

# Effect of a Health Communication Strategy on Uptake of Cervical Cancer Screening in Isiolo County, Kenya

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## Abstract

**Background:** To assess the effect of a health communication strategy on women's community-level uptake of cervical cancer screening in Isiolo County.

**Purpose:** to determine the effect of a health communication strategy on women's community-level uptake of cervical cancer screening in Isiolo County.

**Methodology:** The study adopted a community-based cluster randomized trial design. Multi-stage sampling was used to derive the sample size. There were 444 women overall, varying in age from 15 to 65 years. Community Health Volunteers disseminated health information to the intervention arm of study and referred participants to link health facilities for screening. An interviewer-administered questionnaire was used for data collection. The research was done between February and August of 2022.

**Findings:** At baseline, the study findings showed that 18.2% of respondents had ever been screened. Reasons for not screening included: fear (12%); feeling healthy (17%) among others. At post-intervention, the cervical cancer screening uptake among the respondents in the intervention arm was found to have increased from 18.2% to 45.9%, while that of the control arm remained at 18%. Respondents in the study's intervention arm had a 3.867 higher chances of being screened than respondents in the control arm (OR 3.849, CI.1.802- 8.223, P<0.001)

**Conclusion:** At baseline, the screening uptake for cancer of the cervix was low. The existing communication strategies in Isiolo County were limited in addressing cervical cancer. Targeted health communication on cervical cancer screening by Community Health Volunteers, subsequently cervical cancer screening uptake post-intervention.

**Keywords:** cervical cancer, community unit, community health volunteer, health communication strategy, cervical cancer screening uptake.

## 1. Introduction

The global burden of cervical cancer is high, with 604,000 new cases of cervical cancer in 2018 and 342,000 deaths as a result of the disease (Sung et al., 2021). In developed countries, such as the United Kingdom (UK) and the United States (US), the incidence of cervical cancer has reduced, owing to the implementation of population-wide screening programmes (Jedy-Agba et al., 2020). The incidence rate in Eastern Africa is 40.1 per 100,000 women (Ferlay et al., 2019) compared to the United States of America which has an incidence rate of 7.8 per 100,000 women (Swanson et al., 2018). In Kenya, there are 5250 new cases of cervical cancer recorded each year, and there are 3286 related deaths (MOH, 2018).

Women present with advanced stages of invasive cervical cancer in developing countries where screening rates are low. Up to 90% of cervical cancer mortalities occur in women who are optimally involved in raising families and contributing to the socio-economic development of their communities (Kimani et al., 2012). According to Kenya Health Information System (KHIS), the screening coverage in Isiolo County is 5% (Health Information Systems in Kenya, 2017). One of the strategies for eliminating cervical cancer is through health communication to educate women on the importance of screening and where they can access the service. The global strategy to eliminate cervical cancer proposes a 70% screening level by 2030 for all countries, as a cervical cancer elimination

strategy (WHO, 2020).

A major barrier to cervical cancer screening in rural Kenya is inadequate knowledge (Rosser et al., 2015). The community strategy is an effective method of reaching out to women of reproductive age at the basic health care level where 80% of citizens live (Kimani et al., 2012). Health communication strategies include use of electronic (e.g. internet, radio, social media) and non-electronic (e.g. print media, face-to-face communication) media (RHlhub, 2017). Community health volunteers form part of the community strategy workforce where they play key roles including door-to-door visits to teach health-related preventive methods and collecting data from each household (Kuule et al., 2017; Kawakatsu et al., 2012). The CHVs, in their regular and routine home visits, disseminated information on cervical cancer screening to women at the community using a lesson plan modified from CHVs training module 13. The study was to supplement current initiatives to increase cervical cancer screening uptake in Isiolo County and beyond, supporting the WHO's goal of eradicating cervical cancer by 2030.

## 2. Materials and Methods

### 2.1 Study Population

The study population was women at the community in Isiolo County, Kenya. The County consists of Isiolo, Merti and Garbatulla Sub Counties. The County population is approximated at 268,002 with high illiteracy levels are high, with 20% of the population not having gone to school (Census, 2019). Over 68% of persons in Isiolo County are nomads who live in rural areas where most dwell in temporary houses known as 'Manyattas'. Only 14.5% of the population are formally employed. The study area was divided into 40 functional community health units, with each unit linked to the nearest health facility.

### 2.2 Study Design and Sampling Technique

This study adopted a community-based cluster randomized trial. Cluster randomized trials focus on external validity and effectiveness of public health interventions (Hunter et al., 2013).

Multi-stage sampling method was used to derive the required sample size. Isiolo County was purposively selected for this study. A sampling frame of 40 (forty) community units in Isiolo County was prepared. The community units were then operationalized into clusters. Six clusters were randomly selected from all the clusters using simple random sampling. The six clusters were then randomly assigned into either intervention or control arm of the study. A sample size was computed and apportioned to each arm of study. Every cluster was proportionately allocated the number of households to be included in the study. Systematic random sampling was then used to select the study participants at household level for intervention and control arms.

### 2.3 Sample Size Determination

Hospital based data showed that 5% of women in Isiolo County are screened for cervical cancer (DHIS, 2018)

For a dichotomous outcome of interest, the formula to calculate sample size was adopted from Chan, (2008) as follows;

$$m \text{ (size per arm)} = c \times \frac{\pi^1 (1 - \pi^1) + \pi^2 (1 - \pi^2)}{(\pi^1 - \pi^2)^2}$$

Where  $c = 10.5$  for 90% power and 5% significance,  $\pi^1 =$  first proportion estimate of 0.05 and  $\pi^2 =$  second proportion of 0.15.  $\pi^1 - \pi^2$  is the size difference of importance in the study (effect size).

$$\text{Thus } m = 10.5 \times [0.05(1-0.05) + 0.15(1-0.15)] / (0.05-0.15)^2 = 184$$

Each arm had 184 respondents. An additional 20% was added to each arm of the study to cater for attrition caused by nomadism. Thus, each arm had 222 respondents making a total sample of 444 respondents.

### 2.4 Research Tools and Data Collection Technique

A structured questionnaire was developed and consisted of the respondents' bio data, socio-economic status and socio-demographic characteristics. In addition, knowledge and attitude of the respondents was included in the questionnaire. The study was done in three phases as shown in Figure 1.

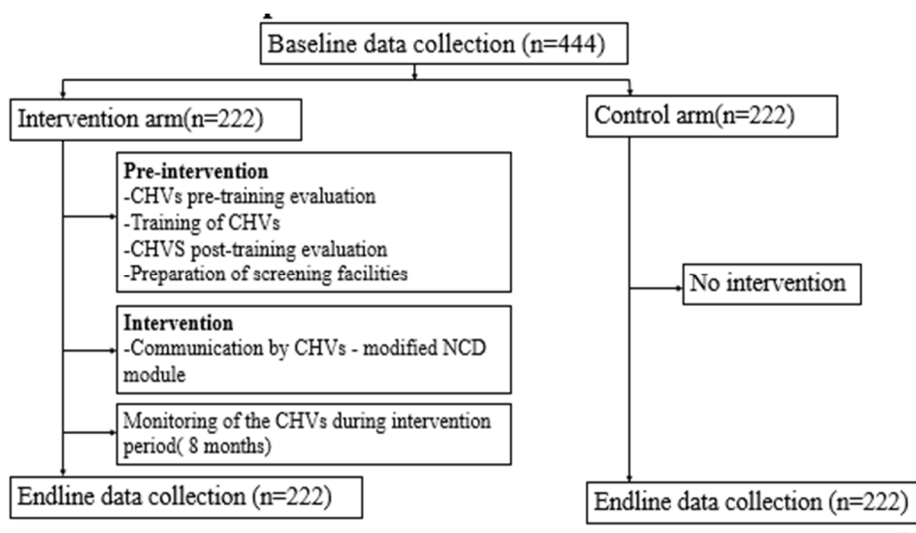


Figure 1. Data collection process

### 3. Results

#### 3.1 Comparative Analysis of the Two Arms of Study

Table 1. Comparison of the sociodemographic and socioeconomic variables of the respondents

| Variable                             | Category       | Intervention arm | Control arm | X <sup>2</sup> | df | P value |
|--------------------------------------|----------------|------------------|-------------|----------------|----|---------|
| Age of the respondent                | 15-24          | 37(8.3%)         | 53(11.9%)   | 8.518          | 4  | 0.074   |
|                                      | 25-34          | 101(22.7%)       | 85(19.1%)   |                |    |         |
|                                      | 35-44          | 70(15.8%)        | 62(14%)     |                |    |         |
|                                      | 45-54          | 11(2.5%)         | 12(2.7%)    |                |    |         |
|                                      | 55-64          | 3(0.7%)          | 10(2.3%)    |                |    |         |
|                                      | Total          | 222(50%)         | 222(50%)    |                |    |         |
| Highest level of education           | Primary        | 27.5%            | 103(23.2%)  | 5.102          | 3  | 0.164   |
|                                      | Secondary      | 7.7%             | 31(7%)      |                |    |         |
|                                      | Post-secondary | 3.2%             | 16(3.6%)    |                |    |         |
|                                      | Non formal     | 11.7%            | 72(16.2%)   |                |    |         |
| Marital status                       | Married        | 169(38.1%)       | 196(44.1%)  | 1.274          | 2  | 0.529   |
|                                      | Single         | 41(9.2%)         | 19(4.3%)    |                |    |         |
|                                      | Widowed        | 12(2.7%)         | 7(1.6%)     |                |    |         |
| Number of children                   | None           | 18(4.1%)         | 11(2.5%)    | 3.1            | 2  | 0.212   |
|                                      | 1-4            | 122(27.5%)       | 157(35.4%)  |                |    |         |
|                                      | 5 and above    | 82(8.5%)         | 54(12.2%)   |                |    |         |
| Income                               | 0-5000         | 98(22.1%)        | 81(18.2%)   | 2.705          | 1  | 0.1     |
|                                      | Above 5000     | 124(27.9%)       | 141(31.8%)  |                |    |         |
| Possession of health insurance cover | Yes            | 79(17.8%)        | 57(12.8%)   | 3.276          | 1  | 0.07    |
|                                      | No             | 143(32.2%)       | 165(37.2%)  |                |    |         |
|                                      | Total          | 222(50%)         | 222(50%)    |                |    |         |

Table 1 shows the comparison of respondents’ socio-demographic and socio-economic characteristics in the study’s control and intervention arms. The two study arms did not significantly differ from one another

3.2 Uptake of Cervical Cancer Screening

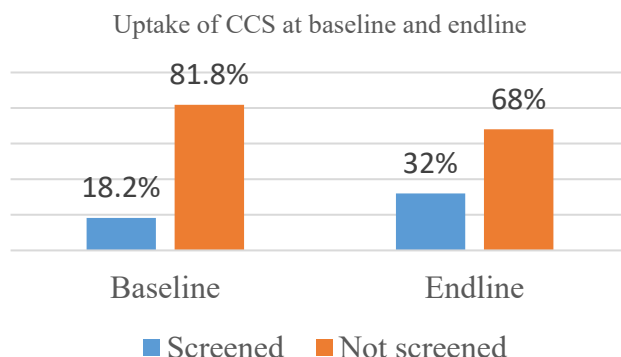


Figure 2. Screening for cervical cancer pre- and post-intervention

Figure 2 indicates that out of the 444 respondents, 81 (18.2%) had ever undergone a cervical cancer screening. However, post-intervention those screened for cervical cancer increased to 142(32%) of the total respondents.

3.3 Existing Strategies Used to Enhance Uptake of Cervical Cancer Screening in Isiolo County

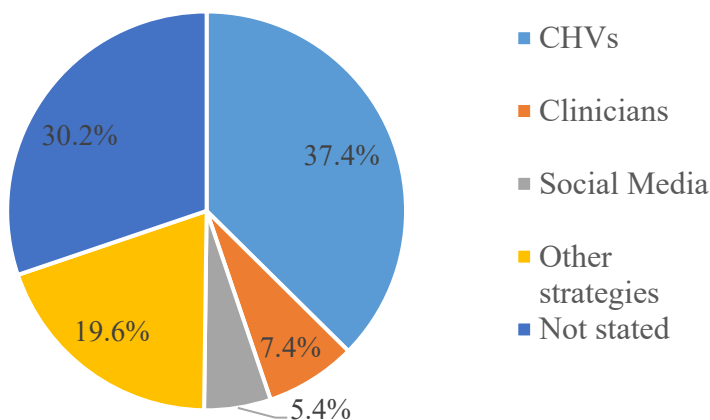


Figure 3. Existing health communication strategies

Figure 3 indicates that out of all the communication strategies, Community health volunteers accounted for 37.4%. This strategy was used to disseminate targeted information on cervical cancer screening as an intervention in this study.

### 3.4 Factors influencing uptake of Cervical Cancer Screening

#### 3.4.1 Comparison of Knowledge Factors for Intervention and Control Arms at Endline

Table 2. Comparison of Knowledge for intervention and control arms at endline

| Variable                              | Category             | Endline             |                |
|---------------------------------------|----------------------|---------------------|----------------|
|                                       |                      | Intervention(n=222) | Control(n=222) |
| Awareness of gynecological diseases   | Yes                  | 123(55.4%)          | 107(48.2%)     |
|                                       | No                   | 99(44.6%)           | 115(51.8%)     |
| Name of gynecological disease         | Cervical cancer      | 40(18.0%)           | 6(2.7%)        |
|                                       | Others               | 82(36.9%)           | 100(45.0%)     |
|                                       | Not Stated           | 100(45.0%)          | 116(52.3%)     |
| Awareness of cervical cancer          | Yes                  | 164(73.9%)          | 100(45.0%)     |
|                                       | No                   | 58(26.1%)           | 122(55.0%)     |
| Definition of cervical cancer         | Correct definition   | 46(20.7%)           | 24(10.8%)      |
|                                       | Incorrect definition | 119(53.6%)          | 138(62.2%)     |
|                                       | Not stated           | 57(25.7%)           | 60(27.0%)      |
| Signs and symptoms of cervical cancer | Correct signs        | 129(58.1%)          | 87(39.2%)      |
|                                       | Incorrect signs      | 25(11.1%)           | 24(10.8%)      |
|                                       | Not stated           | 68(30.6%)           | 111(50.0%)     |

Table 2 indicates that at endline, awareness of gynecological diseases was more in the intervention arm 123(55.4%). Those who named cervical cancer as a gynecological disease in the intervention arm were 40(18.0%) while in the control arm were only 6(2.7%).

#### 3.4.2 Knowledge Factors at Baseline and Endline

Table 3. Knowledge variables associated with uptake of cervical cancer screening

| Variable                          | Data round | Category        | Screened  | Not Screened | p-value |
|-----------------------------------|------------|-----------------|-----------|--------------|---------|
| Gynecological diseases awareness  | Baseline   | Yes             | 51(27.6%) | 134(72.4%)   | 0.00    |
|                                   |            | No              | 30(11.6%) | 229(88.4%)   |         |
|                                   | Endline    | Yes             | 91(39.6%) | 139(60.4%)   | 0.00    |
|                                   |            | No              | 51(23.8%) | 163(76.2%)   |         |
| Name of any gynecological disease | Baseline   | Cervical cancer | 5(55.6%)  | 4(44.4%)     | 0.00    |
|                                   |            | Others          | 46(26.1%) | 130(73.9%)   |         |
|                                   |            | Not Stated      | 30(11.6%) | 229(88.4%)   |         |
|                                   | Endline    | Cervical cancer | 20(43.5%) | 26(56.5%)    | 0.002   |
|                                   |            | Others          | 70(38.5%) | 112(61.5%)   |         |
|                                   |            | Not Stated      | 52(24.1%) | 164(75.9%)   |         |
| Cervical cancer awareness         | Baseline   | Yes             | 48(28.2%) | 122(71.8%)   | 0.00    |
|                                   |            | No              | 33(12%)   | 241(88%)     |         |

|                            |          |            |            |            |      |
|----------------------------|----------|------------|------------|------------|------|
|                            | Endline  | Yes        | 133(40.5%) | 195(59.5%) | 0.00 |
|                            |          | No         | 9(7.8%)    | 107(92.2%) |      |
| Cervical cancer definition | Baseline | Correct    | 14(38.9%)  | 22(61.1%)  | 0.00 |
|                            |          | Incorrect  | 34(26%)    | 97(74%)    |      |
|                            |          | Not stated | 33(11.9%)  | 244(88.1%) |      |
|                            | Endline  | Correct    | 29(41.4%)  | 41(58.6%)  | 0.00 |
|                            |          | Incorrect  | 104(40.5%) | 153(59.5%) |      |
|                            |          | Not stated | 9(7.7%)    | 108(92.3%) |      |
| Cervical cancer signs      | Baseline | Correct    | 34(27.9%)  | 88(72.1%)  | 0.28 |
|                            |          | Incorrect  | 14(26.4%)  | 39(73.6%)  |      |
|                            |          | Not stated | 33(12.3%)  | 236(87.7%) |      |
|                            | Endline  | Correct    | 76(35.2%)  | 140(64.8%) |      |
|                            |          | Incorrect  | 12(24.5%)  | 37(75.5%)  | 0.00 |
|                            |          | Not stated | 54(30.2%)  | 125(69.8%) |      |

Table 3 indicates that there was a significant association between cervical cancer screening and awareness of gynecological diseases ( $p$ -value<0.01). At endline awareness of cervical cancer increased from 28.2% to 40.5% ( $p$ -value<0.01). All other knowledge variables were significantly associate with uptake of cervical screening at endline.

### 3.5 Regression analysis of knowledge factors at end line

Table 4. Knowledge determinants of cervical cancer screening at end line

| Variable                              | Category         | Sig.  | Exp(B)       | 95% CI Exp(B) |       |
|---------------------------------------|------------------|-------|--------------|---------------|-------|
| Awareness of gynecological diseases   | No (Ref)         |       | 1            | 0.019         |       |
|                                       | yes              | 0.502 | 0.363        | 7.026         |       |
| Name of gynecological disease         | Not Stated (Ref) | 0.83  | 1            | 0.023         |       |
|                                       | Cervical cancer  | 0.636 | 0.482        | 0.029         | 9.9   |
|                                       | Others           | 0.715 | 0.574        | 11.241        |       |
| Awareness of cervical cancer          | No (Ref)         |       | 1            | 0.016         |       |
|                                       | Yes              | 0.597 | 0.413        | 10.887        |       |
| Definition of cervical cancer         | Not Stated (Ref) | 0.709 | 1            | 0.009         |       |
|                                       | Correct          | 0.416 | 0.254        | 0.01          | 6.906 |
|                                       | Incorrect        | 0.407 | 0.252        | 6.547         |       |
| Signs and symptoms of cervical cancer | Not stated (Ref) | 0     | 1            | 1.802         |       |
|                                       | Correct          | 0.001 | <b>3.849</b> | 1.404         | 8.223 |
|                                       | Incorrect        | 0.003 | 2.657        |               |       |

Table 4 indicates that the respondents who correctly named the signs and symptoms of cervical cancer were 3.849 times more likely to be screened than those who did not state any sign and symptom (OR 3.849,  $p$  = 0.001; CI.1.802-8.223).

3.6 Effect of Health Communication Intervention on Uptake of Cervical Cancer Screening

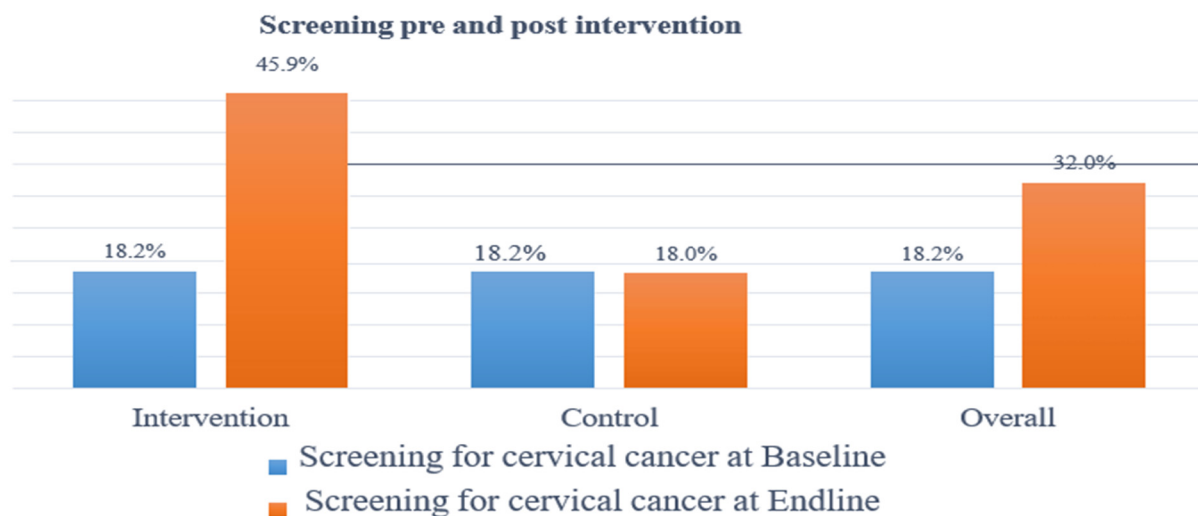


Figure 4. Comparison of uptake at baseline and endline

Figure 4 indicates that overall, 81 (18.2%) of all respondents had been screened at baseline. At endline, 102(45.9%) were screened in the intervention while 40(18%) were screened in the control arm.

3.7 Regression Analysis of Health Communication at Endline

Table 5. The effect of health communication on cervical cancer screening uptake

| Arm of study | B     | df | Sig. | Exp(B) | 95% C.I.for EXP(B) |      |
|--------------|-------|----|------|--------|--------------------|------|
| Control      | -     | -  | -    | 1      | -                  | -    |
| Intervention | 1.353 | 1  | 0    | 3.867  | 2.51               | 5.96 |

Table 5 indicates that the respondents who received health communication were 2.265 times more likely to be screened than those who did not receive health communication (OR 3.867, CI.1.802-8.223, P < 0.001).

4. Discussion

In Isiolo County, the uptake of cancer of cervix screening among women was low in the outset.

According to research findings (Ngugi et al., 2012; Were et al., 2012; Ng’ang’a et al., 2018), cervical cancer screening levels in Kenya are low, below the anticipated national target (Kenya National Screening Guidelines, 2018). The uptake is similarly low in other developing countries (Lyimo & Beran, 2012; Tiruneh et al., 2017). However, in developed countries, the level of uptake for cervical cancer screening is high due to effective screening programmes (Vaccarella et al., 2017; Dessalegn Mekonnen, 2020).

Some of the respondents indicated that they had never been screened for cervical cancer. Their reasons for not screening were; being busy, lack of knowledge about screening and others did not have any reason at all. (Kisiangani et al., 2019) identified reasons for not screening as lack of knowledge and fear of screening. Another study found out that women were not screened because they had never heard about the disease and financial problems (Aweke et al., 2017).

The existing health communication strategies in Isiolo County were limited in addressing cervical cancer. At baseline, it was noted that cervical cancer screening information was minimally disseminated by the Community Health Volunteers, as they concentrated on other health-related issues such as antenatal care, breastfeeding,

hygiene and covid-19 pandemic (Wanja, 2018; Sohrabi et al., 2020; Kisiangani et al., 2019). However, at endline, the respondents indicated that the Community Health Volunteers communicated about cervical cancer screening in the intervention arm of study. Studies have showed that face-to-face education intervention to be effective in cervical cancer screening and subsequently increasing uptake strategy was also used by healthcare workers at the facility level to disseminate information on cervical cancer screening. However, the communication on cervical cancer screening was minimal as most of the respondents indicated that the healthcare workers communicated about other health conditions, particularly COVID-19. This was as a result of the country and the world dealing with the COVID-19 pandemic at the time of study (Sohrabi et al., 2020; Kisiangani et al., 2019). The behavior of women about cervical cancer screening was found to be improved by face-to-face intervention (Naz et al., 2018). By lowering barriers to cervical cancer screening, a face-to-face educational intervention can help to boost uptake (Coronado et al., 2015; Naz et al., 2018).

Other communication strategies used to enhance of cervical cancer screening at the county included: social media; friends, family and religious gatherings. It was noted that 30.2% of the study respondents did not mention any communication strategy used to enhance cervical screening at baseline. One of the main causes of the low uptake of screening for cervical cancer has been identified as a lack of information (Aswathy et al., 2012) whereas adequate information improves rates of screening (Naz et al., 2018).

Most improvement of knowledge variables was realized in the intervention arm of study. The study's intervention arm had more respondents than the control arm who could define the term "cervical cancer." ( $p = 0.001$ ). At endline, the respondents who correctly named cervical cancer signs and symptoms were three times more likely to be screened as compared to those who did not correctly name the signs and symptoms. In comparison to the control arm, the intervention arm respondents had more knowledge at endline. Respondents with increased knowledge were 3.849 times more likely to be screened than those with inadequate knowledge. According to a research conducted in the counties of Tharaka-Nithi and Isiolo to determine knowledge of cervical cancer screening, respondents had insufficient knowledge, which hindered the rate of uptake (Ngari et al., 2021).

A study in Ethiopia, on knowledge of cervical cancer, concluded that inadequate knowledge was a potent barrier to screening. Community-based interventions to disseminate knowledge on cervical cancer screening were recommended with a resultant effect of increased uptake (Chaka et al., 2018). Increased uptake was reported in a study that determined the association between level of knowledge and cervical cancer screening (Agboola & Bello, 2021). Another study in Ivory Coast showed that over half of the respondents in a study on cervical cancer screening were aware of cervical cancer (Boni et al., 2021). Adequate knowledge of cervical cancer screening was reported in a study among Brazilian women (Stormo et al., 2014). Other studies that have associated cervical cancer screening with increased uptake include (Agboola & Bello, 2021, Boni et al., 2021 and 2014 and Musa et al., 2017). Despite inadequate knowledge, there was an increase in the uptake of screening for cervical cancer in a Cameroonian study (Ekane et al., 2015).

Pre-intervention uptake of screening for cancer of cervix was 18.2%; post-intervention uptake in the intervention arm was 45.9%; post-intervention uptake in the control arm was 18.0%. Cervical cancer screening uptake was significantly associated with intervention, with respondents who received health communication being 3.867 times more likely to be screened than respondents who did not. Studies where Community Health Volunteers provided information on cervical cancer screening to the community revealed increased adoption of cervical screening. (Goodman & Nour, 2014; Lott et al., 2020; Chigbu et al., 2017). Another study carried out in Nigeria showed that health education increased the uptake of cervical cancer screening among respondents in the intervention arm compared to the control arm of the study (Abiodun et al., 2014). The percentage of women screened between the intervention and control arms of the study pre- and post-intervention did not significantly differ in another health education intervention study, though (Gana et al., 2017).

## 5. Conclusion

Cervical cancer screening rates were low prior to intervention. Some of the reasons for not screening were; inadequate knowledge, fear of being screened and feeling healthy thus requiring no screening. Increased knowledge of cervical screening post-intervention was significantly associated with increased uptake.

The factors which were found to influence cervical cancer screening post-intervention included knowledge and attitude. Post-intervention there was a positive change of attitude in the intervention arm of the study which was significantly associated with increased uptake. Increased knowledge was shown in the study's intervention arm and was significantly associated with higher uptake of cervical cancer screening.

There were limited health communication strategies used to enhance cervical cancer screening at the county level.



Empowered Community Health Volunteers were shown to be effective in disseminating health communication about cervical cancer screening.

Post-intervention results showed that the respondents who received health communication on cervical cancer screening were more likely to be screened compared to those who did not. The association between health communication by Community health volunteers and uptake of cervical cancer screening was statistically significant (p-value < 0.01).

## 6. Recommendations

According to the study's findings, community health volunteers need to include health communication about cervical cancer screening as part of a community strategy to increase uptake of screening. Among the existing communication strategies to enhance Community Health Volunteers need to be empowered to disseminate specific cervical cancer screening information.

## Limitations

The study limitations were: nomadism in Isiolo County and extreme arid and semi-arid weather conditions;

## Ethical Approval

The National Commission for Science, Technology, and Innovation granted permission (ref.no. 858649) to conduct the study, and the Ethical Review Committee provided ethical approval (ref.no. KU/ERCAPPROVAL/VOL. 1). Administrative clearance was granted by the county government of Isiolo (Ref.no. ICG/DHS/TT/R/21.03.01)

## Competing Interests Statement

There are no conflicting interests or potential conflicts of interest, according to the authors.

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