southwest Ethiopia. The prevalence of precancerous cervical lesion in the study area was found to be 6.84%, indicating a significant public health problem among women of reproductive age found in the study area. The finding of this study is similar with the finding of studies conducted in north Ethiopia (6.7%) [29], Dessie referral hospital, northeast Ethiopia (6.9%) [50], Bishoftu town East Shoa Zone (5.8%) [51], Rwanda (5.9%) [52] and southwest Shoa zone (7.3%) [53]. This similarity might be due to similarity of study subjects' age limit.

The finding of this study was lower than the estimated prevalence of precancerous lesions of the cervix among the general population of Ethiopia;13.4% [13]. The difference might be the data obtained from facilities based-screening report and the finding of current study is an institution-based retrospective cross-sectional.

Besides, the current study reveals lower prevalence rate than studies carried out at southern Ethiopia (22.1%) [30], Harar, Eastern Ethiopia (18.5%) [40], Adama Hospital Medical College, Central Ethiopia (15.7%) [45], East Gojjam, Northwest Ethiopia (15.3%) [34], Addis Ababa (12.8%) [7], Jimma model clinic of Family Guidance Associating (12.9%) [31], Hospitals of Amhara region (13.1%)[54], Bahir Dar, northwest Ethiopia (14.3%)[55], Tanzania (26.8%) [56], Malawi (12.4%), and Zambia (28%)[57]. This discrepancy may be due to differences, the study population, the study period, and the study population. Besides, since some of participants in some of the studies were HIV positive and this could increase the risk of acquiring precancerous lesions compared to the general population.

On the other hand, the finding of this study was slightly higher than studies carried out in Oromia region, Sude district which showed 4.7% precancerous cervical lesion [32]. This could be due to the age of study population, sample size and study period difference. This study was also higher than the studies conducted in Jakarta (4.7%) [58] and Cameron (3.9%) [59]. The difference in the prevalence might be due to difference in socio-demographic

characteristics of the study participants and, availability or accessibility of screening and treatment programs among the three countries.

In this study, different factors were identified that can be associated with the precancerous cervical lesion. Women aged above 35 years were 5.4 times more likely to have precancerous cervical lesion compared as those aged below or equal to 35 years (AOR= 5.43:95%CI:1.02,28.82). The finding is in accordance with a previous study conducted in Jimma where older women (>40) are the most at risk for developing cervical cancer) (OR= 4.7; 95%CI= 2.3-9.6) [19]. The study is also in agreement with a study from Sude Oromia region, where being older age is significantly associated with higher risk of developing cervical lesion (AOR, 3.5; 95% CI: 1.32, 9.39) [32] Another study in Addis Ababa also confirmed that women aged ≥45 years had a higher odd of having precancerous cervical lesion compared to younger ages (≤ 24 years) (AOR = 8.1; 95%CI: 1.53–42.3) [33].

Many studies suggested that educational status of participants was found to have a substantial influence on the magnitude of precancerous cervical lesion [38, 39]. Women who have higher education and adequate information are more likely to protect themselves and seek cervical screening services; that aids from having abnormal cervical lesions. In other words, limited access to information and knowledge about cervical cancer may increase having of abnormal cervical lesions. In this study, women with primary and below education were found to have 8.84 times greater odds of having abnormal cervical lesions than women who achieved educational status of secondary and above .This finding agrees with finding from Harar, where no formal education was found to have 2.7 times higher odds to have precancerous cervical lesion (AOR-2.68 (CI-1.32-5.46)[40] and report from Zambia (AOR=0.48;95%CI:0.30-0.77)[41] and Kenya (AOR=0.97;95 CI:0.57-1.67)[42], where women who attained higher education had reduced risk of cervical lesion. However, this study is in contrary with study conducted in East Gojjam, where education wasn't significantly associated with precancerous cervical lesion [34]. Sample size or methodological differences could contribute for the discrepancies between the two studies.

This study also revealed that, women with previous history of sexually transmitted disease was significantly associated positive precancerous cervical lesions. Women who had

previous history of sexually transmitted disease were 7.71 times as likely to develop precancerous cervical lesion as compared to compared to those who did not have the infections (AOR=7.71:95%CI:1.53-38.89). This result was supported with a previous study public hospitals of Oromia region (AOR: 1.9, 95% CI:1.1–3.5) [44], Adama hospital medical college (AOR = 2.65; 95% CI (1.26, 5.56) [45], Adama town (AOR = 2.485; P < 0.015) [43]. The result is also in accordance with studies conducted South Ethiopian [95 % CI] 2.30 [1.23, 4.29]) [30], east Gojjam (AOR 3.40, 95% CI 1.32–8.78) [34], north Ethiopia (AOR = 49.88:95% CI 16.59, 149.91) [29] and Bahirdar town (AOR =1.74, 95% CI:1.087–2.790) [55]. In the contrary, the finding was different form study conducted in Mekelle hospitals, Northern Ethiopia, where sexually transmitted infection was not associated with the risk of precancerous cervical lesion. The difference might be a known HIV-positive status of participants; might protect them from STIs due to their awareness about possible infection for HIV [60].

According to different studies, lack of awareness and poor health seeking behavior for cervical cancer are common in Ethiopia [61,62]. This study also reveals 97.4 % of the study participants were never screened for precancerous cervical lesion before, suggesting the need of precancerous cervical lesion screening service at the community level that would be integrated with heath system by referral.

7. CONCLUSION AND RECOMMENDATION

7.1. Conclusion

The present study identified a prevalence of precancerous cervical lesion of 6.84%. Those aged >35 years had a higher risk of precancerous cervical lesions than those aged ≤35 years. Women with primary and below education were at risk of developing precancerous cervical lesions than women who achieved educational status of secondary and above. Women who had previous history of sexually transmitted disease had an increased risk of precancerous cervical lesions compared to those who did not have the infections. The majority of women in this study were never screened for precancerous cervical lesion before.

7.2. Recommendations

- Women aged >35 years, primary and below education, a history of STIs, and those with a higher risk of precancerous lesions should be encouraged to be screened frequently for cervical cancer.
- Cervical cancer screening and treatment services should be available and special consideration should be given for those women at a higher risk of precancerous cervical lesion.
- Appropriate community mobilization, campaigns, and education programs need to be employed for creation of awareness about precancerous cervical lesion at the study area.
- Policies and guidelines on the prevention and control of precancerous cervical lesions should be strengthened.
- Online based data recording mechanisms in hospitals are also recommended for appropriate taking of patient's medical record and not missing variables on records.

LIMITATION OF THE STUDY

One of the limitations for this study is the use of retrospective record review design. Besides, since some of the record client cards were incomplete, data collectors were obliged to skip those cards and, also was difficult for data collectors to collect full information. The low prevalence of precancerous of cervical lesion in this study might limit the ability to examine association with various risk factors. Since record review was used for this study, it was impossible to include some key characteristics such as occupation, awareness of cervical cancer, age at menarche, family member diagnosed with cervical cancer, duration of contraceptive use, history of genital ulcers, and so on that need to be included in this study. Finally, due to the nature of this study it was impossible to include and trace the cryotherapy status, reason for cryotherapy and the cryotherapy treatment outcome of those patients with positive VIA result.

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ANNEX

ANNEX I CHECK LIST

JIMMA UNIVERSITY

INSTITUT OF HEALTH

FACULTY OF MEDICAL SCIENCE

BIOMEDICAL SCIENCE DEPARTMENT

ANATOMY COURSE UNIT

Checklist prepared for a five years retrospective study on prevalence and associated factors of precancerous cervical lesions among women a Jimma medical center, Jimma, southwest, Ethiopia.

Patient card no: _____

PART 1: Socio-demographic characteristics,

1. Age _____

2. Residence

□ Rural □ Urban

3. Marital status

□ Single □ Divorced

□ Married □ Widowed

4. Educational status

□ Illiterate □ Secondary

□ can read and write □ Tertiary

□ Primary □ Unknown

PART 2: Reproductive characteristics,

1. History of contraceptive use

□ Yes □ No

2. Types of contraceptive use

□ Condom □ Pill

□ Implant □ Other

□ Injectable

3. Parity _____

4. Menstrual pattern

PART 3: Lifestyle & sexual behavioral characteristics

1. Age at first sex_____

2. Number of sexual partners

□ Patient ___ □ Partner___

3. Previous history of STI

- Patient
- Partner

□Yes □ Yes

□ No □ No

□ Unknown □ Unknown

4. Self-reported HIV status

□ Positive □ Negative

□ Unknown

5. Previous history of smoking

□ Yes □ No

6. History of abnormal pap

□ Yes □ No

PART 4: Cervical lesion screened

1. Cervical lesion

□ Positive □ Suspicious for cancer

□ Negative

2. Counseled to return in years_____

3. Eligible for Cryotherapy

□ Yes □ No

ANNEX II ETHICAL CLEARANCE

Jimma University Institute of Health

Institutional Review Board

Ref.No JIHRPGD/842/20

Date: 5/10/2020

To: Jalalli Takele:

Subject: Ethical Approval of Research Protocol

The IRB of Institute of Health has reviewed your research project **"Prevalence and Associated Factors of Precancerous Cervical Lesions Among Women Attending Hospitals In Jimma Town, Jimma, Southwest Ethiopia.**

Thus, this is to notify that this research protocol has presented to the IRB meets the ethical and scientific standards outlined in national and international guidelines. Hence, we are pleased to inform you that your research protocol is ethically cleared.

We strongly recommend that any significant deviation from the methodological details indicated in the approved protocol must be communicated to the IRB before it has been implemented.

With Regards!

Million Tesfaye, PhD
IRB chairperson
Tel: +251917063744
E-mail: mtesfaye1@gmail.com

ANNEX III DECLARATION

I, the undersigned, declare that this thesis is my original work and has never been presented for a degree in any other university and that all sources of materials used for this thesis have been duly acknowledged. The advisors' and examiners' comments have been duly considered.

Name:	Signature	Date
Jalalli Takele Negewo (B.Sc.)	_____	_____

APPROVED BY:

Advisors

Name of first Advisor	Signature	Date
Mr. Tilahun Alemayehu (B.Sc., MSc., Assistant Professor)	_____	_____

Name of the second Advisor	Signature	Date
Mr. Getachew Chanie (BSc., M.Sc.)	_____	_____