

Perceived Threats Towards Cervical Cancer Among Women ≥ 15 Years in Arsi Zone, Southeastern Ethiopia: A Community Based Cross-sectional Study

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Abstract: All cancer mortality accounted 18.4 per 100,000 in Ethiopia. Cancer of the cervix is the second common cause of cancer with incidence of 16.4 per 100,000 in the country. The aim of this study was to assess women's perception of susceptibility and severity of cervical cancer and their associate factors in Arsi zone, southeastern Ethiopia. A community based cross-sectional study design was carried out in Arsi zone, southeastern Ethiopia among 906 women aged ≥ 15 years using multi-stage sampling technique. Binary logistic regression model was used to determine the association of socio-demographic characteristics and reproductive variables on perceived threats to cervical cancer at p-value of <0.05 using SPSS. When perceived susceptibility and severity combined (perceived threat), 739 (81.9%) of women had low perceived threats to cervical cancer. Ever exposed to STI [AOR=5.8, 95% CI: (2.3-14.9)], ever heard of cervical cancer [AOR=1.87, 95% CI: (1.3-2.8)], ever heard cervical cancer screening [AOR=3.4, 95% CI: (1.7-6.9)], preferences of screening in the future [AOR=2.34, 95% CI: (1.18-4.62)], ever smoked [AOR=2.5, 95% CI: (1.1-5.9)] and ever had abortion [AOR=1.32, 95% CI: (1.05-2.25)] were independently associated with perceived threats to cervical cancer. Women who ever smoked had 2.5 times more likely to perceive threats towards cervical cancer than those non-smokers. The study found that more than one-third of women believed that they were not at risk of developing cervical cancer and the majority of them had lower perceived threats of cervical cancer, which could be a major obstacle in the uptake of cervical cancer screening in the community. Therefore, changing the women's perception of susceptibility and severity of the disease which enhances screening in the community was recommended.

Keywords: Cervical Cancer, Screening, Perceived Threats, Arsi Zone

1. Introduction

Cancer is a disease in which cells of the body grow abnormally. Cervical cancer is one of the easiest gynecological cancers that can be prevented through vaccination against HPV, regular screening, treatment and follows up. When cancer starts in the cervix, it is considered cervical cancer [1]. It is caused by external factors such as persistent infection with certain types of HPV commonly type 16 and 18, having sex at early stage, multiple sexual partner, smoking, diet low in fruit and vegetables, prolonged use of oral contraceptive pills (OCPs), having sexually

transmitted disease (STI) and multiparty. Internal factors such as inherited genetic mutation, HIV related suppressed immune condition and prolonged use of oral contraceptive pills/ hormones are also risk factors for cervical cancer [2, 3].

Ethiopia is the 33rd African countries in age-standardized incidence of cervical cancer and 27th cancer mortality accounting 18.4 per 100,000 population [4]. Cervical cancer is the second common cause of cancer in Ethiopia and its incidence is 16.4 per 100,000 [5]. Another study in Ethiopia revealed that 16,622 new cases of cancer in the Black Lion Specialized Hospital (BLSH) registry data set were diagnosed between 1997 and 2012. Out of these, about 5293

with prevalence of 31.8% were cervical cancer patients [6]. The most prevalent cancers in Ethiopia among the adult population are breast cancer (30.2%), cancer of the cervix (13.4%) and colorectal cancer (5.7%). About two-thirds of reported annual cancer deaths occur among women [7].

Cervical cancer is often at an advanced stage by the time women seek screening services. This late diagnosis may be due to different perception of the women about the disease or absence of services or women may not know risk factors and whether they exposed or not to the diseases [8]. The perception of women using Health Belief Model constructs were not addressed quantitatively. Moreover, this study assessed the association of behavioral risk factors with perception which was not addressed in the previous studies. This includes the history of early sexual initiation, history of multiple sexual partners, history of smoking, and history of an STI/HPV. Before the establishment of decentralization program, understanding women's perceived susceptibility and severity towards cervical cancer across the district hold tremendous importance.

2. Methods

2.1. Study Setting and Period

This study was carried out in Arsi zone, Oromia Regional State of Ethiopia. Arsi zone is found in the southeastern part of the country and it is one of the 21 zones and 6 special zones found in Oromia Regional State. According to the 2017 Zonal Health Department report, the zone has 25 districts, 498 rural and 58 urban Kebeles. Arsi zone is bordered on the southern by Bale zone, on the southwestern by West Arsi zone, on the northwestern by East Shewa, on the northern by Afar Regional State and on the eastern by West Hararghe zone. The study was undergone in 4 districts (Hetosa, Limmu-Bilbilo, Digalu-Tijjo and Robe Dida'a districts) and 20 selected kebeles in the zone.

According to the 2007, population census conducted by the CSA of Ethiopia the projected population of the zone in the year 2017 was 3,459,322. About 832,000 were women age >15 years [9]. The study period took place from February 15 to March 30, 2017.

2.2. Study Design and Population

We carried out community based cross-sectional study design. The source population of this study was all women populations residing in the Arsi zone during the study period and all women aged ≥ 15 years residing in the selected districts in the zone, during the data collection were the study population. All women ≥ 15 years residing in the selected kebeles and participated in the study were study samples.

2.3. Inclusion and Exclusion Criteria

All women whose age ≥ 15 years in the community at the time of data collection and volunteer to participate in the study was included and critically ill and women with psychiatric problems were not interviewed.

2.4. Sample Size Determination and Sampling Technique

The base line of the sample size required for this study was determined by using the formula of single population proportion (n):

$$n = \frac{(Z_{\alpha/2})^2 \times P(1 - P)}{d^2}$$

n=Sample size required

$Z_{\alpha/2}$ =confidence interval at 95% (standard value of 1.96)

d= precision (margin of error) at 5% (standard value of 0.05)

P=estimated knowledge of cervical cancer (31%) taken from a study in Gonder town of Northwest Ethiopia [10]

$$n = \frac{(1.96)^2 \times 0.31(1-0.31)}{(0.05)^2} = 329$$

By considering the design effect of 2.5 in this study: $n \times D = 329 \times 2.5 = 822.5 \approx 823$. The sample size was further increased by 10% due to non-response rate or record error. The final sample size will be $n + (10\% \times n) = 823 + (823 \times 10\%) \approx 906$

A multi-stage sampling technique was used to select the participants. Accordingly, four districts among 25 districts in Arsi zone were selected by a simple random sampling (SRS) technique as primary sampling units. Among selected districts, five Kebeles from each district were selected again by the SRS method as the secondary sampling unit among more than 20 Kebele in each selected district. In each selected Kebeles, one development army (DA) was selected. In each selected development army, 2-3 development teams (DT) were selected by SRS technique. Each development team has a list of households. The first household was selected by lottery method. To obtain the interval (sampling fraction), the number of households in each team was divided by the required sample for that specific team. Then women aged ≥ 15 years was interviewed from house to house by the method of systematic random sampling. We interviewed around 191 to 253 women from each district, proportionally allocated sample size for each selected district, Kebele and development team with a cumulative of 906 participants in this study.

2.5. Study Variables

2.5.1. Dependent Variables

High perceived threats, low perceived threats.

2.5.2. Independent Variables

Socio-demographic variables (educational status, age, place of residence, religion, ethnicity, occupational status, marital status), behavioral risk factors for cervical cancer (parity, ever exposed to STI, ever smoked, ever used OCP, early sexual debut, having many sexual partner, age at first pregnancy, ever had history of abortion, having partner with many sexual partners previously) and other variables which include: monthly income, ever heard cervical cancer, ever heard of screening and preference of screening.

2.6. Data Collection

In this study, the data was collected using interview based questionnaire. The instrument was designed based on study objectives and taken by reviewing different previous studies with modification [11-13]. The data collectors were assigned from Health Extension Workers. The instrument was pre-tested on 5% of the sample size among 45 women in near Kebeles not included in the actual sample. Clarity of the questions, validity and logical consistency of the questionnaire was modified accordingly. The instrument was translated into the local language (Afan Oromo) in order to make clear the interview for the participants and back to English during data analysis.

2.7. Operational Definitions

Perception: The way in which cervical cancer and screening regarded, understood or interpreted by women, the way women think about or understand people with cervical cancer, and screening

Perceived threat: combination of perceived susceptibility (risk of having cervical cancer) and perceived severity (view of the seriousness of cervical cancer)

Perception measurement: Responses were recorded based on responses ranging from “yes” to “don’t know”. Values were given one for ‘Yes’, and zero for ‘No’ or ‘don’t know’ answers. The maximum total score was $4 \times 1 = 4$. If the score of the participant was >3 points or $>75\%$, they were categorized as higher perceived threats otherwise lower perceived threats.

Screening: a procedure used to identify cervical cancer lesions among asymptomatic individuals

Development Army: consists of 12-15 development teams

Development Team: consists of 20-30 households

2.8. Data Processing and Analysis Procedure

Data was coded and entered into Epi info 7, then exported into the SPSS 20.0 version software for analysis. Binary logistic regression analysis was used to determine the effect of socio-demographic characteristics on perceived threats of

cervical cancer. Both crude and adjusted measures of association were considered for all variables. An odd of ratio with 95% confidence interval was used to identify the association. The significance of the association was considered at p-value of <0.05 . Missing values were excluded from data analysis. Pearson chi-square test was used at the primary stage of variable selection into binary logistic regression model. All significant variables at X^2 -test were entered into binary and multivariate logistic regression model with backward stepwise variable entry method.

2.9. Data Quality Assurance

In order to protect the quality of data, the instrument was developed, pre-tested for simplicity, appropriateness and consistency. The Cronbach’s alpha coefficient was calculated to measure the internal consistency of Likert-type scales with the help of SPSS in measuring women’s perception. Accordingly, the Cronbach’s alpha coefficient was 0.72 for perceived threat of cervical cancer.

2.10. Ethical Considerations

This study was carried out after ethical approval taken from the Ethics Committee Review Board in Mekelle University, College of Health Science. During the data collection process, verbal informed consent was obtained from each participant. Those participants age < 18 years were asked, if their mother was not available at the time of data collection and after permission or verbal consent was obtained from father or elders.

3. Results

3.1. Socio-demographic Characteristics of the Study Population

In this study, a total of 906 women having an age range of 15 to 62 years participated in the study with a mean of 31.06 years (SD = +7.71) [Table 1)

Table 1. Socio-demographic characteristics of women participated in the study in Arsi zone, Southeastern Ethiopia, February-March, 2017.

| Variables | Frequency (n=906) | Percentage |
|---------------------|-------------------|------------|
| Age in years | 15-24 | 17.55% |
| | 25-34 | 49.78% |
| | 35-44 | 26.60% |
| | 45-54 | 4.97% |
| | 55-64 | 1.10% |
| Place of residence | Rural | 84.5% |
| | Semi-urban | 15.5% |
| | Muslim | 52.5% |
| Religion | Orthodox | 41.9% |
| | Protestant | 5.1% |
| | Others | 4 |
| | Married | 84.3% |
| Marital status | Single | 6.7% |
| | Widowed | 5.3% |
| | Divorced | 3.6% |
| | Housewife | 80.9% |
| Occupational status | Merchant | 8.8% |
| | Student | 5.1% |

| Variables | | Frequency (n=906) | Percentage |
|------------------------------------|-------------------------|-------------------|------------|
| Ethnicity | Employed | 40 | 4.4% |
| | Others | 7 | |
| | Oromo | 804 | 88.7% |
| | Amahara | 97 | 10.7% |
| | Others | 5 | |
| Educational status | Not read and write | 212 | 23.4% |
| | Read and write | 238 | 26.3% |
| | Primary (1-8 grades) | 345 | 38.1% |
| | Secondary (9-12 grades) | 68 | 7.5% |
| | Diploma | 30 | 3.3% |
| | Degree and above | 13 | 1.4% |
| Monthly household income (ET Birr) | <500 | 233 | 25.72% |
| | 500-1000 | 284 | 31.35% |
| | 1001-1500 | 144 | 15.89% |
| | 1501-2000 | 95 | 10.49% |
| | 2001-2500 | 48 | 5.30% |
| | >2500 | 102 | 11.25% |

3.2. Perceived Susceptibility and Severity (Perceived Threats) to Cervical Cancer

Perceived susceptibility and severity of cervical cancer is generally known as perceived threats. There were two items exploring perceived susceptibility or risk to cervical cancer and two items of perceived severity exploring participants' perception in this study. About 739 (81.9%) of women had low perceived threats to cervical cancer. Table 2 presents the frequency of perceived threats to cervical cancer among women in Arsi zone.

Table 2. Perceived threats of cervical cancer among women in Arsi zone, Southeastern Ethiopia, February-March 2017.

| Perceived threats of cervical cancer | Yes | No | Uncertain/don't know |
|--|------------|------------|----------------------|
| | N (%) | N (%) | N (%) |
| Do you think that you will be at risk of developing cervical cancer? | 139(15.3%) | 347(38.3%) | 420(46.4%) |
| Older women (>30 years) are more at risk of developing cervical cancer | 153(16.8%) | 169(18.7%) | 584(64.5%) |
| Do you think that Cervical cancer is a serious disease? | 458(50.5%) | 102(11.3%) | 346(38.2%) |
| Do you think that cervical cancer causes a serious consequence? | 496(54.7%) | 85(9.4%) | 325(35.9%) |

3.3. Description of Perception Category with Screening Status of Women

The study found that majority of ever screened had a higher perceived threats of cervical cancer screening. (Table 3)

Table 3. Description of perception category with screening status of women in Arsi zone, Southeastern Ethiopia, February- March 2017.

| Knowledge and perception category | | Screening status | |
|--|------|------------------|------------|
| | | Ever screened | |
| | | Yes (n=9) | No (n=897) |
| | | N (%) | N (%) |
| Knowledge towards cervical cancer and screening | Good | 6 | 167(18.6%) |
| | Poor | 3 | 730(81.4%) |
| Perceived Threats of cervical cancer | High | 6 | 161(17.9%) |
| | Low | 3 | 736(82.1%) |
| Perception of women towards women with cervical cancer | High | 2 | 298(33.2%) |
| | Low | 7 | 599(66.8%) |

3.4. Assessment of Reproductive Health History and Occurrence of Risk Factors (Exposure Status) Among Women Towards Cervical Cancer

The study concentrated on behavioral risk factors, whether women exposed to these factors and to analyze whether these factors had relation with knowledge and perception of cervical cancer and screening. In these behavioral risk factors, the participants asked, whether they exposed to sexually transmitted infection (STI), history of cigarette smoking, prolonged use of contraceptive pills, age at first sexual debut, number of children (parity), history of multiple sexual partner and the history of abortion.

Among the study participants (n=906), only 23(2.5%) had exposed to STI/HPV. Regarding history of smoking, only 30 (3.3%) of women had a history of cigarette smoking. These cigarette smoking was not that of commercially prepared form rather culturally home prepared form of cigarette and it was practiced among old age (>40 years) groups. Three hundred four (33.6%) women had ever used oral contraceptive pills. Among the users of oral contraceptive pills (n=304), 277(91.1%) had used for < 1year. The rest 8.9% of participants used oral contraceptive pills for more than 1 year up to 2 years.

In this study, women started the first sexual intercourse at age ranging from 12-29 years. One hundred seventy five (20.3%) women started the first sexual intercourse at age 18

years. About 193(22.4%) and 278(32.2%) women started first sexual intercourse at age <16 and < 17 years respectively. Among participants (n=906) around 44 (4.8%) reported that they had no sexual intercourse. Age at first pregnancy of participants ranges from 14-31 years. Among who had experience of pregnancy (n=831), 140 (16.8%) of women had experienced their first pregnancy at age <17 years.

According to self report from this study (n=906), 38(4.2%) women had >2 partners in their lifetime and 98(10.8%) of their male partner had >2 female partners before their marriage took place. One hundred nine (12%) of the study population had a history of at least one times miscarriage or abortion.

3.5. Relationship Among Socio-demographic and Reproductive Variables with Perceived Threats of Cervical Cancer

The findings of the study suggested that the majority of the

study participants 739 (81.6%) had lower perceived threat to cervical cancer. At the bivariate logistic regression, education (diploma), religion (Muslim), occupation (merchant), ever heard cervical cancer and screening, preferences of screening, ever exposed to an STI, ever smoked, ever used OCP and ever had an abortion were associated with perceived threats to cervical cancer. On the other hand, ever exposed to STI [AOR=5.8, 95%CI: (2.3-14.9)], ever heard of cervical cancer [AOR=1.87, 95%CI: (1.3-2.8)], ever heard cervical cancer screening [AOR=3.4, 95%CI: (1.7-6.9)], preferences of screening in the future [AOR=2.34, 95%CI: (1.18-4.62)], ever smoked [AOR=2.5, 95%CI: (1.1-5.9)] and ever had abortion [AOR=1.32, 95%CI: (1.05-2.25)] were independently associated with perceived threats to cervical cancer. Women who ever smoked had 2.5 times higher odds of being perceived threats than those non-smokers. (Table 4)

Table 4. Associations between socio-demographic characteristics and perceived threats of cervical cancer among women in Arsi zone, Southeastern Ethiopia, February-March 2017.

| Variables | Perceived threats of cervical cancer and screening | | Bivariate analysis | Multivariate analysis |
|--------------------------------------|--|----------------------|--------------------|-----------------------|
| | High (n=167) N (%) | Low (n=739) N (%) | COR (95%CI) | AOR (95%CI) |
| Educational status | | | | |
| Not read and write | 32(19.5%) | 179(24.1%) | Reference | |
| Read and write | 30(18.3%) | 213(28.7%) | 0.87 (0.75-1.014) | |
| Primary (1-8 grades) | 75(45.7%) | 268(36.1%) | 0.82(0.575-1.16) | |
| Secondary (9-12 grades) | 17(10.4) | 49(6.6%) | 0.72(0.41-1.256) | |
| Diploma and above | 13(7.8%) | 30(4.1%) | 2.05(1.15-5.45)* | |
| Religion | | | | |
| Orthodox | 78(46.7%) | 302(40.9%) | Reference | |
| Muslim | 75(44.9%) | 401(54.3%) | 0.51(0.38-0.67)** | |
| Protestant | 14(8.4%) | 36(4.9%) | 0.62(0.35-1.45) | |
| Occupation | | | | |
| Housewife | 78(46.7%) | 611(82.3%) | Reference | |
| Employed | 72(43.1%) | 31(4.2%) | 1.45(0.675-3.13) | |
| Merchant | 10(6%) | 54(7.7%) | 2.02(1.2-3.4)* | |
| Student | 7(4.2%) | 36(5%) | 1.23(0.57-2.59) | |
| Ever heard cervical cancer | | | | |
| Yes | 55(32.9%) | 130(17.6%) | 2.65 (1.9-3.69)** | 1.87(1.25-2.8)** |
| No | 112(67.1%) | 609(82.4%) | Reference | Reference |
| Ever heard cervical cancer screening | | | | |
| Yes | 31(18.6%) | 33(4.5%) | 4.51(2.55-7.99)* | 3.41(1.7-6.85)* |
| No | 136(81.4%) | 706(95.5%) | Reference | Reference |
| Preferences of screening | | | | |
| Yes | 155(92.8%) | 632(85.5%) | 2.42(1.27-4.61)* | 2.34(1.18-4.62)* |
| No | 12(7.2%) | 107(14.5%) | Reference | Reference |
| Ever exposed to STI/HPV | | | | |
| Yes | 14(8.4%) | 9(1.2%) | 7.6(3.23-17.88)** | 5.8(2.27-14.85)** |
| No | 153(91.6%) | 730(98.8%) | Reference | Reference |
| Ever smoked | | | | |
| Yes | 13(7.8%) | 17(2.3%) | 3.67(1.75-7.72)* | 2.5(1.07-5.88)* |
| No | 154(92.2%) | 722(97.7%) | Reference | Reference |
| Ever used OCP | | | | |
| Yes | 69(41.3%) | 235(31.8%) | 1.57(1.11-2.22)* | |
| No | 98(58.7%) | 504(68.2%) | Reference | |
| Ever had abortion/ miscarriage | | | | |
| Yes | 24(14.4%) | 85(11.5%) | 1.52(1.02-2.27)* | 1.32(1.05-2.25)* |
| No | 143(85.6%) | 654(88.5%) | Reference | Reference |

COR-Crude Odds Ratio, AOR-Adjusted Odds Ratio, *p-value at <0.05, ** p-value at <0.01

4. Discussion

This study showed that only 20.4% of the study participants had heard about cervical cancer, 19.1% knowledgeable about cervical cancer and the prevalence of screening among the population was <1%. Regarding women's perceived threats of cervical cancer, this study suggested that majority of the study population uncertain (did not know) that they were at risk of developing cervical cancer which was consistent with the study finding in Kenya indicated that most of women had no opinion about their own risk of developing cervical cancer [7] and higher than the finding in Alabama [14]. Only 15.3% of the study population perceived that they were at risk of developing cervical cancer. Studies among Latina Immigrants in Alabama [14] showed that 30.4% women perceived that they perceive themselves as susceptible to cervical cancer which was higher than the findings of this study. Moreover, the most participants didn't know which age groups were more susceptible to cervical cancer. However, more than half believed that cervical cancer causes a serious consequence. Perceived at risk of developing cervical cancer in this study was lower than studies in Kenya [7]. The discrepancy of this study compared to others might be due to the difference in study setting, knowledge and other socio-economic characteristics among Kenya and Alabama women which might affect women's perception.

Regarding factors associated with perceived threats of cervical cancer, the study found that ever heard cervical cancer, ever heard of screening of cancer, ever exposed to STI, preferences of screening, ever had abortion and ever smoked were independently predictors of high perceived threats to cervical cancer. Smokers compared to non-smokers had high perceived threats to cervical cancer, which was inconsistent with the study done in Appalachian Women which indicated that smokers compared to non-cigarette smokers had low odds of perceived risk of cervical cancer where as women who had good knowledge of cervical cancer, and worried about cervical cancer disease, those who had history of STI and abnormal pap smear result had higher odds of perceived risk of cervical cancer [15]. In this study, women who ever heard cervical cancer and screening were having high odds of perceived threats to cervical cancer. Similar study in Nigeria [16] showed that awareness of cervical cancer and screening were associated with perceived threat of cancer of the cervix. Study in Botswana [11] showed that marital status, employment, income and semi-urban were associated with higher perceived threat. However, income, employment and residing in semi-urban were not significant in this finding. This discrepancy might be due the low level of knowledge in the community as suggested in this study.

The findings in this study also showed that majority of women had lower perceived susceptibility to and severity (perceived threats) of cervical cancer which was inconsistent with the study in Malaysian women in which most women

had good perception of susceptibility to cervical cancer [17]. This discrepancy partly due to education and employment status-majority of the study participants of Malaysian women had secondary and above education as well as majority of them were employed. Moreover, the study populations in Malaysia were those attending health facilities (good health seeking behavior) where as majority of this study population were rural communities.

Among women who ever screened, majority of them had higher perceived threats of cervical cancer than those never screened, which indicated that higher perceived threats of cancer of the cervix lead to up take of cervical cancer screening. This finding was consistent with the findings in Botswana and Kenya-Kisumu which indicated that higher perceived susceptibility to cervical cancer among women increases the rate of screening and with the theory of HBM which states that the greater perceived risk, the greater likelihood of engaging in behaviors to decrease the risk [11, 18, 19].

Strength and Limitation

Regarding strength of this study, the study used large sample size covering mostly rural residents. Hence, as the best of the knowledge of the authors, the representativeness of the study was not compromised.

Despite its strengths, this study might have some limitations. There could be a social desirability bias due to the nature of self-report. Women might prefer to respond positively in a manner of socially acceptable way, particularly on reproductive history, risk factor assessment and barriers towards people diagnosed with cervical cancer, which might affect the real understanding of the true prevalence of risk factors and the underlying reality of perception in the community.

5. Conclusion and Recommendation

The study found that more than one-third of women believed that they were not at risk of developing cervical cancer and the majority of women had lower perceived threats of cervical cancer, which could be a major obstacle in the uptake of cervical cancer screening in the community.

Before the expansion of cervical cancer screening and treatment center across health facilities in the zone, strengthening information delivery to increase the perceived threats would promote the prevalence of screening. Generally speaking, the finding of this study was used as a baseline and critical in the development and implementation of health education intervention targeting cervical cancer risk factors and early screening among rural community thereby reducing the prevalence of cervical cancer in the country.

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