



# Using Film to Disseminate Information on Cervical Cancer Prevention in Lusaka: Results from a Small Intervention Study

Anayawa Nyambe<sup>1,2,3</sup> · Jarl K. Kampen<sup>4,5</sup> · Stridutt K. Baboo<sup>6</sup> · Guido Van Hal<sup>7</sup>

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## Abstract

In order to prevent the spread of cervical cancer, people must be aware and knowledgeable about the available preventive practices such as screening and vaccination. The purpose of this study was to determine the extent that film is effective in disseminating information on cervical cancer and its prevention to women and men in Lusaka. A pilot intervention study was carried out at churches in Lusaka city from August to September 2017. A sample size of 38 women and 43 men filled in both baseline and follow-up questionnaires. A knowledge grade (range, 1–10 points) which linked causes to risk factors for cervical cancer was used to assess the knowledge of a respondent. Significant results ( $p < 0.01$ ) were obtained at follow-up for watching the film and having awareness and knowledge. The main finding is that a short informational film can be an effective means of disseminating information on cervical cancer and its prevention to women and men.

**Keywords** Cervical cancer · Intervention · Knowledge · Film · Zambia

## Introduction

In Zambia, cervical cancer remains the most common cancer among women [1]. Approximately 35% of all cancers managed at the Cancer Disease Hospital are cervical cancers [2]. Screening and vaccination serve as the main secondary and

primary preventive measures against cervical cancer. In 2006, free cervical screening, primarily via visual inspection with acetic acid, was introduced in Zambia [3]. Then, in 2013, the Human papillomavirus (HPV) vaccine Gardasil was piloted, targeting grade 4 schoolgirls and 10-year-old out-of-school girls [4, 5]. Furthermore, since cervical cancer is sexually transmitted, male circumcision [1] and practicing safe sex are also encouraged [6–8]. Other forms of prevention include behavior change, such as not practicing vaginal douching [9, 10], not smoking, and limiting oral contraceptive use to reduce promiscuity [6–8].

Among the main factors that inhibit the use of cervical cancer prevention methods as identified by the Social Ecological Model (SEM) and the Theory of Triadic Influence (TTI) are lack of awareness and knowledge of cervical cancer and the availability of prevention services [11]. The general public of Zambia has been sensitized by using peer educators, the media (television, radio), and printed materials (leaflets). However, studies have shown that the levels of awareness and knowledge of cervical cancer among Zambian populations are low [12]. It has been demonstrated that film may be an effective way of disseminating information on cervical cancer. An intervention study in Nigeria found that the level of awareness of cervical cancer and screening increased to 100%, and the proportion of women with very good knowledge rose from 2 to 70.5%, following structured

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✉ Anayawa Nyambe  
anayawa@gmail.com

<sup>1</sup> Faculty of Medicine and Health Sciences, University of Antwerp, Antwerp, Belgium

<sup>2</sup> Lusaka, Zambia

<sup>3</sup> Present address: Antwerp, Belgium

<sup>4</sup> Biometris, Wageningen University, Wageningen, Netherlands

<sup>5</sup> StatUA (Core Facility for Statistical Analysis), University of Antwerp, Antwerp, Belgium

<sup>6</sup> Department of Public Health and Tropical Medicine, University of Zambia, Lusaka, Zambia

<sup>7</sup> Department of Epidemiology and Social Medicine, University of Antwerp, Antwerp, Belgium

health education based on a movie [13]. A study conducted in the USA among deaf and hearing women found that knowledge for both groups was improved by watching a graphic cervical cancer education video in American Sign Language with English open captioning and voice overlay [14]. Another study in the USA found that knowledge increased when watching a narrative and non-narrative film containing cervical cancer facts [15]. From these studies, the following can be suggested:

- (a) Watching a short film on cervical cancer will increase awareness of cervical cancer.
- (b) Watching a short film on cervical cancer can increase knowledge about risk factors and the prevention of cervical cancer.

Our study aims to determine the extent to which film is effective in disseminating information on cervical cancer and its prevention to women and men who reside in Lusaka City. It will contribute to improving future health promotion campaigns by providing evidence that showing a short film containing important information on cervical cancer prevention from different sources is an effective means of sensitizing the general public.

## Method

### Study Design, Site and Population

A pilot intervention study was carried out from August to September 2017. The respondents included women and men from the general public. According to the last national census, in 2010, 75.3 and 20.2% of Zambians above the age of 15 are Protestants and Catholics, respectively [16], making Christians a key target group. The study participants were randomly assigned to one of two groups: the experimental group receiving the intervention (i.e., watching a short 6-min film on cervical cancer and its prevention) and a comparison group (controls) that did not watch the film. These groups were followed prospectively to assess the effectiveness of the intervention, comparing those who received the intervention with those who did not.

To allow for easy recruiting, the study took place at churches located in suburban (one catholic and three protestant) and compound (one catholic and one protestant) neighborhoods of Lusaka City. The suburbs are considered to have a higher standard of living than compounds. These six churches were chosen based on size, accessibility, and Christian denomination to ensure variety of views. Inclusion criteria for respondents to participate in this research were that they must be either female or male adults, aged 18 years and above, and attending one of the selected churches. Women

with cervical cancer or respondents with relatives with cervical cancer were not specifically targeted in this study. This resulted in a sample size of 52 women and 49 men at baseline, when 51 of them received the intervention. At follow-up, 38 women and 43 men returned to fill in follow-up questionnaires. As a pilot study, this small sample size number was chosen in order to assess feasibility and detect effect size. The identities of the respondents and the information they provided were treated as confidential. Approval for conducting this study was obtained from Eres Converge (Lusaka, Zambia).

### Instruments and Measures

Baseline surveys and follow-up questionnaires were used to collect data from the study participants with indicators of behavior at intrapersonal, interpersonal, and environmental levels as suggested by the SEM and TTI. The baseline survey was used to assess the initial level of knowledge of participants before participation in the intervention and consisted of 11 questions. The follow-up questionnaires were an extended version of the baseline survey. They were divided into a 6-question demographics section (2 intrapersonal items, 1 interpersonal item and 3 environmental items) and a cervical cancer section with 17 questions for women (13 intrapersonal and 4 environmental items) and 16 questions for men (10 intrapersonal items, 2 interpersonal items and 4 environmental items). The cervical screening questions focused on women's screening practice and men's support of a partner; while vaccination questions were directed towards views on vaccinating children and not themselves. Additional file 1 contains the complete baseline and follow-up questionnaires [see ESM 1].

The questions were primarily closed questions with a few open questions where respondents were required to briefly explain their answer. The instruments were self-administered and designed based on the indicators of health behavior as suggested by the TTI and SEM. Each question was either adapted from other studies or developed by the authors of this research. The indicators of behavior at intrapersonal level under consideration in this article included age, education level [17], and awareness of cervical cancer, as well as knowing the risk factors/causes and preventive factors of cervical cancer. At interpersonal level, only living status was assessed [18]. Lastly, environmental level items included employment, money use [17], and religion [17].

### Operationalization of Knowledge of Cervical Cancer

Knowledge was only assessed if a respondent said that they had awareness of cervical cancer and was operationalized by being given a knowledge grade. The knowledge grade (range, 1–10 points) linked risk factors/causes to protective factors of

cervical cancer. The risk factors (HPV infection, practicing unsafe sex, becoming sexually active at a young age, having a STI, having many sexual partners, smoking, using contraceptives, vaginal douching) and protective factors (attending regular screening, HPV vaccination, practicing safe sex, being circumcised, not becoming sexually active at a young age, being faithful to one sexual partner, not smoking, not taking contraceptives, no vaginal douching) were identified on the basis of the scientific literature as seen in the introduction.

The knowledge grade was set up in such a way that respondents were awarded points when they correctly identified risk and protective factors, and penalized for erroneously assigned risk or protective factors. The fundamental cause (HPV infection) and protective factors (screening, vaccination, and practicing safe sex) were given a higher reward or penalty of three points. The remaining risk and protective factors were rewarded or penalized by one point. Only the items of becoming pregnant at a young age, being old, and heredity are neither a (real) protective nor a (real) risk factor for cervical cancer and given a negative point if selected. The knowledge grade was computed as the sum of all “knowledge grades,” and then adjusted by adding the lowest possible total grade (28), dividing the result by the maximal grade (56), and finally multiplying by 10, so that the knowledge grade ranged between 0 (lowest) and 10 (highest). The knowledge grade formula is available in Additional file 2 [see ESM 2]. Respondents who did not know about cervical cancer were not asked questions about risk and protective factors and excluded from analyses concerning the knowledge grade.

### Development of the Film

The film for the intervention was created by combining sections of YouTube health promotion video clips on cervical cancer in Zambia with subtext or added captions [19–21]. Efforts were made to get permission from the owners of the YouTube video clips but they did not respond. The film was therefore made exclusively for the research without distribution, even though the YouTube clips are available online for public viewing. Information on risk and prevention factors that were lacking from the YouTube clips was added to the film. This additional text information on risk factors and protective factors came from the cervical cancer leaflet developed by the Cervical Cancer Prevention Program in Zambia (CCPPZ) [22]. The film was in English, which is the official language of Zambia [16].

The 6-min film was divided into six topics. The first topic explained what cervical cancer is, in the form of a narrative with subtext given by a Zambian medical doctor [23]. The next topic was cervical cancer in Zambia, which was narrated with subtext by specialists [19]. This topic was followed by risk factors which were written as text only from the CCPPZ leaflet [22]. The section on symptoms was narrated

by a specialist, with added captions [20]. The topic on cervical cancer prevention was text only, from the CCPPZ leaflet [22]. At the end, there was a true life story narrated with subtext by a Zambian lady whose mother had passed away from the cancer [21]. A projector was used to air the film from a laptop. The intervention groups only watched the film once.

### Sampling Design

Permission was obtained from churches and meeting dates were arranged. Respondents volunteered to be part of the study. As an ethics requirement, on the first day, all respondents were informed about the research, which would require filling in a baseline survey and after approximately 3 weeks of a follow-up questionnaire. Half of the respondents were randomly selected to watch the film by picking every second person according to gender. The intervention groups stayed behind and watched the film after the control group had left. The baseline survey and the follow-up questionnaires were self-administered and data collectors provided assistance if necessary without giving information which might influence the awareness or knowledge.

### Data Analysis

The quantitative data collected from the baseline survey and follow-up questionnaire was entered into excel for ease of entry. The open-ended questions were grouped into themes and coded to simplify analysis. The data was then transferred to Statistical Package for the Social Sciences (SPSS) software for windows, where it was cleaned for any errors in entry, and statistical analysis was carried out. Descriptive statistics were used to characterize the data. Chi-square and independent *t* tests were run to test the composition of the control and experimental groups as to eliminate any possible confounding variables. The variables for knowledge of cervical cancer risk factors/causes and protective factors were assessed as a combined knowledge grade. To do this, the dependent variables of cervical cancer awareness and knowledge (risk factors, prevention factors) in relation to participating in the intervention were analyzed, using independent and paired *t* tests to see the relationships between and within groups. The statistical significance level was set at 1%.

## Results

### Socio-Demographics and Cervical Cancer Practices

Socio-demographic characteristics (age, education level, employment, income, religion, and living status) were collected during the follow-up questionnaires. A total of 20 respondents

**Table 1** Effects of watching the film on having awareness of cervical cancer

		Do you know what cervical cancer is?		Paired sample <i>t</i> test			
Intervention		Baseline <i>M</i> (SD)	Follow-up <i>M</i> (SD)	<i>t</i>	<i>df</i>	<i>p</i>	95% CI
Watched film ( <i>N</i> = 43)		0.65 (0.48)	0.95 (0.21)	-4.3	42	<0.001	[-0.45, -0.16]
Did not watch film ( <i>N</i> = 40)		0.68 (0.47)	0.68 (0.47)	0.001	39	1.000	[-0.07, 0.07]
Independent sample <i>t</i> -test	<i>t</i>	-0.2	3.4*				
	<i>df</i>	81	53.3*				
	<i>p</i>	0.821	0.001*				
	95% CI	[-0.23, 0.19]	[0.12, 0.44]				

\*Equal variance not assumed

(women *N* = 14, men *N* = 6) did not return for follow up. Only 40.0% (*N* = 8) of them watched the intervention film. No significant differences were found between the respondents who dropped out of the study and those who participated at both baseline and follow-up.

The ages of the respondents who participated at both base line and follow-up (women *N* = 40, men *N* = 43) were distributed between 20 and 73 years (*M* = 37.83, *SD* = 15.68). The largest group (*N* = 22, 26.5%) had attended university education without completion; 19.3% (*N* = 16) had completed secondary education and 14.5% (*N* = 12) had obtained a college diploma. Furthermore, 34.9% (*N* = 29) of respondents were students and 27.7% (*N* = 23) were full-time employees. Income level was expressed as the availability of income in the past year, where respondents reported either saving money (*N* = 30, 36.1%), just getting by (*N* = 25, 30.1%), spending some savings (*N* = 29, 34.9%), or spending savings and borrowing money (*N* = 10, 12.0%). Over half of the population identified as Christian Protestants (*N* = 53, 63.9%) and 30.1% (*N* = 25) as Catholics. Only 30.0% (*N* = 12) of women had attended cervical screening. Only a few men (*N* = 8, 18.6% at baseline; *N* = 13, 30.2% at follow-up) reported being aware that their partners had undertaken screening. Equally, very few women (*N* = 8, 20.0%) and men

(*N* = 6, 14.0% at baseline; *N* = 10, 23.3% at follow-up) reported having their daughters vaccinated. Regarding the intervention, 51.8% (*N* = 43) of the respondents who participated at both baseline and follow-up watched the film. There were no significant results found between the social demographic characteristics of the control group and the experimental group.

### Film and Awareness of Cervical Cancer

Awareness of cervical cancer was assessed by asking, “Do you know what cervical cancer is?” and responses were “yes,” “no,” and “not sure” for all respondents. In analysis, the responses “no” and “not sure” were combined for the analysis because of scarcity. The results in Table 1 show the relationship between watching the film and having awareness of cervical cancer. At the baseline measurement, the experimental group (watched the film) and the control group (did not watch the film) have the same level of awareness (independent sample *t* statistic is not significant). The experimental group has significantly higher awareness than the controls at the second measurement (*N* = 43, independent sample *t* = 3.4, *p* = 0.001), while awareness for controls has not changed between baseline and follow-up measurement (*N* = 40, paired sample *t* statistic is not significant). Watching the film

**Table 2** Effects of watching the film on knowledge of cervical cancer

		Knowledge		Paired sample <i>t</i> -test			
Intervention		Baseline <i>M</i> (SD)	Follow-up <i>M</i> (SD)	<i>t</i>	<i>df</i>	<i>p</i>	95% CI
Watched film ( <i>N</i> = 37)		4.59 (2.16)	6.53 (2.00)	-6.0	36	<0.001	[-2.58, -1.28]
Did not watch film ( <i>N</i> = 35)		3.69 (1.95)	3.80 (2.26)	-0.5	34	0.639	[-0.54, 0.34]
Independent sample <i>t</i> test	<i>t</i>	1.9	5.4				
	<i>df</i>	70	70				
	<i>p</i>	0.068	<0.001				
	95% CI	[-0.07, 1.87]	[1.72, 3.73]				

significantly increases awareness ( $N=43$ , paired sample  $t=4.3$ ,  $p<0.001$ ).

### Film and Knowledge of Risk Factors and Protective Factors

Only respondents who said “yes” and “not sure” for having awareness of cervical cancer were asked questions on knowledge of cervical cancer risk and protective factors. Table 2 shows the results of the effect of watching the film on knowledge by way of the knowledge grade that links risk factors to protective factors for cases where measurements were made at both baseline and follow-up.

### Discussion

The data provided strong evidence in favor of Hypothesis (a) that watching a short film on cervical cancer will increase the awareness of cervical cancer. As seen from the differences of levels of awareness between baseline and follow-up measurement in the experimental group (Table 1), awareness of participants increased after watching the film. A similar increase is not observed in the control group who had comparable levels of awareness at the start of the experiment.

Hypothesis (b), stating that watching a short film on cervical cancer can increase knowledge on the risk factors and protective factors was also found to be true in our experiment. As seen in Table 2, respondents who did not know about cervical cancer learned new information, and those who already knew something increased their level of overall knowledge. These findings support previous literature [13–15]. Nevertheless, it is suggested that a future study should be conducted that specifically assesses the relationship between watching an informational film and the practice of screening and vaccination. The increase in the number of correctly identified factors may have been affected by the format and amount of data available in the film. Risk factors and protective factors were placed as text that was read by respondents, while other information (definition, symptoms, and life experience) were narrated. Although data collectors were available to assist respondents when needed, a modified film would be necessary to effectively reach those who may be illiterate or more comfortable using one of the seven main local languages other than English.

### Conclusion

Our small intervention study supports the overall conclusion that a short informational film is an effective means of disseminating information on cervical cancer and its prevention to women and men. The main limitations of the study are due to

sampling and location. The low rate of volunteering could have been improved by increasing the research time span and perhaps providing participant remuneration. Participants were recruited from churches in Lusaka but this is not representative of all Zambians. A future wide-scale study targeting churches, schools, and other places is recommended to assess knowledge and actual practice of cervical cancer prevention measures. The film should be made in the local language of the target group to avoid any language barriers.

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### Compliance with Ethical Standards

**Ethics Approval and Consent to Participate** Ethical clearance was obtained from Eres Converge in Lusaka Zambia, reference number 2017-June-016 valid from 24 July 2017 to 23 July 2018. This research obtained consent from all respondents and their identities and information they provided are confidential.

Clearance for publication was obtained from the National Health Research Authority of Zambia, Ministry of Health.

**Consent for Publication** Not Applicable.

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Abbreviations** CCPPZ, Cervical Cancer Prevention Program in Zambia; CDC, Centers for Disease Control and Prevention; CSO, Central Statistical Office; HPV, human papillomavirus; SCCA, Stop Cervical Cancer in Africa; SEM, Social Ecological Model; TTI, Theory of Triadic Influence; WHO, World Health Organization

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