Knowledge towards Cervical Cancer Screening and Associated Factors among Urban Health Extension Workers at Addis Ababa, Ethiopia

Tiruneh Ararsa  
Addis Ababa University

Niguse Tadele  
Addis Ababa University

Yohannes Ayalew  
Addis Ababa University

Debela Gela (✉ debegela@gmail.com)  
Addis Ababa University

Research Article

Keywords: Knowledge, Cervical cancer, Health extension workers, Screening, Perception, Ethiopia

Posted Date: December 18th, 2020

DOI: https://doi.org/10.21203/rs.3.rs-123438/v1

License: ☒  This work is licensed under a Creative Commons Attribution 4.0 International License.  
Read Full License

Version of Record: A version of this preprint was published on March 5th, 2021. See the published version at https://doi.org/10.1186/s12885-021-07952-z.
Knowledge towards Cervical Cancer Screening and Associated Factors among Urban Health Extension Workers at Addis Ababa, Ethiopia

Authors:

1. Mr. Tiruneh Ararsa, BSc N, MSc
   Oncology Nurse
   Black Lion Specialized Hospital
   College of Health Science
   Addis Ababa University
   **P.O. Box:** 5657, Addis Ababa, Ethiopia
   **Telephone:** +251911963220
   **E-mail:** tiruneh.ararsa@gmail.com

2. Mr. Niguse Tadele, BSc, MSc
   Assistant Professor
   School of Nursing & Midwifery
   College of Health Science
   Addis Ababa University
   **P.O. Box:** 100686, Addis Ababa Ethiopia
   **Telephone:** +251913163130
   **E-mail:** niguse99@gmail.com

3. Mr. Yohannes Ayalew, BSc, MSc
   Assistant Professor
   School of Nursing & Midwifery
   College of Health Science
   Addis Ababa University
   **P.O. Box:** 4412, Addis Ababa Ethiopia
   **Telephone:** +251911032747
   **E-mail:** yayalew58@gmail.com

4. Mr. Debela Gela, *BSc N, MSc
   Assistant Professor
   School of Nursing & Midwifery
   College of Health Science
   Addis Ababa University
   **P.O. Box:** 4412, Addis Ababa, Ethiopia
   **Telephone:** +251 913179679
   **E-mail:** debegela@gmail.com

*Corresponding author

**Short Title:** Knowledge towards cervical cancer screening of urban health extension workers
Abstract

Background: Cervical cancer is preventable and remains a leading cause of avoidable death among women in the world. In a developing country, the knowledge of screening for cervical cancer behavior still very low. However, little is known about the knowledge towards cervical cancer screening of urban health extension workers in Ethiopia. This study aimed to assess knowledge towards cervical cancer screening and associated factors among urban health extension workers in Addis Ababa, Ethiopia, 2020.

Methods: In this cross-sectional study, 312 urban health extension workers completed the survey in the Amharic language. Data collected using a structured questionnaire face to face interview. Descriptive and logistic regression analyses were conducted using SPSS version 26.

Results: The mean age of the urban health extension workers was 20.41±3.73 years and 55.1% were married. The majority of the participants (75.6%) had diploma educational level, and 38.1% of them had 1-2 years of work experience. More than half (51.6%) of the participants had poor knowledge about cervical cancer screening. Participants with work experience of 5-6 years (AOR=4.32: 95% CI=1.71,10.94) and those who had a monthly income of 5,000-10,000 ETB (AOR=3.75: 95% CI=1.49,9.41) and greater than >10,000ETB (AOR=3.08: 95% CI =1.06, 8.98) were positively associated with knowledge towards cervical cancer screening among urban health extension workers, $p$-value< 0.05.

Conclusion: This study indicated that the knowledge towards cervical cancer screening of urban health extension workers was inadequate. Urban health extension workers’ work experiences and monthly income were found to be independent predictors of the knowledge towards cervical cancer screening of respondents. Therefore, urban health extension workers with low work experiences and those with small monthly income could be targeted for cervical cancer screening information and training interventions.

Keywords: Knowledge, Cervical cancer, Health extension workers, Screening, Perception, Ethiopia
**Introduction**

Cervical cancer is preventable and remains a leading cause of avoidable death among women worldwide. Approximately 90% of women in their lifetime encounter the risk of cervical cancer (CC) in all age groups [1]. The burden of cervical cancer becomes worth, globally, in the factual data it accounts for more than 5 hundred thousand new cases each year, and about 80% of the cases arise in low-income countries [2]. In 2018, a report indicates that globally estimated cervical cancer is more than 5.5 hundred thousand cases and since a huge number, about 3 hundred thousand deaths noted among screened for cervical cancer [3].

In developed centuries like the United States of America, the number of deaths due to the disease of cervical cancer was significantly decreased because of the engagement of cervical cancer screening. This was evidenced towards from 2.8 to 2.3 per 100,000 women [4]. However, in the developing countries, the coverage of cervical cancer screening remains very low, ranging from 2.0% towards 20.2% in the town areas and from 0.4% towards 14.0% in the part of rural of the country [2]. Furthermore, from the huge number of cervical cancer cases, occurred in the world, about 85% of cases were found in economically in the poorest countries [5]. Cervical cancer screening is finding abnormal change in the cervix before confirmations of any symptoms that could lead to cancer and having or developing a disease. Any unusual bleeding from the vagina, having foul-smelling vaginal discharge, and bleeding during sexual intercourse were the common symptoms of cervical cancer. The outcome variations in the cells through screening can advantageous to avoid cancer before emerging the disease [3, 6, 7].

Different studies indicate that an inadequate level of knowledge towards cervical cancer screening includes: knowing the cause, predisposing, who risk factors are, testing centers, signs, and symptoms of the disease, and the purpose of screening. Since the study concerns the knowledge
of cervical cancer among women and its influence on cervical cancer testing, it is expected that having adequate knowledge on cervical cancer screening might influence a women’s decision for cervical cancer screening [8, 9]. The evidence of other studies indicate that women do not know at what specific age they have to conduct cervical cancer screening. If they do not know at what age they need to begin the screening, all women are at risk of cervical cancer [10].

One of the common persistence of women were not enduring for cervical cancer screening were lack of knowledge about the disease and other reasons were do not experiencing through their lifetime of screening for cervical cancer, because of the absence of information, fear of test result, lack of symptoms and not knowing the whereabouts of the screening center [11].

According to WHO recommended, women who were living in the most developing countries, cervical cancer screening should begin at the age of 21 years of women and continued to preforming screening once every 1-5 years and alone testing with cytology every 3 years of women aged 30 to 65 years. Co-testing was not advised from 21 to 29 years women. Co-testing is ideal for females of 30 to 65 years because cervical cytology alone is not as sensitive [8, 12]. In Ethiopia screening prevalence rate of cervical cancer was extremely low, about (2.9%). As data shows women who undergo cervical cancer screening in urban area were (6.9%) and rural (0.9%). This evidenced women those living in the urban area were getting more information than rural [13].

In Ethiopia, different studies done among women indicated that factors associated with knowledge towards cervical cancer screening evidenced such as educational status, occupational status, marital status, monthly household income, used modern contraceptive, multiple sexual partners, and sexually transmitted disease. Besides, women didn’t know the screening method and largely indicated a lack of knowledge towards the persistence of cervical cancer screening and negative perception towards cervical cancer screening [11, 12, 14, 15]. However, little is known about
knowledge towards cervical cancer screening of urban health extension workers in Ethiopia. Therefore, this study aimed to determine the level of knowledge towards cervical cancer screening and associated factors among urban health extension workers in Addis Ababa, Ethiopia. The results of this study are significant to increase the level of knowledge towards cervical screening among the health extension workers and it helps provide information as a baseline for future studies and for planning intervention programs like that of health education and promotion regarding the disease. It is also helpful for policymakers and national programs in the creation of awareness in the prevention of the disease, diagnosis, and treatment.

**Methods**

**Study Design, Setting, and Population**

This facility based-cross-sectional study was conducted among urban health extension workers from 36 health centers in Addis Ababa, Ethiopia using a proportionally allocated systematic random sampling method. All urban health extension workers working in the health center at the time of data collection were included, except those who were non-consented to participate in the study and those who were on maternal leave during the data collection. A total of 312, with a 97.5% response rate, consented and recruited from 36 health centers in Addis Ababa from February to May 2020. The sample size was calculated using a single population proportion formula based on the assumptions of 95% confidence level, 5% margin of error, and 50% population proportion. A sample size correction formula was also used since the total number of urban health extension workers was less than 10,000. Finally, the study participants were recruited using a systematic sampling technique. Two nurses holding a Bachelor of Science degree were involved in data collection under the supervision of two senior nurse’s professional holding Masters of Science degree. Two days of intensive training on the content of the objective study,
measuring tool and participant recruitment strategies were provided for the data collectors. To ensure the quality of the collected data the principal investigator made a continuous follow-up. The research project was approved by an Institutional Review Board of the College of Health Sciences at Addis Ababa University. Permission to conduct the research was gained from the authorities in the study setting and written informed consents were secured from each participant. The study was conducted following the Declaration of Helsinki.

**Measurements**

The sociodemographic and reproductive characteristics of the participants were recorded using 13-items. These include residence, age, religion, educational level, work experience, marital status, age of marriage, number of children, monthly household income, age of first sexual intercourse, history of cervical cancer in the family, history of sexually transmitted infections (STIs), and history of HIV/AIDS test. The cervical cancer screening knowledge questionnaire was used to measure the knowledge towards cervical cancer screening. The tool contains 14 items (5 dichotomous and 9 multiple responses), which cover the knowledge of participants regarding vulnerable groups, predisposing factors, risk factors, signs and symptoms and screening methods, treatment modality, and benefits of cervical cancer screening. Participants were asked to choose one of the two options: Yes (1) or No (1) for dichotomous questions and for multiple response questions we converting each item to Yes (1) or No (0). The scores ranged from 0 to 31. Participants who scored greater than or equal to the mean in the cervical cancer screening knowledge questionnaire were classified as having good knowledge about knowledge towards cervical cancer screening and those who had scored less than the mean was considered to having poor knowledge [16, 17].
Perception of cervical cancer screening was measured using 6-items. Items were scored on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The score range is 6–30, with the scores greater than or equal to the mean indicating positive perception and the score less than the mean score indicating negative perception [18]. The data were collected using a structured questionnaire initially developed in English and translated into Amharic version for better understanding of enumerators and the study participants. The translated Amharic version was translated back to English to ensure the meaning consistency. The instrument was pretested on study participants who were working in other health centers that were not part of the actual study. Results from the pretest were used to modify the instrument in terms of clarifying the questions.

**Data Processing and Analysis**

The data entered and cleaned were undertaken using Epi-data version 3.5.1 and analyzed by using SPSS version 26. Frequency descriptions were computed for sociodemographic and reproductive variables and mean with standard deviation were calculated for knowledge and perception towards cervical cancer screening. The independent variables in this study were sociodemographic characteristics, reproductive characteristics, and perception of cervical cancer screening. The dependent variable was knowledge towards cervical cancer screening of the urban health extension worker. The sociodemographic variables such as age, religion, educational status, marital status, family average monthly income and work experience, reproductive variables such as the age of first sexual intercourse, parity, history of STIs, family history of cervical cancer, and history of HIV/AIDS, and perception towards cervical cancer screening association with knowledge towards cervical cancer screening were analyzed first by using a bivariate logistic regression model. Then, only those variables with p-values < 0.2 were taken as a candidate for multiple logistic regression
analysis. In both bivariate and multiple regression models, the statistical significance of associations between variables was determined using odds ratios with 95% confidence interval and \( p \)-values < 0.05.

**Results**

**Sociodemographic and Reproductive characteristics of the participants**

Out of total of 320 planned study participants, 312 were interviewed and this makes a 97.5% response rate. The mean age of the study participant was 20.41±3.73 years. The majority of the participants were live in Addis Ababa (n=301, 96.5%), age between 20 and 29 (n=204, 64.4%), followers of Orthodox Christians (n=208, 66.7%), had diploma educational level (n=236, 75.6%), had work experience of 1-2 years (n=119, 38.1%), married (n=172, 55.1%), had no child (n=149, 47.8%), married at the age of greater than ≥18 years (n=172, 55.1%), started sexual intercourse at the age of 18 years (n=226, 72.4%), earn a monthly income less than 5000 ETB of average monthly income (n=145, 46.5%), no family history of cervical cancer (n=297, 95.2%), had no history of STI (n=304, 97.4%), and had HIV tested (n=274, 87.8%) (Table 1).
Table 1: Socio-demographic characteristics of the study participants by knowledge of CCS score (n=312).

| Variables                        | Category       | n   | %    | Knowledge of CCS score, Mean (SD) |
|----------------------------------|----------------|-----|------|-----------------------------------|
| Residence                        | Addis Ababa    | 301 | 96.5 | 20.4(3.78)                        |
|                                  | Out of Addis Ababa | 11  | 3.5  | 20.5(2.54)                        |
| Age                              | 20-29          | 204 | 64.4 | 20.4(3.75)                        |
|                                  | (mean =20.41, SD=3.73) | 104 | 33.3 | 20.5(3.77)                        |
|                                  | ≥40            | 4   | 1.3  | 18.0(1.41)                        |
| Religion                         | Orthodox       | 208 | 66.7 | 20.4(3.62)                        |
|                                  | Protestant     | 69  | 22.1 | 20.5(4.06)                        |
|                                  | Muslim         | 28  | 9    | 19.6(2.94)                        |
|                                  | Catholic       | 7   | 2.2  | 20.6(4.10)                        |
| Level of education               | Diploma        | 236 | 75.6 | 20.4(3.82)                        |
|                                  | BSc            | 76  | 24.4 | 20.4(3.48)                        |
| Work experience                  | 1-2 years      | 119 | 38.1 | 19.9(3.75)                        |
|                                  | 3-4 years      | 67  | 21.5 | 21.4(3.81)                        |
|                                  | 5-6 years      | 43  | 13.8 | 21.1(3.52)                        |
|                                  | >6 years       | 83  | 26.6 | 19.9(3.61)                        |
| Marital status                   | Single         | 130 | 41.7 | 20.6(3.85)                        |
|                                  | Married        | 172 | 55.1 | 20.3(3.69)                        |
|                                  | Others         | 10  | 3.2  | 19.9(3.52)                        |
| Age of marriage (n=182)          | <18years       | 10  | 5.5  | 18.5(2.47)                        |
|                                  | ≥18years       | 172 | 94.5 | 20.4(3.68)                        |
| Number of children               | No child       | 149 | 47.8 | 20.3(3.69)                        |
|                                  | 1-2 children   | 129 | 41.3 | 20.3(3.89)                        |
|                                  | 3-4 children   | 34  | 10.9 | 21.1(3.63)                        |
| Monthly income                   | <5000 ETB      | 145 | 46.5 | 20.0(3.83)                        |
|                                  | 5000-10,000ETB | 123 | 39.4 | 20.6(3.41)                        |
|                                  | >10,000ETB     | 44  | 14.1 | 21.0(4.42)                        |
| Age of first sexual intercourse (n=256) | <18years       | 30  | 11.72| 18.8(2.94)                        |
|                                  | ≥18years       | 226 | 88.28| 20.7(3.79)                        |
| History of cervical cancer in family | Yes           | 12  | 3.8  | 20.9(3.65)                        |
|                                  | No             | 297 | 95.2 | 20.4(3.74)                        |
|                                  | Don’t know     | 3   | 1.0  | 22.7(4.73)                        |
| History of STI                   | Yes            | 8   | 2.6  | 20.6(4.27)                        |
|                                  | No             | 304 | 97.4 | 20.4(3.73)                        |
| HIV/AIDS test                    | Yes            | 274 | 87.8 | 20.3(3.78)                        |
|                                  | No             | 38  | 12.2 | 20.9(3.45)                        |

CCS; cervical cancer screening, ETB; Ethiopian Birr, STI; sexually transmitted infection,
Knowledge and Perception towards Cervical Cancer Screening of Participants

Of all the participants, 312 (100%) have heard about cervical cancer. The majority of the participants, 135 (43.3%) were heard about cervical cancer from health professionals (Figures 1). More than two-thirds of the participants, 246 (78.8%) knew that having multiple sexual partners were predisposing factors for cervical cancer. The majority of the participants knew that vaginal bleeding (n=228,73.1%), foul-smelling vaginal discharge (n=225,72.1%), and vaginal bleeding during/after sex (n=213,68.3%) was the signs and symptoms of cervical cancer. Most of the participants, 295 (94.6%) were knew that cervical cancer is a preventable disease, and more than half of the participants, 207 (66.3%) reported that cervical cancer screening service was available in their health center. Most of the participants, 297 (95.2%) knew the screening procedure of cervical cancer screening, out of these 223 (71.5%) of them knew that cervical cancer screening was by Pap smear. About 151 (50.80%) of the participants heard about cervical cancer screening methods from health care provided (Figures 2). Most of the participants, 302 (96.8%) knew that cervical cancer screening was necessary for early detection and prevention of cervical cancer. About 148 (47.8%) of the participants knew that as the frequent cervical cancer screening was every five years. About 134 (42.9%) of the participants knew that women should start cervical screening at the age of 30 years. Almost all of the participants, 295 (94.6%) knew that cervical cancer is curable if detected early (Table 2).

The overall mean score of knowledge towards cervical cancer screening of participants was 20.41±3.74. Of the total participants, 151 (48.4%) score greater than or equal to the mean on the cervical cancer screening knowledge questionnaire measure, indicating good knowledge towards cervical cancer screening. The mean score of perception towards cervical cancer screening of participants was 21.02±3.27. Of the total participants, 146(46.6%) score greater than or equal to
the mean on the perception towards cervical cancer screening questionnaire measure, indicating positive perception towards cervical cancer screening (Table 2).

| Variables                                      | Frequency(n) | Percent (%) |
|------------------------------------------------|--------------|-------------|
| **Predisposing factors to cervical cancer**    |              |             |
| Having multiple sexual partners                | 246          | 78.8        |
| Early onset sexual intercourse                 | 222          | 71.2        |
| Cigarette smoking                              | 155          | 49.7        |
| Infection by HPV virus                         | 184          | 59.0        |
| **Sign and symptoms of cervical cancer**       |              |             |
| Vaginal bleeding                               | 228          | 73.1        |
| Vaginal bleeding during/after sex             | 213          | 68.3        |
| Foul smelling vaginal discharge               | 225          | 72.1        |
| Pelvic or back pain                            | 174          | 55.8        |
| Post coital bleeding                           | 95           | 30.4        |
| **Who is risk to develop cervical cancer**     |              |             |
| All women                                      | 152          | 48.7        |
| Married women                                  | 146          | 46.8        |
| HIV positive women                             | 174          | 55.8        |
| Women who are sexually active                  | 187          | 59.9        |
| **Know screening procedures of cervical cancer**|              |             |
| Yes                                            | 297          | 95.2        |
| No                                             | 15           | 48          |
| **Screening methods (n=297)**                  |              |             |
| Pap smear                                      | 223          | 71.5        |
| VIA                                            | 97           | 31.1        |
| HPV testing                                    | 179          | 57.4        |
| **Frequency of cervical cancer screening**     |              |             |
| Ones every year                                | 115          | 36.9        |
| Ones every three years                         | 48           | 15.4        |
| Ones every 5 years                             | 149          | 47.8        |
| **When women screening for cervical cancer**   |              |             |
| When menstruation start                        | 52           | 16.7        |
| As soon as sexually active                     | 102          | 32.7        |
| At the age of 30                                | 134          | 42.9        |
| When start having children                     | 12           | 3.8         |
| After the menopause                            | 12           | 3.8         |
| **Treatment modalities for cervical cancer**   |              |             |
| Herbal remedies                                | 12           | 3.8         |
| Surgery                                        | 169          | 54.2        |
| Radiotherapy                                   | 168          | 53.8        |
| Chemotherapy                                   | 240          | 76.9        |
| Cryotherapy and LEEP                           | 83           | 26.6        |
Benefit of cervical cancer screening
- Early detection: 232 (74.4)
- Early treatment: 210 (67.3)
- Early diagnosis: 152 (48.7)
- Decreasing chances of an abortion: 74 (23.7)

Knowledge towards CCS (mean=20.41, SD=3.74)
- Good Knowledge: 151 (48.4)
- Poor Knowledge: 161 (51.6)

Perception towards CCS (mean=21.02, SD=3.27)
- Positive perception: 146 (46.8)
- Negative perception: 166 (53.2)

CCS; cervical cancer screening, HPV; Human Papilloma Virus, LEEP; Loop Electrosurgical Excision Procedure, SD; standard deviation

Information Aids about Cervical Cancer

- Teachers: 32.10%
- Health professionals: 43.30%
- Media: 23.40%
- Others (relatives, friends): 1.20%

Figures 1: Source of information about cervical cancer among urban extension health workers in Addis Ababa, Ethiopia (n = 312).
Factors Associated with Cervical Cancer Screening of Participants

In bivariate logistic regression, we found that work experience, number of children, age of marriage, age of first sexual intercourse, and monthly income were significantly associated with knowledge towards cervical cancer screening of urban health extension workers. However, in multiple logistic regression analysis only work experience, and monthly income had a statistically significant association with urban health extension workers' knowledge towards cervical cancer screening.

Urban health extension workers who had 5-6 years of work experience (AOR = 4.32, 95% CI: 1.71, 10.94) were 4.32 times more likely to have good knowledge of cervical cancer screening compared to those who had 1-2 years of work experience. Urban health extension workers with a monthly income of 5000-10000 ETB (AOR = 3.75, 95% CI: 1.49, 9.41) and greater than 10,000 ETB (AOR= 3.08 95% CI: 1.06, 8.98) were 3.75 and 3.08 times more likely to have good knowledge towards cervical cancer screening respectively, compared to those who had a monthly income of less than 5000 ETB (Table 3).
Table 3: Factors association with cervical cancer screening of urban health extension worker (n=312).

| Variables                  | Knowledge of CCS | Crude Odds Ratio, COR (95% CI) | Adjusted Odds Ratio, AOR (95% CI) |
|----------------------------|------------------|-------------------------------|-----------------------------------|
| Work experience            |                  |                               |                                   |
| 1-2 years                  | 69               | 50                            | 1.00                              |
| 3-4 years                  | 25               | 42                            | 2.31(1.25, 4.28)                  |
| 5-6 years                  | 21               | 22                            | 1.44(0.71, 2.91)                  |
| >6 years                   | 46               | 37                            | 1.11(0.63, 1.95)                  |
| Number of children         |                  |                               |                                   |
| No child                   | 82               | 67                            | 1.00                              |
| 1-2 children               | 65               | 64                            | 1.21(0.75, 1.93)                  |
| 3-4 children               | 14               | 20                            | 1.66(0.78, 3.56)                  |
| Age of marriage            |                  |                               |                                   |
| <18 years                  | 10               | 2                             | 1.00                              |
| ≥18 years                  | 82               | 90                            | 5.488(1.16, 25.78)                |
| Age at 1st sexual intercourse|                |                               |                                   |
| <18 years                  | 22               | 8                             | 1.00                              |
| ≥18 years                  | 106              | 120                           | 3.11(1.33, 7.28)                  |
| Monthly income             |                  |                               |                                   |
| <5000 ETB                  | 88               | 57                            | 1.00                              |
| 5000-10,000 ETB            | 53               | 70                            | 2.04(1.25, 3.32)                  |
| >10,000 ETB                | 20               | 24                            | 1.85(0.93, 3.65)                  |

*p-value < 0.05, CCS; cervical cancer screening, CI; Confidence interval, ETB; Ethiopian Birr,

Discussion

This study explored the knowledge towards cervical cancer screening and factors associated with urban health extension workers in Addis Ababa, Ethiopia. In Ethiopia, women are very lucky because the cervical cancer screening service was held cost-free. Using this available opportunity, women need to present themselves to a health facility to get the free service of CCS. This contributes to the reduction of morbidity and mortality. At the same time, health care providers should encourage women to get the service of CCS. It is one of the strategies towards the reduction
of disease burden in developed and developing countries and the preventives mothed through early
detection and treatment by manipulating women’s knowledge about cervical cancer.

The mean age of the study participant was 20.41±3.73 years. There was a statistically significant
positive association between knowledge towards cervical cancer screening and work experience,
and monthly income. Of the total participants, 48.4% had good knowledge of cervical cancer
screening. This corroborates with previous studies conducted in Hosana, Wolaita Zone, and Addis
Ababa, Ethiopia, and other countries like Tanzania, Turkey, and Uganda that found about half of
study participants had good knowledge of cervical cancer screening [19-24]. However, the finding
of this study was lower than the findings of other studies conducted in Swaziland (53.5%),
Tanzania (63.2), Kenya (79.8%), and Qatar (92.2%) that found more than half of the study
participants had good knowledge towards cervical cancer screening [20, 25-28]. This might be
related to the fact that there is a difference in the educational level of the study participants, in
types of health care workers involved in the study, and place and time of the study, which might
be explained by the difference in the level of knowledge about cervical cancer screening. For
instance, the majority of the study participants (75.6%) in this study had a diploma educational
level in the other studies the study participants had a degree educational level. This study was
conducted among health extension workers whereas the other studies were conducted among
nurses. Thus, urban health extension workers require more education and training to improve their
knowledge of cervical cancer screening.

Our study identified that work experience, and monthly income has an association with knowledge
towards cervical cancer screening of urban health extension workers. This study revealed that
urban health extension workers who had 5-6 years of work experience more likely had good
knowledge of cervical cancer screening compared to those who had 1-2 years of work experience.
This corroborates with the findings of studies from other settings that found work experience has the strongest impact on women’s knowledge of cervical cancer screening [11, 12, 15, 24]. This might be related to the fact that as work experience increases exposure to health-related education or information increases. This is also justified by the finding of this study that about half of the participants (50.80%) was heard about the cervical cancer screening methods from health care provided. Therefore, participants with lower work experience need special emphasis when designing interventions aimed at improving the knowledge towards cervical cancer screening.

This study shows that urban health extension workers who had a monthly income of 5000-10000 ETB and greater had good knowledge of cervical cancer screening compared with those who had lower monthly income. This finding is similar to other studies done in other settings that found women with a lower monthly income had poor knowledge of cervical cancer screening [11, 12, 15, 24, 29]. This implies that urban health extension workers with lower monthly income may have a greater economic (financial) burden to deal with the cost of education to develop their educational level. This might also be related to those participants who earn better monthly income were more satisfied by their income to initiated in gathering information with different information systems like join in different social media (internet at home, Facebook, youtube, and telegrams) and using mass media (television and radio). Therefore, participants with lower monthly income need special emphasis when designing and implementing interventions aimed at improving the knowledge towards cervical cancer screening of this population group. This may involve the provision of economic support through allowing sponsoring them to develop their educational level since the majority of the participants in this study had diploma (level four) educational level and giving them access to cancer-related training.
Strengths and Limitations

This study has a couple of strengths. One, it is the first study on knowledge towards cervical cancer screening among urban health extension workers in Ethiopia. Secondly, the study had a 97.5% response rate. Our study also has some limitations. Firstly, the use of a cross-sectional design does not allow inferring causality. Prospective and experimental studies are warranted. Secondly, the use of an interviewer-administered structured questionnaire for data collection. Using this method to identify knowledge towards cervical cancer screening and associated factors among urban health extension workers might involve some risk of information concealing. Thus, future research should incorporate qualitative interviews since it lets participants liberally highlight the knowledge of cervical cancer screening.

Conclusions

This study indicated that the knowledge towards cervical cancer screening of urban health extension workers was inadequate (48.4%), although 100% of the respondents heard about cervical cancer. Urban health extension workers’ work experiences and monthly income were found to be independent predictors of the knowledge towards cervical cancer screening of respondents. Therefore, urban health extension workers with low work experiences and those with small monthly income could be targeted for cervical cancer screening information and training interventions.

Abbreviations

AOR; adjusted odds ratio; CC: Cervical Cancer; CCS: Cervical Cancer Screening; CI; Confidence interval; COR: Crude Odds Ratio; ETB: Ethiopian birr; HIV/AIDS: human immunodeficiency virus/acquired immune deficiency syndrome; HPV: human papillomavirus; LEEP: Loop
Electrosurgical Excision Procedure; SD: standard deviation; STIs: sexually transmitted infections; VIA: Visual inspection with acetic acid; WHO: World Health Organization

**Declarations**

**Ethics approval and consent to participate**

This study was reviewed and approved by an Institutional Review Board of the College of Health Sciences, Addis Ababa University. All subjects provided written informed consent, and the study was conducted following the Declaration of Helsinki.

**Consent for publication**

Not applicable.

**Availability of data and materials**

Datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

**Competing interests**

The authors declare that they have no competing interests.

**Funding**

The study was funded by Addis Ababa University.

**Author contributions**

TA, NT, YA, and DG made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.
Acknowledgment

We are grateful to Addis Ababa University for the provision of financial support to this research project. Our greatest gratitude also goes to all the participants who made this work possible for their collaboration in giving me a vital response.

Authors information

1Black Lion Specialized Hospital, College of Health Science, Addis Ababa University, P.O. Box: 5657, Addis Ababa, Ethiopia. 2School of Nursing & Midwifery, College of Health Science, Addis Ababa University, P.O. Box: 100686, Addis Ababa Ethiopia. 3School of Nursing & Midwifery, College of Health Science, Addis Ababa University, P.O. Box: 4412, Addis Ababa Ethiopia. 4School of Nursing & Midwifery, College of Health Science, Addis Ababa University, P.O. Box: 4412, Addis Ababa, Ethiopia.

References

1. Iyer AL, Bundorf MK, Gyrd-Hansen D, Goldhaber-Fiebert JD, Cyr P-R, Sønbø Kristiansen I: How does information on the harms and benefits of cervical cancer screening alter the intention to be screened?: a randomized survey of Norwegian women. European Journal of Cancer Prevention 2019, 28(2):87-95.
2. Gebreegziabher M, Asefa NG, Berhe S: Factors affecting the practices of cervical cancer screening among female nurses at public health institutions in Mekelle town, Northern Ethiopia, 2014: a cross-sectional study. Journal of Cancer Research 2016, 2016.
3. Lin W, Wang Y, Liu Z, Chen B, Yuan S, Wu B, Gong L: Inequalities in Awareness and Attitude towards HPV and Its Vaccine between Local and Migrant Residents Who Participated in Cervical Cancer Screening in Shenzhen, China. Cancer Research and Treatment 2019.
4. Force UPST: Screening for Cervical Cancer: US Preventive Services Task Force Recommendation Statement. JAMA 2018, 320(7):674-686.
5. Mailhot Vega RB, Balogun OD, Ishaq OF, Bray F, Ginsburg O, Formenti SC: Estimating child mortality associated with maternal mortality from breast and cervical cancer. *Cancer* 2019, 125(1):109-117.

6. Lees BF, Erickson BK, Huh WK: Cervical cancer screening: evidence behind the guidelines. *American Journal of Obstetrics and Gynecology* 2016, 214(4):438-443.

7. Olubodun T, Odukoya OO, Balogun MR: Knowledge, attitude and practice of cervical cancer prevention, among women residing in an urban slum in Lagos, South West, Nigeria. *The Pan African Medical Journal* 2019, 32.

8. Heena H, Durrani S, AlFayyad I, Riaz M, Tabasim R, Parvez G, Abu-Shaheen A: Knowledge, Attitudes, and Practices towards Cervical Cancer and Screening amongst Female Healthcare Professionals: A Cross-Sectional Study. *Journal of oncology* 2019, 2019.

9. Ngwenya D, Huang S-L: Knowledge, attitude and practice on cervical cancer and screening: a survey of men and women in Swaziland. *Journal of Public Health* 2017, 40(3):e343-e350.

10. Vishwakarma S, Rawat R, Mittal N, Shree P: Knowledge, attitude and practices about cervical cancer screening among nursing staff in rural tertiary care center. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology* 2018, 7:3796.

11. Assefa AA, Astawesegn FH, Eshetu B: Cervical cancer screening service utilization and associated factors among HIV positive women attending adult ART clinic in public health facilities, Hawassa town, Ethiopia: a cross-sectional study. *BMC health services research* 2019, 19(1):847.

12. Nigussie T, Admassu B, Nigussie A: Cervical cancer screening service utilization and associated factors among age-eligible women in Jimma town using health belief model, South West Ethiopia. *BMC women's health* 2019, 19(1):127.

13. Gelibo T, Roets L, Getachew T, Bekele A: Coverage and factors associated with cervical Cancer screening: results from a population-based WHO steps Study in Ethiopia. *Adv Oncol Res Treat* 2017, 1(115):2.

14. Teka T, Kote M, Kejela G, Getachew T: Magnitude and Factors Associated with Precervical Cancer among Screened Women in Southern Ethiopia. *Advances in Public Health* 2019, 2019.
15. Geremew AB, Gelagay AA, Azale T: Uptake of pre cervical cancer screening service and associated factors among women aged 30-49 years in Finote Selam town Northwest Ethiopia. *International Journal of Collaborative Research on Internal Medicine & Public Health* 2018, 10(2):0-0.

16. Dulla D, Daka D, Wakgari N: Knowledge about cervical cancer screening and its practice among female health care workers in southern Ethiopia: a cross-sectional study. *International journal of women's health* 2017, 9:365.

17. Heyi WD, Bekabil TT, Ebo GG: knowledge, attitude and practice of cervical cancer screening among women aged 15-49 years in Bishoftu town, East Shewa zone, Oromia region, Ethiopia, 2016. *Ethiopian Journal of Reproductive Health* 2018, 10(2):10-10.

18. Gebregziabher M, Asefa NG, Berhe S: Factors Affecting the Practices of Cervical Cancer Screening among Female Nurses at Public Health Institutions in Mekelle Town, Northern Ethiopia, 2014: A Cross-Sectional Study. *Journal of Cancer Research* 2016, 2016:4743075.

19. Urasa M, Darj E: Knowledge of cervical cancer and screening practices of nurses at a regional hospital in Tanzania. *African health sciences* 2011, 11(1).

20. Yaren A, Ozkilinc G, Guler A, Oztok I: Awareness of breast and cervical cancer risk factors and screening behaviours among nurses in rural region of Turkey. *European Journal of Cancer Care* 2008, 17(3):278-284.

21. Ertem G: Awareness of cervical cancer risk factors and screening behaviour among nurses in a rural region of Turkey. *Asian Pac J Cancer Prev* 2009, 10(5):735-738.

22. Berhanu T, Mamo E, Tewolde T, Beshir M: Knowledge of Cervical Cancer and Its Screening Practice among Health Extension Workers in Addis Ababa, Ethiopia. *Primary Health Care: Open Access* 2019, 9(1):1-5.

23. Tekle T, Wolka E, Nega B, Kumma WP, Koyira MM: Knowledge, Attitude and Practice Towards Cervical Cancer Screening Among Women and Associated Factors in Hospitals of Wolaita Zone, Southern Ethiopia. *Cancer Management and Research* 2020, 12:993.

24. Aweke YH, Ayanto SY, Ersado TL: Knowledge, attitude and practice for cervical cancer prevention and control among women of childbearing age in Hossana Town, Hadiya zone, Southern Ethiopia: Community-based cross-sectional study. *PLoS One* 2017, 12(7).
25. Alali A, Salem M, Elmahdi H, Alkubaisi N, Alwahedi Z, Taher M, Yousuf W, Aljaber A, Mostafa A: Knowledge, attitudes and practices regarding cervical cancer screening among Female health care workers in primary healthcare in Qatar. *World Family Medicine Journal: Incorporating the Middle East Journal of Family Medicine* 2016, 99(3660):1-12.

26. Kieti SN: Knowledge, attitude and practices on cervical cancer screening and prevention methods among nurses at two Nairobi hospitals in Kenya. 2016.

27. Ngwenya D, Huang S-L: Knowledge, attitude and practice on cervical cancer and screening: a survey of men and women in Swaziland. *Journal of Public Health* 2018, 40(3):e343-e350.

28. Mabelele MM, Materu J, Ng’ida FD, Mahande MJ: Knowledge towards cervical cancer prevention and screening practices among women who attended reproductive and child health clinic at Magu district hospital, Lake Zone Tanzania: a cross-sectional study. *BMC cancer* 2018, 18(1):565.

29. Tapera O, Dreyer G, Kadzatsa W, Nyakabau AM, Stray-Pedersen B, Sjh H: Cervical cancer knowledge, attitudes, beliefs and practices of women aged at least 25 years in Harare, Zimbabwe. *BMC Women's Health* 2019, 19(1):91.
**Figures**

### Information Aids about Cervical Cancer

| Source                      | Percentage |
|-----------------------------|------------|
| Teachers                    | 32.10%     |
| Health professionals        | 43.30%     |
| Media                       | 23.40%     |
| Others (relatives, friends) | 1.20%      |

**Figure 1**

Source of information about cervical cancer among urban extension health workers in Addis Ababa, Ethiopia (n = 312).

### Information aids about CCS

| Source                      | Percentage |
|-----------------------------|------------|
| Others (relative, friends)  | 0.60%      |
| Media (TV, Radio)           | 10.50%     |
| Health care providers       | 50.80%     |
| Hospitals                   | 38%        |
Figure 2

Source of information about cervical cancer screening among urban extension health workers in Addis Ababa, Ethiopia (n = 297).

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Supplementaryfile.docx