Knowledge, attitudes and barriers of cervical cancer screening among women in Chegutu rural district of Zimbabwe

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Abstract: Cervical cancer is the most common cancer among females in Zimbabwe, yet the screening rate remains low. Building on the knowledge, attitude and practice model, this study investigated the signs and symptoms of cervical cancer, risk factors, benefits of early diagnosis and treatment, availability of health services and prevention methods. A cross-sectional questionnaire survey was conducted among 156 women aged 15–50 years in Chegutu district. About 5.8% of women had undergone screening and (41%) had poor knowledge regarding risk factors, groups, symptoms and prevention. Over 66% of women knew how the disease was transmitted and which women are at risk. Women, in particular, the less educated and non-Christians had low level of knowledge on cervical cancer and its symptoms and signs. The major barriers of cervical cancer screening were the unavailability of screening services at local health institution (84%), long distances to such facilities (86.5%) and religious prohibition (39.7%). Among women, 42.9% reported that they prefer health workers to deliver cervical cancer education rather than over-reliance

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PUBLIC INTEREST STATEMENT

Cervical cancer is the most common cancer among females in developing countries, yet the screening rate remains low. Using knowledge, attitude and practice model, this study investigated the signs and symptoms of cervical cancer, risk factors, diagnosis and treatment, availability of health services and prevention methods among women in Chegutu district, Zimbabwe. About 41% of women had poor knowledge regarding risk factor, groups, symptoms and prevention. Women, in particular, the less educated and non-Christians had low level of knowledge on cervical cancer and its symptoms and signs. The major barriers of cervical cancer screening were the unavailability of screening services at local health institution (84%), long distances to such facilities (86.5%) and religious prohibition (39.7%). Among women, 42.9% reported that they prefer health workers to deliver cervical cancer education rather than over-reliance

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on family and friends. The public and private sectors and civil society should thus concentrate on developing policies on health education and promotion, particularly targeting preventable health conditions, namely cervical cancer and strategies to prevent transmission of the human papillomavirus.

**Subjects:** Sociology & Social Policy; Health & Development; Public Health Policy and Practice

**Keywords:** cervical cancer; screening; knowledge; attitudes; practice; barriers

1. **Introduction**

Cancer of the cervix uteri is the fourth most common cancer among women worldwide and the leading cause of gynaecologic cancer death in the less developed regions (Bray et al., 2018). In 2018, there were an estimated 570,000 new cases and 311,000 deaths due to cervical cancer and the majority of these deaths occurred in sub-Saharan Africa (Bray et al., 2018). In Zimbabwe, cervical cancer is the number one cause of cancer-related death in women. WHO estimates that in 2018 approximately, 3,186 Zimbabwean women were diagnosed with cervical cancer and that 2,151 died from the disease (Bruni et al., 2019). A 24.7% prevalence of human papillomavirus (HPV) among women in Zimbabwe combined with low screening uptake has resulted in the country being among those with highest cervical cancer incidence rates in the world of 36.7 per 100,000 - per year (Bruni et al., 2019). In addition, 80% of cervical cancer patients in Zimbabwe present late for treatment, when cervical cancer has reached an advanced stage, resulting in increased pre-mature deaths (Mupepi et al., 2011). It is estimated that 2,270 cases of new cervical cancer are diagnosed annually in Zimbabwe and mortality rates of 64% have been recorded (Kuguyo et al., 2017), making it one of the leading causes of female deaths.

Cervical cancer is the most preventable type of human cancer because of its slow progression, cytological identifiable precursors and effective treatment (Bray et al., 2018; Nakisige et al., 2017). A comprehensive approach that includes prevention, early diagnosis, effective screening and treatment programs has widely been acknowledged as the most effective method for cervical cancer control for it is associated with reduced incidence, morbidity and mortality from the disease (Maine et al., 2011; Sankaranarayanan et al., 2013). The Visual inspection with 3–5% acetic acid (VIAC) is one of the most widely used low-cost screening techniques which can be performed with modest equipment and does not require laboratory infrastructure as well as can be performed by trained doctors, nurses and midwives (Huchko et al., 2015; Maree et al., 2012). There are other cervical cancer screening techniques: Pap smear, HPV/DNA test and colposcopy but these techniques are not common in rural areas of Zimbabwe (Kuguyo et al., 2017; Sankaranarayanan et al., 2013).

The Ministry of Health and Child Welfare, Zimbabwe introduced the VIAC screening in 2011. In order to make cervical cancer screening affordable to the majority of women in the country, VIAC is offered for free in public hospitals (Kuguyo et al., 2017). Yet, despite these efforts, the uptake of cervical cancer screening in Zimbabwe is still quite low. The uptake of cervical cancer screening stands at 9.4% (all women aged 25–64 years) in the country (Bray et al., 2018). Of the 47,916 women aged 15–47 years in Chegutu Rural District, only 2.1% have been screened for cervical cancer through VIAC since 2014. There is low uptake of cervical cancer screening in Zimbabwe and other Southern African countries (e.g., Swaziland and Malawi), despite the fact that these countries have the highest age-standardized incidence rates globally of 62.3, 75.3 and 72.9 per 100,000, respectively (Bray et al., 2018; Msyamboza et al., 2016; Ngwenya & Huang, 2018).

The majority of studies rely on the knowledge, attitude and practice model, to investigate the signs and symptoms of health problems and conditions, risk factors, benefits of early diagnosis and treatment, availability of health services and prevention methods (Aweke et al., 2017; Kwol et al., 2017; Nyamambi et al., 2020).
2020; Pan et al., 2017). The women's knowledge and attitude about the disease is influenced by sociodemographic factors and the availability and accessibility of health services. The uptake of screening interventions is influenced by sociodemographic factors, availability and accessibility of health services as well as complex outcome of factors operating at individual, family, and community levels (Aweke et al., 2017). Hence, there is need to understand women's knowledge, attitude, practices and barriers associated with cervical cancer screening and prevention. To the best of our knowledge, there are very few and isolated studies conducted so far on this important issue in Zimbabwe (Mupepi et al., 2011; Mutambara et al., 2017; Pomerai et al., 2015; Tapera et al., 2019) and less is known about women in Mashonaland West and Chegutu in particular. Using the knowledge, attitude and practice model (Aweke et al., 2017; Kwol et al., 2020), this study investigated the signs and symptoms of cervical cancer, risk factors, benefits of early diagnosis and treatment, availability of health services and prevention methods among women in Chegutu rural district, Zimbabwe. The outcome of this study is useful in making recommendations intended to create an effective cervical cancer education and screening intervention in Zimbabwe.

2. Methods

2.1. Study design and period
A cross-sectional study targeting sexually active women aged 15–50 years was conducted from May 2019 in ward 9, Chegutu rural district, Zimbabwe.

2.2. Study area and sampling
The study was carried out in ward 9 of Chegutu rural district, which was selected by simple random sampling. Systematic random sampling was then used to select households in each village. The first eligible consenting women in each of the household were recruited to participate in the study. If no consenting eligible woman was found in the house, eligible participant was sought from the next household. Women who had never had sex were excluded from the sample. Sample size was calculated using a single proportion formula with knowledge of cervical cancer screening 50%, with the assumption of 80% confidence interval and an estimated precision of 0.05 (Getachew et al., 2019). Based on these assumptions, the sample size was calculated to be 156.

2.3. Data collection procedure
Data were collected using a structured interview-based questionnaire. The questionnaire was prepared on a review of previous similar studies performed in Zimbabwe and other countries (Getachew et al., 2019; Khan et al., 2016). The questionnaire was prepared in English and translated to Shona during the interview process. Data were collected on sociodemographic variables, knowledge of cervical cancer (with regard to risk factors, risk groups, symptoms and methods of prevention), cervical screening knowledge, the utilization of cervical screening. The questionnaire was pre-tested in 10% of the total sample and necessary amendments were considered.

2.4. Study variables
Dependent variables: were knowledge of respondents, attitude towards cervical cancer and screening practice defined in operational definition section.

Independent variables: were sociodemographic, behavioral and health service-related factors for cervical cancer prevention and control.

2.5. Data processing and analysis
The data were entered, cleaned and analyzed using SPSS Version 24. Descriptive statistics like the frequency, proportion and mean were used. The following operational definitions were used:

Knowledge: We used a fourteen items composite score of the knowledge to measure the knowledge level of respondents regarding risk groups, risk factors, signs and symptoms and prevention methods of cervical cancer. Each correct answer was given a score of 1 while each wrong answer
was given a score of 0. The cumulative mean score of knowledge of participants about cervical cancer was estimated using mean score (Aweke et al., 2017). Based on this, those who scored greater than or equal to the mean value were considered as having good knowledge and those who had scored less than the mean was considered to have poor knowledge.

**Attitude:** We selected five items to measure attitude towards proxy variables of perceived susceptibility, severity and benefits of screening and prevention of cervical cancer. We used five Likert scales (Strongly disagree, Disagree, Neutral, Agree and strongly agree) to measure the level of agreement on each selected item. Finally and following Aweke et al. (2017) frequency of respondents who exclusively reported one of the three categories i.e. neutral, disagree or strongly disagree together was considered as having negative attitude while frequency of respondents who reported one of the two categories i.e. agree or strongly agree together was considered as having positive attitude.

**Barrier:** Barriers were assessed using questions having “True”, “False” or “Don’t know” response on the respondents’ views regarding health system, personal-related and knowledge-related barriers of screening and prevention of cervical cancer.

3. Ethical consideration

Informed consent was taken from all the study participants. To maintain confidentiality and anonymity no name appeared on the questionnaire and participants were informed that information would only be used for the purpose of influencing programming of cervical cancer in the district.

4. Results

4.1. **Socioeconomic characteristics**

As shown in Table 1, the study participants were between 15 and 50 years of age. The ages of the participants were distributed as follows—The majority of the participants (79) were in the age range 31–40, with 55 participants in the age group 15–30 and 22 participants in the 41–50 years category. Most of the participants belonged to the Christian religion (92.9%) and this may potentially imply churches could be utilized to disseminate information about cervical cancer screening. In terms of academic qualifications, 80 women had secondary education (form 1–4), 12 had attained primary level grade (1–7), and 64 had tertiary qualification (post-secondary qualification.

| Table 1. Sociodemographic characteristics of women who participated in the study |
|---------------------------------|-----------------|------|
| Age                            | Count | %     |
| 15–30                          | 55    | 35.3 |
| 31–40                          | 79    | 50.6 |
| 41–50                          | 22    | 14.1 |
| Religion                       |       |      |
| Non-Christian                  | 11    | 7.1  |
| Christian                      | 145   | 92.9 |
| Level of education             |       |      |
| Primary                        | 12    | 7.7  |
| Secondary                      | 80    | 51.3 |
| Tertiary                       | 64    | 41.0 |
| Marital status                 |       |      |
| Married                        | 111   | 71.2 |
| Never married                  | 19    | 12.2 |
| Divorced                       | 14    | 9.0  |
| Widowed                        | 12    | 7.7  |
| Employed                       |       |      |
| No                             | 133   | 85.3 |
| Yes                            | 23    | 14.7 |
| N                              | 156   | 100.0 |
—certificate, diploma, etc.). One hundred and eleven women were married, 19 never married, 14 divorced and 12 widowed. The majority of the women (133) were unemployed.

4.2. Cervical cancer screening practice
The majority of women 150 (96.2%) had their first sexual intercourse when they were less than 20 years thereby exposing themselves to the risk of contracting cervical cancer. Of the 156 women participants, 147 (94.2%) had never undergone cervical cancer screening while, 9 (5.8%) were screened for cervical cancer in our study. Of these, eight were screened in government hospitals and one at a private hospital. All of them had only one-time exposure for screening within the past 3 years.

4.3. Knowledge of women on cervical cancer screening
According to operational definition given in methods section, 64 (41.0%) of the respondents had poor knowledge i.e. scored less than the mean (0.65 ± SD 0.26), whereas, 92 (59.0%) of respondents had good knowledge i.e. scored greater than or equal to the mean. The majority of the respondents 76.9% knew the virus that is associated with cervical cancer and 76.9% knew how the virus associated with cervical cancer is transmitted, respectively (Table 2). Some of the respondents had no adequate knowledge about how HPV is transmitted and what causes cervical cancer. A lack of understanding and appreciation of how HPV is contracted might impacts negatively on the respondents’ abilities to prevent cervical cancer and also utilizing screening services.

More than half, 133 (85.1%) of the respondents believed that all women are at risk of getting cervical cancer while 23 (14.7%) of them did not know which women are at risk of getting the disease. Ninety-five (60.9%) of participants had no idea what the symptoms of cervical cancer are, of which persistent pelvic pain is one of the symptoms of the disease. About 119 (76.3%) of participants reported that having multiple sexual partners is a risk factor for the disease. Similarly, more than half of the participants affirmed that avoiding early sexual intercourse and HPV vaccination prevent cervical cancer. Among women in the study, approximately half, 81 (51.9%)

| Variables                                      | Yes (%) | No (%) |
|-----------------------------------------------|---------|--------|
| **Risk factors**                              |         |        |
| Name of a virus that causes cervical cancer   | 120 (76.9) | 36 (23.1) |
| How is HPV transmitted                        | 120 (76.9) | 36 (23.1) |
| Ever heard of cervical cancer screening programme | 139 (89.1) | 17 (10.9) |
| **Risk groups**                               |         |        |
| Who should be screened for cervical cancer    | 133 (85.3) | 23 (14.7) |
| **Signs and symptoms**                        |         |        |
| What are the symptoms of cervical cancer      | 61 (39.1) | 95 (60.9) |
| **Methods of prevention of cervical cancer**  |         |        |
| Cancer can be prevented by avoiding multiple sexual partners | 119 (76.3) | 37 (23.7) |
| Cancer can be prevented by avoiding early sexual intercourse | 116 (74.4) | 40 (25.6) |
| Cancer can be prevented by quitting smoking   | 104 (66.7) | 52 (33.3) |
| Cancer can be prevented by through HPV vaccination | 129 (82.7) | 27 (17.3) |
| What does cervical cancer positive test mean   | 54 (34.6) | 102 (65.4) |
| Cervical cancer can be diagnosed in its early stages | 81 (51.9) | 75 (48.1) |
| When should a woman begin cervical cancer screening | 65 (41.7) | 91 (58.3) |
| How often should HIV negative woman be screened for cervical cancer | 34 (21.8) | 122 (78.2) |
| What is the screening procedure for cervical cancer | 146 (93.6) | 10 (6.4) |
of the respondents knew that cervical cancer can be diagnosed in its early stages. Regarding timing of the test, 91 (58.3%) of the respondents had no idea of when women should begin cervical cancer screening and 122 (78.2%) of them reported that they had no information of how often HIV negative women should be screened for cervical cancer. The screening guidelines for cervical cancer in Zimbabwe recommended that HIV negative women should be screened once every 3 years and HIV positive women should be screened annually. The most widely known screening technique is VIAC (Kuguyo et al., 2017; Tapera et al., 2019). The majority of the respondents 93.6% indicated that VIAC is the screening technique for cervical cancer. VIAC is the most widely used screening technique in most of the public health institutions in Zimbabwe and it is accessible for free (Kuguyo et al., 2017).

4.4. Knowledge of cervical cancer screening by socioeconomic group

Table 3 shows that there was variation in knowledge by socioeconomic group among women in Chegutu. The majority (78%) of individuals of ages 15–30 and 114 (79%) of Christian women had above average knowledge regarding the virus that causes cancer. However, 8 (67%) women with a primary level qualification were not aware of the cancer-causing virus, accompanied by 5 (45%) non-Christian women in the study. Women of ages 30–40 (77%), 41–50 (73%), secondary (75%) and 88% with tertiary education had a good understanding of the virus that causes cervical cancer. Most of the women (over 74%) regardless of marital status had good knowledge of the cause of cervical cancer.

The majority of women in this study knew how the human papillomavirus is transmitted, which included 45 (82%) women in the 15–30 group, 59 (75%) of ages 31–40, 16 (73%) in the 41–50 group, 115 (79%) of Christians, 61 (76%) with secondary education, 54 (84%) with a tertiary education, 85 (77%) married, 15 (79%) not married, 11 (79%) divorced and amongst the widowed 9 (75%), respectively. However, lack of knowledge about the transmission of human papillomavirus was relatively high among non-Christian women (56%) and those with primary education (58%).

Further evidence demonstrated good knowledge regarding whether cervical cancer can be prevented through HPV vaccination. There were 91%, 80% and 73% of women of ages 15–30, 31–40 and 41–50, respectively, who knew the importance of HPV vaccination. Furthermore, 86% women of Christian religion had knowledge about how HPV vaccination could positively prevent cervical cancer. Seventy-one participants with secondary education, 86% with a tertiary education, and 82% married, and 89% not married, 79% divorced and 835 widowed had knowledge about the importance of HPV vaccination. Yet, 54% and 75% of non-Christian women and those with primary education, respectively, lacked knowledge regarding whether cervical cancer could be prevented through HPV vaccination.

The majority of women in this study did not know the symptoms of cervical cancer, regardless of age group, religion, education and marital status. For example, 62% and 64% of women with a tertiary qualification and married, respectively, lacked knowledge about the symptoms of cervical cancer. Knowledge about what cervical cancer positive test implies was relatively low; the majority (60%, 67% and 73%) of women of ages 15–30, 31–40 and 41–50, respectively, did not know what the positive test mean. Such figures were identified with 9 (82%) of non-Christians, 93 (64%) Christians, 11 (92%) with primary qualification, 51 (64%) with secondary level education, 40 (62%) with tertiary education, 71 (64%) married, 15 (79%) unmarried, 9 (64%) divorced and 7 (58%) widowed, exhibiting significant lack of knowledge about what cervical cancer positive test implied as shown below in Table 3. Overall, across all variables lack of knowledge tend to be confined to non-Christian women and those with primary education.

4.5. Knowledge score of cervical cancer

Using the cumulative mean score of variables mentioned in Table 2, we categorized respondents into good and poor knowledge following the approach outlined in methods section.
### Table 3. Knowledge about cervical cancer by socioeconomic group

| Age | Christian | Level of education | Marital status |
|-----|-----------|--------------------|---------------|
|     | No | Yes | Primary | Secondary | Tertiary | Married | Never married | Divorced | Widowed |
| 15–30 | 43 | 61 | 16 | 6 | 114 | 4 | 60 | 56 | 86 | 14 | 11 | 9 |
| Correct responses | 78% | 77% | 73% | 55% | 79% | 33% | 75% | 88% | 78% | 74% | 79% | 75% |
| 31–40 | 12 | 18 | 6 | 5 | 31 | 8 | 20 | 8 | 25 | 5 | 3 | 3 |
| Wrong responses | 22% | 23% | 27% | 45% | 21% | 67% | 25% | 12% | 22% | 26% | 21% | 25% |
| 41–50 | 22% | 23% | 27% | 45% | 21% | 67% | 25% | 12% | 22% | 26% | 21% | 25% |
| 41–50 | 78% | 77% | 73% | 55% | 79% | 33% | 75% | 88% | 78% | 74% | 79% | 75% |

**What name is given to the virus that causes cervical cancer?**

| Correct responses | 45 | 59 | 16 | 5 | 115 | 5 | 61 | 54 | 85 | 15 | 11 | 9 |
| Wrong responses | 10 | 20 | 6 | 6 | 30 | 7 | 19 | 10 | 26 | 4 | 3 | 3 |
| 82% | 75% | 73% | 46% | 79% | 42% | 76% | 84% | 77% | 79% | 79% | 75% |

**How is human papillomavirus transmitted?**

| Correct responses | 52 | 70 | 17 | 8 | 131 | 6 | 74 | 59 | 99 | 18 | 12 | 10 |
| Wrong responses | 3 | 9 | 5 | 3 | 14 | 6 | 6 | 5 | 12 | 1 | 2 | 2 |
| 95% | 89% | 77% | 73% | 90% | 50% | 93% | 92% | 89% | 95% | 86% | 83% |

**Ever heard of cervical cancer screening?**

| Correct responses | 47 | 58 | 14 | 5 | 114 | 3 | 64 | 52 | 83 | 15 | 11 | 10 |
| Wrong responses | 8 | 21 | 8 | 6 | 31 | 9 | 16 | 12 | 28 | 4 | 3 | 2 |
| 14% | 27% | 37% | 56% | 21% | 75% | 20% | 19% | 25% | 21% | 21% | 17% |

**Cervical cancer can be prevented by avoiding multiple sexual partners**

| Correct responses | 45 | 58 | 13 | 5 | 111 | 2 | 63 | 51 | 82 | 14 | 11 | 9 |
| Wrong responses | 10 | 21 | 9 | 6 | 34 | 10 | 17 | 13 | 29 | 5 | 3 | 3 |
| 82% | 73% | 59% | 46% | 77% | 17% | 79% | 80% | 74% | 74% | 79% | 75% |

**Cervical cancer can be prevented by avoiding early sexual intercourse**

(Continued)
| Age     | Christian | Level of education | Marital status |
|---------|-----------|--------------------|-----------------|
| 15–30   | 42        | 52                 | 10              |
| 31–40   | 65        | 72                 | 12              |
| 41–50   | 25        | 34                 | 54              |

Cervical cancer can be prevented by quitting smoking
Correct responses: 42, 52, 10
Wrong responses: 13, 27, 12

Cervical cancer can be prevented through HPV vaccination?
Correct responses: 50, 63, 16
Wrong responses: 5, 16, 6

Who should be screened for cervical cancer?
Correct responses: 49, 69, 15
Wrong responses: 6, 10, 7

What are the symptoms of cervical cancer?
Correct responses: 25, 30, 16
Wrong responses: 30, 49, 16

What does the cervical cancer positive test mean?
Correct responses: 22, 26, 6
Wrong responses: 33, 53, 16

(Continued)
Table 3. (Continued)

| Age     | 15–30 | 31–40 | 41–50 | Christian | Yes | No | Level of education | Tertiary | Primary | Secondary | Tertiary | Married | Never married | Divorced | Widowed |
|---------|-------|-------|-------|-----------|-----|----|--------------------|----------|---------|-----------|----------|---------|---------------|----------|---------|
|         |       |       |       |           |     |    |                    |          |         |           |          |         |               |          |         |
| Cervical cancer can be diagnosed in its early stage |       |       |       |           |     |    |                    |          |         |           |          |         |               |          |         |
| Correct responses | 36   | 36   | 9     | 3         | 78  | 2  | 2                  | 26       | 35      | 44        | 58       | 11     | 7             | 7        | 5       |
| Wrong responses | 19   | 43   | 13    | 8         | 67  | 10 | 45                 | 40       | 2       | 7         | 31       | 48     | 42            | 50       | 58      |

When should women start to have cervical cancer screening

| Correct responses | 29   | 28   | 8     | 2         | 63  | 2  | 2                  | 37       | 48      | 9         | 5        | 4      |
| Wrong responses | 26   | 51   | 14    | 9         | 82  | 10 | 54                 | 27       | 63      | 10        | 9        | 4     |

How often should HIV negative women be screened for cervical cancer

| Correct responses | 6    | 23   | 5     | 4         | 30  | 5  | 17                 | 12       | 22      | 2         | 6        | 4     |
| Wrong responses | 49   | 56   | 17    | 7         | 115 | 7  | 63                 | 52       | 89      | 17        | 8        | 8     |

What is the screening procedure for cervical cancer

| Correct responses | 53   | 75   | 18    | 8         | 138 | 6  | 78                 | 62       | 103     | 19        | 14       | 10    |
| Wrong responses  | 2    | 4    | 4     | 3         | 7   | 6  | 2                  | 2        | 8       | 0         | 0        | 2     |

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As shown in Table 4, 32.7%, 44.3% and 50% of those women in the 15–30, 31–40- and 41–50 years old category had low knowledge regarding cervical cancer screening. About 82% of the non-Christian women had low knowledge of cervical cancer screening. Eighty-three percent of those women with primary education and 46% of those with secondary education had low knowledge of cervical cancer. Additionally, 41.4% of the married women and 41.7% of the widowed women had low knowledge of cervical cancer screening. Slightly over a third of women in each category had low knowledge levels. From a health policy perspective, there is need to strengthen education on cervical cancer screening as well as ensuring availability of screening services in rural areas of Chegutu.

4.6. Attitudes towards cervical cancer screening
It was observed that nearly 50% agreed to all the statements regarding attitudes towards cervical cancer screening (Table 5). About 39.1% and 54.5% of women strongly agreed and agreed, respectively, that any women including themselves can acquire HPV. About 14.7% of the study participants were neutral with regards that cervical cancer can be cured with proper treatment. Turning to the last two columns and based on operational definition stated in method section, over 81% of participants had positive attitude towards selected proxy variables. Fifteen (9.6%) of women opposed the idea that they were at risk of developing cervical cancer. About 145 (92.9%) of the participants supported the idea that cervical cancer could be cured with proper treatment. One hundred and twenty-seven (81.4%) of the respondents agreed that they have ability to avoid contracting HPV, while 18.6% had negative attitude.

4.7. Barriers to cervical cancer screening
Screening for cervical cancer by male healthcare staff is seen as a barrier and reported by 55.8% of the women in the study (Table 6). The majority of women (78.2%) agreed that the cancer screening is not very expensive. Unavailability of cancer screening services at local health institution (84%), long distances to such facilities (86.5%) and culture/religion prohibition (39.7%) were found to be major barriers of cervical cancer screening in the district. These results demonstrate that the main barriers identified were health system and personal-related barriers as compared to knowledge-related barriers.

4.8. Health service-related factors
Seventy (44.9%) of the respondents had ever received information about the cervical cancer from social networks (family and friends). News media 35 (22.4%), 34 (21.8%) health workers, 14 (9.0%), print media and other sources 3 (1.9%) were the commonest sources of information about the cervical cancer. Hence, about half, 67 (42.9%) of the respondents think that health education from health workers is the best method for disseminating information on cervical cancer and screening services. Among participants, health education from non-governmental organizations 46 (29.5%), radio advertisement 39 (25%), and television advertisement 4 (2.6%) were the other preferred methods of disseminating cervical cancer screening information.

5. Discussion
From a healthy policy perspective, knowledge, attitude and barriers of the community about any disease including cervical cancer and its factors offer crucial opportunity for comprehensive prevention and control strategies of the disease. Therefore, this study addressed knowledge, attitude and barriers as an entry point for the prevention and control of cervical cancer and its associated factors among women.

In our study, only 5.8% of the women had undergone cervical cancer screening while the rest had not. The number of the respondents who were not screened for cervical cancer was rather too high taking into account the fact that cervical cancer is the leading cause of death in Zimbabwe. According to Chokunonga et al. (2004) cervical cancer is the most frequently occurring cancer among women in Zimbabwe. Hoque and Hoque (2009) found similar results of low prevalence (9.8%) of cervical cancer screening in South Africa while Getachew et al. (2019) found slightly
| Age   | Christian | Level of education | Marital status |
|-------|-----------|--------------------|----------------|
|       | 15–30     | 31–40              | 41–50          | No | Yes | Primary | Secondary | Tertiary | Married | Never married | Divorced | Widowed |
| Poor knowledge | 18 | 35 | 11 | 9 | 55 | 10 | 37 | 17 | 46 | 8 | 5 | 5 |
|         | 32.7% | 44.3% | 50.0% | 37.9% | 83.3% | 46.3% | 26.6% | 41.4% | 42.1% | 35.7% | 41.7% |
| Good knowledge | 37 | 44 | 11 | 2 | 90 | 2 | 43 | 47 | 65 | 11 | 9 | 7 |
|         | 67.3% | 55.7% | 50.0% | 18.2% | 62.1% | 16.7% | 53.8% | 73.4% | 58.6% | 57.9% | 64.3% | 58.3% |
| Variables                                      | Level of agreement, number (%) | Attitude       |
|------------------------------------------------|-------------------------------|----------------|
| Adult women including me can acquire HPV      | Strongly agree 61 (39.1%)       | Agree 85 (54.5%) Neutral 4 (2.6%) Disagree 5 (3.2%) Strongly disagree 1 (0.6%) Positive 146 (93.6%) Negative 10 (6.4%) |
| I am at risk of contracting HPV                | Strongly agree 53 (34.0%)       | Agree 92 (59.0%) Neutral 4 (2.6%) Disagree 6 (3.8%) Strongly disagree 1 (0.6%) Positive 145 (92.9%) Negative 11 (7.1%) |
| I am at risk of developing cervical cancer    | Strongly agree 51 (32.7%)       | Agree 90 (57.7%) Neutral 6 (3.8%) Disagree 8 (5.1%) Strongly disagree 1 (0.6%) Positive 141 (90.4%) Negative 15 (9.6%) |
| Cervical cancer is curable with proper treatment | Strongly agree 44 (28.2%)       | Agree 83 (53.2%) Neutral 23 (14.7%) Disagree 5 (3.2%) Strongly disagree 1 (0.6%) Positive 145 (92.9%) Negative 11 (7.1%) |
| I have the ability to avoid contracting HPV   | Strongly agree 47 (30.1%)       | Agree 98 (62.8%) Neutral 10 (6.4%) Disagree 0 (0%) Strongly disagree 1 (0.6%) Positive 127 (81.4%) Negative 29 (18.6%) |
| Domain          | Barrier                                                                 | Number (%) |           |           |           |
|-----------------|-------------------------------------------------------------------------|------------|-----------|-----------|-----------|
|                 |                                                                         | True       | False     | Don't know |
| Health system   | Discouraged to be screened for cervical cancer by a male health care provider | 87 (55.8%) | 63 (40.4%) | 6 (3.8%)  |
| Knowledge       | Screening is expensive                                                  | 0 (0%)     | 122 (78.2%) | 34 (21.8%) |
| Health system   | Screening services are not available at the local health institution     | 131 (84.0%)| 3 (1.9%)  | 22 (14.1%) |
| Health system   | Travel long distance to access cervical cancer screening services        | 135 (86.5%)| 1 (0.6%)  | 20 (12.8%) |
| Personal        | It is embarrassing to have a cervical cancer screening test              | 4 (2.6%)   | 122 (78.2%) | 30 (19.2%) |
| Personal        | My culture/religion do not allow me to be screened                       | 62 (39.7%) | 93 (59.6%) | 1 (0.6%)  |
| Knowledge       | I do not know where the test is done                                     | 5 (3.2%)   | 136 (87.2%) | 15 (9.6%)  |
| Knowledge       | Cervical cancer screening is so painful                                  | 1 (0.6%)   | 133 (85.3%) | 22 (14.1%) |
higher prevalence (33%) in Ethiopia. This difference might be due to the different study and country settings. Getachew et al. (2019) study was a facility-based study, meaning that participants might have a better health-seeking behavior and may have had contact with health professionals, exposing them to information about cervical screening. The findings of this study showed that slightly less than half (41%) of participating women had poor level of comprehensive knowledge score from the composite score regarding risk groups, risk factors, signs and symptoms and methods of prevention of cervical cancer. In Mberengwa, Pomera et al. (2015) found similar results that cervical cancer knowledge among female patients was low. Aweke et al. (2017), Williams et al. (2018), Ngugi et al. (2012), and Ning et al. (2019) also found similar results of poor knowledge about cervical cancer in Addis Ababa, Ghana, Kenya and North-eastern China, respectively. Although there is a slight difference in knowledge score construction, the level of knowledge in this study is slightly higher than the study in Addis Ababa by Getachew et al. (2019) which found 28% of women having adequate knowledge. Programs to improve knowledge of cervical cancer and screening could help in increasing uptake of screening services.

About three quarters (76.9%) of the respondents knew how HPV is transmitted while (85.3%) of them knew which category of women are at risk of getting the disease. The HPV is a sexually transmitted infection, recognized as the cause of 99% of cervical cancer worldwide (Anorlu, 2008; Maine et al., 2011; Perenc et al., 2014; Walboomers et al., 1999; Wang, 2007). This finding showed that participants had higher awareness level about risk groups when compared to findings of other studies done in Ethiopia (Aweke et al., 2017). This could potentially be attributed to high attention given to media promotion, variations in health information provision about cervical cancer and its exposure. Furthermore, differences in health education at healthcare facilities, cultural conditions and other behavioral change interventions regarding the cervical cancer prevention and control programs of Zimbabwe. Comprehension on the signs and symptoms of cervical cancer was found to be very low (39.1%) among the respondents, and this agrees with previous studies (Okunowo et al., 2018). Okunowo et al. (2018) found that only 40.0% of the respondents had good knowledge of the symptoms of cervical cancer in Nigeria.

As observed from the study, majority of the participants had knowledge about cervical cancer prevention methods. The majority reported that cervical cancer could be prevented by avoiding multiple sex partners (76.3%), delay early sexual debut (74.4%), quitting smoking (66.7%) and through HPV vaccination (82.7%). Our results are in contrast with Aweke et al. (2017) found that very few of participants reported that vaccination could be a preventive method in Ethiopia. The majority of participants had good knowledge of the preventive methods and therefore there is need for the public and private sector to promote behavioral interventions (e.g education on importance of avoiding multiple sex partner and early sexual activities, quitting smoking) focusing on individual, societal and policy changes as well as biological interventions like vaccination. In total, 41.7% and 21.8% of individuals were aware on the timing of cervical cancer screening and how often HIV negative women should be screened respectively, so there should be an emphasis on raising awareness regarding timing and frequency of cervical cancer screening. Not knowing when to start screening for cervical cancer has the propensity to put respondents at risk as they will only show up when the disease is at an advanced stage. As observed in our study we analysed knowledge about cervical cancer by different socioeconomic groups. Overall, lack of knowledge on risk factors, groups, signs and symptoms and prevention methods tend to be confined to non-Christian women and those with primary education. Studies have shown that women with low educational achievement and low awareness of the risk factors for cervical cancer have been seen to have poor uptake of screening services. In a study done by Mutambara et al. (2017) in Zimbabwe participants with a secondary education were found to be more aware of cervical cancer screening than those of lower levels of educational status. The low knowledge among non-Christian women might be associated with religious beliefs (Hasahya et al., 2016; Mutambara et al., 2017). The findings that knowledge varied across socioeconomic groups and non-Christian women and those with primary education had low knowledge levels strongly indicated that different, targeted and inclusive health information dissemination strategies may be required for women to increase knowledge towards prevention and control of cervical cancer. For example, cervical
cancer information dissemination for women with primary education only may be conducted in local language to avoid language barriers. Intensive cervical cancer screening awareness programmes targeted at annual gatherings of non-Christian women should be promoted.

From our study, majority of women had positive attitude towards cervical cancer screening. About 93.6% had positive attitude that adult women including themselves can acquire HPV, 90.4% acknowledged they are at risk of developing cancer while 81.4% agreed that they have the ability to avoid contracting HPV. In their study, Aweke et al. (2017) also found that the majority of women in Ethiopia had positive attitude towards cervical cancer prevention methods. With such positive attitude, it means if barriers are removed and Ministry of Health and Child Welfare decentralise the screening services to rural health centres more women will be screened for cervical cancer.

In addition, respondents also mentioned barriers associated with cervical cancer screening. Unavailability of cancer screening services at local health institution (84%), long distances to such facilities (86.5%) and culture/religion prohibition (39.7%) were found to be major barriers of cervical cancer screening in the district. The health system and personal-related barriers were identified as the major barriers. These findings with regards to availability issue hindering screening resonate with Aweke et al. (2017) and Getachew et al. (2019) for Ethiopia and other countries (Anorlu, 2008; Hasahya et al., 2016; Maseko et al., 2015; Torres et al., 2013). With regard to health service-related factors, 44.9% of the women had ever received information about the cervical cancer from social networks (family and friends), 22.4% news media, 21.8% health workers and 9.0% from print media. The over-reliance on informal sources—social networks are worrisome and calls for strengthening of formal cervical cancer educational programmes. About half (42.9%) of the respondents agreed that health education from health workers is the best method for disseminating information on cervical cancer and screening services. Health education from non-governmental organizations and radio advertisement was the other preferred methods of dissemination. These results demonstrate the need for public and private sector and civil society to join hands in provision of cervical cancer education and screening services.

6. Conclusion

We conclude that cervical cancer screening practices among women were low. Knowledge of cervical cancer and screening was particularly low for women with primary education and non-Christians while family and friends were the major source of cervical cancer information in rural areas. Unavailability of cancer screening services at local health institution and long distances to such facilities were the major barriers identified by women. The Ministry of Health and Child Care in conjunction with the private sector and civil society should make deliberate efforts to ensure that cervical cancer screening and treatment services are rolled out in all public health facilities in rural and urban areas so that more women have access to the services. Mobile cancer screening and treatment units should be rolled out to reach distant and remote rural areas. The Ministry also has the responsibility to make sure that all screening and treatment facilities have the basic infrastructure, equipment, trained personnel and medical consumables required to offer quality and affordable cervical cancer screening and treatment services. Health staff and community health volunteers should be trained on cancer screening and treatment services and roll out education and awareness campaigns. This will go a long way in increasing women’s awareness of cervical cancer and encouraging women to access cervical cancer screening services. In addition, human papillomavirus and cervical cancer should be fused into the health education curriculum from high school to tertiary education and even at workplaces. It is imperative that the Government of Zimbabwe consistently honor its commitment to the Abuja declaration to allocate at least 15% of its national annual budget to health. This could ensure adequate health funding, which could subsequently increase the amount of funding allocated for cervical cancer screening and treatment services. The cervical cancer screening and treatment services should be inclusive of all women, including the marginalized groups and non-Christian groups with low health-seeking behavior.
7. Study limitations
This study is limited by its cross-sectional nature, so we could not assess the uptake of cervical cancer screening and knowledge over time. The data for the study were self-reported, and this could be potentially affected by recall bias. Finally, our findings are limited to Zimbabwe and cannot be generalized.

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